ALIKI ENERGY SINGLE MEMBER P.C.

ENVIRONMENTAL IMPACT ASSESSMENT

ABOUT THE PROJECT

ENVIRONMENTAL IMPACT STUDY OF WPP WITH A TOTAL CAPACITY OF 34.5MW, AT THE "MAVRODASOS" SITE, MIKRO DERIO, M.U.ORFEAS, Municipality of SOUFLI, R.U. EVROS, R.EASTERN MACEDONIA & THRACE

About Aliki Energy SINGLE MEMBER P.C.
Vasilikos Panagiotis

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JULY, 2024

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CHAPTER 1 - INTRODUCTION

1.1 Project Title

This Environmental Impact Study (EIS) is carried out within the framework of the procedure for the Approval of Environmental Terms of a Wind Power Plant (WPP) and was prepared within the framework of the Ministerial Decision oiko. 170225/2014 (Government Gazette 304/Β΄/02-02-2018) and therefore legislative regulations (see 16.8 Institutional framework of study). The title of the work is: "Construction and operation of a Wind Power Plant (WPP) at the "Mavrodasos" site, consisting of eight (8) wind turbines type V136-4.5MW, with a total capacity of 34.5MW, and its accompanying works in the Municipal Unit of Orfeas, the Municipality of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace, the company under the name Aliki Energy SINGLE MEMBER P.C."

1.2 Type and size of the project

This study deals with the environmental impacts arising from the construction and operation of a Renewable Energy Sources project and specifically a Wind Power Plant (WPP). The WPP is in the location "Mavrodasos", falls within the Municipal Unit Orfeas, the Municipality of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace. The WPP consists of eight wind turbines with a nominal power of 4.5MW and a maximum power of 4.3125MW each, of the construction company Vestas, type V136 – 4.5MW. The total power of WPP amounts to 34.5MW and the area of its 2 neighboring polygons to 509.002.91 sq.m and 179.276.97 sq.m.

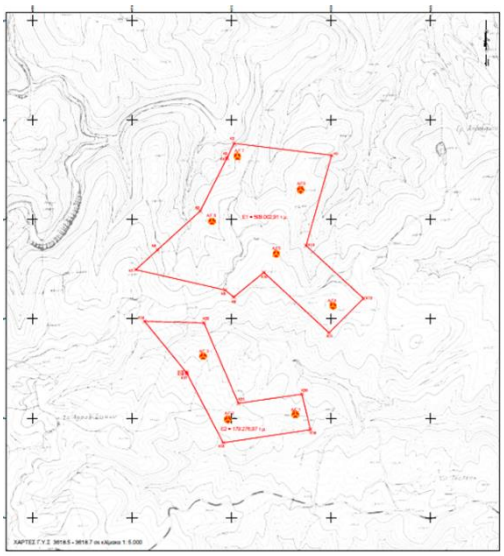


Figure 1: Mapping of the area of land parcels at the location "Mavrodasos"

The table below presents the basic characteristics of the studied WPP.

POSITION	POWER (MW)	TYPE W/T	W/T NUMBER
Mavrodasos	34,5	V136-4,5MW (downrated στα 4,3125MW)	8

Table 1: Key characteristics of WPP

The purpose of WPP is the optimal utilization of wind potential in the installation area for electricity production. Thus, the proposed project consists of eight (8) three-bladed wind turbines

of the construction company Vestas indicative type V136-4.5MW each with an impeller diameter of 136m, with a pillar height of 105m. Therefore, mechanical energy will be converted into electricity, through the electric generator of each wind turbine. Each W/T will be connected to the Medium Voltage (M.V.) network of WPP through a suitable substation (transformer) included within their fuselage. The connection of the eight (8) wind turbines to the national electricity transmission network will be via underground lines/cables of medium voltage 33kV that will start from the fuselage of each wind turbine and will end at the prefabricated control settlement. From there, an underground line of suitable M.V. cross-section (33KV) will start and will end at the existing proposed voltage lifting substation named PATRIARCHS, whose position is reflected in the interconnection map attached to this study. As discussed in the following chapters, this study concerns an important project in the field of utilization of renewable energy sources, which will have a substantial contribution to the reduction of air pollution and greenhouse gas emissions resulting from the combustion of conventional fossil fuels.

1.3 Geographical Location and Administrative Affiliation of a Project or Activity

1.3.1 Location

The area of development of the studied WPP and its accompanying projects is located within the Municipal Unit of Orfeas, the Municipality of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace. The project under consideration is located outside the General Urban Plan, outside the city plan – residential area and statutory settlement boundaries. The closest settlements to the study area are the following:

A/A	NAME OF SETTLEMENT	POPULATION AT CENSUS 2021	DISTANCE OF THE SETTLEMENT CENTRES FROM THE NEAREST W/T (km)
1	Roussa	383	3,4
2	Gonikon	300	7,3
3	Mikro Dereio	91	3,9

Table 2: Data of agglomerations in the vicinity of projects in straight lines

In the area of the Municipality of Soufli, where the WPP is located, neither general urban plans nor Plans of Open city spatial and housing organization plan (OCSHOP.) have been established. The substation named "PATRIARCHS" where the project is to be connected belongs to the Municipality of Arriana where there is no GSP and OCSHOP. In the Regional Unit of Rodopi, where the Municipality of Arriana belongs, there is an area of Specially Regulated Town Planning, in which the substation belongs in territorial unit 4 (mountainous area), as shown in the extract of the map. In the wider area, however, the GUP of the Municipality of Alexandroupolis is being prepared, which was initially approved by the Government Gazette 9Δ/14-1-1988, then as amended by the Government Gazette 844 Δ' / 25-11-1999 and is now at stage B1 (02/2021) during which the spatial development model is evaluated. This land is in an off-plan - residential area for which the building conditions of the Presidential Decree of 24/1985 (Government Gazette 270 D / 31-05-1985) apply.

1.3.2 Project affiliation

Administratively, WPP is in the Region of Eastern Macedonia and Thrace and specifically within the Municipal Region of Orfeas, the Municipality of Soufli, the Regional Unit of Evros.

The location of the area in which the planned WPP and its accompanying works will be constructed is depicted on the orientation map, which is attached to the file of this study. The Municipality of Soufli, Prefecture of Evros falls within Area 1 of the Wind Priority Areas of Annex I of the Special Framework for Spatial Planning and Sustainable Development for RES. In the area of the Municipality of Soufli, the GIS is in force with Government Gazette 9D/14-1-1988 as amended by Government Gazette 844 D' / 25-11-1999. This land is in a residential area outside the city plan for which the building conditions of the Presidential Decree of 24/1985 (Government Gazette 270/D/31-05-1985) apply. The area where the WPP is to be installed is part of public lands and is outside the residential control zone. Also, in the Regional Unit of Rodopi, where the Municipality of Arriana belongs, there is a Specially Regulated Urban Planning area in which the substation belongs in territorial unit 4 (mountainous area). The area of the WPP under study is in an off-plan - residential area for which the building conditions of the Presidential Decree of 24/1985 (Government Gazette 270/D/31-05-1985) apply.

1.3.3 Geographical coordinates of the project

The HGRS 87' coordinates of the wind turbines of the studied WPP are presented below:

TABLE OF COORDINATES W/T VIEW HGRS '87

A/A	X	Y	Z
W/T1	671820.70	4576019.89	286.50
W/T2	671481.22	4575994.39	307.65
W/T3	671357.48	4576312.36	298.00
W/T4	672009.41	4576565.25	306.50
W/T5	671723.95	4576826.90	296.50
W/T6	671404.41	4576990.01	269.50
W/T7	641529.45	4577316.91	259.90
W/T8	671846.84	4577149.10	268.80

TABLE OF PEAK COORDINATES W/T VIEW WGS '84

A/A	φ	λ
W/T1	41°19'11.6035"	26°03'16.8412"
W/T2	41°19'11.0374"	26°03'02.2224"
W/T3	41°19'21.4366"	26°02'57.2262"
W/T4	41°19'29.1318"	26°03'25.5091"
W/T5	41°19'37.8303"	26°03'13.5037"
W/T6	41°19'43.3634"	26°02'59.8032"
W/T7	41°19'53.8591"	26°03'05.6403"
W/T8	41°19'48.1773"	26°03'19.1151"

Table 3: Geographical Coordinates of WPP

It is noted that a plot of land is defined as the polygon surrounding the wind turbines and does not constitute the mapping of the intervention areas where the main project and its companions are constructed. The interventions on the two polygons are carried out only in a small percentage of the area of the installation polygons around the wind turbines (foundation, construction, formation of squares). The coordinates of the two polygons within which the eight (8) wind turbines of the studied project will be installed are depicted in the table below:

TABLE OF COORDINATES VIEW HGRS '87

A/A	X	Y
K1	672002.938	4577322.479
K2	671512.736	4577382.175
K3	671478.004	4577310.485
K4	671475.562	4577305.642
K5	671342.956	4577042.583
K6	671127.718	4576846.493
K7	671019.112	4576747.347
K8	671467.715	4576644.658
K9	671510.770	4576609.194
K10	671662.419	4576733.248
K11	671989.661	4576429.806
K12	672162.731	4576602.796
K13	671874.345	4576868.230
K1	672002.938	4577322.479

E1 = 509.002.91 sq.m.

TABLE OF COORDINATES VIEW HGRS '87

A/A	X	Y
K14	671063.113	4576487.612
K15	671270.933	4576232.503
K16	671274.361	4576228.300
K17	671276.873	4576223.493
K18	671457.911	4575877.049
K19	671896.296	4575942.776
K20	671853.714	4576121.331
K21	671534.504	4576075.326
K22	671361.130	4576479.980
K14	671063.113	4576487.812

E2 = 179.276,97 sq.m.

Table 4: Coordinates of polygons of WPP installation

1.4 Project classification

The planned project consists of eight (8) 4.5MW W/T with a power adjustment of 4.3125MW each, with a total capacity of 34.5MW. According to paragraph 4 of article 1 of Law 4014/2011 (Government Gazette 209 Α΄ / 21-09-2011), as well as with the provisions of MD ΥΠΕΝ/ΔΙΠΑ/63951/4418/2024 (Government Gazette 3867/Β/3-7-2024) "Amendment of the ministerial decision under elements ΔΥΠΑ/οικ.37674/2016 (Β' 2471), for the reclassification of onshore wind power generation projects and onshore photovoltaic power generation projects in the categories and subcategories of Law 4014/2011", The proposed project is classified as:

a) the WPP falls under the 10th Group (Renewable Energy Sources – a/a 1a: Electricity production from onshore wind energy) and according to the MD ΥΠΕΝ/ΔΥΠΑ/63951/4418/2024 (Government Gazette 3867/Β/3-7-2024) is classified in Subcategory A2 ($5 < P \leq 50$ regardless of N and $L < 20$ or $8 < P \leq 50$ and $N = 1$ and $L < 20$ or $5 < P \leq 35$ and within Natura 2000 and $L < 20$ network areas), since its total capacity amounts to 34.5 MW. But because part of the project

falls within an area Natura 2000, which is a Special Protection Area and has a GR1110010 code named Oreinos Evros and Koilada Filiouri, the maximum classification limit is 35 MW ($5 < P \leq 35$ and within Natura 2000 and $L < 20$ network areas) and therefore the project under consideration remains in Subcategory A2. It is also an important bird area (IBA) with code GR003 and named Dasos Dadias and Koilada Filiouri.

b) Road construction projects are accompanying projects and follow the category of the main project; therefore, they are included in Subcategory A2.

c) Electricity interconnection projects are also accompanying projects and follow the category of main project, therefore they are included in Subcategory A2

Therefore, the competent authority for issuing the environmental terms of the project is the Environment AND Spatial Planning Directorarate of Eastern Macedonia & Thrace of the Decentralised Administration of Macedonia & Thrace.

In addition, according to the Greek and European statistical classification of economic activities (STACEA and NACE respectively), the Activity Code Numbers (ACN 2008) are defined by the 1100330/1954/ΔΜΒ΄/ΠΟΛ 1133/6.10.2008 (Government Gazette 2149Β΄/ 16.10.2008 Decision of the Minister of Economy and Finance, as amended by 1061748/ 987/ΔΜΒ'/ΠΟΛ.1086/22.6.2009 (Government Gazette 1285/Β/30-6-2009) Decision, and for the project in question is:

35.11.10.03 : Production of electricity from conversion of wind energy

Finally, according to J.M.D. 3137/191/Φ.15/2012 (Β'1048), as in force, on the correspondence of electricity activities with the nuisance levels mentioned in the urban planning decrees, the WPP under study is classified as a medium nuisance activity (>700kW).

1.5 Project promoter

The details of the company responsible for the licensing and construction of the project are:

NAME	**ALIKI ENERGY SINGLE MEMBER PRIVATE COMPANY**
HEAD OFFICE	Dimitriou Gounari 96, 15125, Marousi, Greece
NUMBER	6972942248
FAX	-
EMAIL	alikienergy@gmail.com

Table 5: Project promoter

1.6 Environmental Designers of the project

The present study was undertaken by the design team consisting of:

Environmental Designers of the project:

The present study was undertaken by Aliki Energy Single Member P.C. and with the design team:

- Panagiotis Machtis - Forester - Environmentalist
- Nikolaos Zafiriou - Surveying Engineer
- Anastasia Kyritsi - Geologist

• Virginia Kakaki - Rural & Surveying Engineer and Geoinformatics Engineer

The responsible designer of the project is Mr. Machtis Panagiotis with registration number 26736 (category 27A - Environmental Studies), a copy of which is attached to the Annexes (17) and has the following contact details:

EMAIL	**machpanos@gmail.com**
PROFESSION	Forester - Environmentalist
POSTAL ADDRESS	2 KONSTANTARA Avenue, KOZANI 50100
NUMBER	6979566588

Table 6: Designer's data

CHAPTER 2 - NON-TECHNICAL SUMMARY

2.1 General elements of the project envisaged

This study deals with the environmental impacts arising from the construction and operation of an WPP at the "Mavrodasos" site, consisting of eight (8) wind turbines of indicative type V136-4.5MW, nominal power 4.5MW and maximum power 4.3125MW each. The entire WPP falls within the Municipal Unit of Orfeas, the Municipality of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace. The planned project has a total capacity of 34.5MW

The studied area belongs to the Aeolian Priority Areas (APA) according to Joint Ministerial Decision 49828/2008 "Special Framework for Spatial Planning RES". Based on the spatial planning, the wind turbines were examined in accordance with article 7 of the JMD (Specific criteria for the location of wind farms on the mainland).

The Entity of each project is the company Aliki Energy SINGLE MEMBER P.C. which undertakes the entire management of the project.

In summary, the studied project includes the following:

Main project:

- ✓ Installation of WPP within two plots of total area: 688,279.88 sq.m., consisting of eight (8) wind turbines, with a rotor diameter of 136m, with a maximum power of 4.5MW each, i.e. a total power of 34.5MW.
- ✓ Configuration of eight (8) squares for the construction of wind turbines with a total occupancy area equal to 65.873,12 m^3.
- ✓ Foundation of wind turbines – construction of pillar bases by excavation of eight (8) foundations.
- ✓ Construction of an internal underground medium voltage network for the transmission of electricity produced from the W/T to the control house, with a total length of 8,155.13 m.
- ✓ The installation of a control house within the square of W/T5 with a coverage area of 31.5sq.m.
- ✓ Construction of a 33kV underground transmission interconnection network from the control house to the 33/150KV (Medium Voltage/High Voltage) lifting substation named "PATRIARCHS" with a total length of 33,900.22 m, of which there is an overlap with the internal network by 2,751.11 m.

Synod projects:

- ✓ Construction of a road construction for access to the project site and the internal road interconnection of the wind turbines of WPP at the location "Mavrodasos" consisting of category C forest roads of total length 4.298.92m of which 3.363.61m concern improvement and 935.31m concern the opening of new roads.
- ✓ Construction of rainwater runoff works.

2.2 Distances of the planned project from residential areas, protected areas and infrastructure

The proposed project concerns the construction and operation of a wind farm with a total capacity of 34.5MW which belongs within the Municipal Unit of Orfeas, the Municipality of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace.

The project under consideration is located outside the General Urban Plan, outside the city plan – residential area and statutory settlement boundaries. The closest settlements to the study area are the following:

A/A	NAME OF SETTLEMENT	POPULATION AT CENSUS 2021	DISTANCE OF THE SETTLEMENT CENTRES FROM THE NEAREST W/T (km)
1	Roussa	383	3,4
2	Gonikon	300	7,3
3	Mikro Dereio	91	3,9

Table 7: Distances of the nearest agglomerations from the nearest W/T of the WPP in the direct distance

In the area of the Municipality of Soufli, where the WPP is located, neither general urban plans nor Plans of Open city spatial and housing organisation plan (OCSHOP.) have been established. The substation "PATRIARCHS" where the project is to be connected belongs to the Municipality of Arriana where there are no G.U.P. and OCSHOP. In the Regional Unit of Rodopi, where the Municipality of Arriana belongs, there is a Specially Regulated Urban Planning area in which the substation belongs in spatial unit 4, as shown in the extract of the map. In the wider area, however, the G.U.P. of the Municipality of Alexandroupolis is being prepared, which was initially approved by the Government Gazette 9Δ/14-1-1988, then as amended by the Government Gazette 844 Δ' / 25-11-1999 and is now at stage B1 (02/2021) during which the spatial development model is evaluated. This land is in an off-plan - residential area for which the building conditions of the Presidential Decree of 24/1985 (Government Gazette 270 D / 31-05-1985) apply.

The installation area of the studied WPP falls within the mountainous Evros - Dereio Valley, an area which is a Special Protection Area and has a code GR1110010. The area is in the Prefecture of Evros, on the border with Bulgaria. It is also an important area for birds with a code GR003 and the name Dadia - Dereio - Aisymi forest. The area is located between the Dadia Forest National Park and the Filiouri valley at the western end of the Prefecture of Evros. It is mainly covered by oak and beech forests with small groups of pines and is crossed by Diavolorema of Dereios. The central part and northeast are dominated by partially forested areas with scattered old oak, used mainly by free-range livestock animals.

The traditional agricultural activities of the inhabitants of the area (e.g. nomadic livestock farming, small-scale farming) have played an important role in the conservation of ecosystems, maintaining sparse oak forests in part of the area. Mature oak trees that remain are used for branching, i.e. collection of branches with leaves for feeding goats in winter. Oak forests are also used to produce firewood, while beech forests and pine reforestations are used for commercial timber.

IBA of Greece GR003 includes three different protection regimes:

1) The Special Protection Area with code GR1110010 and name Oreinos Evros and Koilada Filiouri within which the station falls)

2) The Site of Community Importance with code GR1110003 and name Treis Vrysses at about 17km south of WPP.

3) The Wildlife Refuge with code K731 and name Kallithea - Treis Vrysses Municipalities of Alexandroupolis, Orfeas Soufliou from which the nearest wind turbine is 12km away.

The occupation zone of the project, according to the reformed forest maps of the Regional Umit of Evros, occupies mostly forests and wooded areas.

Wind turbine squares occupy areas designated (ΔΔ)[1], (ΑΔ)[2] and (ΔΑ)[3] and are subject to the provisions of forest legislation.

Regarding the new road construction that will be opened for access to the wind turbines of the project, it mainly occupies areas with the designation (ΔΔ), (ΑΔ) and (ΔΑ) while a small part of it falls under an area (ΠΔ)[1].

The wind turbine installation sites are compatible with social infrastructure and utility facilities as they will not be affected. The nearest airport in the area is the airport "Demokritos" of Alexandroupolis and is located southeast at 52 km.

Near the study area there are no social welfare infrastructures e.g. health care facilities, education, sports facilities, urban infrastructure facilities (e.g. recycling infrastructure, waste treatment, etc.), water supply facilities, livestock farming, ΠΟΤΑ and other Areas of Organized Development of Productive Activities of the tertiary sector, theme parks, tourist ports and other established or developed tourist areas (as recognised in the EIS for each individual establishment).

In conclusion, the planned project is compatible with the approved boundaries of the settlements of the wider area of its location since both the main activity (WPP) and its accompanying facilities are located outside and at satisfactory distances from these boundaries. Also, the project is located outside the approved Local Spatial Plans (GSP., OCSHOP) and outside the residential control zone and at a great distance from them.

2.3 Significant environmental impacts likely to result from the implementation of the project

The individual projects and infrastructures of the studied WPP were designed with the aim of minimizing and mitigating the impacts related to the construction and subsequent operation of the project. The result of this approach was, as documented in Chap. 9 of this document, the integration of the project into the environment with the lowest environmental cost.

Below are tables summarizing the impacts that are judged to have a degree of intensity and which concern in their entirety the construction phase of the project, as well as its operation phase.

ENVIRONMENTAL PARAMETERS	DIRECT (D) / INDIRECT (I)	POSITIVE (P) / NEGATIVE (N)	SHORT TERM (S.T.) / LONG TERM (L.T.)	REVERSIBLE	TREATABLE	SHORT TERM / POSITIVE - NEGATIVE
CLIMATIC & BIOCLIMATIC CHARACTERISTICS						
MORPHOLOGICAL & LANDSCAPE	D	N	S.T.	PARTIALLY	PARTIALLY	P
GEOLOGICAL, TECTONIC & SOIL	D	N	S.T.	PARTIALLY	PARTIALLY	
GEOLOGICAL, TECTONIC & SOIL	D & I	N	S.T.	PARTIALLY	PARTIALLY	P

GEOLOGICAL, TECTONIC & SOIL						
GEOLOGICAL, TECTONIC & SOIL	D	P	S.T.			
GEOLOGICAL, TECTONIC & SOIL	D	N	S.T.	YES	PARTIALLY	
ANTHROPOGENIC PRESSURES ON THE ENVIRONMENT	D	N	S.T.	PARTIALLY	PARTIALLY	P
ATMOSPHERIC ENVIRONMENT - AIR QUALITY	D	N	S.T.	PARTIALLY	PARTIALLY	P
ACOUSTIC ENVIRONMENT AND VIBRATION	D	N	S.T.	PARTIALLY	PARTIALLY	
ELECTROMAGNETIC FIELDS						
WATERS	D	N	S.T.	YES	PARTIALLY	

Table 8 Environmental Impacts during the construction phase of the project.

ENVIRONMENTAL PARAMETERS	DIRECT (D) / INDIRECT (I)	POSITIVE (P) / NEGATIVE (N)	SHORT TERM (S.T.) / LONG TERM (L.T.)	REVERSIBLE	TREATABLE	SHORT TERM / POSITIVE - NEGATIVE
CLIMATIC & BIOCLIMATIC CHARACTERISTICS						
MORPHOLOGICAL & LANDSCAPE	D	N	S.T.	PARTIALLY	PARTIALLY	P
GEOLOGICAL, TECTONIC & SOIL	D	N	S.T.	PARTIALLY	PARTIALLY	
NATURAL ENVIRONMENT	D & I	N	S.T.	PARTIALLY	PARTIALLY	N
ANTHROPOGENIC ENVIRONMENT						

SOCIO-ECONOMIC ENVIRONMENT	D	P	S.T.			
TECHNICAL INFRASTRUCTURE	D	N	S.T.	YES	PARTIALLY	
ANTHROPOGENIC PRESSURES ON THE ENVIRONMENT	D	N	S.T.	PARTIALLY	PARTIALLY	P
ATMOSPHERIC ENVIRONMENT - AIR QUALITY	D	N	S.T.	PARTIALLY	PARTIALLY	P
ACOUSTIC ENVIRONMENT AND VIBRATION	D	N	S.T.	PARTIALLY	PARTIALLY	
ELECTROMAGNETIC FIELDS						
WATERS	D	N	S.T.	YES	PARTIALLY	

Table 9: Environmental Impacts during the operation phase of the project.

2.4 Proposed measures and actions to protect the environment

Some weak negative effects, which are temporary and to a significant extent reversible, will occur during the construction works of the studied WPP and its accompanying technical works, mainly from excavation works that result in the removal of vegetation, the surface alteration of the soil and the landform of the intervention sites as well as from the emission of dust and possibly from the difficulty of passing vehicles in the construction sections along the length existing roads and new roads.

However, by taking appropriate measures, any adverse effects will be minimized and addressed. However, it is estimated that there will also be positive effects from the operation of the project.

The proposed measures aim in turn at the following ways of addressing environmental impacts:

• Prevention - Avoidance

• Reduction of intensity and extent

•Restoration

The installation of the Wind Power Station and its accompanying works, as expected, entails some impacts and changes in the environment of the intervention sites. However, a series of measures are proposed to minimize any nuisance resulting from the construction interventions of the project:

- ✓ Appropriate road design considering the local particularities of the relief, the existing vegetation as well as the avoidance of a large volume of excess excavation materials with the maximum possible equalization of embankments and trenches.
- ✓ Planting of the slopes of the road construction with appropriate plant species of the area and in the appropriate way.
- ✓ Collection, removal and appropriate disposal of all kinds of waste resulting from construction works, after separation of recyclables, with subsequent disposal to recycling centers.

- ✓ Operation of construction sites and movement of transport vehicles in compliance with quiet hours to minimize noise nuisance of the nearest settlements.
- ✓ Provision for the proper sorting, temporary and final disposal of excavated products resulting from earthworks in accordance with the provisions of current legislation.

Furthermore, for all the construction interventions of the entire project, care will be taken to remove forest vegetation as little as possible and to replenish it with phytotechnical works, as required by the principles of sustainable development. The plant species selected for restoration will be consistent with the local bioclimatic conditions and the needs of the fauna, in consultation with the competent Forestry Authority.

Emphasis will be given to restoring the space to its natural original state, to minimize any disturbance to the landscape and relief. The same effort will be made during the excavation stage to limit them to the technical minimum requirements that will at the same time ensure the smooth and safe work of the crews and erection machinery.

During the construction of the project, the necessary measures will be taken to ensure:

• Compliance with environmental conditions by the manufacturer

• The ability to deal with and remedy environmentally undesirable situations due to actions or omissions of the manufacturer.

It is also noted that:

- ➢ The scope of the contract for the earthworks will include planting / restoration works as well as the obligation for their maintenance, where appropriate.
- ➢ The competent archaeological services will be notified in writing upon commencement of construction.
- ➢ To reduce dust during the foundation period of the park, systematic wetting of construction roads, materials, etc. will be applied.
- ➢ All kinds of useless materials (consumables, old machinery) will be removed from the project area and will be disposed of in accordance with the applicable provisions.
- ➢ In the project area, any kind and form of burning materials will be prohibited.
- ➢ For surface and groundwater there will be special prevention to prevent pollution from any kind of liquids (oils, etc.). Uncontrolled discharge of liquids into the soil will be strictly prohibited. The mineral oils used will be managed in accordance with the regulations in force.
- ➢ During the construction of the project, smooth movement of vehicles to and from residential areas will be ensured.
- ➢ All surfaces capable of bearing vegetation will be planted. Planting work will begin after the formation of the finished surfaces.
- ➢ The project promoter should undertake:
  - o the control and supervision of the construction of the external transmission network.
  - o the installation of the necessary electromechanical equipment to connect the project to the existing Extra High Voltage Center (EHVC)
  - o Taking immediate action if deemed appropriate.
  - o the supply of the required materials for the construction of the project will be ensured by legally operating quarries in the wider area.
- ➢ Take care to prevent the escape of temporarily deposited materials from rainfall.

2.5 Benefits from the implementation of the project/activity

The project under consideration aims at the construction and operation of a RES project and specifically a wind power plant with a view to complying with the current legislation, exploiting the wind potential of the area and becoming independent of conventional fuels that not only increase the price of electricity but also emit polluting and harmful substances to the environment.

Renewable energy sources are characterized as mild forms of energy because no energy intervention (e.g. combustion) is necessary for their utilization, since they exploit a form of energy created by natural processes. They have been used since antiquity to meet energy needs and are inexhaustible in contrast to fossil fuels. Renewable energy sources have a zero-energy footprint. The term energy footprint was the amount of carbon dioxide (CO_2) released into the atmosphere.

The development of the planned project and wind energy projects in general contributes both to the objectives of the European Union to increase the penetration of RES and to the goals of the Greek government for the decarbonization of electricity production. WPP do not occupy a large area and are capable of sharing land with sectors such as agriculture and livestock making wind energy efficient in terms of space. Wind turbines are a form of energy production with minimal maintenance requirements and operational reliability.

At the local level, the realization of the project under study will lead to the creation of jobs during the construction phase and during the operation phase. According to a measurement by the Hellenic Wind Energy Division(report HWED), jobs are created in the areas of maintenance, operation in wind turbine suppliers and in the construction sectors of the project's foundations. During the operation of the project, jobs are created to monitor and supervise the operation of the wind turbine on a continuous basis.

The planned project and wind projects in general strengthen the economy of local communities. According to article 7 of Law 3851/2010, as in force, it is stipulated that 1.7% is assigned 80% to the first-degree local authority, within the administrative boundaries of which the RES stations are located and 20% to the first-degree local authority or local authorities, through the territorial region of which the station's connection line to the System or the Network passes. If the stations are installed within the administrative boundaries of more than one local authority, 1% is attributed to the licensee's supplying electricity to the household consumers of the first-degree local authority in which the RES stations are installed and is refunded through the electricity bills to the household consumers. An amount of 0.3% is attributed to the National Fund for the Implementation of Town and Urban Plans (green fund).

Furthermore, benefits arise for the local community from the construction of public utility projects as a compensatory measure from the installation and operation of WPP as well as sponsorships that serve local needs. The project under study, with its implementation, promotes a form of alternative tourism of educational nature with a visit to the premises of WPP. Therefore, a wind energy project not only does not have a negative impact on the environment, but also contributes to its restoration and the achievement of the country's national goals by avoiding the emission of pollutants into the atmosphere.

2.6 Alternatives

Technical characteristics of alternatives

The choice of the location of the WPP at the "Mavrodasos" site, as well as its accompanying works, was made after a meticulous examination of the area to initially satisfy the data for high potential and then the restrictions provided for in the relevant legislation for the protection of the environment, the existing settlements and the general activities of the wider area.

The challenge for choosing a location in relation to the above parameters and other more general parameters was:

1. The highest possible wind potential of the area
2. Access roads must ensure the transport capacity of the sections of the W/T with the least possible interventions to an existing network and with the fewest possible openings of new roads inside and outside the WPP fields.
3. The distances from neighboring settlements must be above the limit that allows their integration into the landscape and the minimization of visual disturbance.
4. Land use shall not prohibit the delimitation of the project.
5. The works must not be located within protected areas or archaeological sites and must be at a sufficient distance from them to have the required compatibility.
6. The positions of the W/T must be in a position suitable for connection to the Transmission System.
7. The configuration and technical characteristics of the soil must be suitable for the construction and development of the project.
8. The area must be relatively sufficient for the development of the project.
9. Cause as little visual discomfort as possible.
10. The compatibility with the specifications in the current legislation and the same is specified in the Joint Ministerial Decision 49828/2008 "Special Framework for Spatial Planning and Sustainable Development for Renewable Energy Sources and its Strategic Environmental Impact Study".
11. Electrical interconnection should have as few energy losses as possible.

Relevant restrictions apply to interconnection projects, commensurate with the nature of these works. However, there are technical and non-technical limitations related to indicating the competent System administrator. The above restrictions also apply to the road access network of the project, considering the relief of the area.

For the alignment of the internal access roads of the W/T within the fields of WPP, the alignment that is finally proposed has the least environmental impact and the smallest slopes.

The final solution chosen satisfies in the best possible way the conditions and limitations required for such projects.

Specifically:

1) At the proposed location, the wind potential is satisfactory. This area belongs to the Wind Priority Areas (WPA). As a result, maximum electricity production is ensured.
2) The location and the number of W/T make maximum use of the available wind potential of their installation area.
3) In the proposed area, the network of provincial and rural roads is satisfactory and does not require the opening of many kilometers of new roads.
4) Observes the restrictions of distances from settlements.
5) It does not affect existing land use and will not require future land use changes.
6) The location of the W/T is outside the demarcated archaeological sites.
7) The interconnection of the project with the existing road network does not require extensive works and infrastructure.
8) The technical design of the project makes optimal use of the available technology, to achieve the maximum possible efficiency of the project with the lowest feasible environmental cost and with the least audiovisual disturbance.

Based on the above, the selected design of the project, as it is formed by the examination of the various scenarios, analyzed in chapter 7 of this study, satisfies the data for the optimal efficiency of the project with a view to minimizing the environmental impact.

Finally, an analysis of the zero-solution scenario, i.e. the non-siting and installation of the project, was carried out, which was rejected as the negative effects from the construction and operation of the WPP appear to be of significantly lower intensity and duration than the positive effects of the development of the project under study.

CHAPTER 3 – SUMMARY DESCRIPTION OF THE PROJECT

3.1 Key elements of the project

The objective of this study is the assessment of the environmental impacts arising from the construction and operation of the wind power plant (WPP) at the location "Mavrodasos" in the Municipal Unit of Orfeas and the Municipal Unit of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace of the company "Aliki Energy Single Member PC.».

The main and accompanying projects of WPP are summarized below:

Main project:

- ✓ Installation of WPP within two plots of total area: 688,279.88 sq.m., consisting of eight (8) wind turbines, with a rotor diameter of 136m, with a maximum power of 4.5MW each, i.e. a total power of 34.5MW.
- ✓ Configuration of eight (8) squares for the construction of wind turbines with a total occupancy area equal to 65.873,12 m3.
- ✓ Foundation of wind turbines – construction of pillar bases by excavation of eight (8) foundations.
- ✓ Construction of an internal underground medium voltage network for the transmission of electricity produced from the Motorways to the control house (coupling box), with a total length of 8,155.13 m.
- ✓ The installation of a control house within the square of W/T5 with a coverage area of 31.5sq.m.
- ✓ Construction of an interconnecting underground transmission network of 33kV from the control house to the 33/150KV (M.V./HV) lifting submarine named "PATRIARCH" with a total length of 33.900.22 m. of which there is an overlap with the internal network by 2.751.11 m.

Synod projects:

- ✓ Construction of a road construction for access to the project site and the internal road interconnection of the wind turbines of WPP at the "Mavrodasos" site, consisting of category C forest roads with a total length of 4.298.92m, of which 3.363.61m concern improvement and 935.31m concern the opening of new roads.
- ✓ Construction of rainwater runoff works.
- ✓ Configuration of a mobile construction site that will be installed within part of the wind turbine installation squares.

The electrical interconnection of WPP will be carried out through an existing M.V./H.V. lifting substation (33KV/150KV) named PATRIARCHIS, which falls within the Rhodope Regional Unit of Eastern Macedonia and Thrace and the exact location of which is presented in the attached interconnection map for the present study.

The identification of suitable locations for the installation of the 8 wind turbines was based on the utilization of the optimal wind potential and on the other hand the compliance with the current legislation and the selection of sites that affect the environment and the

activities of the wider area at least. The coordinates of the 8 wind turbines of the studied project were presented in chapter 1 hereof.

The area of installation of the studied WPP falls within the mountainous Evros - Dereio Valley, an area which is a Special Protection Area and has code GR1110010. The area is in the Prefecture of Evros, on the border with Bulgaria. It is also an important area for birds with a code GR003 and the name Dadia - Dereio - Aisymi forest. The area is located between the Dadia Forest National Park and the Filiouri valley at the western end of the Prefecture of Evros. It is mainly covered by oak and beech forests with small groups of pine trees and is crossed by Diavolorema Dereios. The central part and northeast are dominated by partially forested areas with scattered old oak, mainly used by free-range livestock animals.

In the area of the Municipality of Soufli, where the WPP is located, there are no general urban plans or Open City Spatial and Housing Organisation Plans (OCSHOP). The substation "PATRIARCHIS" where the project is to be connected belongs to the Municipality of Arriana where there are no GIS and OCSHOP. In the Rhodope Regional Unit, where the Municipality of Arriana belongs, there is a Specially Regulated Urban Planning area in which the substation belongs in territorial unit 4 (Mountain Area) As shown in the map excerpt. In the wider area, however, the GIS of the Municipality of Alexandroupolis is being prepared, which was initially approved by the Government Gazette 9Δ/14-1-1988, then as amended by the Government Gazette 844 Δ' / 25-11-1999 and is now at stage B1 (02/2021) during which the spatial development model is evaluated. This land is in an off-plan - residential area for which the building conditions of the Presidential Decree of 24/1985 (Government Gazette 270 D / 31-05-1985) apply.

The area of the wind turbine within which the 8 wind turbines V136-4.5 MW will be placed, was located according to article 13 of Law 4685/2020 (Government Gazette 92 A'/7.5.2020) and occupies 688,279.88 sq.m. with the wind turbines connected to each other through internal interconnection routes. Each wind turbine includes an electric generator with a nominal operating voltage of 800V. The generator is connected to the electrical network via a power converter with an output voltage of 720V, which is located on the nassela of the wind turbine and allows it to operate at variable speeds. Through the inverter the frequency as well as the quality of the injected power are controlled. Through underground medium voltage cables, the power of each wind turbine of the station will be transferred to the control building of the WPP from where a cable of appropriate cross-section will start which will end at the existing substation of voltage lifting voltage 150/33kV (M.V./H.T.) which belongs to the Regional Unit of Rodopi, Eastern Macedonia and Thrace.

3.2 Key elements of the construction and operational phases of the project or activity

Generally, the construction of a wind farm takes about 18 months from the moment all the required permits have been secured. This period refers to all procedures as indicated in the following table:

PHASE DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
STUDIES																			

Topographic, road construction, geotechnical																		
INFRASTRUCTURE																		
Road construction roads																		
Squares																		
WIND TURBINE INSTALLATION																		
Transportation, placement - connection																		
NETWORK CONNECTION																		
Installation of M.V. Pipelines, Works Interconnection with the HV Substation																		
Control House																		
OPERATION TESTS																		

Table 1:Investment implementation schedule

Once the production licenses for the examined project have been issued, approximately 18-20 months are required for the realization of the studies, the construction of the WPP, the infrastructure works and its connection to the network. Also, after securing the required permits, the order of the wind turbines takes place. The time required to deliver the turbines depends on the construction company and ranges from 18-24 months. The required time for transportation from the port to the installation site and for the assembly of the wind turbines is approximately 7-8 days per W/T, considering a period of 3-4 days for the assembly and dismantling of the crane as well as 3 days for the lifting of the tower and the installation of the R/F.

However, a catalytic role in the implementation of the schedule is played by the delivery time of the wind turbines by the construction company, which ranges from 16 to 20 months. The order for the wind turbines will take place after all the necessary permits have been secured, so at this stage it is not possible to give exact dates.
Although the main project is the planned WPP, for its installation and operation accompanying technical works are required. For the construction and subsequent operation of the project, a specific workflow is foreseen, such as access/road works, installation works, electrical interconnection projects.

The necessary structural and accompanying works of the studied WPP, as mentioned above, are the following:

1. Configuration of the installation squares of the Aircraft.
2. Construction of the access road and the internal road construction approaching the installation sites of the W/T.
3. Excavation of bases / foundation of aircraft.

4. Construction of an internal medium voltage network, underground M.V. lines for the connection of the M/V with the control building of the WPP.
5. The construction of an external medium voltage network (underground M.V. lines for the connection of the building, we control the PATRIARCHIS Submarine.

3.2.1 Road Construction

For the project under consideration, the existing road network will be used, which will be improved and rehabilitated where necessary, as well as a small intervention area (opening of new roads).

The attached road construction study shows that the road construction of the project has a total length of 4,298.92 m, of which:

- ✓ The 3.363,61m concern the improvement of existing roads.
- ✓ The 935.31m concerns the opening of new roads.

3.2.2 Configuration of squares

At the installation site of each wind turbine, an erection square will be formed. That is, the ground will be properly formed on a flat surface for the purpose of both the temporary deposition of the wind turbine parts for their assembly and the installation of lifting machinery (cranes) and their safe operation during the lifting maneuvers of the parts of each wind turbine.

The foundation of the W/T will be located at a suitable point of the plateau. The leveling of the construction surface will be done to the greatest extent by clearing the area, so that there is solid ground in the wider area where the equipment will be deposited and where the transport vehicles and lifting machinery will move.

Then, the created surface will be smoothed, and a back layer will be constructed to obtain a horizontal surface, while finally a final layer 3A will be implemented.

Both the area (> 4000 sq.m.) and the design of the square of each wind turbine follow the specifications given by the wind turbine manufacturer. The formation of a road – entrance type in each square is the necessary assembly surface of the main crane, due to the long length of its boom. Similarly, this surface was designed according to the specifications of the wind turbine manufacturer.

The manufacturer (Vestas) of wind turbines (W/T) for the safe storage and assembly of its engines during their assembly phase has set some minimum specifications which are depicted in the document entitled "Crane Pads Requirements DMS no: 0050-8073 Ver. 7". Among other things, this document depicts the minimum specifications for the type W/T that will be used for the project under study, namely V 136 with a tower height of 105m, an extract of which is depicted in the drawing below on the next page.

The specific plan shows that for this type of A/F, **the necessary deck area amounts to 5,009 sq.m.**

The specifications of the necessary deck surface are designed for flat terrain.

Furthermore, based on these specifications, it is determined that if not the whole, some parts of the squares (foundation area of the R/F, area in which the crane does not step during lifting, space in which auxiPSEFTISy cranes will step, etc.) must be in a trench for safety reasons.

From the design of the decks of the squares for the project under study, it is found that the deck area ranges from 5,760 sq.m. – 6,347 sq.m., therefore they seem to occupy a slightly larger area than necessary, by about 30%.

This difference arises due to the relief of the terrain prevailing in the study area, in which almost all positions alternate folds with pits, which makes it more difficult both to design the square and to comply with the obligation to base on a trench of its specific parts.

As indicated in the table below, the deck surface required has predetermined areas. Occupancy surfaces (deck surface + slope) range from 7,728 sq. m. to 9,051 sq. m. The difference between the occupancy surface and the deck surface is restored and released after the completion of the construction phase of the project. The restoration concerns the restoration to the original form of vegetation.

A/A	DECK SURFACE	OCCUPANCY SURFACE (Deck & slope)
Square Area W/T1	6347.68329 m²	7877.59 m²
Square Area W/T2	6347.69698 m²	7784.43 m²
Square Area W/T3	6347.66225 m²	7728.71 m²
Square Area W/T4	6347.69809 m²	8224.68 m²
Square Area W/T5	6347.68386 m²	9051.84 m²
Square Area W/T6	6347.66760 m²	8390.41 m²
Square Area W/T7	5760.20267 m²	8305.28 m²
Square Area W/T8	6347.64779 m²	8510.18 m²

Thus, considering both the conditions prevailing in the study area, but also the obligations that had to be observed during the design of the squares, the greatest possible effort was made to keep the intervention area as small as possible.

Finally, it is inevitable that on non-flat ground, when a surface is leveled, slopes of both embankments and embankments will be created, which in turn increase the total area of occupation of the squares, but which are of a temporary nature, because their immediate phytotechnical restoration is foreseen after the completion of the construction of the project.

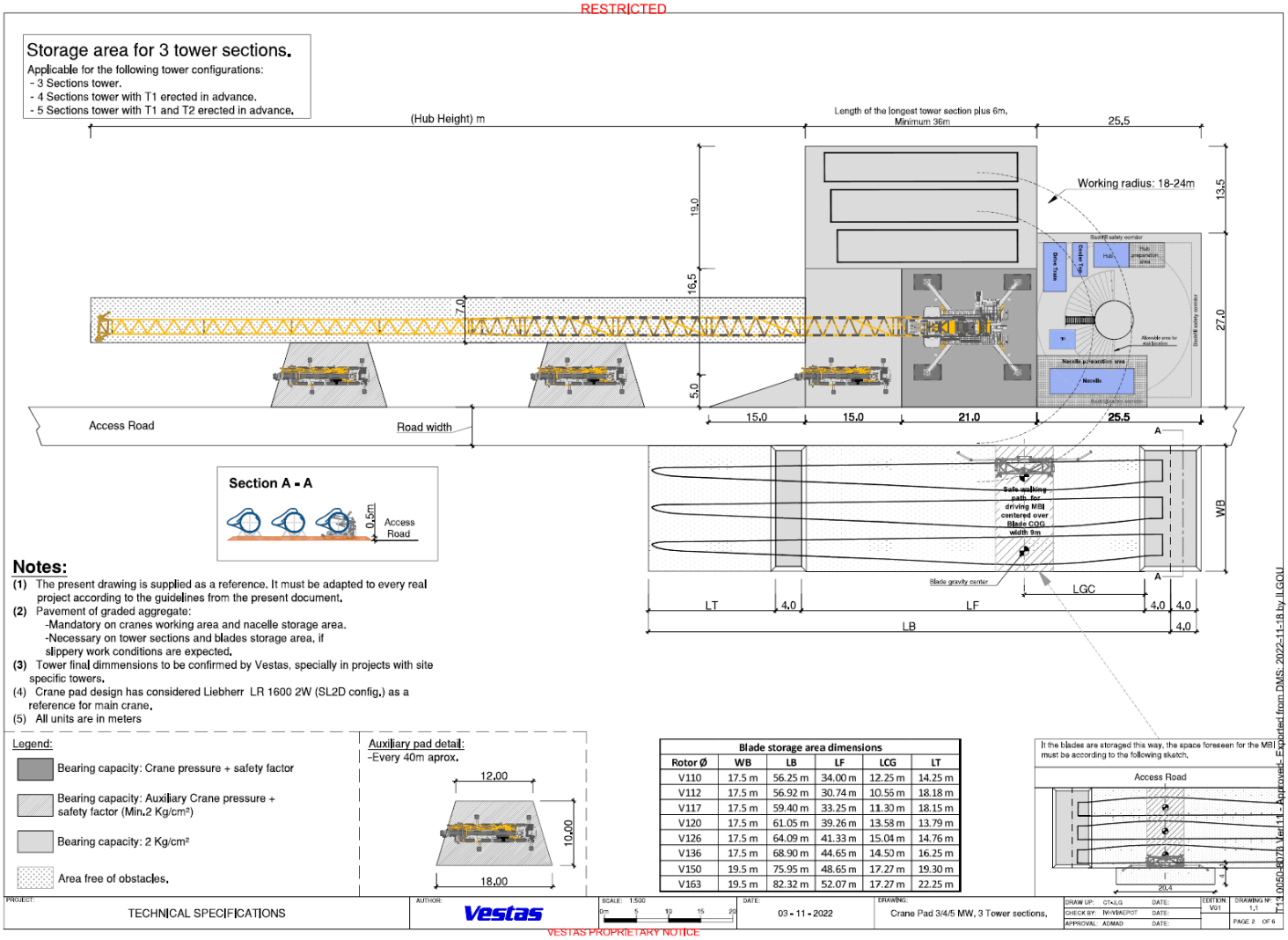
ACCESS ROADS	**OCCUPATION AREA**	**40.619,08**
	DECK AREA	21.392,31
	RESTORATION AREA	19.226,77
	PERCENTAGE	**47,33**

SQUARES	OCCUPATION AREA	65.873,12
	DECK AREA	50.185,73
	RESTORATION AREA	15.687,39
	PERCENTAGE	**23,81**

Total	106.492,20	Rates
Area of disturbed surface	71.578,04	67,21434997
Area to be restored	34.914,16	32,78565003

Table 2: Areas to be disturbed and restored

The area that will remain vegetation-free during the operation of the project consists of areas of a total area of 34.914.16 sq.m. or 32.79% of the total area of the project. Based on Table 11, this area was derived from the difference between the area of the squat and the deck of the access roads and squares where the wind turbines were erected. It should be noted that after the closure of the project the surface will be restored. The disturbed surface 71.578,04 sq.m. or 67.21% of the total area of the project results from the addition of the deck areas of the access roads and the squares for the construction of the wind turbines.



3.2.3 Foundation excavation and erection of W/T

The construction of the foundation of each wind turbine includes in order the following works:

- ✓ Digging bases
- ✓ Installation of foundation grounding
- ✓ Laying concrete
- ✓ Foundation formwork construction
- ✓ Installation of the reinforcement of the shoe and placement / alignment of the anchorage materials
- ✓ Laying of pipes for the passage of M.V. cables
- ✓ Concreting of the pile with concrete
- ✓ Berm

After the excavation of the eight bases (one for each wind turbine), on which the tower-pillar will be placed in parts, the process of erection of the wind turbines will include the assembly of the blades, the placement of the casket-nasela, the erection and connection of

the tower parts, the connection of the fuselage and finally the connection of the blades on the hub.

For the proper and safe execution of the erection works, a crane of suitable lifting capacity (blade lifter) is used. The crane can successfully lift all the main parts of the wind turbine, which will be transported to the erection sites (squares) by road.

3.2.4 Interconnection projects

The electrical interconnection of the studied WPP, as mentioned above, includes the construction of an internal underground medium voltage transmission network from the WPP to the control house and the construction of an underground M.V. transmission network from the control house to the existing substation

More specifically, for the electrical internal interconnection of the wind turbines, an underground network will be constructed from which the M.V. cables will pass. The internal medium voltage network will connect the WPP W/T with the gallery in the control house. The cables to be used will be aluminum with XLPE insulation.

For the electrical interconnection of the wind turbines, an underground network will be constructed from which the M.V. cables will pass. The cable channel will run parallel to the roads of the wind farm where possible, thus avoiding additional ground surface changes.

For the routing of all cables, ditches/cable channels will be constructed through which the underground medium voltage transmission lines will pass. The channels will be of standard cross-section (1m)x(1m)-(area 1m2) for the laying of cables within the route defined in the attached drawings (along the road construction). The cable channel will run parallel to the road construction of the wind farm where possible and at about 1 meter from it, thus avoiding additional ground surface changes.

The total length of the ditch (channel) that will be constructed for the electrical interconnection needs of the project will have a length of 39.304.24m, of which 33.900.22m is covered by the external interconnection. However, from junction 1 to the control house, the external interconnection is covered by the internal one by 2.751.11 m. The 8.155,13 m concerns the internal interconnection of the WPP Aircraft (up to the square of W/T 5 where the control house (CH) of the WPP is to be installed. It is noted that the total length of the interconnection ditch amounts to 39.304,24 m since it is not the sum of the internal and external interconnection of the WPP, as depicted on the attached interconnection map, since the cables of the Motorways through branches are interposed in a common ditch. The total length of cables amounts to 54.992.11 m, with the internal interconnection from the W/T to the Control Housing amounting to 21.091.89 m. while the external, i.e. from the Control House to the Submarine amounting to 33.900.22 m.

A detailed description of the interconnector is presented in subsection 6.2.2 of this environmental impact study.

3.2.5 Installation of a control building

It is planned to install a prefabricated control building with indicative dimensions of 10.5x3x3m, which will have an office space, a control and remote supervision system, an M.V. area where the M.V. panels will be installed and space for the building's power transformer.

A detailed description of the interconnector is presented in subsection 6.2.3 of this environmental impact assessment.

Table of Coordinates of the Control Cluster

Area of plot = 31,50 m2 - Perimeter = 27,00 m

α/α	X	Y	Distances
O1	671786.699	4576790.088	----
O2	671784.936	4576792.515	O1 - O2: 3.00
O3	671793.431	4576798.686	O2 - O3: 10.50
O4	671795.194	4576796.259	O3 - O4: 3.00
O1	671786.699	4576790.088	O4 - O1: 10.50

Table 3: Control container coordinates

3.2.6 Key elements of the operational phase of the WPP

The operation of the V136-4.5MW wind turbines of the construction company Vestas is fully automated. Specifically, the production of electricity from the proposed installation is based on the conversion of the kinetic energy carried by the air masses into mechanical rotational energy, through a properly designed airfoil system (rotor/blades). The rotor is automatically oriented upstream of the wind with an active rotation system (electric motors) and has three blades. Each V136-4.5MW wind turbine is equipped with a three-phase, six-pole (6-city) asynchronous winded cage induction generator, variable speed. The rated power of the generator is 4.50KW, its nominal operating voltage is 800V and the rotational speed ranges from 1450 to 1550rpm the generated alternating electrical voltage is rectified to direct voltage and then converted back to alternating voltage of controlled amplitude and frequency via a converter. The generator is variable speed and is connected to the grid via a power converter which is placed inside its naselle and controls the frequency as well as the quality of the injected power. The output voltage of the inverter is 720V.

The wind turbine starts producing power at wind speed – cut in speed at 3m/s. When the wind speed exceeds 25 m/s – cut out speed, the wind turbine stops its operation. At the maximum speed of 10-12 m/s the wind turbine produces the maximum power. During the operation phase of the project, for its safe operation, in accordance with the applicable legislation, operation tests are carried out.

Staff consisting of 2-3 people will monitor the operation of the wind turbines. However, their processes are fully automated, so it will have minimal intervention. The wind turbine

equipment includes an integrated SCADA system for control and monitoring through sensors. Through this system it is possible to control the transformers and operate automatic power switches for each wind turbine of the wind farm.

The service life of these wind turbines is about 25 years. However, this period may be increased and according to the current legislation the operating license of the project may be increased for another 20 years.

After their closure, the equipment used may be dismantled and the site restored. The wind turbines are dismantled and their main parts (turret, fuselage, hub, blades) are recycled by approximately 90%. However, they may also be made available for later use.

After the expiration of the operating license of the project, the decision on the permanent cessation or not of the project will be taken based on the assessment of the operational status of the R/F, the operating and maintenance costs for the continued operation of the WPP, the market situation in the electricity sector and the then available technology.

3.3 Quantities of raw materials, water and energy required, expected quantities of waste

- The basic building materials required for the foundation include concrete, steel, welded mesh, sand, gravel, bricks, tiles, lime, marble dust, insulation materials, tiles, paints, etc. and will be transported to the project by road from local suppliers.
- For the needs of production, washing of machinery and spraying of the construction site areas, water is required, which is estimated at approximately 21 m3/day.
- The origin of the water will be made by private companies or municipal services or by the municipal water supply networks of the area, in any case after agreement and payment of the relevant price, the arrival will be made by tankers and will be stored in plastic tanks exclusively within the scope of intervention of the studied project.
- The total volume of excavations of roads, squares and wind turbine foundations amounts to 95.556,39 m3.
- The volume required for backfilling works is estimated at 75,872.98 m3. An excess of 19,683.41 m^3 is therefore expected.
- The management of the excess of inappropriate excavation products (resulting from the various project techniques of the entire project) will be done in an environmentally sound way (through CAMS) and in accordance with the provisions of article 30 of Law 4819/2021 with the possibility of further utilizing it in the construction of embankments or other beneficial structures such as paving works, slope laying of the project and foundation of the wind turbines of the project. They will be deposited in temporary areas within the construction squares and then transported for use, in case a quantity of concrete or excavations is deemed unsuitable for use, they will be led to approved recycling companies
- During the construction phase of the overall project (WPP and these accompanying works) no toxic waste, sludge or other form of hazardous liquid waste requiring special care and attention is produced or created.
- The liquid waste is limited to that which will come from the construction site, which will be installed in the project area, namely:

- ✓ mineral oils from the maintenance of excavation vehicles and machinery,
- ✓ diesel or petrol for the propulsion of excavating vehicles and machinery,
- ✓ liquid waste from washing concrete vehicles,
- ✓ urban wastewater from the hygiene of the personnel who will staff the construction site.

The above waste is expected to be collected in appropriate containers and removed from the workplace.

- After the completion of the concrete laying in the various technical works of the entire project, the excess concrete coming from the works of the foundation of the wind turbines of the project, as well as the one that was deemed unsuitable for use, will be led to approved recycling companies of ECDW, as mentioned in paragraph 3.3.
- The waste that will come from the maintenance materials of vehicles and machinery, from the hygiene of the personnel, from the packaging of construction materials as well as from any other possible use on the construction site will be collected in appropriate closed type bins and will be disposed of two authorized management bodies.
- During the construction phase of the overall project, limited noise will arise from the operation of the machinery and vehicles transporting the towers and wings of the aircraft, the erection works, the passage and operation of the necessary machinery for the opening of the M.V. ditch, the construction site and the traffic on the road network of the area.
- Construction site noise will not exceed the limit of 55 dB(A) set by the current legislation on the urban environment (P.D. 1180/1981).
- No acoustic or vibrational nuisance is expected from the foundation of the W/T and generally of the WPP.

The air pollutants that will accompany the main project and its accompanying works will consist of:

- ✓ Mainly in the dust emitted, which will arise because of earthworks and the handling and deposition of various materials.
- ✓ To a lesser extent the gaseous pollutants produced by the fuels of the various machines and vehicles that will be used to carry out the project.
- ✓ No substantial damage to the atmosphere of the wider area is expected during the construction phase.

During the operational phase of the entire project

The nature of the project is not characterized by significant consumption of materials, energy and water. During the operation phase of the project, material inputs have to do with the basic needs of employees (consumables and household essentials), stationery, household equipment and furniture, supplies of spare parts and electromechanical components and materials and fuel inputs for vehicles. During the operation of the WPP, the use of other types of raw materials is not foreseen.

The wastewater associated with the operation of the WPP is the urban type of wastewater from the project operation staff and the lubricating oils used in the mechanical parts of the equipment. The quantities of these are limited as effluents.

The basic wastewater that requires special management in the operation of a Wind Power Station results from the basic maintenance mainly of the mechanical parts and consists of:

- Waste oils, or semi-synthetic oils or synthetic oils, for use in lubrication of toothed gears and other moving parts and in refrigeration systems.
- Used voltage lifting transformer oils.
- Used hydraulic oils from use in hydraulic pressure transmission units for braking systems (brake), blade rotation systems (Pitch), wing tips, etc. These materials fall under the legislation on hazardous waste. It should be noted that none of the oils used include PCBs.

Solid waste from the operation of the WPP relates to waste from operating personnel and solid materials, such as rubber or metal waste resulting from replacement or maintenance work of mechanical parts, however, these quantities are not considered significant.

The main solid waste that requires special management in the operation of the Wind Power Station results from the basic maintenance mainly of the mechanical parts and consists of:

- Empty packaging of the above-mentioned oils: Metal barrels and plastic containers
- Used filters impregnated with the above oils (usually paper and metal)
- Empty packages of lubricating greases based on mineral oils and special additives
- Empty metal containers and sprays containing adhesives, pastes, lubricants, mild solvents and cleaners (15 01 02 and 15 01 04 and 15 01 07 and 15 01 10)
- Cotton cloths used for surface cleaning and therefore impregnated in the above materials (oils, greases, cleaners, etc.) (15 02 02)
- Low power batteries, for use in automatic greases and generally small automation (16 06 01 and 16 06 04)
- Higher power batteries for use in UPS systems (16 06 01).

These materials fall under the legislation on hazardous waste.

- Residues of mechanical, electrical and electronic equipment. These materials shall not be considered hazardous waste.

For all the above wastes, the prescribed proper management is carried out and appropriate measures are taken to:

a. Do not create risks for aquifers (surface and groundwater), air, soil, flora, fauna and general agricultural, forestry and fisheries production.
b. Do not cause nuisance by noise or odors.
c. Do not cause negative effects on the natural landscape as well as on areas of environmental interest.
d. Do not endanger public health.

Regarding electromagnetic radiation emissions, it is emphasized that the operation of the WPP is not characterized by the emission of electromagnetic radiation, which is harmful to the environment and humans.

As far as pollutant emissions are concerned, during the operation phase of the overall project (WPP and accompanying works) there will be no pollutant emissions in the atmospheric environment of the area.

CHAPTER 4 - OBJECTIVE AND FEASIBILITY OF IMPLEMENTING THE PROJECT - WIDER LINKS

Introduction to Renewable Energy Sources

One of the main pillars of operation of the modern model of economic development at a global level is the use of energy. Modern societies consume very large amounts of energy to meet all their needs, both at unit level (e.g. households) and in larger and more complex structures (public and private sector enterprises, public transport, industry, etc.). The continuous improvement of living standards is inextricably linked to the increase in energy demand.

Nowadays, the largest percentage of energy is produced mainly from conventional energy sources, in other words thermal plants that run on fossil resources, such as oil and its derivatives, coal, natural gas and radioactive minerals. The intensive utilization of these conventional fuels, which are essentially natural resources, located underground but considered exhaustible, Due to their very slow replenishment, in addition to the risk of their rapid exhaustion, they create a series of environmental problems, with the greenhouse effect being the focus.

In nature, apart from conventional fuels, a multitude of other energy sources are available, which have been used since antiquity to meet various energy needs, such as wind, sun and water. These forms of energy are called Renewable Energy Sources (RES) because they are connected to the daily cycle of nature and are practically considered inexhaustible. Such as Directive 2001/77/EP defines Renewable Energy Sources (RES) as non-fossil renewable energy sources, i.e. wind, solar and geothermal energy, wave energy, tidal energy, hydraulic energy, gases released from landfills, sewage treatment plants and biogases.

The interest in the wider exploitation of RES, as well as in the development of reliable and cost-effective technologies that commit their potential, first appeared after the two oil crises of 1973 and 1979, and consolidated in the last decade after the realization of global environmental problems. Today, considering the official plans of developed countries for energy, the further and expanded utilization of RES is demonstrated. The cost of soft energy applications has been continuously decreasing over the last twenty years because of their penetration into global electricity production.

The main advantages of renewable energy sources are summarized as follows:

- They are inexhaustible sources of energy and contribute to reducing countries' dependence on exhaustible energy resources, enabling countries to:
  1. To improve its energy independence
  2. To strengthen the trade balance by limiting energy imports

3. To create strategic reserves in domestic mineral resources for the security of the country and future generations.

- They lead to the decentralisation of the energy system, due to their geographical dispersion, with the result that energy needs can be met at local and regional level and consequently relieve infrastructure systems and limit losses from energy transmission.
- They have relatively low operating costs independent of fluctuations in the international economy and more specifically in the prices of conventional fuels.
- They offer the possibility of rational utilization of energy resources covering a wide range of energy needs of users.
- It contributes to the revitalization of economically and socially degraded areas by creating new jobs and attracting similar investments.
- They are friendly to the environment and humans.

Energy Demand in Greece and the contribution of RES

According to ADMIE's Ten-Year Transmission System Development Plan 2022 - 2031, the following figure presents the energy demand forecast. The variables listed are:
Historical data as recorded from 2001 to 2019.
"NECP scenario": According to Regulation (EU) 2018/2019, the targets set in the National Energy and Climate Plans (NECPs) become binding and therefore the assumptions described therein should be the key parameters taken into account when developing electricity transmission systems: This scenario has been formulated with ADMIE's estimates based on available historical demand data and published forecasts prepared by other competent bodies (medium-term GDP development, long-term demand forecasts, etc.), considering the available forecasts of suppliers. In particular, the reference point is the total electricity demand in GETS in the year 2019.

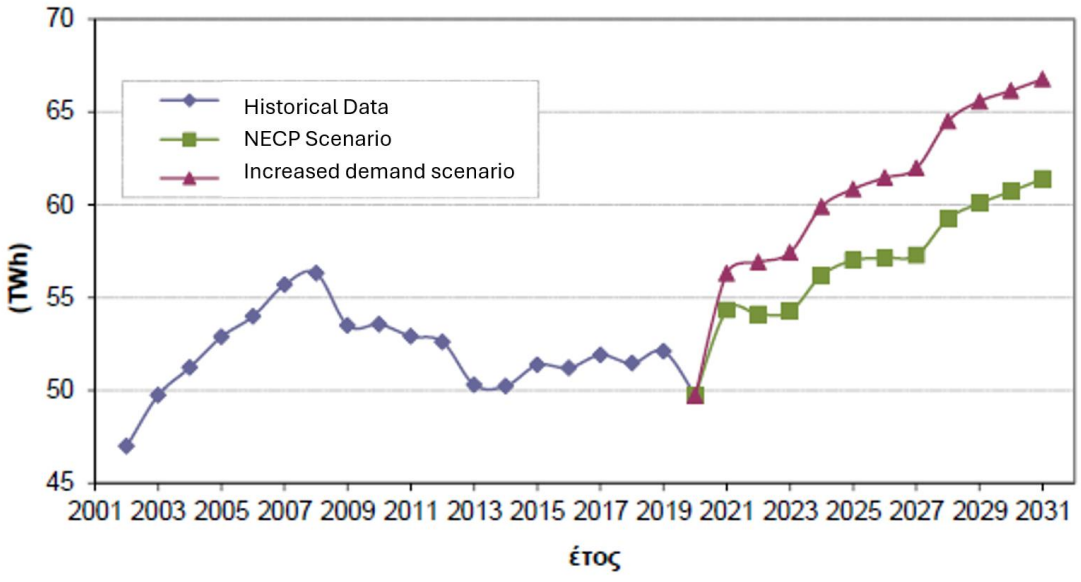


Image 1: Evolution of total electricity demand for the period 2000-2018 (source : ADMIE)

The average annual growth rate of total net demand during the decade 2000-2010 was 2.17%, showing a significant decrease compared to previous decades. During the period 2000-2007 the average annual growth rate of total net electricity demand was 3.39%. In 2008, at the beginning of the economic crisis, total net demand (excluding pumping load) in the System reached 56.3 TWh,

which is a historical maximum, showing an increase of 1.11% compared to 2007. 2009 was characterized by a significant decrease in total net demand in the System, by 5.01% compared to 2008, which is due to the remarkable reduction of industrial loads by 20.19% compared to 2008, while consumption at Distribution level also decreased by 3.63%. After 2013, total net electricity demand in GETS shows a stabilization of approximately 51 TWh. In 2018, total net electricity demand in GETS amounted to 51462 GWh, showing a decrease of 1.0% compared to 2017. From the data of 2019 so far, it appears that the total net electricity demand in GETS in the first ten months of 2019 is increased by 2.9% compared to this corresponding period of 2018. The following is a diagram of the country's energy mix for the period 2006 - 2016:

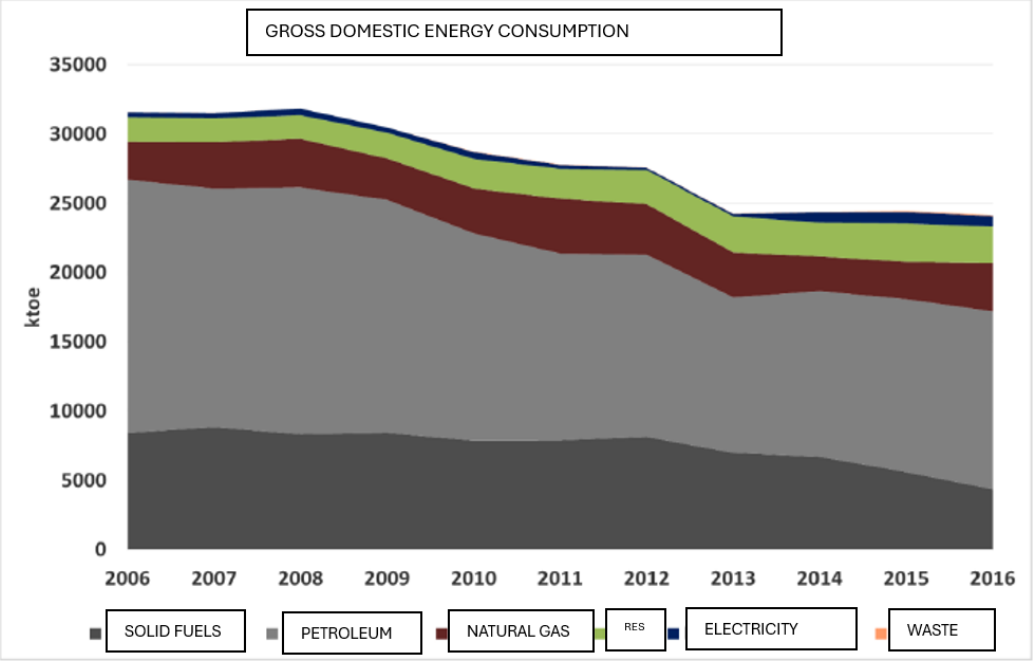


Image 2: Greece's energy mix in electricity production for the period 2006-2016

The contribution of petroleum products to gross domestic energy consumption in 2016 is particularly high (more than 50%), while solid fuels, RES and Natural Gas have a significant contribution. The coverage of needs for domestic energy consumption is mainly achieved through imports, indicating high energy dependence. The share of imports in the period 2006 - 2016 increased by 16%, while at the same time, despite the high penetration of RES, there was a decrease in primary production of 33%, mainly due to the reduced utilization of solid fuels for electricity production. In addition, exports increased by 15.2%, which were exclusively petroleum products.

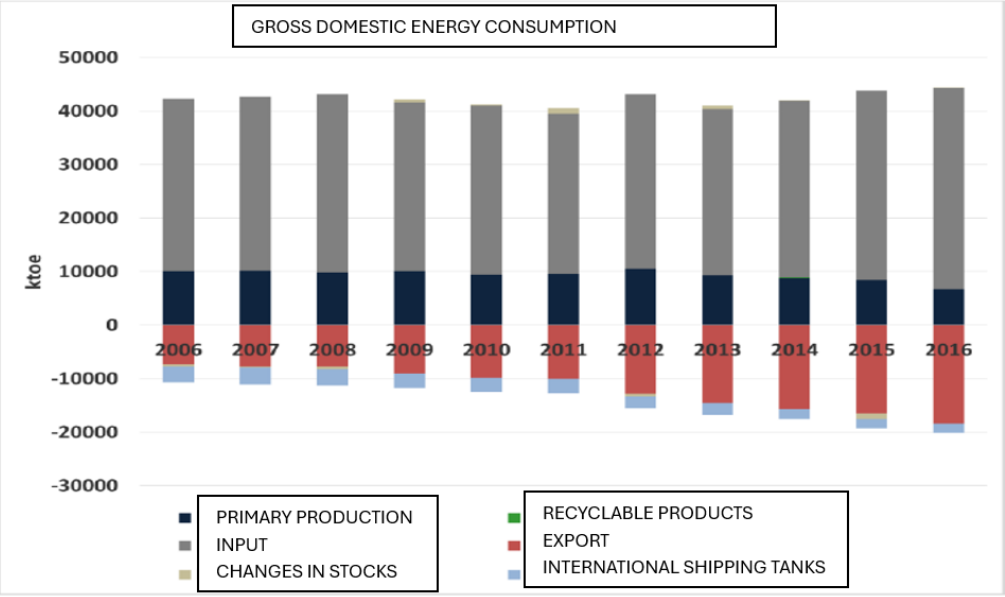


Image 3: Gross inland consumption of energy 2006-2016

The Greek electricity system has the pecuPSEFTISity that it consists of the interconnected system and the autonomous electrical systems of the islands (Non-Interconnected Islands – NII), which are located at a relatively long distance from the mainland. The interconnected system supplies electricity to the mainland and the interconnected islands, while at the same time it is interconnected with the electricity systems of all neighboring countries. Many power stations operate in the northern part of the country (mainly lignite and hydroelectric plants) away from the largest energy consumption center (mainly in the Attica region). Gradually, however, a situation of more uniform distribution of electricity production is being created, through the development of RES projects and the construction of natural gas stations in the center of the country.

The total net installed capacity for the interconnected system and for the NII is shown in the following table:

UNITS	**INTERCONNECTED SYSTEM**	**NII (MW)**
COAL	3903.9	-
NATURLIG GAS	4900.3	-
PETROLEUM	-	1808.3
HYDROPOWER	3170.7	0.3
RES	5343.8	460.7
TOTAL	17318.7	2269.3

Image 4: Installed capacity for production in the interconnected system and the NII (source: IPTO "Power Adequacy Study 2020-2030)"

Regarding gross electricity consumption in the period 2006 - 2016, there was a significant increase in electricity production from wind and photovoltaic plants (more than 400%), while at the same time production from lignite and oil plants decreased by 47% and 42% respectively. The above trend of electricity production from RES stations and conventional RES stations and conventional stations seems to have continued in 2017 with lignite production and natural gas participation

marginally increased compared to 2016. Moreover, in 2017, the contribution of interconnections and hydropower plants to demand coverage was marginally reduced compared to 2016, with this decrease being covered by the marginal increase in lignite production, natural gas production and the increase in the contribution from RES beyond hydropower plants. It is noted that gross electricity production in 2016 amounted to 51 TWh, reduced by 15% compared to 2006 while in 2017 it amounted to approximately 52 TWh. Total electricity disposal (net electricity production including net imports) for 2016 amounts to 57.3 TWh.

Below are indicative graphs showing the shares of the different fuel types in gross electricity consumption for the years 2006 and 2016, showing the significant variation in the fuel mix over the period considered.

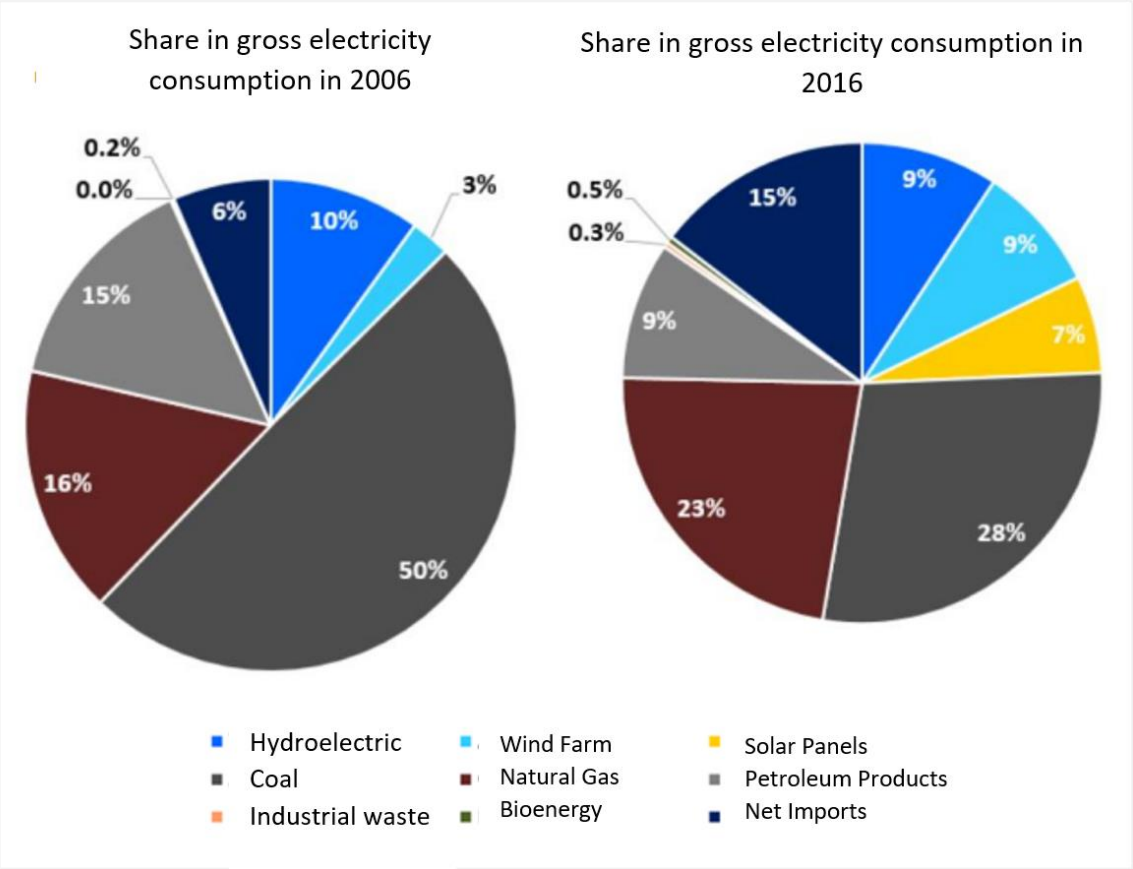


Image 5: Comparison of energy mix in electricity consumption for the years 2006 and 2016

The transformation of the electricity sector and the evolution of final energy consumption have led to a significant improvement in both the greenhouse gas emission factor and the conversion factor of final energy consumption into primary energy consumption. More specifically, the greenhouse gas emission factor for 2016 amounted to 0.606 kg CO2/kWh, while the conversion factor of final energy consumption to primary to 2.17. These values are significantly better than those calculated in 2010 under national regulations of 0.969 kg CO2/kWh and 2.90 respectively.

The contribution of RES to energy consumption in Greece shows a significant increase during the period 2006 - 2016, as its total contribution in 2016 as a share in final energy consumption amounts to 15.2%, halving the relative share corresponding to RES in 2006.

In absolute terms, electricity production from RES in Greece has already risen to more than 25% year-on-year as a share in gross final electricity consumption, making its contribution a leading player in covering electricity needs in Greece. It is also important to note that due to the increased electricity production from RES at distribution network level, the phenomenon is already observed, especially during the summer months, that the hours with the highest electricity demand at system level (8-10pm) are different from the hours with the highest total demand (2-3pm).

Essentially, distributed generation from RES succeeds in reducing in absolute terms the peak load of the system.

Below is a relevant graph:

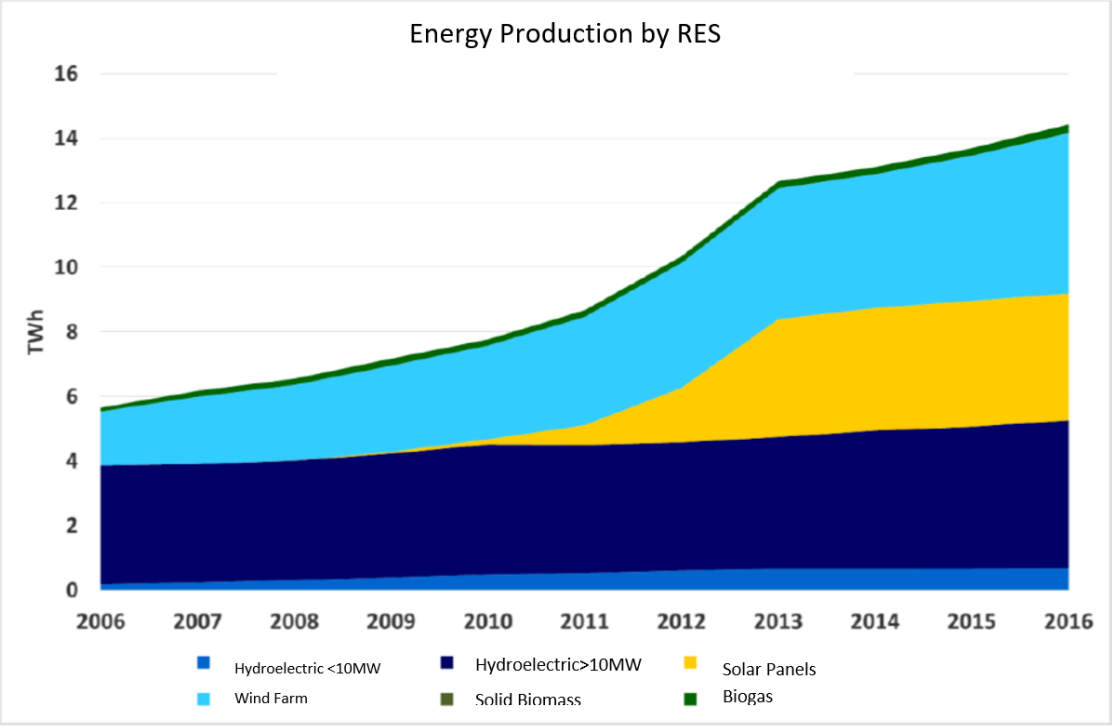


Image 6: Electricity production from RES in the period 2006-2016

Electricity production from RES approaches more than 15TWh per year. Electricity production from wind accounts for more than 35% of total electricity production from RES, while photovoltaics account for a share of 27%. The installed capacity of RES plants has increased significantly in recent years with a notable growth of photovoltaic plants during the period 2011 - 2013 and a steady increase in the power of wind power plants for the entire period 2006 - 2016.

National energy and environmental objectives in the context of European policies

Directives 2010/75/EU and 2015/2193/EU in conjunction with Best Available Techniques decisions introduce strict emission limits (mainly for SO_2, NO_x and PM2.5) for power plants.

Additional indirect restrictions are introduced by both the Waste Framework Directive 2008/98/EC, as amended by Directive 2018/851/EU, and the draft Electricity Market Directive.

In the context of national energy planning, basic quantitative targets are set, for the period up to the year 2030, which derive from the priorities that have been formed at national level, as well as from the climate and energy targets that have been developed and agreed at European Union level. In addition, these are "intermediate" targets in the framework of central international and European plans and strategies for reducing its emissions greenhouse by the year 2050. These national targets for the year 2030 arise both in the context of specific quantitative commitments undertaken by the Member States (i.e. targets for sectors outside the Emissions Trading System and reduction of national emissions of certain air pollutants compared to 2005) and considering the characteristics and specificities of the national energy system. the domestic potential for the development of technologies and applications, for adaptability as well as socio-economic characteristics.

The national plan is part of the central European policy to tackle the phenomenon of climate change with specific climate targets up to the year 2050 and the need to develop a long-term energy and climate plan that will extend up to the year 2050. The actions in this context aim at the complete decarbonization of the domestic energy system, the greater penetration of RES and the further improvement of emissions and energy intensity indicators.

Specifically, the national targets set up to and including the year 2030 concern the following:

- For sectors outside the non-ETS, the reduction in greenhouse gas emissions should exceed 35% compared to the corresponding emission levels in 2005.
- For the sectors included in the Emissions Trading System (ETS), the reduction of greenhouse gas emissions should exceed 70%, compared to the corresponding emission levels of the year 2005.
- The overall reduction of GHG emissions by more than 40% compared to 1990 and by more than 55% compared to 2005.
- The achievement of a share of RES in gross final energy consumption of at least 35%.
- Improvement of energy efficiency in final energy consumption by at least 38% compared to the projected evolution of final energy consumption until the year 2030, as estimated in 2007, resulting in final energy consumption not exceeding 16.5 Mtoe
- In the context of enhancing energy security, the following are promoted:
  - ✓ Increasing the diversification of energy sources and suppliers from third countries
  - ✓ The optimal utilization and use of domestic energy sources
  - ✓ The emergence of the country as a regional energy hub
  - ✓ Reducing the energy dependency rate
  - ✓ The interconnection of autonomous island electrical systems
  - ✓ Ensuring the adequacy of the System's power

4.1 Objective and feasibility

The ability of a body to produce work is called energy. Energy sources are divided into non-renewable sources derived from fossil fuels, mainly oil and gas, and renewable ones derived from natural processes (water, wind, sun, geothermal, etc.). It is well known that the negative and harmful effects on the environment from burning fossil fuels vary. But the main effect is the emission of carbon dioxide into the atmosphere, a greenhouse gas that results in global warming. Acid rain is also an environmental phenomenon that owes its creation to the burning of fossil fuels (by emitting nitric, sulfuric or carbonic acids).

The European Union has established a framework to implement a long-term strategy for 2050, the European Green Emission. With the main aim of creating a resource-efficient economy, ensuring

zero emissions of pollutants (mainly greenhouse gases) by 2050, it has committed its 27 member states to reduce emissions of pollutants into the atmosphere by at least 45% by 2030. Its main dividend is the limitation of the temperature increase by 1.5oC. Based on the above, the need for penetration of environmentally friendly energy sources is imperative, since they are the basis of the economic development model and the most effective solution that nature and science offer to humanity.

Renewable energy sources are characterized as mild forms of energy because no energy intervention (e.g. combustion) is necessary for their utilization, since they exploit a form of energy created by natural processes. They have been used since antiquity to meet energy needs and are inexhaustible in contrast to fossil fuels. Renewable energy sources have a zero-energy footprint. The term energy footprint was the amount of carbon dioxide (C02) released into the atmosphere.

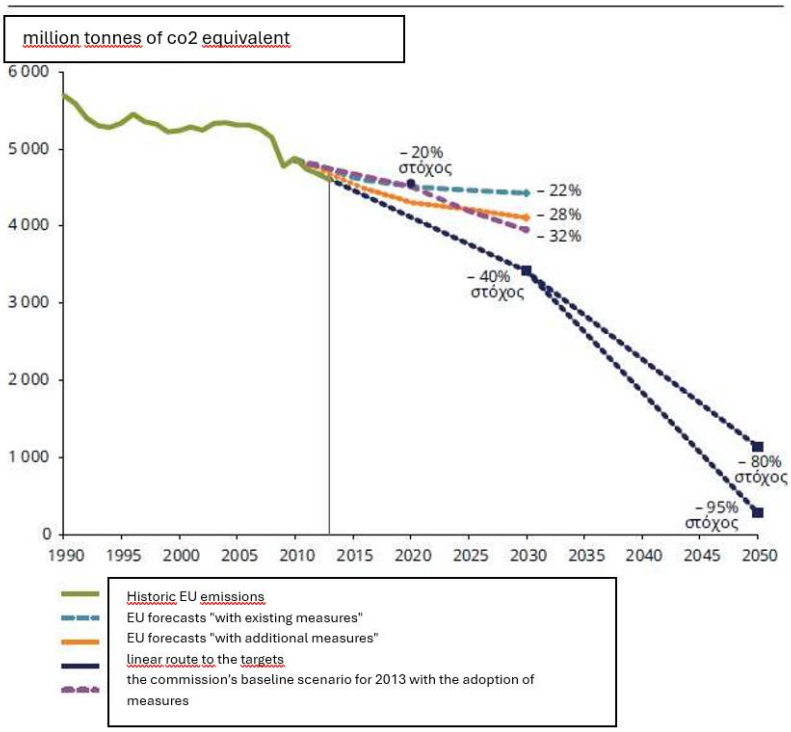


Image 7: European Union Vision 2050-Zero C02 emissions (source: European Environment Agency).

Wind energy is the fastest growing form of renewable energy in Europe with a growth rate of more than 20% per year and the main factor in mitigating climate change on the planet. Its exploitation to produce zero-emission electricity in the atmosphere, for which the Member States of the European Union will have to pay high fines, contributes to the independence from imported conventional fuels, which leads to economic, social and environmental benefits.

Wind energy owes its creation to solar radiation. It is based on a principle, the "theory of vertical convection", according to which a layer of air that will meet the earth's surface will heat up and rise, while its place will be taken by a cooler body that in turn will heat up and rise, and so on. Therefore, it is an inexhaustible source of energy (if the sun exists, there will be wind). The inexhaustible and unlimited wind is exploited by wind turbines.

4.1.1. Objective and feasibility of the project envisaged

The project under consideration aims to create three wind power plants for electricity production based on compliance with the current legislation, the exploitation of the wind potential of the area and the independence from conventional fuels that not only increase the price of electricity but also emit polluting and harmful substances to the environment.

Greece has a high production potential due to the prevailing climatic conditions. Due to the sunshine that prevails during most days of the year, it has a strong wind capacity (significantly exploitable wind speeds of 7-10m/s). Therefore, all this untapped production potential can be exploited and the energy mix of the country and the EU in general can be strengthened.

In the last decade, Greece's energy system has been characterized by the reduction of fossil fuel consumption, which is mainly based on lignite plants, but also by the high dependence on imported fuels (oil, natural gas), which, in addition to the pollutants they emit into the environment, also increase the price of electricity. On the contrary, wind farms and renewable energy sources in general have zero emissions of pollutants into the atmosphere and are the cheapest form of electricity production since they are not exposed to international fluctuations in fuel prices.

Based on the study carried out by HSAWE, it is documented that renewable energy sources not only reduce the price of the wholesale electricity market by replacing high fossil fuel prices, but also allow the transfer of resources to the Energy Transition Fund. In Greece, from 2016 to 2019, lignite plants brought a total loss of 683 million euros, which were paid by consumers, while if they continued to remain in operation, the additional losses would be in the order of 1.3 billion euros.

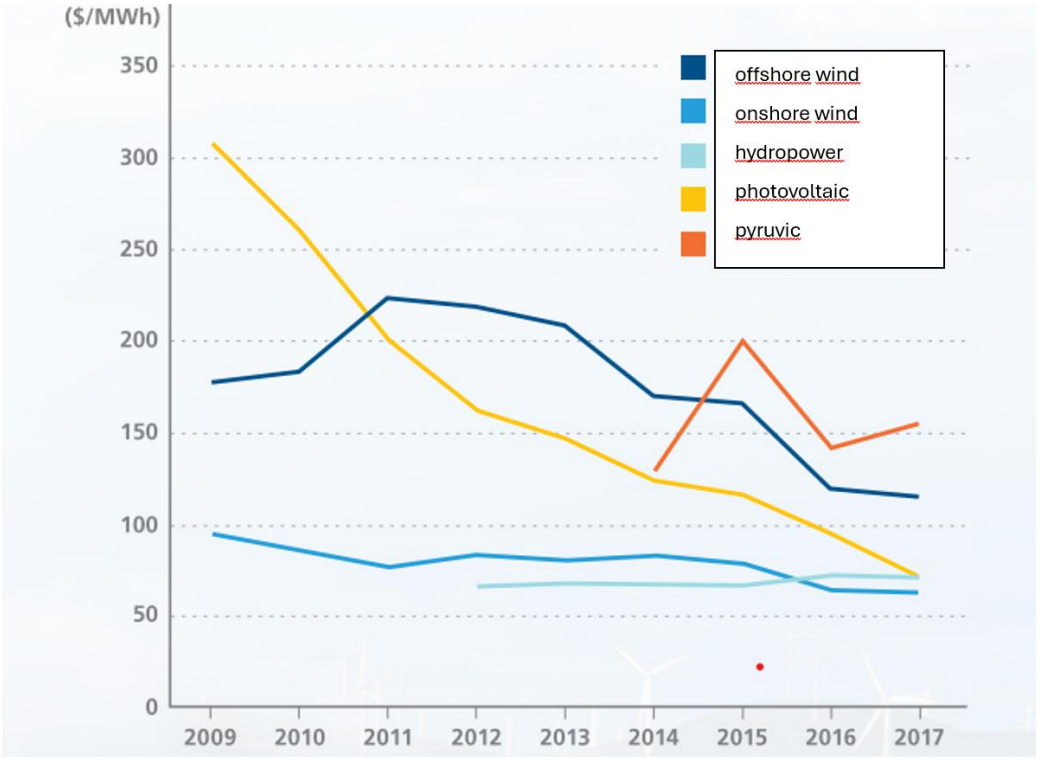


Image 8: Total cost of production per technology (source: IMF, 2019).

The cost of production from wind power plants and generally from RES is significantly reduced and continues to decrease with the creation of increasingly efficient machines. As shown in the

image above (source: HSAWE, International Monetary Fund) during the period 2009-2017 solar and wind energy are the cheapest electricity generation solutions.

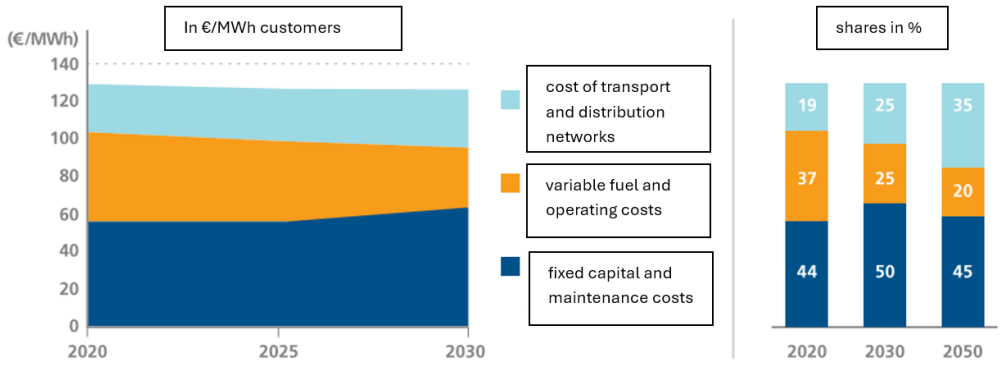


Image 9:Projected electricity costs from 2020-2050. (source: National Energy and Climate Plan).

Based on the NECP 2030 (National Energy and Climate Plan), variable fuel costs are projected to decrease by 2050 by increasing electricity production from wind and renewables in general. The above cost includes all investments required to produce electricity (transmission and distribution network costs, construction costs, maintenance costs).

It is also predicted that the share of electricity production from wind and photovoltaic plants in Greece's energy mix will reach 50%, while at the same time the corresponding percentage of lignite and oil will decrease to 1.5%. Therefore, achieving this target will require a lot of investment in renewable energy stations.

Based on HSAWE statistics (HWEAWind Energy Statististics-2022), the total installed capacity in Greece until 2022 amounts to approximately 4,681MW. During the year 2022, 230MW of wind power was connected to the electricity grid of Greece.

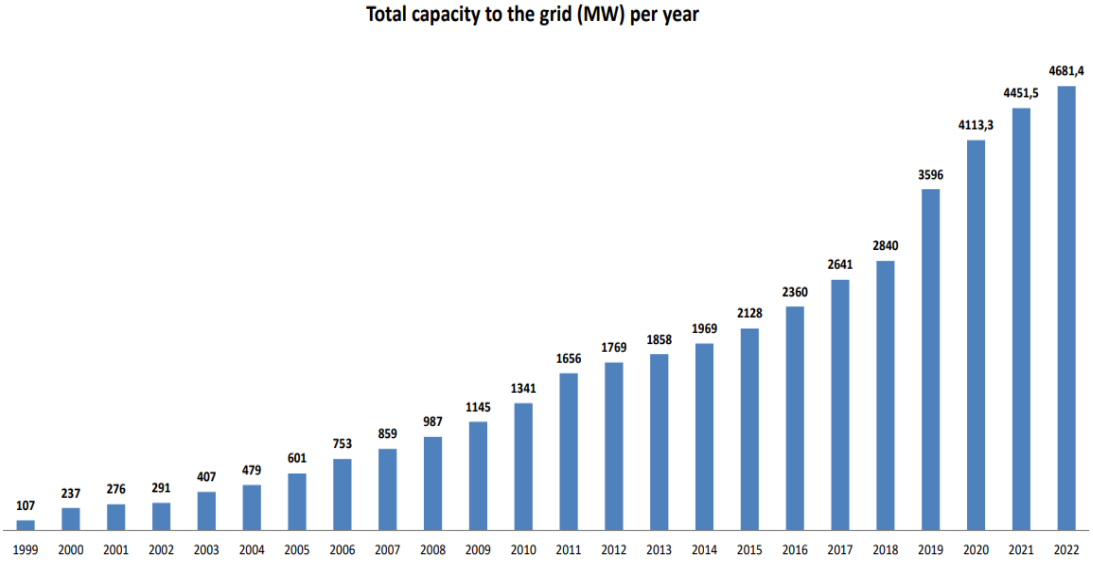


Image 10: Total installed capacity per year (source: ELATAEN, 2022)

In terms of wind installations per region, Central Greece is first, with an installed capacity of 1872MW, followed by the Peloponnese with an installed capacity of 639MW, while in third place is Eastern Macedonia and Thrace with an installed capacity of 534MW.

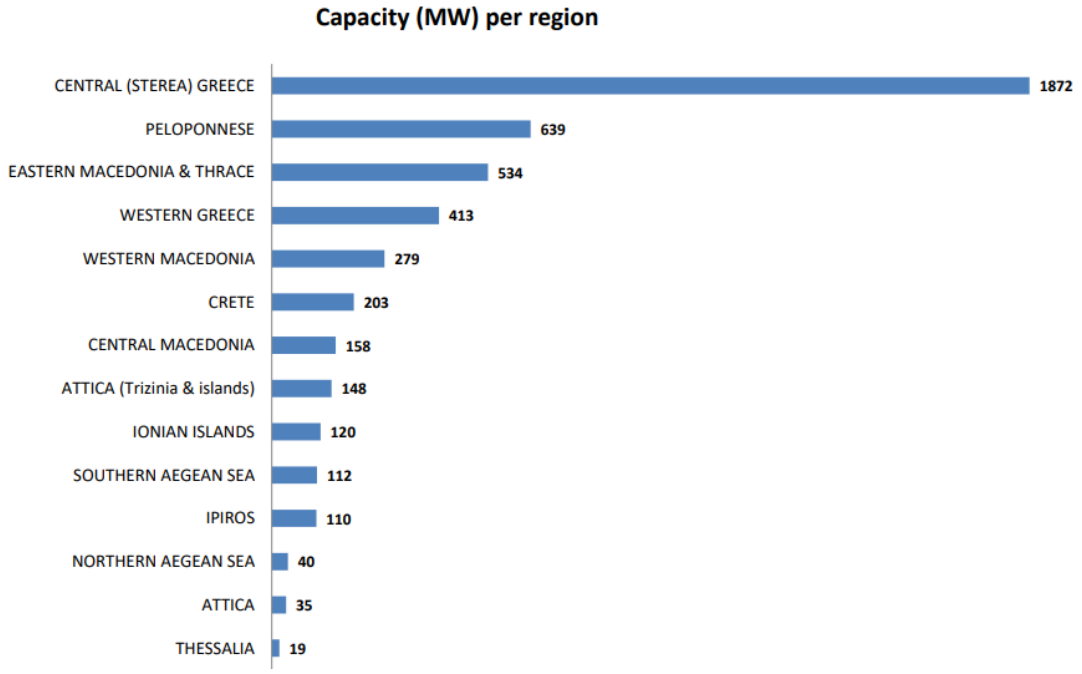


Image 11: Total installed capacity per region until the year 2022.

According to Law No. 3851/-Government Gazette A' 85/2010 "*Accelerating the development of Renewable Energy Sources to tackle climate change*", the promotion of RES is a priority of utmost importance for the country.

According to Article 5 of Directive 2009/28/EC of the European Parliament and of the Council of the European Union, the calculation of the share of energy from RES is the sum of gross final consumption of energy from, gross final consumption of RES for heating and cooling and final consumption of energy from RES in transport. The national target for RES according to article 1 of Law 3468/2006 (Government Gazette 129 A) by 2020 became unattainable since the target installed capacity for 2020 amounted to 7,000MW.

The following rotogram presents the energy mix of Greece until 2022.

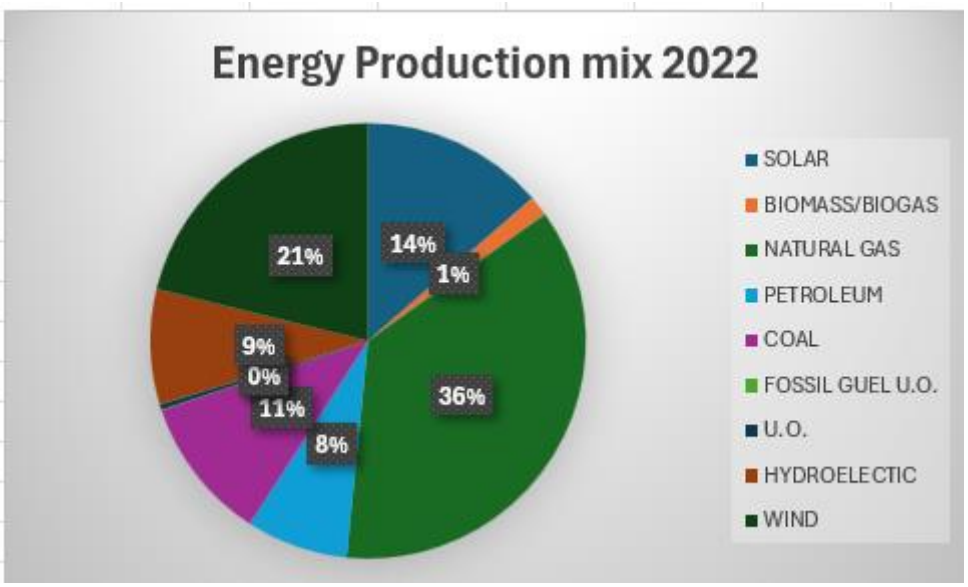


Image 12: Percentage rodogram of energy production mix 2022. (source : https://www.RES & Guarantees of Origin Manager.gr/dimosieuseis/eguiseis-proeleusis-energeiako/ , 24/07/23)

According to HSAWE press release until 2021, the total percentage production of fossil fuels amounts to 54.79% (28.62 TWh) of the total production, while the total percentage production from RES amounts to 44.84% (23.41 TWh) with wind energy holding 21.16% of the energy mix.

By 2022, wind power held 47.21% of total installed capacity from renewable energy sources while solar energy accounted for 30.41%. 19.09% was produced by hydropower and 3.27% by biomass. Based on the Greek energy mix (RES & GUARANTEES OF ORIGIN MANAGER data), the production of each kilowatt hour from renewable energy sources prevents the emission of about one (1) gram of carbon dioxide (CO2) into the atmosphere and avoids the emission of other radioactive pollutants (sulfur compounds, nuclear waste, nitrogen oxides, etc.) that have a significant impact on the environment.

2022	NATURAL GAS [1]	PETROLEUM	COAL	FOSSIL FUELS U.O. [2]	TOTAL FOSSIL FUELS	U.O. [2]	HYDROELECTRIC	WIND FARM	SOLAR	BIOMASS/BIOGAS	RES U.O [2]	TOTAL RES	TOTAL	CO_2 EMISSIONS (gCO_2/KWh)
%	34.47%	7.57%	10.69%	0.05%	54.79%	0.40%	8.56%	21.16%	13.63%	1.47%	0%	44.82%	100%	
TWh	19.05	3.95	5.59	0.03	28.62	0.21	4.47	11.05	7.12	0.77	0	23.41	52.24	346.4218
[1] IT CONTAINS THE PRODUCTION OF CHP WHICH USES AS FUEL NATURAL GAS														
[2] Unknown Origin														

Image 13: Greece's energy mix until 2022. (source : https://www.RES & Guarantees of Origin Manager.gr/dimosieuseis/eguiseis-proeleusis-energeiako/, 24/07/23).

For the WPP under study, it covers the requirements, in terms of wind potential, for the development of a sustainable investment, while helping to achieve the national target for RES, beneficially offsetting the small-scale impacts from its construction and operation. The project has been designed with the aim of protecting the environment and making the best use of the available wind potential of the installation site. The wind farm will be an independent electricity producer and will be interconnected to the PPC network, to which the entire production will be available exclusively in accordance with the current legislation. The disposal of the Electricity, which will be produced by the Wind Park, is ensured through a special contract with RES & Guarantees of Origin Manager.

4.1.2. Developmental, environmental, social and other criteria supporting the implementation of the project

The development of the planned project and wind energy projects in general contributes both to the objectives of the European Union to increase the penetration of RES and to the goals of the Greek government for the decarbonization of electricity production.

It also contributes to the energy independence from conventional fuels (natural gas, oil), which promotes the economic development of the country (the price of imported fuels is high). At the same time, they are a polluting source of energy.

Therefore, a wind energy project not only does not have a negative impact on the environment, but also contributes to its restoration and the achievement of the country's national goals by avoiding pollutants in the atmosphere.

In Greece, the updated National Energy and Climate Plan (NECP) announced by the new leadership of the Ministry of Environment and Energy contains more ambitious and important targets for 2030. Among them stands out the large reduction of greenhouse gas emissions by 42% in 2030 compared to 1990 (compared to 32% of the previous NECP) and the emblematic choice for complete lignite phase-out of electricity production in 2028.

The achievement of these objectives is necessary for environmental and economic reasons. The threat of climate change, and especially the fact that it is man-made, require action now for a clean energy mix. Furthermore, the need for low energy costs for consumers and the national economy imposes the abandonment of polluting and expensive fossil fuels and the massive development of wind energy and RES, which are the cheapest form of electricity production. For these and other important developmental, social, political, geostrategic reasons, Europe has presented an impressive strategy to become the first climate-neutral continent in 2050. The updated NECP for 2030 and the Long-Term Energy Strategy for 2050, presented almost simultaneously by the Greek Government, are in line with the new European Strategy.

In addition, apart from carbon dioxide, the release into the atmosphere of sulfur dioxide and nitrogen is avoided, which also owes its creation to the combustion of fossil fuels and contributes to the occurrence of the phenomenon of acid rain.

Greece is a country favored in terms of wind potential exploitation since high speeds are encountered for significant long periods of time in one year.

WPP do not occupy a large area and are capable of sharing land with sectors such as agriculture and livestock making wind energy efficient in terms of space. Wind turbines are a form of energy production with minimal maintenance requirements and operational reliability.

Also, according to the Kyoto Protocol, fines will be imposed for the emission of air pollutants into the atmosphere. With the development of the planned project and RES projects in general, the fines for the release of pollutants are reduced.

The company "Aliki Energy SINGLE MEMBER P.C.", which is the management company of the entire WPP, intends to install in the studied project a Bird Monitoring System of the company Digisec which uses advanced artificial intelligence and machine learning algorithms and high-definition cameras (8 megapixels) to identify and detect and monitor birds at a high-risk collision distance by emitting special sounds to warn them. Sound is applied during repeat until the birds leave the protected area.

In case the birds do not change course and continue heading towards the wind turbine, the system deactivates it to protect them from a potentially fatal collision. Of course, the detection algorithm

is of the latest technology, resulting in signal errors, to stop the wind turbine generator, to be almost zero false positives. During maintenance of the wind turbine, the system is deactivated. The BMS (Bird Monitoring System) is discussed in detail in Chap. 10.4 of this EIS.

Also, again under the responsibility of the company, a fire protection system will be installed which is placed on the nassal of each wind turbine and with appropriate, advanced technology and high-definition cameras (IRPanoramic) will detect the fire at a range of up to 5 km.

Finally, the parts of a wind turbine after the end of its operation (25 years) are recycled at a rate of 85-90% and can be used for secondary uses.

4.1.3 Benefits expected at local, regional and national level

The implementation of the planned wind power plant will lead to significant benefits at local, regional and national level.

At the local level, they will lead to job creation during the construction and operational phases. According to a measurement by the Association of Power Producers (report HSAWE), jobs are created in the areas of maintenance, operation in wind turbine suppliers and in the construction sectors of the foundations of the project. During the operation of the project, jobs are created to monitor and supervise the operation of the wind turbine on a continuous basis.

The planned project and wind projects in general strengthen the economy of local communities. According to article 7 of Law 3851/2010, as in force, it is stipulated that 1.7% is attributed 80% to the first-degree local authority, within the administrative boundaries of which the RES stations are located and 20% to the first-degree local authority(ies), from the territorial region of which the station's connection line to the System or Network passes. If the stations are installed within the administrative boundaries of more than one local authority, 1% is attributed to the licensees for supply of electricity to the household consumers of the first-degree local authority in which the RES stations are installed and is reimbursed through the electricity bills to the household consumers. An amount of 0.3% is allocated to the Green Fund.

Furthermore, benefits arise for the local community from the construction of public utility projects as a compensatory measure from the installation and operation of the WPP as well as sponsorships that serve local needs. These should also include the accompanying projects of WPP (road openings and improvements, electricity networks) which, as infrastructure projects, offer the opportunity to upgrade the living standards of the local community.

4.2 Historical development of the project or activity

The design of the studied project began in the year 2021. Initially, the WPP at the "Mavrodasos" site consisted of 12 wind turbines with a power of 3.45 MW with an impeller diameter of 117 meters, there was a power segmentation from 41.4MW to 34.5MW and a reduction of polygon limits since the power was reduced to 10, then the final modification was made where the wind turbines were reduced to 8 with a power adjustment of 4.3125MW each impeller diameter of 136 meters, Consequently, the polygon was modified as it was divided into two polygons. The above modifications were made with a view to the maximum efficiency of the projects and their optimal compatibility with the natural and man-made environment of the installation area. In the same context, the finalization of the design of the accompanying infrastructures of the WPP took place, as described in the text of this EIA. Finally, the producer certificate was transferred to the company "Aliki Energy SINGLE MEMBER P.C.".

In summary, the amendments made:

2022:

a) change of the number of wind turbines of the wind power plant from twelve (12) wind turbines of 3.45 MW power with an impeller diameter of 117 meters to ten (10) wind turbines of 3.45 MW power with an impeller diameter of 117 meters,

(b) reduction of installed capacity and maximum generation capacity from 41,4 MW to 34,5 MW respectively and

(c) reduction of the boundaries of the installation site based on the geographical coordinates submitted to the RAE.

2023:

a) change in the number and type of wind turbines of the wind power plant from ten (10) wind turbines of 3.45 MW power each with an impeller diameter of 117 meters to eight (8) wind turbines of 4.5MW power with a power adjustment of 4.3125MW each with an impeller diameter of 136 meters and reduction of the installation field.

b) the reduction of the boundaries of the installation site, based on the geographical coordinates submitted to R.A.A.E.W. and its division into two polygons.

c) the transfer of the Producer Certificate from the company under the name "EUROPEAN WIND FARMS GREECE ApS" to the company under the name "Aliki Energy SINGLE MEMBER PRIVATE CAPITAL COMPANY" under the name "Aliki Energy SINGLE MEMBER P.C."

Below are presented the existing numbers of RAE producer certificates.

Project Initial Location	1st Amendment of Producer Attestation	2nd Amendment of Producer Attestation	Transfer of producer attestation	Initial Producer Attestation	
Mavrodasos	995/2022	34/2023	1393/2023	2000/2021	SAA: ΨΦΓ2ΙΔΞ-ΤΥΖ

Table 4: Existing No. RAE producer certificates

Following a spatial study carried out, a preliminary design was carried out to assess the suitability of the location for each of the two projects, which included:

- The study of the location of the Motorways and the preparation of an energy study for the evaluation of the efficiency of the planned WPP, with a view to the optimal exploitation of the wind potential of its installation site.
- Analysis of various scenarios for the interconnection of the studied project with the existing electricity transmission system.
- The preparation of a techno-economic study to assess the viability of the potential investment.

Following the preliminary planning of the WPP, a request file was submitted for the receipt of an Electricity Producer Certificate to RAE, which was followed by the modifications of the project.

Finally, it should be noted that in the nearest area of the project there is one WPP belonging to the company EUROPEAN WIND FARMS GREECE Aps at the location "Lefki" as well as two (2) other WPP which belonged to the same company at the locations "Ammoudes" and "PSEFTIS". The last two, as well as the WPP "Mavrodasos" under study, were transferred to other companies

due to the large financial requirements of the projects (e.g. letters of guarantee, etc.), with the historical developments separately for each project being as follows:

a) WPP at LEFKI position

- No.1998/2021 Producer Certificate for the wind power plant with an installed capacity of 41.4MW and a maximum production capacity of 41.4MW at LEFKI, in the Municipal Unit ORFEAS, the Municipality of SOUFLI, the Regional Unit of EVROS, the Region AN. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS" and "EUROPEAN WIND FARMS GREECE ApS". (AD-06998)
- No. 993/2022 Decision amending no. 1998/2021 Producer Certificate (License Registration No. RAE AD-06998), as in force, for a wind power plant, with an installed capacity of 41,4 MW and a maximum production capacity of 41,4 MW at the location LEFKI, the Municipal Unit ORFEAS, the Municipality of SOUFLI, the Regional Unit of EVROS, the Region AN. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS" and "EUROPEAN WIND FARMS GREECE ApS". This amendment concerned: a) the change of the number of wind turbines of the wind power plant from twelve (12) wind turbines of 3.45 MW power with an impeller diameter of 117 meters to ten (10) wind turbines of 3.45 MW with an impeller diameter of 117 meters, b) the reduction of the installed power and maximum production capacity from 41.4 MW to 34.5 MW respectively and c) the reduction of the boundaries of the installation site.

b) WPP at AMMOUDES

- No. 1999/2021 Producer Certificate for the wind power plant with an installed capacity of 48.3 MW and a maximum production capacity of 48.3 MW at AMOUDES, in the Municipal Unit ORFEAS, the Municipality of SOUFLI, the Regional Unit of EVROS, the Region E. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS" and "EUROPEAN WIND FARMS GREECE ApS". (AD-06999).
- No. 1049/2022 Decision amending No. 1999/2021 Producer Certificate (License Registration No. RAE AD-06999), as in force, for a wind power plant with an installed capacity of 48.3 MW and a maximum production capacity of 48.3 MW at AMMOUDES, in the Municipal Unit ORFEAS, in the Municipality of SOUFLI, in the Regional Unit of EVROS, in the Region of E. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS" and "EUROPEAN WIND FARMS GREECE ApS". This amendment concerned: a) the change of the number of wind turbines of the wind power plant from fourteen (14) wind turbines of 3.45 MW power with an impeller diameter of 117 meters to ten (10) wind turbines of 3.45 MW with an impeller diameter of 117 meters, b) the reduction of the installed capacity and maximum production power from 48.3 MW to 34.5 MW respectively and c) the reduction of the boundaries of the installation site.
- No. 1283/2022 Decision amending No. 1999/2021 Producer Certificate (License Registration Number R.A.A.E.Y. AD-06999), as in force, for a wind power plant with an installed capacity of 34.5 MW and a maximum production capacity of 34.5 MW at AMMOUDES, in the Municipal Unit ORPHEA, the Municipality of SOUFLI, the Regional Unit of EVROS, the Region E. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS". This amendment concerned: a) the change in the number and type of wind turbines of the wind power plant

from ten (10) wind turbines of 3.45 MW power each with an impeller diameter of 117 meters to five (5) wind turbines of 6.0 MW each with an impeller diameter of 150, b) the reduction of the installed power and maximum production capacity from 34.5 MW to 30 MW respectively, and c) the reduction of the boundaries of the installation site as well as the departure of the wind turbines within it.

- No. 1396/2023 Transfer Decision (correct repetition on 19-12-2023) of no. 1999/2021 Producer Certificate (License Registration No. R.A.A.E.W. AD-06999), as in force, for a wind power plant, with an installed capacity of 30.0 MW and a maximum production capacity of 30.0 MW, at the location AMMOUDES, of the Municipal Unit ORFEAS, of the Municipality of SOUFLI, of the Regional Unit of EVROS, of the Region of AN. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS". The aforesaid Decision concerned the transfer of No. 1999/2021 Producer Certificate, as in force, from the company under the name "EUROPEAN WIND FARMS GREECE ApS" to the company under the name "Aetos Wind SINGLE MEMBER PRIVATE CAPITAL COMPANY" and d.t. "Aetos Wind SINGLE MEMBER P.C".

c) WPP in place of PSEFTIS

- No. 4126/2021 Producer Certificate for the wind power plant with an installed capacity of 48.3 MW and a maximum production capacity of 48.3 MW at the location LIEFTIS, of the Municipal Unit ORFEAS, the Municipality of SOUFLI, the Regional Unit of EVROS, the Region E. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS" and "EUROPEAN WIND FARMS GREECE ApS". (AD-08733).
- No. 992/2022 Decision amending No. 4126/2021 Producer Certificate (License Registration No. RAE AD-08733), as in force, for a wind power plant with an installed capacity of 48,3 MW and a maximum production capacity of 48,3 MW at the location LIEFTIS, of the Municipal Unit ORFEAS, the Municipality of SOUFLI, the Regional Unit of EVROS, the Region E. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS" and "EUROPEAN WIND FARMS GREECE ApS". This amendment concerned: a) the change of the number of wind turbines of the wind power plant from fourteen (14) wind turbines of 3.45 MW power with an impeller diameter of 117 meters to ten (10) wind turbines of 3.45 MW with an impeller diameter of 117 meters, b) the reduction of the installed capacity and maximum production power from 48.3 MW to 34.5 MW respectively and c) the reduction of the boundaries of the installation site.
- No. 1398/2023 Decision to transfer no. 4126/2021 Producer Certificate (License Registration No. R.A.A.E.W. AD-08733), as in force, for a wind power plant with an installed capacity of 34.5 MW and a maximum production capacity of 34.5 MW, at the location LIEFTIS, of the Municipal Unit ORFEAS, the Municipality of SOUFLI, the Regional Unit of EVROS, the Region E. MACEDONIA & THRACE, of the company under the name "EUROPEAN WIND FARMS GREECE ApS". The aforesaid Decision concerned the transfer of No. 4126/2021 Producer Certificate, as in force, from the company under the name "EUROPEAN WIND FARMS GREECE ApS" to the company under the name "Olympias Wind Energy SINGLE MEMBER PRIVATE CAPITAL COMPANY" and d.t. "Olympias Wind Energy SINGLE MEMBER P.C.".

4.3 Financial data of the project or activity

4.3.1 Total budget estimate

The total cost of the studied project is estimated at approximately € 35,451,398.

CONSTRUCTION COST	TOTAL COST (€)
BUY V136-4,5MW	26.424.848
ERECTION AND TRANSPORT	4.500.050
ELECTRICAL EQUIPMENT	566.500
GRID INTERCONNECTION PROJECTS	3.300.000
LAND USE RIGHTS	660.000
TOTAL	35.451.398

Table 5: Construction cost of the planned project

4.3.2 Individual budget estimate of proposed environmental measures and actions

According to Law 3468/06 (Government Gazette 129 A'/27.06.2006), as amended by Law 3851/10 (Government Gazette 85 A'/04.06.2010), Local Government Organizations are financially supported by the operation of the WPP in the direction of developing other activities and promoting the construction of infrastructure projects, such as sewerage, internal road works, cultural and tourist upgrading projects, with the aim of further increasing jobs and improving per capita income.

According to no. 7 of Law 3851/2010 (Special fee and incentives to residential consumers of areas where RES projects are installed), a special fee of 3% is withheld from the start of operation of the park.

Specifically, according to Law 3851/2010, which replaced Law 3468/2006:

- "*An amount of up to 1% of the pre-VAT selling price of electricity from RES shall be reimbursed to the holders of a supply license who supply electricity to the household consumers of the first-degree local authority in which the RES stations are installed, in order to credit up to this total amount the electricity consumption bills of household consumers. Beneficiaries of the credit referred to in this paragraph are primarily household consumers within the administrative boundaries of the municipal or community district in which the RES stations are located and then household consumers of other municipal or community districts. The credit shall be made to the actual bill of each beneficiary, in proportion to the energy consumed, provided that in total the above amount is not exceeded. The credit relates to the energy part of the account and is carried out in the following priority: up to (a) the charging of the first 800 kilowatt hours of each beneficiary consumer; (b) the total night tariff consumption charges of each beneficiary consumer; c) the charge for consumptions between 801 and 1,600 kilowatt hours of each beneficiary consumer and d) 60% of the charge for consumptions over 1,601 kilowatt hours of each beneficiary consumer, on a four-monthly basis. The credit shall be indicated separately on the regular statement of account of each account.*
- *The amount of 0.3% on the pre-VAT selling price of electricity from RES is paid to the Special Fund for the Implementation of Regulatory and Environmental Plans (SFIREP)*
- *An amount of 1.7% is attributed 80% to the first-degree local authority, within the administrative boundaries of which the RES stations are located and 20% to the first-degree local authority or local authorities, through whose territorial region the station's connection line to the System or the Network*

	WIND ENERGY PRODUCTION FIT [1] GWh	WIND ENERGY PRODUCTION SADC [2] GWh	TOTAL REVENUES WIND PRODUCTION WITH FIT M€	TOTAL REVENUES WIND PRODUCTION WITH SADC M€
21-Oct	651.30	391.70	61.55	36.60
21-Nov	603.00	349.00	57.10	32.67
21-Dec	750.30	446.70	70.34	41.28
22-Jan	572.90	369.10	54.82	33.85
22-Feb	519.10	313.90	49.27	22.80
22-Mar	580.70	379.30	56.19	35.04
22-Apr	509.60	335.40	48.75	31.07
22-May	364.40	225.60	35.34	20.80
22-Jun	489.20	301.80	48.65	27.61
10/21-6/22	**5.040.5**	**3112.50**	**482.01**	**287.75**

passes. If the station is located within the administrative boundaries of more than one local authority, The amounts from the special charge are allocated to them, depending on the power of the station units installed in each local authority. If the connection line of the station to the System or the Network passes through the area of more than one local authority, the amounts of the special charge are allocated to them according to the length of the section of the connection line located in each local authority. The connection point of the station shall be determined in accordance with the terms of its connection, formulated by the competent Operator".

The above is supported by a relevant Technical Report of the Hellenic Association of Renewable Energy Producers about Important reimbursement to consumers thanks to wind farms. Specifically:

A) Reimbursement *to consumers*

Based on the processing of official data for the last quarter of 2021 and the first quarter of 2022, thanks to wind farms, 758.5 million were returned to consumers. euro. This is the difference between the total amount paid by suppliers through the energy exchange for wind production and the constant low price at which wind farms were remunerated through the long-term contracts they conclude with the public company RES & GUARANTEES OF ORIGIN MANAGER.

Although official data have not yet been announced, based on preliminary estimates for the period after 1/4/2022, it is estimated that this total benefit from wind farms has exceeded 1 billion euros. As wind farms increase, this benefit increases. In fact, the benefit of new wind farms is even greater, because they produce even cheaper electricity than existing ones.

The following tables and the graph/image below summarize these data derived from the processing of official data published by RES & GUARANTEES OF ORIGIN MANAGER. Because RES & GUARANTEES OF ORIGIN MANAGER publishes monthly average values, it is likely that the exact amounts will be slightly different without changing the basic conclusion.

[1]	These are wind farms that do not participate directly in the financial market and are represented by the FIT (FIT is the type of energy sales contract they have and corresponds to the term Feed-in Tariff)	[2]	These are wind farms that participate directly in the stock market ("PPA" is the type of contract they sign and corresponds to the term Operational Support Differential Increment Contracts -Differential Increment Contracts).

	Average marginal price on the Energy Exchange € / MWh	**Total Wind Revenue [3] M €**	**Suppliers' payments to the market for wind generation [4] M€**	**To be returned to the consumer via (ETF)**	
				M€	€ / MWh
21-Jul	101.86	71.06	73.33	2.26	3.02
21-Aug	121.72	61.45	72.75	11.30	17.41
21-Sep	134.73	72.97	99.18	26.21	33.91
21-Oct	204.03	98.15	200.66	102.51	98.28
21-Nov	228.88	89.77	213.90	124.03	130.28
21-Dec	235.38	111.62	259.20	147.57	123.29
22-Jan	227.27	88.67	208.69	120.02	127.41
22-Feb	211.71	78.07	172.17	94.14	112.96
22-Mar	272.59	91.23	252.65	161.42	168.15
22-Apr	246.56	79.82	193.05	113.22	133.99
22-May	225.06	56.14	127.99	71.86	121.79
22-Jun	240.33	76.26	178.38	102.12	129.1
10/21-6/22		**769.76**	**1806.6**	**1036.9**	**127.17**

[3]	The total fee for wind farms	[4]	The temporary income of the RES & Guarantees of Origin Manager from the Exchange thanks to wind with FIT and the temporary income of wind with ETS

Table 6: The receipts of wind farms, the payments of suppliers transferred to consumers' bills and the refund to consumers thanks to the energy produced by wind farms during the fourth quarter of 2021 and the first quarter of 2022 (Source: Processing of data published by RES & GUARANTEES OF ORIGIN MANAGER)

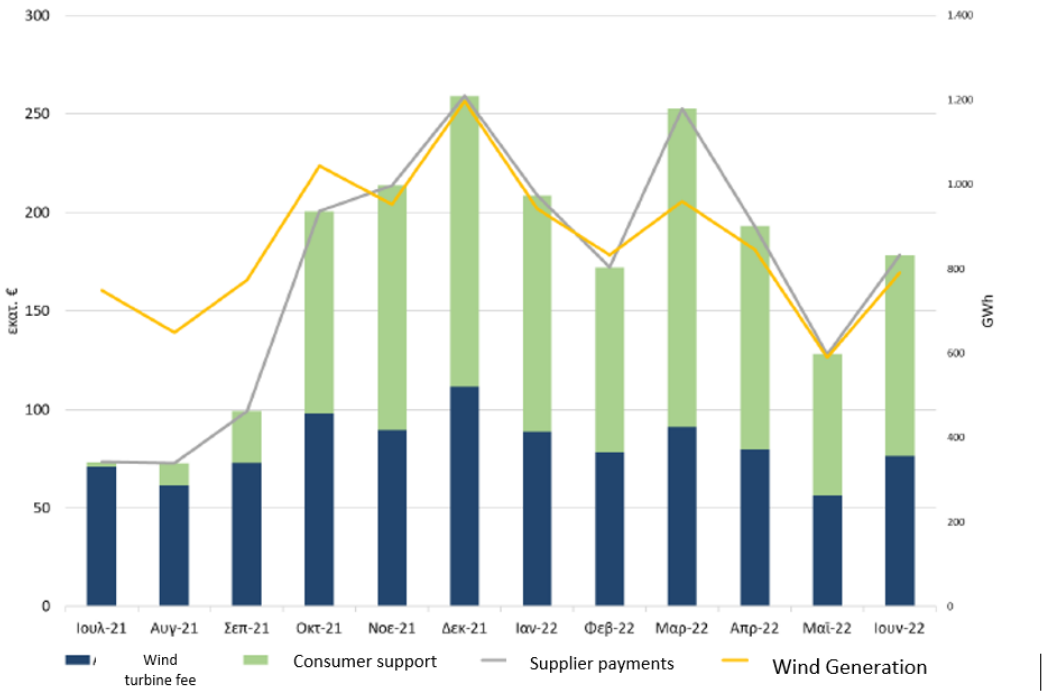


Image 14: The subsidy to consumers thanks to the energy produced by wind farms every month during the second half of 2021 and the first quarter of 2022 (Source: Processing of data published by RES & GUARANTEES OF ORIGIN MANAGER)

B) ***Do RES further reduce the price of electricity?***

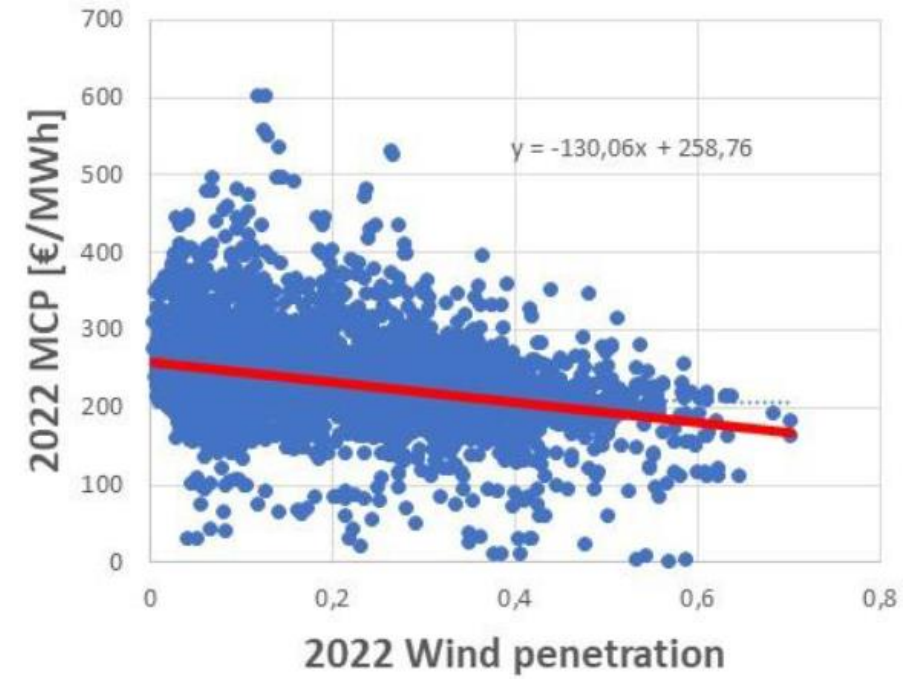
Because wind and sun are free, wind farms – and all renewables – lead always to the shutdown of the most expensive conventional plants that would have had to work to meet energy demand if RES did not exist. In this way, the total burden passed on to the consumer for the total energy is less.

Based on market outturn data until 19.6.2022, during the first half of 2022, an hourly penetration of 30% of wind and photovoltaics led to an average price decrease in the wholesale electricity market by 39.22 euros per megawatt hour (it is noted that wind and photovoltaic penetration in 2021 reached 30%).

In 2021, the total reduction brought about by RES thanks to this phenomenon (internationally called the merit order effect) was 2.5 billion euros. If it weren't for renewables, most of that would have been spent on importing gas.

The following charts illustrate how renewables reduced market prices each month of the first half of 2022 and overall, in the first half of 2022. The impact of wind penetration is clearly shown, and the impact of wind and PV penetration is discernible. Specifically, the correlation of the price in the market every hour (vertical axis) with the penetration of wind and PV at that time (horizontal axis) is shown. Each blue dot depicts the market price at a specific time (vertical axis) and the RES penetration at that time (horizontal axis). The higher the penetration of RES (i.e. the farther to the right of the horizontal axis is a blue dot), the lower the market price (i.e. the lower on the vertical axis is the blue dot). The correlation is strongly negative.

The slope of the regression line (red line) is -130,72 €/MWh per penetration unit. That is, for every 10% increase in hourly RES penetration (0.10 in the chart), the market price decreased in 2022 by an average of €13,072/MWh.



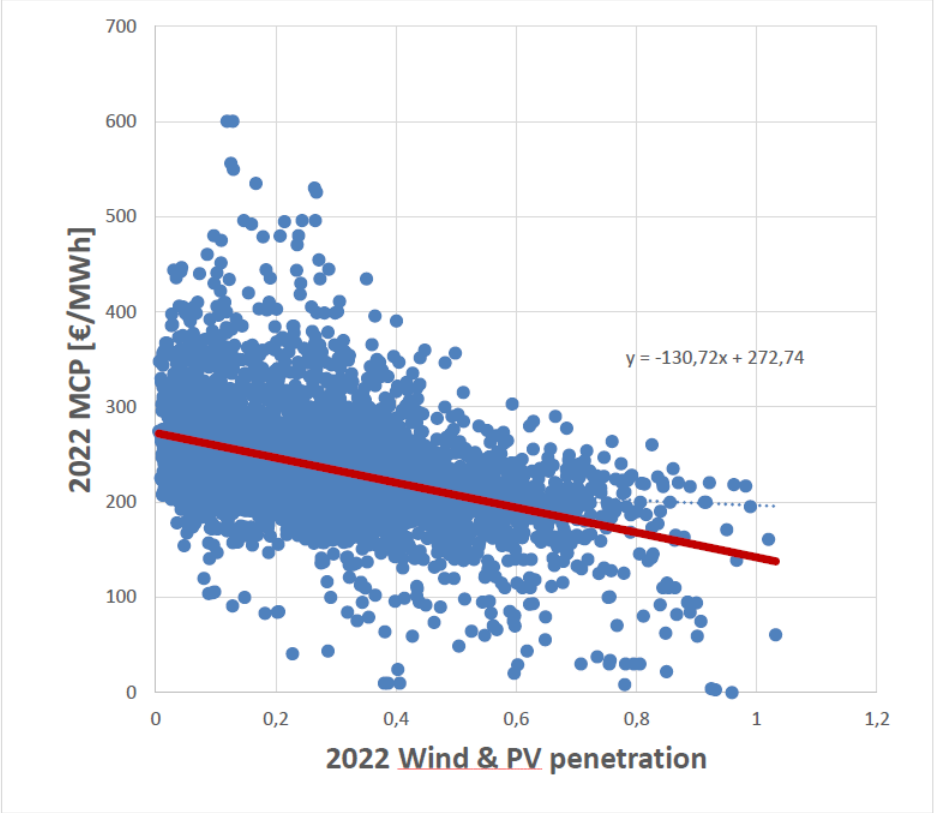


Image 15:Correlation of market price every hour with wind and PV penetration at that time (Data 01/01/2022 to 19/06/2022 – Processed by iWind Renewables)

In conclusion, therefore, we conclude:

1) The crisis has triggered a public debate in which consumers are confronted with terms and concepts that they do not have to know exactly how they work and what they mean: limit price, wholesale price, marginal pricing, energy exchange, indexation clause and so much more.

This should not obscure the big picture: a key prerequisite for reducing and keeping electricity bills reduced is that electricity is produced by the cheapest technologies. And these are proven wind farms and other renewable energy sources. New wind farms produce electricity that is 3-4 cheaper than fossil fuels, natural gas and lignite.

If wind energy had been developed more in previous years, electricity would have been cheaper, while conversely if the wind farms we have not been built today, electricity would have been even more expensive.

2) However good and effective state interventions may be in exceptional circumstances, the necessary controls and improvements in the functioning of the market have a limit: if the energy we produce comes from expensive fuels, the costs paid, either as consumers or as taxpayers, will be high. Even if gas prices de-escalate and this crisis ends, nothing will ensure that in the coming years we will not have the same or worse crisis as long as we remain dependent on fossil fuels and their international price fluctuations.

4.3.3. How to finance the development and operation of the project

The project under consideration will be built from own funds in a 20% stake and with a loan from the bank in a stake of 80%.

4.4 Correlation of the project with other projects or activities

In this section, it is necessary to assess any cumulative and synergistic effects of RES projects in Orfeas in the Municipality of Soufli, R.U. Evros, since in addition to the project under study (wind farm at "Mavrodasos"), there are other wind farms that are each separately subject to a separate environmental permitting process, in accordance with the current institutional framework.

Synergistic effects refer to impacts that may alter **the intensity of individual impacts** in combination, while cumulative or cumulative impacts are those expected to be caused by all projects (in this case R/P) that **are either operational or will be implemented in the wider area of the project.**

It is important to note that section 4.4 of **UNHCR 170225/2014 Government Gazette 135 B'** "Specifications of Environmental Impact Studies" refers to **"similar or other projects and activities (existing or under construction)"** while **section 9.1.7** refers to **"synergistic or cumulative action"** with other effects from the same project or from other projects or activities that have **developed or environmentally licensed in the area."**
Based on the above data, for the assessment of synergistic effects, WPP are obtained with an operation permit, installation, EPPO (data extraction from www.rae.gr, 19/06/2024) **or with a request for EPPO (FSM).**
Projects that have received only a Production License (producer certificate) are not taken into account, since this license in no way ensures the implementation of a RES project, as according to a relevant information note available on the website of the Regulatory Authority for Energy (RAE) (https://www.rae.gr/adeiodotisi-2/) it is essentially a feasibility license.

In the immediate area, within a radius of 10 km where the planned project is to be installed at the "Mavrodasos" site, based on the geoinformation map of RAE (Regulatory Authority for Energy), the nearest projects are the WPP at the "Lefki" site, the "Ammoudes" WPP and the "PSEFTIS" WPP with a production license.

The assessment of the synergistic effects of this Environmental Impact Study and the Special Ecological Assessment considered **all adjacent WPP with a production license (with and without an application for environmental permit) as well as the WPP PATRIARCHIS with an operating license.**

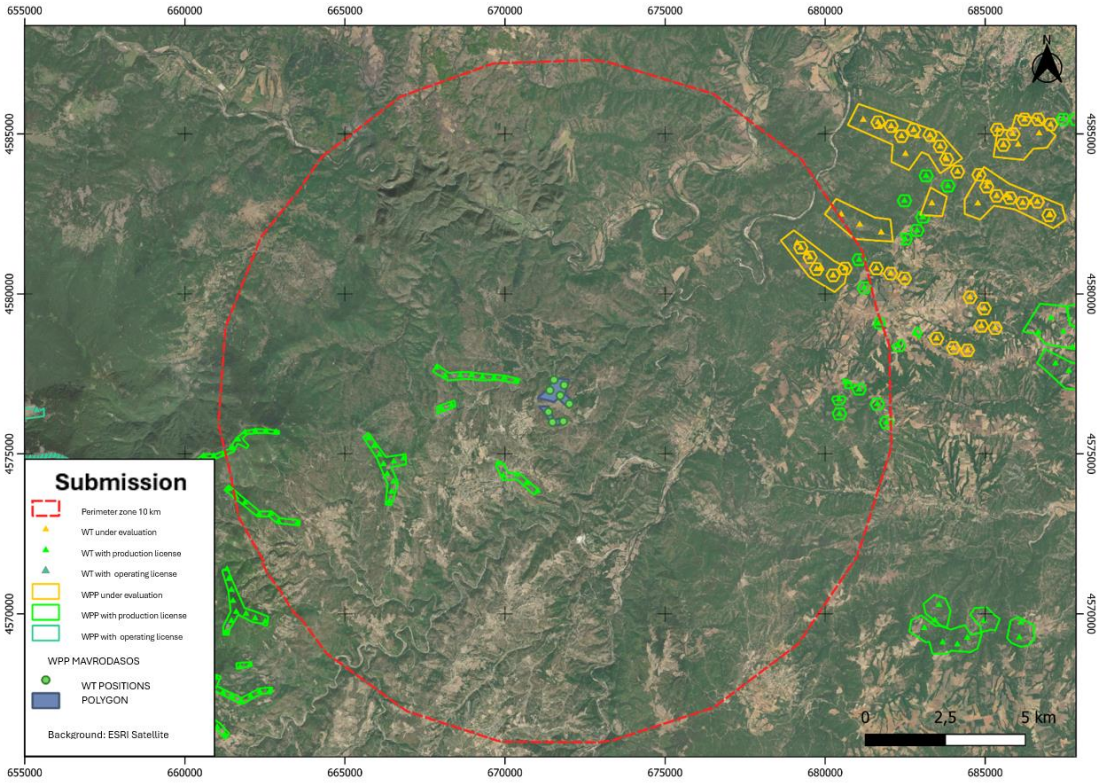
Specifically, in the wider area of the project there are **six WPP** that have received a production license (Source: R.A.E. available on 19/06/2024), which have a total capacity **of 182.5 MW,** and consist of 54 wind turbines and one WPP under evaluation, with a total capacity of **144 MW,** consisting of 9 wind turbines.

At this point it is worth noting that the WPP Pyramis Vrachou, which consists of 10 wind turbines, is partially located within the perimeter zone of 10 km with six wind turbines out of ten located within it. Moreover, WPP AGATHEA consists of 7 wind turbines, 6 of which are located within the perimeter zone of 10 km.

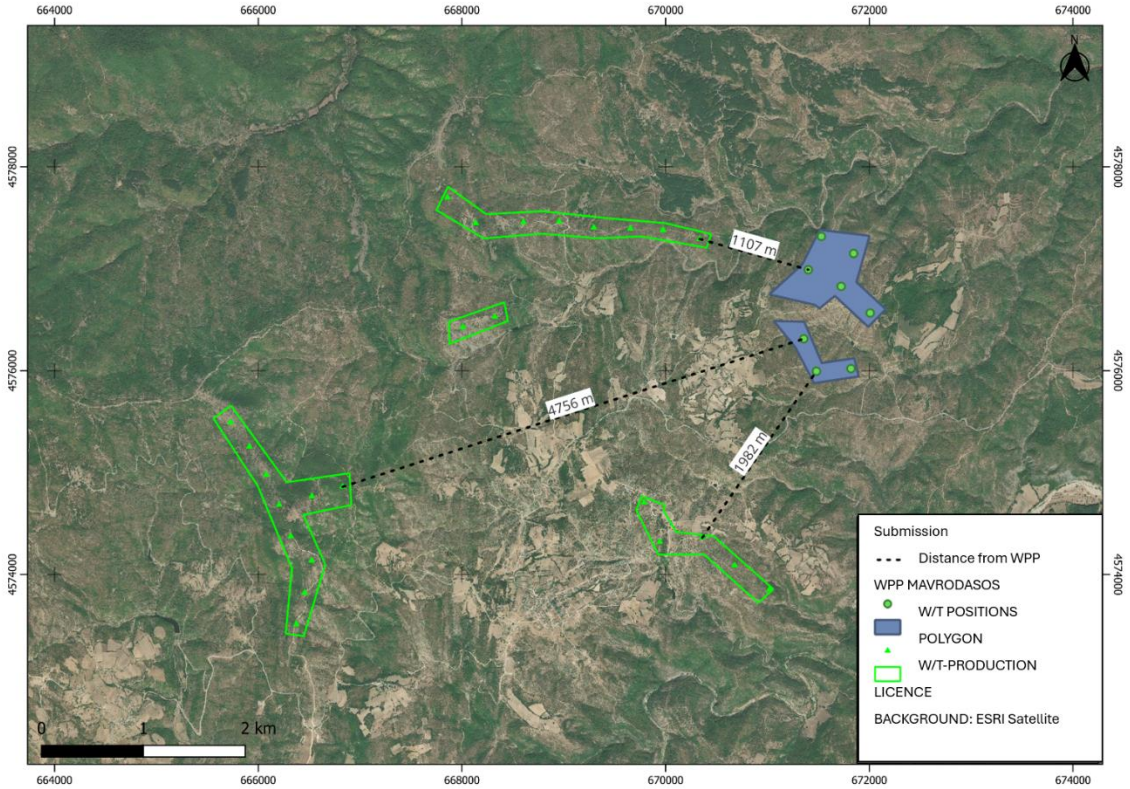
Therefore, the total number of wind turbines to be implemented (licensing stage under production and under evaluation), within an area radius of 10 km from the planned project, amounts to 63 wind turbines. The projects identified within a radius of 10 km with a production license, an operating license and an evaluation are listed in the following table.

N/A	No. Production License	Place	Municipality	Maximum Power (MW)	Status	Distance from nearest W/T of the project
1	C-08019	LEFKI	SOUFLIOU	34,5	PRODUCTION LICENSE	0.8 km
2	C-08020	AMMOUDES	SOUFLIOU	34,5	PRODUCTION LICENSE	1 km
3	C-012430	PSEFTIS	SOUFLIOU	34,5	PRODUCTION LICENSE	1.5 km
4	C-08027	AGATHEA	SOUFLIOU	34,5	PRODUCTION LICENSE	8.59 km
5	C-012427	Pyramis Vrachou	SOUFLIOU	34,5	PRODUCTION LICENSE	8.36 km
6	C-015288	COTTON BONE FOREST GUARD	DIDYMOTEICHO, SOUFLIOU	144	APPLICATION FOR EVALUATION	8.5 km
7	C-015363	FARRIER	DIDYMOTEICHO, SOUFLIOU	10	PRODUCTION LICENSE	8.3 km

Table 7: Correlation of WPP with related projects in the near region



Map 1: Mapping of the studied WPP in relation to the nearest WPP in a perimeter zone of 10km



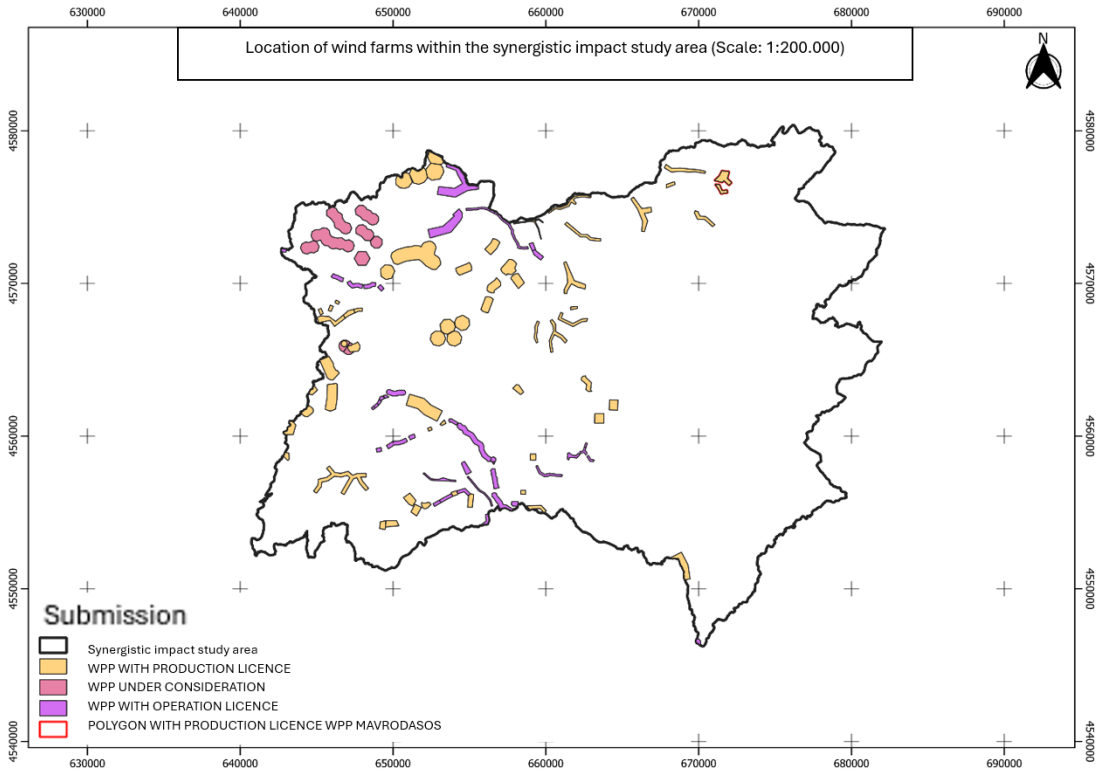
Map 2: Distances from neighboring WPP

The planned project at the "Mavrodasos" site borders to the west with the WPP at the location "Lefki" at 1,107 m from the nearest wind turbine W/T6. South-southwest borders with WPP "Ammoudes" at 1,982 m from W/T2 which is the closest, while west at 4,756 m it borders with WPP "PSEFTIS" where the nearest wind turbine is W/T3. North of the planned project extends the border with the neighboring country Bulgaria. It is worth noting that all neighboring WPP mentioned above hold a RAE producer certificate and are not in the process of evaluation at the Online Environmental Register (OER).

It is clarified that in the Special Ecological Assessment, the case of final licensing and implementation of all projects is considered "exaggerated" without this being a given.
Regarding the protected areas under study, and in order to better address the synergistic effects of the project under study, the Special Ecological Assessment has set to take into account the wider boundaries of the entire area enclosed within the **main SPA GR1110010 under study, but also the nearest Greek SPA GR1130011**, as almost all the already installed WPP (operating license) of the wider area are located within it.
Therefore, the area resulting from the union of the boundaries of the above two areas is referred to as the **"synergistic impact study area" (SIA.).**

Within the SIS., there are 14 WPP (nine within and five partially within) that have received an operating license which have a total capacity of 314.2 MW, occupying a total area of 1,053.88 ha (total area of polygons within the SIS. – out of the five WPP partially located **within the SIS.**

It should be noted that of the five WPPs, which are partially located within the SIS. (WPP: Magoula Kazakou – Diplon, Sarakatsanaiika, Monastiri II, Geraki, Fantaros) and consist of 46 wind turbines, only 19 of them are located within it. Therefore, the total number of wind turbines located within the SIA. amounts to 161 wind turbines.
As far as the WPP with a production license within the SIA is concerned, they amount to 44 WPP (including the one studied) at the stage of licensing under production (production license), while for the WPP in evaluation within the SIA., they amount to 4, i.e. a total of 48 WPP. The following map **shows the boundary of the synergistic impact study area** as defined in the SEA.



Map 3: Map of the location of wind farms within, partially within and within the boundaries of the "synergistic impact study area" (licensing stage in operation and under production)

CHAPTER 5 - COMPATIBILITY OF THE PROJECT WITH STATUTORY SPATIAL AND URBAN PLANNING COMMITMENTS OF THE AREA

5.1 Location of the Activity

5.1.1 Statutory boundaries of settlements and approved urban plans

The proposed project concerns the construction and operation of a wind farm with a total capacity of 34.5 MW which belongs to the Municipal Unit Orfeas of the Municipality of Soufli, the Regional Unit of Evros of the Region of Eastern Macedonia and Thrace.

The project under consideration is located outside the General Urban Plan outside the plan - residential area and statutory settlement boundaries. The closest settlements to the study area are the following:

N/A	NAME OF SETTLEMENT	POPULATION AT CENSUS 2021	DISTANCE OF THE SETTLEMENT CENTRES FROM THE NEAREST W/T (km)
1	Roussa	383	3,4
2	Gonikon	300	7,3

3	Mikro Dereio	91	3,9

Table 8: Elements of settlements in the vicinity of projects in straight lines

The closest settlement to WPP with statutory boundaries is Roussa, which is located 3.4 km southwest of the project's wind turbines. The boundaries of the settlement have been determined by Government Gazette 109/D/23-02-1987.

In the area of the Municipality of Soufli, where the WPP is located, there are no general urban plans or Open City Spatial and Housing Organisation Plans (O.C.S.H.O.P..). The substation "PATRIARCHIS" where the project is to be connected belongs to the Municipality of Arriana where there are no GUP and O.C.S.H.O.P. In the R.U. of Rodopi, where the Municipality of Arriana belongs, there is a Specially Regulated Urban Planning area in which the substation belongs in spatial unit 4 as shown and in the map excerpt. In the wider area, however, the GUP of the Municipality of Alexandroupolis is being prepared, which was initially approved by the Government Gazette 9Δ/14-1-1988, then as amended by the Government Gazette 844 Δ' / 25-11-1999 and is now at stage B1 (02/2021) during which the spatial development model is evaluated. This land is in an off-plan - residential area for which the building conditions of the Presidential Decree of 24/1985 (Government Gazette 270 D / 31-05-1985) apply.

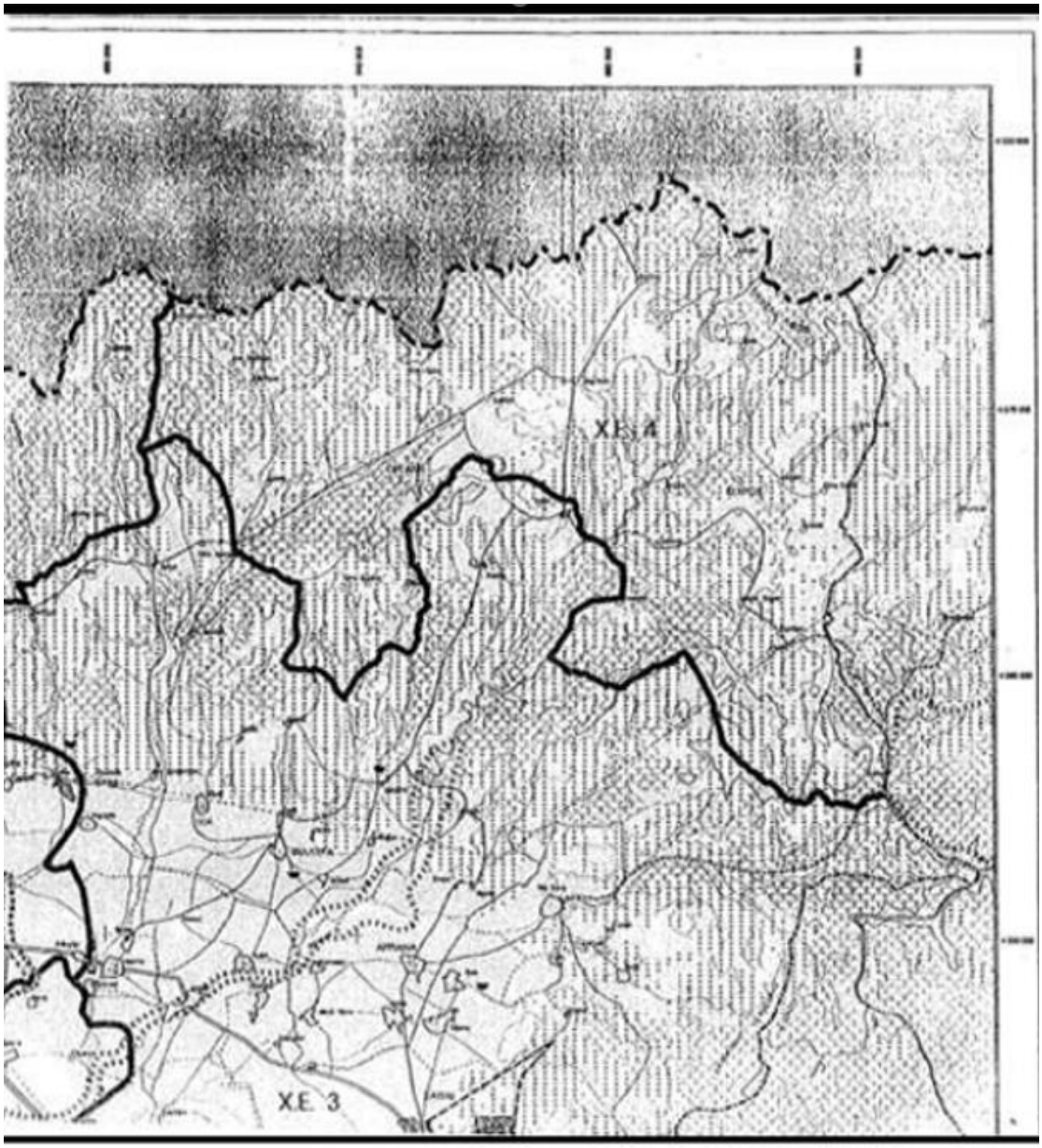
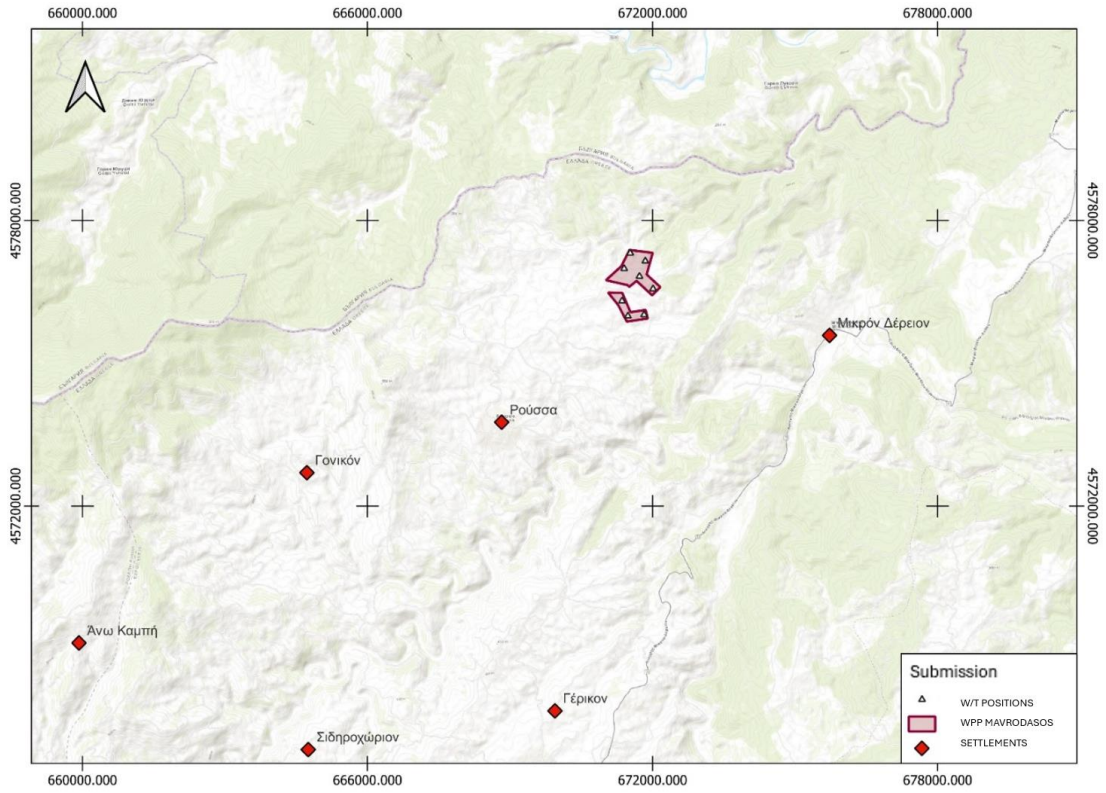


Image 16:Mapping of the spatial units of local authority boundaries

There are no traditional settlements near the installation sites. The nearest traditional settlement to WPP is the settlement of Paliouri and the settlement of Metaxades, northeast of the project at about 20Km from it.



Map 4: Statutory boundaries of settlements

5.1.2 Area boundaries of the National System of Protected Areas

The area of installation of the studied WPP falls within the mountainous Evros - Dereio Valley, an area which is a Special Protection Area and has code GR1110010. The area is in the Prefecture of Evros, on the border with Bulgaria. It is also an important area for birds with a code GR003 and the name Dasos Dadia - Dereio - Aisymi. The area is located between the Dadia Forest National Park and the Filiouri valley at the western end of the Prefecture of Evros. It is mainly covered by oak and beech forests with small groups of pine trees and is crossed by Diavolorema Dereios. The central part and northeast are dominated by partially forested areas with scattered old oak, mainly used by free-range livestock animals.

The traditional agricultural activities of the inhabitants of the area (e.g. nomadic livestock farming, small-scale farming) have played an important role in the conservation of ecosystems, maintaining sparse oak forests in part of the area. Mature oak trees that remain are used for branching, i.e. collection of branches with leaves for feeding goats in winter. Oak forests are also used to produce firewood, while beech forests and pine reforestations are used for commercial timber.

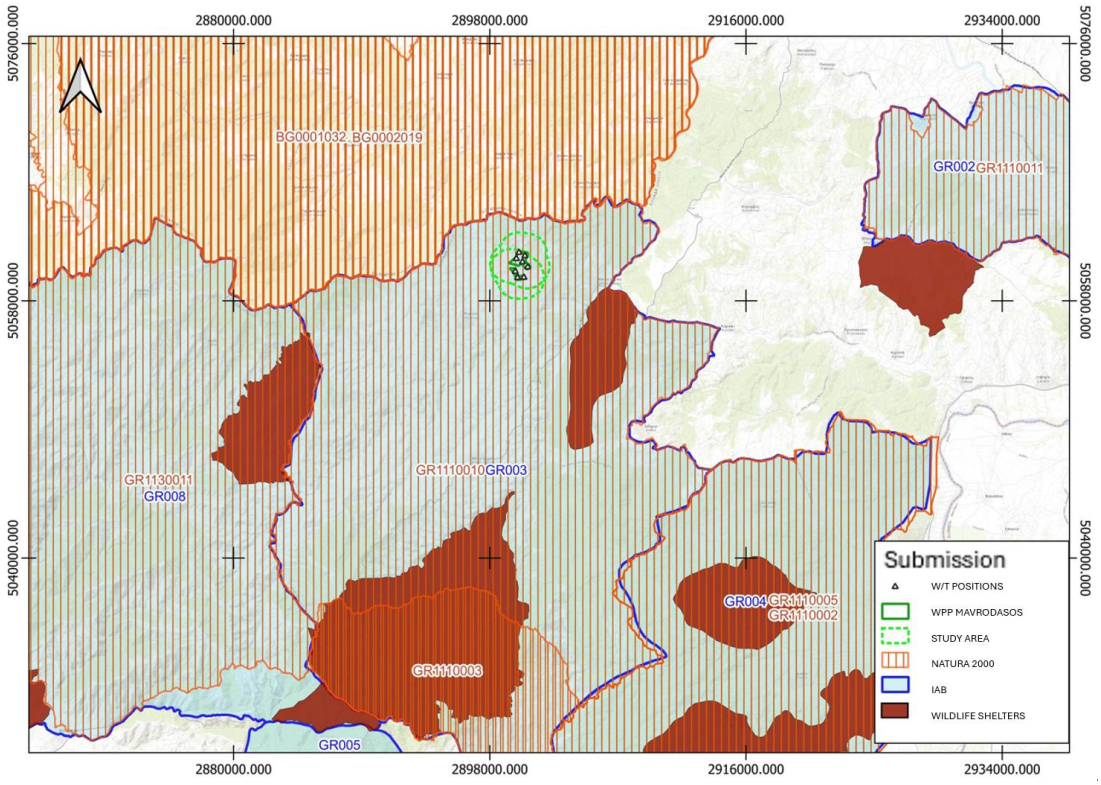
SPRC GR003 includes three different protection regimes:

1) The Special Protection Area with **code GR1110010** and name Mountainous Evros – Dereios Valley (within which the station falls)

2) The Site of Community Importance with **code GR1110003** and name Treis Vrysses at about 16.5 km south of WPP.

3) The Wildlife Refuge with code **K731** and name Kallithea - Treis Vrysses Municipalities of Alexandroupolis, Orfeas Soufliou from which the nearest wind turbine is 11.2km away and the Refuge named Poulia southeast of WPP at 3.4 km from the nearest wind turbine.

The SPA GR003 and GR1110010 SPA characterization species are the Egyptian Vulture (Neophron percnopterus), the Black Vulture (Aegypius monachus) and the Cross Eagle (Aquila pomarina).



Map 5: NATURA Areas, Wildlife Sanctuaries and National Parks

The other isural protected areas located in the wider area of installation of the wind farm are the following:

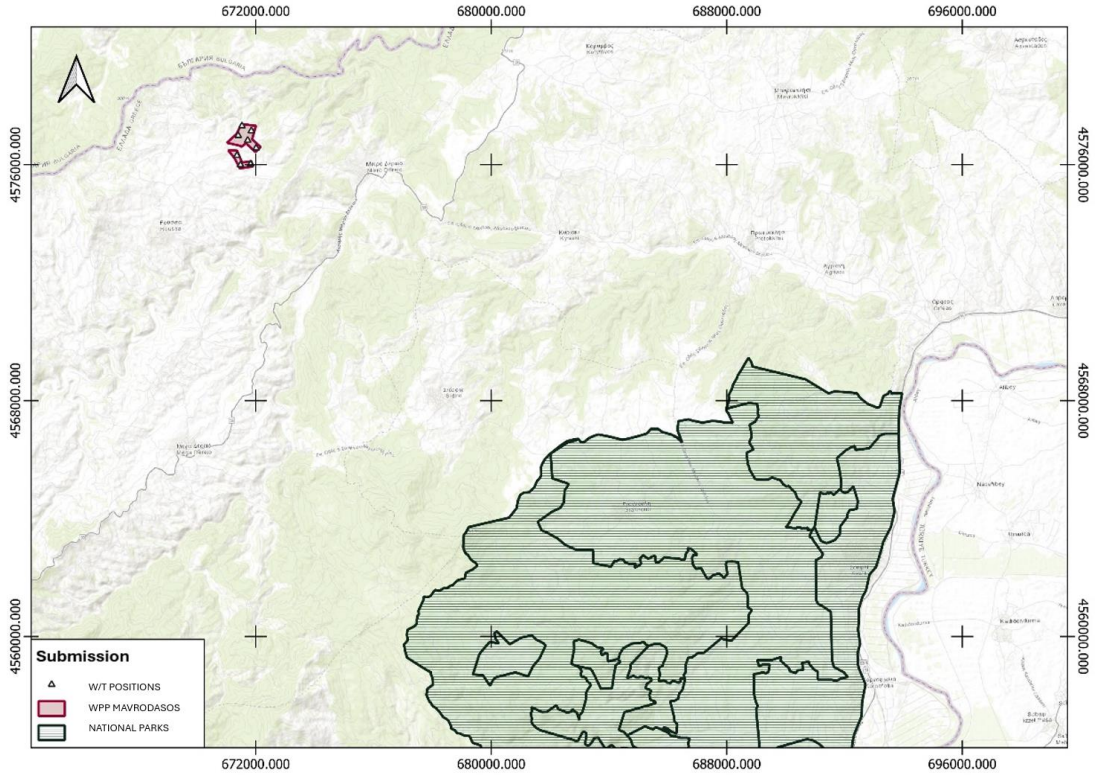
- The Special Protection Zone with code **GR 1130011** and name **Koilada Filiouri** which is located west of the Aeolian Park at about 11.4km from the nearest W/T.

- The site of Community importance with **code GR1110005** and name Evros Mountains - Lyra River - Didymoteicho and Kefalovouno Caves which overlaps with the Special Protection Area with **code GR1110002** and name Dadia Forest - Soufli at 14.1Km southeast of WPP. This area includes the southeastern outskirts of the Rhodope Mountains, as well as a large part of the river Evros.

- The studied WPP borders to the north with Bulgaria and the SPA BG0001032 named "Rodopi - Iztochni". Some important species are: *Barbastellus, Miniopterus schreibersii, Myotis bechsteinii, Myotis blythii, Myotis capaccinii, Myotis emarginatus, Myotis, Rhinolophus euryale, Rhinolophus ferrumequinum, Rhinolophus hipposideros, Rhinolophus mehelyi* and *Rhinolophus blasii*.

- The Wildlife Refuge **"Kechros - Kerasia"** which is located southwest of WPP at 11.4km from the nearest wind turbine of the park.

Southeast of WPP is located the Dadia-Lefkimmi-Soufli Forest National Park. It is a protected forest area with a total area of 428 km². It includes low mountains, with forests, clearings and rock formations, stretching between the villages of Dadia, Giannouli, Kotronia and Lefkimi. The forest is known for the large number of birds of prey it hosts and is 14km from the nearest wind turbine to the wind farm.



Map 6: Dadia Forest National Park

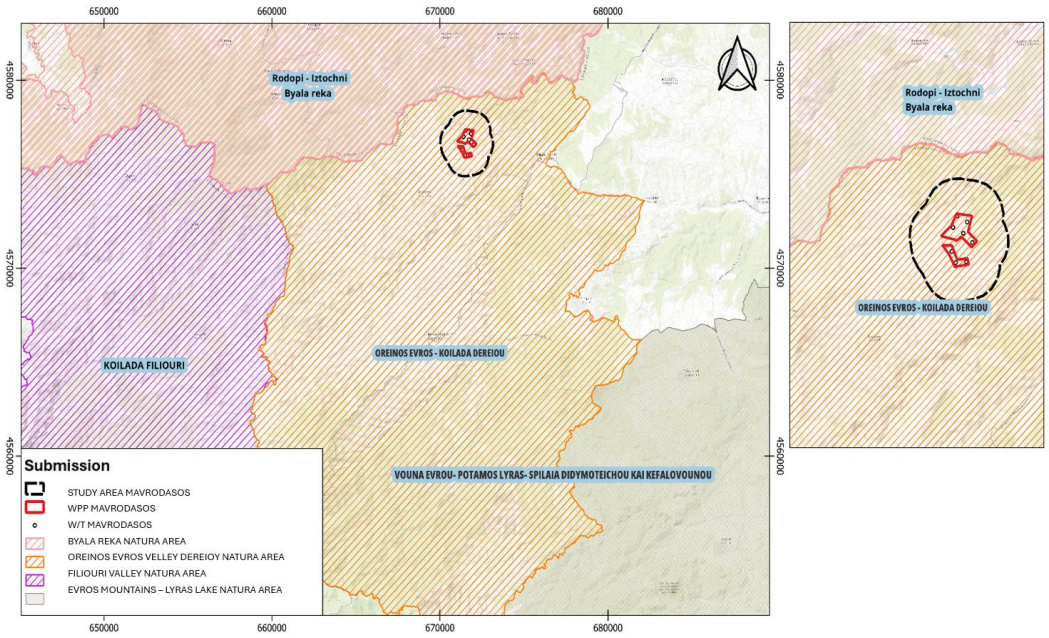
In addition to the above-mentioned Natura protected areas, it is important to mention the Natura protected area of Bulgaria, which borders the Natura area under consideration "Mountain Evros-Dereio Valley" named "Byala Reka" and code name "BG0002019".

The area covers the Byala Reka catchment area in the southeastern part of the Eastern Rhodopes on the state border with Greece.

The watershed includes the Byala Reka Valley and surrounding mountain grounds which runs from the village of Chernichevo in the west to the point where the river crosses the state border in the east.

The vegetation of the area is characterized as diverse and is influenced by the Mediterranean climate. In the area due to the low population density of the area and the border regime, the old forests of *Fagus sylvatica* L., Subsp *moesiaca* and *Quercus alchemic* as well as mixed oak forests of *Q. dalechampii, Q. virgiliana, Q. frainetto* and *Q. pubescens*, scattered in places with *Carpinus orientalis*, they are also widely distributed.

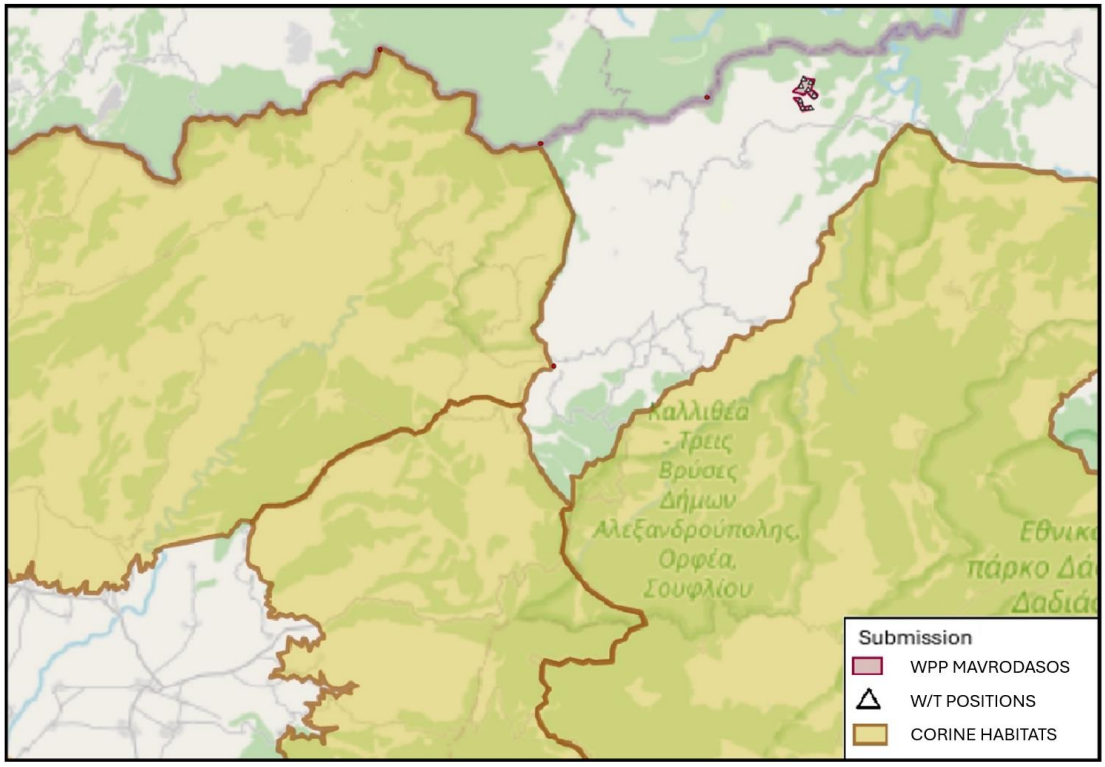
The area also has dry-thermal shrub formations of Mediterranean type with a significant variety of species, dominated by *Phyllirea latifolia* and *Juniperus oxycedrus*, with the participation of *Paliurus spina-christi, Fraxinus ornus* etc. (Bondev 1991).



Map 7: Mapping of the nearest protected areas and the neighbouring "Natura" site in Bulgaria.

Corine Habitats

The installation area of the station is located outside the Corine habitats. The closest habitats to the project are the Eastern Rhodope Mountains with code A00060024, Filiouri Valley with code A00010005 and the Evros Mountains with code A00010002.



Map 8: Corine Habitats Near the project

Finally, as far as the substation where the wind power plant will be connected is concerned, it belongs to the Municipality of Arrian, D.E. Fillyra, O.E. Rodopi Region of Eastern Macedonia and Thrace, it is existing and located within the Special Protection Zone with code **GR 1130011** and name **Filiouri Valley.**

The entire underground interconnection line of WPP with the substation is located within the two protected areas ("Mountain Evros – Dereios Valley" and "Dereios Valley"). Specifically, the largest part passes through the **Special Protection Area** of "Mountainous Evros – Dereio Valley" as well as the **Natura area "Filiouri Valley".**

To safeguard the project, a Special Ecological Assessment has been carried out to assess the potential impact of the WPP on the protected areas and consequently to take appropriate measures to maintain its ecological integrity.

5.1.3 Forests, Forest and reforested areas

The occupation zone of the project, according to the reformed forest maps of the O.E. of Evros, occupies mostly forests and wooded areas.

Wind turbine squares occupy areas designated (ΔΔ), [1](ΔΔ)[2] and (ΔΑ)[3] and are subject to the provisions of forest legislation.

[1] The characterization (PD) corresponds to forests and wooded areas in older shooting aircraft or pre-existing data, forests and wooded areas in recent shooting aircraft and autopsies

[2]The characterization (ID) corresponds to other form W/T coverage areas in recently taken aircraft and autopsies.

[3] The designation (MA) corresponds to forests and wooded areas in older shooting aircraft or pre-existing elements of other form / coverage areas in recent shooting aircraft and autopsies.

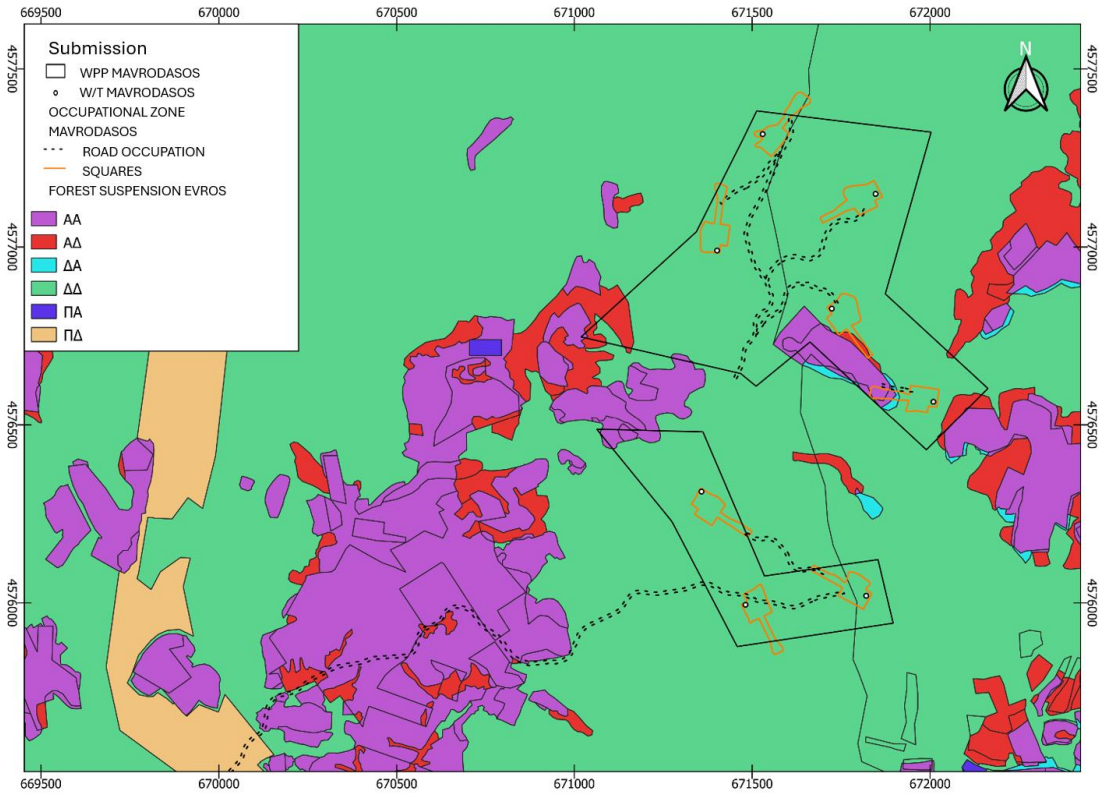


Image 17: Uploaded Forest Map of Evros and mapping of the WPP under examination

Regarding the new road construction that will be opened for access to the wind turbines of the project, it mainly occupies areas with the designation (PD), (AD) and (AA) while a small part of it falls under an area (PD).[4]

The project under consideration is compatible with the provisions applicable to forests, forest areas, reforestable areas and public lands of cases a' and b' of paragraph 5 of article 3 of Law 998/79.

[4] Designation (PD) responds to areas with final acts and designation decisions - forest.

This compatibility is demonstrated:

- from the provisions of paragraph 3 of article 45 of Law 998/79, as amended and in force:

'*The authorisation to intervene, subject to the provisions of paragraph 4 of this Article, shall be issued for a specific area shown on a topographic diagram with peak coordinates, based on the National Geodetic Reference System HGRS '87, at the request of the person concerned, applied mutatis mutandis to such approval and the provision of paragraph 6 of this Article. The above approval shall be granted on condition that it is not possible to dispose of public land not subject to the protective provisions of this Law for the use in question. If it is certified by the competent authority that it is not possible to dispose of the above lands, then the competent forestry department shall examine whether public lands referred to in cases a' and b' of paragraph 5 of Article 3 of this Law can be disposed of, otherwise, forest land or forests can be disposed of. The above general prohibition of the second subparagraph of this paragraph does not apply to the execution of military projects directly related to the national defense of the country, the opening of public roads, the construction and installation of pipelines of natural gas and petroleum products, the construction and installation of power generation projects from Renewable Energy Sources (RES), including large hydroelectric plants and any necessary project for their operation, as well as their connection networks to the System or Network referred to in Article 2 of Law 2773/1999 (A' 286), the alignment of which provides for their passage through a forest or forest area as well as for projects for the exploitation of mineral raw materials, with their extraction, sorting, processing and collection, the opening of access roads and the construction of facilities that serve the needs of exploitation and sorting and processing, as well as for the interventions referred to in Article 56 hereof*'.

- from the provisions of paragraphs 1 and 2 of article 46 of Law 998/79, as amended and in force:

'*Exceptional nature of permissible interventions in afforested areas 1. Forests and wooded areas referred to in Article 117(1). 3 of the Constitution, no interference provided for in the provisions of this Chapter or any other provision shall be permitted, except as provided for in paragraph 1 of Article 48, paragraphs 1, 3, 4 and 5 of Article 53, paragraph 1 of Article 54, paragraph 1 of Article 55 and paragraph 5 of Article 57 of this Chapter; as well as the provisions of Article 16 of this Law. To carry out the interventions provided for in the above provisions, afforestation does not need to be lifted.*'

- from the provisions of paragraph 3a of article 53 of Law 998/79, as amended and in force:

"*For the installation of electricity transmission and distribution networks, the construction of substations and any technical project in general concerning the infrastructure and installation of power plants from Renewable Energy Sources (RES) or Combined Heat and Power (CHP) units using RES, including substations and other connection projects to the System or the Network, accompanying works and any technical project in general concerning the infrastructure and installation of the above stations, as well as water supply pipes of water bottling plants, networks for the transmission and distribution of natural gas and petroleum products, water supply and sewerage pipelines and their accompanying works, solid or liquid waste management systems and, in island regions other than Crete and Evia, Waste Transhipment Stations and their accompanying works, as well as electricity transmission and distribution networks, including voltage reduction and lifting installations, in forests, forest areas, reforestable areas and public lands referred to in cases a' and b' of paragraph 5 of Article 3 of this Law, intervention approval is required, subject to paragraph 4 of Article 45 of this Law. The above networks should, as far as possible, be combined with the existing or ongoing forest road network or with other civil engineering works. b. The execution of the above works is prohibited within the cores of national parks, aesthetic forests and declared natural monuments*".

5.1.4 Social Infrastructure Facilities of Public Utilities etc.

The wind turbine installation sites are compatible with social infrastructure and utility facilities as they will not be affected. The nearest airport in the area is the airport "Demokritos" of Alexandroupolis and is located southeast at 52 km.

Near the study area there are no social welfare infrastructures e.g. health care facilities, educational facilities, sports facilities, urban infrastructure facilities (e.g. recycling infrastructure, waste treatment, etc.), water supply facilities, livestock units, BEVERAGES and other Areas of Organized Development of Productive Activities of the tertiary sector, theme parks, tourist ports and other institutionalized or configured tourist areas (as recognised in the EIA for each individual installation).

In the nearest area of the project, an adequate road network is identified, consisting mainly of forest, country roads and local roads.

East of WPP at 10.249 m through the road construction, the Provincial Road Mandra - Mikro Dereio. For access to the wind turbines of the project, a Class C Forest Road with a total length of 4,298.92m will be carried out.

The routing of the Medium Voltage cable connecting the WPP to the substation will not affect technical works. The installation polygons of the station themselves, as well as the accompanying project of the interconnection of the WPP with the substation, are remote from large technical utility projects. As regards the road network, no highways or major road junctions are expected to be affected.

As far as water supply and sewerage networks are concerned, they are not expected to be affected either. The pipes of the sewer network are located at a depth of about 2m below the ground. Therefore, the Medium Voltage cable laid at 1m will not affect the sewage conductors. In case a water pipeline is detected during the opening of the channels for the passage of the cables, an alternative solution and route with the local Municipal Enterprise for Water Supply and Sewerage will be examined.

Water pipes usually do not pass through major roads, national or provincial roads. However, even if they need to go through there, their placement is done in parallel.

Also, 5 km southeast of WPP there are three telecommunications infrastructures (antennas). Based on the Special Spatial Framework for RES, there is no specific restriction concerning the minimum distance of the installation from the wind turbine, but it is defined on a case-by-case basis after consulting the competent body. In the case of the projects under consideration and according to the opinions of the services for the installation of wind farms, there is no restriction related to the specific incompatible use.

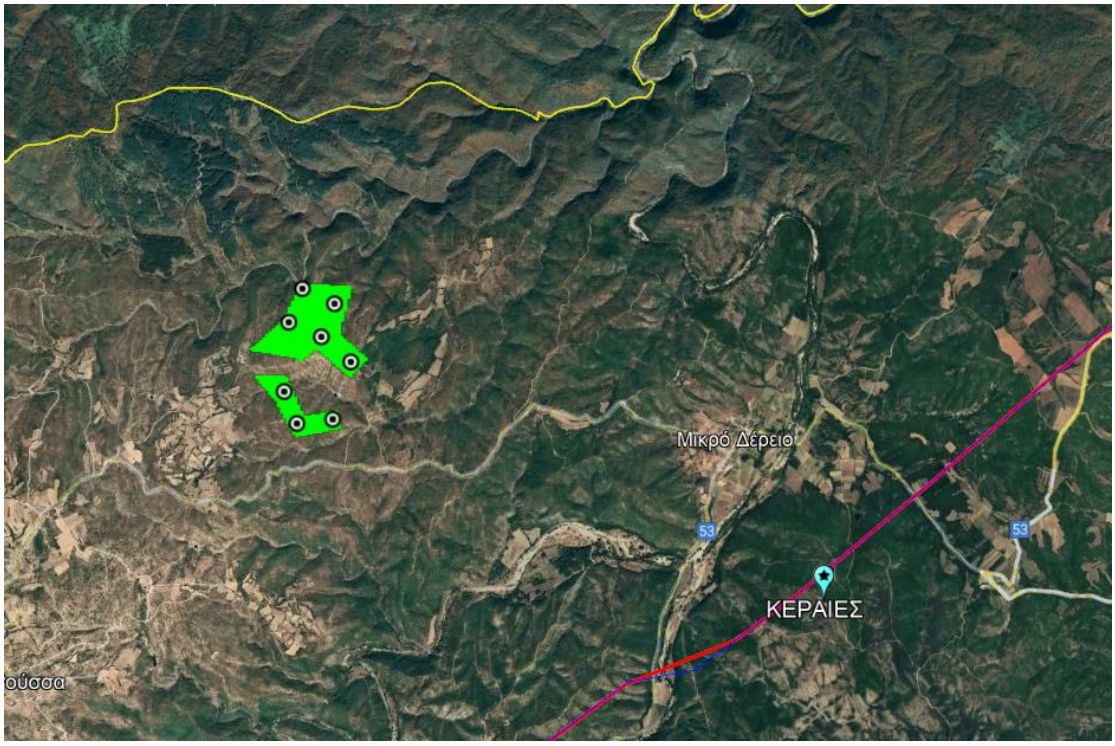
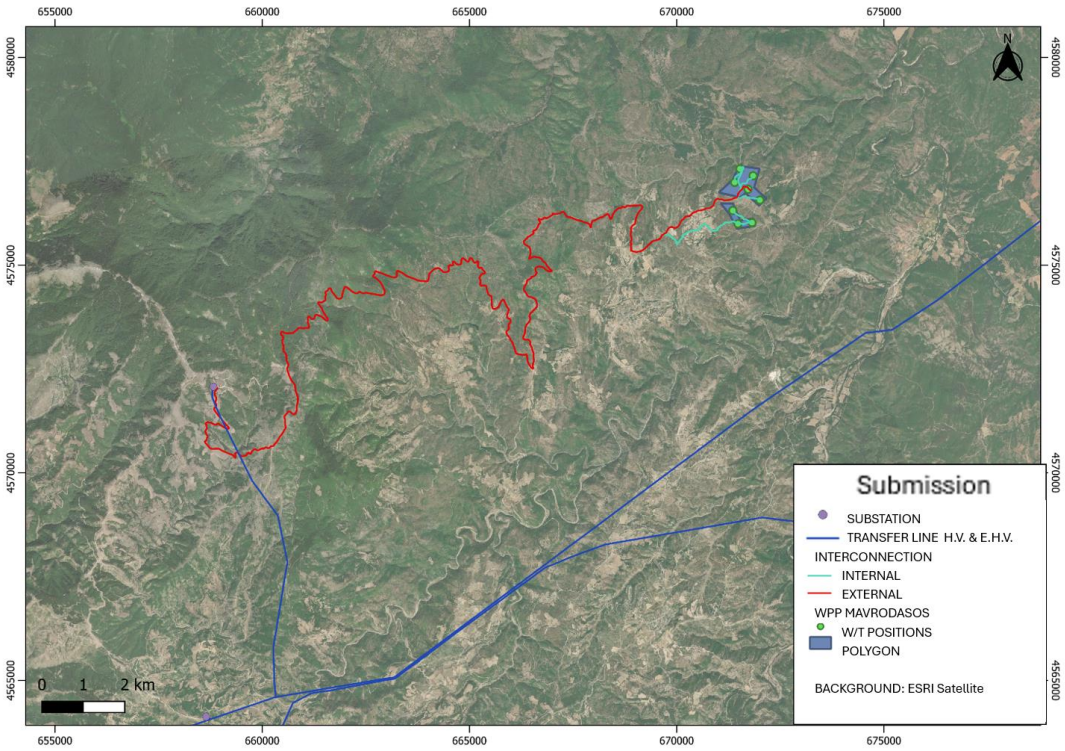


Image 18: Telecommunications infrastructure in installation

As far as electricity infrastructure is concerned, according to IPTO data, a distribution network of High Voltage 150KV and 400KV Extra High Voltage passes through the territory of Evros.



Map 9: Transmission lines of H.V. and E.H.V.

According to the above analysis, the development area of both the main project and its accompanying projects is located at satisfactory distances from the social and utility infrastructures.

5.1.5 Sites of Archaeological Interest

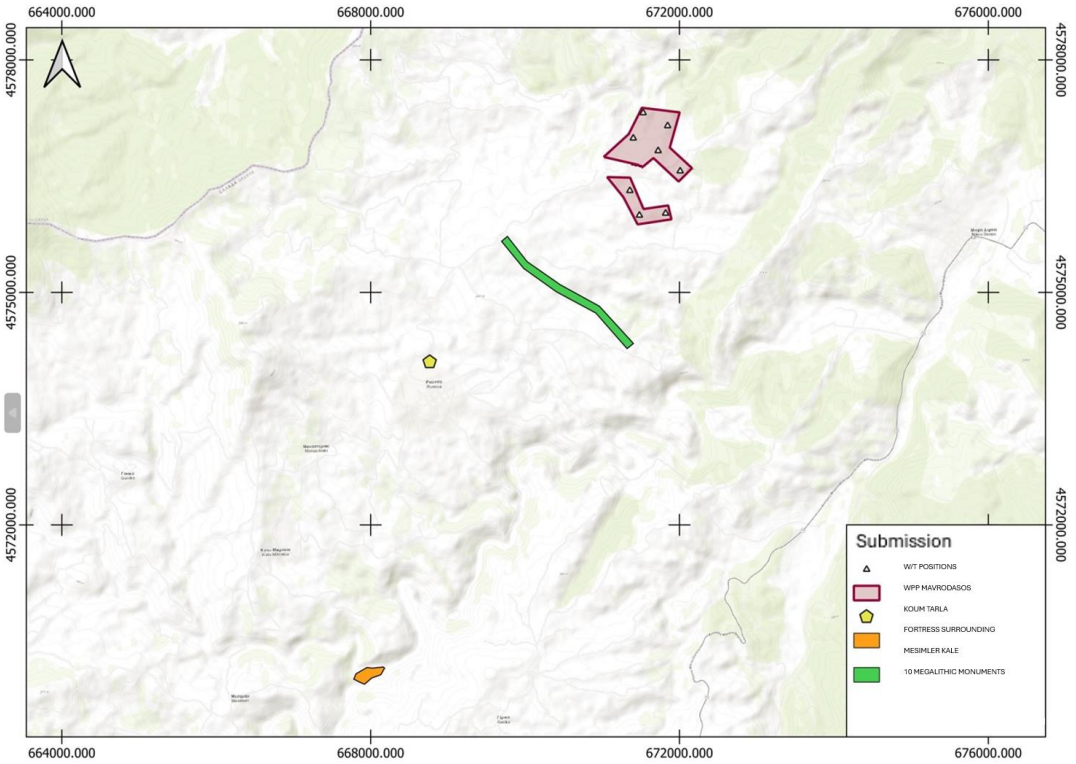
The area in which the WPP is to be built does not fall within declared listed monuments of world cultural heritage and other monuments of major importance.

The nearest archaeological sites and monuments located near the study area are listed below:

10 Megalithic monuments (Dolmen): At the location Ammochorafa (Koum - Tarla) next to the road Mikro Dereio - Roussa, 4km before Roussa, ten megalithic monuments are found. The first of the 10 monuments is located 30m. SE of the road, while the rest extend over an area of 2,200m. SE of the first monument and are successively located at the sites: Koum - Tarla or Watchtower the first, and the rest at Baluk - Kaya and the Muslim cemetery of the now abandoned village of Mylopepes. The site of the monuments is 1.3km from the nearest wind turbine (W/T 2).

The fortress enclosure, on the hill Mesimler – Kale: It is located west of the ruined village of Mesimeri. The enclosure has a length of 497 m. Its west and south sides are built according to the cyclopean system with slates. Inside there are foundations of about 50 circular and quadrangular buildings, as well as tiled tombs. On the NW and SW side of the hill there are parts of a second enclosure. The monument is 6.7km from the nearest wind turbine W/T2

South of WPP is the terrestrial archaeological site of **Koum-Tarla**, which is a religious-funerary site of the Neolithic period and is 3.3Km from the nearest W/T2.



Map 10 : Locations of Archaeological Sites in relation to WPP

5.2 Current Spatial and Urban Planning Regulations in the Project Area

5.2.1 Forecasts and Guidelines of the General, Specific and Regional Framework for Spatial Planning and Sustainable Development

This section presents the basic spatial planning options that have been established at the level of Strategic Spatial Planning for the study area in accordance with Law 4447/2016, as amended and in force, and examines the compatibility of the project under study with them.

General Framework for Spatial Planning and Sustainable Development

The purpose of the General Framework for Spatial Planning and Sustainable Development is to define strategic directions for the integrated territorial development and sustainable organization of the national space for the next 15 years, considering:

- the need for: a) promoting sustainable, balanced and globally competitive development, b) ensuring productive and social cohesion, c) ensuring the protection of the environment and cultural heritage throughout the national space and its individual units and d) strengthening the country's position in the international and European framework,
- the commitments undertaken by the country, at international and Community level, for spatial management, the environment and sustainability,
- the obligation to align with the national public investment programme, the National Strategic Reference Framework and other general or specific development programmes of national importance that have a significant impact on the structure and development of the national space,
- the need to align with the general and individual economic targets set in the Revised Stability and Growth Programme and with the priorities of the National Reform Programme for Growth and Jobs.
- that the General Framework constitutes, by law, the reference basis for the coordination and harmonisation of individual policies, programmes and investment projects which have a significant impact on the cohesion and development of the national space.

In the field of energy (paragraph B1) the aim is to:

i. The full assurance of the coverage of energy needs in all parts of the national space.

ii. enhancing energy security by fully developing RES, promoting the use of alternative fuels and utilizing domestic resources.

iii. Effective control of the environmental performance of the energy sector and the reduction of the sector's impact on climate change in the context of the relevant commitments of our country.

Regarding Renewable Energy Sources, it is mentioned that:

i. Greece will manage to reduce emissions of air pollutants that contribute to the greenhouse effect and will thus meet the obligations arising from the Kyoto Protocol and the decisions of the European Union. Measures to achieve these

goals include increasing the energy produced from RES and limiting emissions from larger industries, improving the energy performance of buildings, etc.

ii. In 2006, RES accounted for only 11.5% of total electricity production in Greece. However, soon, the penetration of RES in energy production is expected to increase, especially with the development of wind energy.

Regional Framework for Spatial Planning and Sustainable Development

The region of Eastern Macedonia – Thrace increases its energy coverage in RES and is evolving into a new energy center of the country as progress is made in the production and transmission of electricity and in investments, especially in wind energy installations.

The objectives of the SmPC of the Region of Eastern Macedonia and Thrace are:

- Strengthening the position and role of the Region in the international, Community and national space within the framework of territorial cohesion policies for the integrated,
- Balanced and sustainable development, with controlled competitiveness of territorial systems and inter-regional space.
- Halting the recession, strengthening social cohesion and ensuring sustainable economic prosperity in the Region.
- Strengthening territorial cohesion at intra-regional level, through the establishment of sustainable development units and the balanced and complementary distribution of productive activities in space.
- Prudent and efficient management of resources, including soil resources, promoting the strengthening of synergies, recycling and reuse in both the production process and residential development.
- Addressing the challenges of climate change and limiting the environmental impact of the energy and transport sectors by prioritising the development of RES and the redesign of the transport system within the framework of regional planning.
- Protection, combined promotion and exploitation of the rich natural and cultural environment, is recognized as an important development resource and comparative advantage of the Region.
- Recognition of the landscape as an important factor of prosperity and quality of life and promotes its protection and promotion as an equal component of spatial planning and development planning policies.
- Sustainable management of space and provision of guidelines for the organization of space, the development of productive activities and the protection of the natural and cultural environment and landscape towards the underlying planning, setting hierarchical priorities and utilizing the available tools of spatial and environmental planning.

Among the prerequisites for the effective activation of the development potential of the Region is the utilization of energy in all sectors. The many and diversified energy resources, either conventional or from renewable sources, as well as the remarkable energy infrastructure of the Region, provide opportunities to strengthen its position mainly in the national area. In this direction, the Region increases its energy coverage in RES and the development of research is being explored to capitalize on the experience on RES to produce know-how.

The spatial units for the development of energy from RES are divided into two categories. The first (and most important in terms of size and potential) spatial unit coincides with the Wind Priority Area (WPA) 1 of the Special Framework in the eastern part of the Rhodope Mountains and in the mountainous areas of the Evros Region. The second section includes a significant part of Bald Mountain in the Regional Area of Drama. The development of wind farms in the two territorial units of renewable energy sources is systematically and as a matter of priority. The installation area of the project is located within the first spatial unit of RES development.

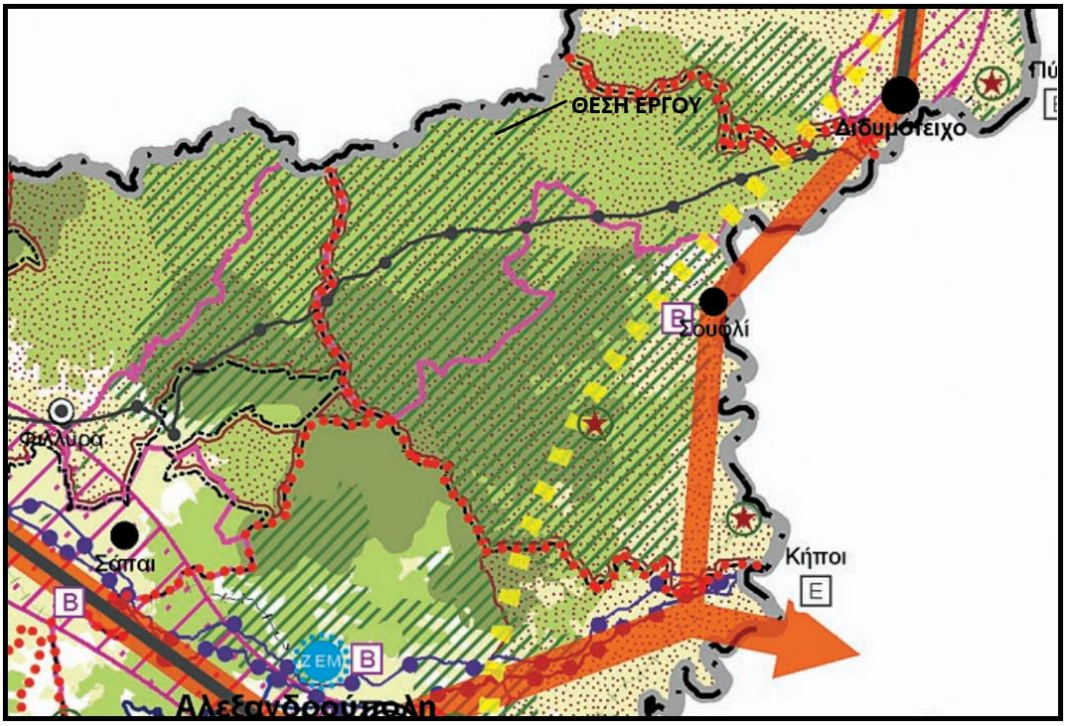
The Municipality of Soufli is a unit with multiple developmental characters and special characteristics (lack of important urban centers and rich natural environment). It includes areas of intense agricultural development, forestry-logging, combined ecodevelopment and RES development.

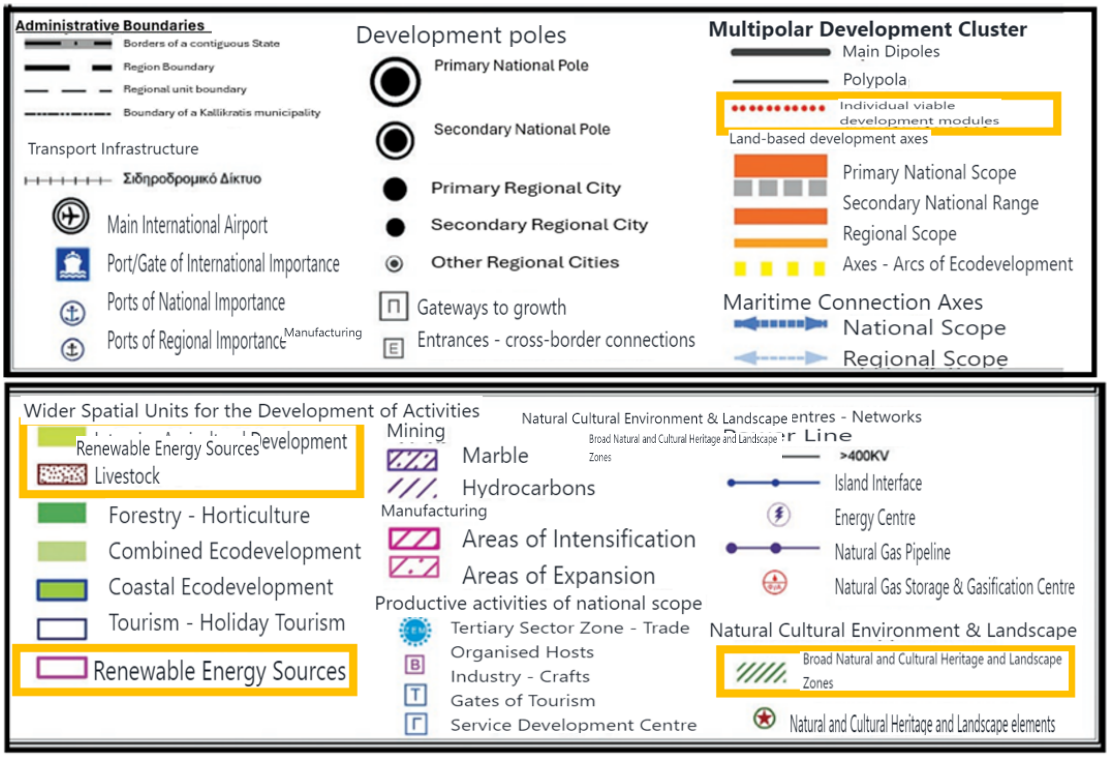
Regarding RES, integrated interventions are promoted that will maximize the benefits of the Region's energy sources. These are as follows:

- ✓ Active integration of the Region in international energy networks, both at the level of natural gas pipelines and in the context of interconnections with the electricity networks of neighboring areas
- ✓ Utilization of the multiple energy sources of the Region in the context of supporting the Development of other productive activities by enhancing synergies at the production level
- ✓ Development of all energy sources, including especially RES, with a view to protecting the natural and cultural environment and landscape of the Region.
- ✓ The completion of all projects for the development of the 400kV base system is being promoted to ensure satisfactory voltage levels, even in cases of disturbances, and to improve the transmission capacity of the power produced by the RES units. The necessary upgrade works of the high voltage network are completed, with the most important being the planned works in Kavala, Nea Santa and Evros, while a new interconnection line YT-400Kv Greece - Bulgaria, Nea Santa - Maritsa is being promoted. The reinforcement of transmission networks is considered necessary in connection with the reception of the produced RES loads.

The exploitation through the development of RES of the significant wind potential of the Region, as well as water resources and geothermal fields, is also promoted. As far as wind energy is concerned, the Wind Priority Area (ΠΑΠ 1 of the ESDP for RES) is being exploited, with a carrying capacity of 538 typical wind turbines with an indicative production capacity of 1,076 MW, in accordance with the guidelines of article 14.

Below is a relevant excerpt of the Spatial Development Model with an indicative list of the area of installation of the project.





Map 9: Model of Spatial Development of the Region of Eastern Macedonia and Thrace

Evaluating all the above, the Region's SmPC encourages the utilization of RES. The project is compatible and does not contradict the objectives and guidelines of the approved SmPC-Macedonia-Thrace.

National Energy and Climate Plan (NECP 2023)

The National Energy and Climate Plan is a Strategic Plan of targeting and policy on Climate and Energy issues. The plan has a detailed roadmap for achieving Energy and Climate Goals by 2030 and longer-term until 2050. The NECP is a revision of the NECP prepared in 2019 and adopted in 2020.

The green energy transition aims to eliminate carbon dioxide emissions from the combustion of fossil fuels and to make processes that emit non-energy greenhouse gases climate neutral. "*The target is the net sum of positive and negative greenhouse gas emissions, taking into account the additional absorption of carbon dioxide from soil, forests and sea, and to be equal to zero in 2050."*

From 2020 until today, the European Union has adopted more ambitious targets for 2030 and included in the NECPs of all Member States, **the goal of climate neutrality by 2050**. Today, Greece has incorporated the long-term goals and the plan to achieve them into the main National Energy and Climate Plan. which therefore covers the entire period between now and 2050, covering in greater detail the plan to achieve the 2030 targets.

Specifically, the NECP (2023) includes the objectives of the climate law, the objectives within the framework of the European Union policy and the European directives on RES, energy efficiency and others.

According to the European Directives, the target for reducing greenhouse gas emissions concerns individual sectors through binding targets for RES and energy efficiency. The NECP aims to develop RES in all sectors, estimating that RES will be the main pillar of the green transition through their direct use for energy production and indirectly to produce green hydrogen and climate-neutral fuels. The target set for renewables is 44% and is much higher than the previous NECP which set a target of 35%.

Summary of the strategic axes of the NECP.

The NECP integrates and describes measures and other policy priority strategies such as:

1. Rapid development of RES:

2. Energy storage:

3. Energy efficiency:

4. Electrification of light transport:

5. Climate-neutral alternative fuels:

7. Bioeconomy:

8. Creating a green hydrogen economy:

The following table presents the targets for installed capacity, which are in line with the connectivity capabilities provided by the country's Transmission System and Distribution Network, based on the development plans of the Operators approved by RAE and based on the System and Network

Connection Offers already granted for the implementation of new RES projects (approximately 11.5 GW in the System and 1.5 GW in the Network). **The targets for renewable electricity generation by 2030 are therefore achievable.**

NECP (Apr. 2023)	2023 (estimation)	NECP 2019 FOR 2030	Basic Scenario					
			2025	2030	2035	2040	2045	2050
Electric Energy Sector								
Power RES beside hydroelectric (GW)	9.3	15.5	14.8	23.5	34.7	46.2	64.4	71.7
Wind	4.7	7.1	6	9.5	14.7	19	27.2	29.2
-of which sea				X	6.2	9.8	15.4	17.3
Solar	4.3	7.7	8.2	13.4	18.7	25.4	35.2	40.3
Rest of RES	0.4	0.7	0.5	0.6	1.3	1.8	2	2.1
Hydroelectric (H/E) (GW)	3.1	3.7	3.1	3.8	3.8	3.8	3.8	3.9
Power from saving electric energy (GW)	0.7	2.7	3.3	5.3	5.7	11	21.3	24.8
-batteries (GW)	0	1.25	1.9	3.1	3.6	8.8	19.1	22.6
-pumped storage	0.7	1.4	1.4	1.4	2.2	2.2	2.2	2.2
Power Units with gas fuel (GW)	5.3	6.9	6.9	7.7	8.7	5.2	2.8	4.2
Power Units with solid fuel (GW)	2.3	0.3	1.5	0	0	0	0	0
Power Units with liquid fuel (GW)	1.7	0.3	1.3	0.7	0.6	0.4	0.4	0.1
Total production of electric energy	54.7	57.9	58	66	87.5	114.6	157.7	175.3
-from gas fuels (TWh)	22.5	19	16.3	12.1	2.6	1.2	1.6	2.9
-from solid fuels (TWh)	5.3	0	4.8	0	0	0	0	0
- from liquid fuels (TWh)	4.7	0.8	2.4	0.2	0.5	0	0.1	0
-from RES (TWh)	22.2	38.1	34.5	53.7	84.4	113.4	156	172.3
Carbon fingerprint from electric production (tCO_2/MWh	0.376	0.115	0.212	0.063	0.013	0.001	0.01	0
Dependance lelectric energy from imports	6.70%	7.90%	3%	4%	3%	3%	3%	2%

Table 9: Summary of the NECP projections for the electricity sector.

According to the above data, the project will help achieve the targets set for Renewable Energy Sources, therefore the project is compatible with the National Energy and Climate Strategy.

National Strategy for Adaptation to Climate Change (NSACC)

Article 45 of Law 4414/2016 (Government Gazette 149/A/2016) approved the first National Strategy for Adaptation to Climate Change (NSACC). The National Strategy for Adaptation to Climate Change sets the general objectives, guiding principles and means of implementing a modern, effective and developmental adaptation strategy within the framework defined by the United Nations Convention on Climate Change, European guidelines and international experience.

The main objective of the National Climate Change Adaptation Strategy (NSACC) is to contribute to strengthening the country's resilience to the effects of Climate Change. APSC is a basis for the strategic approach to developing guidelines aimed at achieving adaptation. NSACC also plays a key role in documenting the need to establish an appropriate institutional and financial framework for support the necessary public and private actions aimed at adaptation. Due to its nature, NSACC does not carry out an in-depth analysis of the necessary sectoral policies, proposes adaptation measures and actions at a broader level and does not attempt to prioritise them.

Articles 42-45 of Law 4414/2016 (A' 149) established the procedures for the preparation and approval of RCCAPs, the procedures for their revision/amendment and their minimum contents. It is noted that the Regional Plans have begun and are being prepared by the Regions. In addition, the 1st RCCAP was approved and the National Council for Adaptation to Climate Change was established.

The content of the Regional Plans for Adaptation to Climate Change was specified by Ministerial Decision 11258/2017 *(Government Gazette B' 873)*. The National Council for Adaptation to Climate Change was established and established by Ministerial Decision 34768/2017 *(Government Gazette B' 3246)*.

The NSACC sets an initial time horizon of five years to develop Greece's adaptation capacity to Climate Change and implement a first set of Actions. The significant degree of uncertainty that Climate Change and its impacts have, the constant developments and new information that emerge, as well as the regular pace of revision of views on how adaptation should be promoted, require continuous evaluation and specialized analysis on an ongoing basis.

Specific main objectives of NSACC are:

1. The organization and strengthening of the decision-making process related to adaptation.

2. The promotion of a sustainable development model through Regional/local action plans that promote adaptation to Climate Change.

3. The promotion of Adaptation Actions and Policies in all sectors of the Greek economy with emphasis on the most vulnerable.

4. The creation of a monitoring, evaluation and updating mechanism.

5. The strengthening of the adaptive capacity of Greek society through information and awareness actions.

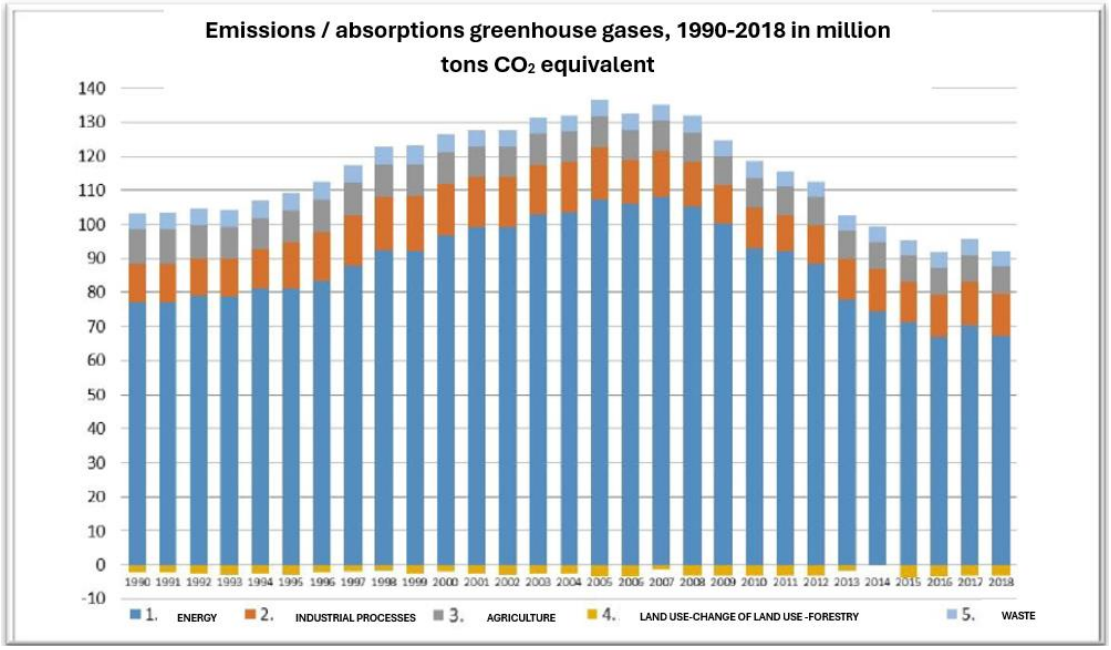


Image 19: Evolution of national greenhouse gas emissions/removals since 1990 (Source: http://www.ypeka.gr/)

Regarding the candidate adaptation projects, NSACC mentions/classifies the proposed actions into different categories ("Protection of Main System Energy Infrastructure", "Projects for the protection of coastal energy installations and island systems", etc.) and among the proposed measures, it mentions the following (measure 5.1): "*Integration of preventive protection measures regarding the siting of energy projects (thermal plants, RES units, natural gas infrastructure and infrastructure oil) and electricity networks. Preventive measures will concern the avoidance of sitting in locations with high vulnerability to climate change, such as coastal areas, areas at risk of flooding and any vulnerable to impacts from extreme weather events.*"

NSACC has carried out an initial, more comprehensive risk and vulnerability analysis for all Regions of Greece, regarding the effects of Climate Change. These measures, therefore, have a more general character and their purpose is to draw up a guideline to be followed by the Regional Climate Change Adaptation Plans (RCCAP).

Regional Plan for Adaptation to Climate Change (RCCAP) of the Region of Eastern Macedonia-Thrace.

The Regional Climate Change Adaptation Plan (RCCAP) of the Region of Eastern Macedonia and Thrace (E.M.Th.) is drafted within the framework of the obligations and specifications arising from the relevant national legislation (Law 4414/2016 (A' 149) and Government Gazette 873/16.3.2017). According to the 4th Report of the Intergovernmental Panel on Climate Change (IPCC, 2007), Eastern Macedonia and Thrace are classified as vulnerable to climate change.

Law 4936/2022 (Government Gazette 105 A/27.5.2022) "National Climate Law – Transition to Climate Neutrality and adaptation to climate change, urgent provisions to address the energy crisis and protect the environment" **ratified the National Plan for Energy and Climate.**

The overall objective of **RCCAP** is to " *contribute to strengthening the region's resilience to climate change in all sectoral policies. This means increasing preparedness and capacity to deal with climate change impacts at local, regional, national and EU level, developing a coherent approach and improving coordination."*

Specific objectives of the RCCAP are:

- record climate change estimates in the Region of Eastern Macedonia and Thrace up to the year 2100
- assess the immediate and future environmental, economic and social impacts of the Regional Climate Change Adaptation Plan (RCCAP) in all sectors of the Region
- assess (from an environmental as well as socio-economic point of view) possible adaptation actions in these sectors.
- prioritise, based on specific criteria, possible adaptation actions in the different sectors and indicate those that can constitute an integrated regional strategy on adaptation to climate change.

By examining in detail, the characteristics of the natural environment of the Region and the climate changes that are expected, RCCAP contributes to the assessment of the risks that these changes involve in the environment, society and economy. The result of the above is the identification of the necessary sectoral policies to identify and prioritize the appropriate measures and actions that contribute to the adaptation of each Region to climate change. In addition, the RCCAP specifies the timing and cost of actions at strategic level, as climate change is both not accurate and a time-consuming process whose effects are felt in the short term.

In conclusion, vulnerability analysis, prioritization, based on appropriate evaluation criteria, and selection of measures and actions, timing and investigation of their funding / implementation are the main axes of RCCAP. The same applies to the application of indicators and other tools for monitoring the evolution and implementation of adaptation measures.

The main objective of RCCAP Eastern Macedonia-Thrace is to achieve the resilience of the Region to the impacts caused by Climate Change:

This objective will be achieved:

- ❖ analysing in depth the necessary sectoral policies.
- ❖ examining the feasibility of implementing individual adaptation measures and actions at local/regional level,
- ❖ attempting to prioritize indicative Measures and Actions and
- ❖ defining the immediate adaptation priorities for the Region concerned.

Key objective of the Regional Strategy for Adaptation to Climate Change

Changing Eastern Macedonia Thrace is to **strengthen resilience** in all priority areas and achieve **the Sustainable Development Goals**.

The Pillars – Priority Axes of the Regional Strategy of Eastern Macedonia and Thrace for Climate Change are the following:

• ***Pillar – Priority Axis 1 (PA1): Leadership and strengthening of Management***

Capacity: *The aim of the pillar is to promote the administrative capacity of bodies and structures related to the implementation of RCCAP. In addition, it is important to set up a permanent mechanism for monitoring implementation and updating based on new scientific evidence and studies.*

• ***Pillar – Priority Axis 2 (PA2): Promotion and dissemination of knowledge &***

Skills: The second pillar focuses on *actions related to continuous information, raising awareness of the whole society on tackling climate change, the impact on society and economy, as well as the education of institutions and citizens on civil protection and natural disaster response.*

• ***Pillar – Priority Axis 3 (PA3): Strengthening Resilience in priority areas*****: The third pillar** *focuses on carrying out infrastructure projects aimed at dealing immediately with dangerous situations but also at*

dealing with the medium-term impacts, conducting specialized studies in priority areas that will improve the level of knowledge and understanding of changes and impacts in the various sectors and finally applying, where possible, information and communication technologies (ICT).

The purpose of the study is to develop a comprehensive picture for the Region of Eastern Macedonia and Thrace regarding the current and future risks of climate change. In this context, the potential opportunities arising from climate change shall also be identified and the adaptability and resilience of the systems considered to the impacts and risks of climate change shall be assessed, considering both physical and socio-economic considerations.

The concepts of climate vulnerability and climate risk are theoretical, so it is not feasible to measure them directly with a commonly accepted measurement system such as an observed phenomenon (e.g. temperature rise).

Therefore, there is no specific proposed measurement system at European or international level. The most widespread way to address this limitation is the use of indicators. **Indicators give information that can be used to determine the state or change in characteristics of a system.**

In general, the assessment of the risk posed by a threat, natural or anthropogenic, depends on the following factors.

- the type of threat
- the magnitude or frequency of occurrence of the threat
- the existence and significance of threatened activities.
- facilities, population, etc.
- the vulnerability of activities, facilities, population, etc. in
- specific threat
- the ability to adapt activities, facilities,
- population, etc. to the specific threat.

For the purposes of this study, the corresponding data/data concerning the threats from the upcoming Climate Change, the risk assessment methodology that may arise and the results of its application are given below.

In general, Climate Change is reflected in the following climatic parameters:

- Temperature (average, maximum, minimum)
- Drought (decrease in average rainfall, continuous days of drought, etc.)
- Wind (average speed, windstorms)
- Heatwaves (days with high temperatures, days with stuffy conditions)
- Cold invasions/frost
- Heavy rainfall/snowfall
- Sea level rise
- Wave invasion (surges)

These parameters are the same as those used internationally in similar assessments such as the Assessment Report (AR) of the Intergovernmental Panel on Climate Change (IPCC, 2014) and the recent report of the European Environment Agency on Adaptation to Climate Change (EEA, 2017).

The period for the implementation of the RCCAP and the implementation of the Measures and Actions it proposes is set at seven years 2019-2025.

According to RCCAP and based on the results of the analysis, in the short- and medium-term horizon until 2050, moderate risk from the effects of climate change is estimated to be faced:

- ✓ activities of the primary sector (agriculture and forestry systems)
- ✓ water resources (irrigation & water supply sectors)
- ✓ the winter tourism sector,
- ✓ Public Health and especially sensitive groups of the population
- ✓ forest systems,
- ✓ biodiversity, inland waters and protected areas (wetlands, biotopes).

Over the long term (period 2071-2100) the climate risk increases significantly for most sectors in the E.M.Th. and especially in the case of the adverse scenario RCP8.5 takes outliers for the sectors:

- ➢ forest systems,
- ➢ agriculture and livestock farming
- ➢ water resources,
- ➢ Public Health and especially sensitive groups of the population
- ➢ and protected areas.

Medium and high long-term risks are expected to be faced by:

- fisheries and aquaculture,
- road and rail transport and, secondarily, port infrastructure,
- the built environment and building infrastructure
- coastal areas,
- the tourism sector,
- landscapes of particular beauty and
- the aquatic environment

The remaining sectors (manufacturing, mining, aviation, tertiary sector, energy, etc.) in both the short and long term are expected to face low to medium risk.

Considering the above, the image below presents an overall climate risk assessment per activity for the periods 2021-2050 and 2071-2100 and for the RCP4.5 and RCP8.5 scenarios:

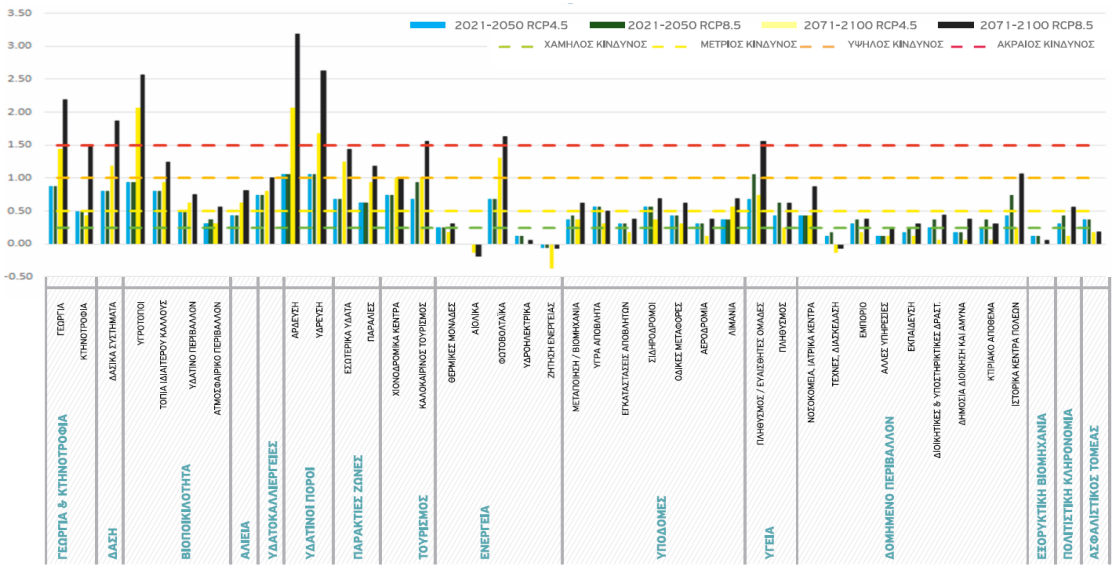


Table 10: Comprehensive climate risk assessment per activity for the periods 2021-2050 and 2071-2100 and for PAM.V.H scenarios RCP4.5 and RCP8.5

The diagram above shows the overall climate risk assessment that includes the analysis of the potential impacts of climate change and the ability of wind farms to mitigate these impacts. Thus, renewable energy sources, such as wind energy, make a key contribution to reducing climate risk, making the energy system more resilient and reducing the risk of extreme weather events linked to climate change.

In conclusion, wind farms are a crucial tool in the global effort to tackle climate change. Integrating them into the energy strategy can reduce climate risk and contribute to a more sustainable and resilient planet for future generations.

Therefore, the examined WPP is in a location that is not vulnerable to extreme weather events. Due to the nature of the project, its location and the specific measures taken, the project is fully in line with the guidelines of RCCAP.

Climate Resilience Assessment of the project (Law 4936/2022 National Climate Law)

- ⇨ *Description of the project*

It is an WPP with a total installed capacity of 34.5 MW that will be installed on the mainland within the boundaries of a Natura 2000 protected area, specifically within the SPA GR1110010 and the Site of Community Importance GR1110003 as well as within the K731 Wildlife Refuge. The project will consist of 8 tripters with a nominal power of 4.5 MW (downrated to 4.3125MW) each and is flanked by accompanying road construction and damping works.

Project title: "Construction and operation of a Wind Power Plant (WPP) at "Mavrodasos", consisting of eight (8) wind turbines type V136-4.5MW (downrated to 4.3125MW), with a total capacity of 34.5MW, and its accompanying works in the Municipal Unit of Orfeas, the Municipality of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace, owned by the company under the name "Aliki Energy SINGLE MEMBER P.C.".

Budget: 35.451.398€

Environmental classification: The environmental classification of the Project under study, according to the number MD YPEN/DIPA/63951/4418/2024 (Government Gazette 3867/B/3-7-2024), is summarized in the following table:

Group	10th: Renewable energy sources
Category	A
Subcategory	A2
n/a	1
Type of project	Onshore wind power generation
Ranking criteria	Installed capacity (P) = 34,5MW (<35 MW)

Table 11: Environmental classification of project

Life Span: 40 years

Design Elements: The Project, with a total capacity of 34.5 MW, will use 8 wind turbines with a nominal power of 4.5 MW and a maximum capacity of 4.3125MW each. The R/W are placed on steel, cylindrical pillars with a slight taper height of 105 m. The rotor of each aircraft has three (3) fins made of epoxy resin reinforced with glass fiber, carbon fiber and solid metal elements 66.7 m long. The diameter of the impeller is 136 m. The generator is connected to the electrical network via a power converter located on the spindle of the engine.

The points where the pillars of the wind turbines will be found are arranged to avoid phenomena of aerodynamic shading and high wind turbulence to optimize energy efficiency and reduce wear. The distances between the pillars exceed by at least 2.5 times the diameter of the impeller, meeting the design condition.

The **energy produced** amounts to 90,666[5] MWh/year.

⇨ *Siting*

The construction of the WPP with a total capacity of 34.5 MW will take place within the Municipal Unit of Orfeas, the Municipality of Soufli, the Regional Unit of Evros, the Region of Eastern Macedonia and Thrace, to exploit the wind potential of the area. The electrical interconnection of WPP will be carried out through the existing Substation "PATRIARCHIS" lifting M.V./H.T. (33KV/150KV) which falls within the Municipality of Arrian, the Regional Unit of Rodopi, the Region of Eastern Macedonia and Thrace.

The HGRS 87' coordinates of the wind turbines of the studied WPP are presented below:

n/a	X	Y	G
W/T1	671820.70	4576019.89	286.50
W/T2	671481.22	4575994.39	307.65
W/T3	671357.48	4576312.36	298.00
W/T4	672009.41	4576565.25	306.50
W/T5	671723.95	4576826.90	296.50
W/T6	671401.41	4576990.01	269.50
W/T7	671529.45	4577316.91	259.90
W/T8	671846.84	4577149.10	268.80

Table 12: Geographical Coordinates of WPP

The coordinates of the polygon within which the ten (10) wind turbines of the studied project will be installed are depicted in the table below:

[5] The calculation was made from the ratio Annual = P (power) x CF (capacity factor) x h (hours of the year). For wind farms, capacity factors range from 0.2 to 0.5. In this case, CF = 0,3 was used.

α/α	X	Y
K1	672002.938	4577322.479
K2	671512.736	4577382.175
K3	671478.004	4577310.485
K4	671475.562	4577305.642
K5	671342.956	4577042.583
K6	671127.718	4576846.493
K7	671019.112	4576747.347
K8	671467.715	4576644.658
K9	671510.770	4576609.194
K10	671662.419	4576733.248
K11	671989.661	4576429.806
K12	672162.731	4576602.796
K13	671874.345	4576868.230
K1	672002.938	4577322.479

Table 13: Coordinates of polygon P1 of WPP installation

α/α	X	Y
K14	671063.113	4576487.612
K15	671270.933	4576232.503
K16	671274.361	4576228.300
K17	671276.873	4576223.493
K18	671457.911	4575877.049
K19	671896.296	4575942.776
K20	671853.714	4576121.331
K21	671534.504	4576075.326
K22	671361.130	4576479.980
K14	671063.113	4576487.612

Table 14: Coordinates of polygon P2 of WPP installation

The coordinates of the route of the electricity transmission line as well as of the occupation zone of roads and squares are mentioned in the attached plans Interconnection Map and Occupation Zone.

⇨ *Summary of how climate change issues are addressed*

Climate change mitigation

The proposed project concerns a wind power plant with a total installed capacity of 34.5 MW. The project is included in the group of the pre-control panel for which a detailed analysis of the carbon footprint is required, because it is a RES power plant. The following detailed analysis on climate change mitigation shows that the CO2 emissions avoided are:

In Greece, electricity production from conventional plants (e.g. lignite, natural gas) has average emissions of around 0.8 to 1.0 kg of CO2 per kilowatt hour (kWh). Thus, an average value of 0.9 kg of CO2 per kWh is considered representative.

Therefore, the avoidance of CO2 emissions per year will be equal to the Annual Energy Production multiplied by the CO_2 Emissions per kWh, i.e.:

Avoidance of CO2 emissions per year = Annual energy production × CO2 emissions per kWh

Avoidance of CO2 emissions = 90.666 MWh × 1.000 kWh/MWh × 0.9 kg CO2/kWh =>

=> CO2=90.666.000 kWh × 0,9 kg CO2/kWh = 81.599.400 kg CO2 =>

=> CO2 ≈ 81.599 tonnes of CO2

Thus, the 34.50 MW wind farm under consideration is expected to avoid about 81,599 tons of CO2 per year.

The financial evaluation of the project concludes that in 2025 the benefit will be € 15,050,5200, while in 2050 it will be € 376,263,000.

Adaptation to climate change

An analysis on climate change adaptation was carried out in a Wind Power Plant.

During the screening, the proposed project is analyzed in terms of sensitivity, exposure and vulnerability to climate change. The vulnerability analysis shows that the project has at least moderate vulnerability to the following risk sources:

- Cold wave/frost
- Forest fire
- Cyclone, storm, hurricane
- Storm (including blizzards, dust storms and sandstorms)
- Whirlwind
- Strong precipitation (rain, hail, snow/ice)

The risk analysis carried out highlights as moderate inherent risks those associated with strong wind and precipitation phenomena as well as landslide risk. For this reason, additional adaptation measures are selected to reduce each inherent risk to an acceptable level of residual risk. Also, a monitoring program of adaptation to climate change and the consistency of the project with adaptation strategies and plans is given.

Additional adaptation measures include the perimeter organization of the site to deal with a possible forest fire, the installation of a lightning protection system and the insurance of the Project against natural disasters. The monitoring program includes the monitoring of the meteorology of the area and the development of emergency protection procedures of the Wind Power Station in case of extreme weather events.

- Climate change mitigation

⇨ *Pre-screening*

According to the European Commission's Technical Guidance on making infrastructure more resilient in the period 2021-2027 (2021/C 373/01), the project falls under a category for which a

carbon footprint assessment is required, so a detailed analysis of climate change mitigation is carried out.

However, RES projects do not emit greenhouse gases during their operation. For wind farms, greenhouse gas emissions are negligible. The purpose of renewables is to prevent the creation of greenhouse gas emissions, as the energy they produce would be produced differently from conventional forms of energy.

⇨ *Detailed analysis*

The detailed analysis of the project includes the calculation of the carbon footprint of the project, the economic valuation of emissions and the consistency of the results with the European and Greek climate change mitigation targets.

- *Carbon footprint of the project*

Renewable energy projects are typically characterized by zero greenhouse gas emissions since fossil fuels are not burned.

- *Relevant project emissions*

The project under consideration occupies an area of approximately 206.002.67 m2 and has an installed capacity of 34.50MW. The projected energy production amounts to 90,666 MWh per year.

Based on this energy production, the following calculations are made:

In the baseline scenario, in the absence of the project, this energy is covered by national electricity generation. In the following methodology, data are taken from the annual Report of (RES-E) and the annual reference list of Greece and therefore we have:

- CO2 emissions = energy production x emission factor = 90.666 MWh x 436.889g/ kWh = 39.61 tn_{CO2} or 39.61 tn CO2 eq/year
- CH4 emissions = energy production x emission factor = 90.666 MWh x 6.27g CH4/kWh = 568.48 tn CH4 or 1.563.32 tn CO2 eq/year
- N2O emissions = energy production x emission factor = 90.666 MWh x 2.66 g N2O/kWh = 241.17 tn N_{2O} or 71.868.66 tn CO2 eq/year

Total = 73.471,59 tn CO2 eq/year (basic emissions)

and

(Relative emissions) = (absolute emissions) – (baseline emissions) = 0 – 73,471.59 =

- 73.471,59 tn CO2 eq/year

The implementation of the Project avoids the emission of 73.471,59 tn CO2 eq per year.

- *Economic valuation of emissions*

Because renewable energy projects have a negative value, their economic valuation through shadow carbon costs records amounts that are not spent to achieve the Paris Agreement target and result in significant savings for the Project Beneficiary.

It is considered that the construction of the project is completed in 2025, when its operation begins, which continues until 2050. Furthermore, the relevant emissions are negative and are considered stable and equal to -73.471,59 tn_{CO2eq} per year, as calculated. Please note that these are the emissions avoided by the operation of the WPP under consideration. So, they are "negative" emissions, and the corresponding calculated costs are a gain for the energy system of the country.

Thus, based on the shadow carbon costs mentioned in Table 6 of the Technical Guidelines on strengthening the resilience of infrastructure to climate change in the period 2021-2027 (2021/C 373/01), in the year 2025 the benefit will be € 15,050,520 and in the year 2050 the benefit will be € 376,263,000. The benefit of avoided emissions is shown in the following diagram.

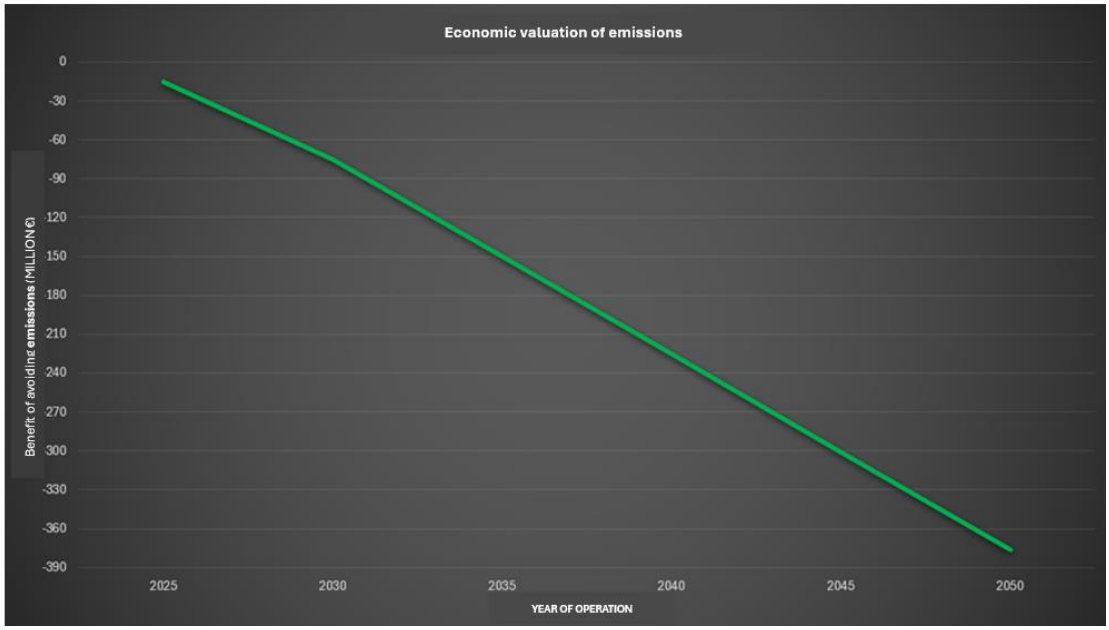


Chart: Project Emission Cost per year of operation

- *Compatibility with the climate-neutrality objective*

In this chapter, a detailed analysis of the Project's contribution to climate change mitigation takes place, concluding with the confirmation of the compatibility of the project with a realistic path of achievement of the targets of Greece and the EU for the reduction of greenhouse gas emissions for 2030, 2040 and 2050 (climate neutrality), the objectives of the Paris Agreement and the provisions of the European Climate Law. Moreover, the project under consideration must be in line with the objectives set by the National Energy and Climate Plan (NECP). Specifically, the NECP sets as a national target for 2030 the share of RES in gross final energy consumption with a share of at least 35% and the share of RES in gross final electricity consumption at least 60%.

Wind farms do not cause greenhouse gas (GHG) emissions, and since their share in gross final energy consumption is required, by national planning, to increase as a RES project, it reduces national GHG emissions. Energy derived from RES replaces energy derived from fossil fuels in the National Mix, thus preventing GHG emissions. RES projects in this respect are in any case compatible with any emission reduction target, National or European. Covering energy needs from RES is the main step towards climate neutrality.

- Adaptation to climate change

The assessment of the adaptation of the WPP project under review to climate change consists of two phases, screening and detailed analysis.

During the pre-screening, the vulnerability analysis of the project to climate change is carried out. The vulnerability analysis decides whether a detailed analysis is required or not. In addition, the risk analysis assesses each source of risk, which is now the inherent risk, in terms of its materiality level. Significant inherent risks require consideration of climate change adaptation measures that reduce each significant inherent risk to an acceptable level of residual risk. Thus, climate vulnerability assessment and risk analysis should be integrated from the beginning of the project development process, as this ensures the widest possible range of possibilities for selecting the best adaptation options.

⇨ *Pre-screening*

The screening phase includes the analysis of the project's vulnerability to climate change. The vulnerability analysis is divided into three steps and involves performing 1) a sensitivity analysis, 2) an analysis of current and future exposure, and 3) a combination of the two for vulnerability assessment.

For sensitivity, exposure and vulnerability analysis, the excel computational tool developed by Gen. Secretariat of Public Investments & NSRF. It is noted that sources of climate risk that are not related to the project under evaluation can either be identified as "low" sensitivity/exposure or not filled in at all in the excel computational tool.

A detailed presentation of the expected change in climate parameters can be found in the National Information Web Site on Adaptation to Climate Change (https://adaptivegreecehub.gr) developed in the framework of the LIFE-IP AdaptInGR (www.adaptivegreece.gr) project.

Sensitivity analysis

The purpose of the sensitivity analysis is to identify the hazards for the project under consideration.

The project consists of eight (8) three-bladed wind turbines with a total capacity of 34.50 MW. The R/S are placed on steel, cylindrical pillars with a slight taper height of 105 m. The runner of each W/T has three (3) blades made of epoxy resin reinforced with glass fiber, carbon fiber and solid metal elements 66.7 m long. The diameter of the impeller is 136 m.

Structurally, mainly due to the size of the Motorways, the project is sensitive to hazards related to extreme weather events and can cause damage to the structure. The operation of the project is directly related to wind speed as out-of-specification speeds reduce performance. Thus, sources of risk that lead to a reduction in project performance also imply a reduction in electricity generation.

Regarding the relationship of the project under consideration with the wider area, the project is connected through the accompanying works to the existing road network and to the local electricity transmission network. The following analysis assesses whether the project under consideration is also sensitive to this issue.

Considering the above characteristics, a sensitivity table is presented below, where each hazard is assigned a sensitivity score. The maximum score of each risk is marked individually. The analysis is based on the type of project and makes no correlation with the location of the facility. So we have:

Source of danger	Sensibility				
	Construction	Operation	Products Services	Integration into the region	Total sensitivity
Heat wave	Low	Low	Low	Low	Low
Cold wave	Low	Moderate	Moderate	Moderate	Moderate
Frost	Low	Moderate	Moderate	Moderate	Moderate
Forest fire	Moderate	Moderate	Moderate	High	High
Cyclone, strong storms, hurricane	Moderate	Moderate	Moderate	Low	Moderate
Storm	Moderate	Moderate	Moderate	Low	Moderate
Whirlwind	Moderate	Moderate	Moderate	Low	Moderate
Drought	Low	Low	Low	Low	Low
Heavy precipitation (rain, hail, snow/ice)	Moderate	Low	Low	Low	Moderate
Flood	Moderate	Low	Low	Moderate	Moderate
Landslide	High	Moderate	Moderate	Moderate	High
Precipitation	High	Moderate	Moderate	Moderate	High
Change in air temperature	Low	Low	Low	Low	Low
Urban heat island	Low	Low	Low	Low	Low
Thermal stress	Low	Low	Low	Low	Low
Temperature variability	Low	Low	Low	Low	Low
Change in solar radiation	Low	Low	Low	Low	Low
About turn Characteristics of winds	Low	High	High	Low	High
About turn features and types of precipitation	Low	Low	Low	Low	Low

Precipitation variability or hydrological variability	Low	Low	Low	Low	Low
Change in average water temperature in aqueous Bodies	Low	Low	Low	Low	Low
Acidification/salinity of marine Water	Low	Low	Low	Low	Low
Saltwater penetration, salinization of surface & Groundwater	Low	Low	Low	Low	Low
Sea level rise	Low	Low	Low	Low	Low
Availability and strain water resources	Low	Low	Low	Low	Low
Coastal erosion	Low	Low	Low	Low	Low
Soil degradation, salinity change, desertification	Low	Low	Low	Low	Low
Changes in the duration of crops Periods	Low	Low	Low	Low	Low

Table: Sensitivity Analysis of WPP MAVRODASOS

As far as construction is concerned, the project under consideration is sensitive to hazards affecting its technical elements. "High" sensitivity is observed in cases of landslides and subsidence that negatively affect the statics of the pillars. "Moderate" sensitivity to the issue of construction is observed in forest fire and flood and in extreme meteorological phenomena such as cyclone, storm, strong precipitation, etc., i.e. acute hazards that can destroy infrastructure, blades or fuselage if their intensity is beyond the design specifications of the equipment. In addition, for these hazards and strong precipitation phenomena associated with electrical discharges, sensitivity is observed as lightning causes damage to generators.

The operation of the project under consideration and consequently the electricity produced as a product are sensitive to hazards that reduce the performance of the project. Thus, "high" sensitivity is associated with possible changes in wind characteristics. During strong winds, wind speeds exceed the optimal operating range of each aircraft, which is overloaded and operates with reduced efficiency. In general, when wind characteristics exceed design specifications with increasing frequency due to climate change, there is reduced project performance. In such conditions, energy production is not as expected, and accurate forecasts are not feasible. "Moderate" sensitivity is estimated to exist for several climate hazards such as extreme meteorological events including cold

wave, frost, cyclone, storm, tornado, etc. "Moderate" sensitivity to operation is also estimated to exist due to incidents such as forest fires, landslides and subsidence.

Finally, sources of danger such as frost, flooding and forest fire in the adjacent forest affect the issue of the inclusion of the project under consideration in the area. These phenomena destroy the road link or make it temporarily impossible, blocking the project by road, and destroy the electricity transmission networks. Forest fire is characterized as a hazard to which the project is "highly" sensitive, while cold waves, frost, floods, landslides and subsidence the sensitivity is "moderate".

Exposure Analysis

The purpose of exposure analysis is to identify hazards for the intended location of the project under consideration, regardless of its nature. Thus, based on the characteristics of the hazards due to the location of the WPP under consideration, the following exposure table is presented, where each source is assigned a location exposure score for current and future climatic conditions. The lifetime of the project (40 years) requires the use of forecasts to understand how the level of exposure changes in the future. For the selection of exposure scores, the relevant RCCAP was studied and the position of the project in terms of flood zones, forest maps and soil erosion were checked.

It should be noted that the WPP in question is intended to be located on land that extends on a rocky ridge with an altitude of 260-308 m and slopes of 6-18% and mostly in a forest area. The analysis has been done with the excel tool proposed by the General Secretariat for Public Investment & NSRF.

Group	Source of danger	Report		
		Existing treaties	Future conditions	Total
Acute hazards	Heat wave	Low	Moderate	Moderate
	Cold wave	Moderate	Moderate	Moderate
	Frost	Low	Low	Low
	Forest fire	Moderate	High	High
	Cyclone, strong storms, typhoon	Low	Moderate	Moderate
	Storm	Low	Moderate	Moderate
	Whirlwind	Low	Low	Low
	Drought	Low	Moderate	Moderate
	Strong precipitation	Moderate	Moderate	Moderate
	Flood	Low	Low	Low
	Landslide	Moderate	Moderate	Moderate
	Precipitation	Low	Low	Low
Chronic risks	Change in air temperature	Low	Moderate	Moderate
	Urban heat island	Low	Low	Low
	Thermal stress	Low	Low	Low
	Variability of Temperature	Low	Low	Low
	Solar variation Radiation	Low	Low	Low
	Change in the characteristics of Winds	Low	Moderate	Moderate
	Change in characteristics and types of precipitation	Low	Moderate	Moderate
	Precipitation variability or hydrological variability	Low	Moderate	Moderate
	Temperature change of water	Low	Low	Low

	Acidification/salinity of sea water	Low	Low	Low
	Saltwater penetration, salinization of surface & Groundwater	Low	Low	Low
	Rise in its level Sea	Low	Low	Low
	Availability and strain water resources	Low	Low	Low
	Coastal erosion	Low	Low	Low
	Soil degradation, salinity change, Desertification	Low	Moderate	Moderate
	Changes in the duration of growing seasons	Low	Low	Low

Table: Report Analysis under examination WPP MAVRODASOS

Based on the predictions of the climate models for the region, it is estimated that the future climatic conditions related to the change in temperature and wind and precipitation characteristics will be, in their majority, worse than the current ones. Due to its location within a forest area, the project under consideration is estimated to have a "high" exposure to forest fire incidents. In addition, it is estimated to have "moderate" exposure to landslides, due to the mountainous nature of the area and the slope of the terrain. Changing climatic conditions is estimated to lead to 'moderate' exposure to several hazards related to extreme meteorological events such as cyclones, storms, strong precipitation and situations such as heatwave, cold wave and drought (acute hazards) and to changes in climate characteristics such as temperature, winds and precipitation characteristics over time (chronic hazards).

Vulnerability analysis

The vulnerability analysis combines the result of sensitivity analysis and exposure analysis. It aims to assess climate risks and thus forms the basis for deciding on the transition to the detailed analysis stage.

The vulnerability analysis is summarized in the table below and refers to the project under consideration at the selected location. This table combines the sensitivity and exposure of the specific infrastructure to each hazard with a combination of the previous results to derive the vulnerability analysis of the WPP. Thus, the following Vulnerability Table is obtained with the analysis taking place using the excel computational tool developed by the General Secretariat for Public Investment & NSRF.

Group	Source of danger	Maximum sensitivity	Maximum exposure	Vulnerability
Acute hazards	Heat wave	Low	Moderate	*Low*
	Cold wave	Moderate	Moderate	*Moderate*
	Frost	Moderate	Low	Low
	Forest fire	High	High	*High*
	Cyclone, strong storms, typhoon	Moderate	Moderate	*Moderate*
	Storm	Moderate	Moderate	*Moderate*
	Whirlwind	Moderate	Low	*Low*
	Drought	Low	Moderate	*Low*
	Strong precipitation	Moderate	Moderate	*Moderate*
	Flood	Moderate	Low	*Low*
	Landslide	High	Moderate	High
	Precipitation	High	Low	Moderate
Chronic risks	Change in temperature Air	Low	Moderate	*Low*
	Urban heat island	Low	Low	*Low*
	Thermal stress	Low	Low	*Low*
	Temperature variability	Low	Low	*Low*
	Change in solar radiation	Low	Low	*Low*
	Change in the characteristics of Winds	High	Moderate	*High*
	Change in characteristics and types of precipitation	Low	Moderate	*Low*
	Precipitation variability or hydrological volatility	Low	Moderate	*Low*
	Change in average temperature of water	Low	Low	*Low*
	Acidification/salinity of marine Water	Low	Low	*Low*

	Saltwater penetration, salinization of surface & Groundwater	Low	Low	*Low*
	Sea level rise	Low	Low	*Low*
	Availability and strain water resources	Low	Low	*Low*
	Coastal erosion	Low	Low	*Low*
	Soil degradation, salinity change, Desertification	Low	Moderate	*Low*
	Changes in the duration of growing seasons	Low	Low	*Low*

Table: Vulnerability Analysis under examination of WPP

The vulnerability analysis completes the screening phase for climate change adaptation. The following hazards shall be demonstrated, to which the project under consideration has at least a moderate vulnerability:

- Cold wave (moderate vulnerability)
- Forest fire (high vulnerability)
- Cyclone, severe thunderstorms, hurricane (moderate vulnerability)
- Storm (moderate vulnerability)
- Strong precipitation (moderate vulnerability)
- Landslide (high vulnerability)
- Sedimentation (moderate vulnerability)
- Change in wind characteristics (high vulnerability)

As hazards arise to which the project under consideration is vulnerable, a detailed analysis on climate change adaptation follows. In the detailed analysis, the inherent risk from each source is mitigated through adaptation measures so that residual risk is at acceptable levels.

⇨ *Detailed analysis*

Risk analysis

Risk assessment relates hazards to how the project under consideration operates in different dimensions (technical, environmental, social and economic, etc.) and examines the interactions between different factors. Therefore, the risk analysis may identify issues that were not identified during the vulnerability analysis.

Risk analysis is the combination of the probability of occurrence of each hazard identified in the vulnerability analysis of the project and the expected severity/magnitude of the impact of that source on that project.

The above vulnerability analysis of the WPP under examination revealed medium or high levels of vulnerability to the following risk sources, for which a risk analysis is required:

- Cold wave: Considering that climate change is mainly related to the increase in atmospheric temperature, cold waves are not expected to increase in the future. However, they can occur as extreme weather events, particularly at altitudes such as that of the WPP under consideration. A cold wave can affect the operation of this WPP, the production of energy and its transmission to the grid.

- Forest fire: Forest fire is a major source of danger to all infrastructure located within forest areas or even adjacent to forest areas. In future climatic conditions, the risk of forest fire will be even more pronounced. A forest fire can directly affect the infrastructure and technical elements of the WPP under consideration. It can also destroy electricity transmission networks.

- Cyclone, severe storms, hurricane: Climate change is associated with the occurrence of extreme meteorological events. Such phenomena can affect the construction and operation of the WPP under consideration, as well as the transmission of energy through the local transmission network and the access of maintenance crews to wind turbines. The same applies to storms and strong precipitation.

- Landslide: Sloping terrain is prone to landslides, especially in cases of extreme weather events. A landslide can cause significant damage to the WPP under consideration, destroy the local energy transmission system or even make access to it impossible.

- Subsidence: A wind turbine of this WPP can be destroyed if subsidence occurs at its installation site, so it has a high sensitivity to such phenomena. However, the exposure of this WPP to this hazard is low, resulting in moderate overall vulnerability.

- Change in wind characteristics: Wind is the "fuel" of the WPP under consideration. Any medium or long-term change in wind characteristics in the area where the WPP will be installed affects its operation and its total electricity production.

A quantitative scale of probability of occurrence of a risk and a scale of consequences has been defined to carry out the risk analysis.

Scale	**Score**	**Description**
Rare	1	5% chance of occurrence in lifetime of the project
Unlikely	2	20% chance of occurrence over project lifetime
Moderate	3	50% chance of occurrence during project lifetime
Likely	4	80% chance of occurrence in project lifetime

Almost certainly	5	95% chance of occurrence in project lifetime

Table: Probability Display Scale Calibration

Scale	Score	Description
Negligible	1	Minimal impact that can be absorbed from ordinary activity
Minor	2	An adverse event affecting the normal operation of the infrastructure, leading to local Effects
Moderate	3	A serious incident that requires additional management actions and results in moderate impact
Important	4	A critical event requiring extraordinary action, resulting in significant, far-reaching or long-term consequences
Devastating	5	Catastrophic event that may lead to downtime or collapse of the component/network, causing significant damage and widespread impact

Table: Impact scale calibration

The product of the probability scores and magnitude of the consequences shall constitute the intrinsic risk score for which the following calibration shall be defined:

Score	Scale	Description
1-3	Negligible	No risk reduction measures are required
4-6	Low	Taking risk reduction measures depends on the circumstances of the project
7-10	Mediocre	Taking risk reduction measures depends on the circumstances of the project
11-19	Considerable	It is proposed to take measures to reduce Risk
20-25	Very considerable	Measures to reduce Risk

Table: Intrinsic risk scale calibration

So, using them, the risk analysis is summarized in the following table:

Source of danger	Probability	Scale of consequences	Intrinsic risk	
			Score	Description
Cold wave	Likely	Negligible	4	Low
Forest fire	Likely	Devastating	22	Very considerable
Cyclone, strong storms, hurricane	Moderate	Important	15	Considerable
Storm	Moderate	Moderate	8	Mediocre
Whirlwind	Unlikely	Minor Importance	4	Low
Strong precipitation	Likely	Minor Importance	8	Mediocre
Landslide	Rare	Devastating	5	Low
Precipitation	Rare	Devastating	5	Low
Change in characteristics of winds	Rare	Moderate	3	Negligible

Table: Risk analysis of the project under consideration

The risk analysis shows that forest fire is a "very significant" inherent risk for this WPP project. Measures are therefore required for this risk.

Cyclones, storms and strong precipitation are estimated to pose moderate risks. Cold spells, tornadoes, landslides and subsidence are low risks. For example, it may be estimated that the consequences of a landslide or subsidence may be catastrophic for the WPP in question, but the probability of occurrence is considered very low (rare).

The change in wind characteristics is estimated to be a negligible risk because the probability of occurrence was estimated to be very small (rare), and the scale of the effects will be moderate.

Based on the scale of inherent risk set, adaptation measures are discussed below to limit these risks to acceptable levels.

⇨ Measures to strengthen adaptation to climate change

Based on the above, for each significant inherent risk identified, targeted adaptation measures are considered and evaluated. The consideration of adaptation measures shall aim at achieving an acceptable level of residual climate risk, taking due account of all legal, technical or other requirements. Thus, the following adjustment measures are required for the WPP under consideration, according to its risk analysis:

Forest fire

1. **Fire extinguishing system.** As the WPP under consideration is located within a forest area, the installation of a fire extinguishing system significantly reduces the risk (Structural measure).

2. **Perimeter protection.** The perimeter organization of the site with control of high vegetation and cleaning of the open ground from dry vegetation during the fire season significantly reduces the risk of fire spreading (Non-structural measure).

Extreme weather events (cyclone, storm, hurricane, tornado, strong precipitation, etc.)

1. **Installation of lightning protection system.** Extreme weather events are accompanied by intense phenomena of electrical discharges. Because the total height of a wind turbine reaches 148.7 m and is placed at an altitude of more than 800 m, lightning protection is of utmost importance for the project (Structural measure).

2. **Autopsy and maintenance after an extreme weather event.** During the occurrence of an extreme weather event, it is possible to cause wear to the blades of a wind turbine by affecting their aerodynamic characteristics or changing their geometry. As a result, there is a decrease in efficiency and load on the generator. Flaps showing obvious signs of wear should be replaced (Non-structural measure).

3. **Project Insurance.** Insuring the Project against extreme weather events partially covers the cost of repairs necessary after the occurrence of such an event (Non-structural measure).

Landslide/subsidence

1. **Design of a support base for W/T.** The design of the bases where the wind turbines are placed should be such as to predict the possibility of landslides and to ensure the static of the devices (Structural measure).

Residual risk

The table below shows the inherent risks, the adaptation measures selected and the residual risk. The calculations were made with the excel file of the General Secretariat for Public Investments & NSRF.

Source of danger	Intrinsic risk		Measures Adjustment	Risk reduction	Remaining danger	
	B(*)	P(**)			B(*)	P(**)
Forest fire	22	Profound	System fire extinguishing, perimeter protection	8	14	Considerable
Cyclone, severe storms, hurricane	15	Considerable	Lightning protection, maintenance, Project insurance	5	10	Mediocre

Storm	8	Mediocre	Lightning protection, maintenance, insurance of Project	2	6	Low
Whirlwind	4	Low	Maintenance, insurance of Project	2	2	Negligible
Strong precipitation	8	Mediocre	Lightning protection, maintenance, Project insurance	2	6	Low
Landslide	5	Low	Design mounting bracket	2	3	Negligible
Precipitation	5	Low	Design mounting bracket	2	3	Negligible
(*) B: Score, (**) Q: Description						

Table: Residual risk assessment

Through adaptation measures, the inherent risk is reduced. The residual risk is characterized in most cases as negligible and low.

However, the residual risk remains significant in the case of a forest fire and moderate in the case of a cyclone, severe storms and hurricane.

Adaptation measures stem from common risk management and WPP planning practices. Moreover, the overall budgetary burden is estimated to be limited in this case and does not make an economic assessment of adjustment measures necessary.

⇨ Monitoring programme

As hazard assessment is an ongoing process, it is important to establish a programme for monitoring the adaptation of the project under consideration to climate change and for the subsequent implementation of additional adaptation measures if required by the evolution of the climatic conditions of the region.

Thus, in this context, a broader environmental management system will be developed in accordance with ISO 14001 for the overall monitoring of the environmental performance of the WPP under consideration and especially for the improvement of its adaptation to climate change. The operator of the operation project will establish an environmental management team and appoint an environmental management officer. The system will consist of procedures and forms that will be inspected and reviewed annually by the climate change team and external certification body. The system will incorporate processes such as:

Methodology for monitoring the evolution of climate change, based on data and projections available in:

3.2.2.1 Geospatial Information Portal of the Ministry of Environment and Energy in the Section on Climate Change. It includes the latest climate forecasts for Greece.

3.2.2.2 National Information Service on Adaptation to Climate Change in the section Tools and Maps of Prospective Climate Diagnosis.

3.2.2.3 Regional Climate Change Adaptation Plans, which, as strategic texts, provide a very general framework for potential climate risks.

The results of the monitoring will be reflected in the annual review, and it will be decided whether, based on the new data, a new source of risk may affect the project under consideration and what additional measures will be required. The identified hazards will also be examined for the intensity of their influence on the project in question.

Methodology for monitoring and evaluating the adaptation measures implemented. The assessment will be carried out by applying appropriate indicators, which respond appropriately to each risk source adaptation measure:

Forest fire

3.2.2.4 Monitoring of vegetation around the facility. Vegetation management to reduce fuel. Consultation with the local authorities for the seasonal cleaning of the forest area near the facility.

3.2.2.5 Annual testing of the fire extinguishing system and joint firefighting exercise with the local fire brigade. At the same time, firefighting personnel may be trained.

3.2.2.6 Control of storage of flammable materials.

Extreme weather events

3.2.2.7 Monitoring the weather forecast to predict extreme situations. Receipt of the relevant warning bulletins from the Meteorological Service. Recording negative impacts on the installation, when they exist and taking deterrence measures for the future.

3.2.2.8 Regular maintenance of equipment and checking its durability according to predetermined standards.

With the implementation of certified environmental management systems, such as ISO 14001, the process will also be audited during the external annual audit of the system by a certification body. Such inspections are an additional safeguard for the proper and full implementation of the prescribed monitoring system.

Special Framework for Spatial Planning and Sustainable Development

In this context, it is examined whether the project meets the criteria for the siting of solar energy installations as defined in Article 17 of No. 49828/03-12-2008.

For the location of wind installations, the national area, based on its potentially exploitable wind potential and its spatial and environmental characteristics, is divided into the following major categories:

- ✓ On the mainland, including Evia.
- ✓ Attica, which is a special category of the mainland due to its metropolitan character.
- ✓ On the inhabited islands of the Ionian and Aegean Seas, including Crete.
- ✓ Offshore sea space and uninhabited islets.

The mainland is further divided into Wind Priority Areas (WPA) and Wind Suitability Areas (WSAs).

Priority areas are defined as Areas of the Mainland which have comparative advantages for the installation of wind power plants while at the same time, they are offered in terms of achieving spatial objectives. In these areas, the maximum possibility of locating wind installations is estimated. The study area falls ***within the WPA of the R.U. of Evros of the Municipality of Soufli.***

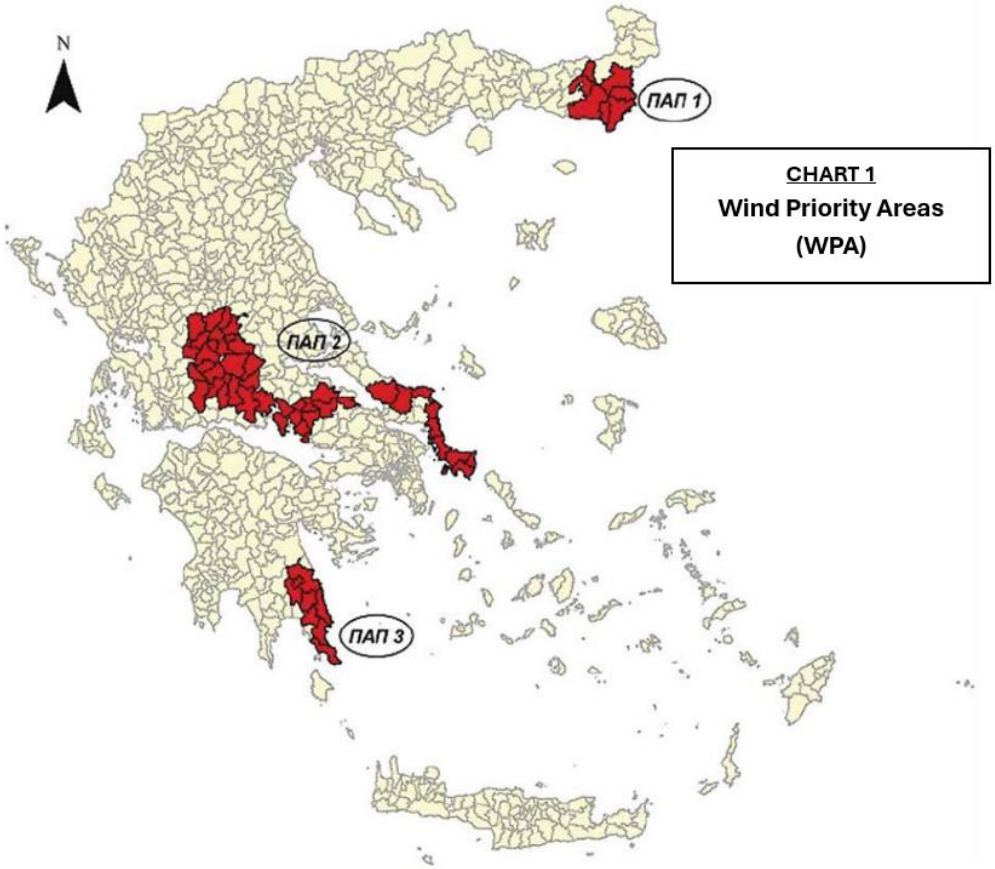


Image 20: Map depicting wind priority areas

The siting of wind installations is excluded from the following exclusion areas:

Exclusion Areas and Incompatibility Zones

- ➢ Declared listed monuments and demarcated archaeological protection zones A

- Areas of Absolute Nature Protection
- Priority habitats of Natura 2000 sites
- Nuclei of National Parks, declared natural monuments and aesthetic forests
- Wetlands of International Importance (Ramsar Wetlands)
- Check on the compatibility of the character of the area with other areas or zones subject to a special use regime prohibiting PV.
- Parts of quarry areas and mining zones operating on the surface
- Bathing beaches included in the water quality monitoring programme
- Informally landscaped tourist and residential areas in the context of off-plan construction
- Beverages of the tertiary sector

The WPP is located within the **NATURA Area with code "GR1110010"** and name **"Mountain Evros – Dereios Valley"** but also within SPPE with code GR003 and name "***Dasos Dadia-Dereio-Aisymi ".*** Therefore, a relevant Special Ecological Assessment (SEA) has been carried out to safeguard the protected area.

The following maps also show the distances of the W/T of the project under consideration in relation to the neighboring WPP.

A. DISTANCES FROM ENSURING THE FUNCTIONALITY AND PERFORMANCE OF WIND INSTALLATIONS		
DESCRIPTION OF ACTIVITY USE AND TECHNICAL INFRASTRUCTURE NETWORK	**REQUIREMENTS UNDER THE LEGISLATION**	**APPLICATION TO THE REQUESTED PROJECT**
A. Maximum distance from an existing land access road of any category	-For installed capacity <10MWe in R.A.P.: 20km route length -In other areas (CIP): 15 km. regardless of the installed power / unit.	Analyzed after the table
B. Maximum distance from the electricity transmission system	As defined by G.E.T.S.O in the terms of connection of the installation (high voltage) and PPC (medium and low voltage)	Greater than 1.5 d = 204m Met. 1km from W/T 1

C. Minimum distance (A) between wind turbines	2.5 times the diameter (d) of the wind turbine impeller (A=2.5d)	The impeller of the selected W/T has a diameter d= 136m Therefore, the minimum distance between the M/W is: A = 2.5 x d = 340m. Met.

Table 15: Distances from ensuring the functionality and performance of wind installations

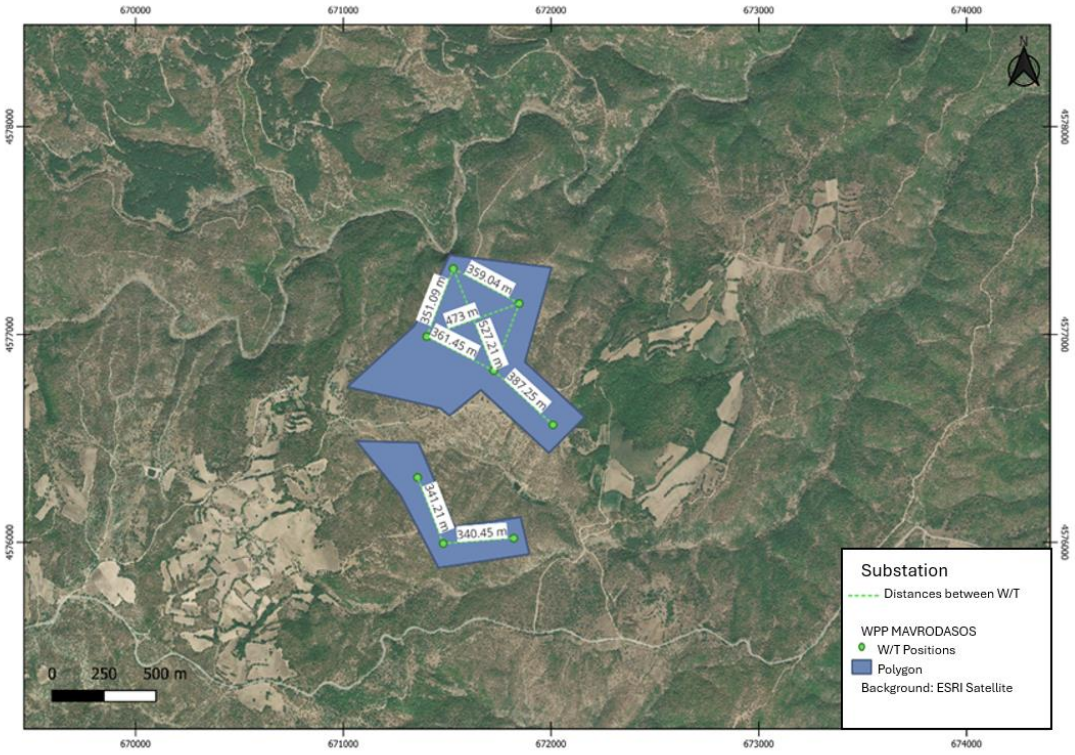
In the area where the project is located there is an adequate agroforestry road network consisting mainly of forest, country roads and local roads.

The closest important road to the project is the Provincial Road Mandra - Mikro Dereio, which passes east of the project and at 10,249 m from the road construction of the project.

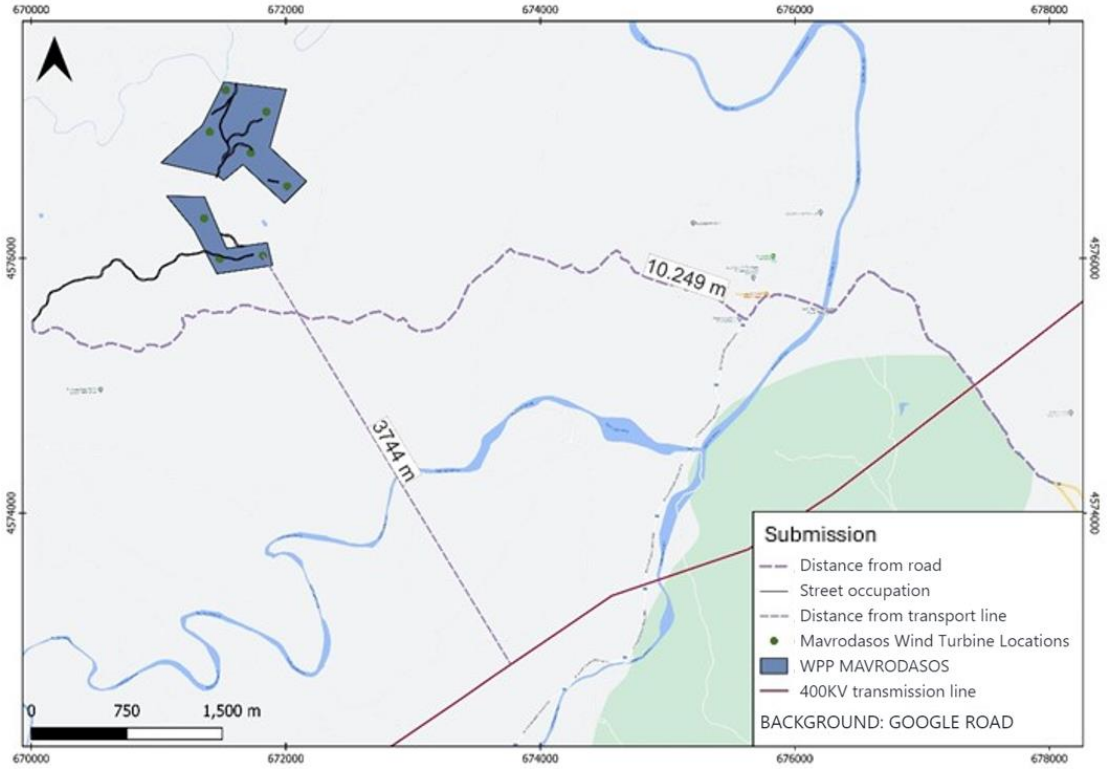
Forest roads pass through the installation area of the project, as well as through the polygons, which will serve access to the project's W/T.

The distance of the nearest wind turbine from the high voltage transmission line is 3,738 m in a straight line from the W/T1.

The above are depicted in the maps below.



Map 10:Mapping of distances of the studied WPP based on the Special Spatial Plan for RES



Map 11: Mapping of distances of the studied WPP based on the Special Spatial Plan for RES

According to the **Special Framework for Spatial Planning and Sustainable Development** and the **Compatibility Check Report (Annex II of the Study)** for RES, **the following conclusions have been drawn:**

- ⇨ The project is located within **a Wind Priority Area (WPA)**
- ⇨ The project, with its implementation, does not **exceed the bearing capacity of the area.**
- ⇨ The project, upon its implementation, does not exceed the maximum permissible density of wind installations of the primary local authority to be installed.
- ⇨ The project is not located within areas defined according to the (SPSPD) -RES as exclusion areas for the installation of wind farms.
- ⇨ The project shall keep all minimum distances from infrastructure and other related civil engineering projects to ensure its sustainability.
- ⇨ The project, with its implementation, does not cause incompatibility with neighboring uses and does not cause visual loading/nuisance to be neighboring settlements or other uses of particular interest.
- ⇨ The project is outside the approved Local Spatial Plans (GSP, OCSHOP).
- ⇨ The project is located outside the UCA and at a great distance from them.

Therefore, according to the above, ***the compatibility of the requested project with the Special Framework for Spatial Planning and Sustainable Development for Renewable Energy Sources (SFSPSD-RES) is demonstrated.***

5.2.2 Institutional Status according to the Approved Frameworks

Project compatibility with statutory settlement boundaries

As explained in section 5.1.1, the project studied is located outside the statutory boundaries of settlements and meets the minimum distances from them, as defined by the WPP for RES, which demonstrates its compatibility with the specific spatial commitment.

Project compatibility with Approved Plans:

Open City Spatial and Housing Organisation Plans (OCSHOP) and General Urban Plans (GUPs)

As analyzed in the first chapter of the present, the studied WPP as it is located within the Orfeas Municipal Corporation, the Municipality of Soufli, the Regional Unit of Evros, while the substation "PATRIARCHIS" where the project is to be connected belongs to the D. Arrian. As far as the existence of spatial commitments is concerned, none of the PPs within which the main and accompanying projects fall has an approved Local Spatial Plan or a General Urban Plan and an Open City Spatial Housing Organization Plan (O.C.S.H.O.P.).

Residential Control Zones (RCZ)

There are no statutory RCZs near the site area of the overall project.

Conclusions of the Compatibility Issue

- The project is compatible with the approved boundaries of the settlements of the wider area of its location, since both the main activity (WPP) and its accompanying facilities are located outside and at satisfactory distances from these boundaries.
- The project is outside the approved Local Spatial Plans (GUP, LSP).
- The project is located outside the RCZ and at a great distance from them.

5.2.3 Specific management plans

National and Regional Waste Management Plan of Eastern Macedonia & Thrace

In application of Law 4042/2012, the National Waste Management Plan (NWMP) and for the implementation of the conditionalities of the funded NSRF program (2014-2020), in 2016 the revised Regional Waste Management Plans (RWMP.) were prepared throughout the country for a five-year period (2016-2020). The new revised RWMP of the Region of Eastern Macedonia & Thrace was prepared and approved by decision of the Ministers of Interior and Environment which was published in Government Gazette 4123 B'/21.12.2016. The revised RWMP sets the new quantitative targets for waste management until 2020 and specifies the required site of solid waste management facilities and actions for the Region to achieve the objectives of the new European Directive and National Legislation. The Regional Solid Waste Management Plan (RWMP) of the Waste Region of Eastern Macedonia & Thrace, where the project under study is located, has been approved by Decision 61076/5267/2016.

Act 39 of 31.08.2020 (Government Gazette 185 A΄/29-09-20) approved the new National Waste Management Plan (NWMP). This incorporates the new targets set by the European Directives for solid waste management until 2030. The preparation of new RWMPs for this period is expected soon. Based on article 227 of Law 4555/2018, SWMB E. Macedonia & Thrace (SOLID WASTE MANAGEMENT AGENCY (SWMA) OF THE REGION OF AN. MACEDONIA - THRAKE REGION) is responsible for the elaboration and implementation of the new RWMP for the Region of E. Macedonia & Thrace for the period 2020-2030.

The main objectives set by the ECHR for all MSW, briefly, are as follows:

- ⇨ *Landfill waste at 10% in 2030, five years ahead of the EU obligation (2035).*
- ⇨ *End uncontrolled waste disposal and rehabilitate illegal landfills by 2022.*
- ⇨ *Increase recycling to 55% in 2025 and 60% in 2030 (including bio-waste).*
- ⇨ *Separate collection of organic waste (brown bin) and development of relevant infrastructure throughout the country for the until 2022.*
- ⇨ *Full coverage of the country by 2030 with 43 Waste Treatment Plants (MEAs) and 43-46 Biowaste Treatment Plants (MEBA)*
- ⇨ *Four power plants with energy utilization of UAV residues.*

Thus, according to the Ministry of Environment and Energy, the objectives mentioned above will be achieved by taking 10 necessary measures, namely:

1. The modernization of the "landfill fee" for waste in landfills and the implementation in practice of the "Pay as You Throw" principle.
2. The promotion of separate collection and the reinforcement of a collection network of recyclable materials with 4 recycling streams (paper, glass, plastic, aluminum).
3. The integrated development of an organic waste collection network (brown bin) by the end of 2022.
4. The increase and upgrading of the Recycling Materials Sorting Centers (RMSC) to meet the new increased recycling needs of the country.
5. The increase of the energy utilization of waste residues and the development of energy production units to reduce landfilling.
6. Energy recovery from the treatment of organic waste (biomass), but also the production of secondary materials (compost) in the context of the circular economy.
7. The creation of the first landfill (Hazardous Waste Landfill) aiming at the holistic management of the country's waste in accordance with EU requirements.
8. The creation of a producer responsibility system for plastic greenhouse waste and plastic pesticide packaging.
9. The extension of extended Producer Responsibility to new product categories, such as furniture, mattresses, expired medicines, waste from photovoltaic and wind farms, toys, etc.

10. The continuous information and sensitization of interested parties.

As far as the RWMP is concerned, it is an integrated management plan for all waste produced in a Region, defines the general guidelines for their management and indicates the appropriate measures that promote hierarchically and combined: a) prevention, b) reuse, c) recycling, d) other recovery, such as energy recovery, and e) safe final disposal at regional level.

The RWMP of Eastern Macedonia - Thrace was approved by Joint Ministerial Decision 61076/5276/15-12-2016, (Government Gazette 4123/B'/21-12-2016) and includes:

- the formulation of management strategies per waste category and the setting of specific objectives per management scenario, with emphasis on achieving qualitative and quantitative targets for the reduction of waste for final disposal and the treatment of the organic fraction.
- The identification of the required projects, actions and interventions for the integrated solid waste management in accordance with the National Waste Management Plan, indicating appropriate measures that will promote prevention, reuse, recycling, recovery and safe final disposal.

The general RWMP objectives of the Region of Eastern Macedonia – Thrace are:

- Prevention-reduction of municipal waste generation, with priority given to the prevention and continuous reduction of the production of packaging waste, (bio-waste) food, paper and WEEE, with particular emphasis on informing and guiding common goals and implementing specialized actions.
- Support for actions promoting the reuse of unwanted products that do not need to be disposed of as waste.
- Enhancing recycling by encouraging alternative management systems for packaging and other products.
- Enhancing recycling and reuse through the development of Green Points, which will become places of education and awareness of citizens on solid waste management issues and will enhance the active participation of citizens.
- Extension - modernization of the network for the collection and transport of municipal waste.
- Strengthening the role of Municipalities with emphasis on decentralized MSW management and pre-sorting, with the goal of improving the services of the Municipality, greater awareness and participation of citizens, continuous optimization of the recycling network, lower municipal fees, better control of waste management.
- Valorisation of the various materials contained in municipal waste and energy recovery from them (e.g. production of biodiesel from waste oils) to save resources and energy and reduce the final disposal rate.

- Final disposal of municipal waste: environmentally acceptable final disposal in landfills of that part of municipal waste which is not subject to further treatment.
- Restoration of environmental damage: closure, gradual restoration and environmental upgrading of sites polluted by the uncontrolled disposal of municipal waste and rehabilitation of remaining illegal landfills.
- Full harmonization with Joint Ministerial Decision 29407/3508/2002 which requires significant upgrading and transformation of management bodies, changes in the planning and licensing process of projects, immediate introduction of waste treatment technologies, changes in the costing of services provided and sets stricter rules for the operation of landfills with the ultimate goal of constructing as few landfills as possible, operating to higher standards and gradually converting them into landfills.

The project under study is compatible with the objectives of the RWMP. The waste that will be produced during the construction and operation of the project will be managed in accordance with the provisions of Law 4819/2021 and the approved RWMP of Eastern Macedonia and Thrace.

River Basin Management Plan of Thrace Water District

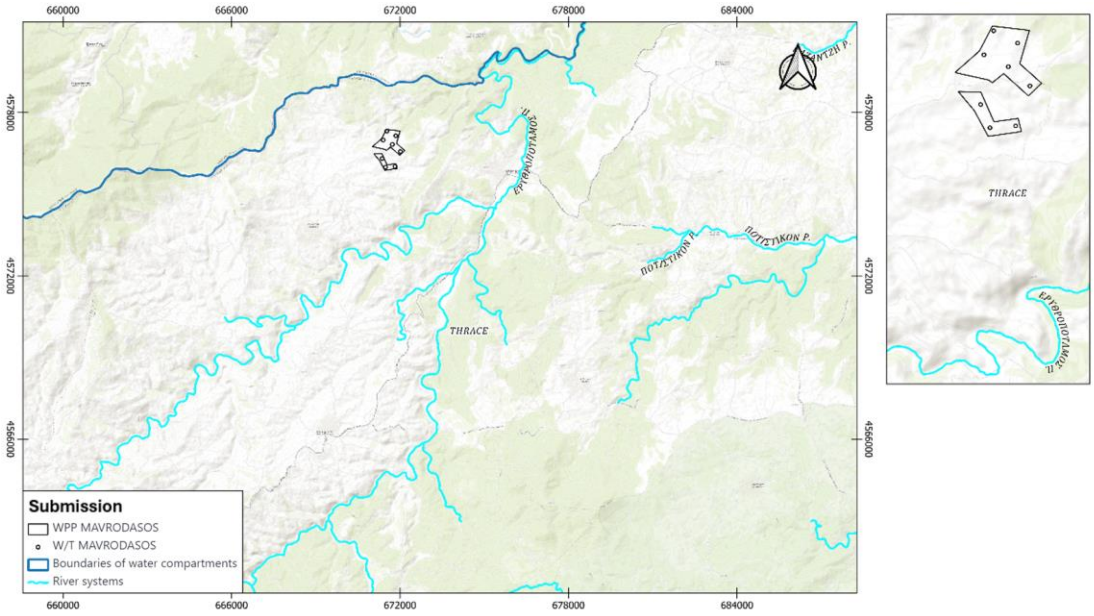
The Water Management Plan is the country's main reporting mechanism to the European Union regarding water resources. Decision 706/2010 (Government Gazette 1383 B΄ / 02-09-2010 & Government Gazette 1572 B΄ / 28-09-2010) of the National Water Commission "on the determination of the River Basins of the country and the designation of the competent Regions for their management and protection" ratified the forty-five (45) River Basins, which belong to fourteen (14) River Basin Districts (corresponding to the term Water Districts of Article 3 of Presidential Decree 51/2007). The RCS Act 17/29-04-2024 ratified the 2nd revision of the country's River Basin Management Plans.

The study area where the project under consideration is located belongs to the Water District of Thrace (EL012). **The River Basin Management Plan of the Water District of Thrace was approved by Government Gazette B' 2290/13/09/2013** while the "Approval of the 2nd Revision of the River Basin Management Plan of the Water District of Thrace" was carried out by the PYS Act 17/29-04-2024 (Government Gazette 81 A'/12-06-2024).

The projects fall under the Evros River Basin, which occupies part of the eastern Balkan Peninsula and is shared between Bulgaria, Turkey and Greece. North and west the basin develops on Bulgarian territory, in the southeast mainly on Turkish territory and in the southwest on Greek territory. The river Evros is partly the national border between Greece – Bulgaria and Greece – Turkey.

The construction and operation of the project under study is not related to increased water needs, nor to increased production of pollutants that may adversely affect the water quality in the river basin. Therefore, the project under study does not contradict the provisions of the Water Management Plan of the Water District of Thrace. A detailed description of the elements of the Water District is given in the 8th chapter of this study.

The following map shows the river systems of the project under consideration in the wider area, while the nearest river water body to the project under consideration is "Erythropotamos R." which is located southeast of the nearest river water system (W/T 1) of the project at 2.3 km.



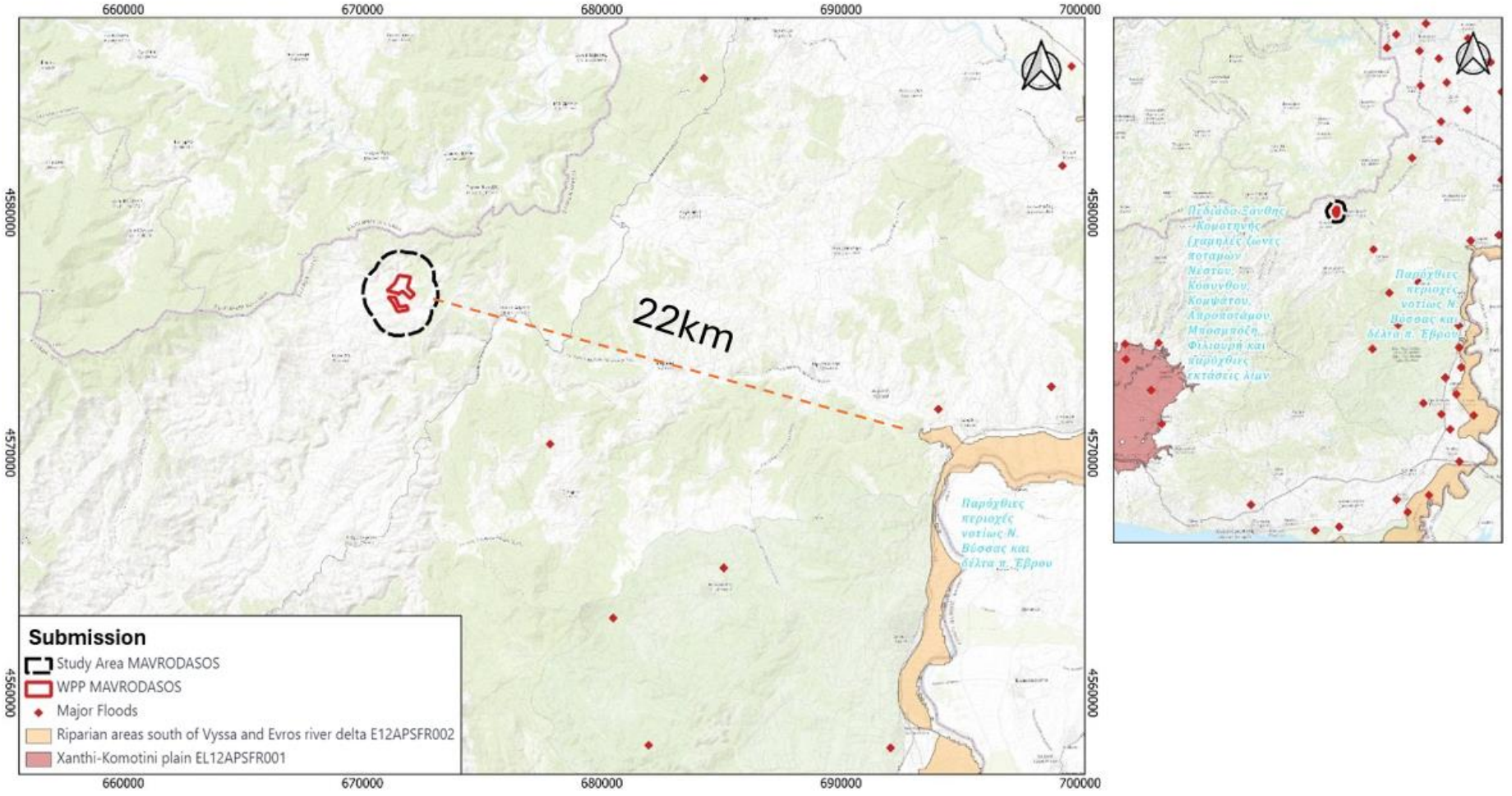
Map 12: Mapping of the project under consideration and the nearest surface river systems

According to the above information, it is established that the design of the project is compatible with what is provided for in the Water Management Plan of Thrace. Specifically, the project is compatible with the objectives set under Directive 2000/60/EC for the assessment and management of flood risks as well as the objectives for the water bodies of the C.A. of the Water District of Thrace, since the construction and operation of the project under study is not related to increased water needs, nor to increased production of pollutants that may negatively affect the water quality in the Evros River Bas and is outside protected areas water areas (Article 6 of Directive 2000/60/EP).

Flood Risk Management Plan for Eastern Macedonia and Thrace

Based on Government Gazette 2688 B΄ / 06-07-2018, the Flood Risk Management Plan was approved in the Evros CA, the purpose of which is to provide appropriate solutions, based on the specific characteristics, needs and priorities of the area, for the prevention, reduction of the risks of flood damage, health and the environment, cultural heritage and economic activity, as well as the restoration of flood damage and to ensure the necessary coordination, through joint synergies with the corresponding 2nd Revision of the River Basin Management Plan, to achieve the environmental objectives of article 4 of Presidential Decree 51/2007, as in force.

The location of the WPP is located ***outside the Potentially High Flood Risk Zones*** (PHFRZ) as shown in the following Map. The project is 22km away from the boundaries of the nearest PHFRZ) "Riparian Areas south of N. Vyssa and Evros Delta", while the significant floods near the study area and the wider area are also depicted.



Map 13: Zone of Potentially High Flood Risk of Thrace and Significant Floods that have taken place

5.2.4 Action Plans for avifauna

Species Action Plans (SAP) are guiding documents used in Europe for the last 30 years. The implementation of the action plans is a key management tool for the protection and management of species (more than 50 SAP) for bird species listed in Annex I of Directive 2009/147/EP on birds have been funded by the European Union since 1993.

Management Plans record the actions (institutional and management measures) required to stabilize and improve the conservation status of a species (or group of species) or habitat, within a specific time frame.

The SAP defines for each planned action specific and measurable objectives which are evaluated within a reasonable period, in which case and depending on the effectiveness of the actions implemented they may be revised.

The Action Plans include detailed information on the biology – ecology of the species concerned and depict in the most detailed way their status: Spread, population status, pressures, threats, current protection status and active conservation programs. Many stakeholders and stakeholders are involved in their implementation.

The most recent and updated Action Plans are the European (EuroSaps) which record the threats faced by the species and the proposed actions - measures to address them on a country-by-country basis.

The immediate objectives to be achieved to fulfil the purpose of the European FMs are:

- the elimination of the threats that caused the decline of species,
- increase in population size,
- their breeding range and productivity,
- ensuring the good quality of breeding and feeding habitat, and
- Increasing the connectivity and communication of existing metapopulations through the creation of Population Corridors and Links.

The LIFE-IP 4 NATURA project entitled "Integrated actions for the conservation and management of Natura 2000 sites, species, habitats and ecosystems in Greece" (code LIFE16 IPE/GR/000002), is the first LIFE Integrated Project (LIFE IP) approved for Greece and the most important project of recent decades for the protection of Greek nature.

The project has not yet been completed as it has a duration of 8 years (2018-2025) and a budget of €17 million.

One of the Action Plans that were established and are part of the preparatory actions of the Life – IP4 Natura program is the "***National Action Plan for the three scavenger species (Bearded Vulture, Griffon Vulture and Bearded Vulture)".*** The purpose, objective and measures of the National Action Plan are detailed in the following paragraph.

A) National Action Plan for the three scavenger bird species (vultures): Bearded vulture (Gypaetus barbatus), vulture (fulvus), black vulture (Aegypius monachus).

The National Action Plan for Cadavers is implemented, monitored and supervised by the Directorate of Natural Environment and Biodiversity Management of the Ministry of Environment in collaboration with NECCA, while the time frame of the plan has a duration of 6 years.

The aim of the NAP for scavenger is to contribute to increasing the range of species to 1990-2000 levels, while their population size should increase by 10 to 20%, according to the tables in the NAP.

The aim of the NAP is to take measures to achieve the conservation and increase of the population size and geographical distribution of vultures at local and national level.

Specific objectives are:

- The maintenance of the already existing reproductive distribution of species and the avoidance of further dramatic reduction of their populations (reduction of their mortality at national level and as a priority in areas of the Natura 2000 Network).
- The maintenance and improvement of the living space of existing reproductive nuclei. (i.e. critical breeding and maximum foraging habitat).
- The collection of primary data on the biology and ecology of vultures in the areas where this is required, with emphasis on the mapping of historical and active breeding sites (at national level).
- The spatial mapping and maintenance of critical breeding, dispersal and foraging habitats, and their improvement,
- The cooperation and active participation of competent bodies and land users to reduce the threats of vultures and their habitats. Recovering the small size of breeding populations and their productivity by increasing food abundance and availability
- The recolonization of parts of the historical areas of distribution of the three species through the strengthening and enrichment of local populations, the creation of breeding nuclei and the increase of connectivity between them.
- The institutional integration of vulture conservation into national and regional policies as a priority in Natura 2000 Network areas and the improvement of legislation on illegal activities such as the placement of poison baits.

For the elaboration of the National Action Plan of Cadavers, a basic prerequisite was the selection of the species/group of species. For this Action Plan, scavenger birds (Griffon Vultures) were selected which are one of the most well-studied groups of birds for several of the following reasons:

Easy identification and identification due to size, emblematicity, rarity and risk status, direct connection and dependence on anthropogenic activities.

For this reason, the population status (distribution, size) and trend of Griffon Vulture species in Greece is very well documented, while the factors affecting their population status are well documented.

Also, additional factors supporting this option are:

- The implementation of previous or still active local conservation programs for Griffon Vultures (Dadia, Crete, Meteora, etc.).
- All three species are endangered in Greece (classified in some risk category) - Vulture: "Vulnerable" VU (populations of mainland Greece and Cyclades are considered "Critically Endangered", CR), Bearded Vulture: "Critically Endangered", CR, Black Vulture: Endangered, EN).
- Due to their high dependence on anthropogenic activities, this CM can deliver significant collateral benefits for society, which is a positive promotion of CMs as management tools.
- Due to the large territory and the variety of habitats they use, they can act as umbrella species not only for bird species, but generally for wildlife and natural habitats.
- Due to their common ecological requirements, one-time actions can benefit all three species of Griffon Vultures.

Based on the above conditions, the selection of the three **scavenger birds of the vulture, Black vulture and vulture, was carried out**. For the fourth Griffon Vulture species of Greece, the Egyptian Vulture, a separate project has been carried out within the framework **of the Life + project "The Return of the Egyptian Vulture" (LIFE10 NAT/BG/000152)** for which the objectives, measures/actions and results of the project are extensively mentioned in a next paragraph.

The following table lists the measures/actions to be taken in relation to the objectives and existing threats.

Objectives	**Measures / Actions**	**Existing threats**
Improving knowledge and documenting the impact of the use of plant protection products and other prohibited toxic substances on poison baits on the viability of vultures	Implementation of a unified information collection system with specific protocols for recording poisoning incidents and collecting dead animals by public services (Directorate of Veterinary Medicine YPAAT / RIS). Issuance of a relevant circular.	Illegal use of poisoned baits

	Development of an easy-to-use, standardized and impartial system for storing and transporting tissues/organs samples of dead vultures through the competent services and certified procedures for toxicological analyses	
	Reinforcement and operation of the Athens Veterinary Center. Conduct of autopsies, histopathological examinations and toxicological analyses on poisoned/dead vultures	
Reduction of vulture mortality due to consumption of poisoned baits.	Amendment and implementation of the Joint Ministerial Decision "Local Action Plan to combat the illegal use of poison baits" (Government Gazette 3793/B/3-9- 2018) and drafting of a new relevant Joint Ministerial Decision in cooperation with the Ministry of Culture to cover errors and legislative gaps already identified in its implementation. Adoption of a Strategy/Roadmap and establishment of a working group for the horizontal implementation of measures in local action plans	
	Creation and operation by the Forest Services (or other relevant services) of seven regional teams of specially trained dogs in finding poisoned baits / Systematic patrols-controls in critical high-risk areas	
Reduction of interactions/competition of carnivorous mammals and human activities	Application of prevention methods, reduction of losses in crop production and livestock (e.g. subsidy of electrified fences, etc.) and pilot application of new techniques (e.g. fladry technique)	
Reduction of interactions/competition	Improvement of the compensation regime of the Hellenic Agricultural	1.Illegal use of poison baits

of carnivorous mammals and human activities	Insurance Organization (simplification of the declaration and inspection procedure for compensation, reduction of the minimum required number of animals, reduction of payment time, compensation of 100% of the value of the damage, etc.) and connection of compensation systems with preventive measures in areas of high risk of attacks and high risk of livestock losses.	
	Maintenance of high densities of wild ungulates (mainly chamois, deer) to ensure food sufficiency for wild carnivores with appropriate management actions (e.g. re-introductions, empowerment of low-sized populations, regulation of livestock grazing, ensuring access to water sources, guarding populations)	1.Illegal use of poison baits 2. Food deficiency 3. Degradation of foraging habitat.
Minimization of vulture mortality due to consumption of NSAIDs.	Study and monitoring of use/licensing of non-steroidal anti-inflammatory drugs (NSAIDS) of veterinary preparations dangerous for vultures in their critical areas / Informing users about their harmful effects through seminars on vulture population management.	Use of harmful veterinary preparations
Estimation of mortality due to electric shock and impact on electricity generation and transmission infrastructure	Creation of protocols and drafting of guidelines for the systematic monitoring (recording of dead birds) in existing electricity transmission networks near breeding sites and perches of Griffon Vultures.	Electrocution & Impact on man-made structures & infrastructure.
	Establishment of mandatory post-construction monitoring programs and assessment of mortality and displacement of vultures from electricity production and	

	transmission infrastructure by applying a specific methodology. Establishment as an Environmental Condition (in DAEC of electricity production and transmission projects, e.g. WPP) the free access to information and implementation of a single information collection system with specific protocols of actions for recording incidents of collisions and collecting dead animals by the forest services.	
Assessment of mortality due to electric shock and impact on electricity generation and transmission infrastructure	Mapping and assessment of the effects of electric shock and impact (and their cumulative effects) on electricity generation and transmission infrastructure in relation to the flight behaviour and biology of vultures	
	Application of mortality mitigation techniques electric shock or impact in W/T or cables transfer electric current (insulation pylons, undergrounding cables and/or use twisted insulated wire, cable marking, selective pause (W/T)	
Reduction of vulture mortality due to impact on power generation infrastructure	Map integration sensitivity to the new spatial planning RES for proper siting production infrastructure and	

	electricity transmission	
	Implementation of mitigation measures in a WPP where at least one vulture impact incident has been recorded. Mandatory introduction of a condition in the DAEC for the implementation of an immediate shutdown system, in accordance with the most effective international practice, which includes the employment of field ornithologists on a permanent basis, who will notify in case of	
	approach of Vultures - Large Raptors (Aquila spp, Haliaeetus albicilla, Clanga spp.). and termination of W/T operation based on a specific protocol. Permanent shutdown of W/T-WPP in case of repeated collision incidents and if mitigation measures have not worked	
Zero poaching mortality	Increased patrols in areas with recorded cases of Griffon Vultures/Raptor poaching	Direct pursuit/killing by humans.
Minimizing illicit trade and trafficking of vulture specimens	Recording of incidents of illegal trafficking and investigation of electronic commerce (stuffed vultures, live samples, eggs) and assessment of the problem / Cooperation with Cybercrime Prosecution for criminal prosecutions	Trade and Embalming
Zero mortality due to drowning in artificial reservoirs	Mapping of hazardous water reservoirs in island and mainland areas/Development of guidelines for safe constructions for wildlife in artificial ponds	Other causes
	Elaboration of technical and sanitary specifications for the	Food deficiency

Optimizing artificial feeding practices	creation of feeding areas for birds of prey (CTAP) and operation of CTAP at national level / Proposal for location with estimation of the existing abundance and availability of food in vulture distribution zones and estimation of the potential supply of regional CTAP in critical areas for the conservation of vultures	
	Creation and operation of a network of feeding areas for raptor birds (FARB) at regional level, by developing cooperation between public services, Protected Areas Management Bodies and their successor Protected Area Management Units of NECCA, non-profit organizations and social partners (e.g. producers) in optimizing the disposal of dead biomass produced in FARB / Promoting cross-border cooperation in border areas and monitoring them with Simultaneous counts	
Optimizing artificial feeding practices	monitoring the use of FARB and studying the behaviour of scavenger species for possible negative effects from their operation (e.g. interspecific competition, low juvenile dispersal, etc.) and interactions between populations of domestic animals (dogs) and vultures and the risk of transmission of anthropozoonoses through the operation of FARB	
Adaptation of European directives/regulations on	Harmonization with EU legislation and elaboration of the appropriate institutional framework for the implementation of EU regulations	

the disposal of dead animals in the open air	on the free disposal of dead animals within SPAs.	
	Promotion (information campaign, introduction of incentives such as exemption from payment of a fee for the collection of fallen stock for compulsory incineration) of all traditional practices of disposal of fallen stock favourable to vultures and their institutionalisation within SPAs at local level	
	Pilot design and operation of small, scattered food disposal sites, cooperation with livestock units, transportation of dead animals, information	
Promotion of traditional/extensive forms of livestock farming	Promotion of agri-environmental policies for developmentpromotion of extensive/nomadic livestock farming (implementation of EU regulations, sustainable management of mountain pastures, grazing management plans/improvement of products produced from free-range animals)	
Increasing the genetic diversity of vulture populations and reducing the effects of inbreeding	Renewal and updating of the legislative framework for the licensing and operation of Care Centres and establishment by ΥΠΕΝ/ΥΠΑΑΤ of captive breeding programmes in their facilities	Small population size - Low genetic diversity
	Establishment and establishment of a supervising authority at the Ministry of Environment and Energy (following the standards of the CITES Committee) with specific responsibilities in enrichment programs coordinated by the Ministry of Environment and Energy and the cooperation of	

	public bodies and non-profit organizations / Development of memoranda of cooperation between the Supervisory Authority, Protected Areas Management Bodies and Care Centers	
	Support and participatioW/Tooperation with existing European captive breeding programmes (EAZA, LIFE, breeding centres, etc.)	
Restoration of vulture population locally by recolonization of critical areas	Creation and support of appropriate infrastructure per region for reintegration and empowerment programs of vultures under state supervision (e.g. acclimatization cages, vulture conservation) in SPAs and PAs with PA with small or isolated vulture populations / Release of individuals coming from Care Centers in Greece	Small population size - Low genetic diversity.
Facilitation of communication and connection between vulture populations	Development of telemetry and ringing programs for the identification of feeding and dispersal areas of juveniles and combining the data with the mapping of critical vulture conservation priority areas.	
Facilitation of communication and connection between vulture populations	Creation of "connectivity corridors" between vulture metapopulations with feeding habitat management and location and operation of FARB.	
Increasing the reproductive success of populations	Delimitation of zones of susceptibility near colonies and nesting territories/ Proposals for the issuance of PPAs for regulation and restrictions (spatially and temporally) on human activities (climbing, aerial gliding, hunting,	Nuisance at breeding sites

	logging, rock lighting, etc.) in the vicinity of critical vulture areas	
	Promotion of forestry management in selected forest stands / maintenance and increase of suitable nesting sites for Black Vultures / Reduction of accumulated biomass in selected stands by mechanical means, cutting and crushing / dispersal of ground and shrub vegetation to shield Black Vulture nesting sites	Destruction of breeding habitat
	Maintaining the accessibility of vultures to natural water collections and streams by halting the horizontal spread of the forest on small surfaces along the streams.	
	Implementation/application of other specialized protection/management measures for Black Vultures according to Joint Ministerial Decision 35633/13-10-2006, the 10-year Special Management Plan for Zone A of the DADIA Forest OP that is already being implemented and the proposed actions of the NRP of the area	
Increasing the viability and productivity of the vulture breeding population	Construction of suitable water tanks (including installation of steel structures in case there is no other possibility) for use by vultures during periods of maximum water scarcity, in critical island areas	Degradation of foraging habitat
Improving our knowledge of the spread and population status of vultures	Creation and updating of the National Data Base for Griffon Vultures regarding their distribution and population status/ Parallel recording of all mortality cases	Knowledge gaps for allocation, condition, productivity

	Establishment of a single, standardized field working protocol for the recording and monitoring of vulture populations	and vulture mortality in Greece
	Program implementation national census of Griffon Vultures (3 times in 6 years, to estimate population trend) - Mapping of all active and historical colonies/Annual fieldwork in selected colonies/territories and assessment of the breeding success of vultures	
Improving our knowledge of the impact of lead use on vulture populations	Apply instant and reliable detection techniques of Lead in laboratory analyses (in certified public laboratories)/ Sample tests lead in cadavers predators in centers care/ Quantification of incidence of lead vulture populations through sampling Controls	Lack of knowledge for the level exposure of vultures in toxic substances and Grade bioaccumulation their

	Research on mortality from infectious diseases/Creation and implementation of a biomedical protocol for the collection and preservation of dead scavenger raptors	
Assessment/evaluation of the cumulative impact of the operation of WPP on vulture populations.	Study assessing the cumulative effects of operational and planned WPP (habitat degradation/displacement/impact on vultures) on vulture populations.	Shortage valuation of Cumulative impact of electric shock and impacts on energy infrastructure in vulture populations.
Study/elaboration of a species recovery plan at national or regional level	Feasibilit study for aid natural populations of vultures in Greece/ Elaboration of a release plan strategy) in national or regional scale.	Lack of a recovery plan for vulture populations for reintroduction or restocking.
	Model development Habitat suitability and potential distribution vultures (habitat suitability)	
Increasing the viability and reproductive success of Vultures.	Streamlining the penal framework for dealing with	Mortality due to exposure to toxic substances.
	Advancing legislation regulations on prohibition the use of lead and reducing the risks of exposure to wildlife lead, and	

	public health / Extension of the implementation of the Joint Ministerial Decision banning lead gunshot in wetlands throughout the country.	
	Advancing legislation regulations to reduce the use of dangerous NSAIDs for the wild Life from the market of veterinary preparations	
	Implementation of legislation on environmental liability/damage to incidents of killing vultures (Handling of complaints, acceleration of procedures, case calibration, penalties)	Mortality due to electric shock or impact on Infrastructure
	Institutionalization and legal Registration of operation FARB for scavenger species at national level. Necessity institutional consolidation of a study FARB specifications	Food deficiency
Incorporation of the national AP into the Regional policies	Incorporation of provisions of the AP Conservation of vultures in Management plans Protected Areas and Monitoring of	Shortage integration of the maintenance of vultures in the national environmental politics.
	Monitoring and evaluation the implementation of the AP	

Prioritising conservation of vultures in daily Provision of powers/ actions of public Services	Conduct at least 4 local seminars for forestry officials and Veterinary Services, environmental sectors regions, guardians hunting of hunting birds organizations and supervisors managing bodies protected areas (PIP) regarding issues Griffon Vulture population management (Monitoring methods populations, tools management, ecosystem vulture services, illegal use of poisoned animals baits, administrative issues regarding the application of mitigation techniques impact of infrastructure	1.Low priority the implementation of conservation actions vultures by the competent public authorities services, 2. Electric shock & Impact on man-made structures & infrastructure 3.Lack of information/training of Public competent services in vulture conservation actions in Greece
Reduction of negatives human impact activities in the Vulture populations	Information/awareness raising land users and social partners (breeders, beekeepers, hunters, tourism entrepreneurs, etc.) and the public in critical areas for vultures relatively with issues of management of their populations (ecosystem	Lack of awareness of social partners/land users about the conservation status and threats of vultures.

	Vulture services, implications of vulture use poisoned baits, alternative methods of mitigation and control of damage to livestock, carnivorous mammals, etc.)/Provision of information material on the conservation and ecological value of vultures	
Dissemination of information on the need to preserve the vulture population	Special topics for ecological value and need Conservation of vultures in Information Centres for Management Bodies (Protected Species areas vulture).	Low dissemination of information on vulture conservation in Greece.

Table 16: Recording of measures and actions in relation to the objectives of the Plan.

Following the above Action Plan for scavengers, data are also recorded from the Deliverable of Action C.1 of the Life P4 project entitled "Identification of critical habitats (sensitivity mapping) of the Griffon vulture in Greece – Determination of management directions. This deliverable is a key guide for the subsequent definition of management guidelines and the implementation of conservation measures towards the aim of improving the existing conservation status of the vulture species.

Identification of critical habitats (sensitivity mapping) of the Griffon Vulture in Greece – Determination of management directions Action Deliverable C.1

One of the main objectives of the implementation of the National Action Plan (NAP) for scavenger bird species, as provided for in the relevant Ministerial Decision (MD 68086/2149, Government Gazette B' 3663/9.8.2021) is the identification, spatial mapping and conservation of critical habitats for their reproduction, dispersal and feeding, as well as their improvement. The purpose of the deliverable in the first phase is to identify and map the areas used by vultures in Greece and in the second phase to identify the critical breeding and feeding habitats of the area.

The identification and mapping of the critical habitats of the vulture is an immediate priority for the implementation of the NAP as:

- ✓ It is a vulture species with the largest spread at present, in Greece and the spread of the Bearded Vulture is limited in Crete and the Matrogypas in Thrace.
- ✓ Due to its wide distribution (compared to the other two species) in the areas of Crete and Thrace, the mapping of critical habitats largely covers those of the Bearded Vulture and the Black Vulture and constitutes an "umbrella" for the other two species, given that the current distribution of the vulture species overlaps 100% with that of the Bearded Vulture and 75%-80%, with that of the Black Vulture.
- ✓ There is a large amount of information about this species, which comes from the local obedience of the populations and from the large number of satellite transmitters that have been placed on vultures in Greece and the Balkans.

The report describes the management priorities for the vulture in relation to the main threats it faces as detailed in the National Action Plan.

The most immediate management priorities are:

- ✓ Regarding the use of poison baits, the drafting and implementation of the Local Action Plans of the **Joint Ministerial Decision Υ.Π.ΕΝ./ΔΔΔ/83415/2715/2022** and the activation and conduct of patrols of the Special Units for the Detection of Poison Baits in the zones of high sensitivity.
- ✓ Regarding food deficiency, the establishment and operation of feeding areas for birds of prey (OCTOP) in areas of medium and low sensitivity to expand the current distribution and considering that the zones of high sensitivity (therefore permanent/regular intense presence) of the vulture are inevitably associated with satisfactory food availability.
- ✓ Regarding the impact on wind turbines, the definition of exclusion zones for the installation and operation of WPP in the zones of high sensitivity and their integration into the spatial planning for RES.
- ✓ Regarding electric shock & collision with electricity transmission infrastructure, the mapping of the electricity transmission network in high sensitivity zones and the identification of high-risk locations, for the subsequent implementation of mitigation measures (insulation of pillars, installation of buoys, etc.).

B) National Action Plan for the Egyptian Vulture (Neophron Percnopterus) in Greece.

In the framework of the LIFE + Programme "The Return of the Egyptian Vulture", the Ornithological Society in collaboration with WWF-Greece, has drawn up the National Action Plan (NAP) for the Egyptian Vulture with the aim of conserving the species in Greece and recovering the population in its breeding areas. The NAP sets out a framework for the conservation of the species, at national, regional and local level, based on effective coordination of actions and the various services and actors involved.

The National Action Plan for the Egyptian Vulture (Neophron Percnopterus) was approved by Joint Ministerial Decision No. oik43236/1053/3760B/25.10.2017.

According to article 5 of the JMD **, the time frame of the present National Action Plan for the Egyptian Vulture in Greece is 5 years (**2016 to 2021).

The aim of the National Action Plan (NAP) is to halt the sharp decline of the population of the species and to prevent the extinction of the Egyptian vulture in Greece and its aim is to take measures to halt the decline, stabilize the breeding population of the Egyptian vulture, as well as optimize the monitoring and research of the population of the species in Greece.

Specific objectives of the NAP include:

1. **Population conservation**: Halt population decline by creating safe breeding areas with reduced risk of poisoning, collision with wind turbines and risk of electric shock, increased availability of food and reduced disturbance near nests.

(i) Continuation of the monitoring programme for the species. (ii) Research on the mortality ratios of the species. iii) Study of the viability of the species. (iv) Risk assessment of bioaccumulation. (v) Research to enhance population.

2. **Legislation and Policy**

i) Elaboration of a National Action Plan for Poison Baits. The project will consider the proposed actions of the respective European Action Plan of ENEC (European Network against Environmental Crime) as well as the proposed actions of other LIFE projects.

ii) Use of alternatives to diclofenac with comparable effects which have been shown not to harm scavenger birds.

3. **Communication and Education**

i) Training of the staff of the competent services in the proper response to poison bait incidents in the areas of application of the NAP.

ii) Informing and training interest groups on issues related to species protection in the areas of application of the NAP.

iii) Informing and raising public awareness on issues related to the protection of the species.

The table below lists the measures/actions of the project in relation to the objectives of the programme.

Category	Target	Action
		Intensification of patrols/controls

Population conservation	Reducing the risk of poisoning due to the illegal use of poison baits	Recording poisoning incidents and creating hazard maps
		Provision of electric fences to land users operating within the areas where the Egyptian vulture occurs
	Reducing the risk of collisions in wind turbines	Creation of hazard sensitivity maps and mapping of wind turbine exclusion zones around nests and roosting sites
	Reducing the risk of electric shock and collision with electricity transmission and distribution network cables	Insulating hazardous pylons and marking electricity cables around nests, roosting sites and migratory straits
	Increase food availability	Establishment and operation of a network of feeding areas for birds of prey (CTAP)
	Reduction of nuisance during nesting	Creation of protection zones around nests
		Seasonal (March-September) exemption for sports & activities through HRM
		Prohibition of lighting the cliffs with nests of Meteora
Improvement monitoring and research of the Population Egyptian vulture in Greece	Systematic Monitoring	Monitor using standard protocol Monitoring
	Research on mortality	Bird ringing
		Telemetry of chicks and where they are feasible adult individuals and spatial Mapping habitat use and migration routes
		Creation and application of biomedicine Protocol of dead birds

	Study of the viability of the species	Development of suitability models habitats/species distribution
		Development of Analysis Models Population Sustainability (ABP)
	Evaluation of the risk of bioaccumulation lead in food chain	Lead sampling in large birds of prey in the centers Care
	Research on strengthening the Population	Feasibility study for Re-introduction-enhancement of natural population in Greece
Legislation and Policy	Reducing the risk of poisoning due to the illegal use of poisoned baits.	Elaboration of the programme "National Action Plan on Poisoned Animals Baits'
	Risk reduction Poisoning.	'Use of alternatives to diclofenac with comparable results which proven not to harm scavenger birds.
Communication and training	Training of stakeholders to improve the response to poison bait incidents	Conducting information and training seminars for employees of the Forest Services, environmental sectors of the regions, game guards of hunting organizations and supervisors of protected areas management bodies
		Conducting training seminars for employees of the Veterinary Services
	Information and sensitization of interest groups.	Raising awareness among land users (livestock breeders, hunters, beekeepers) about the protection of the Egyptian vulture and the problem of poisoned baits

		Raising awareness of development stakeholders in sensitive areas where the species breeds, providing them with information for the protection of vultures
	Public information	Public information and awareness campaign on poisons in the application areas
		Provision of information material of the Programme to target positions.

Table 17: Recording of measures/actions of the Plan in relation to the objectives of the program.

Revised proposal for the proper location of WWF Greece for wind farms in Thrace

The region of Thrace attracts significant investment interest for the installation of WPP. WWF Greece, with its continuous presence in Thrace, has highlighted the need to proactively address the adverse effects resulting from the accumulation of WPP facilities in the area, based on scientific data that consider the ecological continuity of ecosystems that led it to make proposals in application of the precautionary principle.

In this direction, the organization submitted a series of interventions both during the public consultation on the draft Joint Ministerial Decision for the ESDP-RES and after its institutionalization, raising issues for the protection of avifauna in the region of Thrace.

Thus, in the context of efforts to determine the conditions for the sustainable development of WPP in Thrace, WWF Greece proceeded in 2008 to draft a proposal for the proper location of WPP within the established Aeolian Priority Area 1, which was updated due to the emergence of new data from WWF Greece's research activities and changes in environmental legislation.

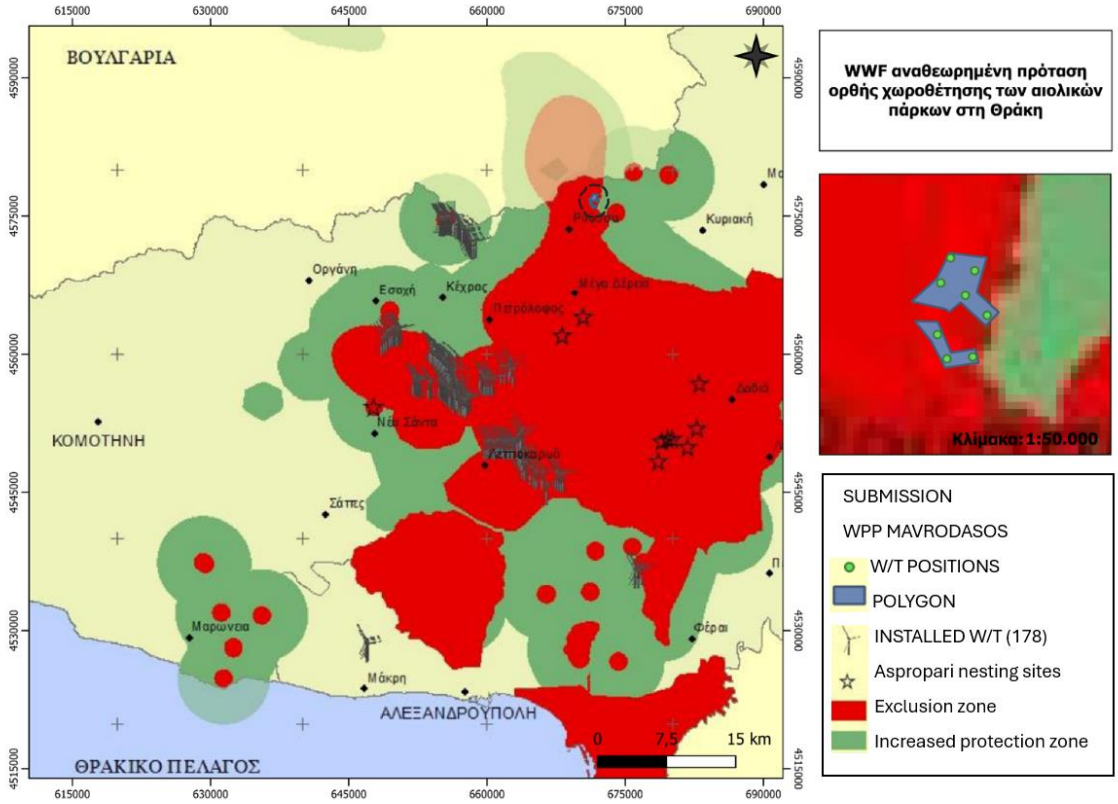
With the research carried out, in 2008 the organization proceeded to write a proposal, which it updated in 2013, to protect birds of prey in the area. This proposal characteristically states:

"*WWF Greece's proposal defines two zones: exclusion zones, i.e. areas where it is proposed to exclude the installation of WPP, and zones of increased protection, i.e. areas within which the installation of WPP should take place under specific conditions.*

In the Exclusion Zones, it is proposed to prohibit the sitting of WPPS. These are areas that constitute the living space of the protected birds of the area. The establishment of AIOPS in these areas threatens the spatial continuity, connectivity and cohesion of individual habitats, which are necessary for the reproduction and survival of endangered bird species. The Exclusion Zones include the important areas of activity of black vultures, the Dadia-Lefkimi-Soufli and Evros Delta Forest National Parks, the vulture colony in southern Evros, the pine forest of Loutro and the nesting sites of domestic raptors and black storks. Exclusion zones are the main measure to help preserve the valuable protected features of the area.

In the Zones of Increased Protection, it is proposed that the installation of WPP should be carried out under specific conditions resulting from the preparation of complete and scientifically substantiated assessments of their impact. The areas of increased protection include areas of Thrace that have been designated as Special Protection Areas (SPAs) under the European Birds Directive (2009/147/EC) but also specific areas, outside SPAs, to preserve the integrity of bird populations that move beyond the boundaries of statutory areas. For WPP included in the areas of increased protection, the mandatory preparation of a Special Ornithological Study is proposed".

Therefore, and based on the above, the organization's proposal defines two Zones on which the compatibility of the examined project is presented on the map below. It should be noted that these Zones have not been institutionalized by the government since no relevant modification of the spatial regime for RES currently in force has taken place. So, we have:



Map 14: New proposal for the siting of wind farms in Thrace with the zones and location of the project under study.

The organization of WWF has been led to the conclusion that to ensure the survival of bird species and the ecological integrity of the area, an immediate and fundamental revision of the approach to the development of WPP in the area is required. According to this view, a new approach to the location of WPP in the area is imperative and proposes:

- Drastic reduction of the total number of WPP that will be allowed to be installed.
- To introduce stricter spatial planning criteria, so that any new installations that are allowed take place in the areas where the least impact is expected
- Installation, covering the cost of the anti-compensatory measures taken by the companies, of an integrated impact monitoring system with the commitment of the state to impose any corrective measures deemed necessary.
- Immediate imposition of specific technical interventions and operating rules, which have been proven to significantly reduce the impact on bats.

For the project, as mentioned above, a Special Ecological Assessment has been prepared, which examines in detail the impact of the project on the protected avifauna of the Natura area and the measures to deal with them.

Control of the project under consideration with the provisions of the Special Environmental Study Plan

In the framework of a project of the Ministry of Environment and Energy on the "*Elaboration of NRPs and Management Plans for Natura 2000 sites*" (included in EPYMEPERAA with MIS codes 5001198 and 5001223), a project was implemented and is being implemented, through the elaboration of eleven (11) individual studies covering all Natura 2000 sites throughout the country as well as one (1) study of technical and scientific coordination of the overall project, to coordinate the sponsors of the 11 studies.

Study 1 concerns the elaboration of Special Environmental Studies for the Natura 2000 sites of the Region of Eastern Macedonia & Thrace and was assigned to the contractor company OMIKRON ENVIRONMENTAL CONSULTANTS S.A. with the Private Agreement signed on 11/02/2019 between the Contracting Body (RIS) and the contractor.

The purpose of this Special Environmental Study was to identify and evaluate the importance of protected objects in Natura 2000 protected areas of the 1st Group of Study 1 sites, to document the need for their protection, to record the threats and pressures that affect or may affect them and to formulate proposals to address pressures/threats, including the delimitation and establishment of protection zones and conditions and management proposals.

Thus, the Special Environmental Study (SES) of Evros has as its main purpose the protection and preservation of the natural environment of the Evros region. In particular, the main objectives of the SES include:

- Assessment of the environmental situation: Recording and evaluation of the current state of natural ecosystems, biodiversity, and natural resources of the area.
- Protection of biodiversity: Identification and protection of important and endangered species of flora and fauna, as well as their habitats.
- Management and sustainability: Design and implementation of management measures and practices that promote sustainable development and conservation of natural resources.
- Proposals for protection: Development of concrete proposals and actions for the protection of the environment and the prevention of ecosystem degradation.
- Compliance with legislation: Ensuring that human activities and development proposals in the area comply with national and European environmental legislation.
- Education and awareness: Promote environmental education and awareness among local communities on environmental issues and the importance of protecting the natural environment.

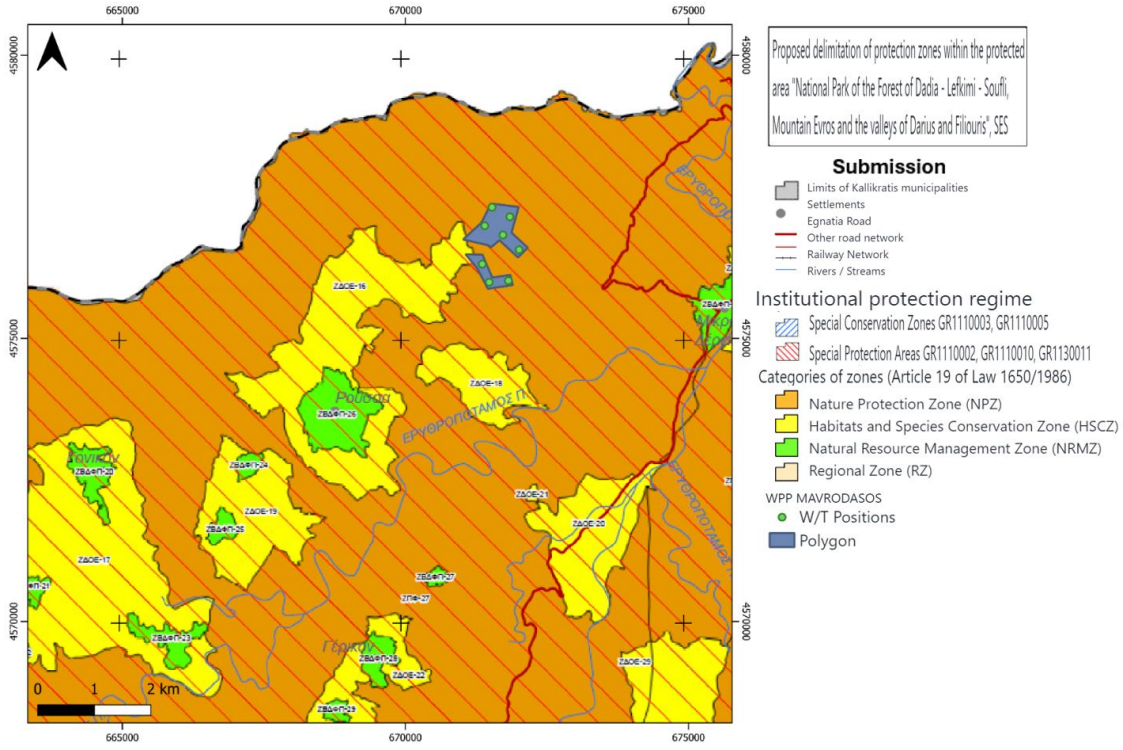
Therefore, and specifically for GR1110010 protected area, which is an important area mainly for the predatory species found in it, the EPM developed proposals for the creation of zones and its characterization based on the criteria of "grouping" the individual Natura areas to form a new complex Biodiversity Protection Area or a new National Park (NP).

Thus, the SES proposes that the designation of the Biodiversity Protection Areas (MPAs) with codes GR1110002 (SPA), GR1110003 (SACs), GR1110005 (SACs), GR1110010 (SPAs) and GR1130011 (SPAs) be transformed as the National Park of Dadia-Lefkimi-Soufli, Mountainous Evros and Dereios and Filiouri Valleys. The designation "National Park" for areas GR1110002, GR1110003, GR1110005 (northern part), GR1110010 and GR1130011 proposed in accordance with para. 2 of Art. 46 of Law 4685/2020, as these areas include terrestrial, aquatic, marine or mixed character large natural or semi-natural areas in which large-scale ecological functions take place with characteristic species and types of natural habitats of EU importance and/or Greek interest, which need protection and conservation.

Thus, within the boundaries of the protected area, it is proposed to define individual zones such as:

- ⇨ Nature Protection Areas (NPA)
- ⇨ Habitats and Species Areas of Conservation (HSAC)
- ⇨ Sustainable Natural Resources Management Zones (SNRMZ) and
- ⇨ Regional Zones (RZ)

The map below shows the creation of the mentioned Zones in relation to the project under consideration:



Map 15: Proposed delimitation of protection zones within the protected area "Dadia-Lefkimi-Soufli Forest National Park, Mountain Evros and Dereios and Filiouri Valleys"

The above map shows that the project under consideration is located:

i. partly in ZDOE-16 Zone, i.e. in an area that is appropriately managed to ensure a satisfactory degree of conservation of the objects to be protected (natural habitat types and species of EU importance and/or national interest) that they host, and

ii. mostly in SPP-27 Zone, i.e. in an area with natural habitat types, and/or habitats of species whose presence and representativeness are assessed as high or whose status requires strict protection.

According to the proposed plan of the EPM, in Zone ZDOE-17 the following uses of art. 14c of Presidential Decree 59/2018, namely:

1. Residence
2. Social assistance
3. Education

3.1. Kindergartens

3.2. Primary (Primary)

3.3. Secondary (Gymnasiums, Lyceums)

3.4. Tertiary (T.E.I., A.E.I.)

3.5. Special education

4.1. Small sports facilities (categories A1, A2, B1, D, E1)

4.3. Special sports facilities

5. Religious sites

6. Cultural facilities

7. Administration

8.3. Outpatient Mental Health Units

8.4. Addiction Prevention and Combating Units

10.1. Commercial premises

10.2. Personal Service Shops

10.3. Supermarkets

11. Offices / Research Centres / Business Incubators

12. Focus

13. Refreshments

15. Tourist accommodation, special tourist infrastructure facilities and other tourism enterprises (Law 4276/2014)

16. Parking (building - stadium)

21A. Data and Technology Support Centres for businesses and other accompanying activities (Data Centres)

22. Professional workshops (article 17 of Law 3982/2011)

24.1. Agricultural, forestry, livestock, fisheries and other agricultural holdings and activities

24.2. Agricultural warehouses, greenhouses and other installations in the agricultural sector (Article 2 of the Presidential Decree of 31.5.1985, D' 270)

24.3. Livestock - Poultry - Pumping installations

24.4. Aquaculture (land, marine, lake and river installations)

24.5. Multifunctional farm (article 52 of Law 4235/2014, A' 32)

24.6. Livestock Parks (article 43 of Law 4235/2014)

24.8. Grazing

24.9. Fisheries (recreational and professional)

24.10. Collection of plants, herbs, invertebrates & fungi (mushrooms) and benthic organisms from the substrate of the coastal zone

24.11. Hunting

24.12. Equestrian Centres

24.13. Rural land reclamation projects

25. Mining activities (mining, quarrying, mining, sand extraction, hydrocarbon prospection, exploration and exploitation zones)

26.2. Heliports

26.4. Railway stations.

26.7. Urban Intercity Bus Stations, Trolleys, Trams

26.8. Parking areas for coaches, lorries and caravans

26.12.1. Roads (motor vehicles) (possibility of specialisation under the relevant legislation)

26.12.2. Roads with light traffic

26.12.3. Pedestrian walkways

26.12.4. Cycle lanes

26.12.6. Footpaths (pedestrian)

30. Recycling corners and green spots (small, large) (joint ministerial decision 18485/26.4.2017 Government Gazette B'1412)

34. Renewable Energy Installations

35. Telecommunications, radio and television station antenna parks

36. Military installations

36.A. Wildlife Care Centres (KEPEAP)

47. Camps - Children's countryside

48.1.a. The configuration of the terrain, such as staircases, walls, corridors, ramps, mechanical means of covering altitude differences, as well as structures for the service of disabled and/or disabled persons

48.1.b. Their landscaping and aesthetic upgrade, their equipment and safety and generally constructions to serve the destination of these spaces

48.1.c. Prefabricated and temporary structures

48.1.d. For the operation and service of Public Transport

48.2.a. The construction of infrastructure networks and public utility installations, together with these annexes (above ground and underground)

48.2.b. The installation of stations measuring air pollution, noise and meteorological parameters with the necessary equipment

48.2.f. The installation of desalination plants and other water treatment systems for the supply of water to municipal networks, along with the accompanying works required for their full operation

49. Information kiosks/environmental interpretation projects (signs, lavatories, kiosks, shelters, etc.)

50. Projects to prevent or treat salinisation of groundwater or soils

51. Protection works against erosion, landslides and soil support

53. Projects concerning the restoration and improvement of water stocks

In addition, with the proposed plan of the EPM, in Zone ZPF-27 the following uses of art. 14b of Presidential Decree 59/2018, namely:

1. Residence

7. Administration

11. Offices / Research Centres / Business Incubators

13. Refreshments

16. Parking (building - stadium)

24.1. Agricultural, forestry, livestock, fisheries and other agricultural holdings and activities

24.3. Livestock - Poultry - Pumping installations

24.8. Grazing

24.9. Fisheries (recreational and professional)

24.10. Collection of plants, herbs, invertebrates & fungi (mushrooms) and benthic organisms from the substrate of the coastal zone

24.11. Hunting

24.12 Equestrian centers

24.13 Rural land reclamation projects

26.12.1. Roads (motor vehicles) (possibility of specialisation under the relevant legislation)

26.12.2. Roads with light traffic

26.12.3. Pedestrian walkways

26.12.4. Cycle lanes

26.12.6. Footpaths (pedestrian)

48.1.a. The configuration of the terrain, such as staircases, walls, corridors, ramps, mechanical means of covering altitude differences, as well as structures for the service of disabled and/or disabled persons

48.1.b. Their landscaping and aesthetic upgrade, their equipment and safety and generally constructions to serve the destination of these spaces

48.1.c. Prefabricated and temporary structures

48.2.a. The construction of infrastructure networks and public utility installations, together with these annexes (above ground and underground)

48.2.b. The installation of stations measuring air pollution, noise and meteorological parameters with the necessary equipment

49. Information kiosks/environmental interpretation projects (signs, lavatories, kiosks, shelters, etc.)

51. Protection works against erosion, landslides and soil support

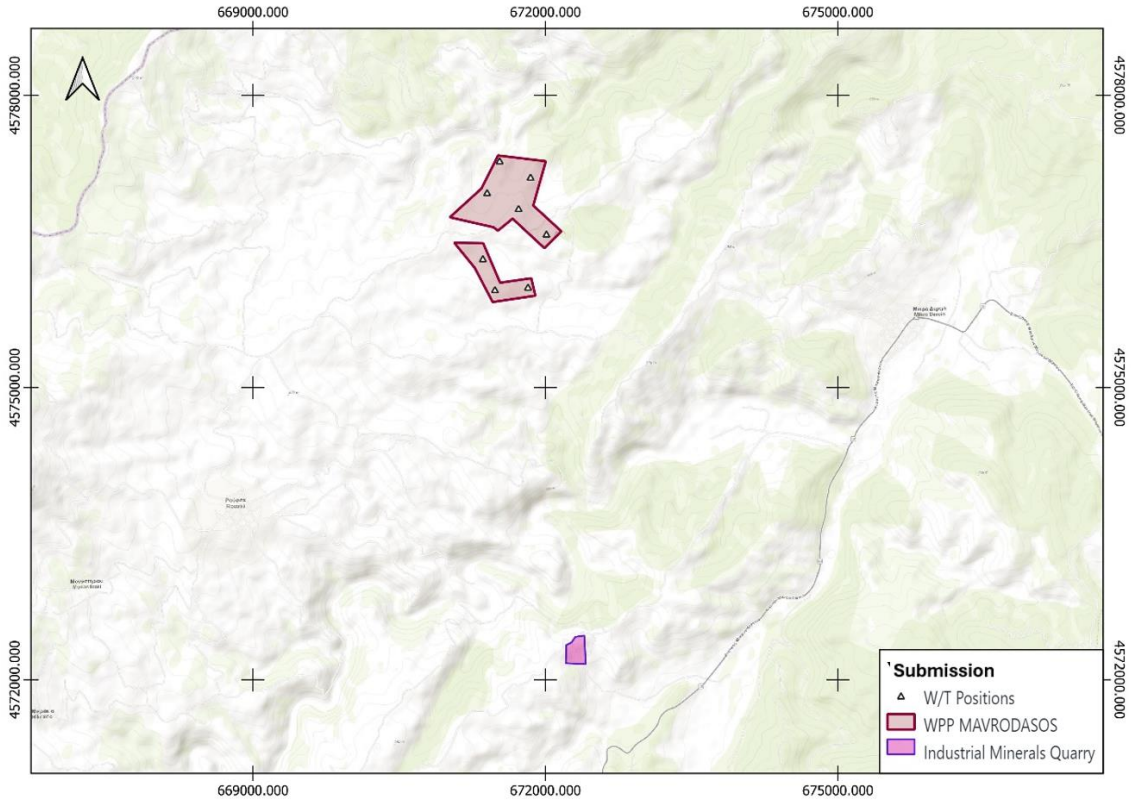
53. Projects concerning the restoration and improvement of water stocks

As can be seen from Map 17, the installation area of the project's wind turbines is mostly within the proposed ZPF-27 zone, in which the siting of RES installations is not foreseen. However, it is important to note again that the above is a non-institutionalized draft of the Special Environmental Study for the Region of Eastern Macedonia and Thrace with its last amendment having been made in the year 2022, which means that the fires of the years 2022 and 2023 have not been considered. Finally, with its institutionalization, zoning issues will be clarified.

5.2.5 Organised activity receptors

The study area of WPP does not belong to organized activity receptors established under Law 4458/98 and Law 3982/2011, i.e. Business Parks, Craft and Industrial Parks, Areas of Organized Tourism Development, Areas of Organized Development of Productive Activities.

In the nearby area of the project and specifically at 3.7km (W/T 1) there is a quarry for the extraction of industrial minerals and specifically calcium carbonate. The location chosen for the installation of the WPP is not a problem, as no location limits and restrictions have been set for this technology by quarry areas.



Map 16: Quarry of Industrial Minerals

CHAPTER 6 – DETAILED PROJECT DESIGN DESCRIPTION

6.1 Project description

The purpose of this study is to evaluate the environmental impacts arising from the construction and operation of a wind power plant consisting of eight (8) wind turbines placed within two polygons at the "Mavrodasos" site as well as their accompanying projects within the administrative boundaries of the Municipal Unit of Orfeas, the Municipality of Soufli, the Regional Unit of Evros, of the Region of Eastern Macedonia and Thrace.

Main project:

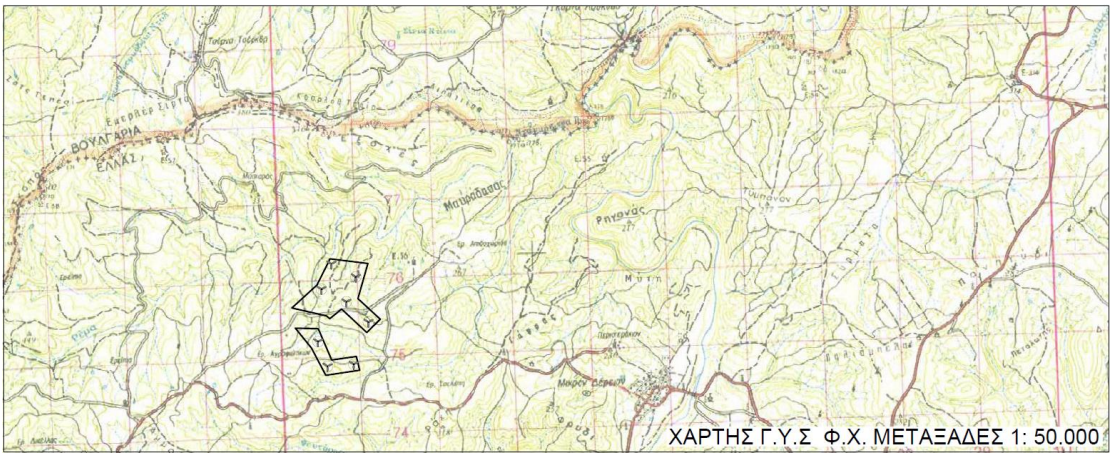
- ✓ Installation of a Wind Power Plant within two plots of total area: 688.279,88 sq.m., consisting of eight (8) wind turbines, with a rotor diameter of 136m, with a maximum power of 4,5MW each, i.e. a total capacity of 34,5MW.
- ✓ Configuration of eight (8) squares for the construction of wind turbines with a total occupancy area equal to 65.873,12 m^3.
- ✓ Foundation of wind turbines – construction of pillar bases by excavation of eight (8) foundations.
- ✓ Construction of an internal underground medium voltage network for the transmission of electricity produced by the wind turbines to the control house (coupling container), with a total length of 8,155.13 m.
- ✓ The installation of a control house within the square of Wind Turbine 5 with a coverage area of 31.5 sq.m.
- ✓ Construction of a 33kV underground transmission interconnection network from the control house to the 33/150KV (Medium Voltage/High Voltage) lifting substation named "PATRIARCHIS" with a total length of 33,900.22 m, of which there is an overlap with the internal network by 2,751.11 m.

Accompanying works:

- ✓ Construction of a road construction for access to the project site and the internal road interconnection of the wind turbines of the WPP at the "Mavrodasos" site, consisting of category C forest roads with a total length of 4.298.92m, of which 3.363.61m concern improvement and 935.31m concern the opening of new roads.
- ✓ Construction of rainwater runoff works.
- ✓ Configuration of a construction site that will be installed within part of the wind turbine installation squares, where the mobile crusher evices will be installed.

The electrical interconnection of the Wind Power Plant will be carried out through an existing Medium Voltage/High Voltage Lifting Substation (33KV/150KV) which falls within the Rhodope Regional Unit, Region of Eastern Macedonia and Thrace. The following paragraphs analyze and describe all the projects and infrastructures to assess their environmental impact in their area of influence.

Below is an indicative picture of the structure of the project on a map of 1:50,000 of the Hellenic Military Geographical Service (see attached Topographic Diagram).



Map 19: Orientation map of the Wind Power Plant at the location "Mavrodasos"

6.1.1 Principle of operation

Solar radiation as well as the rotational motion of the earth are the two causes that cause the existence of wind in the atmosphere. Due to uneven heating of the earth's surface, differences in atmospheric pressure are caused. The temperature of the atmosphere near the equator is higher (the sun's rays fall vertically) than at the poles (the sun's rays fall horizontally). The less warm layers of air on the earth's surface move from the poles to the equator, while the rising hot ones from the equator move to the poles. Also, due to the rotational motion of the earth, the forces of inertia displace the air masses on the earth's surface to the west while the warmer ones to the east. Therefore, atmospheric circulation is a combination of the rotational motion of the earth and solar radiation.

The production of electricity from the proposed installation is based on the conversion of the kinetic energy carried by the air masses into mechanical rotational energy, through a properly designed airfoil system (rotor/blades). The rotor is automatically oriented upstream of the wind with an active rotation system (electric motors) and has three blades. The kinetic energy of the rotor drives multipolar electric generator of alternating voltage. The generated alternating electrical voltage is rectified to continuous voltage and then converted back to alternating voltage of controlled amplitude and frequency by means of a converter.

An array of wind turbines in an area to harness and convert wind energy into mechanical and then electrical energy is called a wind farm. In addition to wind turbines, wind farms contain the transformer stations, power transmission cables, access roads to the turbine sites, wind farm monitoring and control system, installation squares for each turbine and any other accompanying work necessary for optimal utilization of the kinetic energy of the wind.

6.1.2 General characteristics of the project envisaged

The planned project consists of eight (8) wind turbines in total, indicative type Vestas V136-4.5MW, rated power 4.5MW and power regulation 4.3125MW each, which will be placed along the installation site at a specific distance from each other and will be connected to each other through internal interconnection roads. The total capacity of the wind power plant will be 34.5MW. The Entity of each project is the company Aliki Energy SINGLE MEMBER P.C. which undertakes the whole management of the project.

The table below shows the main identifiers of the studied project:

LOCATION	REGION	MUNICIPAL UNIT	REGIONAL UNIT	AREA OF INSTALLATION FIELD	TYPE OF WIND TURBINE	W/T NUMBER OF THE WPP	TOTAL CAPACITY OF WIND POWER

							PLANT (MW)
MAVRODASOS	EASTERN MACEDONIA & THRACE	ORFEAS	EVROS	688.279,88	V136-4,5MW (power setting to 4.3125MW each)	8	34,5

Table 27: Identifying data of the wind farm under study

The area of the Wind Park within which the 8 wind turbines V136-4.5MW will be placed, was located according to article 13 of Law 4685/2020 (Government Gazette 92 A'/7.5.2020) and occupies 688.279,88sq.m. and the wind turbines of the wind farm will be connected to each other through internal interconnection routes. Each wind turbine includes an electric generator with a nominal operating voltage of 800V. The generator is connected to the power grid via a power converter with an output voltage of 720V, which is in the naselle of the wind turbine and allows it to operate at variable speeds. Through the inverter the frequency as well as the quality of the injected power are controlled. Through underground medium voltage cables, the power of each wind turbine of the station will be transferred to the control house from where an underground cable will start and will end at the existing substation of voltage lifting voltage 150/33kV (Medium Voltage / High Voltage) under the Regional Unit of Rodopi, Eastern Macedonia and Thrace, the exact location of which is presented in the attached interconnection map. The coordinates of the eight wind turbines of the studied wind farm are presented below:

Coordinates of W/T location

HGRS'87

ΑΓ1	671820.70	4576019.89	286.50
ΑΓ2	671481.22	4575994.39	307.65
ΑΓ3	671357.48	4576312.36	298.00
ΑΓ4	672009.41	4576565.25	306.50
ΑΓ5	671723.95	4576826.90	296.50
ΑΓ6	671401.41	4576990.01	269.50
ΑΓ7	671529.45	4577316.91	259.90
ΑΓ8	671846.84	4577149.10	268.80

Coordinates of W/T location

WGS' 84

ΑΓ1	41° 19' 11.6035"	26° 03' 16.8412"
ΑΓ2	41° 19' 11.0374"	26° 03' 02.2224"
ΑΓ3	41° 19' 21.4366"	26° 02' 57.2262"
ΑΓ4	41° 19' 29.1318"	26° 03' 25.5091"
ΑΓ5	41° 19' 37.8303"	26° 03' 13.5037"
ΑΓ6	41° 19' 43.3634"	26° 02' 59.8032"
ΑΓ7	41° 19' 53.8591"	26° 03' 05.6403"
ΑΓ8	41° 19' 48.1773"	26° 03' 19.1151"

Table 28: Geographical coordinates of the wind turbines of the wind farm

The vertices of the polygons within which the eight wind turbines of the studied project will be installed are presented in the following table:

Coordinates of W/T location

HGRS'87

K1	672002.938	4577322.479
K2	671512.736	4577382.175
K3	671478.004	4577310.485
K4	671475.562	4577305.642
K5	671342.956	4577042.583
K6	671127.718	4576846.493
K7	671019.112	4576747.347
K8	671467.715	4576644.658
K9	671510.770	4576609.194
K10	671662.419	4576733.248
K11	671989.661	4576429.806
K12	672162.731	4576602.796
K13	671874.345	4576868.230
K1	672002.938	4577322.479

E1 = 509.002,91 τ.μ.

Coordinates of W/T location

HGRS'87

K14	671063.113	4576487.612
K15	671270.933	4576232.503
K16	671274.361	4576228.300
K17	671276.873	4576223.493
K18	671457.911	4575877.049
K19	671896.296	4575942.776
K20	671853.714	4576121.331
K21	671534.504	4576075.326
K22	671361.130	4576479.980
K14	671063.113	4576487.612

E2 = 179.276,97 τ.μ.

Table 29: Coordinates of Wind Power Plant polygons

The area of the plot amounts to 688.279,88m². The identification of suitable locations for the installation of the eight wind turbines was based on the utilization of the optimal wind potential and energy efficiency of the wind turbines and on the other hand, the compliance with the current legislation and the selection of sites that affect the environment and the activities of the wider area at least. Each wind turbine includes a transformer of 5.150KVA, 0.72/33KV through which each wind turbine is connected to the medium voltage (M.V.) network of the wind farm. Medium voltage 33KV cables will start from each wind turbine, which will end up in the control building of WPP. From there, a cable of suitable cross-section will start and will end at the medium voltage lifting substation at high 33/150KV (Medium Voltage/High Voltage), the position of which is presented in the attached interconnection map.

6.1.3 Detailed technology description of the Wind Turbines of the Wind Power Plant

The eight wind turbines selected to be installed in the planned wind farm are type V136-4.5MW of the construction company Vestas, have a nominal power of 4.5MW and power regulation of 4.3125MW each, rotor diameter 136m and have a three-blade variable pitch impeller while the tower has a height of 105m (hub height).

Each V136-4.5MW wind turbine is equipped with a three-phase asynchronous induction generator with cage rotor. connected to the network via a full-scale inverter. The generator housing allows cooling air to circulate within the stator and rotor. Air-water heat exchange takes place in an external heat exchanger. Its type is asynchronous with cage rotor, it has 6 poles, its rated power [PN] is 4450 kW, its rated operating voltage is 800V and its rated revolutions per minute are 1450-1550 revolutions per minute (rpm).

The inverter has a full-scale system that controls both the generator, and the quality supplied to the grid, controls the conversion of variable frequency AC power from generator power to constant frequency AC power with desired active and reactive power levels that are suitable for the grid. The inverter is in the naselle of the wind turbine and has a nominal voltage from the side of the network 720V. The rated voltage on the side of the generator is up to 800 V, depending on the speed of the generator. Each V136-4.5MW wind turbine has a grounding system as well as a lightning protection system installed at the ends of the blades to protect both the wind turbine and its subsystems.

The **blades** are made of carbon and fiberglass and consist of two airfoil shells connected by a support beam and with an integrated structure.

The wing bearings allow the blades to operate at different pitch angles. The length of the blades of the V136-4.5MW is 66.66m, the construction material is reinforced epoxy fiberglass, carbon fiber and solid metal. The connection of the blades is made by insertion of steel roots, the spoilers have a high lifting profile. The blade bearing type has double-row four-point bearings, and lubrication is done manually with grease.

The Pitch System consists of pitch motors, converter and pitch control. In addition, there are batteries and supercaps as a backup system, so that a wind turbine can be safely driven by the wind in extreme conditions. It is present on each flap, and they are all mounted on the hub, while its brake is hydraulic.

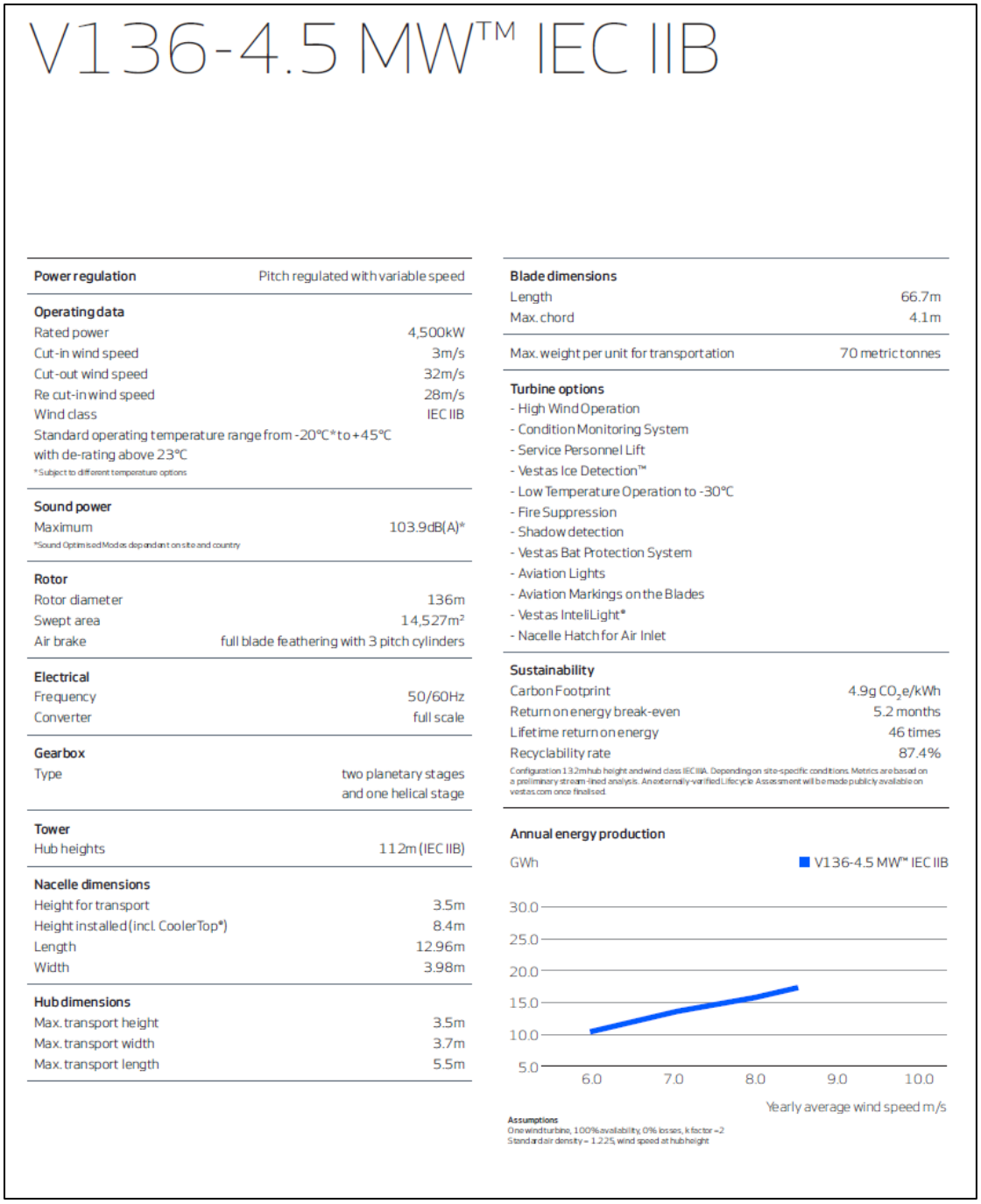
The **hub** supports the three blades and transfers the reaction loads to the main bearing and torque to the gearbox. The hub structure also supports the blade bearings and pitch rollers. The material of the hub is cast iron.

The height of the cylindrical tubular **tower** of the V136-4.5 MW wind turbines amounts to 105m while the construction and assembly of the tower is done in parts with the use of a crane. Inside the tower of each wind turbine there is a metal staircase for access to the wind turbine naselle and full communication from its base to the top while at its base there is a metal door through which access to the interior is made. The tower is plated and painted. It has an electric lighting system and protective devices as well as being completely closed to the external environment.

The gearbox included within the naselle of the wind turbine is of the type of two planetary stages and one helical stage. Through a transmission shaft, the transfer of power (mechanical) from the speed multiplier to the electric generator is carried out. The electrical panel of the wind turbine, which is placed inside the spindle of the wind turbine, is protected by fuses and circuit breakers. The wind turbine is equipped with a state-of-the-art control system that controls its proper operation.

The generator starts producing **power at wind speed** – (cut in speed) at 3m/s. When the wind speed exceeds 32 m/s – (cut out speed), the wind turbine stops operating. The V136-4.5MW wind turbine is of the latest technology, designed with low stress loads and high efficiency in mind. Its lifespan based on the construction company Vestas is 25 years of continuous operation.

The image below shows the basic technical characteristics of the V136-4.5MW wind turbines.



Picture 22: Technical characteristics of Vestas V136-4,5MW

Type of wind turbine	V136-4,5MW
Type of electric generator	Three-phase asynchronous
Number of poles	6
Rated operating speeds	1450 -1550rpm
Rated generator output voltage (stator)	800V
Rated inverter output voltage	720V

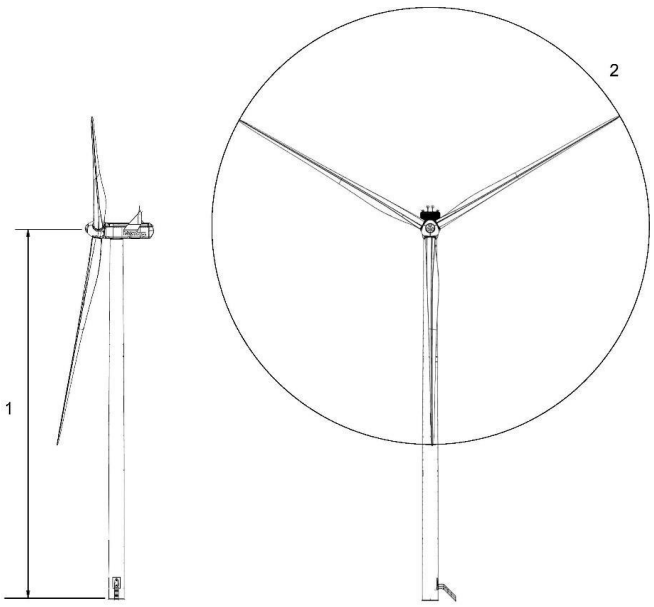
Frequency (F_N)	0-100Hz
Rated operating speeds	14
Winding connection	Delta

Table 30: Electrical characteristics of Vestas V136-4,5MW wind turbines

The nominal voltage of the wind turbine V136-4,5MW operates at a nominal voltage of 800V while the voltage of the inverter is 720V. For the connection of each wind turbine to the medium voltage network of the wind farm, there is a transformer of 0.72/33KV installed in the casualty of each wind turbine. The Low Voltage/Medium Voltage lifting transformer is three-phase, three-end, with two windings, dry type and self-extinguishing, has a nominal power of 5.150kVA. The windings are connected to delta on the high voltage and star on the low voltage side. The transformer has been designed according to IEC standards, but also according to the European Ecodesign Regulation. The following table shows the electrical characteristics of the lift transformer of the V136-4,5 wind turbine.

Rated power	5150 kVA
Rated voltage LV	0,720kV
Rated voltage MV	33kV
Rated Frequency	50 Hz / 60 Hz
Off circuit tap changer	±2x2.5%
Vector Group	Dyn5
Maximum altitude	2000m
Cooling method	AF

Table 31: Electrical characteristics of transformer



6.2 Description of main, auxiliary and ancillary facilities

6.2.1 Foundation - Wind Turbine Installation

6.2.1.1.1 Wind turbine squares

Around the perimeter of each wind turbine installation site, sufficient space was designed to accommodate the unloading of the turbine components as well as the erection of the turbine. A

square of suitable size (according to the manufacturer's specifications) will be created for the positioning, construction and erection of the main parts of the wind turbine (pylon, blade assembly) and the movement of the lifting equipment. For this reason, the ground is to be suitably shaped to the necessary surface area, so that the ground is solid in the wider area. The configuration of the site serves to facilitate movement and access to the site of the Wind Power Plant and movement to and from each wind turbine through the internal road network of the Wind Power Plant. It provides the possibility to turn around vehicles and machinery either for the installation of each wind turbine or for the construction and maintenance of the electrical interconnection network and the internal road network.

In the square of each wind turbine a suitable area for parking will be provided. The plazas to be constructed will have a flat surface and will be compacted with suitable heavy vehicles (rollers). On completion of the works, the necessary regeneration works will be carried out to restore harmony to the natural landscape. The excess of the resulting spoil will be used to construct the embankments of the forest road under improvement and the remainder will be disposed of at a licensed Excavation, Construction & Demolition Waste Management Site.

The total area of the eight squares is 65.873,12 sq.m.

The dimensions of each square will be as follows:

SQUARE	HEIGHT(m)	OCCUPATION ZONE (m^2)	EXCAVATIONS (m^3)	EMBANKMENTS (m^3)
Π1	286.50	7877.59	6915	5367
Π2	307.65	7784.43	2967	2894
Π3	298.00	7728.71	6057	5337
Π4	306.50	8224.68	6353	6549
Π5	296.50	9051.84	14374	17189
Π6	269.50	8390.41	10417	9375
Π7	259.90	8305.28	27731	6884
Π8	268.80	8510.18	11297	13800
TOTAL		**65873.12**	**86111.00**	**67395.00**

Table 32: Data of the installation squares of the Wind Power Plant at the location "Mavrodasos"

Both the area (> 4000 sq.m.) and the design of the square of each wind turbine follow the specifications given by the wind turbine manufacturer. The formation of a road-entrance type in each square is the necessary assembly area for the main crane, due to the long length of the boom. Accordingly, this surface was also designed according to the specifications of the wind turbine manufacturer.

The wind turbine manufacturer (Vestas) has defined some minimum specifications for the safe storage and assembly of its machines during the assembly phase, which are illustrated in the form 'Crane Pads Requirements DMS no: 0050-8073 Ver. 7'. Among other things, this document also illustrates the minimum specifications for the type of wind turbines to be used for the project under study, namely the V 136 with a tower height of 105m, an extract of which is illustrated in the drawing on the following page.

This drawing shows that **the minimum necessary deck area for this type of wind turbine is 5.009 m^2 .**

The specifications of the minimum necessary deck area are designed for flat ground.

Furthermore, based on these specifications, it is specified that, if not the whole, some parts of the plazas (the foundation area of the Wind Turbine, the area where the crane does not touch during the lifting, the area where the auxiliary cranes will touch, etc.) must necessarily be based on a trench for safety reasons.

The design of the decks of the squares for the project under study shows that the surface area of the deck's ranges from 5.760 m² to 6.347 m² , which means that they appear to occupy a slightly larger surface area than is strictly necessary, by about 30 %.

This difference is due to the relief of the soil in the study area, which in almost all places' alternates between folds and hollows, which makes it more difficult to design the square and to comply with the obligation to support certain parts of the square in a trench.

As indicated in the table below, the surface area of the decks required have predetermined areas. The occupation areas (deck area + slopes) range from 7,728 m² to 9,051 m². The difference between the occupation area and the deck area is restored and released after the end of the construction phase of the project. The restoration shall involve the re-establishment of the original vegetation.

A/A	DECK SURFACE	OCCUPIED SURFACE (Deck & Slopes)
Square area W/T1	6347.68329 m²	7877.59 m²
Square area W/T2	6347.69698 m²	7784.43 m²
Square area W/T3	6347.66225 m²	7728.71 m²
Square area W/T4	6347.69809 m²	8224.68 m²
Square area W/T5	6347.68386 m²	9051.84 m²
Square area W/T6	6347.66760 m²	8390.41 m²
Square area W/T7	5760.20267 m²	8305.28 m²
Square area W/T8	6347.64779 m²	8510.18 m²

Thus, considering both the conditions prevailing in the study area, but also the obligations that had to be met during the design of the squares, the greatest possible effort was made to keep the area of intervention as small as possible.

Lastly, it is inevitable that when a surface is levelled, slopes of both embankments and embankments are created on non-level ground, which in turn increase the total area occupied by the squares, but these are temporary in nature, as it is planned to restore them immediately after the construction of the project.

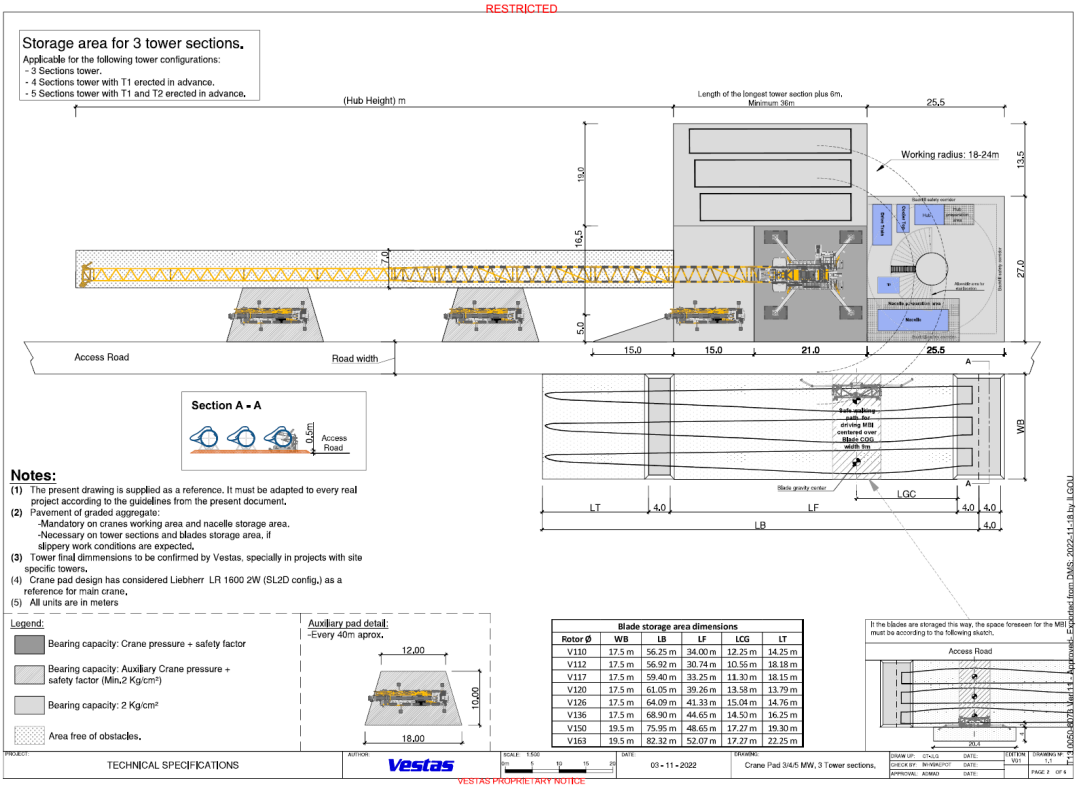
ACCESS ROADS	**AREA OF OCCUPATION**	**40.619,08**
	DECK AREA	21.392,31
	AREA OF RESTORATION	19.226,77
	PERCENTAGE	**47,33**

SQUARES	**AREA OF OCCUPATION**	**65.873,12**
	DECK AREA	50.185,73
	AREA OF RESTORATION	15.687,39
	PERCENTAGE	**23,81**

Total	106.492,20	Percentages
Area of disturbed surface	71.578,04	67,21434997
Area to be restored	34.914,16	32,78565003

Table 33: Areas to be disturbed and restored

The area that will remain free of vegetation during the operation of the project consists of areas with a total area of 34,914.16 m² or 32.79% of the total area of the project. Based on Table 11, this area was obtained from the difference between the area of the occupation and the deck area of the access roads and wind turbine erection plazas. It should be noted that the area will be restored after the project has ceased operations. The disturbed area of 71 578,04 m² , or 67,21% of the total area of the project, is obtained by adding the areas of the decking of the access roads and the wind turbine construction areas.



SQUARE INTERVENTION AREA COORDINATES

Συντεταγμένες ζώνης κατάληψης πλατείας Π1
Εμβαδόν = 7.877,59 τ.μ. - Περίμετρος = 522,53 μ.

α/α	X	Y	Αποστάσεις (μ)
P1	671813.966	4575984.535	----
P2	671837.233	4576025.994	P1 - P2: 47.54
P3	671819.093	4576037.811	P2 - P3: 21.65
P4	671830.528	4576051.299	P3 - P4: 17.68
P5	671831.112	4576055.902	P4 - P5: 4.64
P6	671828.852	4576059.823	P5 - P6: 4.53
P7	671802.029	4576078.741	P6 - P7: 32.82
P8	671791.322	4576083.473	P7 - P8: 11.71
P9	671775.769	4576087.236	P8 - P9: 16.00
P10	671772.589	4576086.152	P9 - P10: 3.36
P11	671770.190	4576083.305	P10 - P11: 3.72
P12	671765.125	4576062.615	P11 - P12: 21.30
P13	671762.611	4576057.573	P12 - P13: 5.63
P14	671749.821	4576064.670	P13 - P14: 14.63
P15	671741.309	4576072.523	P14 - P15: 11.58
P16	671728.853	4576079.440	P15 - P16: 14.25
P17	671721.410	4576080.416	P16 - P17: 7.51
P18	671674.078	4576106.335	P17 - P18: 53.96
P19	671664.718	4576090.064	P18 - P19: 18.77
P20	671753.501	4576041.728	P19 - P20: 101.09
P21	671741.367	4576019.815	P20 - P21: 25.05
P22	671808.421	4575982.922	P21 - P22: 76.53
P23	671811.672	4575980.860	P22 - P23: 3.85
P24	671813.316	4575981.750	P23 - P24: 1.87
P1	671813.966	4575984.535	P24 - P1: 2.86

Συντεταγμένες ζώνης κατάληψης πλατείας Π2
Εμβαδόν = 7.784,43 τ.μ. - Περίμετρος = 544,21 μ.

α/α	X	Y	Αποστάσεις (μ)
D1	671505.293	4576038.831	----
D2	671474.004	4576024.266	D1 - D2: 34.51
D3	671485.265	4576002.636	D2 - D3: 24.39
D4	671468.626	4575994.910	D3 - D4: 18.34
D5	671489.421	4575953.025	D4 - D5: 46.76
D6	671493.262	4575943.002	D5 - D6: 10.73
D7	671495.664	4575942.873	D6 - D7: 2.41
D8	671499.079	4575946.390	D7 - D8: 4.90
D9	671518.178	4575955.469	D8 - D9: 21.15
D10	671547.936	4575894.422	D9 - D10: 67.91
D11	671553.574	4575877.936	D10 - D11: 17.42
D12	671557.531	4575860.571	D11 - D12: 17.81
D13	671561.282	4575856.591	D12 - D13: 5.47
D14	671566.311	4575855.879	D13 - D14: 5.08
D15	671583.745	4575863.126	D14 - D15: 18.88
D16	671586.386	4575866.797	D15 - D16: 4.52
D17	671586.774	4575872.385	D16 - D17: 5.60
D18	671585.100	4575875.742	D17 - D18: 3.75
D19	671567.364	4575895.749	D18 - D19: 26.74
D20	671534.348	4575963.196	D19 - D20: 75.09
D21	671556.857	4575974.874	D20 - D21: 25.36
D22	671550.488	4575987.400	D21 - D22: 14.05
D23	671541.025	4576010.165	D22 - D23: 24.65
D24	671530.314	4576043.761	D23 - D24: 35.26
D25	671526.161	4576050.693	D24 - D25: 8.08
D26	671521.466	4576051.358	D25 - D26: 4.74
D27	671518.316	4576050.001	D26 - D27: 3.43
D1	671505.293	4576038.831	D27 - D1: 17.16

Συντεταγμένες ζώνης κατάληψης πλατείας Π3
Εμβαδόν = 7.728,71 τ.μ. - Περίμετρος = 514,90 μ.

α/α	X	Y	Αποστάσεις (μ)
Z1	671347.430	4576310.786	----
Z2	671341.002	4576295.213	Z1 - Z2: 16.85
Z3	671327.903	4576275.777	Z2 - Z3: 23.44
Z4	671347.862	4576262.666	Z3 - Z4: 23.88
Z5	671338.563	4576249.158	Z4 - Z5: 16.40
Z6	671338.532	4576246.240	Z5 - Z6: 2.92
Z7	671385.958	4576216.392	Z6 - Z7: 56.04
Z8	671400.921	4576239.343	Z7 - Z8: 27.40
Z9	671445.918	4576210.857	Z8 - Z9: 53.26
Z10	671456.120	4576203.773	Z9 - Z10: 12.42
Z11	671486.231	4576185.354	Z10 - Z11: 35.30
Z12	671498.083	4576197.133	Z11 - Z12: 16.71
Z13	671498.920	4576199.916	Z12 - Z13: 2.91
Z14	671497.392	4576202.723	Z13 - Z14: 3.20
Z15	671468.056	4576223.253	Z14 - Z15: 35.81
Z16	671440.868	4576235.740	Z15 - Z16: 29.92
Z17	671411.122	4576254.789	Z16 - Z17: 35.32
Z18	671425.008	4576275.338	Z17 - Z18: 24.80
Z19	671403.836	4576297.114	Z18 - Z19: 30.37
Z20	671379.431	4576307.428	Z19 - Z20: 26.49
Z21	671357.982	4576321.135	Z20 - Z21: 25.45
Z22	671355.347	4576321.397	Z21 - Z22: 2.65
Z23	671353.247	4576319.854	Z22 - Z23: 2.61
Z1	671347.430	4576310.786	Z23 - Z1: 10.77

Συντεταγμένες ζώνης κατάληψης πλατείας Π4
Εμβαδόν = 8.224,68 τ.μ. - Περίμετρος = 538,89 μ.

α/α	X	Y	Αποστάσεις (μ)
S1	672025.679	4576600.724	----
S2	671945.598	4576611.690	S1 - S2: 80.83
S3	671942.109	4576586.865	S2 - S3: 25.07
S4	671936.548	4576587.259	S3 - S4: 5.58
S5	671918.312	4576593.627	S4 - S5: 19.32
S6	671878.263	4576599.902	S5 - S6: 40.54
S7	671843.364	4576608.486	S6 - S7: 35.94
S8	671837.140	4576607.262	S7 - S8: 6.34
S9	671833.277	4576602.049	S8 - S9: 6.49
S10	671830.665	4576582.474	S9 - S10: 19.75
S11	671832.652	4576577.865	S10 - S11: 5.02
S12	671837.071	4576574.950	S11 - S12: 5.29
S13	671882.789	4576573.844	S12 - S13: 45.73
S14	671914.528	4576569.487	S13 - S14: 32.04
S15	671939.414	4576569.278	S14 - S15: 24.89
S16	671935.187	4576550.695	S15 - S16: 19.06
S17	671931.966	4576543.137	S16 - S17: 8.22
S18	671932.581	4576539.845	S17 - S18: 3.35
S19	671935.593	4576537.107	S18 - S19: 4.07
S20	671943.255	4576537.698	S19 - S20: 7.68
S21	671959.934	4576538.979	S20 - S21: 16.73
S22	671992.557	4576534.210	S21 - S22: 32.97
S23	671995.206	4576552.301	S22 - S23: 18.28
S24	672018.478	4576549.012	S23 - S24: 23.50
S1	672025.679	4576600.724	S24 - S1: 52.21

Συντεταγμένες ζώνης κατάληψης πλατείας Π5
Εμβαδόν = 9.051,84 τ.μ. - Περίμετρος = 541,17 μ.

α/α	X	Y	Αποστάσεις (μ)
R1	671737.613	4576849.466	
R2	671710.930	4576831.768	R1 - R2: 32.02
R3	671710.029	4576829.541	R2 - R3: 2.40
R4	671723.655	4576811.002	R3 - R4: 23.01
R5	671710.118	4576802.796	R4 - R5: 15.83
R6	671708.947	4576799.372	R5 - R6: 3.62
R7	671741.401	4576753.952	R6 - R7: 55.82
R8	671745.077	4576754.130	R7 - R8: 3.68
R9	671764.864	4576769.328	R8 - R9: 24.95
R10	671823.254	4576687.682	R9 - R10: 100.38
R11	671823.629	4576687.294	R10 - R11: 0.54
R12	671839.332	4576698.438	R11 - R12: 19.26
R13	671835.324	4576702.668	R12 - R13: 5.83
R14	671780.289	4576780.194	R13 - R14: 95.07
R15	671793.479	4576785.235	R14 - R15: 14.12
R16	671803.022	4576790.905	R15 - R16: 11.10
R17	671805.659	4576795.486	R16 - R17: 5.29
R18	671805.475	4576799.082	R17 - R18: 3.60
R19	671800.630	4576816.110	R18 - R19: 17.70
R20	671795.549	4576842.841	R19 - R20: 27.21
R21	671790.823	4576854.452	R20 - R21: 12.54
R22	671787.982	4576858.245	R21 - R22: 4.74
R23	671781.628	4576862.601	R22 - R23: 7.70
R24	671762.520	4576868.690	R23 - R24: 20.06
R25	671753.690	4576869.049	R24 - R25: 8.84
R26	671749.877	4576867.359	R25 - R26: 4.17
R27	671747.981	4576865.001	R26 - R27: 3.03
R1	671737.613	4576849.466	R27 - R1: 18.68

Συντεταγμένες ζώνης κατάληψης πλατείας Π7
Εμβαδόν = 8.305,28 τ.μ. - Περίμετρος = 560,06 μ.

α/α	X	Y	Αποστάσεις (μ)
M1	671525.136	4577278.059	----
M2	671552.840	4577254.414	M1 - M2: 36.42
M3	671555.982	4577254.267	M2 - M3: 3.15
M4	671581.498	4577286.431	M3 - M4: 41.06
M5	671605.075	4577317.560	M4 - M5: 39.05
M6	671586.290	4577333.239	M5 - M6: 24.47
M7	671611.261	4577366.279	M6 - M7: 41.41
M8	671629.743	4577381.073	M7 - M8: 23.67
M9	671638.441	4577391.890	M8 - M9: 13.88
M10	671646.895	4577395.208	M9 - M10: 9.08
M11	671660.820	4577403.219	M10 - M11: 16.06
M12	671662.854	4577406.446	M11 - M12: 3.81
M13	671663.628	4577410.162	M12 - M13: 3.80
M14	671662.263	4577416.120	M13 - M14: 6.11
M15	671640.099	4577433.429	M14 - M15: 28.12
M16	671629.855	4577433.938	M15 - M16: 10.26
M17	671625.346	4577432.032	M16 - M17: 4.90
M18	671612.898	4577414.289	M17 - M18: 21.67
M19	671605.658	4577399.580	M18 - M19: 16.39
M20	671591.381	4577379.477	M19 - M20: 24.66
M21	671588.454	4577366.587	M20 - M21: 13.22
M22	671570.332	4577343.734	M21 - M22: 29.17
M23	671547.843	4577340.405	M22 - M23: 22.73
M24	671528.571	4577327.754	M23 - M24: 23.05
M25	671510.700	4577324.618	M24 - M25: 18.14
M26	671506.840	4577322.062	M25 - M26: 4.63
M27	671505.915	4577317.028	M26 - M27: 5.12
M28	671508.971	4577312.202	M27 - M28: 5.71
M29	671527.083	4577307.481	M28 - M29: 18.72
M30	671529.034	4577305.742	M29 - M30: 2.61
M31	671522.152	4577296.985	M30 - M31: 11.14
M32	671509.393	4577289.472	M31 - M32: 14.81
M33	671508.540	4577284.840	M32 - M33: 4.71
M34	671511.935	4577281.684	M33 - M34: 4.64
M1	671525.136	4577278.059	M34 - M1: 13.69

Συντεταγμένες ζώνης κατάληψης πλατείας Π6
Εμβαδόν = 8.390,41 τ.μ. - Περίμετρος = 548,18 μ.

α/α	X	Y	Αποστάσεις (μ)
F1	671375.208	4576984.657	----
F2	671387.945	4576985.138	F1 - F2: 12.75
F3	671409.027	4576981.734	F2 - F3: 21.35
F4	671412.072	4577005.733	F3 - F4: 24.19
F5	671428.270	4577002.699	F4 - F5: 16.48
F6	671431.005	4577004.282	F5 - F6: 3.16
F7	671438.656	4577059.596	F6 - F7: 55.84
F8	671436.039	4577061.110	F7 - F8: 3.02
F9	671411.222	4577063.730	F8 - F9: 24.96
F10	671415.755	4577097.001	F9 - F10: 33.58
F11	671420.103	4577135.692	F10 - F11: 38.93
F12	671426.793	4577153.152	F11 - F12: 18.70
F13	671429.580	4577165.280	F12 - F13: 12.44
F14	671428.130	4577168.876	F13 - F14: 3.88
F15	671425.478	4577171.340	F14 - F15: 3.62
F16	671408.006	4577178.506	F15 - F16: 18.88
F17	671402.972	4577178.822	F16 - F17: 5.04
F18	671396.847	4577177.069	F17 - F18: 6.37
F19	671394.772	4577171.004	F18 - F19: 6.41
F20	671394.970	4577166.489	F19 - F20: 4.52
F21	671398.976	4577154.148	F20 - F21: 12.98
F22	671401.460	4577140.367	F21 - F22: 14.00
F23	671401.812	4577130.640	F22 - F23: 9.73
F24	671396.794	4577098.276	F23 - F24: 32.75
F25	671392.480	4577065.827	F24 - F25: 32.73
F26	671385.393	4577066.912	F25 - F26: 7.17
F27	671369.545	4577071.536	F26 - F27: 16.51
F28	671366.917	4577071.132	F27 - F28: 2.66
F29	671365.201	4577069.357	F28 - F29: 2.47
F30	671356.881	4577051.500	F29 - F30: 19.70
F31	671354.661	4577044.101	F30 - F31: 7.73
F32	671353.675	4577035.524	F31 - F32: 8.63
F33	671354.284	4577006.580	F32 - F33: 28.95
F34	671355.630	4576989.208	F33 - F34: 17.42
F35	671357.953	4576987.006	F34 - F35: 3.20
F1	671375.208	4576984.657	F35 - F1: 17.41

Συντεταγμένες ζώνης κατάληψης πλατείας Π8
Εμβαδόν = 8.510,18 τ.μ. - Περίμετρος = 505,95 μ.

α/α	X	Y	Αποστάσεις (μ)
N1	671842.140	4577187.483	----
N2	671817.778	4577174.777	N1 - N2: 27.48
N3	671783.293	4577172.111	N2 - N3: 34.59
N4	671768.609	4577168.619	N3 - N4: 15.09
N5	671759.500	4577162.610	N4 - N5: 10.91
N6	671757.051	4577158.456	N5 - N6: 4.82
N7	671756.118	4577153.981	N6 - N7: 4.57
N8	671756.542	4577149.699	N7 - N8: 4.30
N9	671759.043	4577142.826	N8 - N9: 7.31
N10	671766.688	4577132.527	N9 - N10: 12.83
N11	671756.526	4577124.005	N10 - N11: 13.26
N12	671739.420	4577112.215	N11 - N12: 20.78
N13	671731.911	4577103.974	N12 - N13: 11.15
N14	671717.820	4577097.459	N13 - N14: 15.53
N15	671690.264	4577084.039	N14 - N15: 30.65
N16	671697.200	4577068.196	N15 - N16: 17.30
N17	671699.596	4577066.909	N16 - N17: 2.72
N18	671729.801	4577081.782	N17 - N18: 33.67
N19	671763.531	4577100.143	N18 - N19: 38.40
N20	671787.043	4577108.234	N19 - N20: 24.87
N21	671797.743	4577095.147	N20 - N21: 16.90
N22	671801.622	4577088.556	N21 - N22: 7.65
N23	671852.133	4577112.816	N22 - N23: 56.03
N24	671852.369	4577115.440	N23 - N24: 2.63
N25	671845.053	4577129.652	N24 - N25: 15.98
N26	671865.347	4577139.225	N25 - N26: 22.44
N27	671865.766	4577142.286	N26 - N27: 3.09
N1	671842.140	4577187.483	N27 - N1: 51.00

In the table below, the required intervention areas are calculated in detail, based on their inclusion or not in the provisions of the forest legislation.

DEPARTMENT	TOTAL SURFACE AREA	SUBJECT TO	NOT SUBJECT TO
Δ1	20254.83	12567.91	7686.92
Δ2	2552.11	2552.11	0
Δ3	7945.06	7945.06	0
Δ4	770.92	468.29	302.63
Δ5	3342.68	3342.68	0
Δ6	3846.92	3846.92	0
Δ7	1906.55	1906.55	0
Π1	7877.59	7877.59	0
Π2	7784.43	7784.43	0
Π3	7728.71	7728.71	0
Π4	8224.68	6283.66	1941.02
Π5	9051.84	9051.84	0
Π6	8390.41	8390.41	0
Π7	8305.28	8305.28	0
Π8	8510.18	8510.18	0
ΣΥΝΟΛΟ	**106492.19**	**96561.62**	**9930.57**

Table 34: Land Classification Table based on the Forest Map

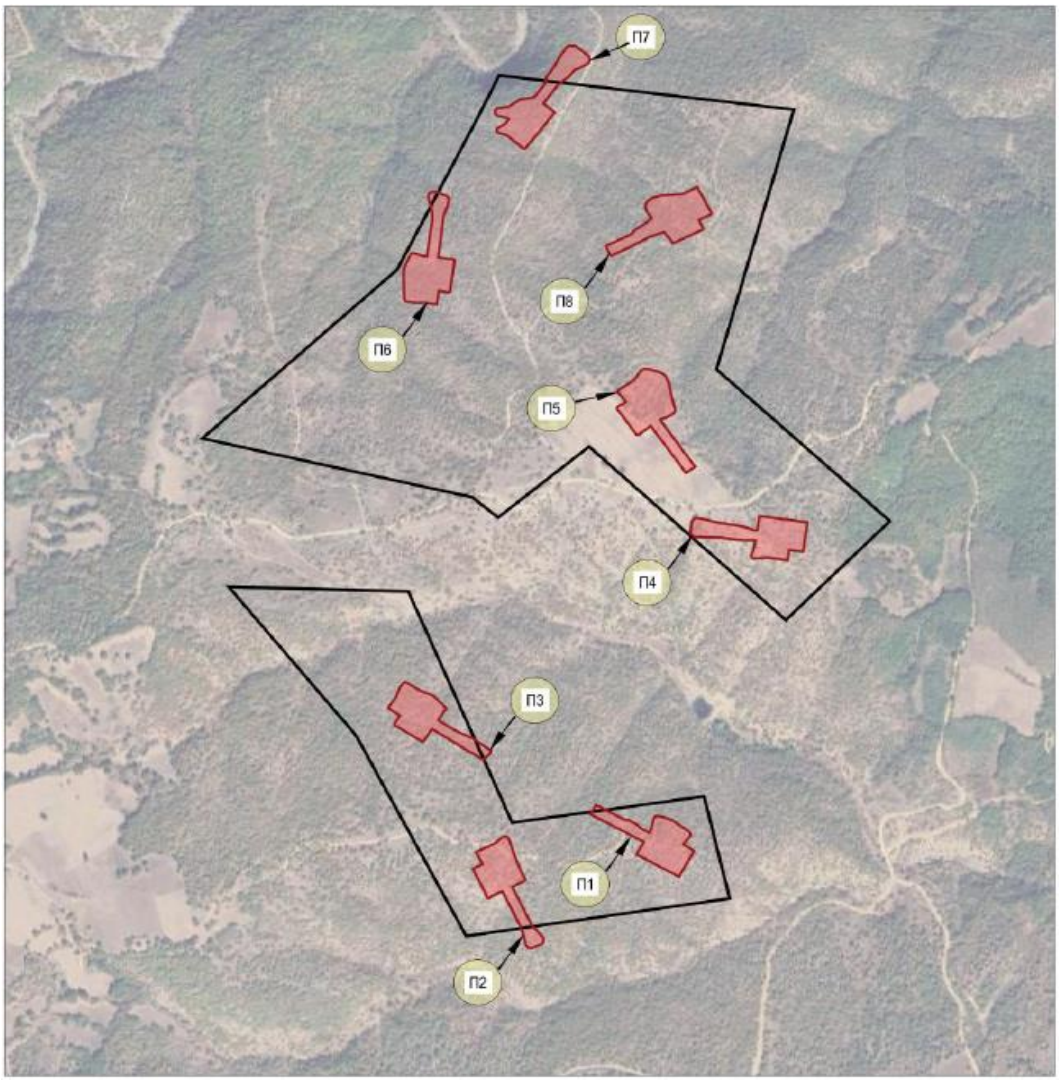


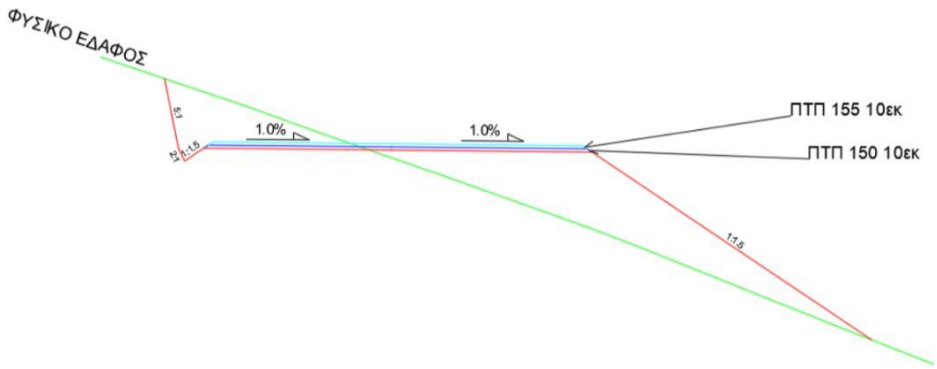
Table 35: Illustration of wind turbine construction squares

Description of Wind Turbine Construction Squares

For the installation of the wind turbine equipment and for the construction of the wind turbines, the ground must be properly shaped so that the work can be carried out safely in accordance with the specifications set by the wind turbine manufacturer. This area is intended for the manoeuvring of the vehicles, the assembly of the pylon and the blades of the Wind Turbine on the hub on the ground before they are placed in their final position.

In the present study, the design of the erection squares has been done keeping in mind the above mentioned as well as the following:

- The foundation of the Wind Turbines should be made in a trench,
- the square should have a longitudinal slope of 1% for water drainage,
- the square must have a single slope of 1% for water drainage,
- to pave a 10 cm thick sub-base with 3A and
- to lay a 10cm thick 3A base.



Picture 24: Typical cross-section of wind turbine construction squares

According to Table 28, as far as the balance of earthworks is concerned, we have 86.111,00 m³ of excavations and 67.395,00 m³ of embankments. According to the above, the excess (difference of the two) amounts to 18,716 m³. The appropriate excavation products will be deposited in temporary areas within the construction squares and then transported for use. The management of excess unsuitable excavation products is carried out in an environmentally sound manner and in accordance with the provisions of art. 30 of Law 4819/2021 with further possibility of its use in the construction of embankments or other beneficial structures. The appropriate excavation products will be deposited in temporary areas within the construction squares and then transported for use.

In conclusion, therefore, all the interventions that will be carried out in the Wind Power Plant under study are the smallest possible with proper environmental management. The new openings achieve greater social promotion of the area since, in addition to the new transport routes, the forest area is also protected with the direct approach of ground firefighting means. It should be noted that the maintenance of the roads under construction will be continuous to facilitate the quick and safe transportation of personnel and surveillance crews as well as firefighting crews. Thus, there is continuous surveillance – prevention but also immediate suppression of forest fires and consequently protection of the settlements around the installation of the Wind Power Plant under study.

Finally, the square of Wind Turbine 6 seems to be located on a ravine. According to the report of the Council of State 762/2020, which is cited in paragraph 6.8, any difference in the relief of the soil or its usual folding or misgangia, where rainwater necessarily drains temporarily from the higher lying areas, but only areas with continuous or periodic flow of rainwater or other water and especially hydrological, does not constitute a watercourse that needs to be demarcated. hydraulic and environmental characteristics that give them the characteristics of a watercourse. In any case, the technical works that will be carried out for the improvement of the existing one, the opening of new roads and the construction of squares cannot affect the hydrographic network. A more detailed description of these is given in paragraph 6.8. A more detailed description can be found in the Technical Description of Forest Road Construction and in the attached Intervention Area Map.

6.2.1.1.2 Foundation and erection of the Wind Turbine

Indicative factors that determine the geometry of excavations and foundations depend on the dynamic loads, the characteristics of the tower, the geotechnical characteristics as well as the seismicity of the area.

The construction of the foundation of each wind turbine includes, in order, the following tasks:

- ✓ Base excavation.
- ✓ Installation of foundation grounding.

- ✓ Concrete placement.
- ✓ Construction of the foundation formwork.
- ✓ Placement of reinforcement of the pedestal and placement/alignment of anchorage materials.
- ✓ Installation of pipes for the passage of medium voltage cables.
- ✓ Backfilling.

All work will be carried out by mechanical means. The excavation of the foundations will be carried out in accordance with the relevant specifications of the Ministry of Infrastructure, Transport and Networks, using the appropriate mechanical means, in compliance with all safety regulations provided for by the relevant legislation. Once the base has been excavated, the bottom will be filled with unreinforced concrete (10 cm). Before the concrete is poured, the earth electrodes and the grounding strips will be installed. The grounding electrodes will be placed perpendicular to the bottom of the support base, in holes to be drilled during the excavation phase. The foundation earthing strips will be installed radially and around the perimeter of the foundation base. Also, (PVC construction) to protect the power and communication cables entering and leaving the base of the wind turbine pylon.

The formwork foundation is then reinforced, and the anchoring materials are installed. Finally, the concrete pile is concreted with appropriate concrete specifications (C 25/30) and backfilled. The site of the wind turbines to be installed will be suitably landscaped. Particular attention will be paid to restoring the site to its original condition.

Support pylons for wind turbines of 91.5m height will be installed. Therefore, the total length of the wind turbines from the ground, adding to the pillar height/hub height the length of the rotor radius (57.2m) amounts to 148.7m. The erection process consists of the following stages:

- ❖ Deposition of the shell near the foundation
- ❖ Construction of the first section (base) of the pillar
- ❖ Preparation of the next piece of each pillar and its erection
- ❖ Erection - connection of the spindle
- ❖ Assembling the impeller on the ground Erection - connection of the impeller

For the proper and safe execution of the erection works, a crane of suitable lifting capacity is used. The crane can successfully lift all the main parts of the wind turbine, which will be transported to the erection sites (squares) by road. The process of erection of wind turbines consists of the assembly of the blades, the placement of the casing-nasela, the erection and connection of the tower parts, the connection of the fuselage and finally the connection of the blades on the hub.

Particular attention will be paid to weather conditions during the construction period of the foundation bases and especially during the pouring period of concrete, due to their influence on its final quality and consequently on its durability. For the construction of each wind turbine, a general excavation of circular foundations with a diameter of 20cm will be carried out. A total of 8 foundations will be excavated.

Emphasis will be given to restoring the space to its natural original state, to minimize any technical intervention. The same effort will be made during the excavation stage to limit them to the technical minimum required, which will at the same time ensure the smooth and safe work of the crews and erection machinery.

The aim is to restore the site, so that the only intervention in nature will be limited to the smallest necessary distance around the pylon diameter of each wind turbine and the internal road construction interconnecting the wind turbines of the wind park, the laying of which will be done by sorting excavation products, minimizing any disturbance of the site.

6.2.2 Interconnection Network

The electrical interconnection of the planned Wind Power Plant, as mentioned above, includes the construction of an internal underground medium voltage transmission network from the Wind Turbines of the Wind Power Plant to the control house and the construction of an underground medium voltage transmission network from the control house to the existing voltage lifting substation named PATRIARCHIS.

The total length of the ditch (channel) that will be constructed for the electrical interconnection needs of the project will have a length of 39.304.24m, of which 33.900.22m is covered by the external interconnection. However, from junction 1 to the control house, the external interconnection is covered by the internal one by 2,751.11 m. The 8,155.13 m concerns the internal interconnection of the Wind Turbines of the Wind Power Plant (up to the square of Wind Turbine 5 where the control house of the Wind Power Plant is to be installed. It is noted that the total length of the interconnection ditch amounts to 39.304,24 m since it is not a sum of internal and external interconnection of the Wind Power Plant, as depicted in the attached interconnection map, since the cables of the Wind Turbines through branches are interposed in a common ditch. The total length of cables amounts to 54,992.11 m, with the internal interconnection from the Wind Turbines to the Control Housing amounting to 21,091.89 m while the external interconnection, i.e. from the Control House to the Substation amounting to 33,900.22 m.

From the medium voltage transformer of each wind turbine of the Wind Power Plant, monopolar medium voltage cables will start underground, which will end up in the prefabricated control house of the Wind Power Plant that will be placed in the square of Wind Turbine 5 (internal Medium Voltage transmission network) from where an underground Medium Voltage cable will start and will end at the substation where the average voltage of 33KV will be raised to 150KV. (External underground medium voltage line).

The following table presents the electrical characteristics of the Low Voltage/Medium Voltage lifting transformer of the V136-4,5MW wind turbine.

Rated power	5.150KVA
Rated voltage LV	0,720kV
Rated voltage MV	33kV
Rated Frequency	50Hz
Off circuit tap changer	±2x2.5%
Vector Group	Dyn5
Maximum Altitude	2000m
Cooling method	AF

Table 36: Transformer Electrical Characteristics

The route of the underground medium voltage pipeline will start from each wind turbine to the control house of the Wind Farm and from the control house to the existing substation named PATRIARCHIS. The project interconnection to avoid additional interventions will follow the length of the new and existing road network where possible, an intervention which will be carried out at the suggestion of the IPTO.

More specifically, for the internal electrical interconnection of the wind turbines, an underground network will be constructed through which the medium voltage cables will be routed. The internal medium voltage network will connect the Wind Turbines of the Wind Power Plant to the control room at the control house. The cables used will be aluminium cables with XLPE insulation.

The 8 cables (internal interconnection) to be used for the construction of the internal interconnection under study shall be unipolar with aluminium stranded conductor with XLPE insulation, with semi-conducting shielding of the insulation. The cross-section of the 8 cables is planned to be 100 mm^2. Also, the cables to be used have PE outer sheath, water protection of metallic shielding and are manufactured according to international standards IEC 60502-2.

The cable that will be used for the interconnection of the Control Centre of the Wind Power Plant with the existing substation will be a single pole with aluminium stranded conductor, with XLPE insulation, with semi-conductive shielding of the insulation. The standard cross section will be 600 mm^2. Also, it will carry PE outer sheath, water protection of metallic shielding and be manufactured according to international standards IEC 60502-2. However, the exact cross-sections of the medium voltage cables to be used in the proposed project will be finalized at a later stage, during the offer of connection conditions to the competent body (IPTO).

The following are the indicative dimensional and electrical characteristics of the cable that will be used to interconnect the control house of the proposed Wind Power Plant with the existing substation named PATRIARCHIS.

AL/XLPE/CWS/WB/PE 19/33KV - BS 7870-4.10

AL/XLPE/CWS(WB)/PE 19/33kV 1X 300/35 C

Nexans Ref.: 13005052
Country Ref.: 13005052
EAN 13: 5204609055682

AL/XLPE/CWS(WB)/PE 19/33kV 1X 300/35 C

DESCRIPTION

Single core electric cable with stranded (class 2), with or without water protection, conductor screen of semiconducting compound, XLPE insulation, insulation screen of semiconducting compound, copper wires plus copper helix tape metallic screen, PE outer sheath.

Application

in grounds, outdoors, indoors and in cable ducts

The cable is suitable for rated voltage 18/30KV (Um=36KV) according to the IEC standards.

Note:

Other cross section of metallic screen are available on request.

DECLARATION OF PERFORMANCE

F_{ca}

STANDARDS

International IEC 60502-2

National BS 7870-4.10

AL/XLPE/CWS/WB/PE 19/33KV - BS 7870-4.10

AL/XLPE/CWS(WB)/PE 19/33kV 1X 300/35 C

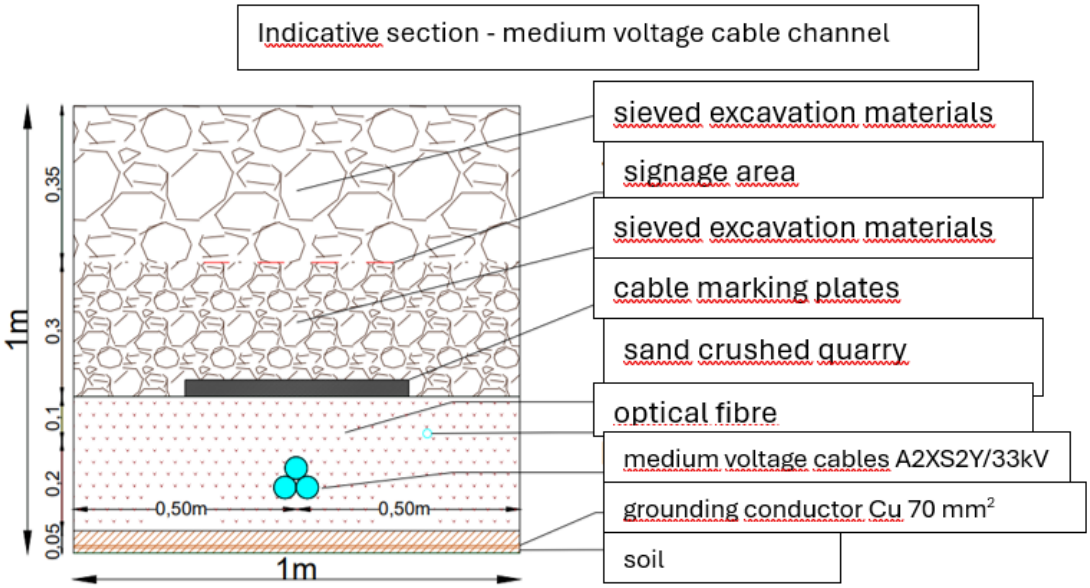
CHARACTERISTICS

Construction characteristics	
Conductor flexibility	Stranded class 2
Conductor material	Aluminum
Material of the inner semi-conductor	Semi-conducting compound
Insulation	XLPE
Material of the external semi-conductor	Semi-conducting compound
Screen	Copper wire + copper tape
Outer sheath	MDPE
Sheath colour	Black
Longitudinally watertight	Yes
Halogen free	Yes
Conductor shape	Circular
Dimensional characteristics	
Conductor cross-section	300 mm²
Phase Conductor Cross Section	300 mm²
Screen section	35 mm²
Nominal outer sheath thickness	2.4 mm
Nominal outer diameter	45.5 mm
Approximate weight	2210 kg/km
Nominal insulation thickness	8.0 mm
Electrical characteristics	
Rated Voltage Uo/U (Um)	19 / 33 (36) kV
Max. DC resistance of the conductor at 20°C	0.1 Ohm/km
Resistance of the screen	0.542 Ohm/km
Perm. current rating buried 15°C - trefoil formation	475 A
Perm. current rating in air 25°C - trefoil formation	580 A
Usage characteristics	
Flame retardant	No

Picture 25: Indicative type of Medium Voltage cable (Interconnection of Control House with Substation Source : https://www.nexans.gr/.rest/catalog/v1/product/pdf/13005052)

Then, optical fiber type FO cable A-DQ(ZN)B2Y 36(3X12) SM 9/125 G652D will be installed for the control of wind turbines, sand of a quarry coating with a thickness of about 5-10cm, cable marking plates and the filling of the ditch with the sifted excavation products. Part of the excavation products will be deposited on one side of the channel and close to it for easy backfilling at a later stage, i.e. after the laying of the wiring. At the end, the channels will be compacted with

excavated products sifted to the level of the natural soil. Below is presented the intersection of the canal proposed to be built for the interconnection of the Residential Control with the existing Substation named PATRIARCHIS.



The existing 33/150KV substation "PATRIARCHIS" as shown in the attached plans (interconnection map), falls within the administrative boundaries of the Regional Unit of Rodopi, Region of Eastern Macedonia and Thrace.

To maximize safety, V136-4,5MW, within its tower, includes a transformer control panel. For the implementation of all the interconnection works of the internal and external network, it is necessary to transport the cables to be installed to the project, in a suitable deposition area. Quarry sand and 3A gravel will also be used. All the above construction will be done in compliance with safety rules and your deposition at the site will be temporary.

For the construction of the above, the following materials are required to be transported and unloaded to the project:

- ✓ All M.V.-33kV cables to be installed at the project, the unloading of which will be done at a suitable temporary deposit site near the project.
- ✓ The grounding conductor and fiber optic cables are to be installed in the underground cable ducts within the Wind Power Plant.
  Quarry sands.
- ✓ Gravel sand 3A.
- ✓ Asphalt and other road resurfacing materials.
- ✓ Underground cable coating marking plates.
- ✓ Underground cable marking tape.
- ✓ Other materials for the construction of underground cable sections (marking labels, cable labelling plates, stakes and spacers for maintaining the correct distances between cables, etc.)

Appropriate protection and safety measures for the personnel and visitors of the project shall be taken throughout the excavation. Finally, all the earthworks necessary for the shaping and drainage of the land and for the construction of the underground channels through which the cables will pass will be carried out.

To certify that each section of the power cables has been properly transported and laid, the following tests will be carried out:

- ✓ Electrical test of the sheath by applying a DC voltage of 3-5 kV between the PVC sheath and the earth and with an application duration depending on the length of the cable under test in accordance with the latest version of the international regulation VDE 0276-HD620, harmonized ELOT HD 620 S1/A1, Vol.1. The above test will be performed on each of the installed cables in sections of 1000-2000m of installed Medium Voltage network.
- ✓ Dielectric strength test with 3Uo voltage (VLF) according to IEEE Std 400.2/2013.
- ✓ Conductor electrical resistance measurement according to IEC-60502/2014.

In case a fault is found in the sheath or insulation in a cable, it will be followed by accurate fault location by an appropriate method by the test crew on the same or next day.

The technical characteristics of the interconnection are listed in the attached Interconnection Map.

Medium voltage connection line 33KV

Line	Μήκος (μ)
NODE 1 TO NODE 2	2334,80
NOD 2 TO W/T 2	23,73
NODE 2 TO W/T 3	281,91
NODE 3 TO W/T1	61,59
NODE 3 TO W/T3	529,05
NODE 1 TO NODE 4	2227,79
NODE 4 TO NODE 4	589,81
NODE 4 TO NODE 5	132,74
NODE 5 TO NODE 6	328,82
NODE 6 TO A SETTLEMENT	61,77
NODE 6 TO W/T5	18,84
NODE 5 TO NODE 7	170,55
NODE 7 TO NODE 8	385,02
NODE 8 TO W/T7	220,28
NODE 7 TO W/T8	441,28
NODE 8 TO W/T6	347,15
TOTAL INTERNAL DITCH	8155,13
OUTER DITCH	31149,11
TOTAL DITCH	39304,24

External interface coordinates

α/α	X	Y	α/α	X	Y	α/α	X	Y
1	671789.183	4576795.600	165	668505.275	4576292.493	329	666388.572	4574573.536
2	671741.196	4576834.493	166	668482.980	4576255.037	330	666375.063	4574558.495
3	671721.227	4576863.749	167	668468.224	4576226.627	331	666358.697	4574531.621
4	671709.998	4576872.520	168	668451.892	4576184.700	332	666322.578	4574465.181
5	671695.881	4576878.107	169	668438.354	4576136.405	333	666315.890	4574436.197
6	671677.949	4576881.297	170	668429.471	4576122.157	334	666313.660	4574405.876
7	671654.433	4576891.221	171	668409.851	4576107.443	335	666335.064	4574366.191
8	671646.961	4576893.386	172	668404.039	4576108.097	336	666370.101	4574324.874
9	671634.261	4576893.882	173	668389.848	4576149.300	337	666381.883	4574294.400
10	671621.993	4576891.115	174	668373.287	4576181.909	338	666396.598	4574271.213
11	671609.960	4576884.303	175	668355.005	4576222.932	339	666419.339	4574244.905
12	671600.337	4576872.993	176	668336.723	4576228.728	340	666463.930	4574228.852
13	671596.146	4576862.936	177	668249.326	4576183.246	341	666486.671	4574229.298
14	671591.676	4576840.790	178	668210.297	4576146.392	342	666534.382	4574207.449
15	671583.173	4576825.329	179	668180.211	4576151.141	343	666573.176	4574191.396
16	671572.223	4576814.515	180	668127.595	4576131.522	344	666597.701	4574165.088
17	671543.838	4576796.666	181	668054.676	4576085.084	345	666632.035	4574062.530

61	670491.110	4576299.010	225	666744.403	4576092.728	389	666482.033	4572536.566
62	670475.760	4576287.110	226	666715.419	4576094.512	390	666413.097	4572657.489
63	670461.740	4576279.430	227	666670.383	4576115.469	391	666400.611	4572705.201
64	670432.900	4576273.080	228	666664.402	4576108.822	392	666393.031	4572819.798
65	670399.690	4576260.250	229	666681.085	4576074.000	393	666383.221	4572840.310
66	670371.650	4576240.940	230	666706.651	4576036.380	394	666367.169	4572846.552
67	670331.960	4576190.670	231	666708.807	4576019.754	395	666330.159	4572837.634
68	670314.100	4576180.080	232	666701.823	4576004.668	396	666269.516	4572839.864
69	670288.812	4576176.940	233	666685.098	4575989.724	397	666208.427	4572846.552
70	670266.610	4576176.640	234	666672.166	4575983.927	398	666138.567	4572866.031
71	670243.460	4576178.490	235	666665.713	4575954.665	399	666118.355	4572900.061
72	670230.620	4576172.810	236	666647.196	4575922.393	400	666085.358	4573007.523
73	670214.620	4576163.020	237	666626.183	4575875.622	401	666072.873	4573043.642
74	670190.940	4576138.010	238	666601.130	4575848.843	402	666053.994	4573075.790
75	670172.950	4576112.750	239	666572.284	4575832.766	403	666049.240	4573115.878
76	670159.050	4576096.340	240	666553.110	4575830.537	404	666037.646	4573143.524
77	670118.440	4576074.120	241	666536.612	4575806.904	405	665997.515	4573184.101
78	670106.140	4576058.640	242	666552.707	4575785.002	406	665975.220	4573234.934
79	670078.620	4575986.140	243	666545.530	4575758.746	407	665941.331	4573287.551
80	670066.450	4575963.910	244	666523.681	4575740.018	408	665905.659	4573334.816
81	670022.260	4575913.640	245	666480.874	4575719.507	409	665887.516	4573376.466
82	670006.910	4575905.180	246	666467.051	4575702.117	410	665888.659	4573402.530
83	669947.275	4575890.005	247	666448.769	4575692.753	411	665951.587	4573454.318
84	669930.580	4575897.500	248	666402.395	4575674.025	412	665953.370	4573479.735
85	669898.170	4575916.550	249	666390.356	4575644.149	413	665946.682	4573527.447
86	669866.420	4575918.010	250	666381.884	4575629.880	414	665946.682	4573568.024
87	669836.130	4575906.900	251	666354.683	4575622.300	415	665969.869	4573597.453
88	669816.680	4575893.540	252	666341.306	4575595.992	416	665991.533	4573622.648
89	669791.540	4575868.930	253	666325.700	4575585.290	417	665995.032	4573648.475
90	669778.840	4575848.690	254	666311.877	4575573.251	418	665992.745	4573670.654
91	669759.530	4575793.920	255	666316.336	4575542.037	419	665985.921	4573693.323
92	669750.400	4575782.280	256	666314.827	4575528.828	420	665964.518	4573708.483
93	669695.230	4575749.070	257	666343.982	4575489.421	421	665919.928	4573727.211
94	669665.870	4575726.450	258	666373.857	4575476.936	422	665907.888	4573763.329
95	669648.332	4575721.152	259	666403.287	4575462.221	423	665916.806	4573823.972
96	669631.298	4575693.254	260	666432.271	4575442.155	424	665938.026	4573876.015
97	669620.406	4575664.874	261	666450.998	4575422.981	425	665952.578	4573918.779
98	669603.485	4575635.469	262	666461.257	4575406.074	426	665944.452	4573945.258
99	669582.243	4575619.345	263	666478.772	4575311.398	427	665920.820	4573971.566
100	669557.672	4575610.842	264	666478.877	4575282.144	428	665886.485	4574033.547
101	669522.808	4575605.041	265	666465.267	4575235.256	429	665852.150	4574111.580
102	669493.631	4575595.741	266	666451.444	4575199.584	430	665836.544	4574155.724
103	669468.719	4575589.627	267	666440.743	4575167.925	431	665827.180	4574165.088
104	669431.807	4575577.513	268	666441.968	4575154.309	432	665812.465	4574167.764
105	669386.312	4575550.262	269	666448.850	4575148.914	433	665794.183	4574157.508
106	669360.827	4575521.462	270	666477.753	4575163.020	434	665774.117	4574137.888
107	669337.621	4575497.347	271	666503.169	4575181.748	435	665745.134	4574083.934
108	669256.176	4575415.901	272	666538.396	4575195.125	436	665719.717	4574027.304
109	669215.226	4575376.316	273	666565.088	4575199.409	437	665702.327	4573993.861
110	669189.745	4575359.481	274	666626.368	4575191.202	438	665674.235	4573972.012
111	669136.055	4575339.461	275	666679.785	4575180.177	439	665628.753	4573946.596
112	669104.660	4575322.626	276	666711.522	4575166.884	440	665601.999	4573939.907
113	669052.844	4575315.964	277	666743.719	4575146.581	441	665580.149	4573941.691
114	669036.791	4575311.951	278	666754.009	4575133.659	442	665556.956	4573961.850
115	668985.958	4575319.532	279	666766.634	4575096.512	443	665543.139	4574008.576
116	668946.888	4575328.660	280	666779.183	4575084.095	444	665540.910	4574080.367
117	668904.804	4575353.420	281	666815.692	4575065.353	445	665539.126	4574197.639
118	668896.778	4575372.594	282	666837.904	4575045.106	446	665536.005	4574232.420
119	668908.817	4575395.335	283	666850.954	4575027.275	447	665529.317	4574251.593
120	668898.561	4575429.670	284	666867.918	4574983.766	448	665508.805	4574263.633

121	668895.770	4575454.004	285	666908.049	4574940.960	449	665479.821	4574271.659
122	668908.985	4575503.464	286	666946.397	4574896.369	450	665454.405	4574304.656
123	668901.237	4575519.742	287	666978.502	4574873.182	451	665412.044	4574447.345
124	668893.656	4575549.172	288	666993.217	4574860.697	452	665410.706	4574473.653
125	668898.116	4575572.359	289	666991.879	4574846.428	453	665408.923	4574488.814
126	668914.802	4575617.621	290	666974.935	4574852.671	454	665397.775	4574499.962
127	668891.873	4575753.395	291	666941.938	4574849.550	455	665363.886	4574504.866
128	668904.358	4575806.904	292	666906.712	4574849.104	456	665341.145	4574509.325
129	668902.574	4575869.776	293	666859.446	4574875.412	457	665312.162	4574505.758
130	668908.371	4575910.799	294	666834.140	4574893.677	458	665290.312	4574499.962
131	668936.463	4575949.147	295	666825.296	4574907.511	459	665273.814	4574505.312
132	668993.093	4575991.062	296	666785.426	4574941.679	460	665259.991	4574525.824
133	669015.554	4576095.383	297	666728.796	4574959.242	461	665262.220	4574559.267
134	669035.008	4576172.990	298	666692.733	4574962.871	462	665268.017	4574603.411
135	669063.991	4576228.283	299	666672.612	4574962.809	463	665265.342	4574639.975
136	669093.867	4576282.683	300	666637.714	4574954.549	464	665253.748	4574654.690
137	669143.397	4576335.056	301	666618.255	4574945.310	465	665244.384	4574685.903
138	669170.051	4576375.183	302	666594.979	4574923.693	466	665247.952	4574710.428
139	669170.116	4576406.644	303	666590.537	4574900.472	467	665272.030	4574755.018
140	669154.510	4576429.385	304	666603.925	4574843.734	468	665299.230	4574783.110
141	669135.782	4576443.654	305	666612.784	4574829.314	469	665363.886	4574797.825
142	669099.218	4576441.424	306	666624.957	4574823.751	470	665379.939	4574816.107
143	669045.709	4576429.831	307	666628.401	4574814.762	471	665378.155	4574828.146
144	669014.942	4576427.601	308	666627.708	4574806.847	472	665341.145	4574865.602
145	668969.014	4576429.831	309	666608.306	4574795.271	473	665316.621	4574891.910
146	668933.342	4576427.601	310	666603.046	4574769.401	474	665311.716	4574913.760
147	668911.953	4576431.094	311	666583.349	4574745.532	475	665303.244	4574929.812
148	668889.588	4576420.618	312	666565.654	4574736.337	476	665283.178	4574931.596
149	668860.660	4576420.913	313	666554.982	4574728.186	477	665247.060	4574927.137
150	668840.594	4576425.372	314	666527.573	4574719.933	478	665225.656	4574934.271
151	668809.827	4576425.372	315	666513.375	4574724.322	479	665206.483	4574975.294
152	668790.653	4576416.900	316	666497.818	4574723.955	480	665210.496	4575057.786
153	668767.912	4576398.172	317	666498.710	4574714.887	481	665214.509	4575078.744
154	668747.400	4576388.362	318	666504.028	4574709.765	482	665203.361	4575091.675
155	668727.335	4576395.050	319	666499.833	4574700.889	483	665185.079	4575089.446
156	668713.066	4576404.414	320	666485.553	4574683.876	484	665158.325	4575060.462
157	668691.662	4576408.427	321	666473.329	4574679.199	485	665144.056	4575053.773
158	668677.393	4576394.604	322	666467.743	4574667.072	486	665115.518	4575058.232
159	668667.584	4576378.106	323	666447.979	4574658.413	487	665095.007	4575090.783
160	668650.639	4576370.972	324	666430.041	4574653.798	488	665080.292	4575124.226
161	668629.236	4576367.850	325	666409.317	4574641.702	489	665064.685	4575149.197
162	668610.954	4576376.322	326	666399.153	4574624.494	490	665046.849	4575165.249
163	668596.239	4576369.634	327	666383.037	4574610.656	491	665027.675	4575169.708
164	668552.986	4576329.057	328	666386.696	4574592.605	492	665008.947	4575163.466

α/α	X	Y	α/α	X	Y	α/α	X	Y
493	664998.692	4575146.967	657	661289.376	4573796.890	821	659473.835	4570412.757
494	664995.570	4575117.983	658	661276.796	4573781.534	822	659439.236	4570442.473
495	664988.436	4575094.351	659	661257.802	4573719.070	823	659424.990	4570459.276
496	664973.275	4575083.203	660	661250.313	4573710.303	824	659405.082	4570479.732
497	664944.737	4575090.337	661	661232.415	4573702.084	825	659383.530	4570482.654
498	664849.314	4575164.803	662	661212.872	4573700.258	826	659355.038	4570475.166
499	664827.911	4575164.357	663	661189.494	4573707.016	827	659346.819	4570466.399
500	664815.871	4575150.088	664	661145.294	4573750.667	828	659347.549	4570446.491
501	664805.616	4575121.997	665	661132.144	4573761.808	829	659346.271	4570432.063
502	664801.602	4575088.108	666	661115.021	4573761.658	830	659347.001	4570417.451
503	664804.724	4575050.652	667	661103.139	4573754.940	831	659353.029	4570365.581
504	664800.265	4575024.790	668	661096.894	4573747.928	832	659349.376	4570361.745
505	664786.442	4575014.534	669	661099.634	4573642.726	833	659341.340	4570371.425
506	664759.878	4575015.998	670	661093.789	4573619.530	834	659324.719	4570380.375
507	664730.064	4575010.027	671	661120.272	4573564.920	835	659313.395	4570392.612
508	664712.398	4575011.950	672	661131.231	4573505.927	836	659301.341	4570410.694
509	664681.073	4575032.568	673	661126.801	4573490.373	837	659273.579	4570431.332
510	664654.187	4575064.116	674	661122.810	4573485.305	838	659245.453	4570442.291
511	664629.135	4575080.202	675	661095.822	4573484.083	839	659212.212	4570452.884
512	664614.323	4575080.528	676	661070.806	4573486.417	840	659034.318	4570529.776
513	664599.928	4575073.368	677	661047.934	4573484.999	841	658970.211	4570568.861
514	664595.776	4575062.736	678	661008.191	4573476.747	842	658947.746	4570579.455
515	664605.405	4575036.829	679	660977.812	4573475.791	843	658935.144	4570579.820
516	664608.445	4575005.733	680	660933.430	4573486.019	844	658881.575	4570578.105
517	664597.825	4574990.455	681	660909.504	4573488.211	845	658783.551	4570571.601
518	664576.785	4574990.943	682	660883.203	4573483.462	846	658751.406	4570586.212
519	664542.533	4574998.035	683	660859.656	4573472.038	847	658728.758	4570599.363
520	664521.196	4574994.603	684	660832.037	4573435.400	848	658707.207	4570630.047
521	664504.185	4574985.104	685	660779.785	4573397.305	849	658633.557	4570712.073
522	664498.834	4574967.714	686	660754.015	4573369.490	850	658612.233	4570751.686
523	664502.401	4574902.166	687	660737.404	4573364.124	851	658612.598	4570757.348
524	664501.955	4574856.684	688	660713.155	4573358.871	852	658627.392	4570758.626
525	664496.159	4574845.982	689	660683.758	4573362.005	853	658638.716	4570763.010
526	664441.758	4574831.268	690	660660.703	4573360.558	854	658650.222	4570777.986
527	664403.411	4574825.025	691	660629.148	4573355.065	855	658675.427	4570851.226
528	664372.643	4574829.038	692	660602.117	4573352.325	856	658680.724	4570872.595
529	664277.220	4574918.665	693	660531.973	4573365.123	857	658675.427	4570893.964
530	664241.102	4574927.137	694	660518.336	4573379.546	858	658630.680	4570973.231
531	664195.174	4574923.124	695	660509.452	4573395.911	859	658631.410	4570995.148
532	664164.853	4574908.409	696	660493.203	4573402.530	860	658637.255	4571019.074
533	664127.397	4574883.438	697	660473.615	4573398.849	861	658663.373	4571058.890
534	664075.672	4574835.727	698	660462.656	4573390.399	862	658663.190	4571096.514
535	664034.649	4574790.245	699	660455.400	4573374.430	863	658653.145	4571140.348
536	664024.839	4574754.126	700	660449.667	4573356.158	864	658633.785	4571183.269
537	664016.813	4574694.375	701	660450.195	4573333.938	865	658641.456	4571197.698
538	664001.652	4574621.693	702	660460.639	4573314.585	866	658659.354	4571207.743
539	663985.599	4574606.086	703	660498.113	4573286.267	867	658676.705	4571215.962
540	663809.468	4574623.477	704	660506.634	4573268.697	868	658704.102	4571216.510
541	663753.284	4574630.165	705	660507.465	4573253.070	869	658728.576	4571203.542
542	663700.221	4574656.474	706	660505.127	4573236.705	870	658747.205	4571200.072
543	663572.693	4574704.631	707	660497.997	4573209.704	871	658764.008	4571202.812
544	663519.185	4574723.359	708	660487.126	4573188.429	872	658822.636	4571169.936
545	663465.230	4574752.789	709	660484.209	4573149.386	873	658860.078	4571156.786
546	663394.332	4574800.946	710	660504.924	4573080.436	874	658884.506	4571154.904
547	663341.715	4574830.822	711	660513.614	4573060.748	875	658903.458	4571160.617
548	663290.436	4574851.779	712	660516.523	4573037.120	876	658931.126	4571182.356
549	663275.276	4574860.697	713	660508.904	4572986.917	877	658947.239	4571181.612
550	663255.210	4574854.901	714	660512.072	4572964.038	878	658972.379	4571161.725
551	663247.630	4574844.645	715	660511.636	4572945.303	879	659070.482	4571096.331
552	663247.184	4574789.799	716	660518.096	4572920.587	880	659115.229	4571076.971

553	663248.521	4574734.507	717	660564.741	4572870.019	881	659158.150	4571061.812
554	663242.725	4574719.346	718	660577.132	4572843.368	882	659183.172	4571055.968
555	663225.334	4574707.307	719	660580.497	4572814.943	883	659196.870	4571069.300
556	663198.134	4574701.956	720	660584.199	4572770.265	884	659194.313	4571085.738
557	663167.813	4574706.415	721	660584.730	4572717.009	885	659170.752	4571111.125
558	663131.249	4574707.307	722	660597.938	4572669.785	886	659140.433	4571141.444
559	663096.468	4574723.359	723	660626.109	4572625.016	887	659026.099	4571276.416
560	663058.121	4574735.844	724	660630.083	4572605.845	888	658912.496	4571415.407
561	662994.802	4574753.680	725	660629.148	4572587.260	889	658882.360	4571456.684
562	662973.845	4574766.612	726	660607.406	4572522.502	890	658848.754	4571505.632
563	662853.005	4574815.661	727	660597.354	4572505.787	891	658843.458	4571517.321
564	662820.008	4574820.566	728	660621.083	4572433.665	892	658838.892	4571533.576
565	662796.376	4574826.809	729	660630.631	4572409.732	893	658847.476	4571560.059
566	662739.746	4574855.346	730	660635.694	4572378.960	894	658862.818	4571580.515
567	662723.693	4574849.550	731	660667.868	4572297.933	895	658887.109	4571606.998
568	662717.005	4574823.687	732	660692.707	4572252.090	896	658895.693	4571633.116
569	662713.883	4574792.920	733	660708.232	4572210.447	897	658881.995	4571660.512
570	662704.074	4574771.963	734	660740.194	4572179.033	898	658874.957	4571684.201
571	662675.536	4574744.316	735	660770.330	4572142.870	899	658872.680	4571706.538
572	662670.631	4574731.831	736	660785.672	4572117.848	900	658892.223	4571774.116
573	662680.441	4574714.887	737	660793.891	4572083.329	901	658888.570	4571807.174
574	662706.303	4574709.090	738	660796.996	4572040.590	902	658878.831	4571830.949
575	662764.716	4574668.513	739	660797.909	4572010.820	903	658862.065	4571856.881
576	662833.386	4574607.870	740	660806.493	4571966.986	904	658858.114	4571874.924
577	662856.127	4574580.670	741	660820.557	4571938.859	905	658861.722	4571910.732
578	662902.501	4574500.853	742	660832.063	4571893.564	906	658853.868	4571949.635
579	662947.091	4574400.079	743	660852.885	4571828.360	907	658862.635	4571964.611
580	662964.035	4574355.043	744	660864.026	4571783.430	908	658871.950	4571971.186
581	662953.779	4574315.804	745	660864.756	4571760.235	909	658879.986	4571981.597
582	662920.783	4574282.807	746	660853.798	4571703.616	910	658894.232	4572004.793
583	662865.491	4574269.875	747	660847.953	4571679.507	911	658921.446	4572021.596
584	662772.743	4574280.577	748	660847.405	4571651.928	912	658918.889	4572030.180
585	662728.598	4574297.521	749	660834.438	4571615.765	913	658894.346	4572054.778
586	662681.333	4574301.981	750	660833.524	4571597.136	914	658889.987	4572065.207
587	662632.283	4574310.007	751	660833.707	4571548.553	915	658885.161	4572082.939
588	662567.627	4574322.938	752	660835.899	4571515.677	916	658870.021	4572114.471
589	662498.066	4574331.856	753	660829.324	4571494.674	917	658865.542	4572117.584
590	662468.637	4574322.046	754	660819.644	4571477.140	918	658857.393	4572114.465
591	662429.397	4574321.600	755	660806.676	4571430.749	919	658857.840	4572108.039
592	662383.915	4574339.436	756	660777.279	4571409.636			
593	662348.243	4574356.827	757	660756.203	4571406.798			
594	662330.407	4574348.800	758	660731.245	4571421.069			
595	662309.003	4574327.843	759	660693.255	4571455.771			
596	662281.803	4574317.587	760	660667.725	4571470.824			
597	662226.065	4574330.072	761	660632.197	4571470.570			
598	662157.396	4574369.312	762	660618.190	4571449.744			
599	662125.291	4574402.755	763	660569.241	4571402.257			
600	662053.055	4574451.804	764	660540.201	4571359.518			
601	662027.638	4574467.411	765	660536.366	4571323.538			
602	662003.114	4574473.653	766	660551.890	4571280.800			
603	661982.602	4574464.735	767	660553.900	4571245.367			
604	661979.927	4574448.237	768	660548.817	4571218.557			
605	661945.146	4574337.207	769	660549.881	4571192.401			
606	661931.769	4574267.646	770	660555.543	4571146.375			
607	661927.310	4574228.852	771	660566.867	4571098.158			
608	661909.474	4574207.003	772	660564.493	4571078.433			
609	661879.153	4574188.275	773	660556.457	4571058.525			
610	661833.670	4574187.383	774	660538.740	4571033.137			
611	661804.241	4574202.098	775	660507.326	4570975.605			
612	661777.041	4574240.892	776	660471.711	4570925.196			

613	661734.680	4574297.521	777	660418.014	4570852.870
614	661686.968	4574352.813	778	660402.123	4570824.126
615	661650.104	4574440.195	779	660361.943	4570758.078
616	661634.437	4574444.506	780	660328.702	4570715.523
617	661617.762	4574441.771	781	660307.150	4570700.546
618	661598.275	4574421.416	782	660297.288	4570687.761
619	661585.748	4574398.742	783	660273.179	4570645.388
620	661575.047	4574376.000	784	660221.309	4570636.439
621	661551.414	4574370.204	785	660209.930	4570639.400
622	661530.456	4574358.164	786	660177.840	4570603.381
623	661523.803	4574342.130	787	660164.326	4570593.270
624	661523.322	4574321.154	788	660130.539	4570593.935
625	661543.833	4574285.928	789	660100.256	4570607.848
626	661544.725	4574270.321	790	660083.443	4570610.961
627	661531.348	4574256.052	791	660068.361	4570602.999
628	661519.755	4574239.554	792	660044.694	4570585.847
629	661520.646	4574200.760	793	660034.648	4570579.637
630	661531.794	4574174.006	794	660003.291	4570585.372
631	661526.443	4574151.711	795	659969.480	4570574.627
632	661502.364	4574135.659	796	659916.114	4570542.378
633	661484.528	4574129.416	797	659903.512	4570536.168
634	661460.449	4574109.350	798	659887.740	4570538.079
635	661444.397	4574100.432	799	659866.407	4570546.060
636	661422.548	4574099.540	800	659856.876	4570551.686
637	661391.992	4574109.423	801	659841.309	4570564.191
638	661367.581	4574110.894	802	659819.611	4570562.801
639	661351.833	4574093.845	803	659790.593	4570548.073
640	661370.904	4574045.144	804	659760.986	4570521.045
641	661427.704	4573977.498	805	659742.052	4570502.167
642	661440.155	4573960.236	806	659729.636	4570461.103
643	661455.477	4573908.517	807	659719.409	4570448.099
644	661475.164	4573866.779	808	659713.929	4570448.683
645	661555.631	4573746.580	809	659684.637	4570477.994
646	661579.722	4573708.825	810	659673.107	4570481.232
647	661582.357	4573684.314	811	659663.170	4570479.242
648	661576.315	4573666.619	812	659643.612	4570464.025
649	661551.820	4573659.313	813	659629.731	4570448.866
650	661529.204	4573671.942	814	659625.896	4570428.227
651	661491.663	4573704.916	815	659620.212	4570420.893
652	661455.860	4573743.346	816	659605.622	4570415.807
653	661410.385	4573766.262	817	659584.835	4570412.745
654	661337.380	4573795.434	818	659565.259	4570404.118
655	661313.236	4573806.230	819	659512.963	4570397.300
656	661298.854	4573805.890	820	659494.394	4570403.570

Coordinates of the control house
Area = 31.50sq.m.
Perimeter=27.00m

α/α	X	Y
E1	671786.699	4576790.088
E2	671784.936	4576792.515
E3	671793.431	4576798.686
E4	671795.194	4576796.259

Coordinates of substation "Patriarch"

View HGRS'87

Centro-gravitational Coordinates

Substation H.V/ M.V

α/α	X	Y
N1	658826.292	4572084.753

Medium voltage connection line 33KV	
EXTERNAL INTERCONNECTION	
Line	Length (m)
SUBSTATION TO NODE 1	31149,11
NODE 1 TO CONTROL HOUSE	2751,11
TOTAL EXTERNAL DITCH	33900,22

Μήκος γραμμής : 2.334,80m

α/α	X	Y
94	669665.870	4575726.450
Ε1	669675.775	4575732.296
Ε2	669743.120	4575733.330
Ε3	669787.310	4575728.570
Ε4	669809.270	4575723.010
Ε5	669852.930	4575698.930
Ε6	669883.350	4575666.660
Ε7	669910.610	4575642.840
Ε8	669957.440	4575610.560
Ε9	669993.160	4575550.770
Ε10	670004.530	4575520.870
Ε11	670004.000	4575499.570
Ε12	670012.704	4575501.997
Ε13	670060.731	4575533.949
Ε14	670068.454	4575567.123
Ε15	670076.872	4575591.980
Ε16	670086.077	4575606.413
Ε17	670097.368	4575617.455
Ε18	670116.247	4575629.896
Ε19	670125.687	4575640.184
Ε20	670131.413	4575653.833
Ε21	670141.132	4575707.287
Ε22	670148.156	4575719.837
Ε23	670158.446	4575729.885
Ε24	670171.773	4575737.290
Ε25	670201.332	4575743.668
Ε26	670217.768	4575750.225
Ε27	670261.303	4575782.731
Ε28	670333.148	4575817.258
Ε29	670348.493	4575820.673
Ε30	670397.294	4575828.479
Ε31	670435.658	4575841.946
Ε32	670522.302	4575847.293
Ε33	670537.761	4575851.829
Ε34	670548.303	4575859.475
Ε35	670556.026	4575869.960
Ε36	670560.093	4575881.322
Ε37	670562.364	4575901.014
Ε38	670571.286	4575916.094
Ε39	670579.803	4575922.964
Ε40	670620.037	4575944.566
Ε41	670627.645	4575952.594
Ε42	670635.188	4575966.917
Ε43	670640.418	4575973.449
Ε44	670649.156	4575980.149
Ε45	670659.173	4575984.718
Ε46	670668.144	4575986.242
Ε47	670677.216	4575985.542
Ε48	670695.300	4575980.426
Ε49	670704.434	4575975.477
Ε50	670711.295	4575968.858
Ε51	670738.557	4575932.732
Ε52	670776.887	4575907.955
Ε53	670787.869	4575898.268
Ε54	670801.463	4575879.873
Ε55	670813.292	4575860.297
Ε56	670823.871	4575848.682
Ε57	670835.550	4575839.705
Ε58	670848.399	4575832.503
Ε59	670876.860	4575824.138
Ε60	670931.333	4575831.326
Ε61	670943.201	4575829.860
Ε62	670955.064	4575831.374
Ε63	670966.532	4575834.388
Ε64	670977.108	4575839.750
Ε65	670985.843	4575847.112
Ε66	670992.704	4575856.246
Ε67	671005.056	4575882.577
Ε68	671014.824	4575908.404
Ε69	671027.463	4575923.901
Ε70	671042.686	4575934.658
Ε71	671124.470	4575973.713
Ε72	671137.733	4575986.388
Ε73	671159.873	4576018.305
Ε74	671168.033	4576023.948
Ε75	671177.424	4576027.146
Ε76	671189.693	4576027.839
Ε77	671219.908	4576022.445
Ε78	671236.980	4576022.869
Ε79	671307.320	4576033.815
Ε80	671352.066	4576049.029
Ε81	671370.486	4576050.525
Ε82	671386.110	4576046.432
Ε83	671411.683	4576030.666
Ε84	671432.600	4576023.489
Ε85	671475.245	4576019.591
Ε86	671489.130	4576014.709

Μήκος γραμμής : 23,73m

α/α	X	Y
Ε86	671489.130	4576014.709
Ε113	671489.693	4576003.254
ΑΓ2	671481.218	4575994.392

Μήκος γραμμής : 2.227,79m

α/α	X	Y
94	669665.870	4575726.450
93	669695.230	4575749.070
92	669750.400	4575782.280
91	669759.530	4575793.920
90	669778.840	4575848.690
89	669791.540	4575868.930
88	669816.680	4575893.540
87	669836.130	4575906.900
86	669866.420	4575918.010
85	669898.170	4575916.550
84	669930.580	4575897.500
83	669947.650	4575890.100
82	670006.910	4575905.180
81	670022.260	4575913.640
80	670066.450	4575963.910
79	670078.620	4575986.140
78	670106.140	4576038.640
77	670118.440	4576074.120
76	670159.050	4576096.340
75	670172.950	4576112.750
74	670190.940	4576138.010
73	670214.620	4576163.020
72	670230.620	4576172.810
71	670243.460	4576178.490
70	670266.610	4576176.640
69	670288.570	4576176.910
68	670314.100	4576180.080
67	670331.960	4576190.670
66	670371.650	4576240.940
65	670399.690	4576260.250
64	670432.900	4576273.080
63	670461.740	4576279.430
62	670475.760	4576287.110
61	670491.110	4576299.010
60	670509.890	4576306.420
59	670578.950	4576318.860
58	670596.150	4576319.120
57	670611.760	4576321.770
56	670643.900	4576330.890
55	670671.820	4576341.080
54	670704.890	4576358.680
53	670731.750	4576370.850
52	670751.190	4576371.110
51	670762.440	4576366.220
50	670796.700	4576368.070
49	670810.720	4576372.830
48	670874.750	4576420.060
47	670884.680	4576432.760
46	670896.050	4576456.170
45	670902.010	4576487.660
44	670910.740	4576511.340
43	670941.160	4576570.340
42	670952.150	4576579.070
41	670963.650	4576583.040
40	670987.070	4576597.860
39	670997.390	4576597.990
38	671018.650	4576589.084
37	671028.870	4576583.700
36	671041.180	4576582.650
35	671071.600	4576587.280
34	671090.920	4576585.820
33	671113.670	4576578.020
32	671133.780	4576563.330
31	671151.240	4576556.320
30	671166.330	4576556.720
29	671187.620	4576561.350
28	671248.880	4576569.810
27	671306.420	4576573.390
26	671407.360	4576617.570
25	671455.780	4576631.860

Μήκος γραμμής : 389,81m

α/α	X	Y
25	671455.780	4576631.860
Σ1	671469.140	4576632.650
Σ2	671487.530	4576625.380
Σ3	671512.530	4576612.010
Σ4	671527.880	4576609.770
Σ5	671553.280	4576617.840
Σ6	671598.520	4576653.420
Σ7	671614.130	4576658.980
Σ8	671633.710	4576658.710
Σ9	671658.050	4576652.360
Σ10	671690.330	4576638.610
Σ11	671722.350	4576631.730
Σ12	671757.800	4576628.550
Σ13	671796.170	4576615.060
Σ14	671837.180	4576610.300
Σ15	671860.730	4576611.880
Σ16	671901.305	4576598.760
Σ17	671936.007	4576594.809
Σ18	671954.375	4576594.548
ΑΓ4	672009.411	4576565.252

Μήκος γραμμής : 18,84m

α/α	X	Y
2	671741.196	4576834.493
ΑΓ5	671723.951	4576826.905

Μήκος γραμμής : 170,55m

α/α	X	Y
19	671509.167	4576749.945
Ζ1	671511.545	4576761.832
Ζ2	671511.196	4576786.577
Ζ3	671514.482	4576798.169
Ζ4	671523.688	4576810.208
Ζ5	671539.842	4576819.998
Ζ6	671547.557	4576826.882
Ζ7	671553.824	4576836.144
Ζ8	671557.491	4576846.709
Ζ9	671558.379	4576856.467
Ζ10	671557.053	4576866.175
Ζ11	671544.136	4576899.012

Μήκος γραμμής : 385,02m

α/α	X	Y
Ζ11	671544.136	4576899.012
Ζ12	671507.253	4576955.445
Ζ13	671487.984	4577019.819
Ζ14	671485.348	4577040.750
Ζ15	671498.508	4577084.517
Ζ16	671527.212	4577133.562
Ζ17	671543.897	4577172.514
Ζ18	671554.120	4577189.886
Ζ19	671568.120	4577227.424
Ζ20	671578.101	4577249.458

Μήκος γραμμής : 220,28m

α/α	X	Y
Ζ20	671578.101	4577249.458
Ζ21	671392.515	4577279.050
Ζ22	671610.904	4577309.378
Ζ23	671613.414	4577320.159
Ζ24	671613.567	4577331.227
Ζ25	671610.078	4577350.787
Ζ26	671610.494	4577361.430
Ζ27	671604.398	4577366.967
Ζ28	671571.809	4577337.668
ΑΓ7	671529.445	4577316.907

Μήκος γραμμής : 441,28m

α/α	X	Y
Ζ11	671544.136	4576899.012
Κ1	671544.207	4576907.080
Κ2	671552.585	4576930.298
Κ3	671568.196	4576947.735
Κ4	671585.290	4576960.772
Κ5	671605.345	4576969.903
Κ6	671629.493	4576968.979
Κ7	671646.015	4576964.327
Κ8	671662.002	4576962.023
Κ9	671676.402	4576967.994
Κ10	671689.327	4576977.172
Κ11	671698.209	4576990.545
Κ12	671700.798	4576997.848
Κ13	671706.689	4577023.003
Κ14	671712.580	4577037.055
Κ15	671726.224	4577056.841
Κ16	671739.855	4577067.711
Κ17	671749.799	4577071.325
Κ18	671769.079	4577071.074
Κ19	671777.808	4577071.697
Κ20	671793.241	4577076.153
Κ21	671807.821	4577086.811
Κ22	671812.421	4577093.628
ΑΓ8	671846.838	4577149.097

Μήκος γραμμής : 347,15m

α/α	X	Y
Ζ20	671578.101	4577249.458
Μ1	671568.143	4577248.862
Μ2	671553.173	4577233.785
Μ3	671533.819	4577203.323
Μ4	671525.449	4577194.200
Μ5	671486.042	4577167.181
Μ6	671454.179	4577153.090
Μ7	671411.160	4577120.512
ΑΓ6	671401.409	4576990.006

Μηκος γραμμής : 281,91m

α/α	X	Y
E86	671489.130	4576014.709
E87	671516.662	4576002.291
E88	671555.795	4575997.845
E89	671594.186	4575986.754
E90	671610.805	4575984.800
E91	671623.305	4575985.877
E92	671635.442	4575989.055
E93	671686.231	4576011.651
E94	671759.549	4576027.205

Μηκος γραμμής : 61,59m

α/α	X	Y
E94	671759.549	4576027.205
ΑΓ1	671820.700	4576019.886

Μηκος γραμμής : 529,05m

α/α	X	Y
E94	671759.549	4576027.205
E95	671754.999	4576053.127
E96	671700.676	4576085.187
E97	671683.914	4576094.002
E98	671668.737	4576098.929
E99	671639.647	4576095.566
E100	671622.534	4576099.941
E101	671615.379	4576104.978
E102	671613.495	4576110.261
E103	671608.278	4576117.214
E104	671597.239	4576144.372
E105	671574.993	4576169.756
E106	671567.747	4576175.985
E107	671557.646	4576181.120
E108	671546.679	4576183.974
E109	671520.411	4576182.110
E110	671510.223	4576183.324
E111	671496.772	4576188.959
E112	671406.957	4576249.554
ΑΓ3	671357.483	4576312.364

Μηκος γραμμής : 132,74m

α/α	X	Y
25	671455.780	4576631.860
24	671474.980	4576670.314
23	671479.874	4576706.059
22	671482.591	4576715.005
21	671488.631	4576724.434
20	671502.829	4576738.154
19	671509.167	4576749.945

Μηκος γραμμής : 328,82m

α/α	X	Y
19	671509.167	4576749.945
18	671537.339	4576791.132
17	671543.838	4576796.666
16	671572.223	4576814.515
15	671582.964	4576824.949
14	671591.676	4576840.790
13	671596.146	4576862.936
12	671600.337	4576872.993
11	671609.960	4576884.303
10	671621.993	4576891.115
9	671634.261	4576893.882
8	671646.961	4576893.386
7	671654.433	4576891.221
6	671677.949	4576881.297
5	671695.881	4576878.107
4	671709.998	4576872.520
3	671721.227	4576863.749
2	671741.196	4576834.493

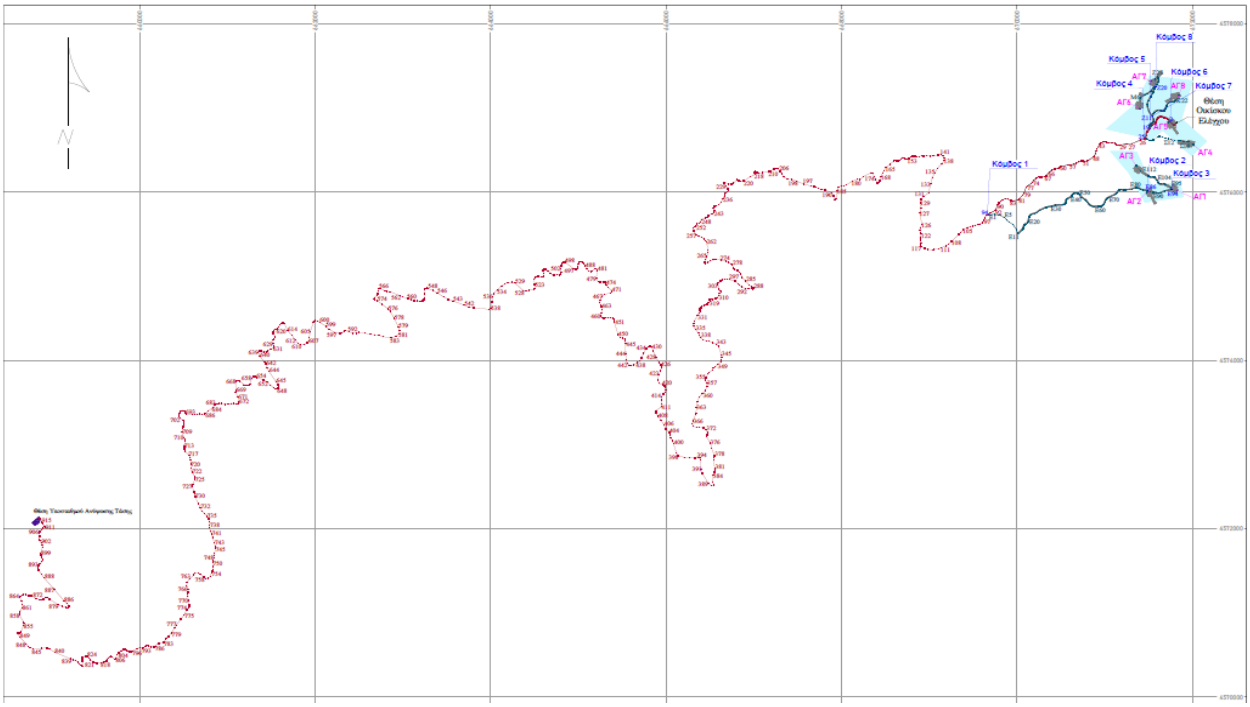
Μηκος γραμμής : 61,77m

α/α	X	Y
2	671741.196	4576834.493
1	671789.183	4576795.600

Internal Interconnection Length

INTERCONNECTION LINE M.V. 33KV

INTERNAL INTERCONNECTION	
Line	Lenght
W/T 1 – CONTROL HOUSE	5429,37
W/T 2 - CONTROL HOUSE	5109,60
W/T 3 - CONTROL HOUSE	5896,84
W/T 4 - CONTROL HOUSE	1113,18
W/T 5 - CONTROL HOUSE	80,61
W/T 6 - CONTROL HOUSE	1293,35
W/T 7 - CONTROL HOUSE	1166,48
W/T 8 - CONTROL HOUSE	1002,46
TOTAL	**21091,89**



6.2.3 Road Construction

It is a fact that the transportation of wind turbine equipment is one of the most important pieces for the implementation of a wind farm. To achieve this, access to the wind power plant site must be ensured by improving the existing network or even creating new routes.

The transportation of the equipment of the Wind Turbines to the installation site of the Wind Power Plant under study is done through a road network. This can take place through cases where:

a. The existing road network meets the specifications for the transport of equipment (e.g. have the appropriate widening).
b. The existing network does not meet the conditions, so it needs to be improved.
c. The opening of a new access road is required since there is no existing road network.

The above are considered necessary, firstly for the transport of the equipment of the Wind Turbines with special vehicles during the construction stage of the Wind Power Plant and secondly for its maintenance during its operation phase.

The intervention projects mentioned in this study aim to serve the needs of the Wind Power Plant under development and are:

- Construction of a road network 935.31 m long,
- Improvement of existing road network 3.363.61 m long and
- Configuration of Wind Turbine Construction Squares

The first case, i.e. the opening of the proposed forest roads aims to:

- To transport the wind turbine equipment to the Wind Farm,
- the movement of personnel and machinery to the wind turbines
- the digging of a trench for the installation of the underground connection cable for the Wind Turbines and

- the fire protection of the site of the Wind Power Plant and, by extension, of the wider area.

During the design and preparation of the forest road design, the Decree No. 126386/1739/10-6-66 as amended by Decree No. 4187/2281/eng. 55/22-05-1973 and 92833/46679/1-12-97 Decisions of the Ministry of Agriculture concerning the classification of categories and the technical characteristics of forest roads. Also taken into account was the document of the Ministry of Agriculture No. 54223/726/04-03-1998 on "Technical Specifications of Forest Roads of Category C", as well as the document of the Special Secretariat for Forests of the Ministry of Environment and Natural Resources of the Ministry of Agriculture No. 135661/4400/16-09-2013 and the document of the Special Secretariat for Forests of the Ministry of Environment and Natural Resources of the Ministry of Agriculture No. ΥΠΕΝ/ΔΠΔ/20103/898/21-02-2020 decision of the General Directorate of Forests and Forest Environment of the Ministry of Environment and Natural Resources.

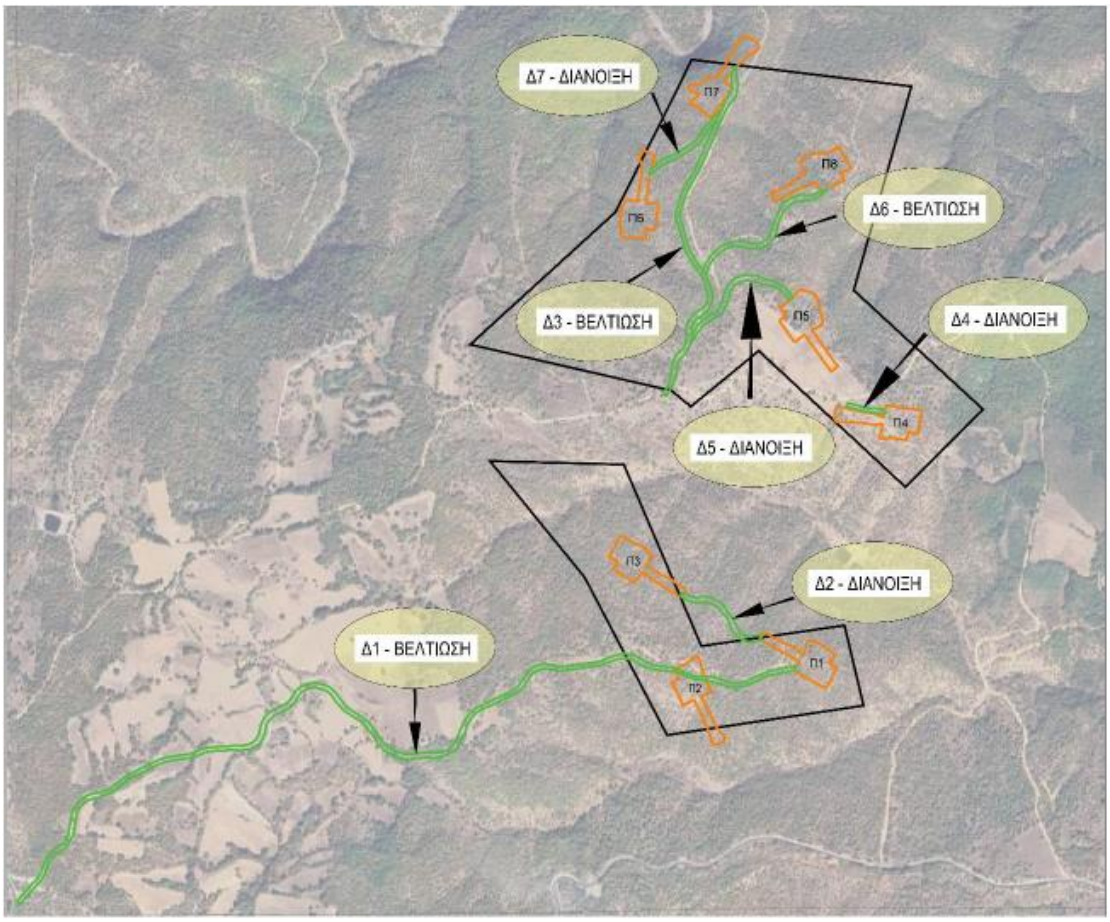
According to the decision 92833/4679/1-12-1997 the technical elements of forest roads of category C are:

- Deck width 4-5 m.,
- maximum longitudinal gradient of 12%,
- minimum radius of curvature of 20 m and at manoeuvres 15 m,
- trenches of triangular cross-section in earthy and rocky soils with an opening of 1.00m - 1.20m and a height of 0.40m,
- triangular cross-section trenches in rocky soils with an opening of 0,80 m and a height of 0,40 m,
- slope gradients for earth and rocky soils 1:1 to 1:3,
- slope gradients for rocky soils 1:5 to 1:10 and
- in places widening to facilitate vehicular movement.

Deviations from the above decision for roads of Category C are allowed regarding road widening in accordance with the order No. 135661 / 4400 / 16-9-2013 on "Roads in areas protected by the provisions of forestry legislation".

This order states "……may be approved to the maximum extent possible to widen the forest road beyond 5m deck width at any points of its length required, up to a maximum of 10m."

There are seven (7) interventions to provide access to the W/Ts and for optimal design they have been divided into seven (7) sections/branches.



Picture 28: Illustration of interventions

The following summary table summarises the data of the roads under study:

SUMMARY TABLE OF ACCOMPANYING ROAD WORKS								
A/A	**FOREST ROAD CONSTRUCTION INTERVENTION**	**LENGTH (m.)**	**PRINCIPLE OF ENGRAVING**		**END OF ENGRAVING**		**VOLUMES (m³)**	
			X	**Y**	**X**	**Y**	EXCAVATIONS	**BACKFILLS**
1	IMPROVEMENT D1	2153.28	670009.70	4575503.45	671757.94	4576028.86	4755.80	4010.82
2	ENLARGMENT D2	275.29	671700.65	4576082.94	671477.00	4576197.39	1478.22	779.12
3	IMPROVEMENT D3	823.19	671452.92	4576633.20	671610.05	4577376.44	1309.90	1368.28
4	ENLARGMENT D4	92.73	671860.23	4576612.89	671951.23	4576596.59	187.97	93.30
5	ENLARGMENT D5	338.55	671504.47	4576746.96	671741.43	4576837.38	710.37	724.20
6	IMPROVEMENT D6	387.14	671540.01	4576900.97	671816.83	4577105.38	664.04	1144.87
7	ENLARGMENT D7	228.74	671583.84	4577268.90	671412.00	4577123.66	339.09	357.39
Total:		**4298.92**	**Total:**				**9445.39**	**8477.98**

Table 37: Aggregated table of accompanying road works

The roads under study were designed for a vehicle with a length of about 45m, which is the length of the largest part of the wind turbine tower.

Picture 29: Design of the Study Vehicle

The transfer of the blades cannot be achieved through a conventional vehicle, so it is necessary to use a special blade lifter vehicle, to avoid additional widening of the roads on bends and to limit the impact on the environment as much as possible.

The blade lifter technology provides a safe solution to avoid obstacles such as trees or buildings and requires less space as it adjusts the load whenever required. At the same time, a wind sensor is available to warn when the maximum permissible wind speed per model is exceeded.

The following tables analyze the technical data of each road construction sector.

1. Improvement of Road D1 (Access to W/T1)

The road starts from an existing road network and follows a north-eastern course to the square of W/T1. The road also provides access to the square of W/T2.

technical elements under road improvement - sector 1	
number of peaks	38
number of cross-sections	169
total road length(m)	2153.28
maximum length of the red line(m)	373.33
minimum length of the red line(m)	286.50
altitudinal difference of the red line(m)	86.83
lower downward slope(m)	-0,05%
maximum downward slope(m)	-11.44%
lower upward slope(m)	+0.03%
maximum upward slope(m)	+8.39%
number of drains	3
excavations in semi-basement soil(m^3)	2377.90
excavations in rocky ground(m^3)	2377.90
total excavation(m^3)	4755.80
total embankments(m^3)	4010.82
percentage of excavation in rocky ground	50%

Table 38: Technical data of road under improvement - Sector 1

2. Opening of Road D2 (Access to W/T3)

Starts from the square of W/T1 and ends at the square of W/T3.

technical elements under road improvement - sector 2	
number of peaks	7
number of cross-sections	25

total road length(m)	275.29
maximum length of the red line(m)	298.00
minimum length of the red line(m)	286.50
altitudinal difference of the red line(m)	11.50
lower downward slope(m)	-
maximum downward slope(m)	-
lower upward slope(m)	+0.15%
maximum upward slope(m)	+8.71%
number of drains	2
excavations in semi-basement soil(m^3)	739.11
excavations in rocky ground(m^3)	739.11
total excavation(m^3)	1478.22
total embankments(m^3)	779.12
percentage of excavation in rocky ground	50%

Table 39: Technical data of road under construction - Sector 2

3. Improvement of Road D3 (Access to W/T7)

It starts from the existing road network and ends at the square of W/T 7.

technical elements under road improvement - sector 3	
number of peaks	16
number of cross-sections	69
total road length(m)	823.19
maximum length of the red line(m)	300.75
minimum length of the red line(m)	259.90
altitudinal difference of the red line(m)	40.85
lower downward slope(m)	-1.39%
maximum downward slope(m)	-11.35%
lower upward slope(m)	+0.09%
maximum upward slope(m)	+4.37%
number of drains	2
excavations in semi-basement soil(m^3)	654.95
excavations in rocky ground(m^3)	654.95
total excavation(m^3)	1309.90
total embankments(m^3)	1368.28
percentage of excavation in rocky ground	50%

Table 40: Technical data of road under improvement - Sector 3

4. Opening of Road D4 (Access to W/T4)

It starts from the existing road network and ends at the square of W/T4.

technical elements under road improvement - sector 3	
number of peaks	4
number of cross-sections	12
total road length(m)	92.73
maximum length of the red line(m)	306.50
minimum length of the red line(m)	301.42

altitudinal difference of the red line(m)	5.08
lower downward slope(m)	-
maximum downward slope(m)	-
lower upward slope(m)	+1.53%
maximum upward slope(m)	+10.34%
number of drains	0
excavations in semi-basement soil(m^3)	46.65
excavations in rocky ground(m^3)	46.65
total excavation(m^3)	93.30
total embankments(m^3)	187.97
percentage of excavation in rocky ground	50%

Table 41: Technical data of road under construction - Sector 4

5. Opening of Forest Road D5 (Access to W/T5)

It starts from Section D4 of Branch 3 and follows a north-eastern course and ends at the square of W/T5.

technical elements under road improvement - sector 5	
number of peaks	8
number of cross-sections	34
total road length(m)	299.58
maximum length of the red line(m)	296.37
minimum length of the red line(m)	359.04
altitudinal difference of the red line(m)	3.21
lower downward slope(m)	-0.51%
maximum downward slope(m)	-5.85%
lower upward slope(m)	+1.45%
maximum upward slope(m)	+6.65%
number of drains	2
excavations in semi-basement soil(m^3)	355.19
excavations in rocky ground(m^3)	355.19
total excavation(m^3)	710.37
total embankments(m^3)	724.20
percentage of excavation in rocky ground	50%

Table 42: Technical data of the road under construction - Sector 5

6. Improvement of Forest Road D6 (Access to W/T8)

Starting from Section D7 of Branch 3 and following a northerly course to the square of W/T8.

technical elements under road improvement - sector 6	
number of peaks	9
number of cross-sections	31
total road length(m)	387.14
maximum length of the red line(m)	291.04
minimum length of the red line(m)	268.80
altitudinal difference of the red line(m)	22.24
lower downward slope(m)	-0.25%
maximum downward slope(m)	-11.25%

lower upward slope(m)	-
maximum upward slope(m)	-
number of drains	1
excavations in semi-basement soil(m^3)	332.02
excavations in rocky ground(m^3)	332.02
total excavation(m^3)	664.04
total embankments(m^3)	1144.87
percentage of excavation in rocky ground	50%

Table 43: Technical data of road under improvement - Sector *6*

7. Opening of Forest Road D7 (Access to W/T6)

It starts from Section 22 of Branch 3 and follows a westerly course to the square of W/T6.

technical elements under road improvement - sector 7	
number of peaks	6
number of cross-sections	23
total road length(m)	228.74
maximum length of the red line(m)	269.61
minimum length of the red line(m)	264.81
altitudinal difference of the red line(m)	4.80
lower downward slope(m)	-0.17%
maximum downward slope(m)	-1.71%
lower upward slope(m)	+0.75%
maximum upward slope(m)	+5.05%
number of drains	2
excavations in semi-basement soil(m^3)	169.54
excavations in rocky ground(m^3)	169.54
total excavation(m^3)	339.09
total embankments(m^3)	357.39
percentage of excavation in rocky ground	50%

Table 44: Technical data of the road under construction - Section 7

TABLE OF EXCAVATIONS - EMBANKMENTS FOR ROADS & SQUARES		
SECTION	**EXCAVATION (m3)**	**BACKFILL(m^3)**
Δ1	4755.80	4010.82
Δ2	1478.22	779.12
Δ3	1309.90	1368.28
Δ4	187.97	93.30
Δ5	710.37	724.20
Δ6	664.04	1144.87
Δ7	339.09	357.39
Π1	6915	5367
Π2	2967	2894
Π3	6057	5337
Π4	6353	6549
Π5	14374	17189
Π6	10417	9375
Π7	27731	6884
Π8	11297	13800
TOTAL	**95556.39**	**75872.98**

As far as the balance of earthworks is concerned, we have 95.556,39 m^3 of excavations and 75.872,98 m^3 of embankments.

According to the above, the excess (difference between the two) amounts to 19,683.41 m³.

The management of the excess of the unsuitable excavation products will be done in an environmentally sound manner (through Collective Alternative Management Systems) and in accordance with the provisions of Article 30 of Law 4819/2021 with the further possibility of its utilization in the construction of embankments or other useful structures. Suitable excavation products will be deposited in temporary areas within the construction squares and subsequently transported for use, and those that are deemed unsuitable for use will be taken to approved recycling companies.

In conclusion, therefore, the total number of interventions to be carried out at the Wind Power Plant under study are the minimum possible with good environmental management. The new openings achieve the greatest social promotion of the area since, in addition to the new travel routes, the protection of the forest area is also achieved with the direct approach of the ground firefighting means. It should be noted that the maintenance of the roads being widened will be continuous to facilitate the rapid and safe transport of personnel and surveillance and fire-fighting crews. Thus, there is continuous surveillance - prevention and direct suppression of forest fires and thus the precaution of the settlements around the installation of the wind power plant under study.

The technical works that will be carried out to improve the existing road network, the opening of new roads and the construction of squares cannot affect the hydrographic network.

Ditch Drainage

It will have a triangular cross-section 0.80m wide and 0.40m high (depth) and the side of the ditch towards the deck will have a slope of 2:3 and towards the trench, up to a height of 40 cm, 2:1 and from there onwards it will follow the slope of the slopes, which is variable and depends on the percentage of rock (in this study 5:1).

Drains

For a safer access to the road, but also for a better protection of the road, it is considered necessary to construct additional technical works for optimal water drainage.

In this case, such works will be culverts, which will direct the water flowing from upstream to downstream of the road without causing damage to the road body.

Twelve (12) culverts are proposed on the roads being widened and improved with the following characteristics:

A/A	ROAD	KILIOMETRIC POSITION	TYPE	DIMENSIONS	AXIS LENGTH	SLOPE %	INCLINED LENGTH
1	Δ1	0+241.40	ΣΩΛΗΝΩΤΟΣ	Φ1.000	6.15	-3.00	6.15
2	Δ1	1+161.89	ΣΩΛΗΝΩΤΟΣ	Φ1.000	9.07	-3.00	9.08
3	Δ1	1+972.17	ΣΩΛΗΝΩΤΟΣ	Φ1.000	5.87	11.02	5.90
4	Δ2	0+099.73	ΣΩΛΗΝΩΤΟΣ	Φ1.000	10.05	-10.00	10.10
5	Δ2	0+228.12	ΣΩΛΗΝΩΤΟΣ	Φ1.000	6.90	-11.67	6.95
6	Δ3	0+224.49	ΣΩΛΗΝΩΤΟΣ	Φ1.000	7.55	3.00	7.55
7	Δ3	0+624.50	ΣΩΛΗΝΩΤΟΣ	Φ1.000	5.78	-10.00	5.80
8	Δ5	0+083.12	ΣΩΛΗΝΩΤΟΣ	Φ1.000	8.74	3.00	8.74
9	Δ5	0+254.66	ΣΩΛΗΝΩΤΟΣ	Φ1.000	7.76	10.00	7.80
10	Δ6	0+122.67	ΣΩΛΗΝΩΤΟΣ	Φ1.000	8.25	3.00	8.25
11	Δ7	0+087.00	ΣΩΛΗΝΩΤΟΣ	Φ1.000	5.79	-10.00	5.82
12	Δ7	0+177.80	ΣΩΛΗΝΩΤΟΣ	Φ1.000	5.32	-3.00	5.33

Table 46: Description of drains

For access to the Wind Power Plant, all existing roads (national, municipal and agroforestry roads) will be used, as shown below:

The route th l the machinery (transport vel

1. Port of Alexandroupolis.
2. March on Dim. Karaoli towards Dimokratias Avenue/E85/EO2.

3. Traffic on the National Road Alexandroupolis-Kipi (E85) towards the National Road Ardanio Orestiada.
4. Head north towards the settlement "Mandra".
5. Exit before the settlement "Mandra" and traffic on the Provincial Road Mandra – Mikro Dereios.
6. Course West until the National Road Mikro Dereios Ormenio and up to the settlement "Mikro Dereio".
7. Exit from the settlement "Mikro Dereio" and use of the existing road heading west until the entrance to the internal network of the WInd Park under construction – improvement.

The mentioned technical works are presented in more detail in the attached Technical Description of Forest Road Construction and in the Intervention Area Map.

6.3 Technical Description of other characteristics of the project design

6.3.1 Building/Control House

Within the WPP installation area and specifically within the square of W/T 5 (SEE interconnection map) a prefabricated type of container of indicative dimensions of 10.5 x 3 x 3 m of 31.50m2 will be placed. The control building will have an office space in which the central supervisory control and remote supervision system of the WPP will be placed, an M.V. area for the installation of the M.V. Panels and a separate area for the Transformer, which will supply electricity to the building.
The control house will be placed within part of the square of W/T5. Its coordinates will be as follows:

Control Cradle Coordinates Table Piece area=31.50 sq.m.- Perimeter =27.00 m.			
a/a	X	Y	DISTANCES
O1	671786.699	4576790.088	-
O2	671784.936	4576792.515	O1-O2:3.00
O3	671793.431	4576798.686	O2-O3:10.50
O4	671795.194	4576796.259	O3-O4:3.00
O1	671786.699	4576790.088	O4-O1:10.50

Table 18: Control house coordinates

Medium Voltage tables have the following fields:

- Departure field to the M.V. boards of the building of the "Patriarch" Submarine. It is noted that one field is required for each circuit (line) of departure to the computer network. This panel will include digital voltmeters and ammeters, a three-phase wattmeter, a reactive power meter and an energy meter.
- A connection field of the substation (M.V./L.V.) for the supply of the various consumptions of the control building (cooling/heating, fire safety, PC, etc.)
- Fields of arrival of underground cables from wind turbines.

The control building of the wind farm will be on the ground floor. The surface of the building will be approximately 31.50sq.m. The building will be properly separated to meet the regulations as well as the operational requirements of the wind farm and will include the following independent spaces:

- Medium voltage switchboard space

- Repair area
- Office for the monitoring and control of the operation of the wind farm, where the central computer of the SCADA system will be installed
- Warehouse for tools, spare parts and consumables, which are necessary for the operation of the wind farm
- W.C. and changing rooms

It is noted that, from the area where the central computer of the SCADA System of the wind farm will be installed, an effort will be made to allow the maximum possible visual overview of the wind turbines of the wind farm and the space will have enough glazing surface for this purpose. Water supply will be carried out with the help of a water tank and sanitation with the construction of a suitable septic cesspool.

In the area of the building there will be

- ✓ Fields of arrival of M.V cables (33 kV) of wind turbines
- ✓ Departure fields of M.V underground line (33 kV) to an existing submarine named PATRIARCHIS.
- ✓ Fields of measuring instruments and tell-tales
- ✓ M.V/LV substation with oil-type transformer, low loss, for the supply of auxiliary circuits and consumptions (for the electrical supply of air conditioning, fire safety / fire extinguishing / fire detection, alarm, lighting and sockets, water heater, power supply of the UPS system, transducers, luminaires, etc.)
- ✓ UPS (Uninterruptible Power Supply) unit to power critical loads (e.g. PC unit, SCADA system, security lights, etc.)
- ✓ LV tables of building services.

An air conditioning system will be installed in the control building of the wind farm, for the needs of the uninterrupted operation of the equipment of the central computer of the SCADA system as well as for the improvement of the working conditions of the technical staff. The air conditioning system will be split system with local units for each main space. The power supply of the air conditioning system will be provided by General Table L.V. of the building.

In addition, an alarm system will be installed in the control building of the wind farm in all areas of the building for the early warning of the staff.

6.3.2 Parking spaces

For the construction and operation of the project, there is no need for the creation of parking spaces, since as such, the surfaces of the installation squares of the W/T can be used.

6.3.3 Technical Description of mechanical installations

The only mechanical installation of the project is the control building.The use of the control house is intended to house electrical equipment including medium voltage switchboards, in which the medium voltage cables of the wind turbines will be collected to transfer the generated electricity to the existing M.V./H.V. lifting substation.

6.3.4 Overall assessment of land occupation area

The total occupation area of the planned project includes the occupation of the total road construction of WPP, the occupation of the installation squares of the WPP Motorways, the intervention surfaces on the existing road network for access to the site of the project.

This is because all cables run along the deck of the new and existing road construction and therefore the intervention area for the laying of the M.V. cables have already been counted in the calculation of the occupation area of the road construction of the works.

The total occupation of the project is listed in the following table:

Total area of road occupation	40619.07 m²
Total area of squares	65873.12 m²
Total surface area of the control tower	31,5 m²
Total project occupancy area	106492.19 m²

Table 19: Total occupation area of the studied WPP

6.4 Construction phase of the project

6.4.1 Planning and timing of individual works and construction stages

The following indicative timetable shows the time required for the implementation of each phase of the wind farm construction once the production permits have been issued. The columns indicate the months required for the construction of the project and the rows indicate the respective construction phase.

PHASE DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
STUDIES																			
Topographical, road construction, geotechnical																			
INFRASTRUCTURAL WORKS																			
Roads																			
squares																			
CONNECTION TO THE NETWORK																			
Construction of internal and external network																			
Control tower																			
Operational tests																			

Table 49: Schedule of construction phases of the project under consideration

Once the generation licenses for the project under consideration are issued, it will take approximately 18 months to carry out the studies, construct the WPP, infrastructure works and connect it to the grid. Also, once the required permits are secured, the ordering of the wind turbines takes place. The time required to deliver the wind turbines depends on the construction company and varies from 18-24 months. The time required for the transport from the port to the installation site and for the assembly of the wind turbines is approximately 7-8 days per W/T, considering a period of 3-4 days for the assembly and disassembly of the crane and 3 days for the lifting of the tower and its installation.

6.4.2 Construction support facilities

As has been mentioned in previous subsections, the session works of the proposed wind turbine project consist of the construction of plazas for each W/T , excavation of the foundation bases of the wind turbines, their transportation, assembly and erection, construction of the internal-agricultural road network for access to the wind turbine sites, electrical interconnection of the project with the existing substation.

A crane of appropriate lifting capacity is used to carry out the transport and erection works. The crane can successfully lift all the main parts of the wind turbine, which will be transported to the erection sites (squares) by road using a bladelifter.

During the construction of the works, a suitable construction site will be arranged within a part of the installation squares of the W/T in such a way as to ensure satisfactory working conditions for the construction workers as well as a facility for temporary storage of the equipment to be installed. This area will be mobile, i.e. it can be moved from square to square.

The said construction site will be maintained and guarded during the construction of the WPP and thereafter appropriately removed. Each construction site will accommodate a mobile pavement material crusher construction site.

More specifically, a mobile crusher unit will be used to produce aggregate paving materials for both the road works and the wind turbine installation plazas. The crushing of the aggregates will be carried out on the rocky excavation products resulting from the excavation of the foundations of the wind turbines of the WPP and from the excavations resulting from the opening of new roads and the landscaping of the squares. The crusher will be crawler-mounted and will have one or two belts for depositing the materials produced. The rock materials will be converted into 3A and temporarily transported to the plaza areas or to the opening points where they are to be used.

Work will be carried out to restore the site of the proposed project to its original condition and appropriate measures will be taken to ensure that the topography is minimally affected. All environmental conditions will be respected during the construction of the project. In addition, any excess material will be removed from the site as required by the provisions of the legislation in force. To deal with air pollutants, in particular dust, wetting of materials, machinery, etc. will be carried out. Once the surfaces to be installed have been prepared, planting work will be carried out on the site as far as possible.

6.4.3 Necessary construction materials

The materials for the construction of the project shall be excavation, paving and cable duct products. The Necessary construction materials and raw materials for the construction of the proposed project, in addition to the support bases and the assembled wind turbine components, include concrete (C12/15, C20/25, C30/37, C35/45) and metal, which will be procured from local traders, steel reinforcement, sand, cables, and grounding and excavation materials for re-filling the

foundations. In addition, steel construction materials, structural mesh, sand, gravel, bricks, tiles, lime, marble dust, insulation materials, tiles, paint, etc. will be used. During the construction phase of the project, earthworks raw materials such as sand or gravel 3A will be required.
Finally, quantities of water in the order of about 21 m3 per day are necessary both for washing the machinery and for spraying the sites. During the construction phase of the project, a staff of between 100 and 150 people will be employed.
The water will come from private companies or municipal services or from the municipal water supply networks of the area, in any case after agreement and payment of the relevant price and will be supplied by tankers and stored in plastic tanks exclusively within the area of intervention of the project.
About the trench channels for the passage of cables. Before laying the M.V. (33KV) transmission cables, the trench for laying them shall be laid for a thickness of 0.05m with earthen material. Then the M.V. cables are placed in the centre of the trench and filled with crushed quarry sand, then the earthing cable, optical fibre is placed, and the filling continues for a new layer of sand, 0.1 m thick. Then the cable marking plate is placed, and the trench is filled with excavated screened material for a layer thickness of 0.3 m and then the cable marking tape is placed.

6.4.4 Liquid waste

No toxic waste, sludge or other forms of hazardous liquid waste requiring special care and attention will be generated or generated during the construction phase of the overall project (WPP and its accompanying works).
Liquid waste is limited to that which will come from the construction site, which will be installed in the project area and will be:

- ✓ mineral oils from the maintenance of excavation vehicles and machinery,
- ✓ oil or petrol from the maintenance of excavation vehicles and machinery,
- ✓ liquid waste from the washing of concrete vehicles
- ✓ municipal wastewater from the hygiene of the personnel manning the site.

The above wastes are expected to be collected in appropriate containers and removed from the work site.
In any case, the characterisation, storage and management of the fluids fall under the following legislation, from which the obligations of the Wind Farm Owner (Hazardous Waste Holder) also derive:

- JMD 13588/725/2006 (Government Gazette 383 B'/28-03-2006) "Measures and conditions for the management of hazardous waste", which specifies the obligations of the holder of hazardous waste, the classification categories of hazardous waste are given (European Waste List according to the Annex of Decision 2000/532/EC, as amended by Decisions 2001/118/EC, 2001/119/EC and 2001/573/EC of the European Commission) and finally other obligations such as clean-up of contaminated sites, etc. are described.
- JMD 24944/1159/2006 (Government Gazette 791/30-06-2006) "Approval of General Technical Specifications for the Management of Hazardous Waste" which specifies the conditions for the proper collection, packaging, labelling, storage and handling of hazardous waste.
- Decree 82/2004 (Government Gazette 64 A'/02-03-2004) "Determination of measures and conditions for the management of used mineral oils", as in force.
- Law 2939/2001 (Government Gazette 179 A'/06-08-2001) "Packaging and alternative management of packaging and other products - Establishment of NHWMP and other provisions", as amended, supplemented and in force.

- JMD 62952/5384/2016 (Government Gazette 4326 B'/30-12-2016) "Approval of the National Hazardous Waste Management Plan (NHWMP), pursuant to Article 31 of Law No. 4342/2015"

6.4.5 Solid Waste

During the construction of the project, quantities of Excavation Construction and Demolition Waste (EWL) will be generated and will be managed under Law 4819/2021. Specifically, waste will be generated which is classified under CSR 17 05 04 "soils and stones other than those mentioned in 17 05 03*".

They will be temporarily deposited on site and then used for later use for backfilling required for the square and road construction.

The excess of the unsuitable excavation products will be managed in an environmentally sound manner (through an EMS) and in accordance with the provisions of Article 30 of Law 4819/2021, with the further possibility of its use in the construction of embankments or other useful structures.

The suitable excavation products will be deposited in temporary areas within the construction squares and will subsequently be transported for use, that which will be deemed unsuitable for use will be taken to approved recycling companies WECD

Furthermore, waste resulting from staff hygiene and maintenance materials and their packaging will be collected in suitable closed-type bins and transported to the Municipality's waste collection points.

For specific categories of solid waste, separate collection and temporary storage systems will be provided for. Once filled, they will be delivered to authorised companies.

6.4.6 Air pollutants during the construction phase of the project

The air pollutants that will be generated by the construction of the project are mainly dust emissions into the atmosphere caused by the earthworks and the movement of vehicles (cars, trucks, cranes) and a small amount of pollutants (exhaust gases) from the vehicles through which the construction of the project will be carried out, which will be emitted for the specific period of time during which the construction will take place.

The air pollution during the construction phase of the project is due to the dust caused by the excavation work for the construction of the wind turbine squares and the interconnection roads.

However, to minimise these pollutants, the speed limit of vehicles and the number of vehicles and machinery used will be reduced. In addition, the materials will be wet to avoid dust dispersion and the handling of machinery at the construction sites will be as careful as possible.

6.4.7 Noise and vibration emissions from the construction activities of the project or activity

During the construction phase of the proposed project, limited noise will be generated by the operation of the machinery and vehicles used to transport and erect the foundations (blades, tower, etc.) of the project and for the necessary excavations for the improvement and opening of access roads, trenching of M.V. ditches and the construction site.

The assessment of the noise generated at the construction site and at the individual points where construction machinery will be operating is carried out in accordance with the methodology proposed by British Standard BS 5228 (Noise control on construction and open sites, BSI-1984), which refers to the need to protect people living and working near such areas from noise. At this stage, it is not possible to formulate an accurate record of site operating data (types of machinery, actual operating times etc.), therefore an approximate assessment of impacts will be carried out.

We consider a mobile construction site of 12-hour operation with the following composition:

- ✓ 1 excavator
- ✓ 1 loader
- ✓ 1 leveller

- ✓ Trucks
- ✓ 1 road roller

The results of the prediction of the noise level Leq(12) for a receiver located between 15 and 400 m from the source are presented in the following table.

Receiver distance (m)	15	30	50	100	200	400
Leq(12) dBa (rural area)	81	75	71	65	59	53
Leq(12) dBa (urban area)	84	78	74	68	62	56

Table 50: Noise level for receiver at distances from 15 to 400m.

6.4.8 Electromagnetic radiation emissions

The construction phase of the studied project is not associated with electromagnetic radiation emissions to the environment.

6.4.9 Waste EWL codes that may be generated during the construction phase of the project

As discussed in the above subsections of this section, a table has been prepared to present the EWL codes of the solid waste estimated to be generated during the construction phase of the project:

EWL code	Type of waste	Origin
02 01 07	Waste from forestry	Waste from the cleaning of the project's land and the construction of the road construction as well as plant tissue residues to be planted
15 01 01	Paper and cardboard packaging	Packaging from materials supplied for the needs of the project
15 01 02	Plastic Packaging	
15 01 03	Wooden Packaging	
15 01 06	Mixed Packaging	
15 02 02*	Absorbent materials, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated with dangerous substances	Hazardous waste coming from or contaminated by residues of hazardous substances.
15 02 03	Absorbent materials, filter materials, wiping cloths and protective clothing other than those referred to in 15 02 02	Waste that will come from packaging from materials procured for the needs of the project
16 01 03	End-of-life tyres	Waste which may result from the abandonment of obsolete components or from breakdowns and accidents during the work phase.
16 01 07*	Oil Filters	
16 01 22	Components not otherwise specified	
16 02	Waste from electrical and electronic equipment	Waste that will come from works during the construction phase.
17 01 01	Concrete	Waste from construction site equipment (e.g. empty plastic containers, iron and steel elements, wooden packaging from material pallets, metal packaging, construction site phosphorescent plastic mesh, WEEE/Waste Electrical and Electronic Equipment, etc.).
17 02 03	Plastic	
17 04 02	Aluminium	
17 04 11	Cables other than those referred to in item 17 04 10	
17 05 04	Soil and stones other than those referred to in 17 05 03	They will be reused mainly within the project site for the necessary configurations – backfills, as well as for plantings, since these are mainly soil horizon materials rich in organohumic.
20 01 01	Paper and cardboard	Waste from the daily activity of staff (e.g. solid waste from food packaging, etc.) or from temporary office spaces to be housed in prefabricated Isobox facilities (e.g. paper, inks, etc.).
20 01 08	Biodegradable kitchen and accommodation waste	
20 02 01	Biodegradable waste	
20 03 01	Mixed municipal waste	

Table 51: Waste EWL codes in the construction phase

6.5 Operational phase of the project

6.5.1 Detailed description of the operation and management of the project

The operation of the project involves the utilisation of wind energy, which is initially converted into kinetic energy of the wind in the rotor and then into electricity. In particular, the wind hits the wind turbine blade, causing it to rotate due to its aerodynamic shape. The kinetic energy of the rotor drives a multi-pole (6-city), electric alternating voltage generator rated at 720V, through which, the conversion of kinetic energy into electric energy is achieved.

The operation of the W/T is fully automated (they are automatically switched on, orientate the plane of their blades perpendicular to the wind direction, shut down in case of failure or strong wind). The wind turbines start operating automatically when the wind speed reaches 3 m/s (cut-in wind speed). The generated power increases according to the power curve until the wind speed reaches a nominal wind speed of about 12-13m/s (nominal wind speed). The wind turbine continues to produce power until the wind speed reaches 25m/s (cut-out speed). If the average wind speed exceeds the maximum operating speed, the wind turbine shuts down by turning the blades. When the average wind speed returns to levels below the cut-out limit, the W/T is automatically restarted.

Each of the eight V136-4.5MW wind turbines includes a substation to raise the voltage from low to medium voltage L.V./M.V. The generated energy will be injected from the WPP control building to the M.V./H.V. raising substation through the eight (8) underground cables, one for each wind turbine.

During its operation phase, it will be manned by 2-3 people as permanent technical staff, with the main objective of uninterrupted operation and the restoration of any damage. Their involvement in the daily operation of the wind farms will be limited, due to the automated operation of the wind farms, and their main task will be the maintenance and restoration of any faults - damages. In addition, there should be a supervisor to check that the equipment is well maintained and to provide technical support for any issues that may arise during the first five years of operation of the equipment. The manufacturer Vestas provides a preventive maintenance system to carry out checks on the equipment to minimise the possibility of operational failure and optimise operation. To ensure proper operation of the turbine, maintenance will be carried out at regular intervals after delivery of the turbines (3-month, 6-month, 12-month and 4-year maintenance.

Indicatively, the maintenance of wind turbines is generally carried out as follows:

- ✓ Three-monthly maintenance (It takes place three months after the delivery of the W/T and involves checking the electrical parts and checking the screws).
- ✓ Six-monthly maintenance (The first six-monthly maintenance is carried out six months after delivery of the W/T and is repeated after one year. It involves checking the electrical parts and the mechanical parts by greasing the bearings and checking the hydraulic pressure).

- ✓ Twelve-month maintenance (It takes place one year after the delivery of the W/T or six months after the six-month maintenance. The work done at the six-monthly maintenance is repeated and some materials are also changed).
- ✓ 4-year maintenance (This takes place four years after the delivery of the W/T and includes the quarterly and annual maintenance together).

The lifetime of these wind turbines is about 25 years. However, this period can be increased and, according to the current legislation, the operating licence can be extended for another 20 years.

After they have ceased to operate, the equipment used may be dismantled and the site restored. The wind turbines are dismantled and their main parts (tower, nacelle, hub, blades) are recycled by about 90%. However, it is possible to dispose of them for later use. However, the operating period may be shorter than the service life (25 years) due to either design errors or natural disasters. Due to the evolution of their technology, wind turbines can be replaced after a certain period by newer and more technologically advanced turbines to optimise the use of wind energy.

The company Aliki Energy Single Member P.C. proposes to install in each wind turbine of the project the Bird Monitoring System of the company Digisec which uses artificial intelligence algorithms, through machine learning technology that is constantly upgraded, and high-definition cameras (8k) recognizes the species of birds. The system divides the coverage area into three (3) different zones, which can be configured in terms of distances depending on the species of protected birds in the project area.

Specifically, in the detection zone, the system can detect birds at a range of up to one kilometre. During this phase, the system records the birds in the database, which is accompanied by a photographic (also available as a video) image. Then, if the bird approaches the turbine and enters the deterrence zone - the medium risk zone (where the distance from the turbine varies from 265m to 385m), the system emits a sound in the direction of the bird to prevent it from approaching the turbine any closer.

However, if the bird continues its course and enters the High-Risk Area (HRA) and the Wind Turbine Shutdown Zone (distance less than 55m) towards the wind turbine, the system will stop the operation of the wind turbine with an appropriate command to avoid impact with the wind turbine. The turbine shall remain stopped until the bird has left the High-Risk Area. Of course, the detection algorithm is state of the art so that the signal errors to stop the wind turbine generator are almost zero (zerofalsepositives). During maintenance of the wind turbine the system is switched off. A more detailed presentation of the system (Bird Monitoring System) is given in Chapter 10.4 of this document.

Also with the protection of the environment in mind, the company Aliki Energy Monopoly Ltd. intends to install in each wind turbine of the WPP an anti-fire system, a fire detection system for fire safety which will be installed in the nacelle (shell) of each wind turbine and with appropriate, advanced technology and high-resolution IRPanoramic cameras will detect fire (even small-scale, when it is at an early stage) at a range of up to 5 km.

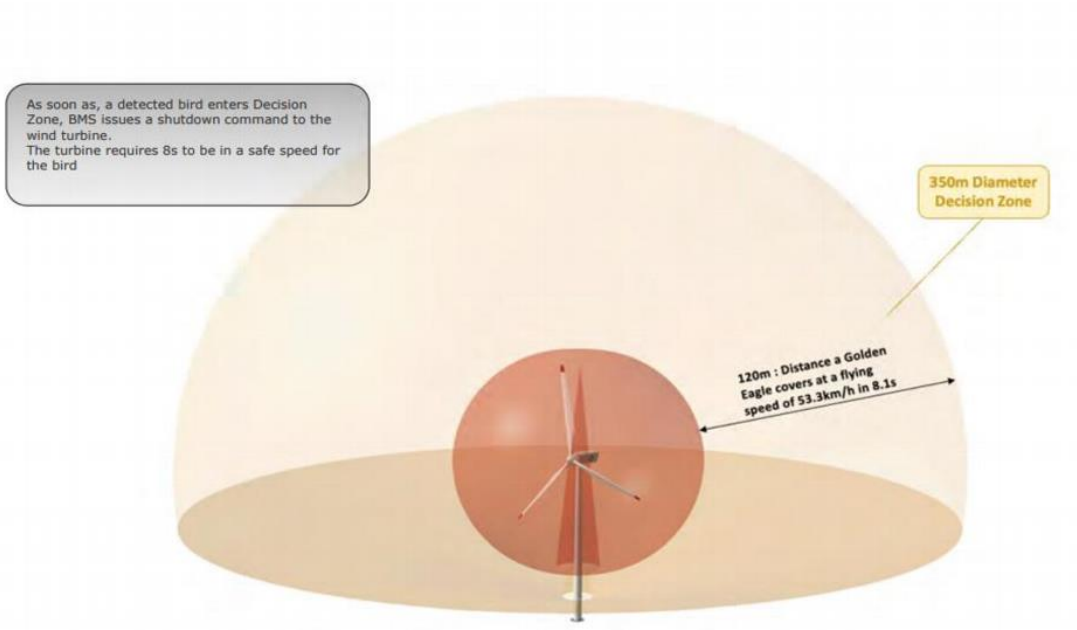


Figure 31: Illustration of bird detection zones

6.5.2 Operational phase of the project

The nature of the project does not require the consumption of significant amounts of materials, energy and water. Only the basic needs of the staff (consisting of 1-2 persons) who will work on the project under consideration are related to the use of resources of such inputs as well as the maintenance works of the WPP. The needs of the staff essentially include stationery, spare parts in electrical (switches, transformers, fuses, cables) or mechanical components (gears, motors, cables, fuses) and other types of equipment for their own use (e.g. furniture, supplies).

The water use during the operation of the project concerns the personal use by the staff for consumption and hygiene (cleaning uses). Finally, the energy inputs during the operation of the project concern the consumption of fuel for the movement of vehicles, which is small since the number of staff is small due to the automated operation of the wind turbines and does not require the daily presence of staff on site.

6.5.3 Liquid Waste Discharges

The wastewater associated with the operation of the WPP studied is limited and is separated into urban type wastewater from the project operating personnel and lubricating oils used in the mechanical parts.

For the maintenance of the mechanical parts, liquid wastes are generated which fall under the European Waste List (Decision 2014/955/EU "amending Decision 2000/532/EK as regards the list of wastes in accordance with Directive 2008/98/EK of the European Parliament and of the Council") and which will be managed in accordance with the provisions of KYA 13588/725/2006 (Government Gazette 383 B'/28-03-2006).

However, none of the oils used in the operation of the project contain toxic and hazardous substances such as PCBs. Specifically, they consist of used mineral oils, or semi-synthetic oils or synthetic oils, from use in lubrication of gear teeth and other moving parts and in

cooling systems, from used oils of step-up transformer oils and from used hydraulic oils from use in hydraulic pressure transmission units for braking systems (brakes), pitch systems, blade rotation systems, blade tips, etc.

The recycling of waste related to mechanical parts will be done according to Law 2939. /2001 (Government Gazette 179 A'/06-08-2001), as in force, and ΠΔ 82/2004 (Government Gazette 64 A'/02-03-2004) in cooperation with an appropriately licensed company or directly with a Collective Alternative Management Systems (CAMS). During the operation of the project, appropriate measures (recycling, removal) will be taken to ensure that waste generation is kept to a minimum and that no risks are created for the soil, air, fauna and flora and the forested agricultural and livestock area in general.

Appropriate measures are also taken to avoid noise nuisance and to avoid any risk to public health.

For the temporary storage of hazardous waste on the holder's premises until collection, suitable watertight plastic collection containers (containers) of appropriate specifications are used, located in an area with appropriate signage and adequate ventilation and lighting. They shall also be in such a place and in such a way that they do not interfere with other activities of the installation.

The following table shows the European Waste List (EWL) codes for the estimated liquid waste for the operational phase of the project:

Code EWL	Type of waste
13 01	waste hydraulic oils
13 01 10*	non-chlorinated mineral-based hydraulic oils
13 02	waste gearbox and lubrication engine oils
13 07	waste gearbox and lubrication engine oils
13 07 01*	waste gearbox and lubrication engine oils
13 07 02*	gasoline
20 02 01	biodegradable waste

Table 52: Waste EWL codes of the operational phase

6.5.4 Solid waste discharges with quality assessment

The solid type of waste from the operation of the WPP is related to waste from operating personnel and solid materials such as rubber or metal waste resulting from replacement or maintenance operations of mechanical parts, however, these quantities are not considered to be significant.

The basic solid wastes that require special management in the operation of wind power plants arise from the basic maintenance of mainly mechanical parts and consist of:

- ✓ Empty packaging of the above-mentioned oils: metal drums and plastic containers
- ✓ Used filters impregnated with the above oils (usually paper and metal)
- ✓ Empty packages of mineral oil-based lubricating greases and special additives
- ✓ Empty metal cans and sprays containing adhesives, pastes, lubricants, mild solvents and cleaners (15 01 02 and 15 01 04 and 15 01 07 and 15 01 07 and 15 01 10)
- ✓ Cotton cloths used for cleaning surfaces and therefore impregnated with the above materials (oils, greases, cleaning agents, etc.) (15 02 02)

- ✓ Low-capacity accumulators (batteries) for use in automatic gear cutting machines and small automatic machines in general (16 06 01 and 16 06 04)
- ✓ Higher capacity batteries for use in UPS systems (16 06 01) The above materials are covered by hazardous waste legislation.
- ✓ Waste of mechanical, electrical and electronic equipment the above materials are not considered as hazardous waste.

The characterization, storage and management of waste produced by the operation of Wind Power Plants fall under the provisions of Greek legislation, from which the obligations of the owner of the Wind Power Plant (Hazardous Waste Holder), i.e. the KYA 13588/725/2006 (Government Gazette 383 B'/28-03-2006) and the Law 4819/2021 (Government Gazette 129 A'/23- 07-2021).

The project proponent will contract with certified companies for the transport and management of the waste to be produced. Municipal waste will be disposed of in agreement with the local authority concerned. A table with the relevant Agencia Gubernamential Local codes EWC of the solid waste likely to be generated during the operation phase of the project is provided below:

Code EWL	**Type of waste**
07 02 13	plastic waste
15 01 01	paper and cardboard packaging
15 01 02	Plastic packaging
15 01 04	metal packaging
15 01 05	synthetic packaging
15 01 06	mixed packing
15 01 07	glass packaging
15 01 10*	packaging containing residues of or contaminated with dangerous substances
15 02 02*	absorbent materials, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated with dangerous substances
15 02 03	absorbent materials, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15
16 06 01*	lead batteries
16 06 04	alkaline batteries (other than those mentioned in 16 06 03)

17 02 02	Glass
20 01 36	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
20 02 01	biodegradable waste
20 03 04	septic tank sludge

Table 53: ESU codes for potential solid waste during the operational phase of the project

6.5.5 Air emissions of pollutants and greenhouse gases from the operation of the project

No air pollutants of any kind are emitted during the operation of the project. As has been mentioned above, the power generation of the studied WPP is wind, a renewable, inexhaustible and zero-emission source of energy that essentially leads to "lightening" of the atmosphere from pollutants. The operation of the wind farm will improve the overall quality of life in the area and human health due to the reduction (alleviation) of air pollutant emissions into the environment.

Emissions of pollutants and dust associated with road traffic are estimated to be extremely limited to negligible even though the roads are planned to be paved, as they will be used exclusively for the approach to the WPP under consideration. Furthermore, not only are no greenhouse gases produced, but on the contrary, the production of greenhouse gases and other harmful pollutants is reduced because of the operation of the projects under consideration.

6.5.6 Noise and vibration emissions from project operation

The logarithmic law of sound transmission was used to estimate the noise generated by the wind farm under consideration and, by extension, by the 8 wind turbines, as well as to draw the isothermal curves. This determination was made using the specialized software WindPro from the Danish company EMD International A/S. The calculations are based on the approved standard ISO 9613-2, which is a widely used standard for the prediction of noise levels.

The main parameters of the model were the locations of the W/T, the dimensions of the W/T and especially the hub height and the noise emission at the source (LW,ref) at a given wind speed.

From the software solution system and the method mentioned above, isothermal curves are obtained as shown in the following figure and in the attached drawing according to which:

The isothermal curves that exceed the maximum permissible noise limit of 45dB(A), as set out in the Specific Spatial Planning for RES and in Π.Δ. 1180/81 (Government Gazette 293/A/6-10-1981), extend to radii of less than 939m from the centres of the wind turbines.

The nearest settlements to the wind farm are Roussas, Mikro Dereio and Goniko, where the noise generated by the wind turbines is below the maximum permissible limit. The exact noise levels reaching the above settlements are detailed in the attached noise study.

It should be stressed that this is the worst-case scenario and that in reality this noise will only be for high wind speeds (>8 m/s) for a few days during the year, mainly in the summer period. In this case, the noise of the ambient noise will overwhelm the noise of the W/T and therefore the sound emissions caused by the source alone will not be perceived.

The following is a drawing of the isothermal curves of the WPP.

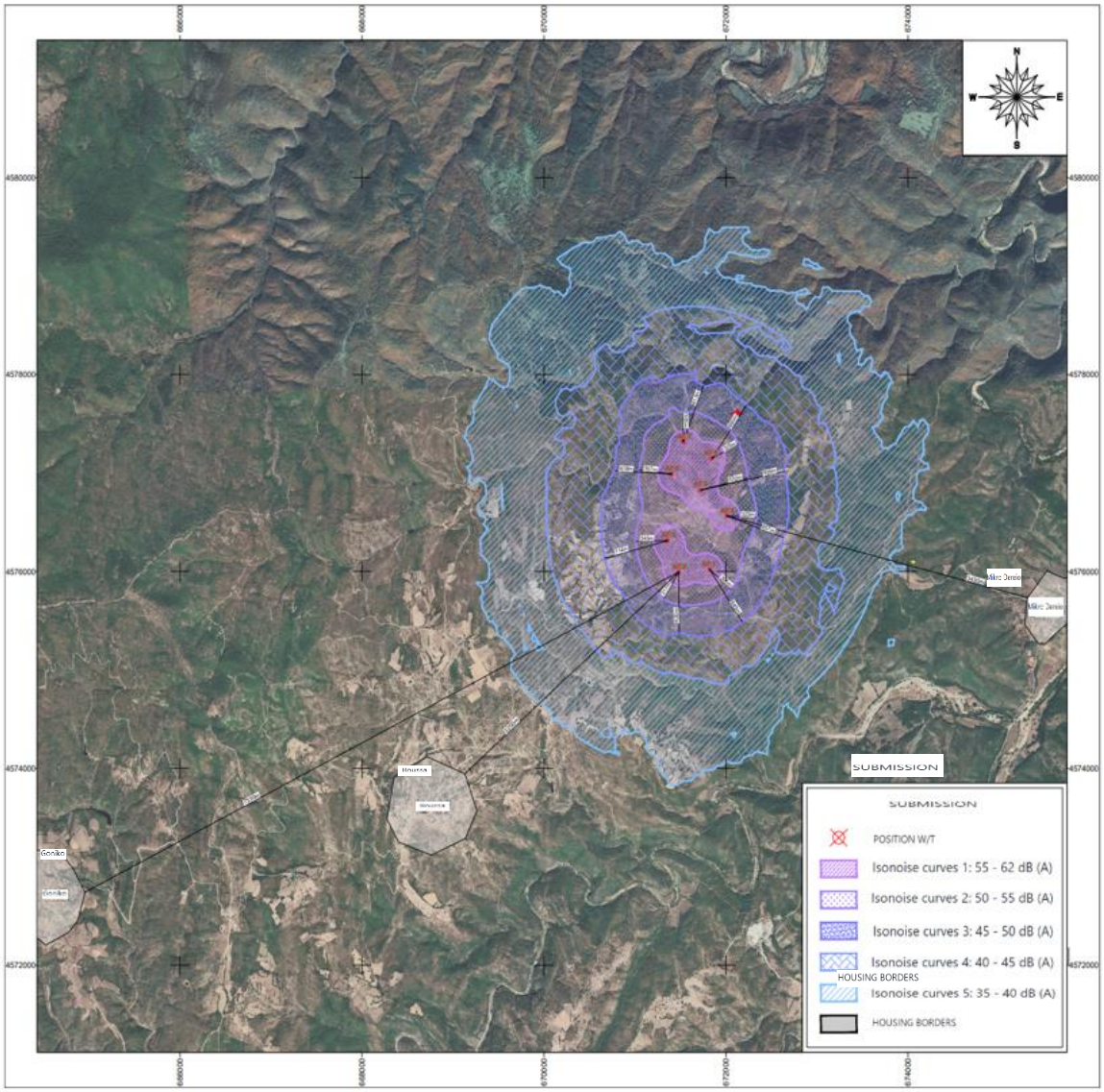


Figure 32: Drawing of isonoise curves

The table below presents the results of the noise study in the nearest project area.

Points of interest	Nearest W/T	Distance (m)	Noise level dB(A) Produced by WPP at the location "Mavrodasos"

Settlement - Roussa	W/T2	3.174 m	30,26
Settlement - Mikro Dereio	W/T4	3.404 m	29,05
Settlement - Goniko	W/T2	7.293 m	19,64

Table 54: Summary table of noise study results

6.5.7 Electromagnetic radiation emissions

About emissions of electromagnetic radiation, it is stressed that the operation of WPP is not characterised by the emission of electromagnetic radiation that could harm in any way the man-made and natural environment.

The electromagnetic field of the generator is confined to the engine shell, which in this case is located 105 m above the ground and is extremely weak. Also, the Transformer is located inside the fuselage of the W/T and is at the same height as the generator; the emitted electromagnetic radiation is very low and certainly negligible at points where access is free.

6.6 Shutdown and recovery

The lifetime of the Vestas V136-4.5MW wind turbines as predicted by the manufacturer Vestas is about 25 years. Under existing legislation this period may be extended for a further 20 years. Also, with regular maintenance and inspection of the machines, failures and damages are prevented so that the lifetime of the wind turbines can be increased even further.

The decision on the definitive termination of the project will be taken based on an assessment of the operational status of the equipment, the operating and maintenance costs for the continued operation of the WPP, the market situation in the electricity sector and the technology available at the time. When the operation of the project is finally discontinued, the wind turbines will be taken to dismantling and dismantling, dismantling and removal of equipment and materials will be carried out, the environment will be restored and restored to its natural state with all necessary measures in cooperation with the concerned Forestry Department.

Also, after the expiry of the operating license of the project, the decision on the definitive termination or not of the project will be taken based on the assessment of the operational status of the wind turbines, the operating and maintenance costs for the continued operation of the wind turbines, the market situation in the electricity sector and the technology available at that time.

In any case, all works that will follow the permanent cessation of operation of the project or part of it (e.g. cleaning of equipment, restoration of the installation area) will be licensed according to the legislation in force (Law 4819/2021, JMD 13588/2006 (Government Gazette B 383) and Law 2939/2001 (Government Gazette A 179), and will be carried out according to the instructions of the competent authorities.

6.7 Exceptional circumstances and risks to the environment

Wind power plants are operating successfully both in Greece and abroad without any accident of significant magnitude being reported. At the same time, due to their safe and automated operation, WPP are known to have no negative impact on either the environment or public health.

The Vestas V136-4.5MW wind turbines of the Vestas manufacturer used for the project under study have fully automated operations and include safety systems to prevent failures. The project as mentioned above is not associated with chemical or radiation emissions. However, the construction of the wind farms of the project under study requires that suitable weather conditions are in place to avoid difficulties in both sitting, transportation and erection.

The adverse events, risks and accidents related to both the construction and operation of the WPP are fire caused by lightning. The Vestas V136-4.5MW wind turbines include lightning protection to protect the project from surges. It is also envisaged that the project developer will install a fire protection system on each wind turbine and a fire detection system within a radius of up to 5km from the wind turbine location which could also contribute to the prevention of large-scale fires in the nearby project site.

In addition, in order to prevent birds from colliding with the blades of the wind turbines, the project operator, Aliki Energy Single Member P.C. intends to install a suitable system which, using algorithms and machine learning and artificial intelligence technologies through high-definition cameras, will identify the type of birds that are heading for or near the wind turbine in question, will emit a sound to change the direction of the bird and in case the bird comes significantly close to the wind turbine, the wind turbine will be shut down.

6.8 Water body delimitation

The siting of the wind turbines and the overall works of the project under study will not affect the bed of any watercourse in the area. Also, the development area of the projects is hilly - semi-mountainous in character and hence there is no need for a proposal for delineation of watercourses. However, the following map depicts the streams in the project study area and are also depicted on an attached Land Use Map.

According to Law 4258/2014 (Government Gazette A'94/14.4.2014) of the Ministry of Environment and Energy (see https://www.kodiko.gr/nomothesia/docume/97146/nomos-4258-2014), in paragraph 1 of article 1, watercourses or watercourses (non-navigable rivers, torrents, streams and brooks) are defined as natural or managed configurations of the surface of the land that are the main receptors of the surface water. surface water bodies which are the main receptors of surface runoff and ensure its conveyance to other receptors at lower levels. The concept of watercourse does not include land reclamation works such as irrigation and drainage ditches and navigable rivers.

In the under study project, we do not find watercourses as defined above, but small watercourses called half-gorges as defined in the above law in paragraph 2 of article 1, which are defined as the surface folds of the ground receiving surface runoff waters, with a watercourse catchment area of less than or equal to 1.0sq.k, when located outside the boundaries of a residential area, or less than or equal to 0.50 sq.k. for those within the

boundaries of a residential area. The starting point of the watershed measurement of a watercourse is defined as any point on the deep line of the minor watercourse.

Thalweg is "the line where the sloping surfaces of the topographic relief meet and where run-off water is concentrated. They have essentially no specific geographical characteristics, since there are no trenches or dips in the ground, the flow of water is temporary and depends exclusively on seasonal rainfall'.

Based on the above, there is no question of delimitation of a watercourse, since in this case there are reasons to ensure the unimpeded flow of surface waters and the environmental protection of the watercourse, which is not the case in the study area.

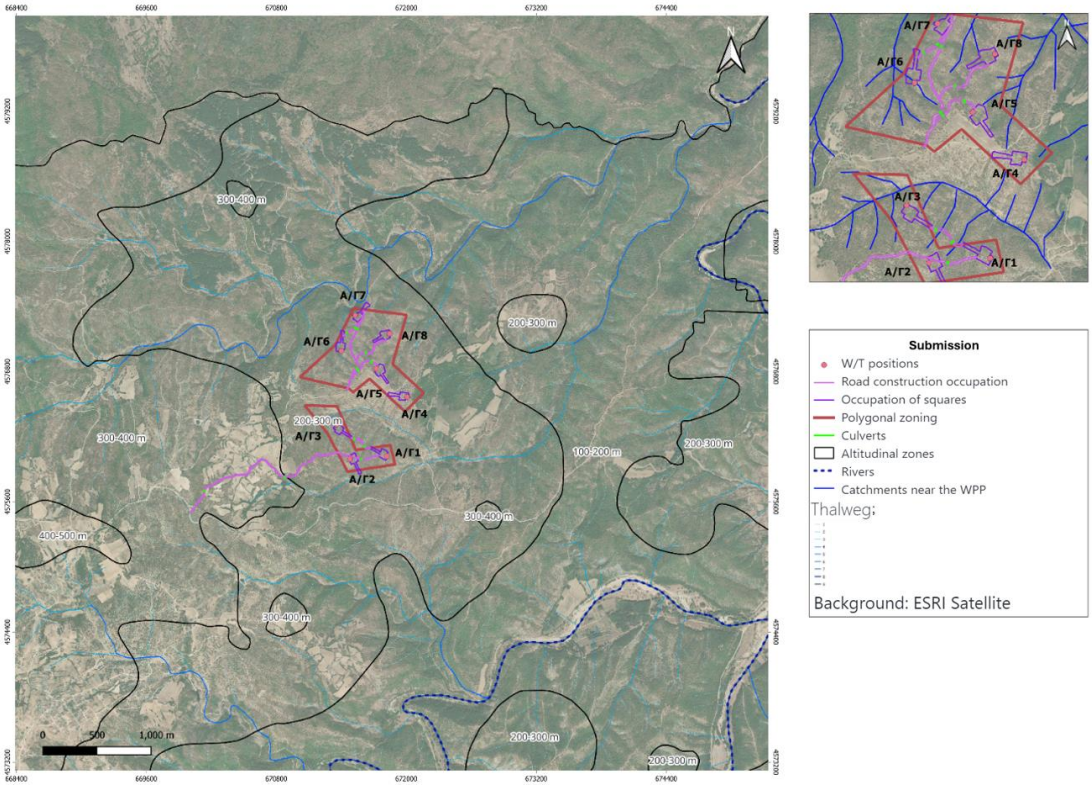
About delimitation, it is stated in the above law that, for small watercourses (half-grains) as defined in paragraph 2 of Article 1, delimitation is generally not required. Exceptionally, where there are compelling reasons for the protection of the natural and man-made environment, their delimitation is possible by decision of the Secretary General of the relevant Decentralised Administration, which is issued upon the recommendation of the Water Department of the relevant Decentralised Administration and following the provisions of Article 3. In this case, for the Region of Attica, the consent of the Central Coordination Committee of article 140 of Law 4070/2012 (Government Gazette 82 A'), as currently in force, is also required.

Finally, based on the reference in Council of State (CoS) 762/2020, it is stated that, "Not every difference in the relief of the ground or ordinary folding of the ground or a thalweg, where necessarily transient stormwater runoff from the higher lying areas, constitutes a watercourse requiring delineation, but only areas with a continuous or periodic flow of rainwater or other waters and with specific hydrological, hydraulic and environmental characteristics which, in the reasoned and scientifically based judgment of the Administration, give them the characteristics of a watercourse. "

The following map is based on the data of the Hydrographic Network (https://gaia.igme.gr/portal/apps/webappviewer/index.html?id=46eae22415674d5983727359c7adddbf) of the Geoportal Data Geoportal Hellenic Authority for Geological & Mineral Exploration (HEAGME). It shows the nearest river named Erythropotamos, the thalweg starting from the project study area and descending respectively with the elevation zones and topography. The accompanying works, the zone occupation zone and the project's road construction are equally depicted. The roadway is divided into 3 sections where a Forest Road Improvement is being done, and 4 sections where a New Widening is being done. It is noted that there are 11 culverts on the above forest roads.

The culverts are designed for safer access to the road, but also for better protection of the road, so the construction of additional technical works for optimal water drainage is considered necessary. Their purpose is to direct the water flowing from upstream to downstream of the road without causing damage to the body of the road.

It is noted that for forest roads, in addition to the design proposed by the company, there is always an audit, and the final solution of the design is decided by the competent Forestry Department, so it is decided again whether runoff water works are required, which the company naturally intends to construct.



Map 20. Mapping of the project under consideration and the thalweg in the area

As shown on the map above, a ravine/ thalweg within the square of W/T 6. However, as mentioned above, according to the Council of State Decision No. 762/2020, it is not necessary to delineate the ravines/ thalweg.

The ravine/ thalweg is numbered 1 in the Strahler classification, which means that it does not receive water from other smaller thalweg, only rainwater.

In conclusion, the placement of the plaza on top of it is not expected to affect the hydrologic network of the area.

CHAPTER 7. ALTERNATIVES

After the preliminary design and design phase of the project, several proposals were examined, the positive and negative elements of each of them were analyzed, before the proposal described in this study was selected.

7.1 Alternative scenarios for the development of WPP

7.1.1 Technical characteristics of alternatives

The choice of the location of the WPP at the "Mavrodasos" site, as well as its accompanying works, was made after a meticulous examination of the area to initially satisfy the data for high potential and then the restrictions provided for in the relevant legislation for the protection of the environment, the existing settlements and the general activities of the wider area.

The selection of the position was made based on the criteria listed below. It should be noted that the high wind potential of the examined area is not the only criterion for choosing the location of the wind farm.

For the selection of the position, the following parameters were considered as a whole:

- The wind potential of the area,
- the existence of access roads,
- distances from the nearest agglomerations,
- the residential network, traditional settlements, areas of historical parts of cities,
- land use, ecosystems – flora – fauna,
- demarcated archaeological sites and zones,
- distances to key infrastructure networks,
- distances from existing and planned projects and activities,
- the neighboring networks of PPC of similar capacity and
- environmental protection areas and specific environmental protection programmes (NATURA, RAMSAR, ecological resources of trans-European importance, etc.).

The requirement for the selection of a location in relation to the above parameters but also to the general parameters was:

i) The highest possible wind potential of the area.
ii) The access roads must ensure the ability to transport the sections of the Wind Turbines with the fewest possible interventions in an existing network and with the fewest possible openings of the road construction inside and outside the plots of the eight (8) wind turbines (W/T).
iii) The distances from neighboring settlements must be above the limit that allows their integration into the landscape and the minimization of visual disturbance.
iv) Land use does not prohibit the delimitation of the project.
v) The works should be located as far as possible outside protected areas or outside archaeological sites and should be at a sufficient distance from them to have the required compatibility.
vi) The positions of the W/T must be in a position suitable for connection to the Transmission System.
vii) The configuration and technical characteristics of the soil must be suitable for the construction and development of the project.
viii) The area must be relatively sufficient for the development of the project.

ix) Cause the least possible visual disturbance.
x) The compatibility with the specifications in the current legislation and the same is specified in the Joint Ministerial Decision 49828/2008 "Special Framework for Spatial Planning and Sustainable Development for Renewable Energy Sources and its Strategic Environmental Impact Study".
xi) Electrical interconnection should have as few energy losses as possible.

Relevant restrictions apply to interconnection projects, commensurate with the nature of these works. However, there are technical and non-technical limitations related to indicating the responsible system administrator.

The above restrictions also apply to the road access network of the project, considering the relief of the area.

For the alignment of the internal access roads of the W/T within the fields of WPP, the alignment that is finally proposed has the least environmental impact and the smallest slopes.

Based on the above, scenarios (alternatives) were examined exclusively for a different location of the W/T, as the topology of the area does not allow the creation of alternative road construction nor a different location of the WPP.

7.1.2 Alternatives to siting

The correct location of the wind turbines of an WPP is done considering wind, topographic and environmental factors. The alternatives for the location of the W/T were thoroughly examined during the design of the project.

The criteria considered were:

- The climatic data of the location (wind speed, direction, frequency and intensity of wind, etc.),
- the geomorphological configuration of the soil,
- the fact that the location is outside archaeological sites, protected areas or areas of outstanding natural beauty and the visual and acoustic disturbance it causes to the nearest settlements is small or non-existent,
- minimizing the impact on the natural environment of the area,
- compliance with the specifications in the current legislation and as specified in Joint Ministerial Decision 49828/2008 "Special Framework for Spatial Planning and Sustainable Development for Renewable Energy Sources and its Strategic Environmental Impact Study",
- the optimal wind potential of the area,
- the energy efficiency of wind turbines,
- low atmospheric turbulence,
- the local slope (not more than 14%) and the suitability of the foundation within the ground,
- the minimum distance between two consecutive wind turbines, i.e. a distance of more than two and a half rotor diameters if they are placed upstream in the main wind direction and more than five diameters if they are placed downstream in the main wind direction, to minimise the phenomenon of aerodynamic shading, and

- The selected installation sites of wind turbines of adjacent wind farms with or without a production license, to satisfy safety distances of seven diameters of the largest impeller diameters.

Considering the above limitations, two scenarios for the location of the W/T were chosen:

First alternative (main solution)

The installation of eight (8) Vestas V136 type W/T, with a nominal power of 4.3125 MW each, at the location "Mavrodasos" and at a specific distance from each other and in appropriate locations to optimally exploit the wind potential of the project installation site, was examined. The total capacity of WPP is 34.5MW and its efficiency has been confirmed after an appropriate study. The image below shows the locations of the wind turbines of the main solution and the polygons within which they develop.

Map 21: Illustration of main solution wind turbines and polygons

The main reasons for choosing this solution are:

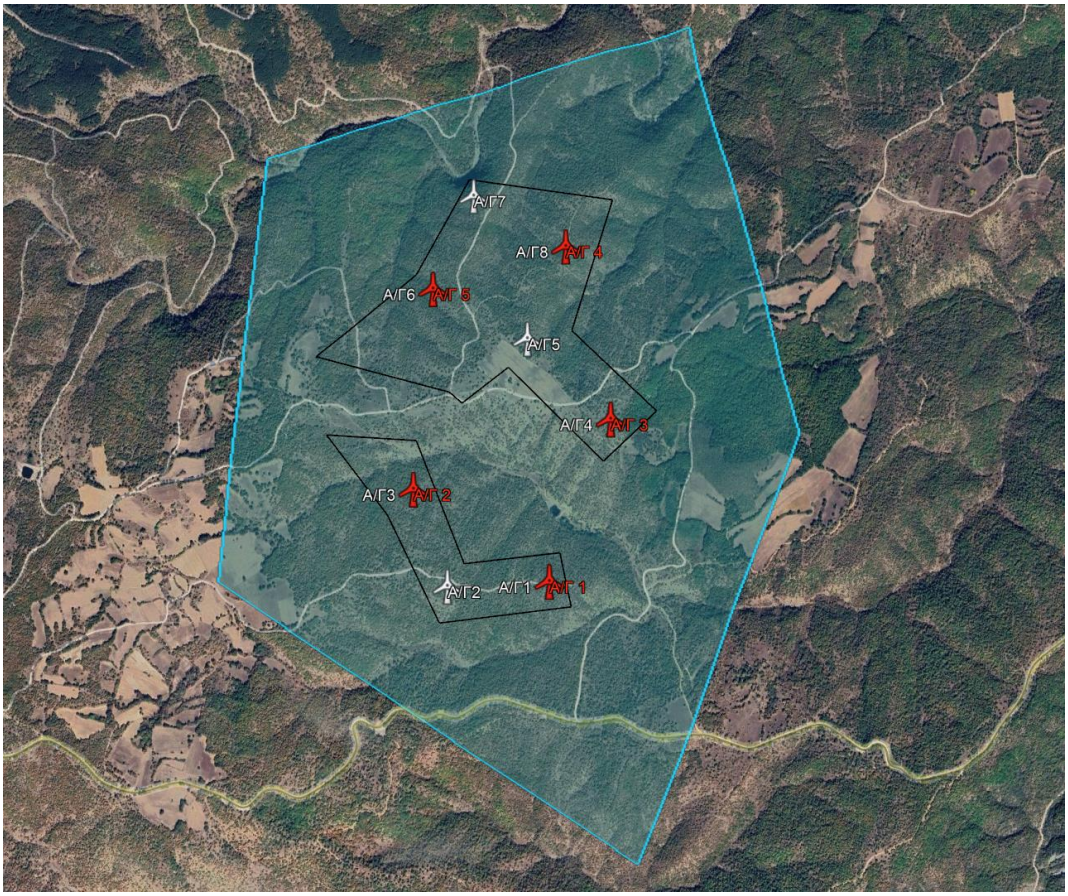
- Lower requirements for the opening of squares, since due to the choice of the smaller type of W/T, the area of each square is reduced compared to the rejected solution, which results in smaller scale interventions in the environment due to the reduction of excavations accompanying the opening of roads, squares and underground electrical interconnection channels.

- Less intense disturbance around the installation squares of the W/T resulting in less loss of habitat area.
- Less burden on the fauna of the area that nest in the wider area since they do not create additional occupation of its habitats.
- Avoidance of the use of prohibitive gradients that make it very difficult for the special vehicles that will transport the loads of the W/T very difficult, since they are characterized by slopes greater than 20% that require the technical characteristics of a forest road, while at the same time avoiding the large number of necessary maneuvers of the vehicles.
- Avoidance of extensive foundation works of static nature due to the use of smaller diameter impeller and tower W/T.
- Better performance without electrical losses, by using an appropriate cable length in relation to the total power of the project.

Second alternative (unacceptable)

The possibility of changing the type of wind turbines of WPP (in relation to the main solution) and its placement in an appropriate way to maximize the wind potential of the installation site was examined. In this alternative, it is proposed to reduce the number of W/T from eight (8) to five (5), since they are Vestas V162 type W/T with a capacity of 6.2MW each and therefore the total power to be licensed will reach 31MW. The following figure shows the positions of the wind turbines and the polygon according to the considered second alternative and the considered first alternative.

Map 22: Mapping of Wind Turbine Locations and Polygon of Main Solution (black line, white spots) and Alternative (blue line, red spots)



The redesign on this basis slightly reduces the total installed capacity compared to the proposed alternative (from 34.5 MW to 31 MW), while at the same time it leads to a reduction in interventions in the environment since the environmental and energy efficiency of this WPP is reduced. The expected impacts on all environmental parameters examined in the Environmental Impact Study (landscape, forest vegetation, fauna, avifauna, soil, waste generation, etc.) would be reduced both in size and intensity. In this WPP remains the provision for a concrete preparation plant and a crusher mill to meet the needs of the construction, while the same applies to the existing substation.

Thus, the main technical quantitative elements of the above alternative are summarised in the following table:

	Main Technical Characteristics of the Main Proposed Solution	**Main Technical Characteristics of the Alternative**
	MAVRODASOS	**MAVRODASOS**
Number of polygons	2	1
Area of polygon	688.280 sq.m.	3.721.629 sq.m.
Number of W/T	8	5
Type of W/T	Vestas V136	Vestas V162
Power of W/T	4,3125 MW	6,2 MW
Total Installed power	34,5 MW	31 MW
Number of Squares	8	5
Square Size	65.873,12 sq.m.	42.500 sq.m.
Number of foundations	8	5
Total road construction	4.298,92 μ	3.704 μ.
Type of control house	Container	Container
Control Housing Area	31,05 sq.m.	31,05 sq.m.
Network M.T. 33 kV	Basement	Basement
Substation 33/150 kV	Yes (within 13 km in a straight line)	Yes (16.9 km in a straight line)

In the proposed solution, there are no movements from the locations of the wind turbines for this alternative as the safety distances required by Law 4685/2020, as in force, are observed.

Therefore, there is an intention for a total review of the design, considering the possibility of its new location as well as the latest wind data. This planning cannot be followed at this time as there is a visible risk of non-implementation of the project since the statutory 36-month period set out

in art. 12 of Law 4865/2020, as in force, according to which "... 2. The Certificate shall automatically cease to be valid ... (ββ) Within thirty-six (36) months from the date of issue of the Certificate, no application has been submitted to the Operator for the granting of a Final Connection Offer...".

The reasons why this solution is not chosen as the main one are:

1. Due to the application of safety distances between the W/T, there is an obligation to locate them in a larger position with a requirement for heavy forest area dismantling works, thus increasing the degree that can lead to habitat damage, biodiversity loss and drought.
2. Partial requirement for the use of slopes greater than 20% for the creation of squares where they will lead to the use of large trenches.
3. Compared with the first alternative (main solution), there are much larger electrical losses and less electricity output.

7.1.3 Alternatives to equipment technology

The wind turbines that will be installed are supplied by VESTAS type V136, nominal power 4.3125 MW each, horizontal axis, three blades with pitch regulation of the blades, impeller diameter 136m. and a pillar height of 105m. The type of W/T to be installed in the project was selected based on wind data, the most modern technological equipment in the W/T, as well as energy, environmental, aesthetic and economic criteria aimed at optimizing all project parameters. The design of this wind turbine responds to the wind characteristics of the study area, while displaying very good power quality characteristics. It delivers its rated power of 4.3125 MW, starts production at 3m/sec (cut-in wind speed) and is switched off at 25m/sec (cut-out wind speed) for safety reasons. The operation of these W/T is fully automated (e.g. automatically put into operation, automatically orient the runner's plane perpendicular to the wind direction, automatically adjust the pitch of the blades, automatically disable in case of damage or strong winds, etc.), with minimal intervention by its operating staff.

Thus, the possibility of installing another type of wind turbine, i.e. VESTAS V162-6.2 MW, with a larger rotor and tower diameter and a higher rated power, was examined in the context of the selection of the optimal solution in terms of the technical characteristics of the wind turbines in combination with the environmental footprint of the applied wind energy technologies. However, this option was rejected because the increase in the geometrical characteristics of the turbine would have resulted in the need for larger interventions (plaza areas, excavation of foundations, etc.). Also, larger wind turbine types would also require significantly larger access road interventions, resulting in an increase in general environmental degradation with larger and more demanding pavements.

In conclusion, therefore, the evaluation of this solution showed that the installation of W/T in the same locations, with other higher power plants, will lead to more extensive and more damaging impacts on the habitats of the area (forest area) than the proposed ones. In addition, several of the proposed sites are not suitable for in-ground foundations as there is a greater local slope of the ground. Thus, based on the observance of the rules of art and science dictated by the topography of the area, which does not allow the placement of W/T in locations where, due to lack of space (steep slopes and folds of the ground, etc.), it is not possible to create a suitable platform for the placement of equipment, considering the general presence of obstacles.

Specifically, in this alternative, the placement of 5 VESTAS V162-6.2 MW gensets, with a total capacity of 31 MW, essentially in larger squares, will result in greater disturbance around them, resulting in greater habitat loss. In addition, this alternative can be more detrimental to the fauna

of the area that may nest in the wider area as they create additional habitat occupation of that habitat.

These considerations support the rejection of this option as this alternative would entail more extensive interventions for the installation of W/T under consideration. Thus, this alternative is rejected for the following reasons:

- The W/T of the alternative solution are of type VESTAS V162-6.2 MW, i.e. larger impeller and tower diameter than the proposed solution, therefore larger foundation works of structural nature will be required.
- The power is lower in the alternative; however the Interconnection Line will remain almost the same as that of the main solution, which as a result will bring higher electrical losses that will limit the project efficiency. In particular, the project under consideration will require an interconnection cable with a total length of 49 341,5 m, i.e. 5 650,61 m less than the main solution. * In the main solution the interconnection is longer (54 992,11 m).

Finally, in case there is a proposal to change the technology of the WPP and replace the proposed technology with a new one that is more efficient, more cost-effective and with less environmental impact, there will be changes in the implementation design of this project. These changes will be related to a new siting and a possible change in the layout and number of W/T, transformers, auxiliary control cabinets, etc.

7.1.4 Alternatives for the Road and Electricity Interconnection Line

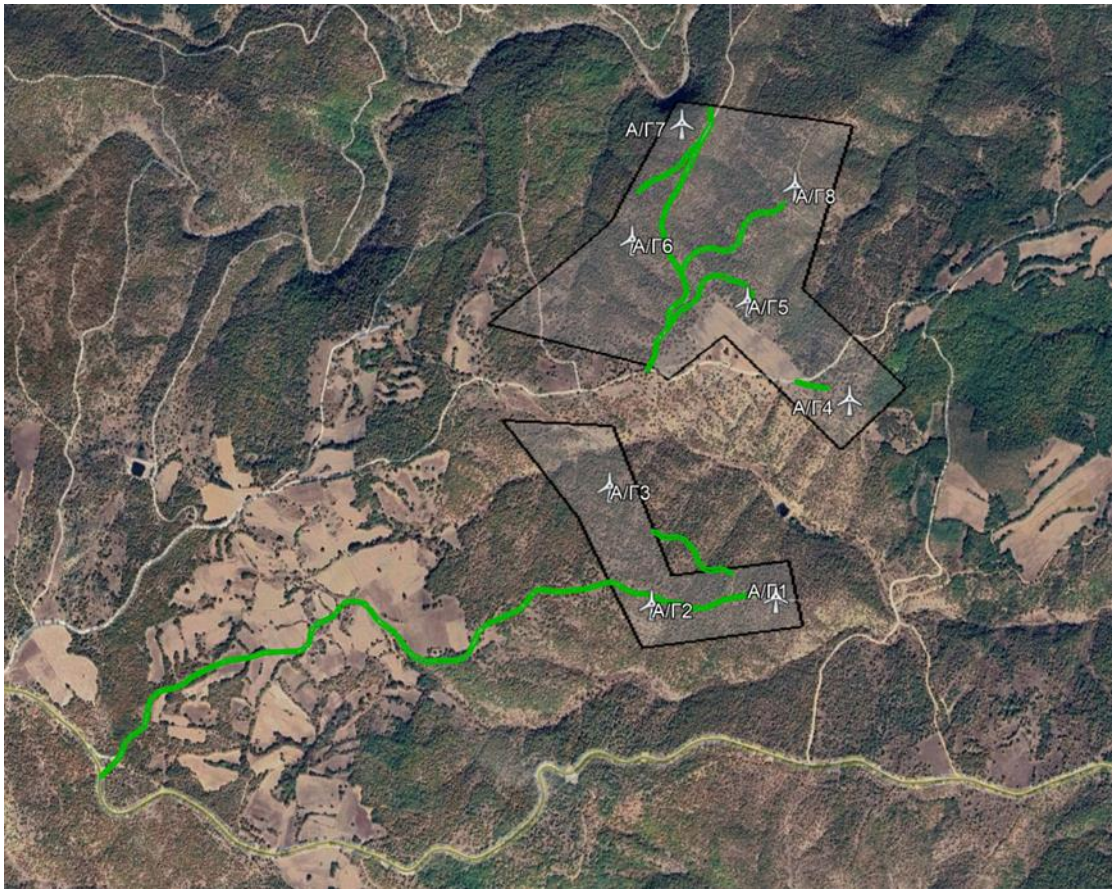
The alternatives for access roads to the WPP were based on the configuration and technical characteristics of the terrain to be suitable for the construction and development of the project. They were based primarily on the following criteria:

1. The geomorphological configuration of the soil.
2. The fact that the site is located outside archaeological sites or areas of outstanding natural beauty and the visual and acoustic disturbance to the nearest settlements is low to zero.
3. To minimise the impact on the natural environment of the area.
4. The local terrain slope.

First Alternative (Main Solution)

To meet the needs for the transport of the equipment of the WPP, as well as the approach to the configuration of the installation sites of the W/T, it is necessary to open and improve the forest road network in the nearest area of the project. The widening and improvement works will amount to a total length of 4 298,92 m. The new roads approaching the site of the WPP have a mostly linear layout and follow the topography of the terrain, so there is no risk of erosion and soil washing due to the existing vegetation, at the same time, on both sides of the new road, it is planned and feasible to restore the slopes both by artificial interventions and by natural regeneration, without creating any obstacle to the spread and dispersal of species, since these are earth roads, 5 m wide. in a part of the forest that largely follows the topography of the area.

The following is an illustration of the access to the main solution.



Map 23: Illustration of the locations of proposed polygons and W/T (black line and white points), and proposed Forest Roads (green line)

As far as the underground line connecting the WPP under consideration with the existing W/T was selected based on the following criteria:

1. Minimize electrical losses.
2. Proximity of the M.V./H.V. substation to the WPP.
3. Less disturbance of medium voltage cables.
4. Minimization of environmental impact.

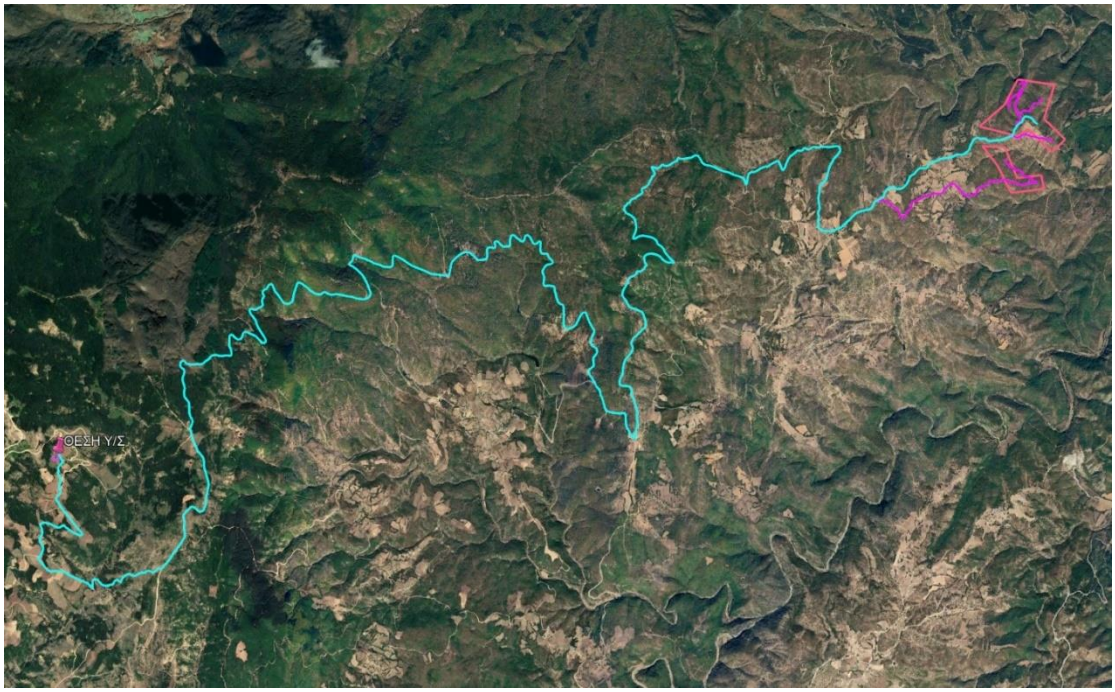
In its entirety, the route of the project's underground M.V. interconnection line will be routed within the deck of the new and existing roadway of the WPP up to the location of the existing substation. The total length of this interconnection is 54,992.11 m (from the substation to the house and from the house to each W/T).

It should be noted that the overall route of the interconnection line enters within a Natura 2000 area, but also within an Important Bird Area (GR003) called "Forest of Dadia - Derio - Aysymi". However, as documented in Chapters 8 and 9 of this study, for the above area, the nature of the accompanying project (underground M.V. line), and the nature of its construction (placement and use of decking of existing and new roads) is not related to the threats recorded for the above protected area, nor is it expected to cause a detrimental impact on its protected features (protected avifauna).

The reasons why the first alternative is chosen as the main alternative are as follows:

- Impacts on flora are minimised as the construction of the medium voltage transmission line will be carried out (underground cable) within the deck of the new and existing forest road, thus preventing the removal of additional forest vegetation, beyond that which will be removed during the road construction works of the project.
- The impacts in terms of aesthetic disturbance are minimized since the transmission line is planned to be underground, therefore not visible from any point in the wider area.
- The use of the accompanying infrastructure of a neighbouring project (existing substation) is used in the context of adopting the practice of joint construction and use of networks, to minimise environmental impacts at a synergistic level.

An illustrative picture of the main solution's interconnection line is given below.



Map 24: Illustration of Polygon and W/T positions (black line and white points), the Internal (pink line) and External Interconnection Line (light blue line) and the Substaion (purple point)

Second alternative (rejected solution)

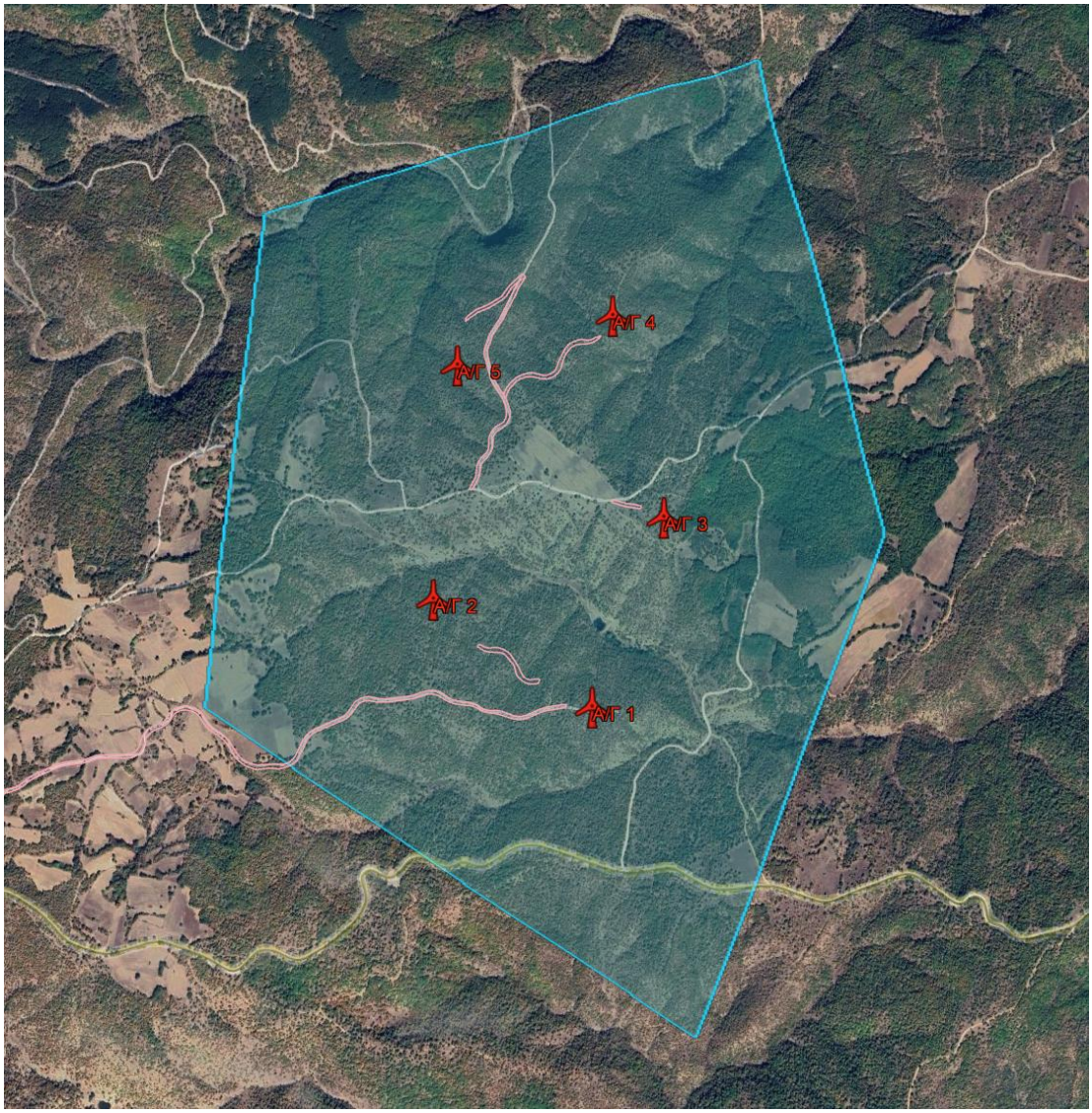
The evaluation of this option showed that the alternative locations of the W/T would result in more extensive impacts on the habitats of the area (forest area) than the proposed ones. Specifically, under this alternative, the placement of the five (5) W/T essentially in larger plazas would result in greater disturbance around them resulting in greater loss of habitat area. This alternative can be more detrimental to the fauna of the area that may be nesting in the surrounding area since they create additional habitat occupancy in that area.

These considerations argue in favour of rejecting this option as it would entail more extensive interventions for the installation of the WPP under consideration. Thus, this option is rejected for the following reasons:

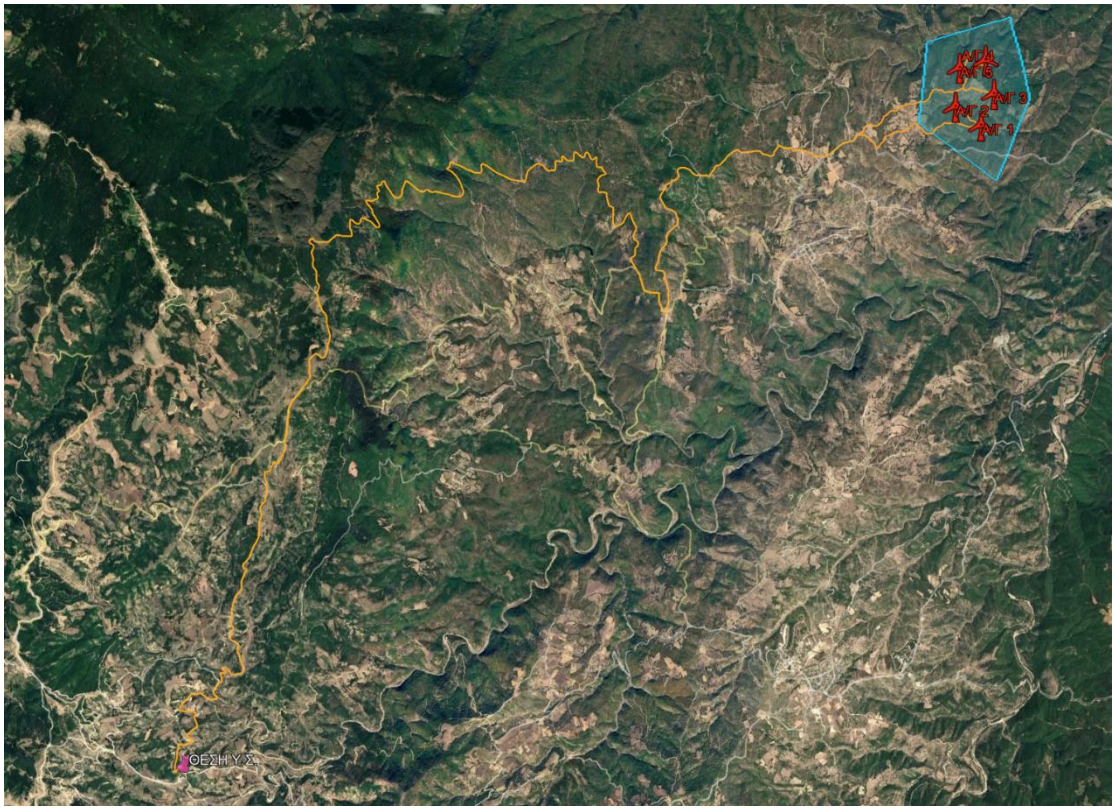
The evaluation of this alternative, includes the following features:

- The generated power of the WPP will be lower in the alternative, however the Interconnection Line will be reduced compared to that of the main solution. In particular, the project under consideration will require an interconnection cable with a total length of 49,341.5 m, i.e. 5,650.61 m shorter than the main solution.
- The area of occupation of the main solution will be 41.120 sq. m. from the proposed 36.891 sq. m. of the rejected solution.
- the development polygon of the WPP increases in size and area, as it will amount to 3,721,629 sq. m. compared to the main solution polygons of 688,418 sq. m.
- With the utilization of the modern technological developments in W/T, it was chosen to use a type of W/T with a nominal power of 6.2 MW. This reduces the number of gensets from 8 to 5 and the type of W/T will be changed from V136 to V162.
- The area of the squares, which will increase for each W/T but will decrease overall as the number of squares is reduced, is 42.500 sq. m. from the 65.873,12 sq. m. proposed in the main solution.
- The W/T in the discarded solution are of the VESTAS V162-6.2 MW type, i.e. a larger impeller and tower diameter than in the proposed solution, therefore larger structural foundation works will be required.
- The Control House remains as it is in area, i.e. 31.05 sq. m., but its location changes, from W/T 5 of the proposed solution to the W/T 3 of the rejected solution.

The following are illustrative images of the road layout and interconnection of the discarded solution.



Map 25: Illustration of the Proposed Forest Road Alternative (pink line)



Map 26: Illustration of Alternative Location of W/T and Alternative Interconnection and Substation

7.1.5 Evaluation of the final proposed solution

In addition to the above-mentioned points concerning the selection of the final proposed solution, it should be noted that the location of the final proposed solution in relation to the other location examined, and considering the information received, gives this location the status of being the one that best meets the conditions and constraints required for such projects.

Specifically:

1) At the proposed site, the wind potential is satisfactory. The area in question belongs to the wind priority areas (WPA). This results in ensuring maximum electricity generation.
2) The siting and number of W/T make maximum use of the available wind potential in their installation.
3) In the proposed area the network of rural and country roads is satisfactory and the opening of many kilometres of new roads is not required.
4) It respects the distance restrictions from settlements.
5) It does not affect existing land uses and no future land use changes will be required.
6) The site of the W/T is outside of designated archaeological sites.
7) The interconnection of the project with the existing road network does not require extensive works and infrastructure.
8) The technical design of the project makes optimal use of the available technology to achieve the maximum possible efficiency of the project at the lowest possible environmental cost and with the least possible audio-visual disturbance.

Based on the above, the selected project design, as formulated from the consideration of the various scenarios analysed in this chapter, satisfies the data for optimal project efficiency with a view to minimising environmental impacts.

7.2 Zero Solution

This section attempts a two-dimensional assessment of the future evolution of the environmental parameters of the study area. As an initial assumption or zero solution, the evolution of the state of the various environmental characteristics without the existence of the project over a time horizon identical to the average operating time of the project under consideration (20 years) is estimated. The environment is monitored in relation to all those parameters that can be assessed over this period, such as ecosystem structure, species populations, land use, noise, vibrations, etc.

In conclusion, an investigation of the existing condition of the project study area, as discussed in Chapter 8, is undertaken and compared to the potential environmental changes that would result from the construction and operation of the project.

The environmental parameters as they currently occur in the study area are as follows:

From the point of view of the natural environment, the site of the installation of the WPP and the accompanying works is characterised by the existence of natural pastures, hardwood vegetation, broadleaf forest, mixed forest and land mainly covered by agriculture with significant areas of natural vegetation. The area under consideration and therefore the site of the project falls within a NATURA 2000 area, but also within an Important Bird Area with the code 'GR003' and the name 'Dasos Dadia - Deriou - Aysymi'.

From the point of view of the anthropogenic environment, near the area of the project under consideration, the nearest residential settlement "Roussa" is located approximately 3km southwest of the wind turbine W/T2. The vehicular traffic, around the location of the WPP and the accompanying projects, is characterized as mild, resulting in minimal traffic load and related to the communication between the different settlements. In addition, there are associated RES projects under development and already developed in the surrounding area (WPP). The main land uses of the area under consideration are woodland, residential areas and rocky areas.

Estimating the environmental conditions as they will have developed over a 20-year time horizon, the following results are obtained:

For the state of the natural environment, as it is expected to be formed in the next 20 years in the area under consideration, no differences are estimated, apart from any vegetation removal and point changes in the topography will be caused in case the planned related projects under development (neighbouring WPP) are installed in the area. However, substantial human-related factors that have a significant impact on the ecosystem structure of the environment (fires, overgrazing) cannot be predicted with certainty.

In addition, based on the due assessment and evaluation of the project's impact on the populations of the species of the area under consideration that may be affected:

- The risk of impact is assessed as low for avian species as advanced mitigation measures are included in the project under consideration. This is since the bird monitoring system that will be installed on each W/T is considered advanced as it uses high-tech cameras that continuously scan the covered area, detects birds far enough away and decides with high accuracy that they are on a collision course. Thus, based on the detection and classification process, the monitoring system uses state-of-the-art acoustic guidance units to deter birds entering the "turbine danger zone" and perhaps the "critical zone" or even to stop the

operation. A detailed presentation of the system is given in Chap. 10.4 of this Environmental Impact Study.

- The contribution to habitat loss is small, so the estimated impact is on suitable foraging and nesting habitat extending within the site under consideration.
- The effect of disturbance and displacement is expected to be of minor significance to local populations of the species of interest.

The conclusion of the Appropriate Assessment is that after a thorough analysis of the individual impacts of the project in terms of achieving the specific habitat and fauna conservation objectives of the area, and taking into account the best available information reviewed in this study, and provided that the proposed mitigation measures will be implemented, it is concluded that the impacts of the project on the wider area are not expected to be significant to the extent that it will damage its ecological integrity.

As regards anthropogenic parameters, no significant differences are expected over a 20-year time horizon. In particular, the neighbouring settlements are not expected to increase their population, since the latest censuses record a decrease in their permanent population, mainly due to urbanisation. The traffic volume in the study area is not expected to vary significantly and the potential for the construction of various projects in the area that could cause noise or vibration in the future is not recorded. The only technology infrastructure projects that appear to be planned in the area are the planned technology projects related to the study project, which as documented in Ch. 9 of this study, are technology that does not burden the existing state of the environment, since their operation is not associated with the production of pollutants, vibrations, and as documented in the attached noise propagation assessment study, no acoustic disturbance is expected from the operation of the project within the boundaries of the nearest settlements and legally existing homes.

An attempt to assess and predict the future course of the primary, secondary and tertiary sector in the study area is considered risky, due to the many and often unpredictable parameters that affect it (e.g. subsidies, availability of new European funds, etc.). Therefore, depending on the future economic activities, the corresponding impacts on the fauna and flora of the study area are expected. As far as the main land uses are concerned, no substantial changes are expected in the future.

However, substantial human-related factors that significantly affect the ecosystem structure of the environment cannot be predicted with certainty.

In conclusion, and having considered the most important aspects of development, the study area is not expected to be significantly different from the construction and operation of the project under study, compared to its situation as it would be in the future under the No Action scenario.

The *zero option*, i.e. not siting and installing the project in the area, would only make sense for a detailed presentation and assessment if the impacts from the construction and operation of the project under study were significant and compared to the benefits that would result from the development of the project.

In summary they are:

- ⇨ The project under study exploits wind energy, a renewable natural resource whose exploitation does not produce any kind of solid, liquid or gaseous waste.
- ⇨ The installation of the WPP outside protected areas and away from anthropogenic activities that may be affected.
- ⇨ The negative environmental impacts from the construction and operation of the project, which are assessed and evaluated in detail in the following chapters, are generally minor, localised and much of them are fully manageable and reversible. About bird fauna, which

is a sensitive element, the impacts that may occur are manageable with the implementation of the proposed measures and actions.

- ⇨ The positive environmental impacts from the operation of the project are not only limited to the avoidance of greenhouse gas emissions from the replacement of conventional fuels for electricity generation, but also extend to meeting the principles of sustainable development.

In addition, the "zero" alternative implies:

- ⇨ The non-contribution to the implementation of the Special Framework for Spatial Planning and Sustainable Development for RES (Joint Ministerial Decision 49828/2008) as the area of the proposed project is a "Wind Priority Area (WPA) according to the Annex of the said Joint Ministerial Decision of the international target for clean energy production.
- ⇨ The non-utilization of the huge and untapped wind potential of our country.
- ⇨ Its non-contribution to the production of "clean" energy to meet the country's energy needs, with the consequent saving of foreign exchange resources.
- ⇨ Its failure to contribute to meeting the high environmental targets (reduction of CO_2, NOx, SO_2, etc.) set under the Kyoto Protocol signed in December 1997 and the Paris Agreement on climate change signed in April 2016.

In conclusion, the zero option is rejected as the negative impacts from the construction and operation of the WPP appear to be of a significantly lower intensity and duration than the positive impacts of the development of the project under study.

CHAPTER 8 - CURRENT STATE OF THE ENVIRONMENT

8.1 Study area

The proposed WPP with a total capacity of 34.50 MW will be installed at the "Mavrodasos" site in the Region of Eastern Macedonia and Thrace, Regional Unit of Evros, Municipality of Soufli, Municipal Unit Orfeas, Municipal Community of Dereio. The project under study and the largest part of the interconnection (accompanying project) at the site "Mavrodasos" falls under the Natura 2000 site named "Mountain Evros – Dereios Valley" and code GR1110010 while the remaining part of the interconnection falls within the Natura area "Filiouri Valley" with code "GR1130011".

It is not located within declared archaeological sites and monuments and complies with all relevant guidelines and restrictions set out in spatial and urban planning.

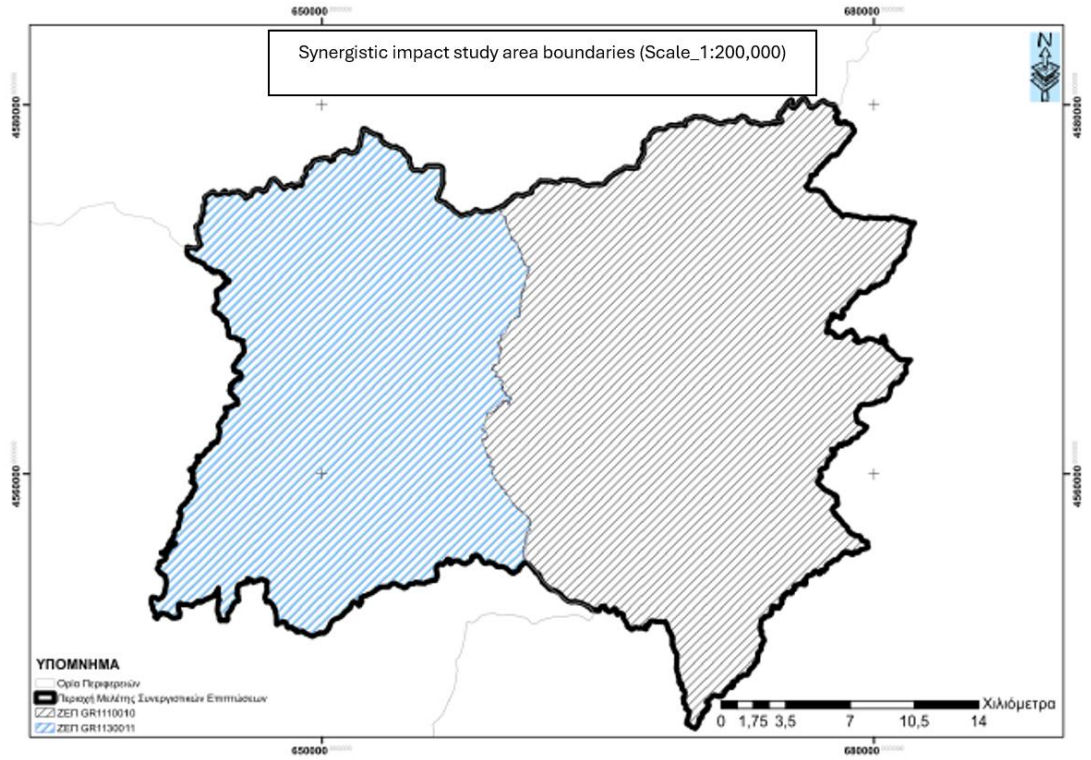
According to Annex 2 of UNHCR 170225/2014 (Government Gazette 135 B΄/27-01-2014), "the study area *is defined as the area around the project or activity, on the natural and anthropogenic elements of which its construction and operation may have an impact"*. For point and area projects, the following cases apply:

- For point and area projects or activities of subcategory A1, 2 km from the boundaries of the land or occupation site for areas outside the boundaries of settlements or city plan or 1 km respectively for areas within the boundaries of settlements or city plan.
- For projects and activities of subcategory A2, the above minimum radii shall be cut in half. The extent of the study area may, on a case-by-case basis and at the discretion of the EIA designer, be increased, depending on the environmental medium and depending on the type and size of the project or activity in relation to its area of influence".

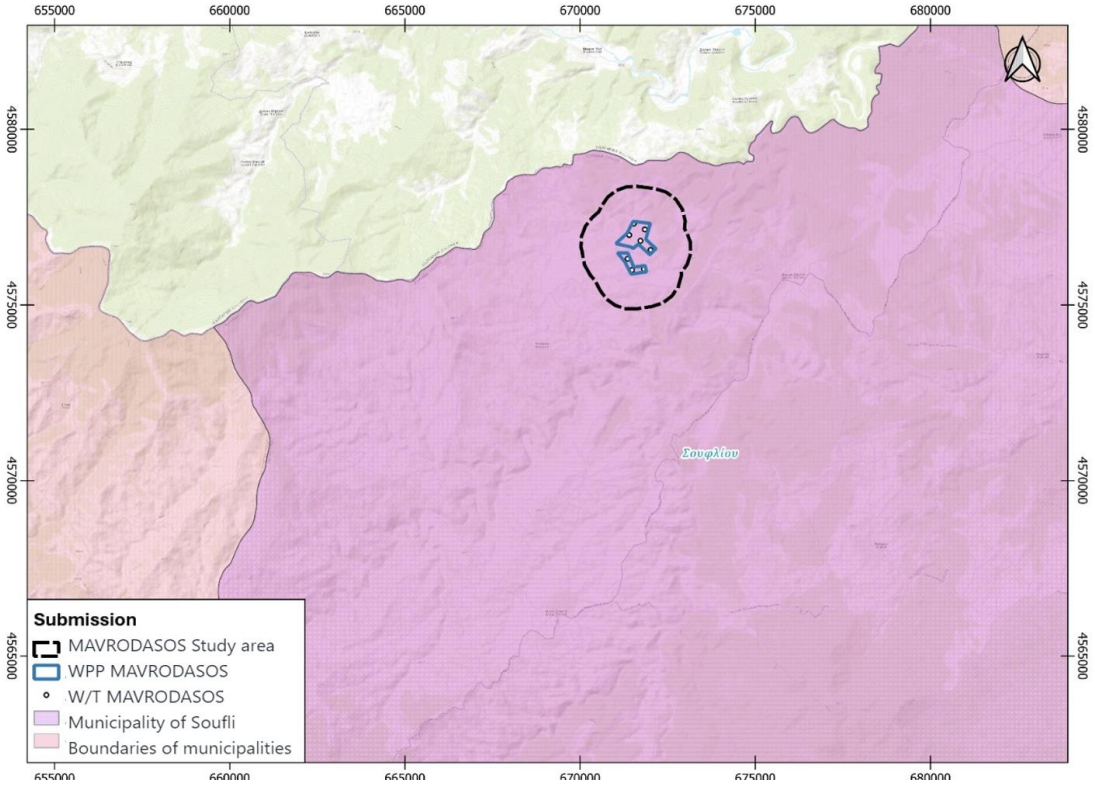
For the present study, 1 km from the area of occupation of the aircraft was considered as a minimum design radius, as the project under study is classified in subcategory A2, therefore belongs to the second case. The wider area of the project is defined as the area included within the administrative boundaries of the Municipality of Soufli.

As mentioned above, the project along with the accompanying works falls within protected Natura areas, which is why according to the SEA, the Study Area (SPA) is defined as "the wider area of installation of the Agathea WPP with the description and characteristics mentioned to refer to all the protected characteristics of the SPA GR1110010 and SPPE GR003 areas, while the protected characteristics of the nearest SPAs GR1130011 were also taken into account, GR1110002 and BG 0002019 as well as the nearest SPC GR008".
Therefore, the study area is defined as SPA GR1110010 and SPC GR003.
However, for the protected areas under study, and in order to better address the synergistic effects of the project under study, in the Special Ecological Assessment and in the existing study, it was chosen to take into account the wider boundaries of the entire area enclosed within the **main SPA GR1110010 under study, but also of the nearest Greek SPA GR1130011**, as almost all the already installed WPP (with a license to operate) of the wider area are located within it.

Therefore, the area resulting from the union of the boundaries of the above two areas from now on will be referred to as **the "synergistic impact study area" (SIS.).**



Map 17: Map of the boundaries of the protected areas under study SPAs GR1110010 and GR1130011, and boundaries of the area of study of synergistic effects (SIS.) (boundaries of the union of the two protected areas)



Map 18: Mapping of the project under study and the Municipality of Soufli

8.2 Climatic and bioclimatic characteristics

The climate of P.A.M.TH. has a Mediterranean character in the coastal area and a Middle European character in the other parts. The average annual temperature ranges between 14o and 16 ^{oC} with great variations. The rainfall in P.A.M.TH. during the period of vegetative growth (four months May-August) shows the greatest variation throughout the country.

In the coastal zone there is a mild winter from Kavala to Alexandroupolis and contrasts with the prolonged periods of snow and low temperatures from Nevrokopi and Echinos to Ormenio and the other northern settlements of the Evros region. At the same time, the development of microclimatic systems in various areas is enhanced by the peculiarities of soil morphology that create suitable conditions for biodiversity. The high wind speeds recorded in the Evros and Rhodope Regions are also observed. The alternations of winds in relation to the rest of the Region, but also most areas of Greece, make them areas of priority for the exploitation of wind potential through the development of RES projects.

The table below presents climatological data from the recording station closest to the site of the project, the Meteorological Station of Alexandroupolis, which is located southwest at about 54 km. The data shall be considered representative for the area where the projects are located.

	JAN	FEB	MAR	APR	MAY	JUNE	AUG	AUG	SEP	OCT	NOV	DEC
Minimum temperature (^{0}C)	1.4	1.8	3.7	7.2	11.5	15.5	18.0	18.0	14.4	10.5	6.7	3.3
Average temperature (^{0}C)	5.1	6.0	8.5	13.3	18.6	23.4	26.2	25.8	21.2	15.8	10.9	7.1
Maximum temperature (^{0}C)	8.6	9.8	12.3	17.3	22.6	27.4	30.5	30.7	26.2	20.4	14.9	10.6
Average rainfall (mm)	63.3	56.3	48.6	35.1	36.2	28.3	19.8	13.1	27.9	51.5	82.7	82.7
Total rain days	12.4	10.6	10.6	10.1	9.7	7.2	4.4	3.3	4.4	7.7	10.2	13.1
Average wind direction	B	B	BA	BA	BA	SW	BA	BA	BA	B	BA	B
Average wind intensity (Kt)	8.0	8.2	8.0	6.2	5.4	5.4	6.6	6.7	6.5	7.3	6.7	7.8

Table 20 : Climatological data from Meteorological Station of Alexandroupolis Longtitude(Lon): 22.97 Latitude(Lat): 40.53 Altitude (Alt): 2m, Region: Eastern Macedonia - Thrace, Data Period: 1959 – 2010 Source: E.M.Y.

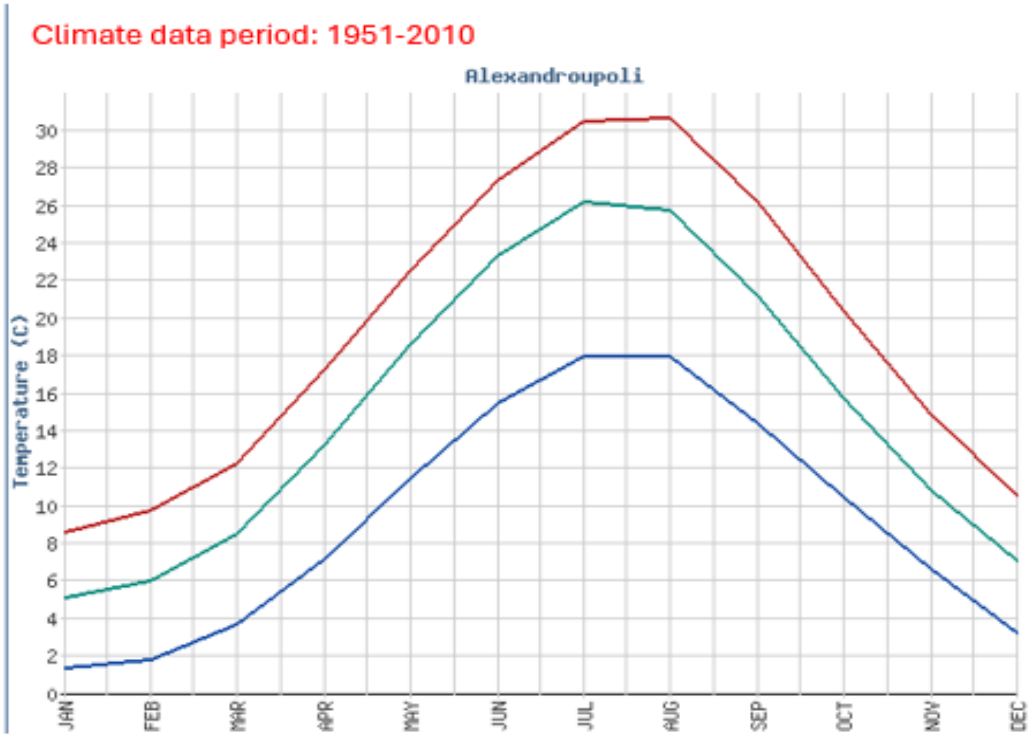


Image 21:Temperature change diagram ((Source:http://www.emy.gr/emy/el/climatology/climatology)

The average annual temperature is 15.1^{0}C, the minimum temperature on a year average at 10.9^{0}C and the maximum temperature on a year average at 30.5^{0}C. The warmest period is June – August and the coldest is January – February.

Most rainfall occurs in the period November – March with a peak in duration and intensity in December.

The prevailing winds during the twelve (12) months of the year have a northeast direction with the highest blooms occurring in the period February – March.

The Mediterranean continental climate prevails in the project area, characterized by a dry and warm period in the summer months and a wet and cold period in the winter months. The area of Alexandroupolis is characterized by a weak thermo-Mediterranean bioclimate character with the number (X) of biological dry days during the hot and dry period ranging from 100<X<125.

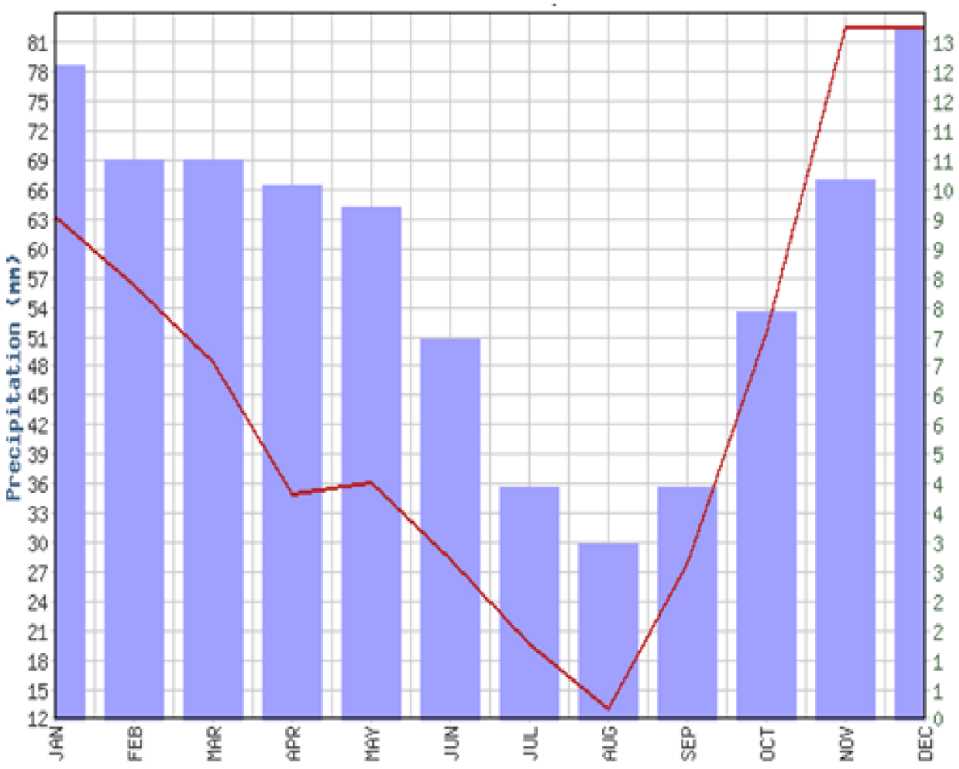


Image 22: Precipitation change chart

Wind data

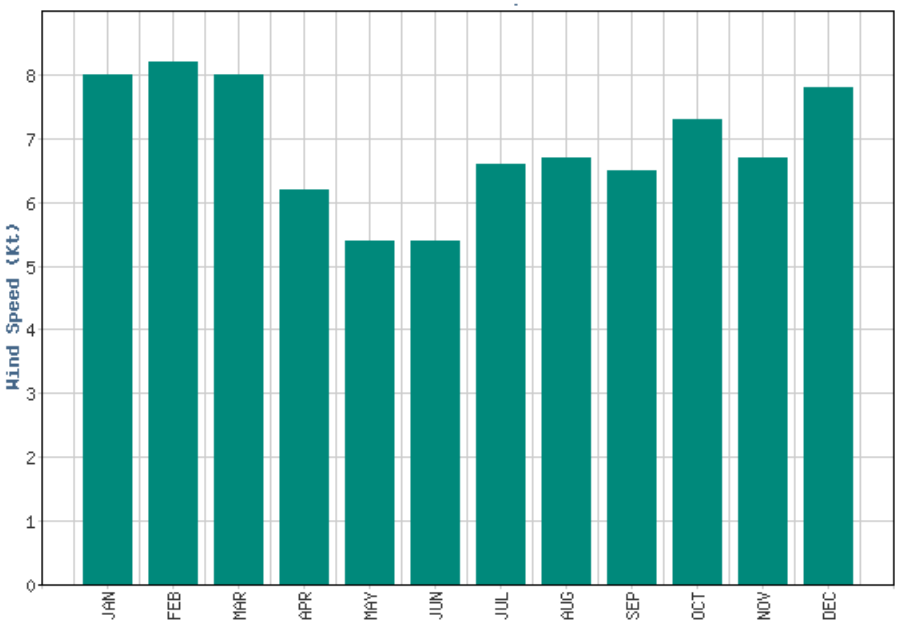


Image 23: Diagram with average wind speed(Source: http://www.emy.gr/emy/el/climatology/climatology)

Based on the diagram below, the prevailing winds in the study area, as well as in the wider area, are the Northeast and secondly the North. Calm occurs quite often in the study area, at a rate of 34%.

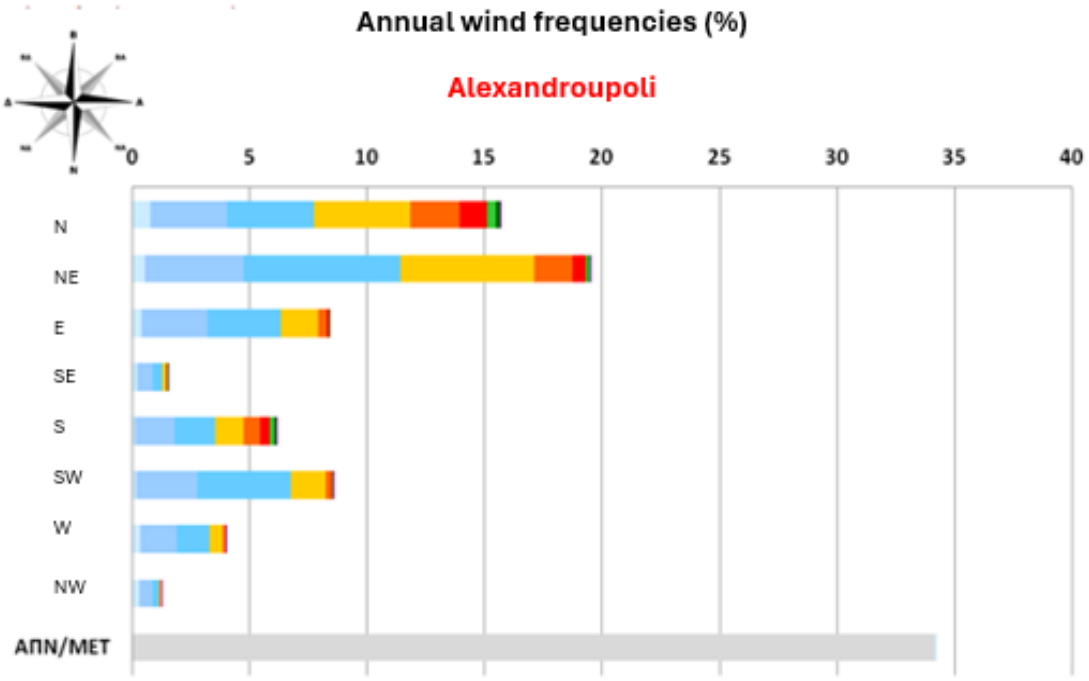


Image 24: Annual Wind Frequencies (Source :http://www.emy.gr/emy/el/climatology/climatology)

Emberger ombrothermal quotient, Q2

In the Mediterranean area, bioclimatic floors have been determined by Emberger's Ombrothermal quotient and apply only to the Mediterranean climate.

$$Q_2 = \frac{P}{(\frac{M+m}{2})(M-m)} \Rightarrow Q_2 = \frac{2000P}{M^2 - m^2}$$

Where P = annual rainfall in mm,

M= the annual average of the maximum temperatures of the warmest month in absolute terms

Degrees

m= the average value of the minimum temperatures of the coldest month in absolute degrees

Based on the value of Q and m, the bioclimatic diagram is compiled by Emberger, and an area is included in the corresponding bioclimatic floor. The lower the Q index, the drier the bioclimate of a place. The following bioclimatic floors are distinguished:

a) Wet floor

b) Floor humidifier

c) Semi-dry floor

d) Dry floor

In addition, its value can determine the winter condition of an area by the intensity of cold. Based on the value of m, the individual bioclimates or bioclimatic floors are subdivided into five variants or sub-floors, according to the following:

m > 7 0<^{0}C winter warm

3 ^{0}C < m< 7 ^{0}C winter mild

0 ^{0}C <m <3 ^{0}C winter cold

m < 0^{0}C winter harsh

As far as the study area is concerned, below are presented the climatic data to which the projects under examination fall:

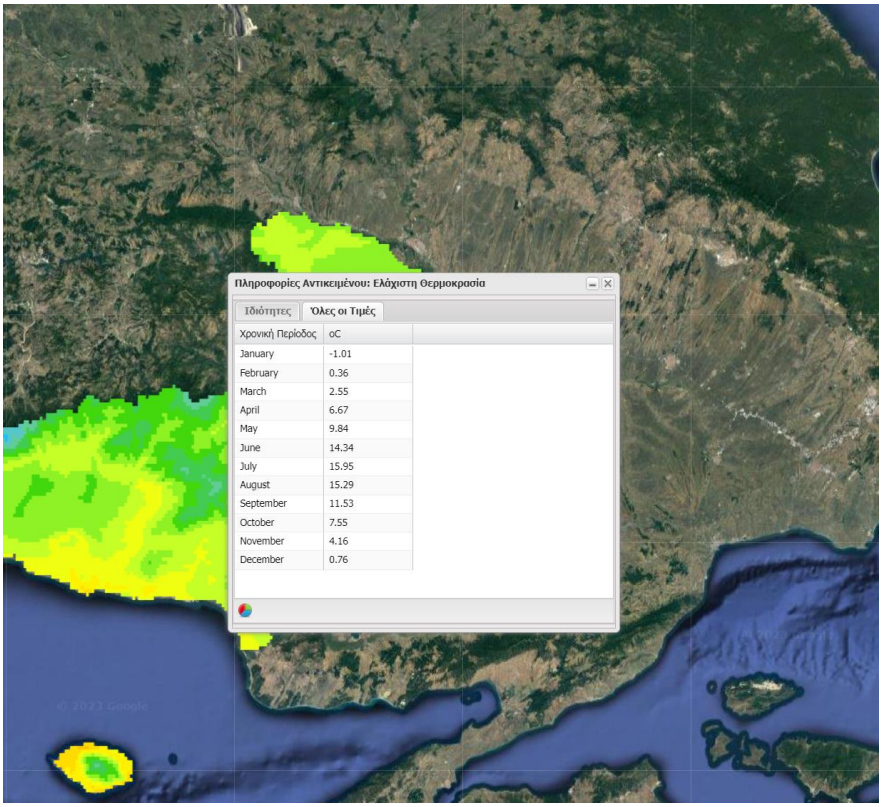


Image 25: Mapping of minimum temperatures in the study area

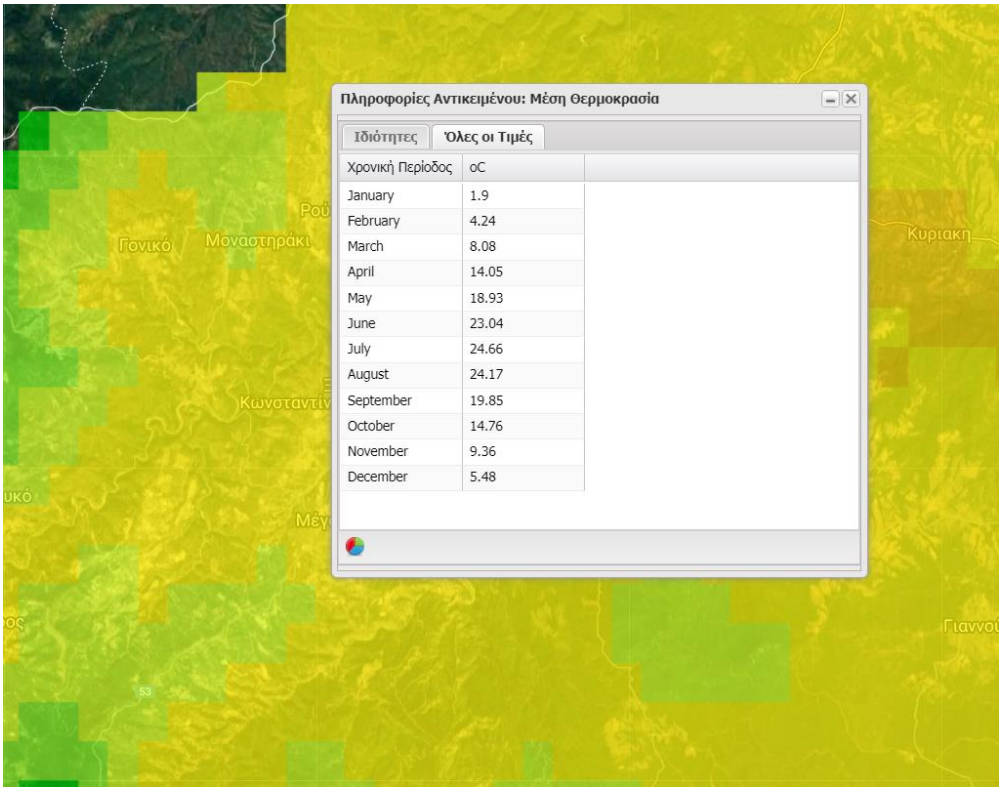


Image 26: Mapping of average temperature in the study area

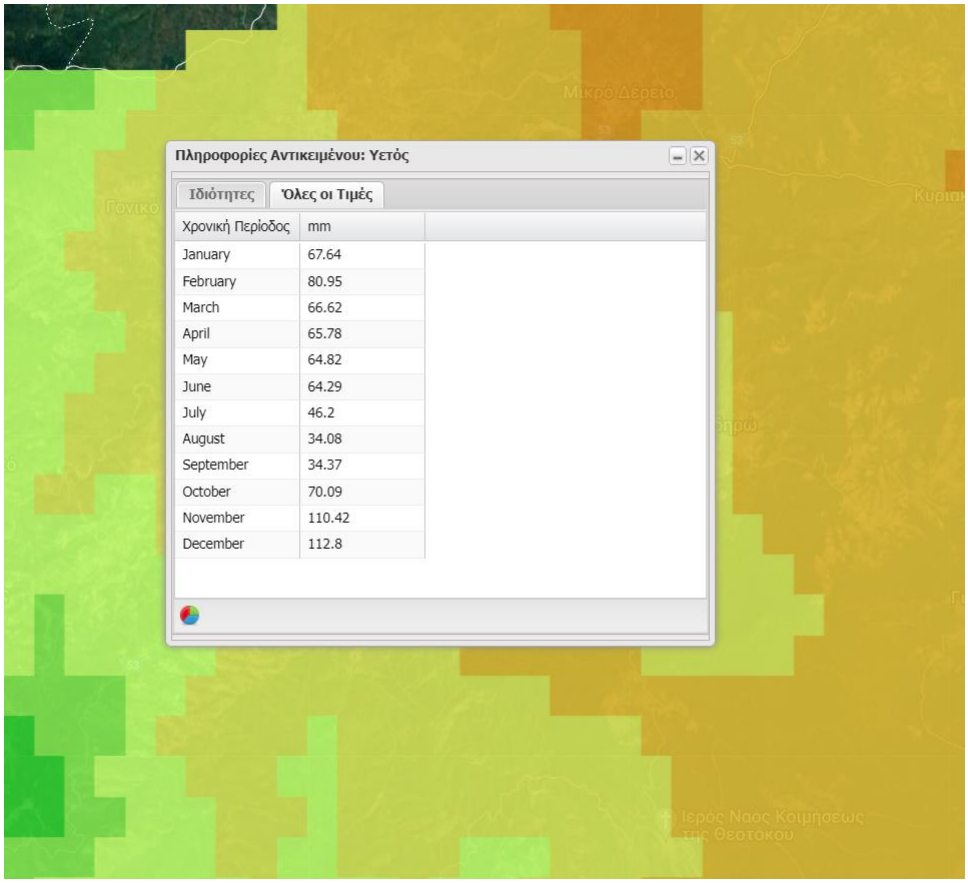


Image 27:Precipitation impression in the study area

The chart below shows the average monthly temperature and the average monthly precipitation for the area of Alexandroupolis.

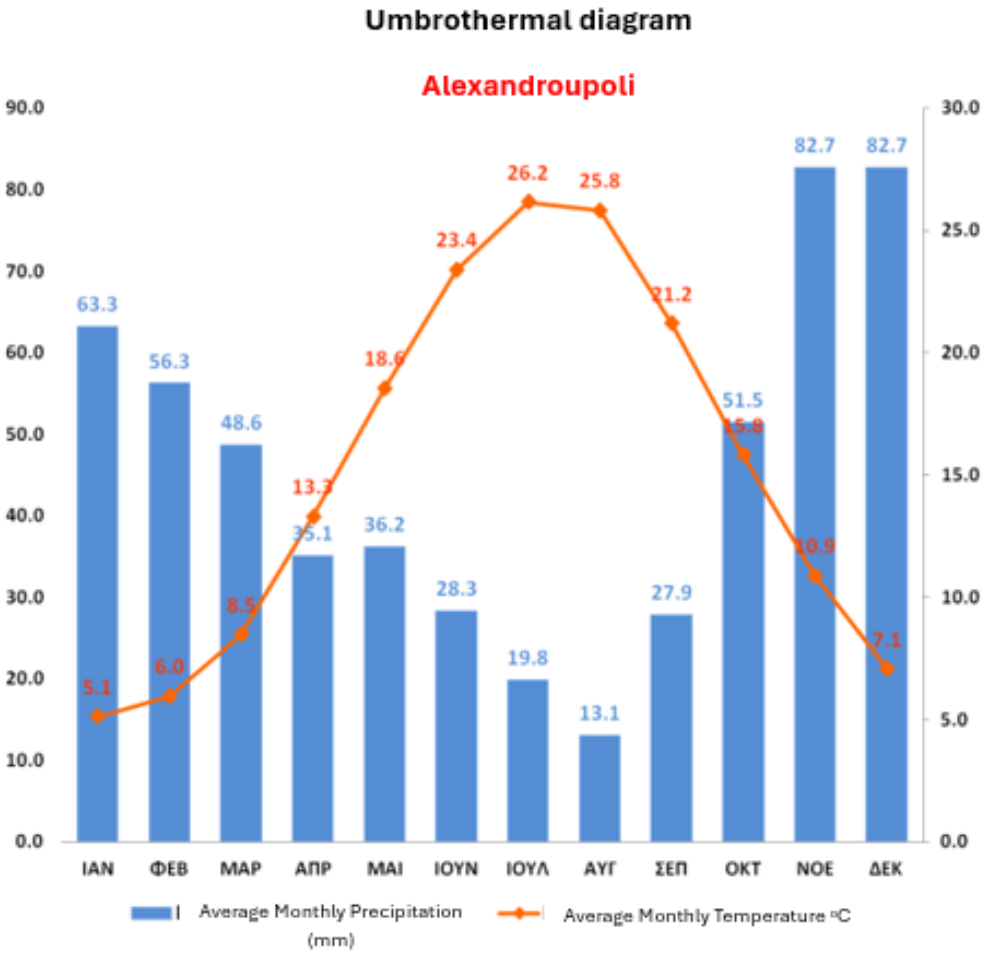


Image 28: Emberger rainwater diagram for the area of Alexandroupolis (Source:http://www.emy.gr/emy/el/climatology/climatology)

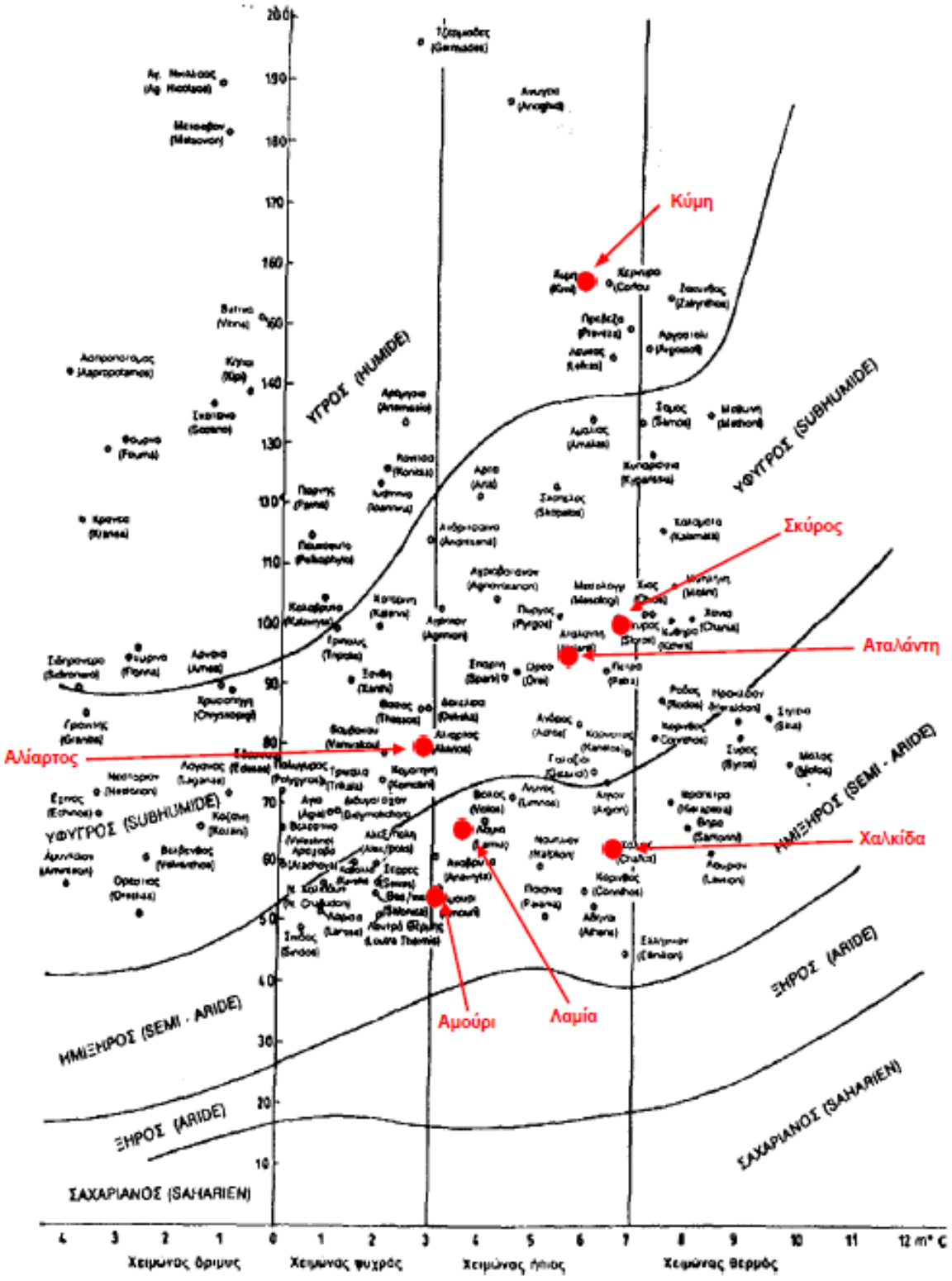


Image 29: Emberger climate chart for Greece (Source: Mavrommatis 1980).

According to the following maps of bioclimatic floors and bioclimatic conditions, the bioclimatic floor of the study area is characterized as wet with harsh winter m<0ºC and the character of the bioclimate is characterized as sub-Mediterranean with several hot and dry days with 0<X<40.

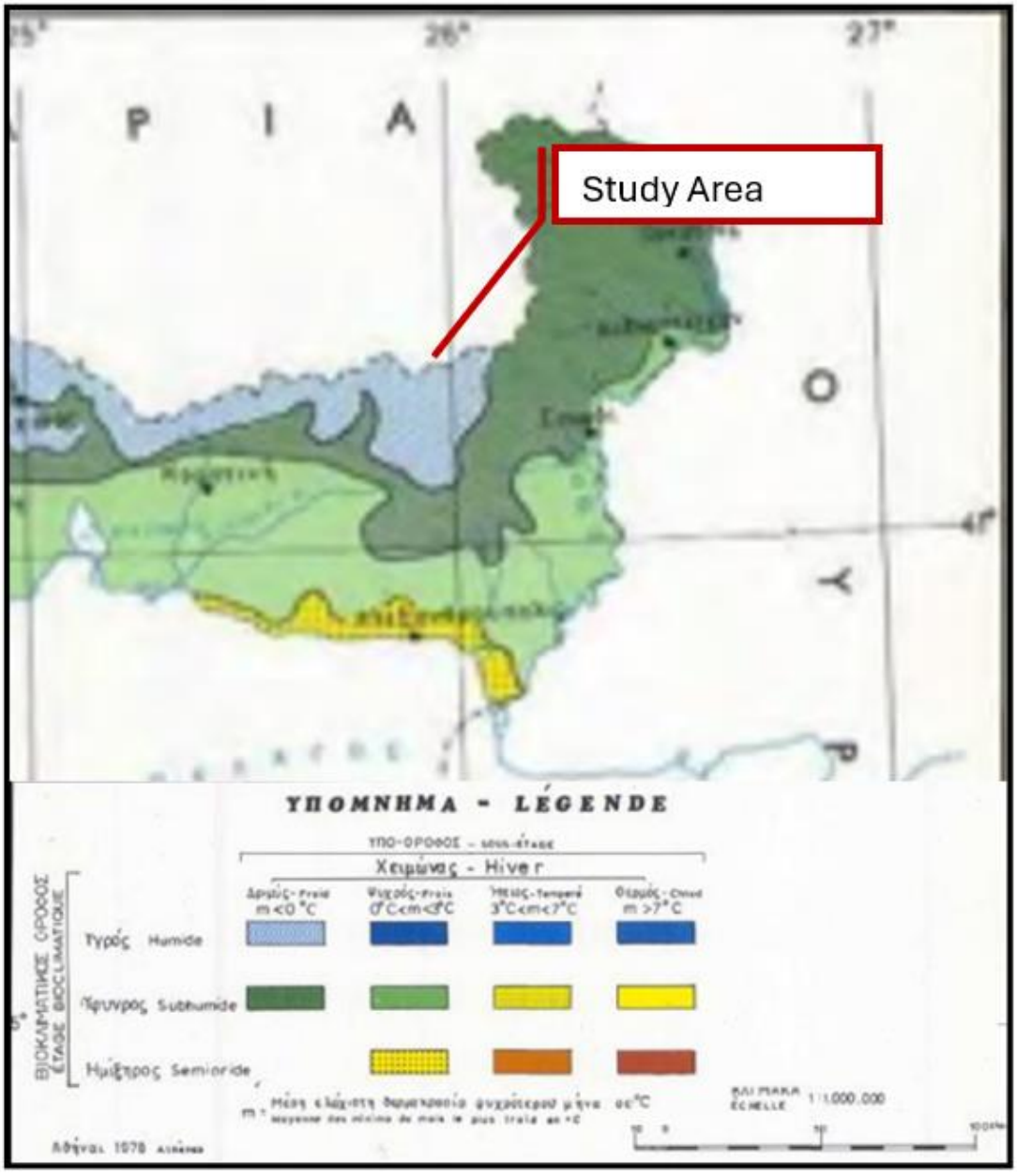


Image 30: Map of bioclimatic floors (map of the Ministry of Agriculture of 1978, Mavrommatis)

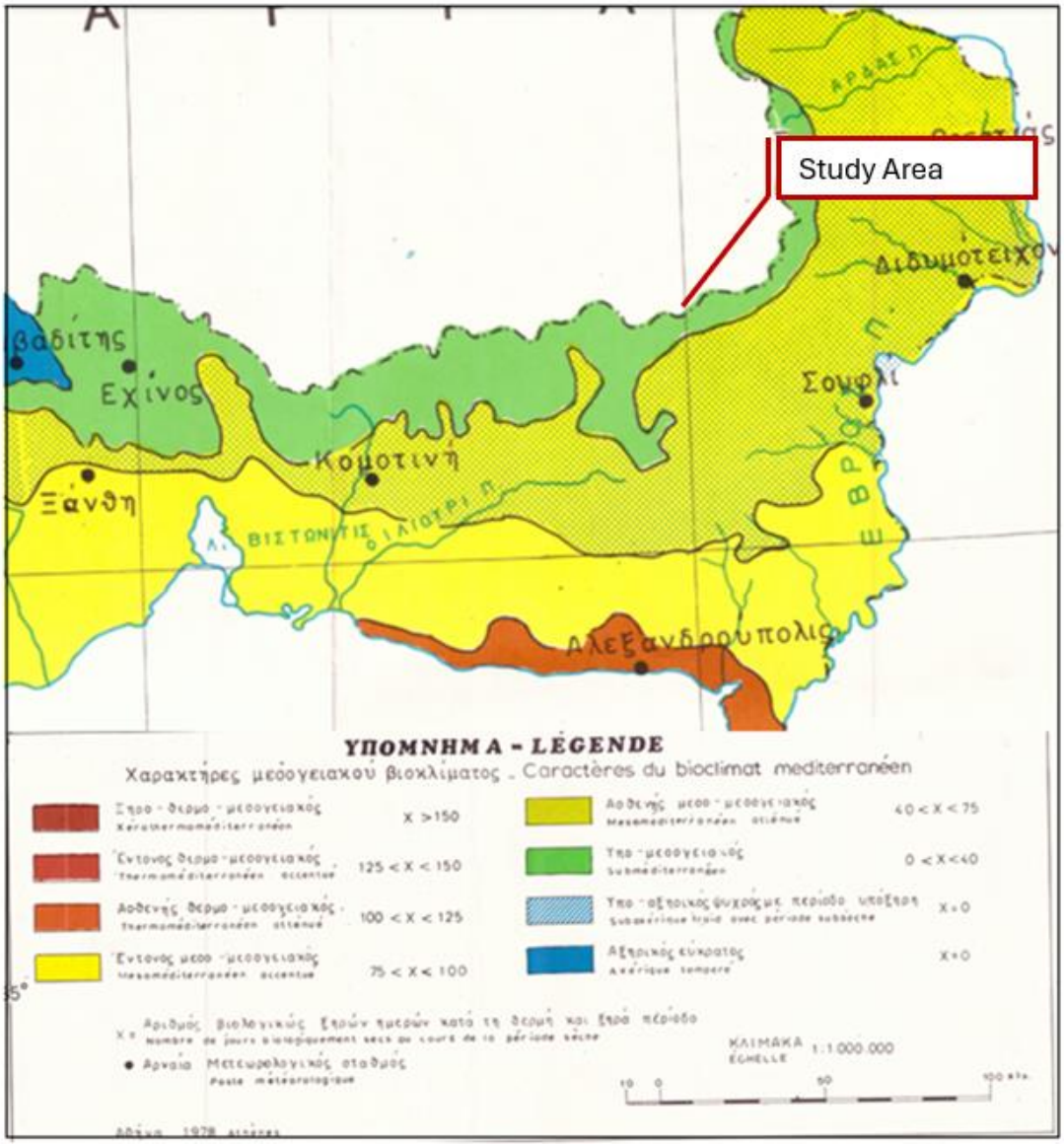


Image 31:Map of bioclimatic conditions of Gauss (Map of the Ministry of Agriculture of 1978, Mavrommatis)

8.3 Morphological and Landscape features

8.3.1 Total reference landscape and sections of the Morphological Landscape of the wider area and study area

The Region of A.M.Th. is characterized by intense mountainous morphology (mainly Rhodope Mountain range) and lowland parts which originate from tertiary tectonic depressions of the Rhodopic mass. The morphology of the area has come from the results of the tectonic activities of the past (fault action) of the wider area. The mountainous areas of Eastern Macedonia – Thrace cover 39.6% of the total area of the Region. The most important massif is the Rhodope Mountains that develops between Greece and Bulgaria. Most of the Rhodope Mountains are in the neighboring country, but the highest peaks of Koula (1,827 meters) and Papikio are located on the border. The eastern end of the Rhodope Mountains gradually breaks into the eastern part of Thrace in the low-rise mountains of Sapka and Kallithea (1,044 and 945 meters respectively).

Especially for the installation area, the WPP is placed within the Natura area "Mountain Evros – Dereios Valley", northwest of the National Park "Dadia – Lefkimi Forest" at about 14 km, while northwest is located the Natura area named "Filouri Valley" at 11.1 km. The river water body

named "Erythropotamos R." is located southeast of the nearest W/T (W/T 1) of the project at 2.3 km.

The W/T are located on an axis E-W basically, at an altitude of ~303 m and around are located hill ranges of similar altitude (300m). In the study area and in the wider area of the project, a road network consisting of agroforestry roads, a provincial road network and local roads is located.

East of WPP at 10,249 m passes the Provincial Road Mandra – Mikro Dereio.

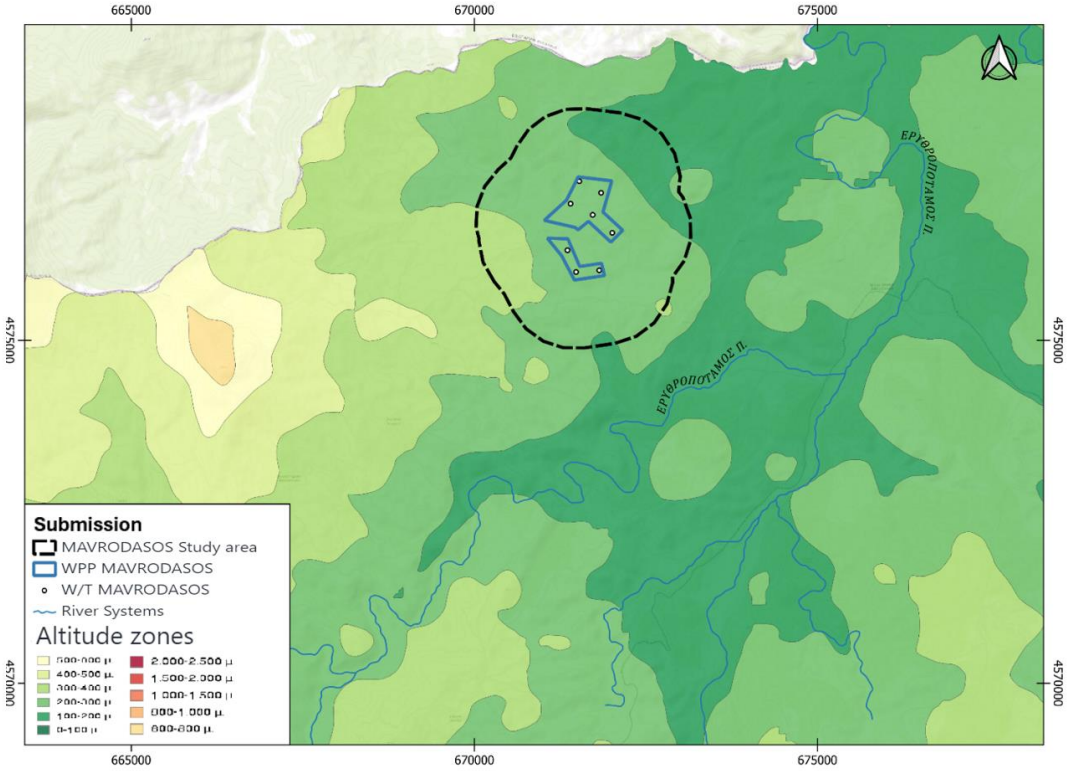


Image 32: Morphology of the project study area and the wider area

8.3.2 Areas relevant to the European Landscape Convention

The ratification of the European Landscape Convention (Law 3827/2010, Government Gazette 30/A'/25.02.2010) is considered important as it combines the dimension of landscape with spatial planning in a direct or indirect way.

Within the specifications of the Regional Frameworks for Spatial Planning and Sustainable Development of the Regions of the country, a methodology for landscape study is presented, which is approached based on the European Landscape Convention. The new RSPSDF identify, record and standardize the landscape in "landscape zones" to identify landscapes of particular importance and to carry out coordinated actions for their protection, promotion and management.

According to Law 3827/2010, in the study area of the project there is no landscape included in a Landscape Protection and Management Program. According to the RSPSDF, Landscapes of Particular Importance of Eastern Macedonia and Thrace at international level are recognized in Philippi in the zone of Drama – Kavala, the Deltas of Nestos and Evros, as well as Samothrace. Of national importance are the Straits of Nestos, Thassos, and Maroneia in the Rhodope-Evros zone. Finally, of regional importance are the Treasure and Platanovrysis Dams in Nestos, the

mountainous settlements of Rodopi, Porto Lagos, Lake Vistonida, as well as lakes, lagoons and lakeside settlements located within the Region of Eastern Macedonia and Thrace.

In general, according to the above Framework, within landscape zones, the following general management guidelines are set:

- Establishment of special control of integration into the landscape in the context of issuing and implementing building permits and other technical projects.
- Promotion in the field of underground mining and promotion of landscape restoration through specific policies and programmes.
- Avoidance of building on slopes greater than 45% except in landslide areas where slopes are limited to 20%.
- Promotion of projects for signalling routes protected as landscapes, site signalling and studies for the investigation of values – elements in climates underlying regional planning for the identification of specific protection rules that will feed into the underlying planning.

Landscape and morphological features of a wider study area

The landscape zones identified in the Region of Eastern Macedonia and Thrace are presented in the table below and have been characterized and evaluated in the context of the study based on their value in International, National and Regional value and in Particularly Degraded. According to Law 3827/2010, the study area of the project does not fall within a landscape included in a Landscape Protection and Management Program.

Landscape categories based on their value	
International Value	Drama – Kavala Zone: Philippi Nestos Zone: Nestos Delta Evros Zone: Evros Delta Samothrace Zone: Samothrace
National Value	Nestos Zone: Nestos Delta: Nestos Straits Rhodope-Evros Zone: Maroneia Zone Thassos Zone:Thassos
Regional Value	Nestos Zone: Dams of Thesaurus and Platanovrysi Rhodope Mountains Zone: Mountain Settlements of Rodopi Kampos Xanthi-Komotini Zone: Porto Lagos, Lake Vistonida, lakes and lagoons and lakeside settlements
Particularly degraded	Drama-Kavala Zone: Egnatia (Kavala section)

Table 21: Landscape Zones located in the Region of Eastern Macedonia and Thrace

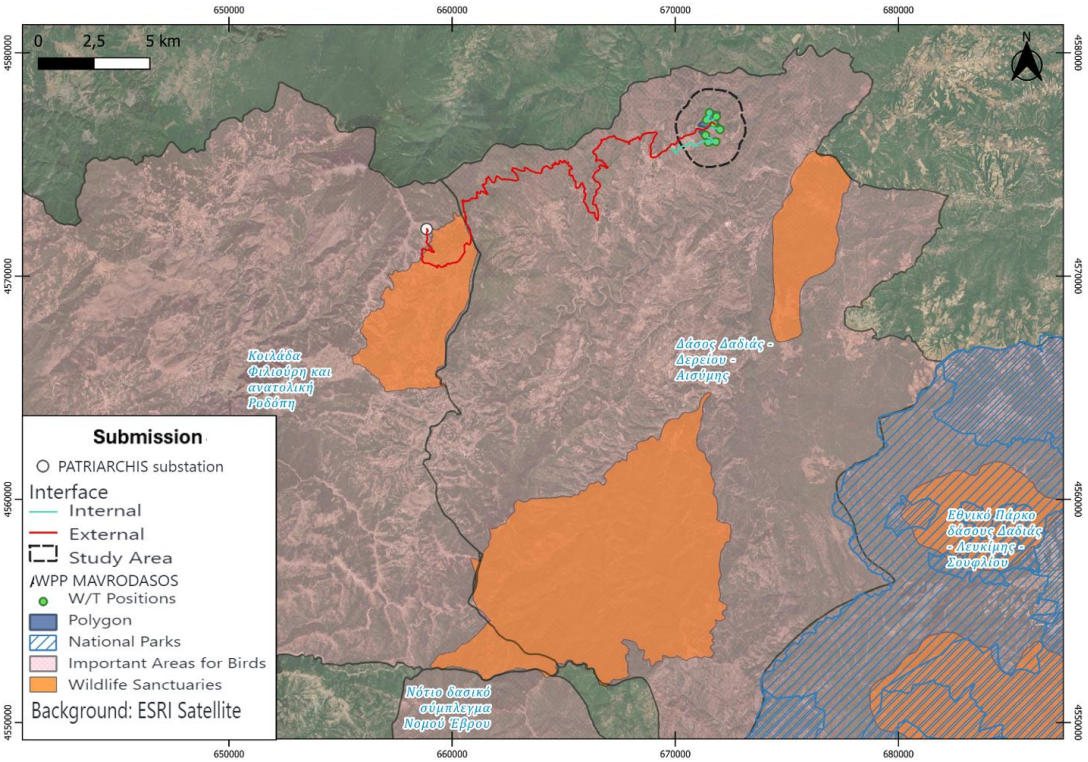
Furthermore, according to the SSPSDF-RES and the criteria for the inclusion of wind installations in the landscape, the following Table is presented which includes the distances from Points of Particular Interest as well as the rules of visual interference of the main installations (wind turbines) of the proposed project with the specific use. It is noted that points of particular interest are not considered, from which the W/T of the project are not visible.

Point of Particular Interest	Maximum Distance from W/T (km) (within PAP area)	Apply for required projects
The closest limit of inscribed in the World Heritage List and other monuments, archaeological sites and historical sites of paragraph 5 (bb) of article 50 of Law 3028/02.	6	Within the zone of 6 km from the installation sites of the aircraft there are two archaeological sites, the "Megalithic Monuments" at 1.3 km and the archaeological site "Koum Tarla" at 3.3 km
The nearest boundary of the absolute protection zone (Zone A) of other archaeological sites.	6	There are no Absolute Protection Zones A within a radius of 6km around the installation sites of the aircraft of the examined project.
The nearest boundary of an institutionalized core of a National Park, a monument of nature, an aesthetic forest of paragraphs 3 and 4 of article 19 of Law 1650/1986	0,8	Within the PAP area and within the zone 0.8 km from the locations of the S/A no natural area of these categories is located.
The nearest boundary of an institutionalized traditional settlement	6	There is no such settlement within a circle radius of 6 km from the locations of the S/S of the project under consideration.
The nearest city or settlement boundaries	2	within a radius of 2 km from the locations of the project aircraft, no settlement is located
The nearest boundary of an established or formed tourist area, medium and large tourist accommodation, special tourist infrastructure, tourist ports	2	within a radius of 2 km from the locations of the project there is no institutionalized or formed tourist area, medium and large size tourist accommodation, special tourist infrastructure, tourist ports.

Table 22:Points of special interest (Source: Annex IV, SmPC,2018)

The following paragraphs analyze the Points of Special Interest in relation to the study area of the projects under consideration.

The nearest boundary of an institutionalized core of a National Park, a natural monument, an aesthetic forest of paragraphs 3 and 4 of article 19 of Law 1650/1986:
The map below shows the nearest National Park and Wildlife Refuges as well as the proposed location of the project under consideration. For points of particular interest that are not depicted on the map below, a detailed description is made in the following paragraphs.



Map 29: Mapping of the proposed project, the National Park, Natura and Wildlife Sanctuaries.

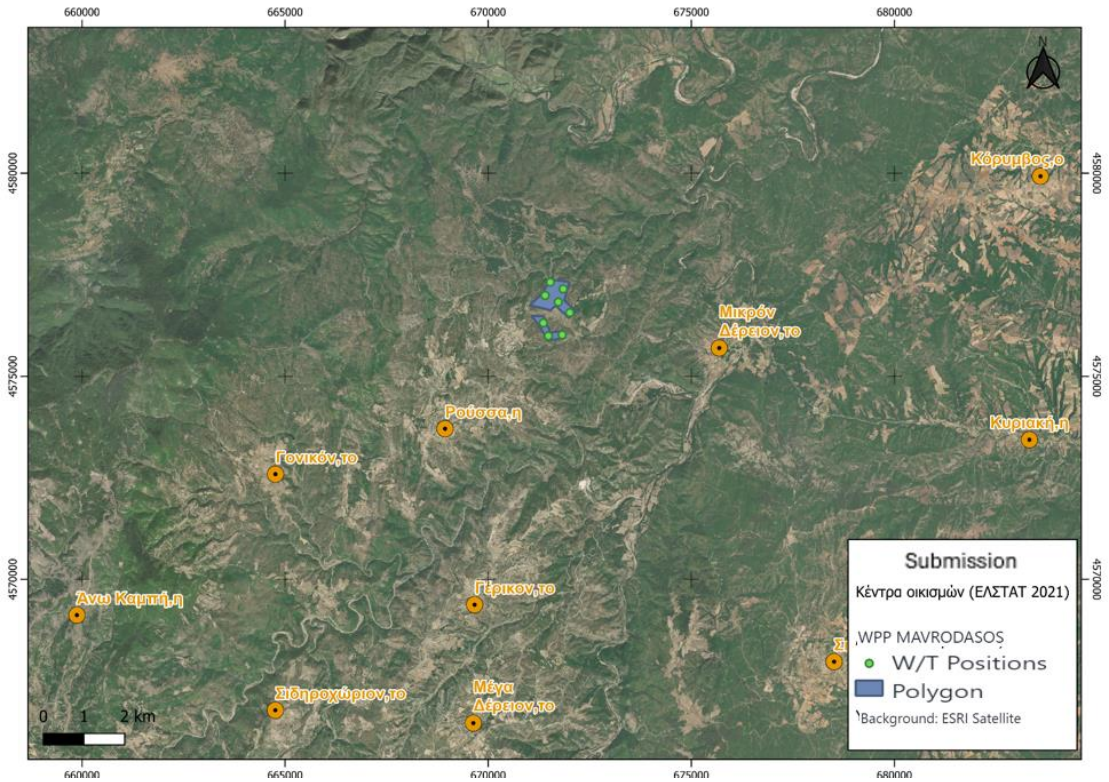
Nearest cities or settlements and the nearest boundary of an institutionalized traditional settlement.

Traditional settlements are settlements that have preserved unchanged the image they had in the past as well as their local character.
There are more than 800 traditional settlements in Greece classified by law . In the wider area of the Regional Unit of Evros, no traditional settlements are found. There are no traditional settlements near the installation sites.

N/A	NAME OF SETTLEMENT	POPULATION AT CENSUS 2021	DISTANCE OF THE SETTLEMENT CENTRES FROM THE NEAREST W/T (km)
1	Roussa	383	3,4
2	Parental	300	7,3
3	Mikro Dereio	91	3,9

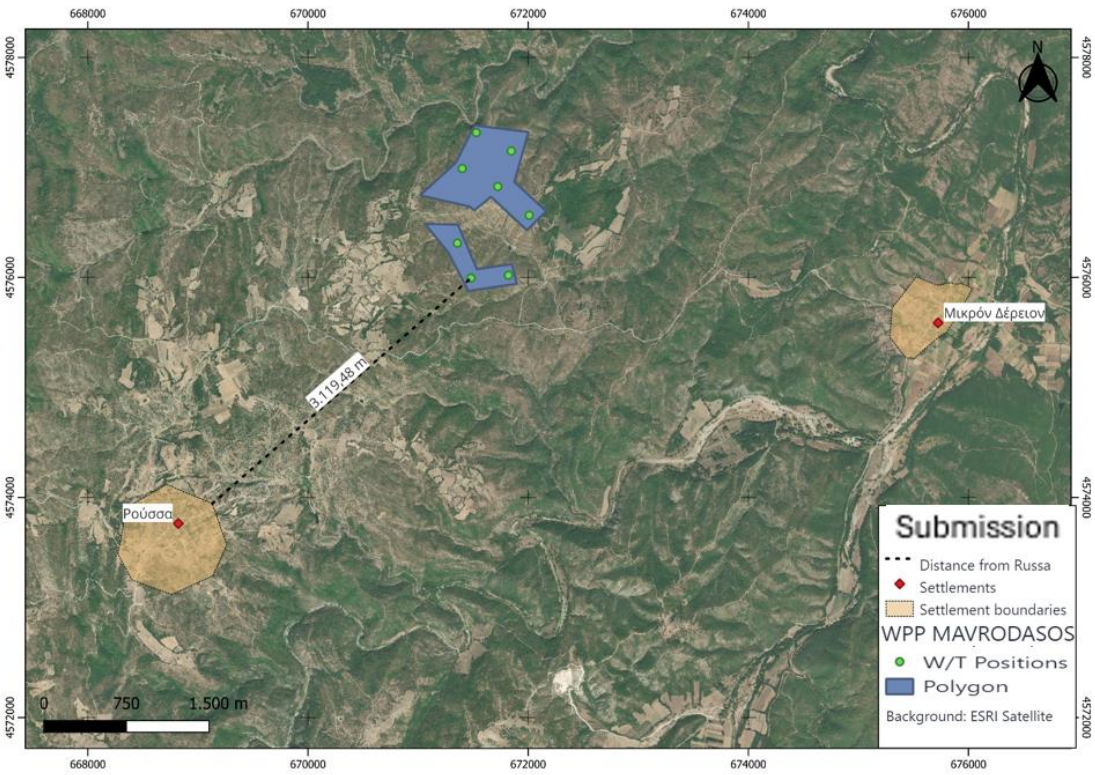
Table 23: Agglomerations near the study area distance in a straight line

In the area of the Municipality of Soufli, where the WPP is located, there are no general urban plans or Plans of Spatial and Residential Organization of the Open City (PSROOC.). The substation "PATRIARCHIS" that the project is to be connected to belongs to the Municipality of Arriana where there are no GIS and PSROOC. In the O.E. of Rodopi, where the Municipality of Arriana belongs, there is a Specially Regulated Urban Planning area in which the substation belongs in territorial unit 4 as shown and in the map excerpt. In the wider area, however, the GIS of the Municipality of Alexandroupolis is being prepared, which was initially approved by the Government Gazette 9Δ/14-1-1988, then as amended by the Government Gazette 844 Δ' / 25-11-1999 and is now at stage B1 (02/2021) during which the spatial development model is evaluated. This land is in an off-plan - residential area for which the building conditions of the Presidential Decree of 24/1985 (Government Gazette 270 D / 31-05-1985) apply.



Map 19: Nearest settlements

The nearest settlement with pre-1923 or less than 2000 inhabitants is the settlement of Roussa of the Municipality of Soufli, Municipal Unit Orfeas of the Regional Unit of Evros, which is 3.1 km from WPP. The boundaries of the settlement have been determined by Government Gazette 109/D/23-02-1987.



Map 20: Distances from institutionalized settlements near WPP

The nearest limit of the inscribed in the World Heritage List and other monuments, archaeological sites and historical sites of paragraph 5 (bb) of article 50 of Law 3028/02 and the nearest limit of the zone of absolute protection (Zone A) of other archaeological sites.

The archaeological sites and monuments located near the study area are listed below: 10 Megalithic monuments (Dolmen): At the location Ammochorafa (Koum - Tarla) next to the road Mikro Dereio - Roussa, 4km before Roussa, ten megalithic monuments are found. The first of the 10 monuments is located 30m. SE of the road, while the rest extend over an area of 2,200m. SE of the first monument and are successively located at the sites: Koum - Tarla or Watchtower the first, and the rest at Baluk - Kaya and the Muslim cemetery of the now abandoned village of Mylopepes. The site of the monuments is located southwest and is 1.3km from the nearest wind turbine of the project under examination (W/T 2).

- **The fortress enclosure, on the hill Mesimler – Kale:** It is located west of the ruined village of Mesimeri. The enclosure has a length of 497 m. Its west and south sides are built according to the cyclopean system with slates. Inside there are foundations of about 50 circular and quadrangular buildings, as well as tiled tombs. On the NW and SW side of the hill there are parts of a second enclosure. The monument is located southwest and is 6.7km from the nearest wind turbine W/T2
- Southwest of WPP is the terrestrial archaeological site **of Koum-Tarla**, which is a religious-funerary site of the Neolithic period and is 3.3Km from the nearest W/T2.

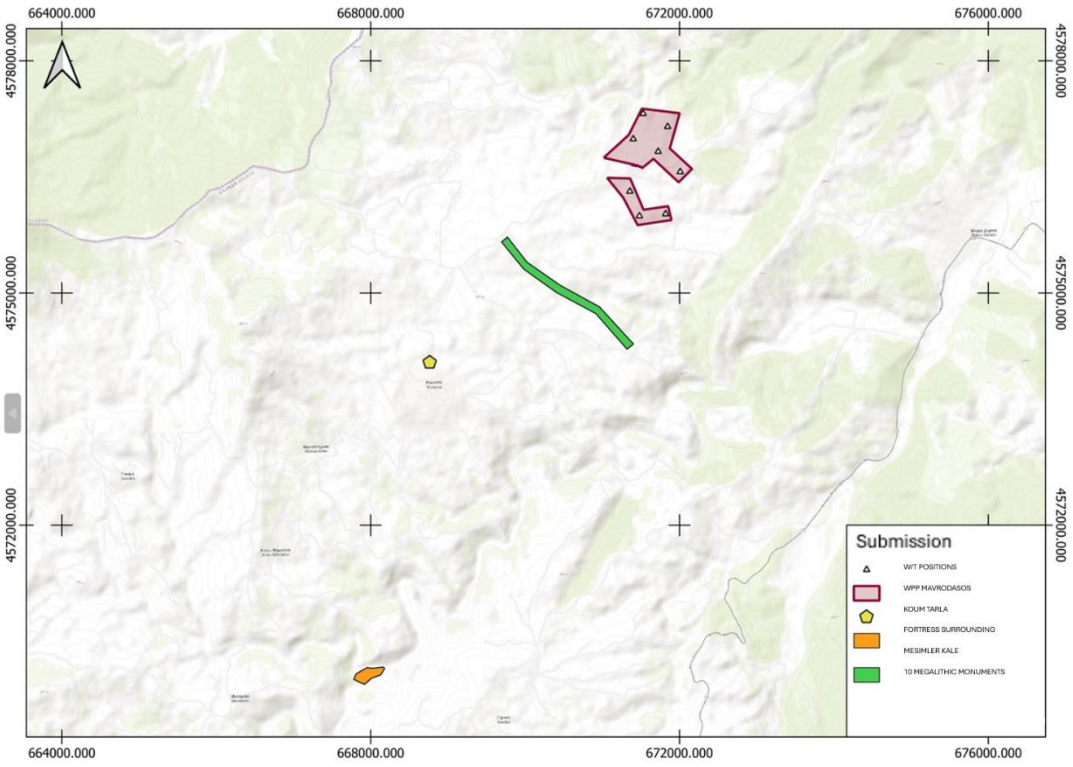


Image 33: Locations of Archaeological Sites in relation to WPP

Elements of importance and vulnerability of the landscape

Preservable Natural Monuments

Protected Natural Monuments are public or private areas that have natural characteristics of great ecological value. It can even be individual trees, parts of forest, areas with rare plant species that present great botanical, aesthetic or historical value. For the protection of preserved natural monuments, the same rules apply as for the cores of National Parks.

The nearest Preservable Monuments in the study area of the project are the "Haidous Forest" in Xanthi. The Forest of Haidou is in the Rhodope Mountains, on the border with Bulgaria with an area of 180 acres, covered by trees, mainly coniferous and deciduous broadleaves. Regarding the fauna of the area, large mammals such as bears, wolves, jackals, etc. are observed, as well as 102 species of birds. The Haidous Forest is located west of the project area at about 98 km.

Landscapes of Outstanding Natural Beauty

The nearest Landscape of Outstanding Natural Beauty (TIFK) in the study area is the Evros River Forest with code "AT5011010" which is located southeast of the project under study at a distance of about 48 km. It has an area of 5121.96 hectares (ha).This forest is a typical riparian forest of poplars and a few willows, a remnant of the ancient riparian forests of Evros.

Aesthetic Forests

The Region of Eastern Macedonia and Thrace has two Aesthetic Forests, namely the Nestos Forest and the Amygdaleona Forests of Kavala. The nearest Aesthetic Forest is the Nestos Strait and is located west of the project under consideration at about 100 km.

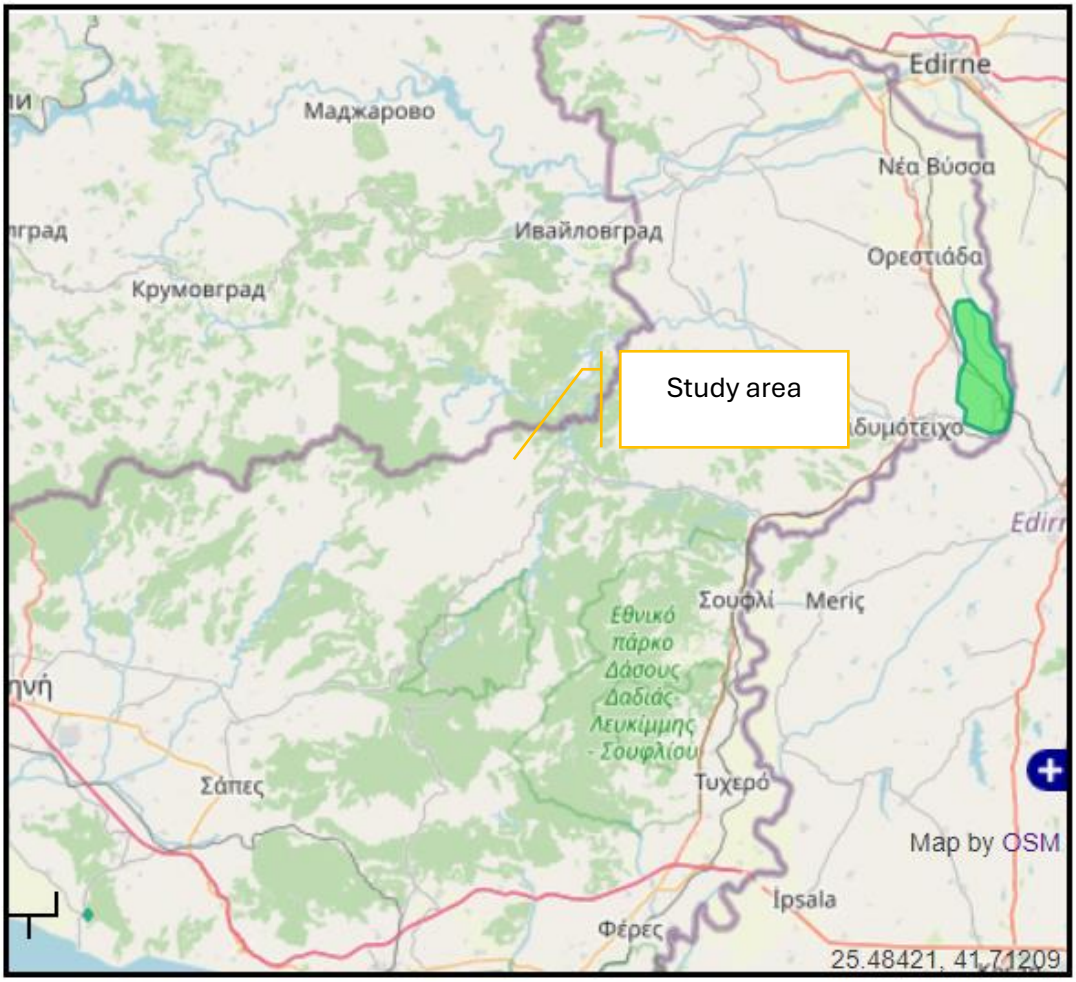
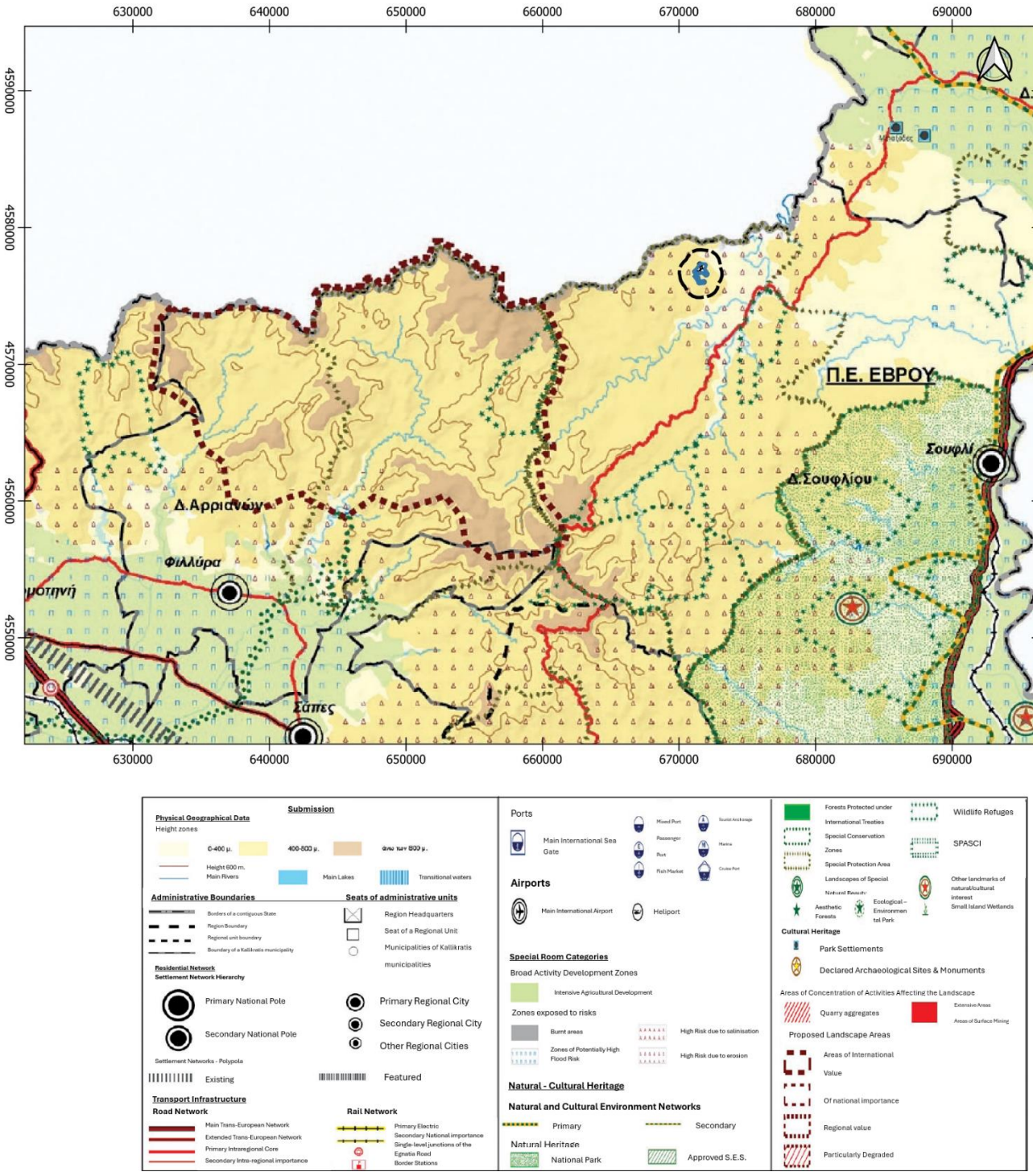


Image 34:Landscapes of Outstanding Natural Beauty (TIFK) (Source: Nature Bank, Filotis)

Nearest boundary of statutory or configured tourist area, medium and large tourist accommodation, special tourist infrastructure, tourist ports

Near the study area there are no landscaped tourist areas, special tourist infrastructure and tourist ports. Following the above data and by mapping the studied project at the location "Mavrodasos" on map P.2d "Environment, Cultural Heritage and Landscape", the study area is identified and located outside:

- the Protection Zones of Law 3937/2011
- small island wetlands of landscapes of natural beauty
- Residential Control Zones
- the Aesthetic Forests of Western Monuments
- Natural Interest routes (E4)
- demarcated archaeological sites,
- traditional settlements
- monuments & historical sites
- routes of cultural interest
- landmarks of tourist interest



Map 21: Mapping of Landscape Zones (Map D2d: Environment, Cultural Heritage and Landscape, MEPPAM.V.H, 2018).

Summarizing all the above information and as noted in the project compatibility check report with the SSPSDF-RES (which is presented in Annex IV), the distances of the WPP under examination from areas and points of particular interest are the following:

- At a distance of at least 6 km, from the boundaries of WPP, the archaeological site of "Ten Megalithic monuments" is located at 1.3 km and the archaeological site "Koum Tourla" at 3.3 km, therefore it is necessary to apply the rules of integration into the landscape.
- The nearest boundary of the absolute protection zone (A) of other archaeological sites is more than 10 km away. from the boundaries of the WPP, so there is no need to apply the rules of integration into the landscape.
- At a distance of at least 6 km, from the boundaries of WPP, there are no Nuclei of National Parks, Preserved Natural Monuments or Aesthetic forests, therefore it is not necessary to apply the rules of integration into the landscape.
- At a distance of at least 6 km from the boundaries of WPP, no traditional settlements are found, so it is not necessary to apply the rules of integration into the landscape.
- The nearest settlement <with 2,000 inhabitants) is the settlement of Roussa, with 3.2 km from the location of the project, so it is not necessary to apply the rules of integration into the landscape.
- The nearest boundary of an established or developed tourist area, medium or large tourist accommodation, special tourist infrastructure or tourist ports is more than 10 km away. from the boundaries of the WPP, so there is no need to apply the rules of integration into the landscape.

8.4 Geological, tectonic and soil features

8.4.1 Geological

The wider area of the Region of Eastern Macedonia and Thrace belongs in terms of alpine-prealpine structure to the area of the Rhodope Mass Zone, while a smaller part of it is occupied by the rocks of the Perirhopic mass. The region of Eastern Macedonia and Thrace geotectonically belongs to the following zones: a) Rhodope mass, b) Serbo-Macedonian mass and c) Perirhodopic zone. In Greece, the mass of the Rhodopes is separated from the Serbo-Macedonian mass, in the west by the line of the Strymon, while in the south-southeast it borders with the Perirhodopic zone.

The map below shows the geotectonic zones of Greece.

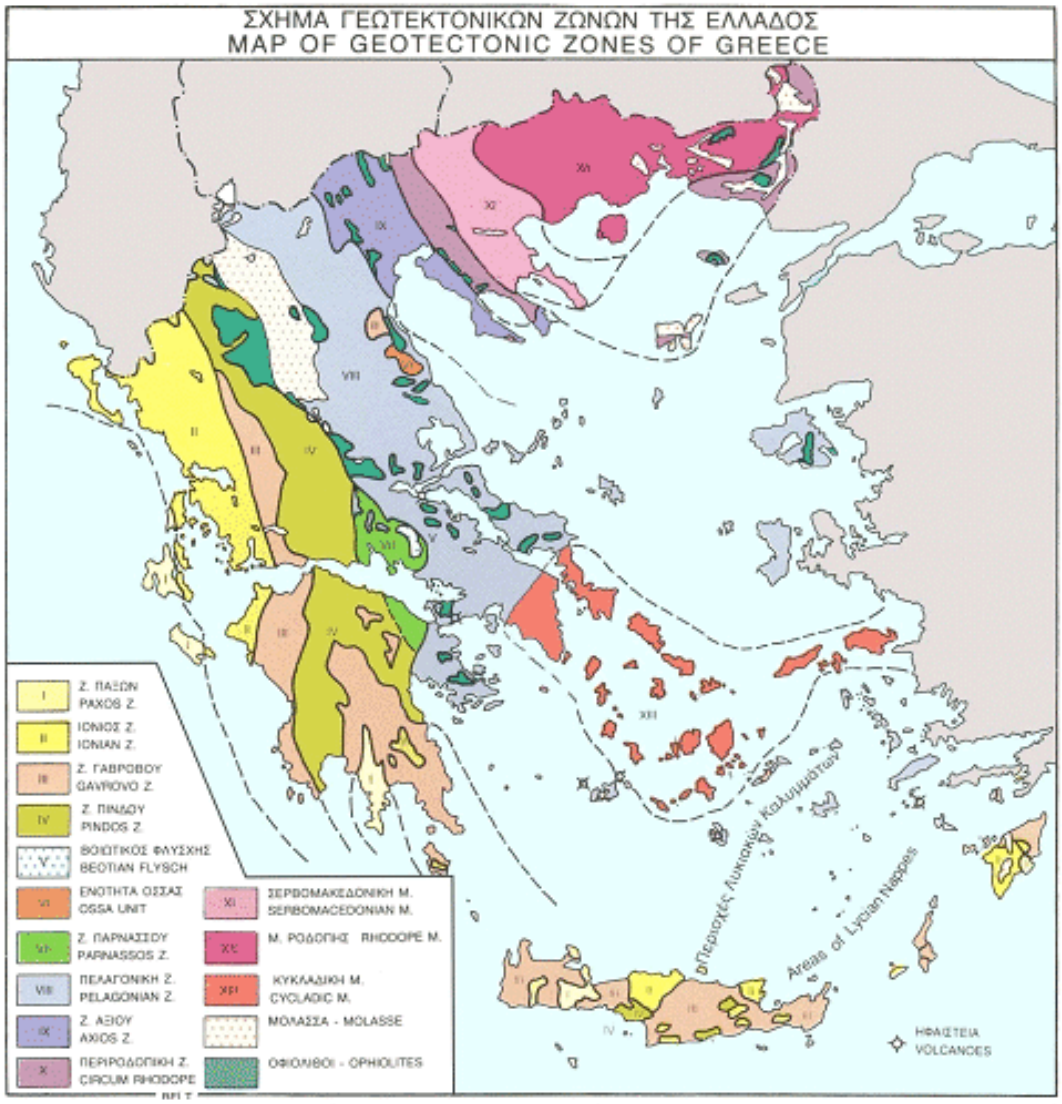


Image 35: Geological structure of the area
(https://gaia.igme.gr/portal/apps/webappviewer/index.html?id=61dc7b67790944a198d4dbdc876d1a3c)

A characteristic feature of the Rhodope Mass are the large rift sedimentary basins of the Tertiary, which from west to east are the following: basin of Strymonas or Serres, Philippi or Rama, Prinos, Nestos, Xanthi-Komotini, Kirkis-Aisimi and Orestiada. Volcanic and volcaniclastic rocks are interposed in these sedimentary basins, while plutonic penetrations are observed in the areas of Vrontou, Kavala, Philippi, Elatia, Paranesti, Xanthi, and Kirkis - Leptokaria. Throughout the

Rhodope mass, suprabasic serpentinite bodies are scattered. Main fault lines divide the Rhodope Mass into two lithostratigraphic units,

a) the higher tectonic unit (Iron Water section)
b) the lower tectonic unit (Pangeon unit).
These in turn are separated from the thrust of Nestos which has a direction SNA-NNW. The first tectonic unit consists of gneiss, amphibolites, mica schists and marbles, while the second also has mixmatites. Soil-wise, the Region is characterized by unrelated tertiary deposits, while limestone and holocene aluvium materials are also found. Especially, the area in which the sub-study project falls, according to the following geological map, belongs to an area with metamorphic rocks (Rhodope Masses, Serbo-Macedonian, Pelagonian, Cyclades) and specifically, rocks such as amphibolites, gneiss, shales with marble layers (Rhodope).

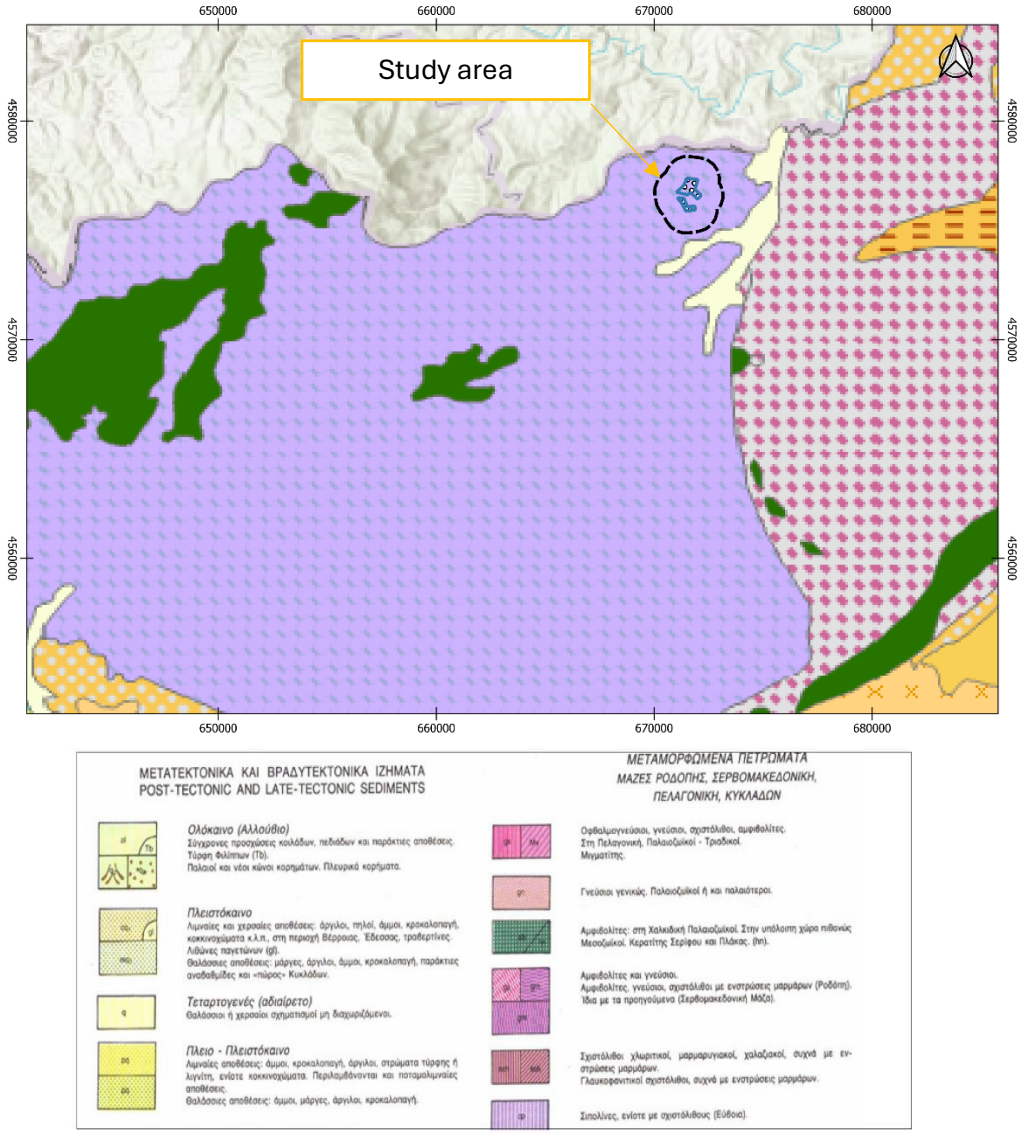


Image 36: Geological map excerpt
https://gaia.igme.gr/portal/apps/webappviewer/index.html?id=61dc7b67790944a198d4dbdc876d1a3c

8.4.2 Masonic

According to the map of seismic hazard zones, the Region of Eastern Macedonia and Thrace is characterized by a Hazard Zone I. According to the new Greek Seismic Regulation EAK-2000 (Government Gazette B΄ 1154 / 12-8-2003), the wider area of installation of the project belongs to Zone I of the 3 Seismic Hazard Zones (I, II, III) into which Greece has been divided. The expected seismic acceleration for each seismic hazard category is given by: **A= a.g where g: gravity acceleration and for zone I the seismic acceleration is calculated 0.16.**

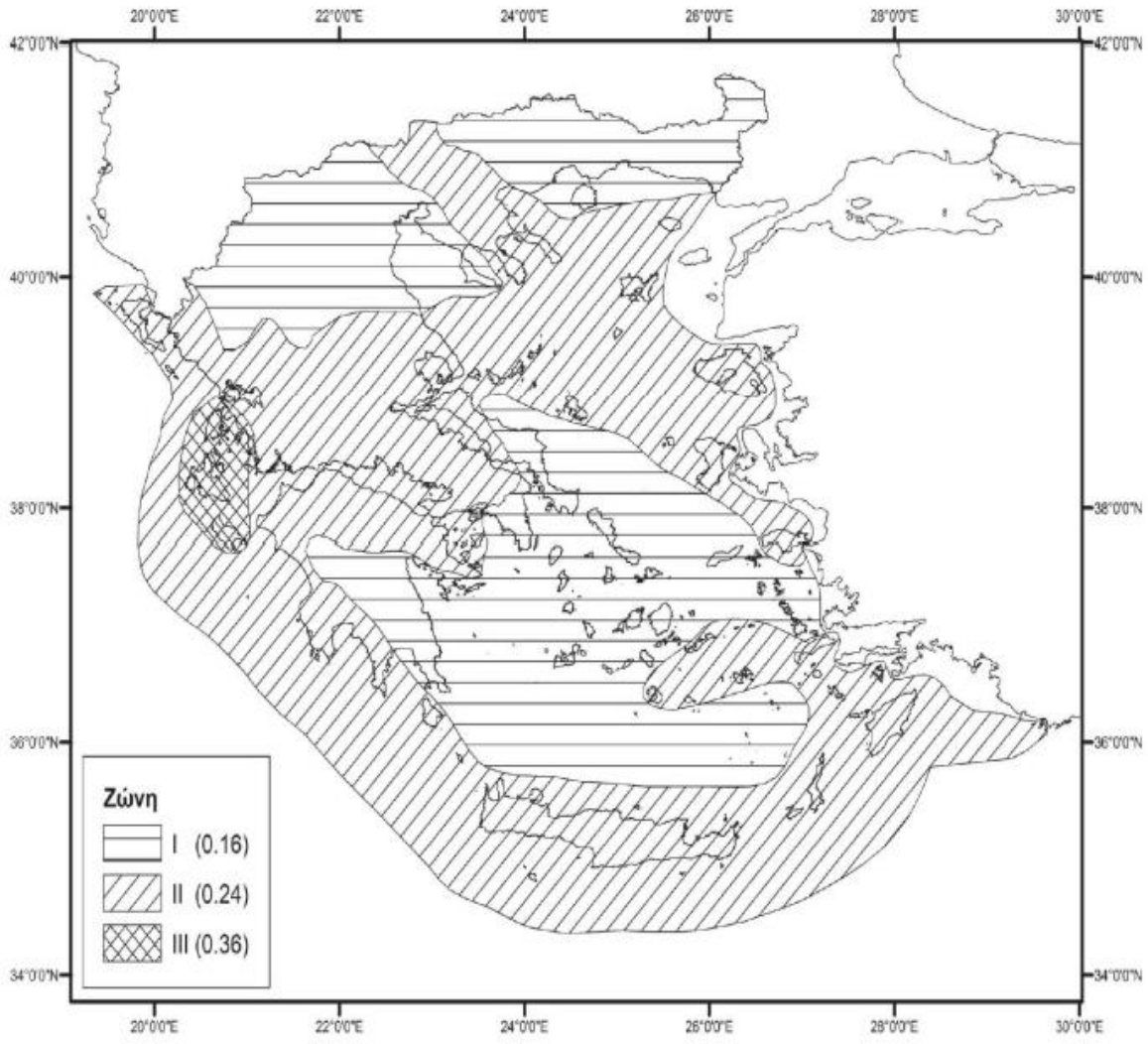


Image 37: Map of seismic hazard zones of Greece.

According to the data of the Institute of Geodynamics, the map shows that near the study area in the last 40 years there has been no earthquake of high or low strength. The largest earthquake detected in Eastern Macedonia & Thrace took place in 1984, with a magnitude of 4.9 on the Richter scale, at a depth of 41 km and at 43.2 km SSE of Alexandroupolis. The nearest major earthquake in the WPP under study was located 25 km southeast, with a magnitude of 3.6 on the Richter scale, at a depth of 10 km.

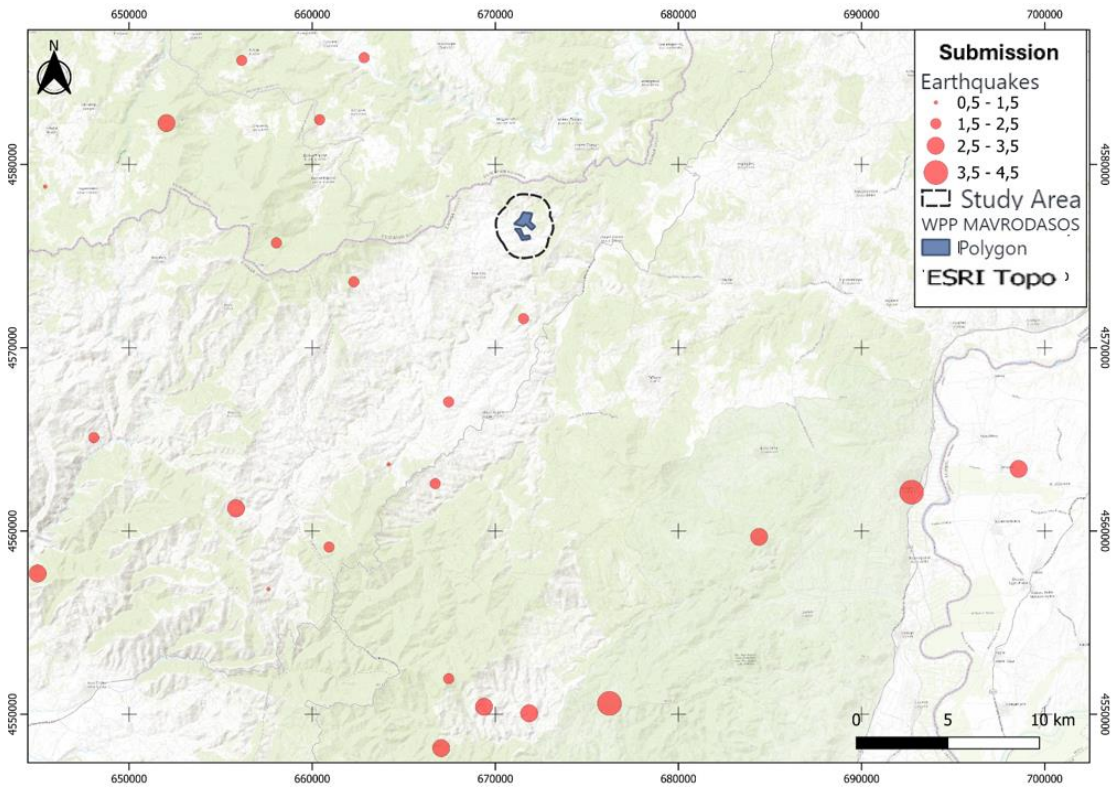


Image 38: Earthquakes in the wider area from 1984 to 2024 (Source: http://www.gein.noa.gr/el/seismikotita/xartes).

8.4.3 Soil

A source of soil data is the land and land capacity maps of the Ministry of Rural Development. The Earth Map gives information on physiography, soil erosion, slope, exposure to the horizon and ecological area.

To collect data on the soil condition of the study area, the patches of Land Maps and Land Capacity of the Forest Directorates of the Ministry of Agriculture were used from the website of the Geospatial Information Portal of the Ministry of Environment and Energy (RIS).

Land assessment is defined as the assessment of its physical potential for one or more alternative uses based on land classification and mapping data. The result of such an assessment is presented in the form of a map showing the earthiness of the different parts of the earth (the cartographic units) it depicts. The term Earth capacity is the natural ability of the land to produce products without improvements, such as fertilization, irrigation, leachate, etc., while Land suitability is the suitability of a portion of land for a particular crop.

The biological and physical characteristics considered in assessing the land potential of an area for forest production are the following:

- The local climate
- The parent material of the soil
- The exposure of the surface to the horizon
- The depth of the soil

In the following paragraph there is an analysis of the above soil elements of the area.

The land capacity map for forestry evaluates land into five classes of land tenure. The following paragraph discusses the five classes of land capacity for increasing economic forests.

According to the Land Map, each cartographic unit is characterized by a group of exponential numbers (e.g. 14, 25, 41). The bases (1,2,4) refer to the land capacity classes for forestry found in the unit and the exponents (4,5,1, total=10) to the decimal places of the unit area corresponding to each class.

The Land Capacity classes are listed below:

CLASS 1: UNRESTRICTED LAND TO INCREASE ECONOMIC FORESTS

It includes types of land with deep soils from tertiary deposits at northern exhibitions of the zone of deciduous oaks.

CLASS 2: LAND WITH SLIGHT RESTRICTIONS TO INCREASE ECONOMIC FORESTS

Includes:

1. Types of land with deep soils from tertiary deposits at southern exhibitions of the zone of deciduous oaks.
2. Land types with deep soils of colluvial flysch, alluvium, tertiary deposits, sandstone flysch, limestone colluvium, mixed flysch, peridotites and hard limestones in northern exposures of the evergreen broadleaf zone.

CLASS 3: LAND WITH MODERATE RESTRICTIONS TO INCREASE ECONOMIC FORESTS

Includes:

1. Land types with deep soils of colluvial flysch, alluvium, tertiary deposits, limestone colluviums, peridotite galluses, peridotites and hard limestones in southern exposures of the evergreen broadleaf zone.
2. Types of land with shallow soils from tertiary deposits at northern exhibitions of the zone of deciduous oaks.
3. Land types with shallow alluvial soils, tertiary deposits, sandstone flysch, mixed flysch, peridotites and hard limestones in northern exposures of the evergreen broadleaf zone.

CLASS 4: HEAVILY RESTRICTED LAND TO INCREASE ECONOMIC FORESTS

It includes land types with shallow soils from tertiary deposits, sandstone flysch, limestone colluvium, mixed flysch, peridotites and hard limestones in southern exposures of the evergreen broadleaf zone.

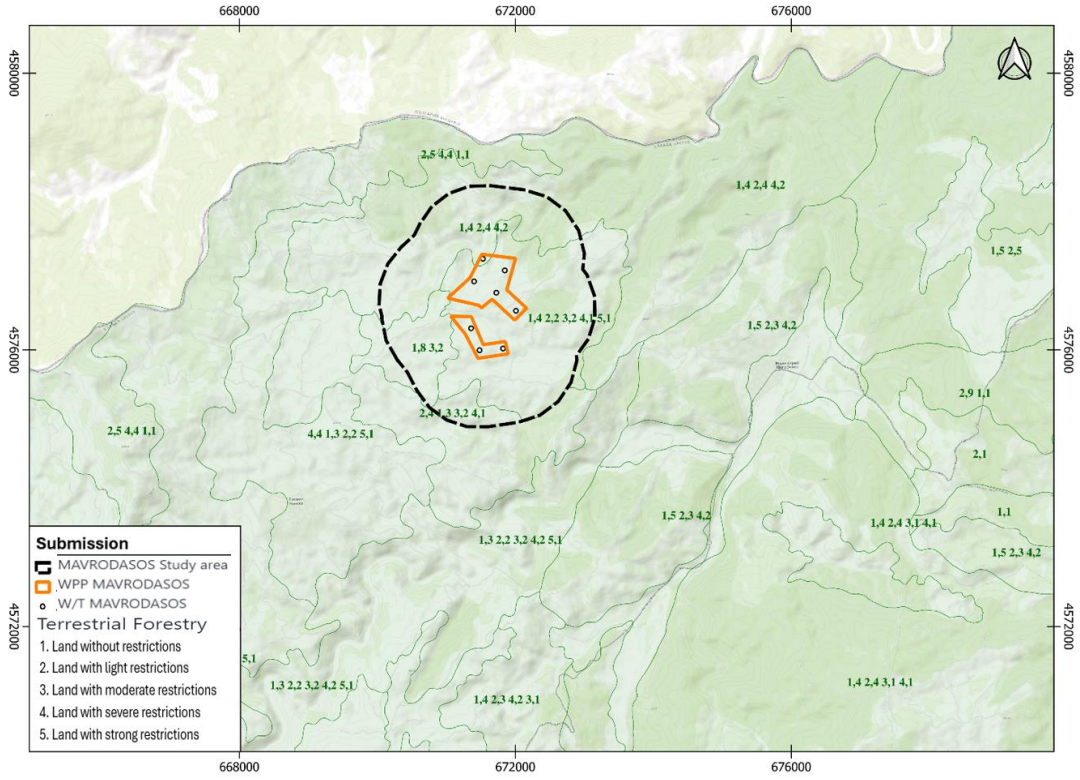
CLASS 5: LAND WITH STRONG RESTRICTIONS TO INCREASE ECONOMIC FORESTS

It includes types of land with rocky soils regardless of the nature of the parent material, forest vegetation zone and exposure.

In the following paragraph and according to this soil map, the land capacity classes for the project under consideration and its study area are presented.

The wind turbines and the parcel of the WPP under examination fall under code 1 area **.4,2.2,3.2,4.1,5.1**: 40% of the area belongs to land with no restrictions, 20% belongs to land with light restrictions, 20% belongs to land with moderate restrictions, 10% belongs to land with strong restrictions and the remaining 10% of the area belongs to land with strong restrictions.
The study area of the WPP under examination falls within the following areas:

- With code **2.4,1.3,3.2,4.1:** 40% of the area belongs to land with light restrictions, 30% belongs to land with no restrictions and 20% of the area with light restrictions and 10% of the area belongs to land with strong restrictions.
- with code **1.4,2.4,4.2**: 40% of the area belongs to land with no restrictions, 40% of the area belongs to land with light restrictions and 20% belongs to land with severe restrictions.
- with code **1.8,3.2**: 80% of the area belongs to land without restrictions, and 20% belongs to land with moderate restrictions.



Map 22: Mapping soil capacity to increase economic forests

The Earth Map describes the various microenvironments based on their most stable biological and physical characteristics.

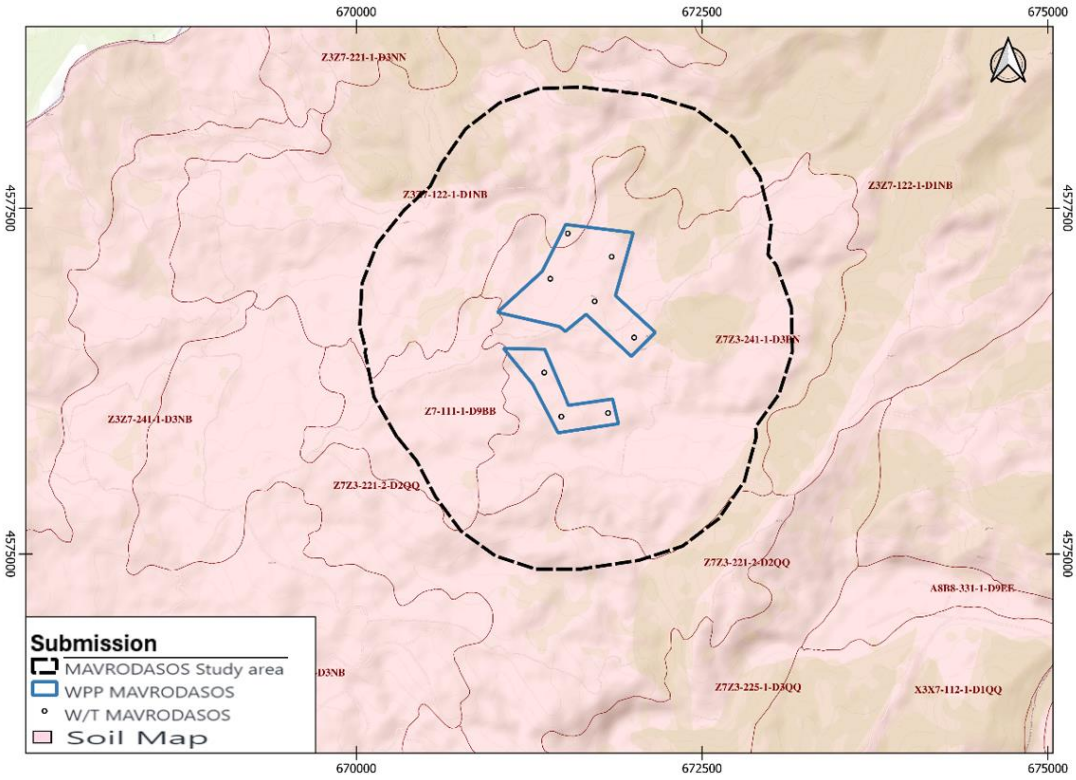
These characteristics directly determine the production potential of land in renewable natural resources as well as the biological and physical constraints of the environment.

The codes depicted on the following land map represent the geomorphology (parent material, physiography), the ecological area, the degree of anthropogenic influence, exposure, depth, erosion and slope of the soil. The following paragraph describes the soil characteristics of the area of the project under study and its study area: The WPP under examination and the wind turbines fall within

- to area **Z7Z3-241-1-D3-BN** which means that the parent material is characterized by gneiss with rounded tops and lower slopes. The soil is characterized as deep and shallow, soil erosion is characterized moderate and none with a slight slope. The area belongs to a

Deciduous Oak Zone with a strong degree of anthropogenic influence on vegetation as well as on northern and southern exhibitions.

- in area **Z7-111-1-D9-BB** which means that the parent material is characterized by gneiss with lower slopes, with deep soil, no erosion, with a slight and moderate slope. It belongs to a Deciduous Oak Zone, in an area with crops and northern exhibitions.
- The study area falls within the areas with the above code in an area with code "**Z3Z7-122-1-D1NB"** which means that the parent material is characterized by gneiss with rounded tops and lower slopes. The soil is deep, soil erosion is characterized by none and moderate with light and moderate slopes. The area belongs to a Deciduous Oak Zone, with a weak degree of anthropogenic influence on vegetation with southern and northern exposures.



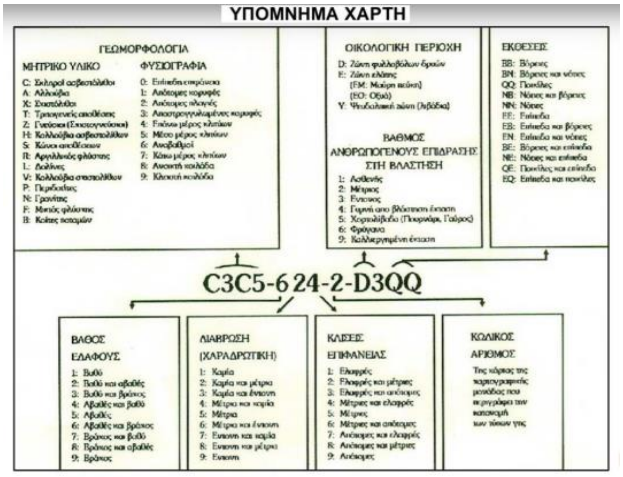


Image 39: Explanation of soil map symbols

8.5 Natural environment

8.5.1 General

The Region of Eastern Macedonia and Thrace includes important mountains, ecosystems with high ecological and aesthetic value, biodiversity, rivers (Evros, Nestos, Arda) that flow into bays with wetlands protected by the RAMSAR treaty. The natural environment of the Region of Eastern Macedonia and Thrace includes a significant number of natural ecosystems and individual elements of nature, which are of environmental and ecological interest.

The project under study is located within the Important Bird Area of Greece (S.P.P.E.) with code "GR003" under the name "Mountainous Evros – Dereios Valley" and an area of 48873 ha. This area is located between the Dadia Forest National Park and the Filiouri valley at the western end of the Regional Unit of Evros. It is covered by oak and beech forests with small groups of pines and is crossed by the river diavolorema Dereios. The central part and northeast are dominated by partially forested areas with scattered old oaks, mainly used by free-range livestock animals. The traditional agricultural activities of the inhabitants of the area (e.g. nomadic livestock farming, small-scale agriculture) have played an important role in the preservation of ecosystems, maintaining sparse oak forests in part of the area. Mature oak trees that remain are used for pruning, ie. collection of branches with leaves for feeding goats in winter.

Important Bird Areas (IBAs) are an international network of sites that are vital for the conservation of globally threatened species, endemic species or bird species that depend on these habitats for their survival. These areas have been identified based on scientific criteria and 208 are identified in Greece. The project under consideration also falls within the Natura area – Special Protection Area (SPA) "Oreinos Evros – Koilada Dereios " with an area of 48942.19 ha. On the map shown, the Important Bird Area is depicted with code (GR003).

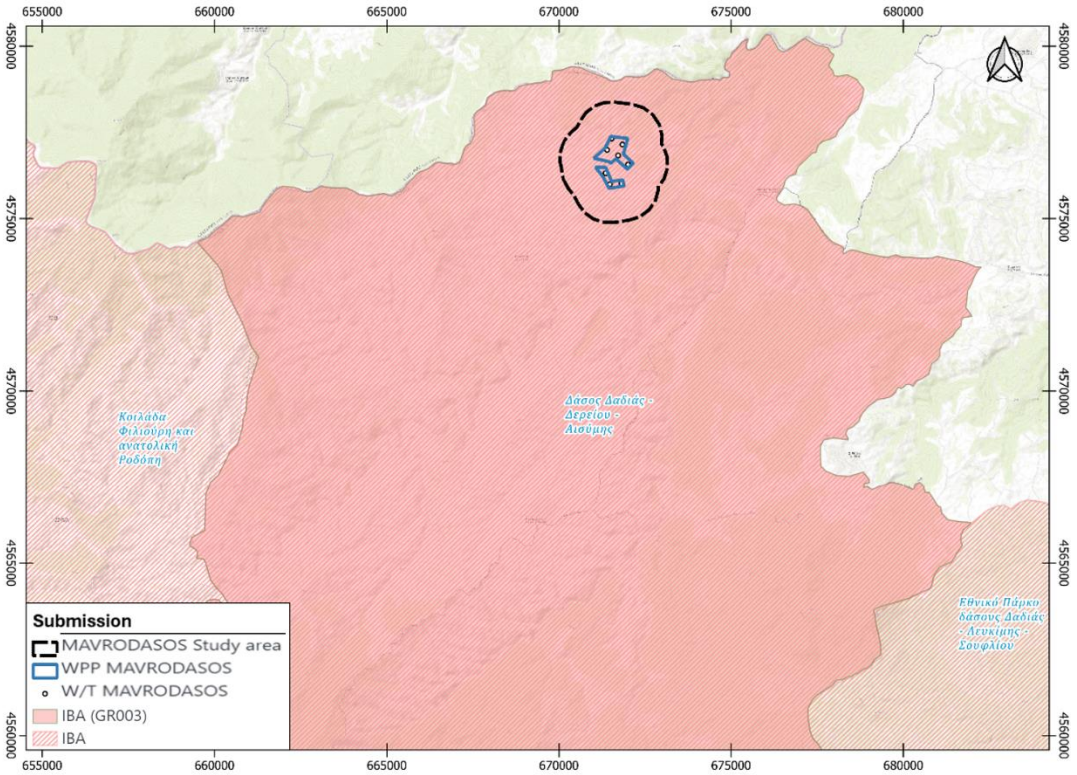


Image 40: Mapping of the Important Bird Area GR005 and the sub-study project (Source: Ornithological Society)

The following paragraphs analyze the fauna, flora and vegetation in the wider area and in the study area of WPP.

Flora

Habitats of the Important Bird Area "GR003" named "Mountain Evros – Dereios Valley" to which the project belongs are Forests (43.6%), Scrub (38.5%), Meadows/Pastures (9.1%), Artificial landscapes (8.6%).

Habitat Code	Coverage Habitat percentage (%)	Habitat characterization
N06	0.10	Freshwater zones
N07	0.05	Vegetation, marshes, swamps
N08	56.54	Maquis and Phrygana
N12	3.56	Alpine and sub-alpine vegetation
N16	26.80	Broadleaf deciduous forests
N17	1.95	Coniferous forests
N19	10.80	Mixed forest
N23	0.20	Settlements

Table 24: Natural habitat classes according to Corine(Natura Data Press Release)(Source: https://natura2000.eea.europa.eu/)

Vegetation

General Data

In the analysis that follows, the vegetation zones are presented. Based on climatic criteria and the potential state of vegetation, vegetation is divided into zones by altitude and longitude. The following table lists the Vegetation Zones of Greece.

The vegetation zones of Greece

1) Meso-Mediterranean Zone
a) Subzone Oleo-Ceratonion (olive – carob zone, Thermo-Mediterranean zone) b) Subzone Quercionilicis(aria, Middle Mediterranean zone)
2) Para-Mediterranean zone (Quercetalia pubescentis) (Trans-Mediterranean or Upper Mediterranean zone, deciduous oak zone)
(a) Subarea Ostryo-Carpinionorientalis (b) Subarea Quercionfrainetto-cerris
3) Beech-fir Forest area (Fagetalia) (Mountain-Mediterranean zone)
(a) Subarea Fagionsylvaticae (moesiacae)(b) Subarea Abietioncephalonicae
4) Zone of cold-lived conifers (Vaccinio-Picetalia)
(a) Pinionheldreichiib) Vaccinio-Piceion subarea
5. Upforest zone (Daphno-Festucetalia, Astragalo-Acantholimonetalia)a) Subarea Astragalo-Daphnion (b) Subarea Junipo-Daphnion

Table 25: Vegetation zones and subzones of Greece

According to the phytosocial map of Greece according to Mavrommatis 1980 and the results of the first national forest census (1992), the following natural formations appear because of climate (bioclimatic formations):

- Mid-Mediterranean conformation of Arias (Quercionilicis), type of Balkan and Eastern Mediterranean
- Sub-Mediterranean conformation (Ostryo-Carpinion)
- Conformations of thermophilic subcontinental deciduous oaks
- Sero-Mediterranean conformation of beech – hybrid fir
- Azonian riparian formations of estuary deltas

The bioclimatic formations of Greece are analyzed below, namely :

- **Meso-Mediterranean conformation of Arias (Quercionilicis),** type of Balkan and Eastern Mediterranean. In the Mediterranean conformation of Quercionilicis and indeed in the Balkan and Eastern Mediterranean type, QuercusIlex is of lesser importance and is usually replaced by Q. Coccifera and Q. Calliprinos. From a bioclimatic point of view, this formation belongs to the humidified bioclimatic floor with cold (0^o <m< 3m) where m is the minimum temperature of the coldest month and in the intense average Mediterranean type of bioclimate with a long dry period (75<X<100, where X is the number of biologically dry days during the hot and dry season) the plains of Thrace. The coast of Alexandroupolis belongs to the formations of Q. Coccifera with a semi-dry scholar with cold winter (0<m<3 C) and to the weak mid-Mediterranean type of bioclimate with a short dry season (100<X<125, where X is the number of biologically dry days during the hot and dry season).
- **Sub-Mediterranean conformation (Ostryo-Carpinion)**
  This conformation appears as a continuation of the Eu-Mediterranean vegetation zone (Quercetalia ilicis), vertically in the mountains and horizontally in the interior of the country. The morphology of the terrain is usually characterized as hilly or sub-mountainous. The sub-floor of Ostryo-Carpinion is characterized by a mixture of transitional "aspects" to the next configurations, where Quercus frainetto and Q. Pubescens appear. Characteristic species of this suborder are fluffy and broad-leaved oak, and maple.
  From a bioclimatic point of view, areas such as the coast of Alexandroupolis belong to the semi-arid sub-floor with cold winter (0^o<m<X<m<X<X<m) where m= the minimum temperature of the coldest month and to the weak mid-Mediterranean type of bioclimate with a short dry season (40<X<m<X) where X is the number of biologically dry days during the hot and dry season).
  On the contrary, areas such as the plains of Thrace belong to the humidified sub-floor with cold winter (0^o<m<X), to the intense mid-Mediterranean type of bioclimate with a long dry season (75<X<100) where x is the number of biologically dry days during the hot or dry season.
- **Formations of thermophilic deciduous oaks**
  This conformation is the most wet-cold-lived sub-Mediterranean conformation of subcontinental deciduous oaks with characteristic species Quercus frainetto, Q.Pubescens and Q.Cerris.From a bioclimatic point of view, areas such as the middle mountainous zone of Eastern Macedonia and Thrace belong to the sub-floor humidifier with harsh winter (m<0^oC), where m=minimum temperature of the coldest month and in the weak mid-Mediterranean type of bioclimate with a short dry period (40<X<75) where X is the number of biologically dry days during the hot and dry period). On the contrary, areas such as the plains of Thrace belong to the humid sub-floor with cold winter (0<m<3C) where m= the minimum temperature of the coldest month and to the intense mid-Mediterranean type of bioclimate with a short dry season (40<X<75, where X is the number of biologically dry days during the hot and dry season.
- **Sero-Mediterranean formation of pine forest, spruce**

This conformation shows the hypaean formations Pinus silvestris (forest pine), Piceaexcelsa (spruce), Facussilvatica (forest beech) and the subalpine Balkan formations with Pinusheldreichii (leukoderm pine). It occurs in the upper mountainous zone and on the high peaks of the mountains of Macedonia and Thrace along the Greek-Bulgarian border. From a bioclimatic point of view, these areas belong to the humid sub-floor with harsh winter (m<0C) and to the temperate adry (without dry period) type of bioclimate (approaching or belonging to the climate of Middle Europe), (2T<Pmm<3T) where a month is characterized as dry when rainfall is greater than twice and less than three times the average monthly temperature.

- **<u>Azonian riparian formations of estuary deltas</u>**

  The above-mentioned bioclimatic conditions are reflected in the picture of the prevailing vegetation, which has also been affected by anthropogenic pressures that have operated from the past until today.

  For the identification of the vegetation of the study area, the following Map of phytosocial formations of the Ministry of Agriculture of the Athens Forest Research Foundation was used. As shown in the map below, the sub-study project belongs to the Sero-Mediterranean Formation of Beech and Hybrid Fir.

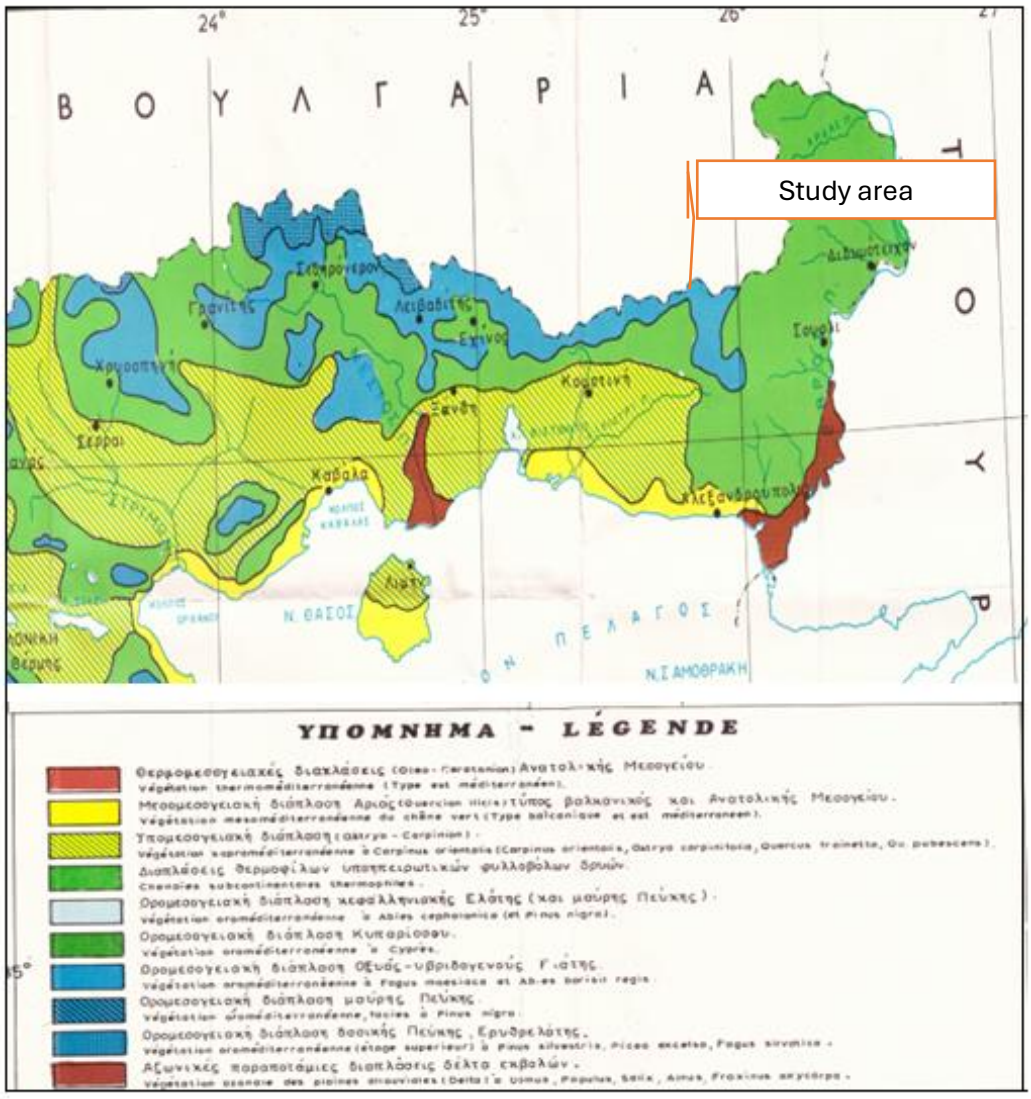


Image 41: Map of phytosocial formations (Mavromatis 1980).

Vegetation of the study area

For the identification of the vegetation of the study area, the proposed WPP and the vegetation species have been depicted on the following map.More specifically, the project under consideration falls on areas with oak and agricultural crops. The interconnection falls within the aforementioned areas as well as areas with beech, black pine, in an area with juniper while the substation "PATRIARCHIS" falls within an area with meadows.

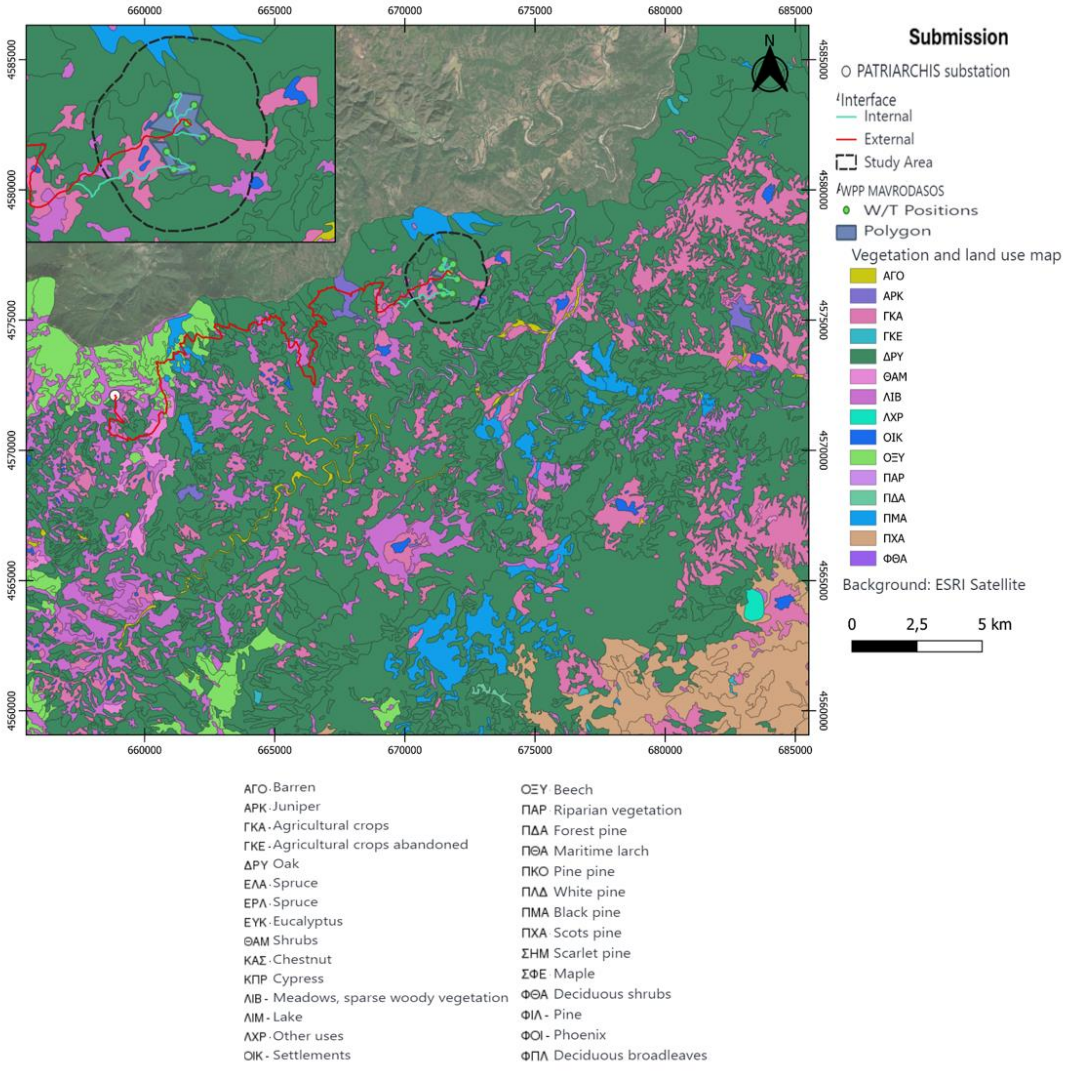


Image 42: Mapping of the project under examination and the vegetation and land use map of the University of Thessaloniki (Source: http://mapsportal.ypen.gr/maps/?limit=20&offset=0).

Fauna

The area of installation of the project under study is located outside areas of the Natura 2000 network SAC, SCI. However, according to the attached SEA, the other fauna (except avifauna) of the wider area and the research area was recorded, which is presented in the table below:

STATUS AND STATUS OF FAUNA SPECIES OBSERVED IN THE INVESTIGATION AREA			
Latin Name	**Common name**	**Status**	
		IUCN EU	**ELL(KB)**
MAMMALS			
Order Carnivora			
Canidae			
Vulpes vulpes	Fox	LC	NE
Ferrets (Mustelidae)			
Martes foina	Petrokounavo	LC	NE
Meles meles	Badger	LC	NE
Felids (Felidae)			
Felis silvestris	Wildcat	LC	NE
Order Lagomorpha			
Lagidae (Leporidae)			
Lepus europaeus	Hare	LC	NE
Order Etartiodactyla			
Suidae			
Sus scrofa	Wild boar	LC	NE
Cervidae			
Capreolus capreolus	Roe	LC	VU
Order Rodents (Rodentia)			
Squirrels (Sciuridae)			
Sciurus vulgaris	Squirrel	LC	NE
REPTILES			
Order scaly (Squamata)			
Suborder Lizards			
Horse mackerel (Lacertidae)			
Lacerta viridis	Prasinosaurus	LC	LC
Podarcis muralis	Wallosaur	LC	LC
Anguidae			
Pseudopus apodus	Fidosaurus	LC	LC

Suborder Snakes			
Psammophiidae			
Malpolon insignitus	Sapitis	LC	LC
Order Turtles (Testudines)			
Turtles (Testudinidae)			
Testudo graeca	Graikologona	VU	LC
Testudo hermanni	Mediterranean turtle	NF	VU
AMPHIBIANS			
Order Anura			
Phrynidae (Bufonidae)			
Bufotes viridis	Green toad	LC	LC

Table 26: Status and status of fauna species observed in the survey area.

The study area where the proposed WPP is to be installed, as mentioned above, is part of an Important Bird Study Area with code (GR003) named **"Dadia – Dereio – Aisymi Forest"** as well as a NATURA area with code "GR1110010" and name "**Oreinos Evros – Koilada Dereio ".** The important bird species of the study area are listed in the table below.

Avifauna of the Natura area "Oreinos Evros and Koilada Dereios ".

Notable birds
Accipiter gentilis butoides (Double-chin)
Accipiter nisus nisus (Chewing gum)
Aegypius monachus (Black vulture)
Alcedo atthis (Kingfisher)
Anthus campestris campestris (Chamokelada)
Anthus cervinus (Roach)
Anthus pratensis pratensis (Meadow cellar)
Anthus spinoletta littoralis (Water cellar ...)
Anthus trivialis trivialis (Dendrokelada)
Apus apus apus (Ashara)
Apus melba melba (Skeparnas)
Aquila chrysaetos chrysaetos (Chrysaetos)
Aquila clanga (Spotted)
Aquila heliaca heliaca (Queen Eagle)
Aquila pomarina (Screaming)
Ardea cinerea (Egret)
Bubo bubo bubo (Boufos)
Buteo buteo buteo (Buzzard)
Buteo rufinus rufinus (buzzard)
Caprimulgus europaeus
Charadrius dubius (River whistler)
Ciconia ciconia (White stork)
Ciconia nigra (Black stork)
Circaetus gallicus
Circus aeruginosus (Marsh Harrier)
Circus cyaneus (Marsh Harrier)

Circus macrourus (Steppe Harrier)
Circus pygargus (Harrier)
Clamator glandarius (Ivy)
Coccothraustes coccothraustes
Columba oenas oenas (Fassopigeon)
Columba palumbus palumbus (Fassa)
Coracias garrulus
Cuculus canorus (Cuckoo)
Delichon urbica urbica (House swallow)
Dendrocopos leucotos lilfordi (Lefkonotis)
Dendrocopos medius medius (Mesotsiklitara)
Dendrocopos syriacus (Balkan tsiklitara)
Dryocopus martius martius (Mavrotiklitara)
Egretta garzetta (Egret)
Emberiza caesia (Skourovlachos)
Emberiza citrinella
Emberiza hortulana (Vlachos)
Erithacus rubecula balcanica (Balkan robin)
Falco columbarius (Dwarf falcon)
Falco eleonorae (Eleonora's falcon)
Falco peregrinus brookei (Peregrine falcon)
Falco subbuteo (Tree falcon)
Falco vespertinus (Kestrel kestrel)
Ficedula albicollis
Ficedula hypoleuca (Black Flycatcher)
Ficedula parva parva (Nanoflycatcher)
Ficedula semitorquata
Fringilla coelebs coelebs (Finches)
Fringilla montifringilla (Winterfin)
Gypaetus barbatus aureus (Vulture)
fulvus (Griffon vulture)
Hieraaetus fasciatus
Hieraaetus pennatus (Stavraetus)
Hippolais olivetorum (Liostritsida)
Hippolais pallida elaeica
Hirundo daurica rufula (Tree swallow)
Hirundo rustica rustica (Swallow)
Jynx torquilla torquilla
Lanius collurio collurio (Aetomachus)
Lanius senator senator (Redhead)
Lullula arborea arborea (Tree wheat)
Luscinia megarhynchos (Nightingale)
Merops apiaster (Bee-eater)
Milvus migrans aegypticus
Milvus milvus (scissor shearfish)
Motacilla alba alba
Motacilla cinerea (Cinderella)
Motacilla flava beema
Muscicapa striata neumanni (Cinderella)
Neophron percnopterus (Egyptian vulture)
Oenanthe hispanica (Asprocola)
Oenanthe oenanthe oenanthe
Oriolus oriolus oriolus (Sycophagus)
Otus scops (Gkionis)
Pandion haliaetus

Pernis apivorus (Wasp)
Phoenicurus ochruros
Phoenicurus phoenicurus phoenicurus
Phylloscopus bonelli orientalis
Phylloscopus collybita abietinus
Phylloscopus sibilatrix
Phylloscopus trochilus acredula
Picus canus canus
Prunella modularis
Regulus regulus (Golden Basilisk)
Saxicola rubetra (Chestnut Throat)
Scolopax rusticola (woodcock)
Streptopelia turtur (Triangle)
Sturnus vulgaris tauricus (Taurus starling)
Sylvia atricapilla (Mavroskoufis)
Sylvia borin borin
Sylvia cantillans albistriata
Sylvia communis communis (Warblers)
Sylvia curruca curruca
Sylvia hortensis crassirostris (Warbler)
Sylvia nisoria nisoria
Turdus philomelos (Thrush)
Turdus torquatus alpestris (Applique thrush)
Upupa epops epops (Hoopoe)

Table 27:Remarkable birds of the Natura area "Mountain Evros and Dereios Valley"

The Natura area named "Mountainous Evros – Dereios Valley" is an important area mainly for the reproduction of raptors and species found in mountainous forest areas but also for feeding the Black Vulture of Greece.

Designation species include Ciconia nigra (Black stork), Neophron percnopterus (Egyptian vulture), Aegypius monachus (Black vulture), Circaetus gallicus (Snake eagle), Aquila chrysaetus (Golden eagle), Aquilapomarina (Screaming eagle) and Hieraatus pennatus (Buzzard). The area is also important for other rare breeding species such as **Ficedula semitorquata and Sylvia nisoria.**

Types of designation of the Natura area "Mountain Evros – Dereios Valley".

***Ciconia nigra* (Black stork):** The black stork is characterized as a rare and local visitor and migratory species in Greece. Its breeding grounds are Northern Greece and mainly in Thrace (especially in the Prefecture of Evros), Macedonia, Epirus, locally in Thessaly, as well as in Lesvos (6-8 pairs, Kakalis to assist). Its population is estimated at 70-100 pairs. (of which about 50 pairs are reproduced in the Prefecture of Evros), with stable trends. During the migration period it has a wider distribution but continues and is considered rare.

***Neophron percnopterus* (Egyptian vulture):** The species is critically endangered (CR [A2ac, C1) with an international endangered hazard class (EN). Until the first post-war years, the Egyptian vulture was characterized as a common and widespread species in all lowland and semi-mountainous areas of the country. In the last 30 to 40 years, the species has begun to show signs of population decline. In the 80s, The breeding population was estimated at 200-250 pairs. with the highest concentration in Meteora. In the period 1994-2003 the population decreased to 100-140 pairs while today the total population does not exceed 30-50 pairs. Nesting sites are observed

in Epirus and Thessaly while very few pairs are observed in other areas. During the migration period in autumn individual species move to the south and over the Peloponnese, Crete etc.

Aegypious monachus: The black vulture is classified as endangered (EN) in terms of the hazard category in Greece and near threatened (NT) in terms of the international risk category. It is a rare and migratory species. Until the early 50's in mainland Greece and Crete the species declined dramatically in population and distribution. In the 1980s the two breeding grounds were those on Mount Olympus (2 pairs) and Ethnikos Dadia – Lefkimi – Soufli Forest Park (briefly Dadia O.P.). From the 80s onwards the only breeding one has remained in the Dadia Forest National Park as the 1-pairs recorded nesting in southern Bulgaria did not reproduce successfully. Today, the current population of the Ministry of Foreign Affairs is estimated at 20-100 individuals in the Dadia Forest National Park, of which 20-22 pairs. They nest regularly. The population remains stable in the number of pairs as well as in the total number. It has been observed that individuals often move from the Dadia Forest National Park to the Prefecture of Drama (Nevrokopi) and north to Ardas valleys.

Aquilla Chrysaetus **(Golden Eagle):** The Golden Eagle is an endangered species and of diminished interest in the international category Until the 60s the Golden Eagle had a wide distribution in all the mountains of mainland Greece and several islands. Today its distribution is observed in some mountainous and semi-mountainous areas of Thrace and Macedonia, in the Pindus Mountain range and reaches up to Central Greece as well as in very few places in the Peloponnese and in Evia. On the islands it is found in Crete and the Cyclades (Syros). In the 80s the population ranged from 150 to 200 pairs. Where a decreasing trend had been observed, in 1990 it was estimated at 140-180 pairs. and today they have been estimated at 100-150 pairs. of which 60 individuals or 16-22 pairs. exist in Crete.

Aquila Pomarina **(Screaming Eagle):** The Screaming Eagle is an endangered species and of diminished interest in terms of international class. It is a widespread species, migratory can be characterized as a summer visitor. It is a common species and with a wider distribution in the pre-war years with nesting areas in Thrace, Macedonia, Thessaly and Epirus. The breeding population in Greece is estimated at 67-90 pairs. The species have been identified in areas with lowland and semi-lowland forests in proximity to freshwater wetlands where they can find their prey.

Hieeratus Pennatus **:** The Falcon is a species of endangered in Greece and of reduced concern (LC) in terms of the international risk category with a wide distribution. The nesting sites are mainly in northern and central Greece. The breeding population in Greece is estimated at 50-100 pairs. with negative trends. The species is very widespread during the migration period, especially in autumn when several individuals are observed in Attica, the southern Peloponnese, Crete etc. It is characterized as a forest predator and nests mainly in medium and low altitude forests alternating with scrub, meadows, clearings and open areas where it finds its prey. Its food is mainly small and medium-sized birds, reptiles and mammals.

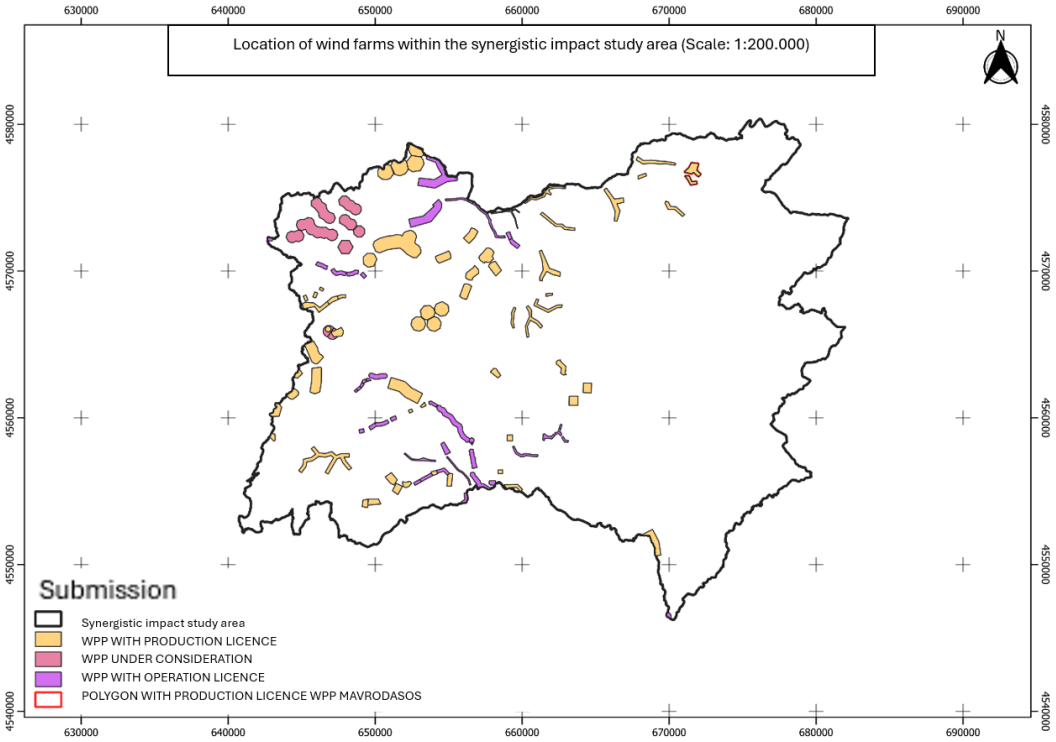
Types of designation of the neighbouring SPA BG0001032 named 'Rodopi - Iztochni'. *Barbastellus barbastellus, Miniopterus schreibersii, Myotis bechsteinii, Myotis blythii, Myotis capaccinii, Myotis emarginatus, Myotis myotis, Rhinolophus euryale, Rhinolophus ferrumequinum, Rhinolophus hipposideros, Rhinolophus mehelyi and Rhinolophus blasii.*

For the above species, National Action Plans have been established, the "National Action Plan for the three scavenger species (Bearded Vulture, Griffon Vulture and Bearded)" and the "National Action Plan for the Egyptian Vulture)" which are described in detail in the paragraph "Action Plans for the Avifauna 5.2.4".

Area of study of synergistic effects:

The synergistic effects of the installation of a project in an area result from the cumulative effect of all types of impacts of these projects and concern almost exclusively the avifauna of the area. According to the international bibliography and the guidelines of the Directives, synergistic effects can be examined at two levels. Projects located at a very short distance and radius from the project under consideration (usually < 2 km) and those located within a larger radius and area (usually between 2 km and 10 km).

The reason is that in the first case the project in question may be small in size with little or little impact on bird species but within a small radius around it many other small or larger projects can be located and in total cause impacts on the species and in the second case, regardless of the assessment of the specific project, Numerous projects, regardless of impact size, may be identified over a larger radius which multiply the impact of the project under consideration. For the above reason, the area of study of synergistic effects is the following:



Map 23: Map of the location of wind farms within, partially within and within the boundaries of the "synergistic impact study area" (licensing stage in operation and under production)

8.5.2 Areas of the national system of protected areas

In the Region of Eastern Macedonia and Thrace there are thirty-five (35) sites in the NATURA 2000 network, with an area of approximately 660,000 hectares.

There are also a total of two (2) aesthetic forests, three (3) wetlands of international importance, two (2) preserved natural monuments, twenty-four (24) landscapes of natural beauty, one (1) controlled hunting area, two (2) game farms and forty-nine (49) wildlife refuges.

These protected areas are of international, European and national importance.

As stated in the Regional Spatial Framework (SPF) of the Region of Eastern Macedonia and Thrace (PAM.V.H), natural resources of international importance include:

1) Nestos Delta and neighboring lagoons

2) Evros Delta
3)Porto Lagos
4) Lake Vistonida
5) Lake Ismarida and adjacent lagoons
6) Virgin Forest of Central Rhodope
7) Virgin Forest of Paranesti
8) Natural Monument of Beech Forest in Tsichla - Chaidous Xanthi
9) Dadia, Lefkimmi, Soufli and Samothrace Forest National Park.

Natural resources of European importance include Natura 2000 sites. Of national importance are the four National Parks of PAM.V.H, the Landscapes of Outstanding Natural Beauty (LONB) of the Region and the aesthetic forests of Nestos and Amygdaleon of Kavala.

Below are listed in a table the National Parks, the National Parks, the Aesthetic Forests, the Preserved Natural Monuments and the Biogenetic Reserves of the Region of Eastern Macedonia and Thrace and the Government Gazette for the Designation of these areas.

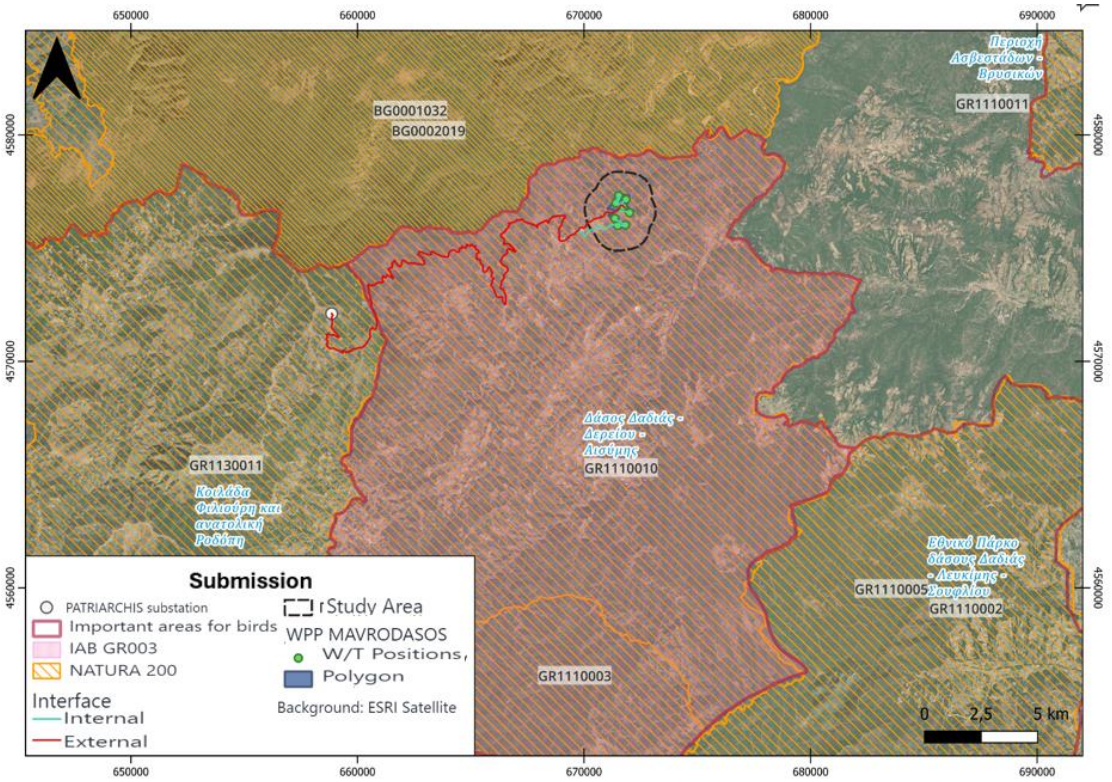
National Parks	Government Gazette Characterization
Evros Delta National Park	4110 (Government Gazette 102/Δ/16-03-2007)
Dadia-Lefkimi Soufli Forest National Park	35633 (Government Gazette 911/Δ/13/10/2006)
National Park of Eastern Macedonia and Thrace	44549 (Government Gazette 479Δ/17.10.08)
Rhodope Mountains National Park	40379 (Government Gazette 445Δ/02.10.09)
Aesthetic Forests	-
Nestos Straits	(Government Gazette 283/D/77)
Forests of Amygdaleona, Kavala	Government Gazette 606/D/79 and Government Gazette 437/D/81
Beech Forest	(Government Gazette 121/D/80
Preserved Natural Monuments	-
Virgin Forest of Central Rhodope	(Government Gazette 121/D/81)
Beech Forest – Thrush – Haidou Xanthi	(Government Gazette 121/D/80)

Table 28: Important protection areas of the Region of Eastern Macedonia and Thrace (PECA PATHM, 2016).

The project under study falls within the Natura area "Oreinos Evros-Koilada Dereios" with code "GR1110010". In the Special Ecological Assessment (SEA.) that has been carried out and is

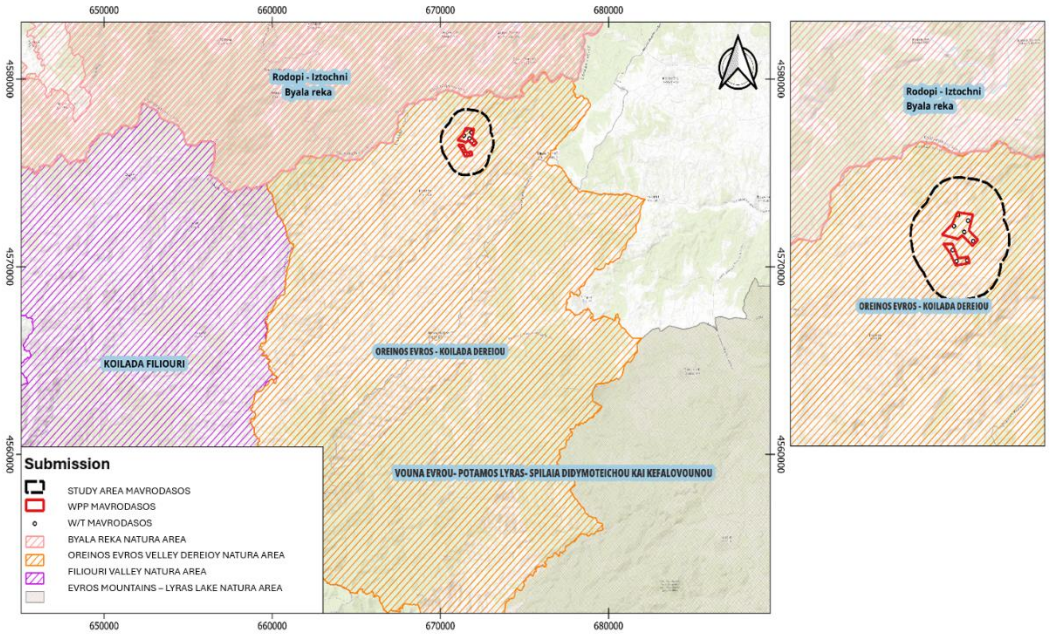
attached, the potential impact of the project on the protected elements of the Important Bird Area IAB (GR003) is examined in detail, while the protected species of the Natura area have been taken into account", giving importance to those species of avifauna (raptors - scavenger species) that, according to their ecology, operate within a radius that can cover the distance to the study area of the specific project.

The project under study is located outside protected landscapes and landscape elements or protected natural formations. The Natura area coded "GR1130011" and named "Filouri Valley" is located west of the study area of the project under consideration, at 11.2 km from the nearest M/C of the project (W/T 2). As shown in the following map, part of the project's interconnection falls **within Natura "Mountain Evros – Dereios Valley"** while the remaining part of the interconnection falls within the neighbouring Natura site "Filouri Valley".



Map 35: NATURA 2000 Network boundaries in the wider area of interest and the project under study.

In addition to the above protected areas, it is important to note the Natura protected area of Bulgaria named "Byala Reka" and code name "BG 0002019".



Map 24:Mapping of the Natura protected areas and the neighboring Natura area of Bulgaria "Byala Reka".

The area covers the Byala Reka catchment area in the southeastern part of the Eastern Rhodopes on the state border with Greece.
The watershed includes the Byala Reka Valley and surrounding mountain grounds which runs from the village of Chernichevo in the west to the point where the river crosses the state border in the east.

The vegetation of the area is characterized as diverse and is influenced by the Mediterranean climate. In the area due to the low population density of the area and the border regime, the old forests of *Fagus sylvatica L., Subsp moesiaca* and *Quercus alchemic* as well as mixed oak forests of *Q. dalechampii, Q. virgiliana, Q. frainetto* and *Q. pubescens*, scattered in places with *Carpinus orientalis*, are also widely distributed.
The area also has dry-thermal shrub formations of Mediterranean type with a significant variety of species, dominated by *Phyllirea latifolia* and *Juniperus oxycedrus*, with the participation of *Paliurus spina-christi*, *Fraxinus ornus* etc. (Bondev 1991).
The river that runs through the area is comparatively deep and its waters are not polluted. The riverbed is sandy – stony while its banks are overgrown with willows, *Salix* spp. species and some shrubs. In some parts of the area only low rocks are found while arable land occupies a comparatively small part of the total area, mainly around the settlements.

The Natura protected area is home to 167 bird species. 33 species out of 167 are listed in **the Red Data Book for Bulgaria (1985)** while 67 bird species are of European Conservation Concern (SPEC) (BirdLife International, 2004). Two species (2) out of 67 belong to **the SPEC 1 category** (species whose populations are considered as of World Conservation Interest) as these species are classified as globally threatened, 22 species in category in SPEC 2 (species whose populations are at an unfavourable conservation status at European level and concentrated in Europe) and 43 species in category SPEC 3 (species whose populations are at a desirable conservation status at European level although not concentrated in Europe) as endangered species in Europe.

Bulgaria's Natura site is a site of global importance and representative of the Mediterranean habitat. Five of the 9 species established in the country, which are characteristic of this habitat, have been identified in the area: *Hippolais olivetorum* , *Sylvia cantillans* , *Sylvia melanocephala* , *Lanius nubicusnting* (Pardalocephalus) and *Emberiza melanocephala* (Viticulturist).

The site also provides suitable habitats for 51 species, listed in Annex 2 of the Biodiversity Act, which need special conservation measures. Forty-six of them are also included in Appendix I of the Birds Directive and more than half of them breed in the area with insignificant populations. It is also considered an area of global importance as a permanent feeding and feeding site for *the species Aegypius monachus* (Black vulture).

It is also a very important area at European Union level for the species mentioned above as well as for the breeding of *Ciconia nigra* (Black stork), Honey Buzzard *Pernis apivorus* (wasp), Booted eagle *Hieraaetus pennatus* (Buzzard), Short-eagle *Circaetus gallicus* (snake eagle), Sparrowhawk *Accipiter brevipes* (Saini), Nightjar *Caprimulgus europaeus* (Goat), Olive-tree Warbler *Hippolais olivetorum* and Masked Shrike *Lanius nubicus* .

The following table shows the threats and human activities that may have an impact on the area.

Threats	Classification (Degree of nuisance)
Collection of animals (insects, reptiles, ampifia)	High
Household waste disposal	High
Land clearance	High
Movement of vehicles	High
Other forms of energy	High
Transfer / removal of land, vegetation	High
Poisoning, trapping, poaching	High
Abolition of pastoral systems, lack of grazing	Moderate
Air pollution	Moderate
Baits	Moderate
Corrosion	Moderate
Geological phenomena, natural disasters	Moderate
Hunt	Moderate
Modification of inland water structures	Moderate
Reduction of grassland	Low
Egg thieves from nests	Low
Opening of paths and roads	Low
Pollution	Low
Soil contamination and solid waste (excluding liquid waste)	Low
Forestry	Low
Crops	Low
Disposal of aggregates	Low
Construction of high-voltage lines	Low
Fertilizers	Low
Fire/Fire suppression	Low
Removal of forest land without the possibility of afforestation or natural growth	Low
Geological phenomena, natural disasters	Low

Fishing	Low
Crop change	Low
Movement of vehicles	Low
Other forms of energy	Low
Moving sand, stones and other materials from the beach	Low
Removal of dead trees	Low
Removal of forest vegetation	Low
Removal of natural fences	Low
Restructuring of agricultural land holdings	Low
Road construction	Low
Removal of sand and gravel	Low
Egg Stealing	Low

Project distances from other important natural areas

Below are detailed the distances of the project from the other important natural areas.

Corine Habitats

The study area is not part of a Corine habitat. The nearest Corine habitat is the "Evros Mountains" with code "A00010002". The habitat is an area of forest mainly with deciduous and conifers. It includes mixed oak forests, maquis and alluvial forests along the streams. At a lower altitude, at the foot of hills with greater erosion, there are surface rocks, ravines, cliffs and streams with water most of the time. Areas that no longer produce have been converted into pine plantations. The map below shows the closest Corine area to the project under consideration.

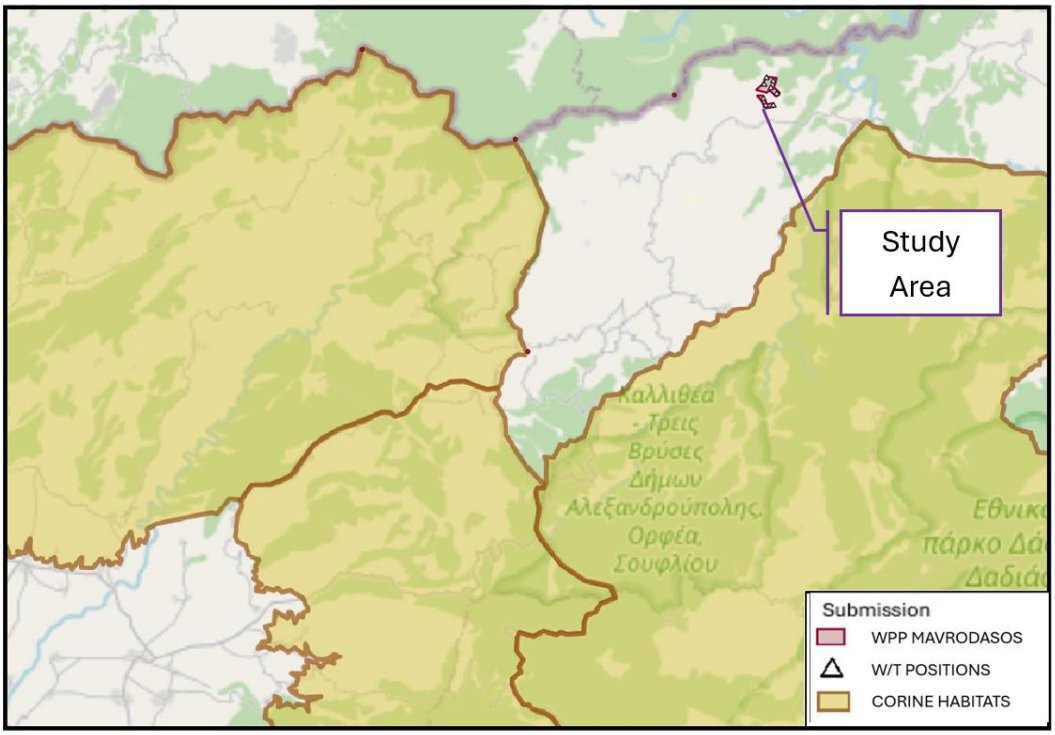


Image 43: Mapping of Corine biotopes near the study area (Source: Nature Bank, Filotis).

Ramsar Wetlands

The area of installation of WPP is not part of a Ramsar Wetland. The nearest wetland is the Evros Delta, which is located southeast of the project study area, at about 51 km. The table below lists the Ramsar wetlands throughout Greece.

Ramsar Wetlands
Evros Delta
Lake Vistonida, Porto-Lagos, Lake Ismarida and adjacent lagoons
Lakes Volvi and Koroneia
Kerkini Artificial Lake
Axios Delta, Loudias, Aliakmonas
Lake Mikri Prespa
Amvrakikos Gulf
Lagoons of Messolonghi
Kotychi Lagoons

Other important natural areas

National Parks

National Parks include areas, most of which are dominated by forest character, of ecological and scientific interest. 10 National Parks have been declared under Law 996/1971 which is part of Law 86/1969 "*On the Forest Code*". The National Parks of Prespa, Vikos-Aoos, Pindos, Oiti and Sounion include cores and peripheral zones, while the rest include only cores. According to Law 3937/2011, "National parks declared pursuant to article 78 of Legislative Decree 86/1969 (Government Gazette 7 A), as replaced by article 3 of Legislative Decree 996/1971 (Government Gazette 192 A), are designated national parks by presidential decree issued on the proposal of the Minister of Environment, Energy and Climate." According to Law 996/1971, which is part of Law 86/1969 "*On the Forest Code*", the projects do not belong to a National Park area. The nearest national park is that of Mount Olympus.

National Parks

According to Law 1650/1986, articles 18 and 19, the location of the project does not belong to a National Park. The nearest National Park to the study area is the Dadia Forest National Park which is located southeast of the project under consideration at about 14 km.

Aesthetic Forests

According to Law 996/71, the location of the project does not belong to an area that has been characterized as an Aesthetic Forest. The Region of Eastern Macedonia and Thrace has two (2) Aesthetic Forests, namely the Nestos Forest and the Amygdaleona Forests of Kavala. The nearest Aesthetic Forest is the Nestos Strait and is located southwest of the proposed project at about 94 km.

Preserved Natural Monuments

According to Law 996/71, the location of the project does not belong to an area that has been designated as a Preservable Natural Monument. Closest to the area of installation of the proposed project is the Preserved Natural Monument named "Beech Forest" in Tsichla, Haidou Xanthi, which is located northwest of the project at more than 98km. It is an area with extensive beech forests, which includes meadows and wetlands and is in good natural condition, without intense exploitation by humans.

Wildlife Sanctuaries - Game Farms

Three wildlife refuges are in the wider area.

- The Wildlife Refuge named "Kehrou Kerasia" is located southwest of WPP at a distance of 11.4km from the nearest wind turbine of the park.
- The Wildlife Sanctuary named "Poulia" and code K10 is located southeast of the study area at 4 from the nearest W/T of the project (W/T1).
- The Treis Vrysses Wildlife Refuge, which is located south of the project, at 12 km from the nearest W/T of the project under consideration.

Areas of Absolute Nature Protection

Areas of Absolute Nature Protection may be located within Nature Protection Areas, within Natural Parks and within Residential Control Zones (RCZ). In the latter case, they are characterized by the act defining the RCZ (article 29 of Law 1337/1983 (Government Gazette 33 A'). Until August 2019, four (4) areas of Absolute Nature Protection have been designated.

Areas of Absolute Nature Protection	
Wetland of Dystos, Evia, Area 1	PD, Government Gazette 60/D/08.02.1990 (ZOE)
Mikro and Megalo Seitani of Samos Area A1-Core and A2	PD, Government Gazette 100/D/27.02.1995 (ZOE)
Zone A1 of Zakynthos National Marine Park	PD, Government Gazette 906/22.12.1999
Zone A of Absolute Protection of Nature of Lake Kastoria	PD, Government Gazette 226/T.A.A.P./19.06.2012

Table 29: Areas of Absolute Protection of Nature (https://www.ekby.gr/ekby/el/EKBY_home_el.html)

According to Law 1650/86, as in force, the location of the project does not belong to an Area of Absolute Nature Protection. The nearest area of Absolute Nature Protection is "the Zone A' Absolute Protection of Nature Lake Kastoria" which is located outside the Region of Eastern Macedonia and Thrace.

Nature Protection Areas: According to Law 1650/86, as in force, the location of the project does not belong to a Nature Protection Area.
The nearest nature protection area is Lake Kastoria.

Biogenetic Reserves

According to the Council of Europe's European Biogenetic Reserve Network, the proposed projects are not located in a Biogenetic Reserve Area. The closest area to the project under review, which has been designated as a Biogenetic Reserve Area, is the "Beech Forest" in Tsichla, Haidou, Xanthi, which is located northwest of the project at more than 98 km.

Biosphere Reserves

According to UNESCO's "Man and Biosphere" programme, the proposed projects are not located in a Biosphere Reserve Area. According to the UNESCO program "Man and Biosphere", two (2) areas have been included in the "Biosphererereserves", the Olympus National Park (core area of 3,988 hectares) and the Samaria National Park (core area of 4,850 hectares). The nearest Biosphere Reserve is that of Mount Olympus, which is located outside the Region of Eastern Macedonia and Thrace.

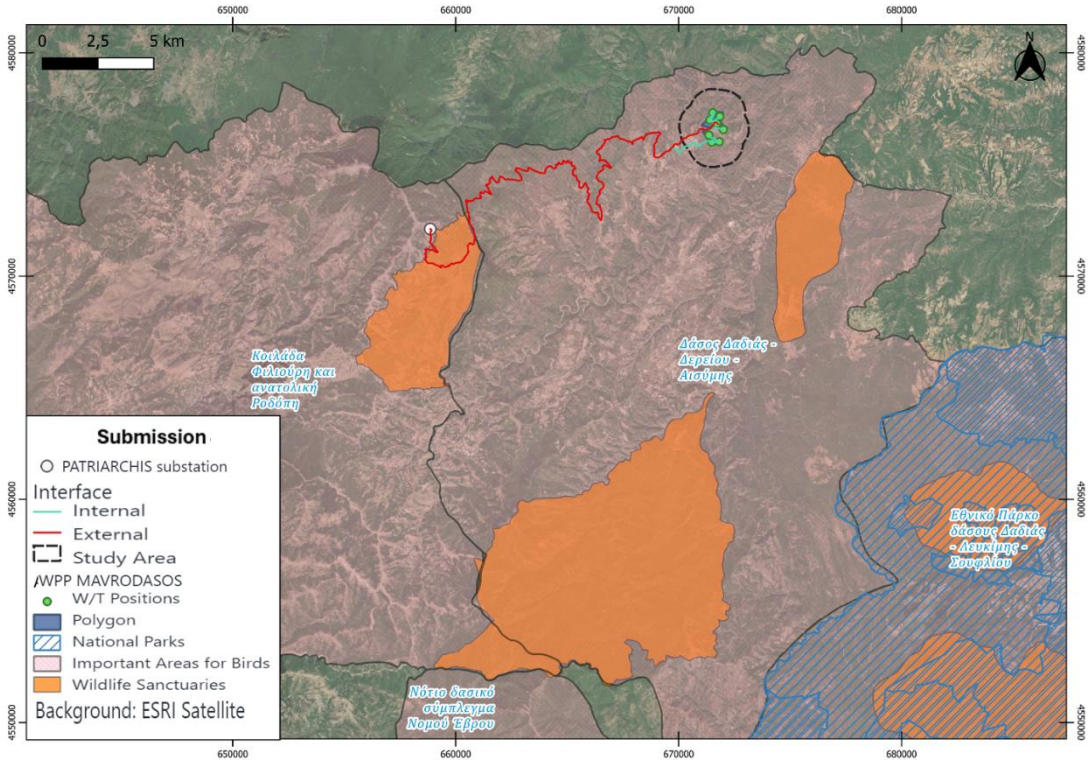
Regions where the Eurodiploma has been awarded

According to the Council of Europe, the proposed projects are not located in an area where the Eurodiploma has been awarded, as only the Samaria National Park has been awarded.

World Heritage Sites

According to the World Heritage Convention operating under the auspices of UNESCO, the proposed works are not located in a World Heritage Site. The closest World Heritage Site to the site is Mount Athos.

Map 25:



National Parks, Wildlife Refuges and Natura area in the wider study area (Own Treatment).

8.5.2.i Summary of the ecological elements of the affected Natura 2000 site.

ECOLOGICAL ELEMENTS OF THE STUDY AREA				
FLORA	FAUNA			
FORESTS	**AVIFAUNA**	**MAMMALS**	**REPTILES**	**INVERTEBRATE**
Oak	Aegypius monachus	Fox	Prasinosaurus	Green toad
Beech	Aquila pomarina	Petrokounavo	Wallosaur	
Pine	Neophron percnopterus	Badger	Fidosaurus	
	Gyps fulvus	Wildcat	Sapitis	
	Accipiter brevipes	Hare	Graikologona	
	Aquila chrysaetos	Wild boar	Mediterranean turtle	
	Bubo bubo	Roe		
	Buteo buteo	Squirrel		
	Lanius collurio			
	Merops apiaster			
	Streptopelia turtur			
	Clanga pomarina			
	Ciconia nigra			
	Falco peregrinus			

	Hieraaetus pennatus			

Table 30: Ecological elements of the study area

8.5.3 Forests and wooded areas

The occupation zone of the project, according to the reformed forest maps of the O.E. of Evros, occupies mostly forests and forest areas.

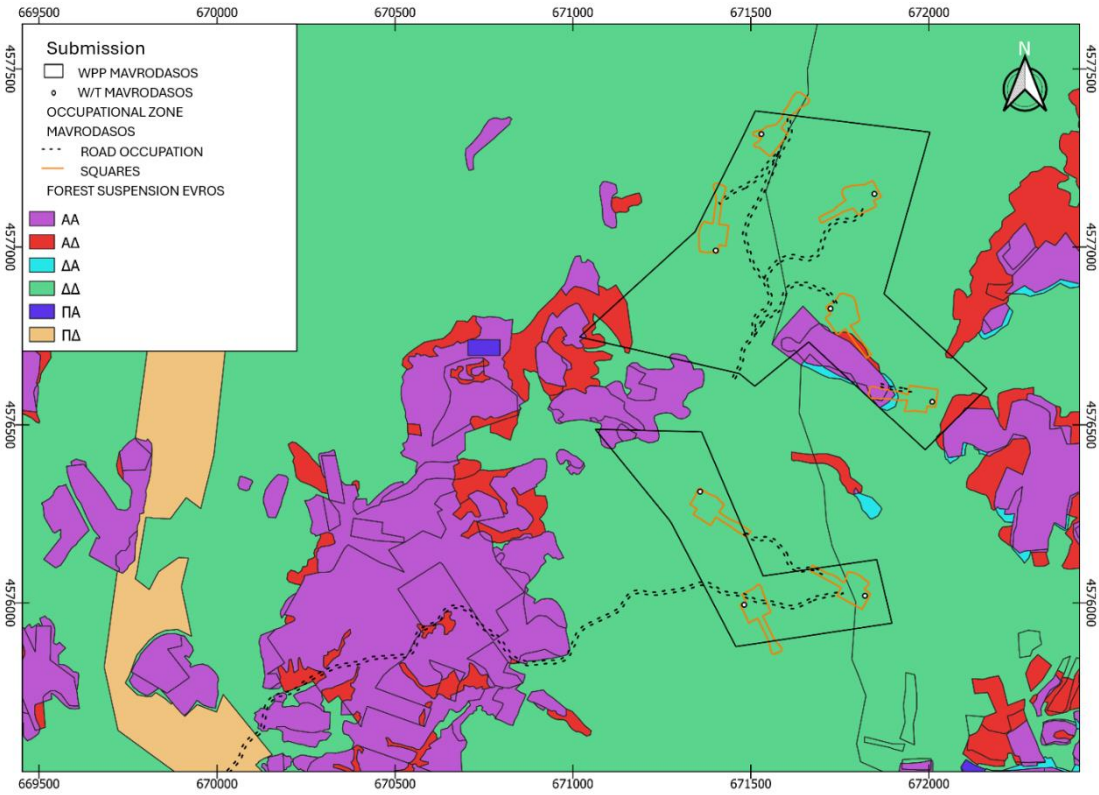
Wind turbine squares occupy areas designated (DD), (AD) and (DA) and are subject to the provisions of forest legislation.

Regarding the new road construction that will be opened for access to the wind turbines of the project, it mainly occupies areas with the designation (PD), (AD) and (AA) while a small part of it falls within an area (PD).

Abbreviation	Explanation
DD	FORESTS AND WOODED AREAS IN OLDER SHOOTING AIRCRAFT OR PRE-EXISTING DATA
	FORESTS AND WOODED AREAS IN RECENTLY TAKEN AIRCRAFT & AUTOPSIES*
DA	FORESTS AND WOODED AREAS IN OLDER SHOOTING AIRCRAFT OR PRE-EXISTING DATA
	OTHER FORM / COVERAGE AREAS IN RECENTLY TAKEN AIRCRAFT & AUTOPSIES*
DD	OTHER FORM / COVERAGE AREAS IN OLDER SHOOTING AIRCRAFT
	FORESTS AND WOODED AREAS IN RECENTLY TAKEN AIRCRAFT & AUTOPSIES*
AA	OTHER FORM / COVERAGE AREAS IN OLDER SHOOTING AIRCRAFT
	OTHER FORM / COVERAGE AREAS IN RECENTLY TAKEN AIRCRAFT & AUTOPSIES*
PD	FINAL ACTS & DESIGNATION DECISIONS - FOREST
PA	FINAL ACTS & DESIGNATION DECISIONS - NON-FOREST
PX	FINAL ACTS & DESIGNATION DECISIONS - GRASSLAND
AN	AFFORESTED OR AFFORESTED LAND
XX	GRASSLAND ON OLDER SHOOTING AIRCRAFT
	GRASSLAND IN RECENTLY TAKEN AIRCRAFT & AUTOPSIES*
XA	GRASSLAND ON OLDER SHOOTING AIRCRAFT
	OTHER FORM / COVERAGE AREAS IN RECENTLY TAKEN AIRCRAFT & AUTOPSIES*
AX	OTHER FORM / COVERAGE AREAS IN OLDER SHOOTING AIRCRAFT
	GRASSLAND IN RECENTLY TAKEN AIRCRAFT & AUTOPSIES*

* OR ON THE CADASTRAL MAPS OF LAW 248/1976

Table 31: Forest Map Explained



Map 26: Mapping of the forest area of the study area of the WPP at the location "Mavrodasos" of the reformed forest map of the O.E. of Evros.

The project under consideration is compatible with the provisions applicable to forests, forest areas, reforestable areas and public lands of cases a' and b' of paragraph 5 of article 3 of Law 998/79.

This compatibility is demonstrated:

- from the provisions of paragraph 3 of article 45 of Law 998/79, as amended and in force:

'*The authorisation to intervene, subject to the provisions of paragraph 4 of this Article, shall be issued for a specific area shown on a topographic diagram with peak coordinates, based on the National Geodetic Reference System NGRS '87, at the request of the person concerned, applied mutatis mutandis to such approval and the provision of paragraph 6 of this Article. The above approval shall be granted on condition that it is not possible to dispose of public land not subject to the protective provisions of this Law for the use in question. If it is certified by the competent authority that it is not possible to dispose of the above lands, then the competent forestry department shall examine whether public lands referred to in cases a' and b' of paragraph 5 of Article 3 of this Law can be disposed of, otherwise, forest land or forests can be disposed of. The above general prohibition of the second subparagraph of this paragraph does not apply to the execution of military projects directly related to the national defense of the country, the opening of public roads, the construction and installation of pipelines of natural gas and petroleum products, the construction and installation of power generation projects from Renewable Energy Sources (RES), including large hydroelectric plants and any necessary project for their operation, as well as their connection networks to the System or Network referred to in Article 2 of Law 2773/1999 (A' 286), the alignment of which provides for their passage through a forest or forest area as well as for projects for the exploitation of mineral raw materials, with their extraction, sorting, processing and collection, the opening of access roads and the construction of facilities that serve the needs of exploitation and sorting and processing, as well as for the interventions referred to in Article 56 hereof*'.

- from the provisions of paragraphs 1 and 2 of article 46 of Law 998/79, as amended and in force:

'*Exceptional nature of permissible interventions in afforested areas 1. Forests and wooded areas referred to in Article 117(1). 3 of the Constitution, no interference provided for in the provisions of this Chapter or any other provision shall be permitted, except as provided for in paragraph 1 of Article 48, paragraphs 1, 3, 4 and 5 of Article 53, paragraph 1 of Article 54, paragraph 1 of Article 55 and paragraph 5 of Article 57 of this Chapter; as well as the provisions of Article 16 of this Law. To carry out the interventions provided for in the above provisions, afforestation does not need to be lifted.*'

❖ from the provisions of paragraph 3a of article 53 of Law 998/79, as amended and in force:

"*For the installation of electricity transmission and distribution networks, the construction of substations and any technical project in general concerning the infrastructure and installation of power plants from Renewable Energy Sources (RES) or Combined Heat and Power (CHP) units using RES, including substations and other connection projects to the System or the Network, accompanying works and any technical project in general concerning the infrastructure and installation of the above stations, as well as water supply pipes of water bottling plants, networks for the transmission and distribution of natural gas and petroleum products, water supply and sewerage pipelines and their accompanying works, solid or liquid waste management systems and, in island regions other than Crete and Evia, Waste Transhipment Stations and their accompanying works, as well as electricity transmission and distribution networks, including voltage reduction and lifting installations, in forests, forest areas, reforestable areas and public lands referred to in cases a' and b' of paragraph 5 of Article 3 of this Law, intervention approval is required, subject to paragraph 4 of Article 45 of this Law. The above networks should, as far as possible, be combined with the existing or ongoing forest road network or with other civil engineering works. b. The execution of the above works is prohibited within the cores of national parks, aesthetic forests and declared natural monuments*".

8.6 Man-made environment

8.6.1 Spatial Planning - Land Use

For spatial planning and land use, the following Spatial Planning Frameworks have been considered:

1. General Framework for Spatial Planning and Sustainable Development (Government Gazette 128/A΄/03-07-2008)
2. Special Framework for Spatial Planning and Sustainable Development for RES (Government Gazette 2464B/03.12.2008)
3. Regional Framework for Spatial Planning & Sustainable Development of the Region of Eastern Macedonia and Thrace.
4. For the above data, an analysis of the projects under study has been carried out in subchapter. 5.2.

SPATIAL PLANNING

The Municipality of Soufli belongs to the Regional Unit of Evros and covers an area of 1323,7 km². In terms of spatial planning, the municipality is part of the central part of Evros. The seat of the Municipality is in Soufli, which is located northeast of Alexandroupolis at about 65 km and is built on the east side of Profitis Ilias. Neighboring municipalities are the Municipality of Didymoteicho which is located north of the Municipality and the Municipality of Alexandroupolis which is located south, to the east it is separated from Turkey and to the west it is separated from Bulgaria.

Other urbanly organized areas such as Industrial Areas and Integrated Tourism Development Areas (IAITDA) near the study area are only the **Industrial Area of Alexandroupolis, which is located 42 km south of the project.**

According to data from the Presidential Decree of 1985 (Government Gazette 181/D/3.5.1985), which defines the boundaries of the country's settlements up to 2000 inhabitants, the boundaries

of the nearest settlement of Roussa are determined, which is 3.2 km from the nearest wind turbine of the wind farm under consideration.

LAND USE

The land use in the Region of Eastern Macedonia – Thrace is determined by the morphology of the soil, the existing water resources and the general development of the area. Regarding the territorial organization and land use of the Region, the table below presents the comparative picture between the Region and the Regional Unit of Evros.

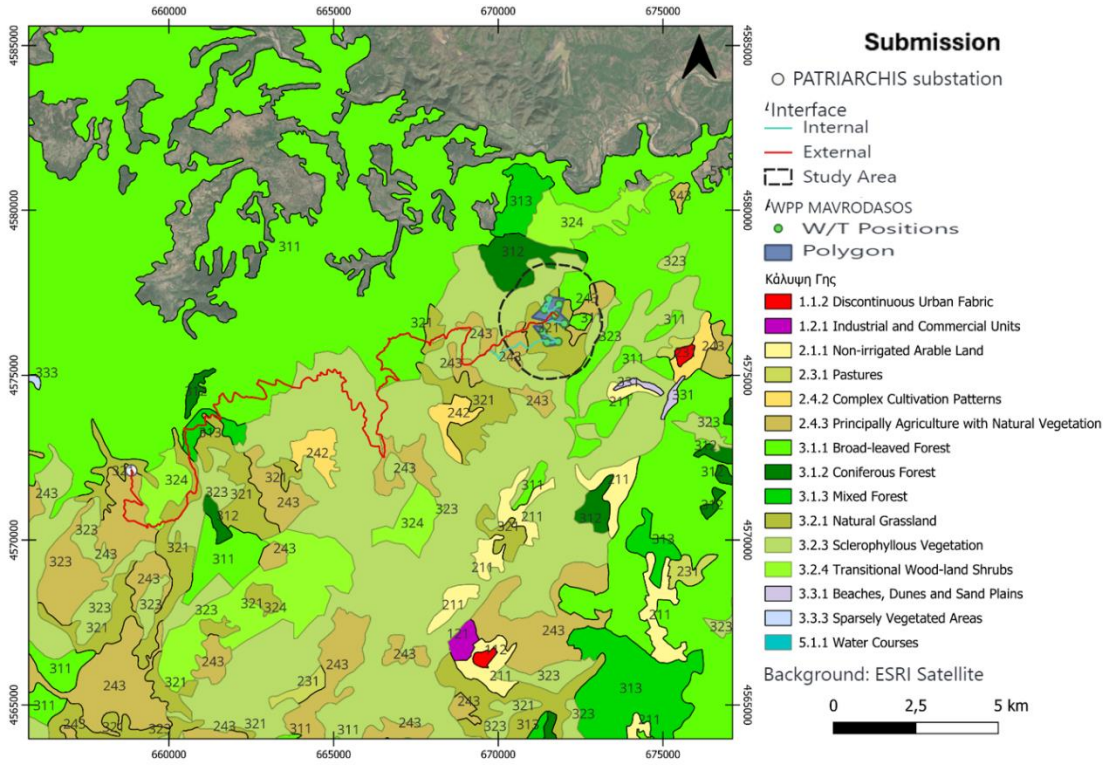
Administrative Units	Total Area	Morphology			Agricultural land		Pasture	Forest cover		Residential use
		Lowland	**Semi-mountainous**	**Mountain**	**Total**	**Irrigated**		**NSSG**	**Corine**	
Regional Unit of Evros	4,242	57,05	27,86	15,09	39,56	12,38	25,01	29,56	40,43	0,11
Region of Eastern Macedonia and Thrace	14,157	34,38	26,05	39,57	29,44	11,15	32,68	31,28	52,26	1

Table 32: Distribution of land use in O.E. Evros and O.E. Eastern Macedonia and Thrace

For the identification of the land uses of the study area , the Corine Land Cover program has been used, which refers to the state of land cover/land use in the year 2018. The European project Corine Land Cover (CLC) has been established by the European Environment Agency (EEA) and provides information on land cover and land change in Europe. According to the picture below, the WPP under examination and the wind turbines fall within an area with natural pastures

The study area of WPP covers areas with "Coniferous forests" (code 3.1.2), in "natural pastures" (code 3.2.1), in an area with "sclerophyllous vegetation" (code 3.2.3) and in an area with "land mainly used for agriculture together with significant parts of plant vegetation" (code 2.4.3).

The interconnection falls within the above-mentioned areas, except for the area designated as 'coniferous forests' while the substation falls only on land with land mainly used for agriculture together with significant parts of plant vegetation.



Map 27: Corine Land Cover Map 2018 and mapping of the examination of WPP and its accompanying projects (Source: http://mapsportal.ypen.gr/layers/geonode:gr_clc2018).

8.6.2 High productivity agricultural systems and land

In the immediate area of the project there are no scattered cultivated areas and grazing points and no high-productivity land or facilities and uses of the primary sector, receptors of industrial, craft or business facilities as well as individual units, development incentive areas or economic and urban incentive zones are identified.

8.6.3 Structure and functions of the anthropogenic environment

The Municipality of Soufli belongs to the Regional Unit of Evros and covers an area of 1323,7 km². In terms of spatial planning, the municipality is part of the central part of Evros. The seat of the Municipality is in Soufli, which is located northeast of Alexandroupolis at about 65 km and is built on the east side of Profitis Ilias. Neighboring municipalities are the Municipality of Didymoteicho which is located north of the Municipality and the Municipality of Alexandroupolis which is located south, to the east it is separated from Turkey and to the west it is separated from Bulgaria. The current Municipality emerged in 2010 with N. Kallikratis and consists of three Municipal Units, the Municipal Unit of Orfeas, the Municipal Region of Soufli and the Municipal Region of Tychero. The WPP under examination belongs to the Municipal Unit Orfeas, Municipal Community of Dereio.

MUNICIPALITY OF ORFEAS - NORTH
Municipal Community of Mikro Dereio
Gericon, the
Gonikon, the
Mega Dereion, the
Mikron Dereion, the
Petrolofos, o
Roussa, the
Sidirochorion, the
Local Community of Amorio
Amorion, the
Local Community of Sunday
Sunday, the
Local Community of Lavara
Banners,
Local Community of Mandra
Mandra, the
Local Community of Mavrokklisi
Korymvos, o
Mavrokklision, the
Local Community of Protoklisi
Agriani, the
Protoklision, the
MUNICIPALITY OF SOUFLI - NORTH
Municipal Community of Soufli
Giannouli, the
Iron, the
Souflion, the
Local Community of Dadia
Dadia, the
Kotronia, the
Dadia Monastery, the
Local Community of Kornofolia
Kornofolia, the
Kornofolia Monastery, the
Local Community of Lagyna
Lagyna, the
Twilight Local Community
Twilight, the
MUNICIPALITY OF TYCHERO - NORTH
Municipal Community of Tychero
Lucky, the
Local Community of Lefkimmi
Lefkimmi, the
Local Community of Lyra
Lyra, the
Local Community of Provatonos
Thyme, the
Sheep,o
Tavri, the

Local Community of Fylaktos
Amulet, the

Table 33 :Administrative division of the Municipality of Soufli (Source: https://www.statistics.gr/)

8.6.4 Cultural heritage

According to Law 3028/2002 (Government Gazette 153/A/28-06-2002) "For the Protection of Antiquities and Cultural Heritage in general", the site of the proposed WPP is located outside the declared listed monuments of world cultural heritage and other monuments of major importance. The table below shows the nearest archaeological sites and monuments.

Name of Monument	Prefecture	Municipality	Apartment	Settlement	Place	Type of Monument
Megalithic monuments (Dolmen) at the site "Koum - Tarla" (Sand Fields)	EVROS	SOUFLIOU	ORFEAS		"Koum - Tarla" (Ammohora)	Funeral Sites and Monuments, Archaeological Sites, Religious Sites
Fortress enclosure on the hill "Mesimler Kale", near Noon	EVROS	SOUFLIOU	ORFEAS		"Mesimler kale", west of the ruined village of Mesimeri	Defense Complexes, Archaeological sites, Castles / Fortresses
Building of the old Primary School in Amorion, n. of the Community	EVROS	SOUFLIOU	ORFEAS	Amorion		Urban buildings, public utility buildings
Complex of rural houses in Lavara, n. Athanasia Konstantinidou	EVROS	SOUFLIOU	ORFEAS	Banners		Rural Economy, Residential Complexes

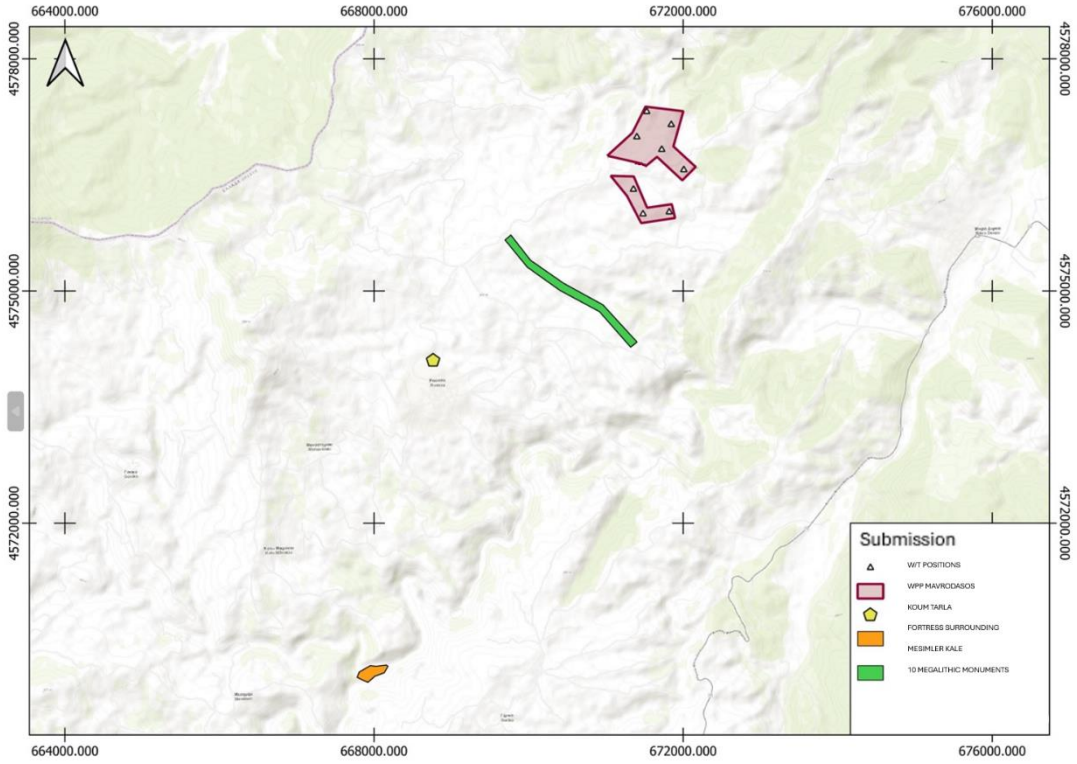
Table 34:Archaeological sites and monuments in the Municipal Unit Orfeas

In the Municipal Unit of Orfeas, the following archaeological sites and monuments are located:

- **10 Megalithic monuments (Dolmen):** At the location Ammochorafa (Koum - Tarla) next to the road Mikro Dereio - Roussa, 4km before Roussa, ten megalithic monuments are found. The first of the 10 monuments is located 30m. SE of the road, while the rest extend over an area of 2,200m. SE of the first monument and are successively located at the sites: Koum - Tarla or Watchtower the first, and the rest at Baluk - Kaya and the Muslim cemetery of the now abandoned village of Mylopepes. The site of the monuments is located southwest and is 1.3km from the nearest wind turbine W/T2.
- **The fortress enclosure, on the hill Mesimler – Kale:** It is located west of the ruined village of Mesimeri. The enclosure has a length of 497 m. Its west and south sides are built according to the cyclopean system with slates. Inside there are foundations of about 50 circular and

quadrangular buildings, as well as tiled tombs. On the NW and SW side of the hill there are parts of a second enclosure. The monument is located southwest, 6.7km from the nearest wind turbine W/T2

- Southwest of WPP is the terrestrial archaeological site **of Koum-Tarla**, which is a religious-funerary site of the Neolithic period and is 3.3Km from the nearest W/T2.



Map 28: Locations of Archaeological Sites and Monuments in relation to WPP

8.7 Socio-economic environment

8.7.1 Demographic situation and trends

According to the statistical data of 2001, the population of the Region of Eastern Macedonia and Thrace is estimated at 611,067 inhabitants, thus covering 5.51% of the total population of the country. For 2011, the population of the Region of Eastern Macedonia and Thrace was estimated at 606,170 inhabitants, corresponding to 5.62% of the total population of the country. Of its total inhabitants, 49.3% (299.100 inhabitants) are males and 50.7% (307.070 inhabitants) are female. For the period 2015-2019, there is a decrease in population (-1.1% for the whole period) following the trend of the rest of the country (-1.2%). It is important to mention that the population of the Region has an increased age and the ratio of elderly people in need of support to people of working age show a strong age dependence, as the corresponding dependency ratio reached 0.367 in 2019, a value higher than that of the country (0.346). The percentage of the urban population corresponds to 59.1% of the total population which shows increasing trends while the rural population corresponds to 40.9% and shows a decreasing trend. The table below shows the evolution of the population of the Regional Unit of Evros and the Region of Eastern Macedonia and Thrace over a period of 10 years.

Year	Administrative division	Permanent population	% In total R.E.M.Th
2011	P.E. Evros	147.530	24,33
2011	Total R.E.M.Th	606.170	100
2021	P.E. Evros	133.862	23,8
2021	Total R.E.M.Th	562.069	100

Table 35: Population situation in the Regional Unit of Evros and in the whole of P.A.TH.M. and trend of evolution (Source: https://www.statistics.gr/el/statistics/pop)

The following table records the administrative division of the Municipality of Soufli into Municipal Units and Local Communities.

MUNICIPALITY OF SOUFLI (Headquarters: Souflion, the)	14.941
MUNICIPALITY OF ORFEAS - NORTH	4.761
Municipal Community of Mikro Dereio	1.903
Gericon, the	125
Parent, the	309
Mega Dereion, the	528
Mikron Dereion, the	158
Petrolofos, o	112
Roussa, the	325
Sidirochorion, the	346
Local Community of Amorio	412
Amorion, the	412
Local Community of Sunday	100
Sunday, the	100
Local Community of Lavara	1.093
Banners,	1.093
Local Community of Mandra	150
Mandra, the	150
Local Community of Mavrokklisi	313
Korymvos, o	201
Mavrokklision, the	112
Local Community of Protoklisi	790
Agriani, the	530
Protoklision, the	260
MUNICIPALITY OF SOUFLI - NORTH	6.170
Municipal Community of Soufli	4.487
Giannouli, the	185
Iron, the	465
Souflion, the	3.837
Local Community of Dadia	546
Dadia, the	533

Kotronia, the	12
Dadia Monastery, the	1
Local Community of Kornofolia	443
Kornofolia, the	432
Kornofolia Monastery, the	11
Local Community of Lagyna	328
Lagyna, the	328
Twilight Local Community	366
Twilight, the	366
MUNICIPALITY OF TYCHERO - NORTH	4.010
Municipal Community of Tychero	2.311
Lucky, the	2.311
Local Community of Lefkimmi	201
Lefkimmi, the	201
Local Community of Lyra	185
Lyra, the	185
Local Community of Provatonos	1.004
Thyme, the	232
Sheep,o	712
Tavri, the	60
Local Community of Fylaktos	309
Amulet, the	309

Table 36: Demographic situation of the Municipality of Soufli for the year 2011 (Source: https://www.statistics.gr/)

8.7.2 Productive structure of the local economy

The Region of Eastern Macedonia and Thrace, according to 2003 data, holds the penultimate position in the ranking of regions based on per capita product, with € 10,500 in 2003. From the data of 1995 it seems that its position did not improve, as at that time it accounted for 81% of the Greek average. The Region of Eastern Macedonia – Thrace is mainly characterized as agricultural with a share of the primary sector GDP more than double the national average. According to 2011 data, it produces 10% of the national product of the agricultural sector, 4.4% of manufacturing and 3.5% of services. R.E.M.Th. Gross Regional Product decreased from €9.2 billion in 2010 to €6.95 billion in the year. However, in 2014 there was a slight increase, influenced by the national pattern of the Greek economic crisis.

GDP per capita in 2010 started at 15,000. € and decreased to € 11.5 thousand in 2017. Until 2015 the decrease was gradual and from the year 2016 when the increase began reached in 2018 11.9 thousand € (at current prices). R.E.M.Th is in the penultimate position in terms of this indicator compared to the rest of the country and ranks in the lowest position compared to the corresponding national index (€ 17.2nd). It is characteristic that it is halfway through the level recorded for Attica, which holds the first place. The table below presents a record of the GDP of the Regional Units in relation to the Region of Eastern Macedonia and Thrace. The data in the table show that the Regional Unit of Evros holds the largest GDP compared to the other Units of the Region.

	Administrative Units	2016	2017	2018	2019
GDP per capita by Region and Regional Unit	Region An. Macedonia Thrace	11.277	11.308	11.472	11.639
	P.E. Evros	**12.085**	**12.060**	**12.114**	**12.342**

	P.E. Xanthi	9.505	9.542	9.740	9.803
	P.E. Rodopi	10.499	10.469	10.449	10.517
	P.E. Drama	10.422	10.149	10.401	10.441
	P.E. Thassos/ Kavala	13.126	13.486	13.836	14.202

Table 37: Per capita Gross Domestic Product of P.E.Evros and O.E. Eastern Macedonia and Thrace (Source: https://www.statistics.gr/el/statistics/-/publication/SEL57/).

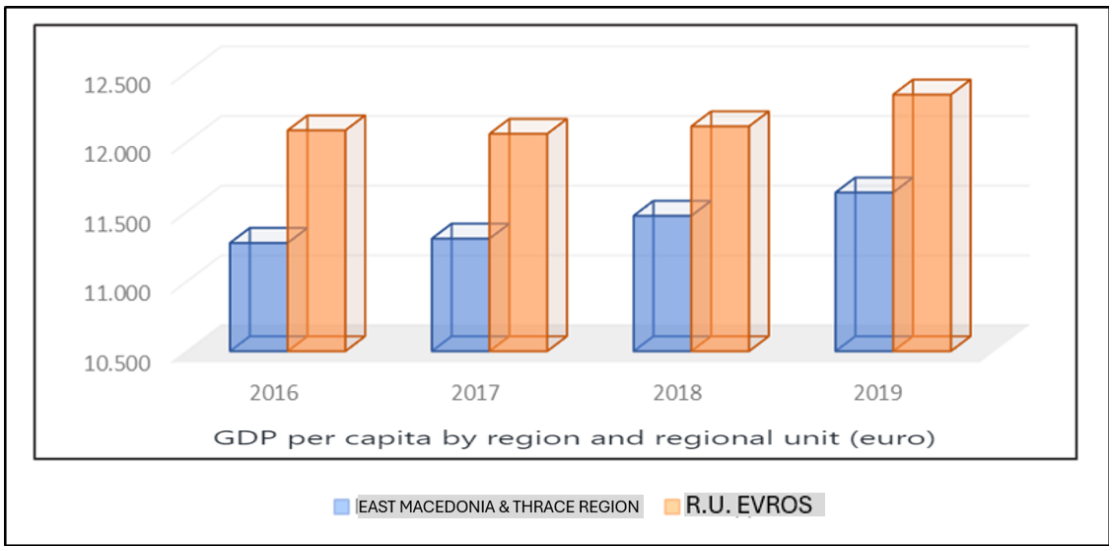


Image 44: GDP per capita in Eastern Macedonia-Thrace and Evros (Source: https://www.statistics.gr/el/statistics/-/publication/SEL57/)

8.7.3 Employment, with information on the main indicators by productive sector and trends in their development.

At the national level, the Region of Eastern Macedonia and Thrace does not show potential in terms of employment growth, while at the same time compared to EU regions it shows low convergence rates over time. The Region of Eastern Macedonia and Thrace relies heavily on the primary sector, taking advantage of its geomorphology, with significant agricultural production and a significant percentage of its employed population.

Regarding the primary sector, in terms of land use, the agricultural sector covers 96% of the total area of the Region. Based on the data of the General Secretariat of Forests for the year 2003, 35.2% of the total area is covered by fields (agricultural land), 37.7% by productive forests, 15.0% by forest areas (7.0% scrublands and 8.0% by pasture) and the remaining 2% by barren land. According to 2003 data, the cultivated areas of the Region cover 11% of the cultivated areas of the country while the average plot area amounts to 6.92 acres. against 7.34 acres. of the whole of Greece. The percentage of irrigated crops in the Region corresponds to 39.4% and concerns intensive industrial crops (mainly in Xanthi and Rhodope) such as cotton, corn, tobacco, and industrial tomatoes. A significant percentage of national production is held by the Region with the production of cotton, wine, wheat, potatoes, melons and cucumbers. Since 2005, the introduction and dissemination of the sector of aromatic – medicinal plants, as well as the cultivation of energy plants, began on a pilot basis. The livestock sector also presents a wide variety and number of livestock farming, including sheep and goats (8% of the country - 2000), cattle (15.6% of the country), pigs (9% of the country), equines, rabbits, poultry and beehives. Milk production accounts for 9% of national production, while fresh silk cocoons account for more than 50% of the country's total production. The fisheries sector of the Region also plays an important role with

a strong participation in the formation of regional income. There are 32 aquaculture units in operation, active in the development of marine and coastal fishing, as well as inland fishing (rivers, lagoons, fish farms). The main forms of production are observed in the wider area of Nestos, Lake Vistonida and the sea front of the Lake and concern mussel farming or extensive fish farming (wide species).

The secondary sector of the Region of Eastern Macedonia and Thrace has as its main activity manufacturing and construction. Specifically, five Industrial Areas (Industrial Areas) are identified, one in each prefecture capital and Craft Parks (I.A.) in various areas. The manufacturing sector developed after 1980 due to development laws, mainly due to low labor costs and decentralization of production. With today's data, the sector is in recession, as large manufacturing units have closed, and the operation of industrial areas is not considered satisfactory. The few new and dynamic units that begin to establish themselves choose locations outside the organized receptors. SMEs in the Region are mainly divided into: Food and Beverage (30.8%), Wood and Furniture (24.3%), Metal Construction (18.2%), Ready-to-Wear (16.5%). Regarding their territorial dispersion, the Regional Unit of Evros holds the first place, followed by the Regional Unit of Rodopi, Xanthi, Kavala and Rama.

As far as the tertiary sector of productive activity is concerned, trade and transport play an important role, followed by public services, education and hotels – restaurants. Emerging activities include banking, insurance, real estate and public administration. The tourism sector plays the latter role as it is focused on mass and maritime tourism and mainly concerns the zones of Thassos and Kavala beach. Tourism is not an important part of the tertiary sector as its participation in relation to the national average is reduced, despite the existence of tourist resources with potential for further development (religious and archaeological sites) (Thassos and Samothrace, Nestos and Evros Delta, Dadia forest, the Rhodope mountains, Falakro ski resort, old town of Xanthi, thermal springs of Eleftheron, Mud baths of Krinides, etc.).

		Economically active						**Inactive**
	Total		**Employed**				**Unemployed**	
		Total economic active	**Total employees**	**Primary sector**	**Secondary sector**	**Tertiary sector**	**Total**	
R.U.E. Macedonia Thrace	608.182	234.579	187.306	**38.787**	**30.892**	**117.627**	47.273	373.603
R.U. Evros	147.947	57.337	48.443	**8.312**	**5.578**	**34.553**	8.894	90.610
Municipality of Soufli	14.941	5.127	4.471	**1.598**	**502**	**2.371**	656	9.814

Table 38: Employment in the Municipality of Soufli, Regional Unit of Evros, P. Eastern Macedonia and Thrace (Source: NSSG, Census 2011) (Source: https://www.statistics.gr/)

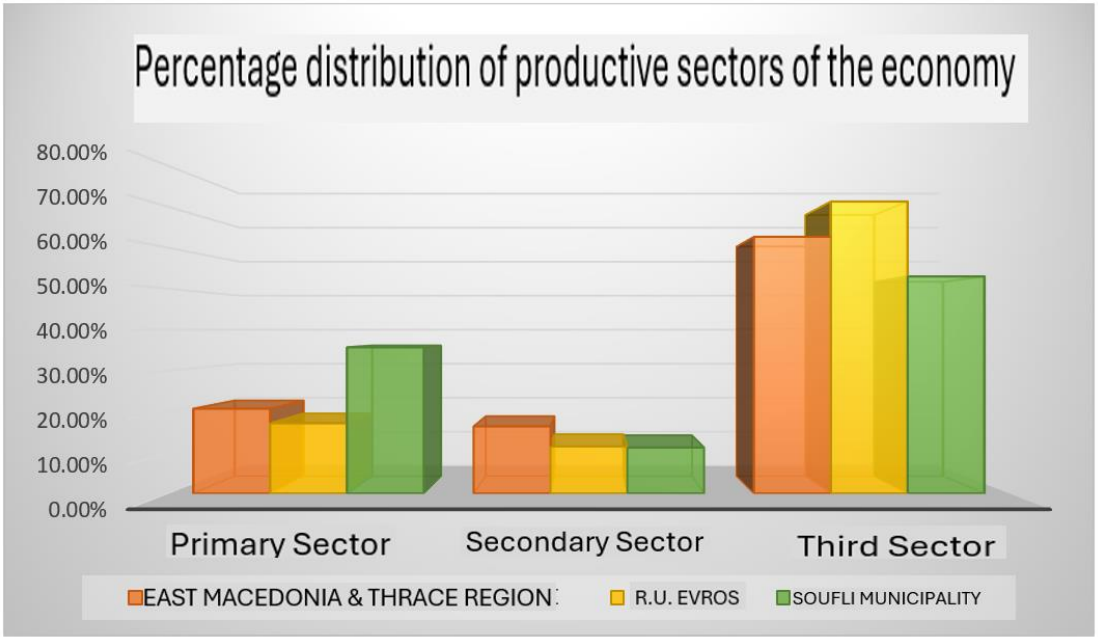


Image 45:Percentage distribution of the productive sectors of the economy (Own Treatment).

The implementation of the project is expected to contribute positively to the socio-economic environment of the region as it is a source of sustainable development. The implementation of the project will provide some **temporary jobs** in the installation works, which will be filled by local human resources. It is estimated that during the construction of the proposed WPP with a total capacity of 34.5 MW the company will employ approximately 11 people.

8.8 Technical Infrastructure

8.8.1 Land, sea and air transport infrastructure

The following section lists the land, sea and air transport infrastructure of the Region of Eastern Macedonia and Thrace (R.E.M.Th.). The Region of Eastern Macedonia - Thrace plays an important role in the utilization of the North-Northeast axis of development of the country towards the Balkans, the new Central and Eastern Europe, thus contributing to the dynamic integration of Greece into the international and European environment.

An important land transport infrastructure in the Region of Eastern Macedonia and Thrace is the Via Egnatia that connects it with the Greek mainland and with neighboring Turkey. The Region of A.M.Th. includes the eastern part of the Egnatia Motorway (246 km) which consists of four vertical axes. The vertical axes of the Via Egnatia that connect its settlements and give access to Bulgaria are the following:

- Alexandroupoli – Ormenio
- Komotini – Nymfaia
- Xanthi – Echinos
- Greek-Bulgarian border
- Drama – Nevrokop – Exochi.

Regarding the regional/local road network (national, provincial, intermunicipal, rural), the Region has a wide road network that serves medium-sized cities, the countryside and many small settlements as well as the connection of the region with other neighboring ones.

The length of the National and Provincial Road network under the responsibility of the Region amounts to approximately 3,800 km and the network, outside cities, consists of many local roads in sparsely populated areas.

Road transport dominates both passenger and freight traffic. East of WPP at 10,249 m passes the Provincial Road Mandra – Mikro Dereio.

Rail transport is underperforming, especially in terms of passenger traffic and the railway infrastructure connects all the cities of R.E.M.Th, except Kavala. The existing railway network connects Thessaloniki with Ormenio of Evros and then the Greek-Bulgarian border and passes through all urban centers of the Region of Aristotle University of Thessaloniki, except Kavala, while there is a lack of planning of a new connection to Bulgaria.

Within the framework of the Trans-European Transport Network and as far as rail transport is concerned, there is a section that is part of the main trans-European network (corenetwork) and it is the section Toxotes up to Pythio, N. Evros (connection with Turkey) and the section Toxotes – Kavala – Thessaloniki (coastal alignment), which is part of the main trans-European high-speed network (corehighspeedrail) with a construction deadline of the year 2030. The rest of the rail network is classified as: Detailed. Also, in Alexandroupolis there is a combined (road – rail) transport hub (RRT – Road – Rail Terminal) which is included in the detailed trans-European network. The railway network is located 52 km south of the project area and is shown on the following map.

The two international airports of Alexandroupolis and Kavala are designated as Main International Airports and their interconnection with the railway network and, by extension, with the ports of the two cities is promoted as a matter of priority. Regarding the airport of Chrysoupoli, the improvement of the connecting road and the interchange with the Egnatia Motorway and the connection with Kavala and Xanthi through appropriate connections with MMM are being promoted.

Apart from the airports, in the Region of Aristotle University of Thessaloniki there are currently two heliports licensed by the CAA: a) the General Hospital of Xanthi and b) the General Hospital of Alexandroupolis as well as three helipads that are not licensed as they have many shortcomings: a) one in Nevrokopi of the Regional Unit of Drama, b) one in Samothrace and c) one in Dikaia of the Regional Unit of Evros.

The nearest airport to the project site is the airport "Demokritos" of Alexandroupolis and is located southeast at 52 km.

Ports of the Region of Eastern Macedonia and Thrace with an important role are the Ports of Alexandroupolis and Kavala as they give the possibility of prudence in the North and East Aegean for the freight interconnection of the country with potential for development due to their proximity to airports, such as the airports of Kavala and Alexandroupolis, their railway interconnection

(Alexandroupolis) and their integration into the national road network. The ports of the Region include smaller ones such as Porto Lagos, Thassos, Kamariotissa in Samothrace, Keramoti, Prinos and the port of Eleftheron - Peramos. The nearest port to the project area is the Port of Alexandroupolis, which is located southeast at 54 km from the project study area.

8.8.2 Organised industrial activity receptors

Industrial Areas of Industrial Area/Quarrying or Mining Zones

No industrial areas are in the study area and the wider project area. The nearest industrial area is the Industrial Area of Alexandroupolis. In the nearby area of the project and specifically at 5.2Km (W/T 8) there is a quarry for the extraction of industrial minerals and specifically calcium carbonate. The location chosen for the installation of the WPP is not a problem, as no location limits and restrictions have been set for this technology by quarry areas.

8.8.3 Environmental Infrastructure Systems

The following paragraph analyzes the environmental infrastructure of the Region of Eastern Macedonia and Thrace

A) Waste Transhipment Points and Waste Management Centers for Recyclable Materials.

To date, thirteen (13) of the SMAs have been built in Xanthi, Feres, Soufli, Didymoteicho, N. Vyssa, Samothrace, Komotini, Sapes, Thassos, Chrysoupoli, Eleftheroupoli, Drama and K. Nevrokopi. The SMAs of Myki and Kavala have not been built. The HERRC that have been constructed are those of Alexandroupolis, Didymoteicho, Komotini, Xanthi and Drama. but only the one in Alexandroupolis, which has been built and operated by the Hellenic Recovery Recycling Corporation (HERRC) and recycles the packaging waste of the Municipalities of Komotini, Alexandroupolis and Samothrace, is in operation.

The nearest KDAI is in Alexandroupolis southwest at about 50km from the nearest W/T of the project.

B) Landfills

According to the PECA , there are three landfills operating in R.E.M.Th., in Kavala, Xanthi and Komotini. In detail :

- The Kavala landfill is located at Eski Kapou, 10 km away. from the city of Kavala and serves all the Regional Areas of Kavala and Thassos and has been operating since 1994.
- The Xanthi landfill is in the Prasinada farm of the Municipality of Topeiros, with the closest settlements to it being Petrochori and Vaniano. It has been operating since January 1995 and serves the IP of Xanthi. The landfill field has a total area of 200 acres. and receives about 45,000 tons of waste per year.
- The Komotini landfill is located at "Siderades" in the Municipality of Komotini, about 15 km. from the city of Komotini and has been operating since August 2002. It is owned by the Municipality of Komotini. The landfill site has a total area of 116 acres.

Regarding the Landfill of Residues, four Landfill sites are to be constructed:

- The Western Sector Landfill (Kavala) will receive the remains of the Kavala MEA of the environmental parks of Thassos and Drama as well as the residues of the Drama HERRC.

- The Eastern Sector Landfill (Alexandroupolis) where it will receive the remains of the Alexandroupolis MEA, the environmental parks of Orestiada, Samothrace and the remains of the Didymoteicho and Alexandroupolis KDAI.
- The Xanthi Landfill will receive the remains of the Xanthi Environmental Park and the Xanthi Environmental Park.
- The Komotini Landfill where it will receive the remains of the Komotini Environmental Park and the Komotini Environmental Park.

According to the above data, the nearest active landfill is that of Komotini and is located southwest 50 km from the study area of the project under consideration.

(c) wastewater treatment plants

In the Region of Eastern Macedonia and Thrace, it is estimated that approximately 13,000 thousand tons of sewage treatment plant sludge are produced annually, based on data from the DEYA of each Regional Unit. Sewerage networks and wastewater treatment plants have only urban centers of more than 10,000 inhabitants and B priority settlements (discharge to a sensitive recipient) while a significant number, but not all, of C priority settlements are covered.
More specifically, the WWTPs of the Region are 19 and are distributed as follows (data 12/2011): IP of Xanthi: 1 in Xanthi and 1 in Avdira (in the Workers' houses of Pigadia) IP of Evros: 1 in Alexandroupolis, 1 in Didymoteicho and 1 in Orestiada (and the area of Pyrgos) IP of Drama: 1 in the city of Drama IP of Thassos: 1 in the area of Limenas Thassos and 1 in Skala Panagia-Potamia IP of Kavala: 3 for the areas of Aspri Ammos, Palio and Dato, 6 for the areas of Podochori, Kargiani, Akropotamos, Orfani, Eleftheroupoli, N. Peramos and 1 for the Municipality of Nestos Rodopi: 1 for the city of Komotini. The closest facility to the project under consideration is the Soufli Wastewater Treatment Plant (Soufli WWTP) located southeast of the project at approximately 30 km. The following map shows the nearest wastewater facility in relation to the study area.

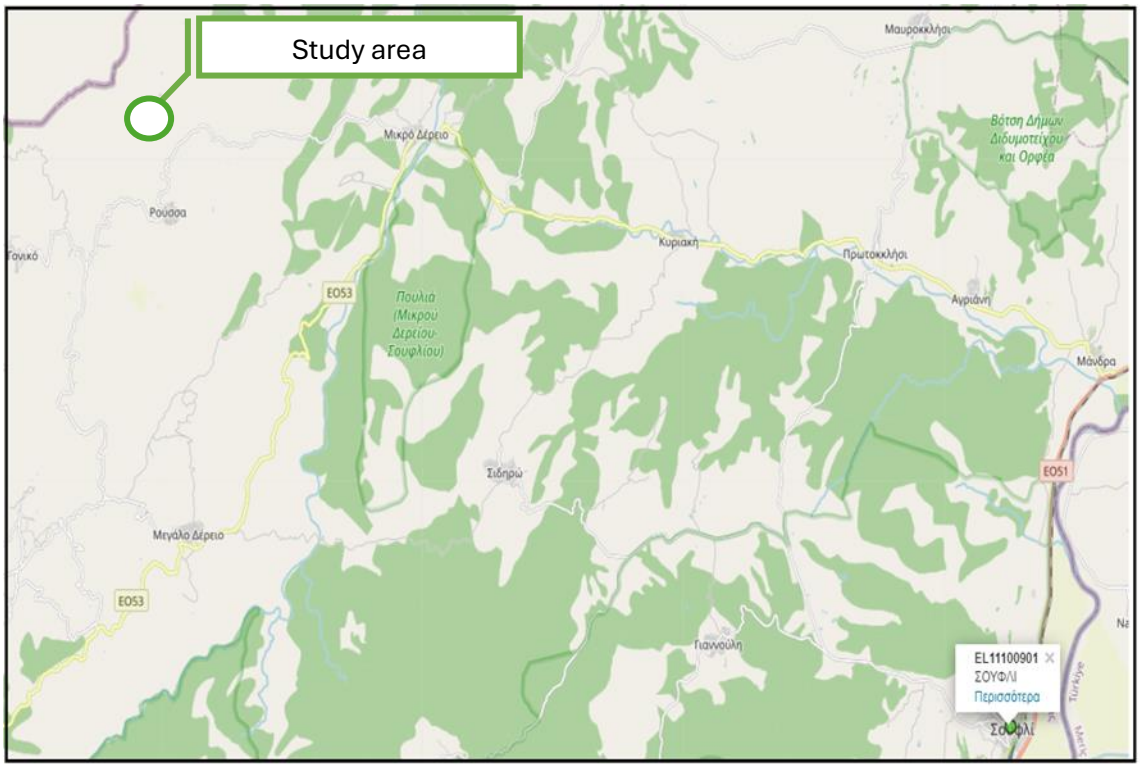


Image 46: Nearest Wastewater Treatment Plant (WWTP Soufli) with code "EL11100901 in the area of installation of the project. (Source: http://astikalimata.ypeka.gr/).

8.8.4 Water supply, electricity transmission networks. natural gas and telecommunications facilities

Water Supply Networks

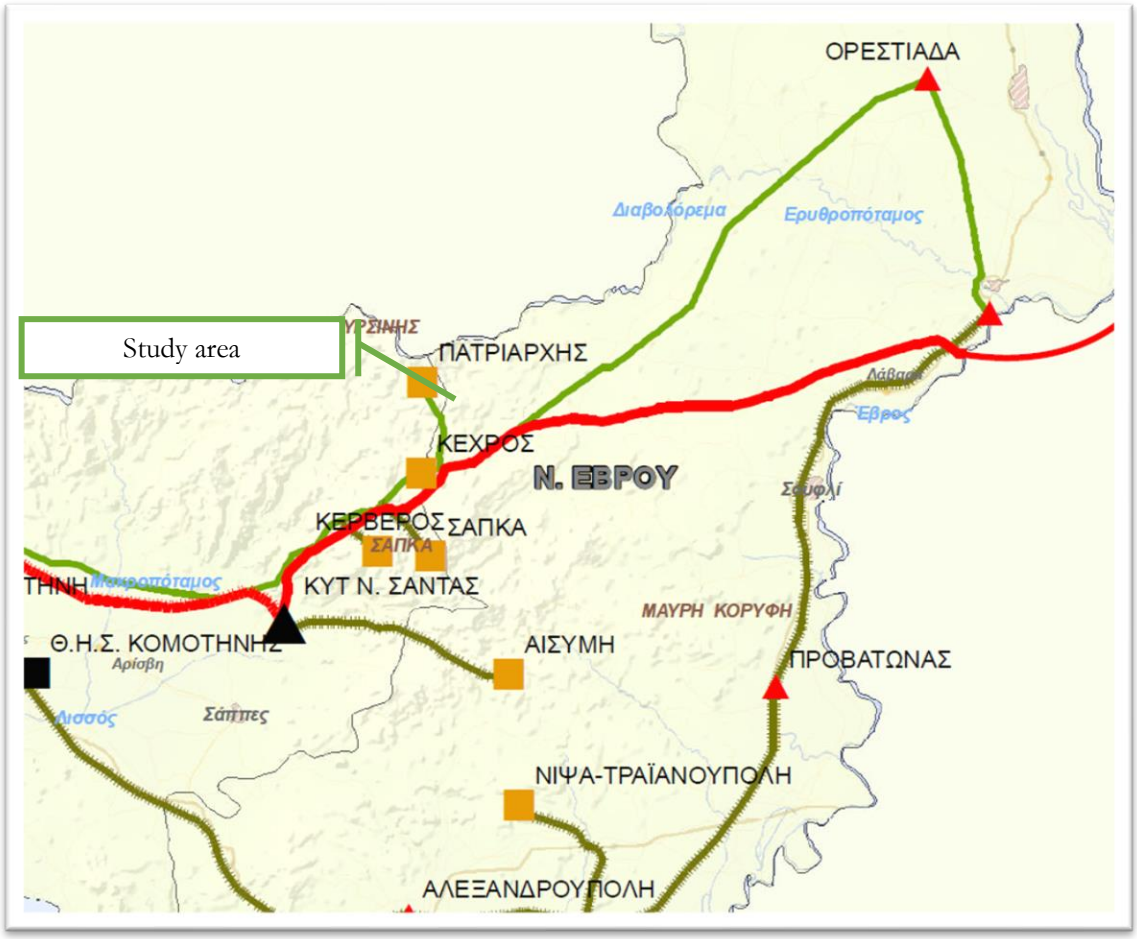
All settlements in the Region are covered by water supply network infrastructure, while future coverage concerns the needs of settlements and areas of a few inhabitants where there is no water supply network.

Electricity transmission network

The electricity network of the Region is included in the wider Interconnected Electricity Transmission System of the mainland part of the country, the backbone of which is the 400kV network. The connections concerning R.E.M.Th. are connections with Bulgaria and Turkey. The connection to the Bulgarian system is via a 400kV Transmission Line (GM) (type B'B'), between the Extra High Voltage Center (EHVC) of Thessaloniki and Blagoevgrad in Bulgaria, while for the connection with Turkey the construction of the 400 kV GM RIC of Philippi-RIC N. Santas-Babaeski (Turkey) has been completed since 2008. Regarding the 150kV network, the most important system development projects in R.E.M.Th include:

- Upgrade of the 150kV loop in Evros. Aid works for the connection of the N. Santa RIC to the 150kV System
- Rearrangement of circuits in Kavala.
- Local electricity needs for residential or commercial use are covered by PPC.

The map below shows the electricity transmission network of the wider area.



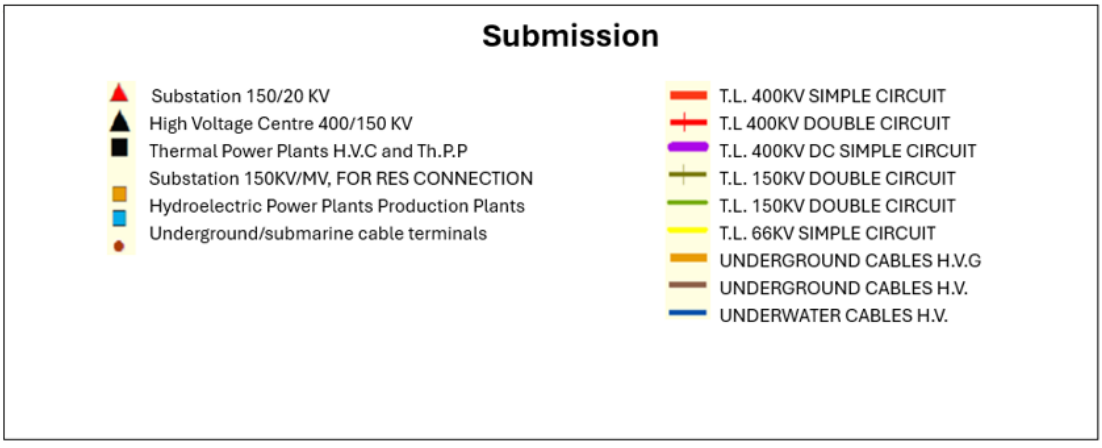
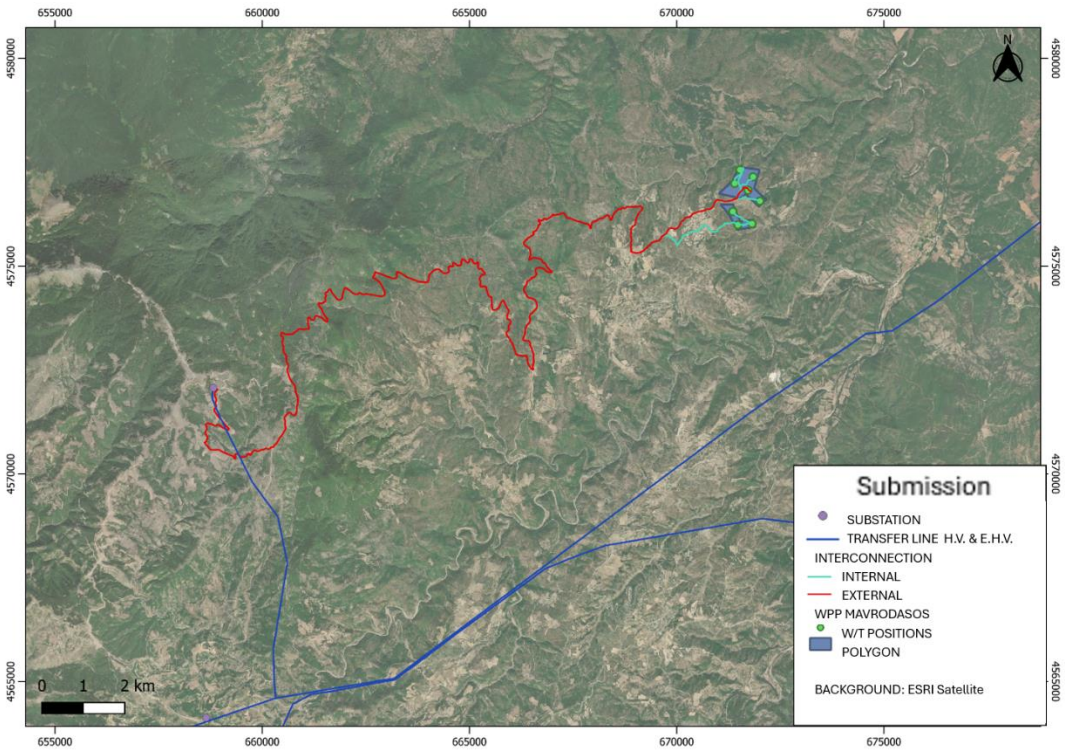


Image 47: Electricity Network of the wider region (IPTO map)(Source: https://www.admie.gr/systima/perigrafi/hartis-grammon).

The following map shows the 150KV and 400KV power lines. **Specifically, as pointed out in Chapter 5.2.1, the project under consideration is 3.74 km from the 150 KV power line.**



Map 29: Mapping of power transmission lines near the study area (Own Processing).

Natural Gas Installations

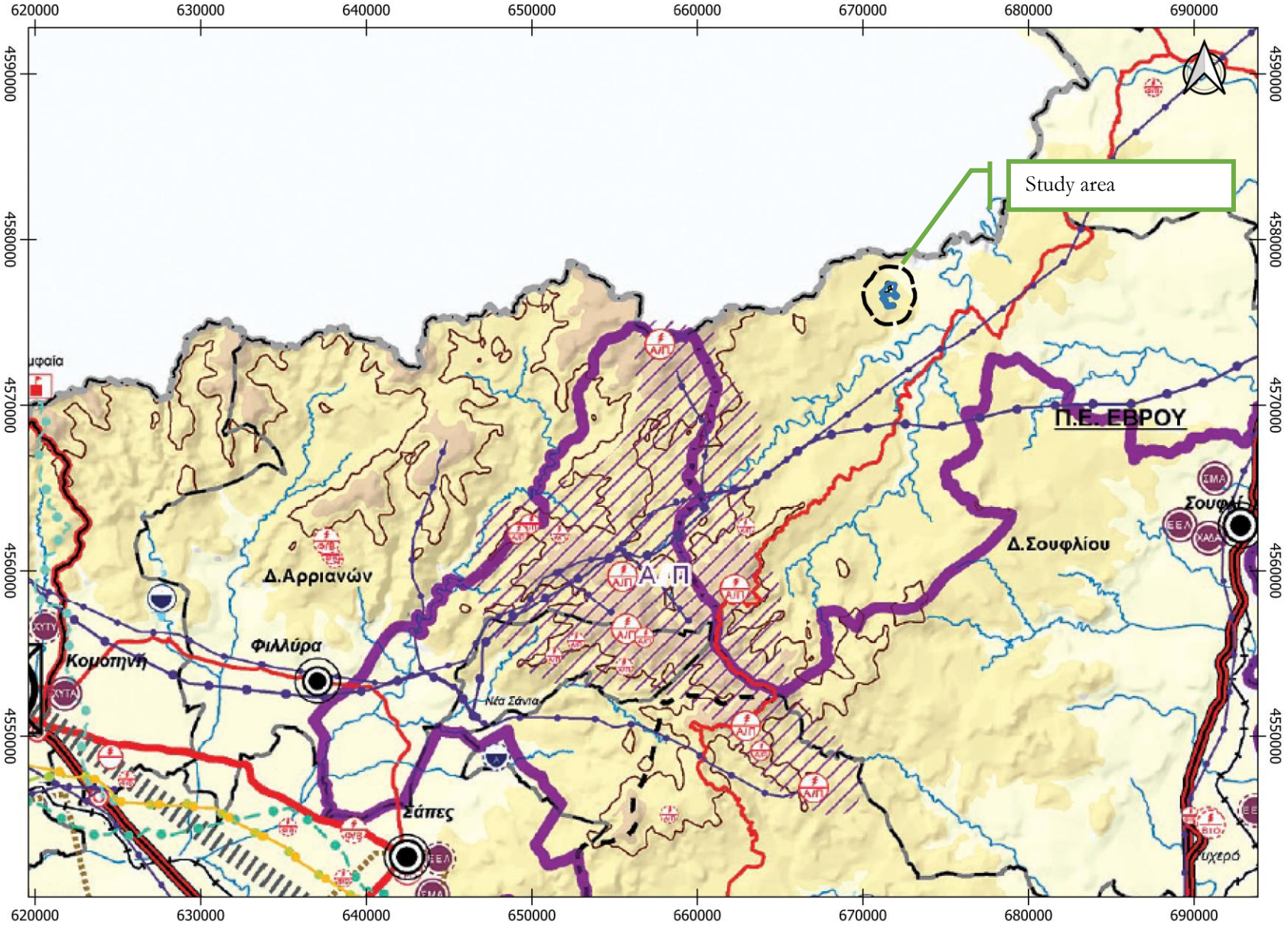
Natural gas in the Region of Eastern Macedonia is imported into the National Natural Gas Transmission System (NNGTS) through three entry points, one of which is in Kipi, Evros, with the point having the largest capacity. The section that starts from the Greek-Turkish border in Kipi in Evros runs west through the Regional Prefectures of Evros, Rodopi, Xanthi, Kavala and Drama, until Karperi where it meets the Central High-Pressure Pipeline, which starts from the Greek-Bulgarian border (Serres area) and continues to the facilities of the island of Revithoussa Megara.

The planned major natural gas transmission pipelines concerning R.E.M.Th are:

- TAP, for the transport of natural gas from Azerbaijan to Western Europe via Turkey, Greece, Albania and Italy
- The IGB (connection between Greece and Bulgaria from Komotini to Haskovo), for the supply of the neighboring country and, through it, other Balkan countries, with the possibility of reverse flow
- and the SouthStream pipeline that will export Russian gas to Europe. The southern branch of the pipeline will enter through the Greek-Bulgarian border and will run through the northern part of the country ending in Italy.

There are no natural gas distribution networks for industrial - artisanal as well as for domestic use. **The TAP pipeline network is located south of the project area 46 km from the project study area.**

The following map depicts the project under examination and the technical infrastructure in the wider area and study area of the project.


Study area
Π.Ε. ΕΒΡΟΥ
Δ.Αρριανών
Δ.Σουφλίου
Φιλλύρα
Κομοτηνή
Σάπες
Νέα Σάντα
Σουφλί
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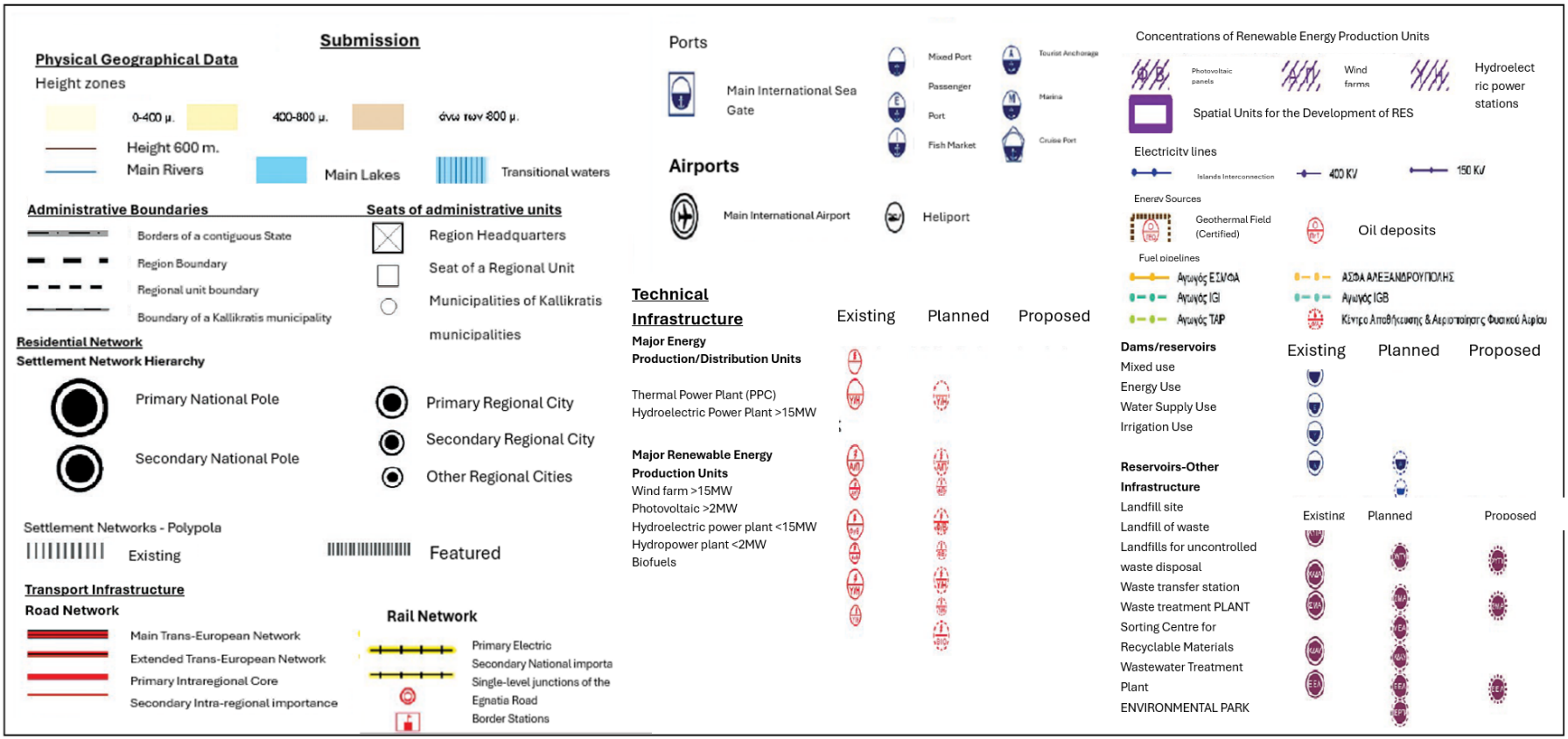


Map 30: Technical Infrastructure in the Region of Eastern Macedonia and Thrace (CSE, 2018)

8.9 Anthropogenic pressures on the environment

The following section lists the sources of pollutants resulting from human activity.

Anthropogenic pressures exerted on the environment are categorized as point, diffuse and other pressures, as follows:

1) Point: Sewage Treatment Plants (WWTPs), Discharge of sewerage networks to a natural recipient, Industrial Units, Livestock Units, Aquaculture – Aquaculture § Leaks from illegal landfills and landfills
2) Diffuse: Agricultural activities, Residential development, Urban wastewater that does not end up in WWTP, Livestock farming (pastoral and stabled).
3) Other Pressures: Runoff from mining activities (mines, mines), Desalination Plants, Ports-Marinas-Navigation, Artificial enrichment of groundwater.

The following paragraphs analyze the sources of pollution in the Region of East-Macedonia and Thrace.

A) Urban Wastewater - Wastewater Treatment Plants

The main problem in the Region is the management of urban wastewater from settlements and waste from livestock and processing units, as well as the pollution of the river Nestos – and the river Evros. Wastewater Treatment Plants (WWTPs) have been constructed in large urban centers and it is planned to expand the sewerage networks to include neighboring settlements. The rest of the settlements that do not have a WWTP (while some others do not have a sewerage network) are considered point sources of pollution. An important problem is also the produced sewage sludge in existing WWTPs where it is not treated at the final disposal stage.

B) Solid Waste

The management of Municipal Solid Waste has shown little progress in recent years and in addition it is necessary to increase recycling.

(c) Industry

A large proportion of air emissions and quantities of liquid and solid waste come from industry. Units that are installed in R.E.M.Th. and are a big problem are:

- the fertilizer industry,
- oil refineries
- The (potential) gold mining industry
- installations of the SEVEZO Directive (for the prevention and response to industrial accidents in the Region). Specifically, in the Regional Unit of Rodopi there are: 2.These facilities require the elaboration of a Major Technological Accident Response Plan (SATAME).

D) Agriculture - Livestock - Aquaculture

The main environmental pressure on the natural environment is caused by the intensification of production and the increased use of fertilizers and pesticides. It is important to mention that a large part of the cultivated areas fall under protected areas (Ramsar and Natura areas). This creates the need for integrated management of agricultural activities. The main environmental pressures caused by livestock farming are overgrazing and the production of significant quantities of waste, which are also causes of pollution, mainly of water bodies.

The following tables record point and diffuse sources of pollution received by the River Basin where the proposed project belongs.

Evros River Basin (EL1210)

The proposed project falls within the P. Evros River Basin. The Evros River Basin has a total area of 53,000 km2 and occupies part of the eastern Balkan Peninsula and is shared between Bulgaria, Turkey and Greece. The river Evros is partly the national border between Greece – Bulgaria and Greece – Turkey.

In Evros LAP (EL1210), the total annual loads resulting from the sum of the individual point pressures are 204.54 tn/year BOD, 196.17 tn/year N and 26.65 tn/year P.

Point sources of pollution	BOD (tonnes/year)	Y/(tonnes/year)	P(tonnes/year)
WWTP	122,70	165,69	19,06
Large Hotels	0	0	0
Industrial units	12,23	5,95	0,79
Livestock units	69,61	24,53	6,80
Aquaculture	0	0	0
Landfill / illegal landfill	0	0	0
Total	**204,54**	**196,17**	**26,65**

Table 39: Total annual loads of BOD, N and P generated by point sources of pollution in Evros LAP (EL1210)

The above table shows that point sources of pollution with increased BOD loads (biochemical oxygen demand) are Wastewater Treatment Plants and livestock farms.

The point sources of pollution with high nitrogen (N) and phosphorus (P) loads are wastewater treatment plants and large livestock farms.

In Evros LAP (EL1210), the total annual surface loads resulting from the sum of the individual point pressures are 203 tn/year BOD, 196 tn/year N and 27 tn/year P.

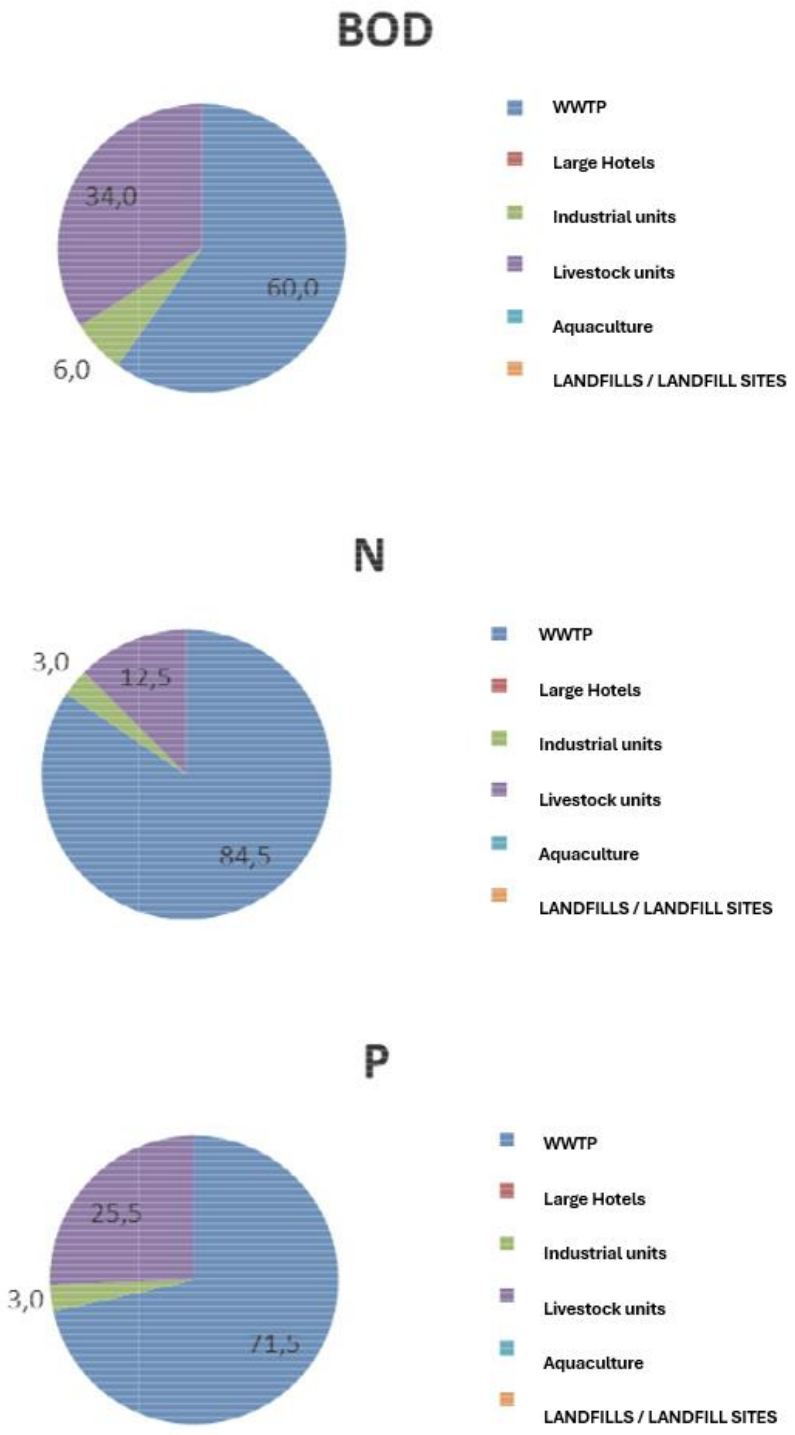


Image 48: Allocation of annual burden BOD, N and P from point pressures in the Evros LAP (EL1210) of the Thrace MoD (EL12)

The above table shows that the land use with the highest pollutant load is WWTP and livestock activity.

8.10 Atmospheric environment - Air quality

8.10.1 Indication of the main sources of pollutant emissions into air

For the assessment of air quality based on measurements carried out by the National Air Pollution Monitoring Network (NAPMN), an air quality assessment has been carried out for the whole country in the framework of the project "Update of the cartographic depiction of air pollution through the recording of air emissions of sources and development of an appropriate calculation tool" included in the Operational Program Environment & Sustainable Development of OPESD. Specifically, an inventory of emissions of air pollutants from all sources has been carried out for the whole country with a resolution of 2km x 2km. Based on emissions, using simulation techniques (CAMx), concentrations of air pollutants have been calculated with the same spatial analysis.

8.10.2 Assessment and evaluation of the existing quality of the atmospheric environment in the study area

Regarding the study area, the primary source of pollution is the traffic of vehicles serving the surrounding settlements. In general, the main pollutants produced during the operation of industries are mainly CO, CO_2, NOx and SO_2. However, industrial activities producing air pollutants will have to apply emission limitation measures and comply with the limits of existing legislation. The following table shows the legislation concerning air quality.

Air quality directives	
Directive 2008/50/EC	Air quality and cleaner air for Europe (Joint Ministerial Decision 14122/549/E103, Government Gazette 488/B/2011).
Directive 2004/107/EC	Regarding arsenic, cadmium, mercury, nickel and polycyclic hydrocarbons in ambient air (Joint Ministerial Decision 22306/1075/E103, Government Gazette 920/B/2007).
Directive 2015/1480/EU	Amendment of certain annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council, which lay down rules on reference methods, data validation and location of sampling points for ambient air quality assessment (JMD 174505/607, Government Gazette 1311/B/2017).

Table 40: Directives concerning air quality

Data on air pollutant emissions in the study area has not been recorded. The nearest station of the National Air Pollution Monitoring Network (NAPMN) in installation of the project is that of Alexandroupolis station and is located 50 km away.

According to the "Annual Air Quality Report 2020", an air quality assessment was carried out for the whole country in the framework of the project "Update of the cartographic depiction of air pollution through the recording of air emissions of sources and development of an appropriate computational tool" included in the Operational Program Environment & Sustainable Development of the NSRF. This was based on indicative measurements at locations other than the fixed measurements of NAPMN (National Pollutant Monitoring Network) but also for additional pollutants than those measured at the locations of the NAPMN. The following tables record data on air pollutants recorded at the Alexandroupolis station.

	Alexandroupolis Station	
	Place	

	WGS 84		EGSA '87		Altitude (m-asl)
Name	**Geogr. length**	**Geogr. amplitude**	**X**	**Y**	
Alexandroupoli	25.87305556755	40.844722212846	657752.40	4522922.58	11

Table 41:Metastructured pollution measurement stations of EDPAR which are operated by the Regions. (Coordinates, Altitude)

Characterization	**Pollutants to be measured**							
Urban-Traffic	C6H6	PM10	PM2.5	Pb	*As*	Ni	Cd	B(a) P
	X	X	X	X	X	X	X	X

Table 42: Transmitted pollution measurement stations of the EDPAR which are operated by the Regions. (Pollutants measured)

Pollutants to be measured	**Average annual value, μg/m3**
Particulate matter (PM10)	29,8
Nu	1,4
AS	0,7
Cd	0,2
Pb	5,0
Benzopyrene	0,6
Benzene	2,4

Table 43:Measured air pollutants in the study area

In conclusion, for none of the above pollutants, the limit values were exceeded, so in installation of the project there are no pollutant emissions exceeding the limits.

8.11 Acoustic environment and vibration

The acoustic environment of the study area is characterized by low noise levels. The study area, as far as anthropogenic activities are concerned, is mainly agricultural and there are no significant sources of noise pollution.
The main sources of noise in the area are the following:

- The circulation of vehicles on the existing road network of the settlements
- the usual functions of settlements as well as the local and interurban traffic of the area

8.12 Electromagnetic fields

In this section reference is made to the sources of electromagnetic fields near the study area. The sources of electromagnetic fields are electricity transmission and distribution facilities, television and radio antennas, anti-theft security systems and mobile telephony base stations.

Regarding electromagnetic fields in the frequency range 0-300GHz, Greek legislation, following the recommendation of the World Health Organization, the International Commission on Non-Ionizing Radiation Protection and the European Union, has adopted basic restrictions and reference levels and has issued limits for the safe exposure of the public to the environment of low and high frequency emission devices across the range of modern applications and services.

Specifically, the value for the protection of the public against continuous exposure to frequency fields of 50Hz is 100μT. The corresponding price for professional employment is 500 M.V..

Telecommunications infrastructure (mobile telephony masts)

According to the Greek Atomic Energy Commission, the sources of electromagnetic fields located near the area are telecommunications infrastructure (mobile telephony antennas).

Based on the Special Spatial Framework for RES, there is no specific restriction concerning the minimum distance of the installation from the wind turbine, but it is defined on a case-by-case basis after consulting the competent body. In the case of the project under consideration and according to the opinions of the services for the installation of wind farms, there is no restriction related to the specific incompatible use.

For further documentation, the following image presents all the locations where the telecommunications infrastructure is in the Municipality of Soufli near the project study area. The available data were taken from the website of the Greek Atomic Energy Commission. At 5 km, three mobile telephony antennas are located southeast of the project study area and fall within the Wildlife Refuge "Poulia". Magnetic and electric field strength measurement data was recorded for two of the three mobile phone masts.

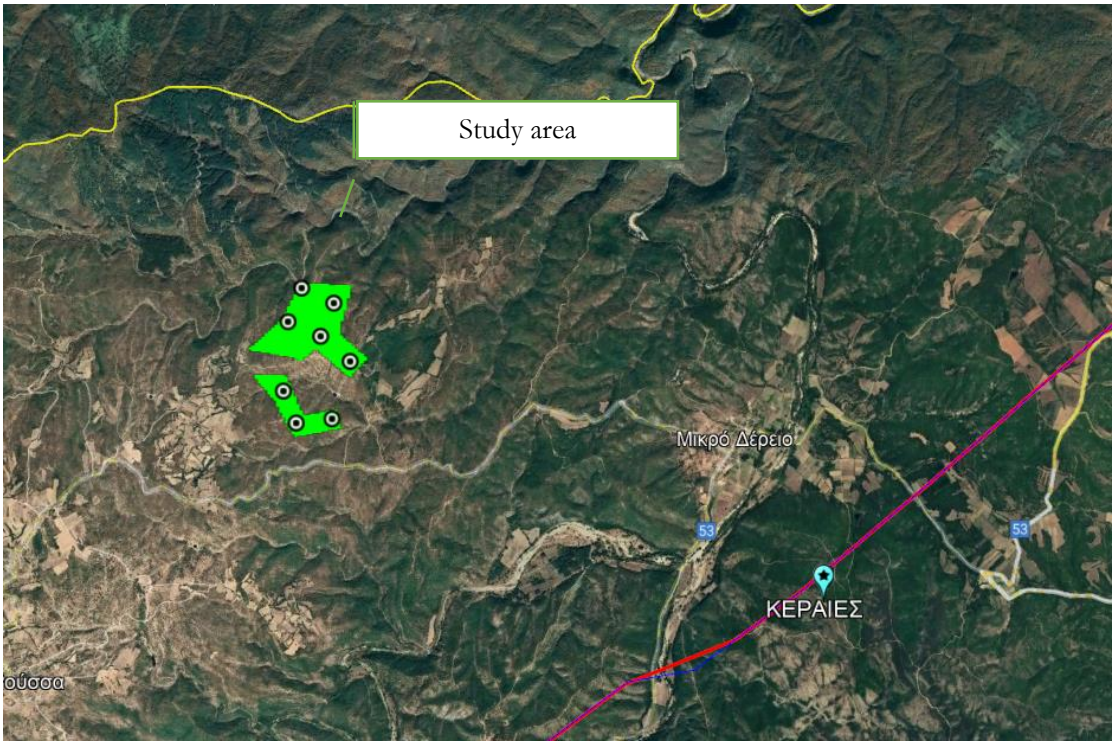


Image 49: Mapping of electromagnetic field sources near the study area (mobile telephony antennas) (Source: Greek Atomic Energy Commission)

Mobile telephony antenna NOVA TELECOMMUNICATIONS

After an autopsy carried out by the company ALFA Measurements, it was found that on a hill near Mikro Derio, in the Municipality of Soufli, in the prefecture of Evros, there is an installed mobile telephony base station of the company Wind as well as mobile telephony base stations of other companies. More specifically, for the mobile telephony base station of the company Wind, it was found that there are 3 microwave links, and 3 directional antennas type mobile telephony relay panel, in a pillar about 35 meters high.

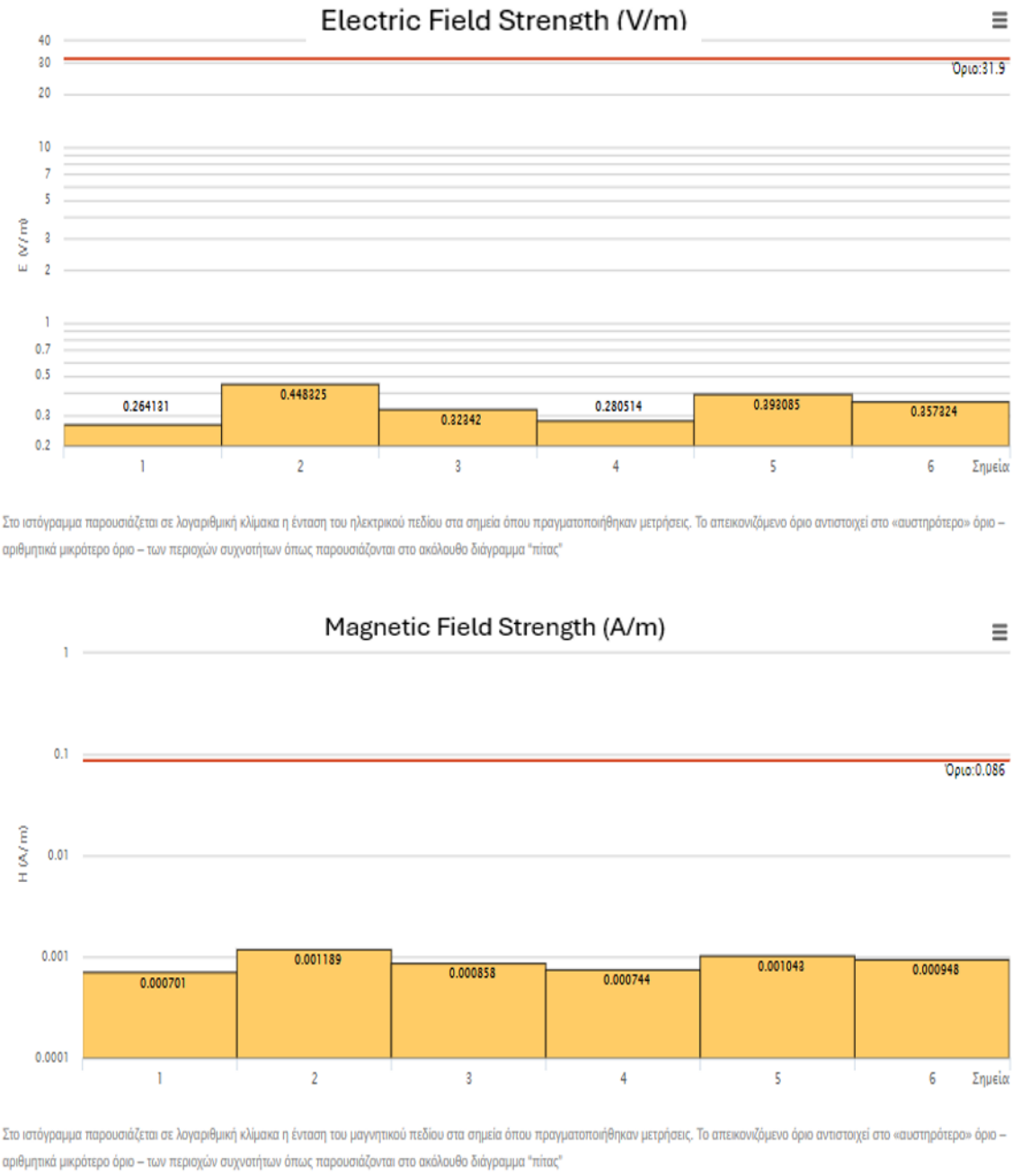


Image 50: Electric and Magnetic Field Strength Wind Mobile Telephony Antenna

The limit of the electric field strength is 31.9 V/m, and the limit of the magnetic field strength is 0.086 V/m. The electromagnetic field values of the Wind-owned antenna are lower than the limits presented in the above electric and magnetic field strength diagrams.

Vodafone telecommunication antenna

After an autopsy carried out by the company ALFA Measurements , it was found that on Kapsala hill, in the municipality of Soufli, in the prefecture of Evros, there is an installed mobile telephony base station of the company Vodafone as well as mobile telephony base stations of other companies. More specifically, it is mentioned for the mobile telephony base station of the

company Vodafone, that the existence of 6 directional antennas type mobile telephony relay panels and 6 microwave links, on a mast about 50 metres high.

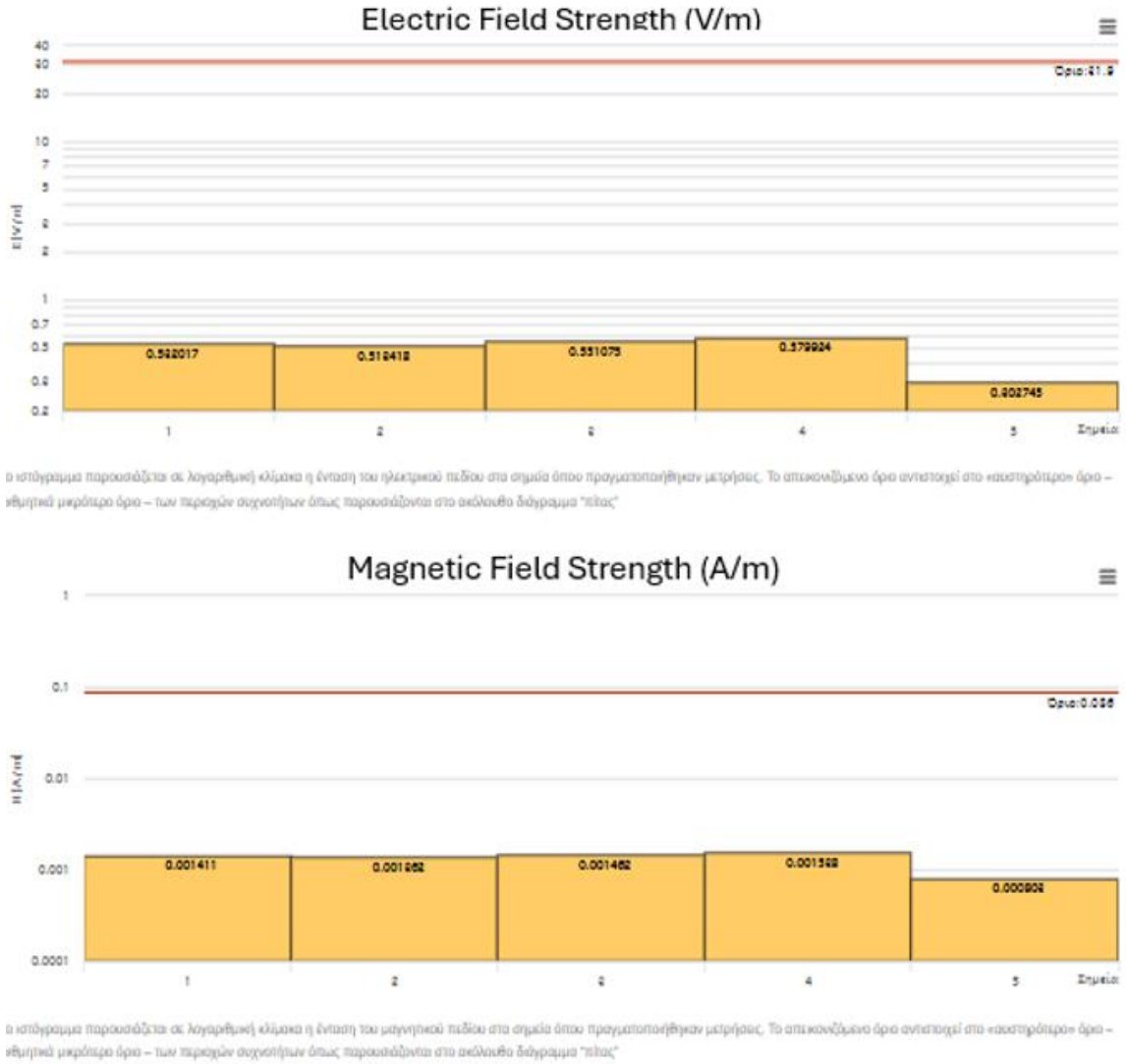


Image 51: Cosmote electric and magnetic field strength

The limit of the electric field strength is 31.9 V/m, and the limit of the magnetic field strength is 0.086 V/m. The electromagnetic field values of the antenna owned by "Cosmote" are lower than the limits presented in the above electric and magnetic field strength diagrams.

8.13 Water

8.13.1 Management Plans

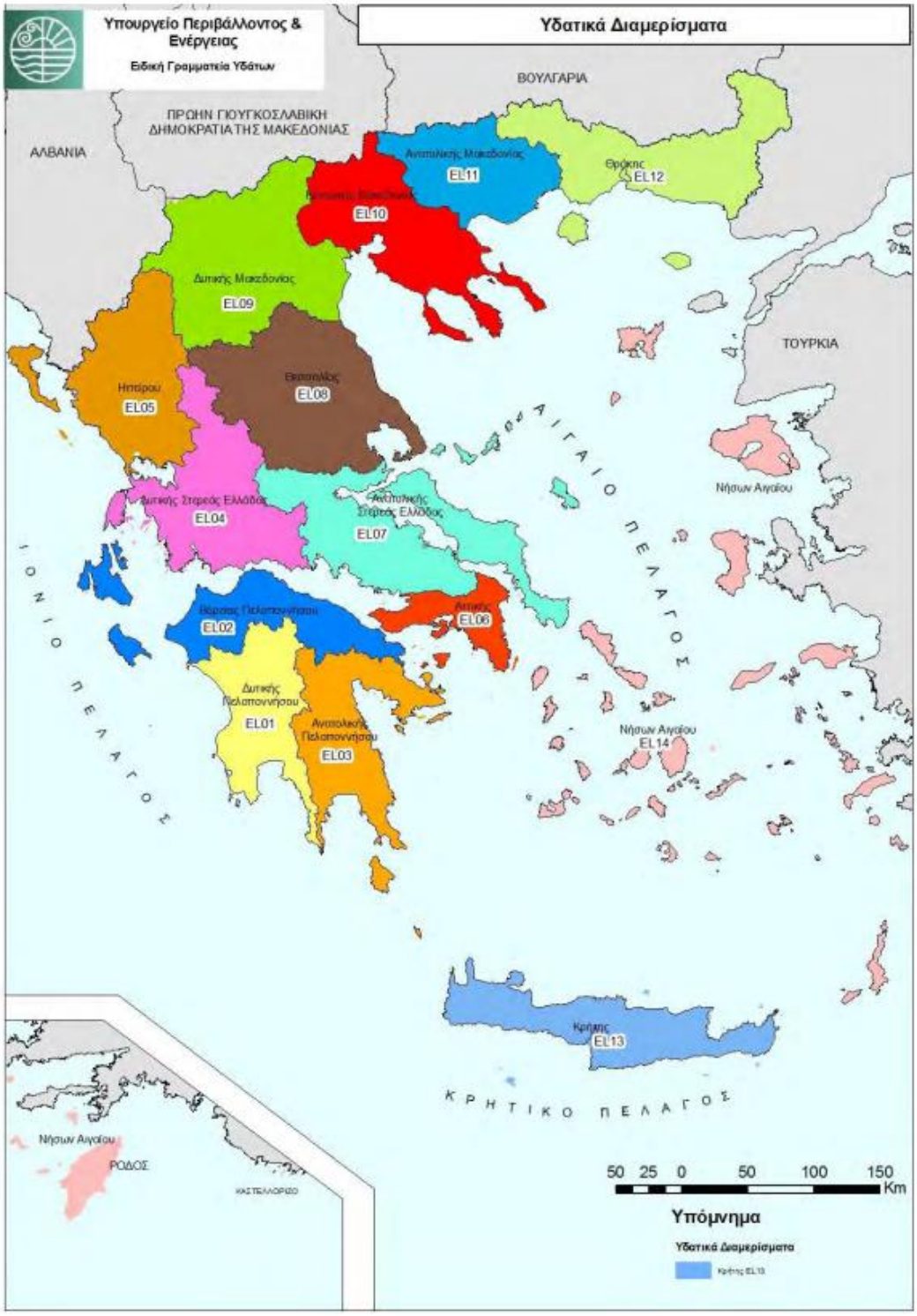
Directive 2000/60/EC, known as the Water Framework Directive (WFD) entered into force on 22 December 2000, establishing, for the first time, a framework for the protection of surface, groundwater and coastal/transitional waters overall at River Basin (BASIN) level. Directive 2000/60/EC is a comprehensive and innovative effort to protect and manage water resources and constitutes the most basic institutional tool introduced in the field of water at European Union (EU) level. It combines qualitative, ecological and quantitative objectives for the protection of inland surface water (rivers and lakes), transitional, coastal and groundwater and sets as a central idea their integrated management at the geographical scale of River Basins. In addition, it redefines the concept of River Basin.

In the Region of Eastern Macedonia-Thrace, the 2nd Revision of the River Basin Management Plan of the Water District of Thrace (Government Gazette 81 A'/12-06-2024) is in force, in which the projects of this study are included.

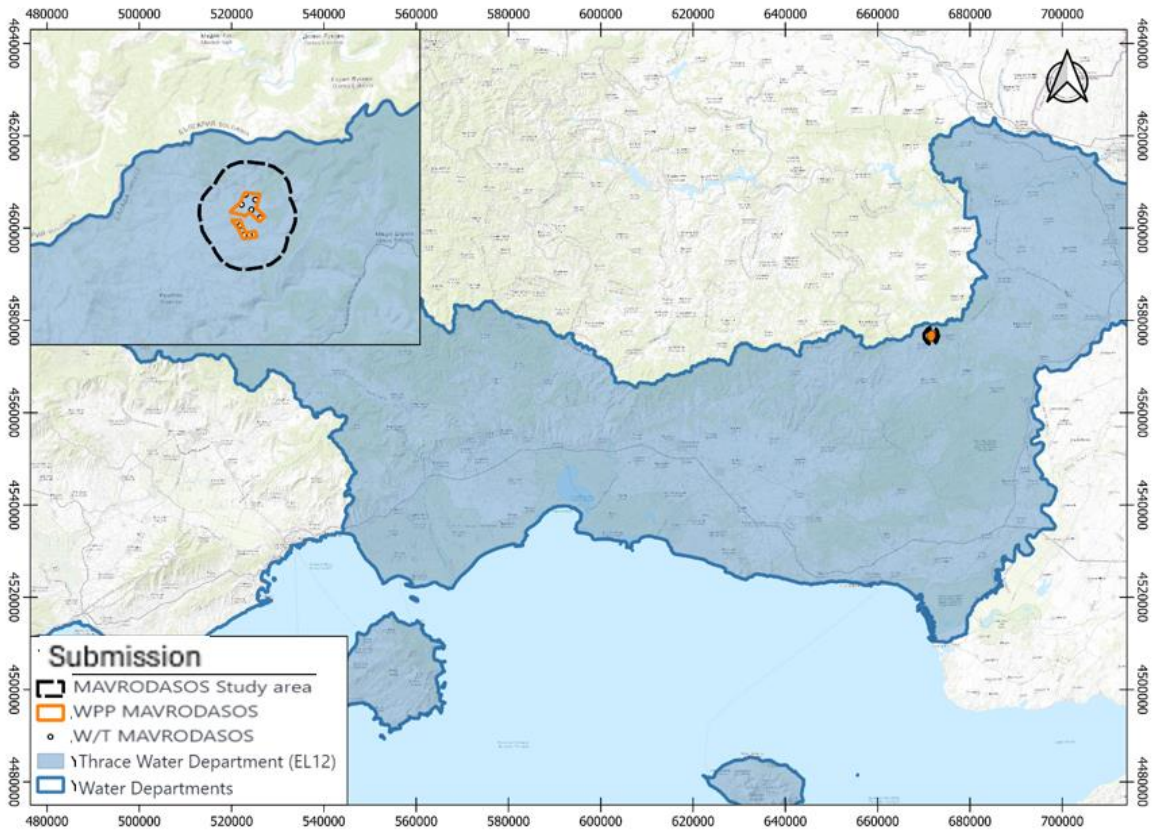
In the context of the 2nd Review of River Basin Management Plans, the following actions are carried out:

- Update the identification and characterisation of surface (river, lake, transitional and coastal) and groundwater bodies.
- Review and update of type-specific reference conditions and evaluation/classification of the status/potential of surface (ecological, chemical), including highly modified and artificial, and groundwater (quantitative, qualitative) water bodies, based on new data available from the operation of the National Water Status Monitoring Network.
- Re-evaluation of surface bodies with significant hydromorphological modifications, to determine those that constitute highly modified (CHM) and artificial (AF).
- Update of the list of significant pressures as included in the 2nd Revision of the RBMP of the MoD of Thrace, as well as their impacts.
- Update of the Register of Protected Areas, based on new data that has emerged from the current legislation in application of the relevant EU Directives.
- Review of environmental objectives for all surface water bodies and groundwater, including heavily modified and artificial bodies.
- Assessment of the progress of the implementation of the 1st Revision of the S.D.L.A.P. of the Ministry of Thrace
- Revision of the Programmes of Basic and Complementary Measures for the protection and restoration of the water resources of the Ministry of Thrace, as included in its 2nd Review, in accordance with article 12 and Annex VIII of Presidential Decree 51/2007, and
- Update the economic analysis of water use and determine the existing degree of cost recovery for water services

The Greek territory has been divided into 14 water districts and 45 river basins. According to the number 706/2010 (Government Gazette 1383 B΄/2010) of the National Water Commission, the Water District of Thrace has an area of 11,243Km2, of which 564m2 belongs to the islands of Thassos and Samothrace. The district is bounded north by the line of the Greek-Bulgarian border and the watershed of the Nestos-Fort basins, east from the line of the border between Greece and Turkey to the Gulf of Ainos west of the watershed of the basins of Nestos-Fortress, Nestos-Strymonas, Nestos-Karvali stream and the watershed of the coastal streams of Chrysoupoli up to the Gulf of Kavala.



Map 31: Water Districts of Greece



Map 32: Boundaries of Water District of Thrace

The MoD of Thrace (EL12) consists of five (5) river basins, those of Nestos (EL1207), Rem. Xanthi – Xirorema (EL1208), of Rem. Komotini – Loutro Evros (EL1209), Evros (EL1210) and Thassos – Samothrace (EL1242).

LAP NAME	AREA (km2)	ALTITUDE(m)		
		MESO	BET	MINIMUM
Nestos (EL1207)	2975,5	606	2.200	0
Rem. Xanthi – Xiorema (EL1208),	1.662,6	363	1.822	0
Rem. Komotini – Loutro Evros (EL1209)	1958,3	289	1459	0
Evros (EL1210)	4.080,8	175	1.202	0
Thassos – Samothrace (EL1242)	652,8	347	1.600	0

Table 44:Table of River Basins of the Water District of Thrace (EL12)

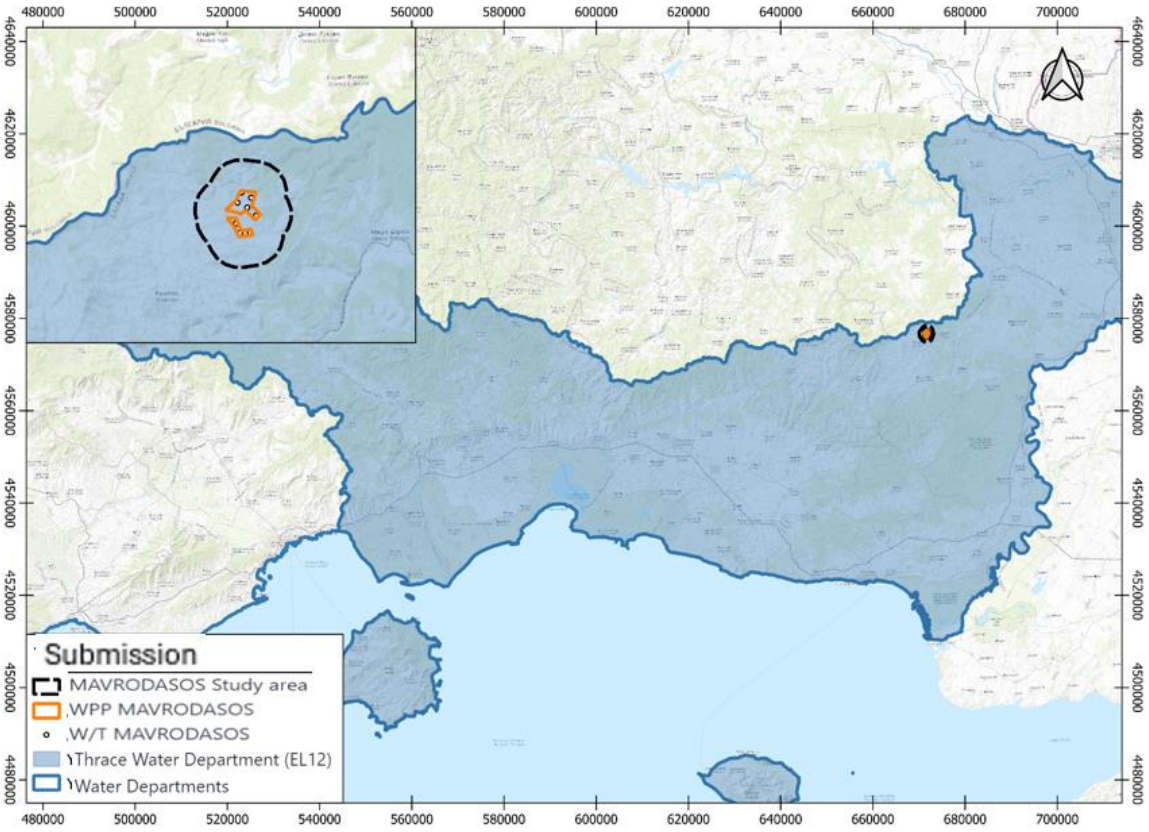
The CA R. Komotini – Loutro Evros (EL1209) together with the LAP (EL1208) Rem. Xanthi – Xirorema are the two CA of the continental part of the Thrace Department, which drain parts that belong entirely to the Greek territory, i.e. are not part of cross-border basins. According to the 2nd Revision of the River Basin Management Plan (LAP) of the Water District of Thrace (EL12) (Government Gazette 81 A'/12-06-2024), the project falls under the Evros River Basin Management Plan (CA)

The Evros River Basin, with a total area of 53,000 km2, occupies part of the eastern Balkan Peninsula and is shared between Bulgaria, Turkey and Greece. North and west the basin develops on Bulgarian territory, in the southeast mainly on Turkish territory and in the southwest on Greek territory. The river Evros is partly the national border between Greece – Bulgaria and Greece – Turkey.

The total length of the river is 528 km, of which 310 km belong to Bulgaria, while 208 km define the borders of Greece with Bulgaria and Turkey. The river basin is divided among the three states it crosses as follows:

- 35,085 km2 (66.2%) belong to Bulgaria.
- 14,575 km2 (27.5%) belong to Turkey, and
- 3,340 km2 (6.3%) belong to Greece.

The Evros River Basin (EL1210) includes the above part of the wider Evros River basin which is in the Greek territory as well as some smaller watercourses in the southwest of the Evros basin (ch. Loutrou, r. Irini, r. Arapis). The CA also includes sub-basins of two more transboundary rivers, tributaries of Evros: Ardas, in Orestiada and Erythropotamos in Didymoteicho. Greece shares both tributaries with Bulgaria.



Map 33: Evros River Basin (EL1210)

The table below summarises the environmental objectives for CE 12:

OBJECTIVE	Number of surface water bodies
No degradation of good and higher ecological status/potential	137
No deterioration of good chemical status	189
Achievement of good ecological status/potential - Article 4.4	2

Ecological status - compliance with Article 4.5	61
Chemical status - Compliance with Article 4.5	11
Compliance with Article 4.6	0
Compliance with Article 4.7	0

Table 45: HS status targets up to 2021

OBJECTIVE	Number of surface water bodies
No degradation of good quantitative status	18
No deterioration of good chemical status	15
Achievement of good quantitative status	0
Achievement of good chemical status	3
Compliance with Article 4.4	3
Compliance with Article 4.5	0
Compliance with Article 4.6	0
Compliance with Article 4.7	0

Table 46:HS status targets up to 2021

8.13.1.1 Compatibility check of the project in relation to the provisions of the water management plans and the other regulatory provisions

According to the 1st Revision of the FRMP of the Ministry of Thrace (EL12), the following objectives for the environmental protection of water bodies are set: the non-deterioration of the good status of Water Bodies that have good ecological status. In addition, it is necessary to improve the ecological status of systems in moderate or poor condition. It also aims to complete the inventory of the chemical and ecological status of water bodies whose status remains unknown.

The construction of the wind farms is not expected to create additional pressures on the waters of the area and therefore does not contradict the provisions of the Management Plan. The analysis of the pollutants to be produced by the activity shows that the project will not cause additional damage to the water bodies of the immediate and wider area. The project is in no way incompatible with the revised River Basin Management Plan and its planned measures. However, to comply with the objectives of the RBMP, it is necessary during the construction and operation of the project under study to take all necessary measures to ensure the preservation of the image of the RBMPs and their non-negative influence.

8.13.1.2 Compatibility check of the project in relation to the provisions of any approved Flood Risk Management Plan

Based on the approved Flood Risk Management Plan of the Evros River Basin of the Water District of Thrace (EL12) and the corresponding Environmental Impact Study, the examined projects fall under the Evros River Basin LAP.

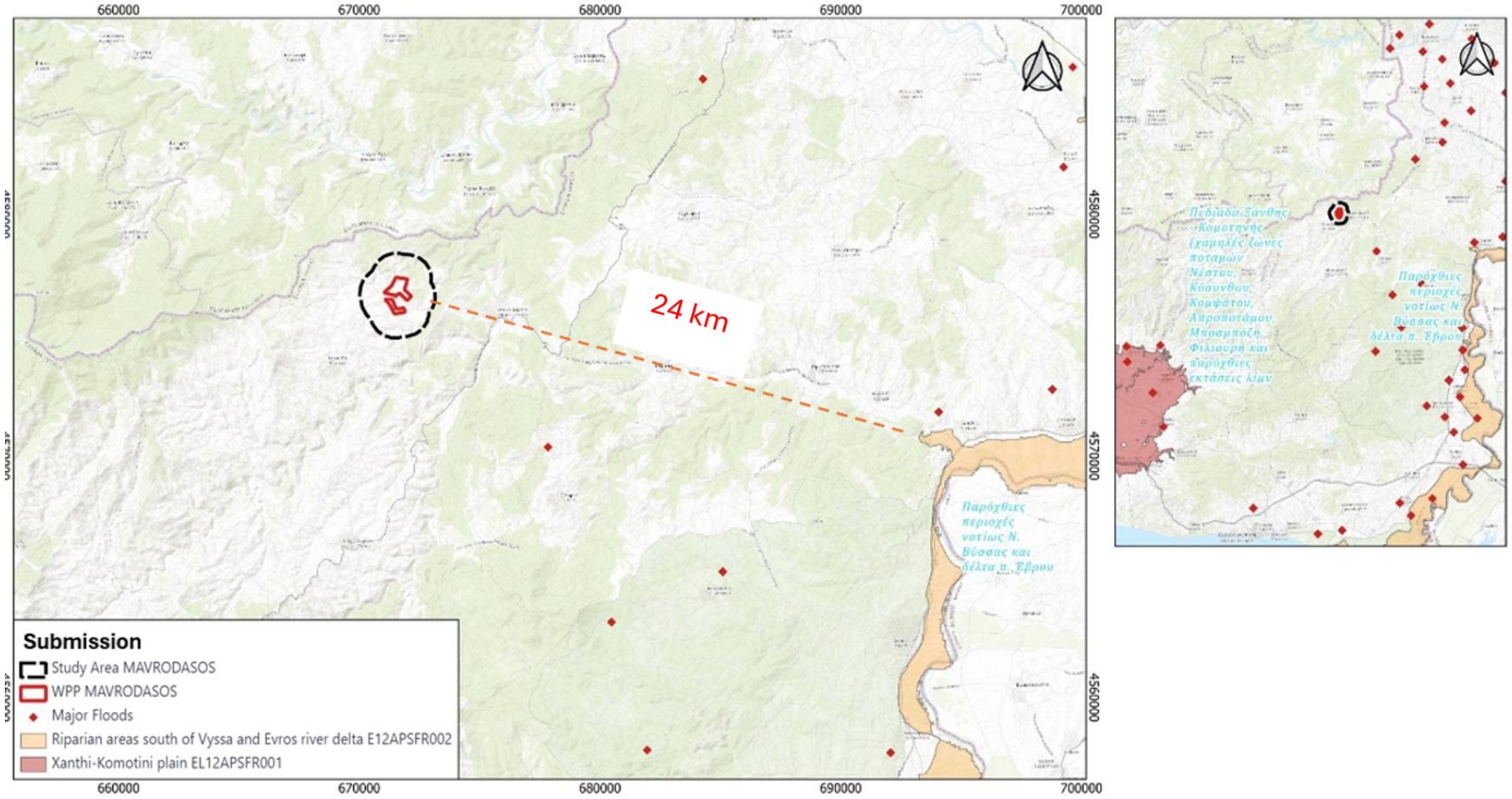
Within the framework of the Flood Risk Management Plan, flood hazard maps and flood risk maps have been created. The former depict the extent of the flood, and their main purpose is to represent the characteristics that each flood will display for the scenarios: low probability floods or extreme scenarios.

- Floods of medium probability (with a possible recurrence period ≥ 100 years)
- high-probability flooding, as appropriate.

In the case of the study area, the causes of flooding considered are river flows. The flood risk maps are also prepared for three flood scenarios and describe the potential negative consequences associated with floods to identify areas where action is needed to prevent the consequences of floods.

According to all maps of the Evros River Basin Flood Risk Management Plan of the Thrace Water District (EL12), for all examined scenarios and all time periods, the project location area is outside a potentially high flood risk zone.

The locations of the projects are located outside the Potentially High Flood Risk Zones as shown on the Map. It also shows significant floods that had taken place inside and outside the SDLAP in the past. The following image shows the Potentially High Flood Risk Zone named "Riparian Areas south of N. Vyssa and Evros Delta (EL12APSFR002), which is located southeast of the project under consideration at a distance of 24 km.



Map 34: Zone of Potentially High Flood Risk of Western Thrace and Significant Floods that have taken place

8.13.2 Surface water

8.13.2.1. Description of surface natural or artificial hydrographic network

In the water district of Thrace (EL12) 200 surface waters have been identified. Of these, 69 belong to the CA of Evros.

WD TYPE	EL1208
WD Rivers	63
WS Rivers - Reservoirs	1
Transitional WS	1
Coastal WS	4
TOTAL	69

Table 47: Surface Water of Thrace Water District

The main rivers of the Western Republic of Thrace are the river Nestos and the river Evros, which are the transboundary rivers of the water district. The waters of these rivers are shared between Greece, Bulgaria and Turkey. The water district of Thrace includes only one natural lake, Ismarida, which is located about 50Km from the studied area. The rest of the lakes are reservoirs and there are five in total. Finally, the department includes important transitional waters (lagoons, river deltas, etc.), some of which are protected by international treaties.

Catchment code	Rivers Name	Length (km)	Extent sub-catchment area (km^2)
GR07	NESTOS	112.4	2.429
GR10	EVROS	208.2	2.03
GR10	ARDAS	42.6	344
GR10	ERITHROPOTAMOS	170.9	971
GR09	LISSOS (FILIOURIS)	98.9	1.486
GR08	KOMSATOS	82.6	596
GR08	KOSINTHOS	73	530
WD 12	**TOTAL WD 12**	**788.6**	**8.386**

Table 48: Main Rivers YW Thrace

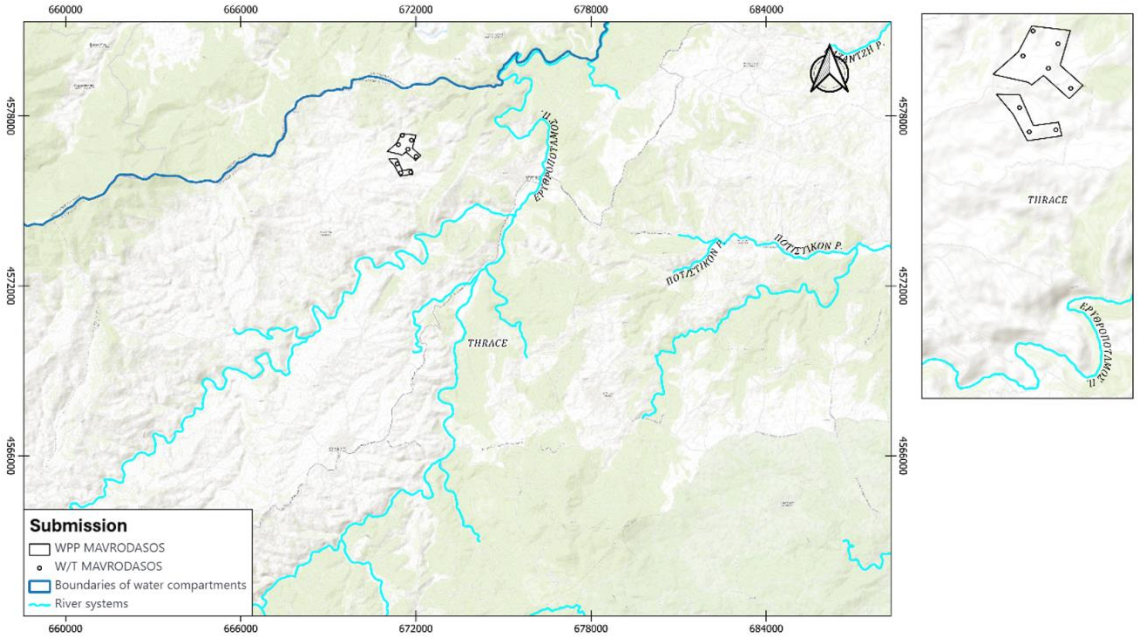
Catchment code	Lakes Name	Length (km)	Related River or tributary
GR09	ISMARIDA LAKE (MITRIKOU)	1.87	VOZVOZIS (R. KOMOTINI)
GR07	A.L. PLATANOBRYSI	3.25	NESTOS
GR07	A.L. THISAVROS	13.26	NESTOS
GR09	A.L. GRATINIS	1.43	AMIGDALOREMA
GR09	A.L.N. ADRIANIS	0.62	LISSOS (FILIOURIS)
GR10	A.L. ESIMIS	0.98	CHEIM. LOUTROU
WD12	TOTAL WD 12	21.4	

Table 49: Main Lakes of Thrace

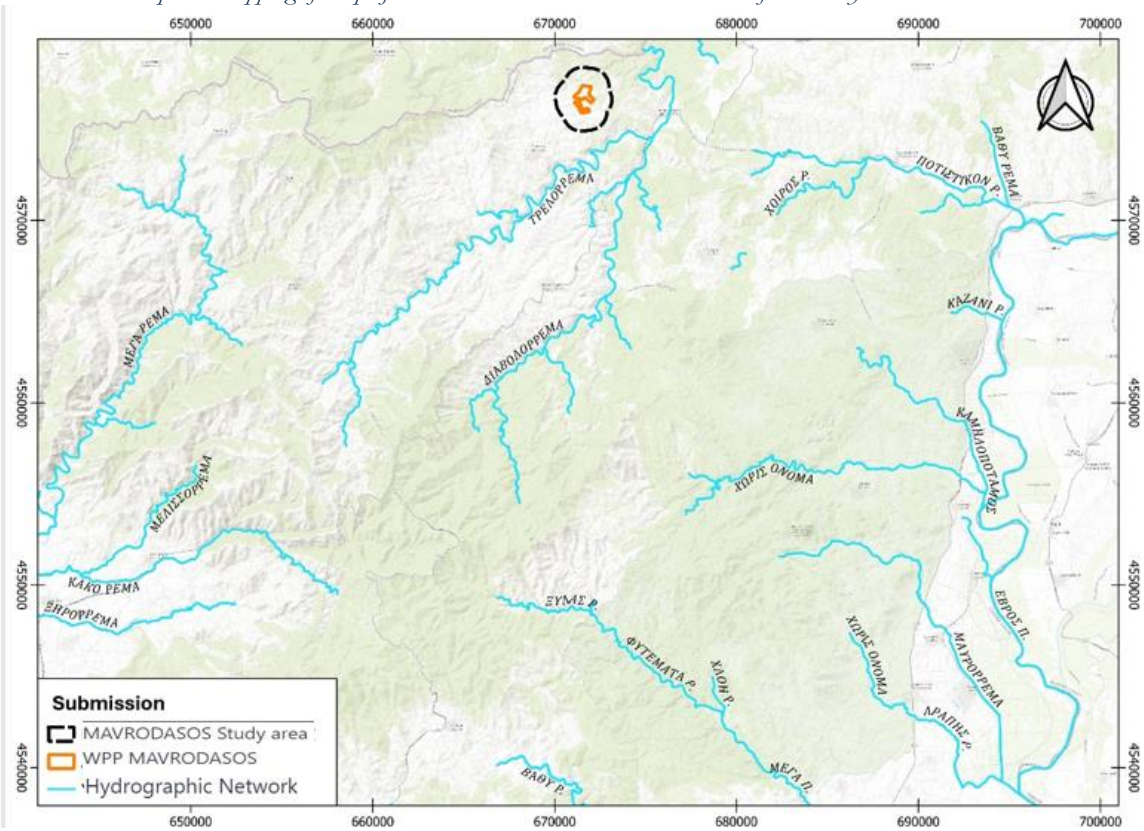
East and south of the project pass the Erythropotamos which is in good chemical condition. The table lists in detail all river bodies belonging to the water district of Thrace: The river water body named "Erythropotamos R." is located southeast of the nearest W/T (W/T) of the project at 2.3 km.

A/A	W/S Name	W/T Code	Category	Length (km)	Direct catchment area(km²)	Cumulative catchment area	Average Annual Drainage (hm³)	W/S TYPE
107	ΔΥΤΙΚΟΣ ΒΡΑΧΙΟΝΑΣ	EL1210R00020100124H	ΙΤΥΣ	6,44	7,71	305,13	70,89	R-M1
108	ΔΥΤΙΚΟΣ ΒΡΑΧΙΟΝΑΣ	EL1210R00020100125H	ΙΤΥΣ	11,66	34,40	297,42	70,05	R-M1
109	ΑΡΔΑΝΙΟΥΣ Ρ.	EL1210R00020100126H	ΙΤΥΣ	6,03	32,87	263,02	66,08	R-M1
110	ΑΡΔΑΝΙΟΥΣ Ρ.	EL1210R00020100127N	ΦΥΣ	7,27	72,10	230,15	60,97	R-M1
111	ΑΡΔΑΝΙΟΥΣ Ρ.	EL1210R00020100128N	ΦΥΣ	4,99	21,84	158,04	47,84	R-M1
112	ΑΡΔΑΝΙΟΥΣ Ρ.	EL1210R00020100129N	ΦΥΣ	14,82	87,60	136,21	43,59	R-M5
113	ΑΡΔΑΝΙΟΥΣ Ρ.	EL1210R00020100130N	ΦΥΣ	3,02	21,46	48,61	20,89	R-M5
114	ΑΡΔΑΝΙΟΥΣ Ρ.	EL1210R00020100131N	ΦΥΣ	3,95	27,15	27,15	13,03	R-M5
115	ΠΡΟΒΑΤΩΝΑΣ Ρ.	EL1210R00020200139H	ΙΤΥΣ	10,02	21,67	81,34	14,40	R-M1
116	ΠΡΟΒΑΤΩΝΑΣ Ρ.	EL1210R00020200140N	ΦΥΣ	8,46	59,67	59,67	11,25	R-M1
117	ΕΒΡΟΣ Π.	EL1210R00020300132A	ΤΥΣ	7,93	35,88	35,88	4,32	R-L2
118	ΜΑΥΡΟΡΡΕΜΑ Ρ.	EL1210R00020400141H	ΙΤΥΣ	9,69	65,35	100,38	16,61	R-M1
119	ΜΑΥΡΟΡΡΕΜΑ Ρ.	EL1210R00020400142N	ΦΥΣ	8,99	35,03	35,03	7,85	R-M5
120	ΔΙΑΒΟΛΟΡΡΕΜΑ Ρ.	EL1210R00020600143N	ΦΥΣ	6,80	7,68	227,16	57,87	R-M1
121	ΔΙΑΒΟΛΟΡΡΕΜΑ Ρ.	EL1210R00020600145N	ΦΥΣ	7,45	37,25	161,82	42,07	R-M1
122	ΛΥΓΑΡΙΑ Ρ.	EL1210R00020600146N	ΦΥΣ	8,65	25,52	25,52	7,00	R-M1
123	ΔΙΑΒΟΛΟΡΡΕΜΑ Ρ.	EL1210R00020600147N	ΦΥΣ	12,94	42,86	99,04	28,04	R-M5
124	ΔΑΜΑΣΚΗΝΙΕΣ Ρ.	EL1210R00020600148N	ΦΥΣ	9,13	16,29	16,29	4,52	R-M5
125	ΛΙΒΑΔΕΙΑ Ρ.	EL1210R00020600149N	ΦΥΣ	6,97	39,88	39,88	13,04	R-M5
126	ΚΑΜΗΛΟΠΟΤΑΜΟΣ Ρ.	EL1210R00020601144N	ΦΥΣ	10,05	57,66	57,66	14,51	R-M1
127	ΚΑΖΑΝΙ Ρ.	EL1210R00020800150N	ΦΥΣ	0,86	0,42	24,54	6,45	R-M1
128	ΚΑΖΑΝΙ Ρ.	EL1210R00020800151N	ΦΥΣ	2,26	24,12	24,12	6,38	R-M1
129	ΠΟΤΙΣΤΙΚΟΝ Ρ.	EL1210R00021000154N	ΦΥΣ	11,41	73,82	194,73	57,81	R-M1
130	ΠΟΤΙΣΤΙΚΟΝ Ρ.	EL1210R00021000155N	ΦΥΣ	20,28	67,19	96,12	28,02	R-M1
131	ΠΟΤΙΣΤΙΚΟΝ Ρ.	EL1210R00021000156N	ΦΥΣ	3,48	28,93	28,93	7,98	R-M1
132	ΠΟΤΙΣΤΙΚΟΝ Ρ.	EL1210R00021001153N	ΦΥΣ	5,29	24,79	24,79	7,11	R-M1
133	ΜΠΕΡΔΕΜΕΝΟ Ρ.	EL1210R00021400168N	ΦΥΣ	4,11	185,64	451,66	76,82	R-M2
134	ΜΠΕΡΔΕΜΕΝΟ Ρ.	EL1210R00021400171H	ΙΤΥΣ	11,80	78,76	196,76	33,75	R-M1
135	ΔΑΣΟΣ Ρ.	EL1210R00021400172H	ΙΤΥΣ	8,51	30,29	118,00	20,93	R-M1
136	ΞΗΡΟΝ Ρ.	EL1210R00021400173N	ΦΥΣ	21,23	87,71	87,71	16,23	R-M1
137	ΜΑΝΝΑ Ρ.	EL1210R00021401169H	ΙΤΥΣ	2,90	2,74	69,27	12,58	R-M1
138	ΜΑΝΝΑ Ρ.	EL1210R00021401170N	ΦΥΣ	8,28	66,53	66,53	12,12	R-M1
139	ΑΡΑΠΗΣ Ρ.	EL1210R00030100114H	ΙΤΥΣ	2,22	1,32	39,48	8,80	R-M1
140	ΑΡΑΠΗΣ Ρ.	EL1210R00030100115N	ΦΥΣ	4,51	38,16	38,16	8,65	R-M1
141	ΕΙΡΗΝΗ Ρ.	EL1210R00050100117N	ΦΥΣ	7,19	46,67	248,53	67,41	R-M1
142	ΑΠΟΚΡΗΜΝΟ Ρ.	EL1210R00050200118N	ΦΥΣ	10,97	93,85	93,85	32,34	R-M1
143	ΕΙΡΗΝΗ Ρ.	EL1210R00050300119N	ΦΥΣ	18,01	108,01	108,01	28,69	R-M2
144	ΛΟΥΤΡΟΥ Ρ.	EL1210R00090100121H	ΙΤΥΣ	7,26	16,23	213,81	64,20	R-M1
145	ΛΟΥΤΡΟΥ Ρ.	EL1210R00090100122H	ΙΤΥΣ	16,99	103,25	197,59	62,10	R-M2
146	ΛΟΥΤΡΟΥ Ρ.	EL1210R00090300123N	ΦΥΣ	1,86	52,17	52,17	24,86	R-M1
147	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111200157N	ΦΥΣ	7,87	96,52	959,53	427,68	R-M1
148	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111200158N	ΦΥΣ	9,01	50,15	863,01	409,13	R-M1
149	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111200161N	ΦΥΣ	20,01	176,26	675,55	365,87	R-M2
150	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111200178N	ΦΥΣ	46,02	180,43	205,69	68,18	R-M5
151	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111200179N	ΦΥΣ	34,24	164,61	211,14	86,20	R-M5
152	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111201177N	ΦΥΣ	4,14	32,36	32,36	7,71	R-M1
153	ΚΑΖΑΝΤΖΗ Ρ.	EL1210R00111202159N	ΦΥΣ	14,08	62,48	104,96	26,39	R-M1
154	ΚΑΖΑΝΤΖΗ Ρ.	EL1210R00111202160N	ΦΥΣ	4,93	42,48	42,48	12,00	R-M1
155	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111203163N	ΦΥΣ	5,76	12,46	478,03	172,90	R-M1
156	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111204165N	ΦΥΣ	11,33	46,52	46,52	23,24	R-M5
157	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R00111209166N	ΦΥΣ	4,36	25,26	25,26	10,91	R-M5
158	ΑΡΔΑΣ Π.	EL1210R00131601175H	ΙΤΥΣ	5,20	88,49	88,49	17,08	R-M1
159	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R0B111200162N	ΦΥΣ	8,60	21,26	499,29	182,84	R-M1
160	ΕΡΥΘΡΟΠΟΤΑΜΟΣ Π.	EL1210R0B111200164N	ΦΥΣ	14,26	48,74	465,57	169,19	R-M5
161	ΑΡΔΑΣ Π.	EL1210R0B131600174H	ΙΤΥΣ	37,21	273,95	362,43	1.867,87	R-M2
162	ΕΒΡΟΣ Π.	EL1210R0B151900176N	ΦΥΣ	19,90	199,48	199,48	3.195,74	R-L2
163	ΕΒΡΟΣ Π.	EL1210R0T020000136N	ΦΥΣ	15,47	67,76	2.873,73	7.620,29	R-L2
164	ΕΒΡΟΣ Π.	EL1210R0T020000138N	ΦΥΣ	32,42	134,98	2.716,38	7.594,41	R-L2
165	ΕΒΡΟΣ Π.	EL1210R0T020000167N	ΦΥΣ	26,05	60,28	1.075,06	6.020,27	R-L2
166	ΕΒΡΟΣ Π.	EL1210R0T020100133N	ΦΥΣ	20,76	39,02	2.923,59	7.774,34	R-L2
167	ΕΒΡΟΣ Π.	EL1210R0T020100134H	ΙΤΥΣ	0,96	1,38	2.884,57	7.621,67	R-L2
168	ΕΒΡΟΣ Π.	EL1210R0T020100135H	ΙΤΥΣ	10,64	9,46	2.883,19	7.621,48	R-L2
169	ΕΒΡΟΣ Π.	EL1210R0T020100137H	ΙΤΥΣ	4,95	8,25	8,25	1,22	R-L2

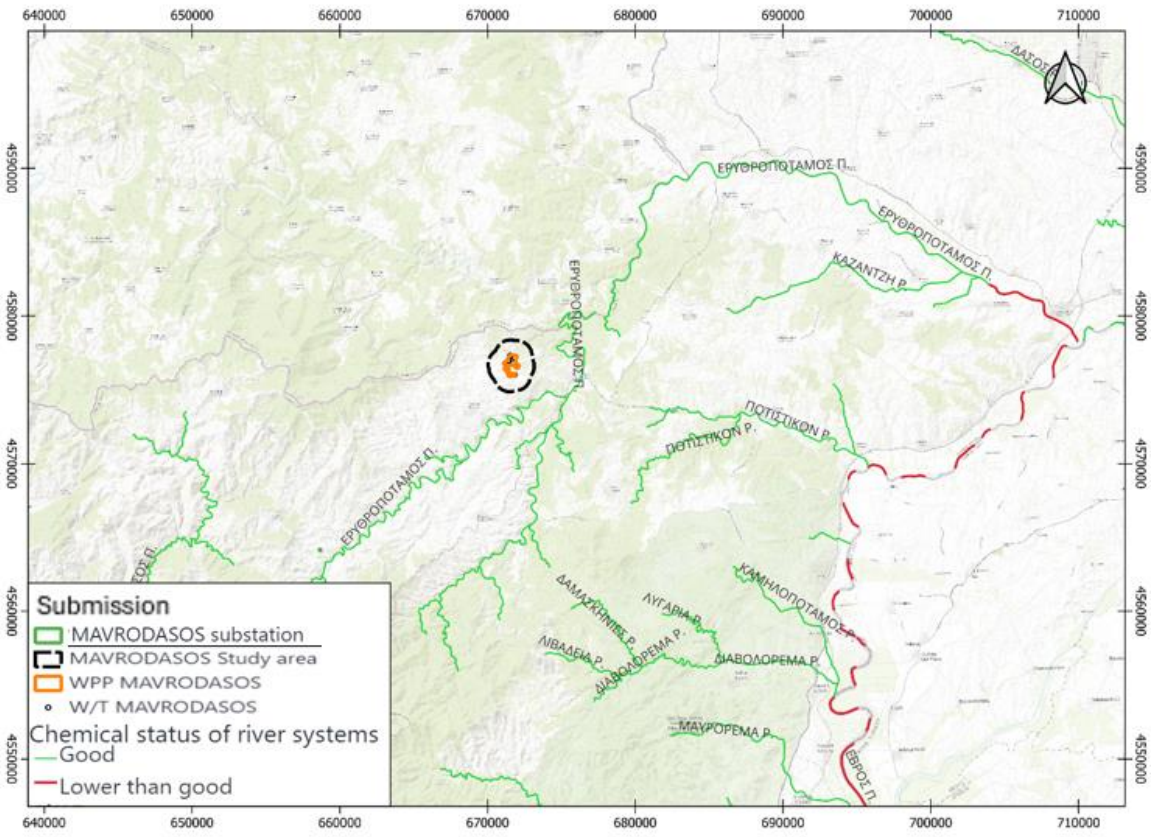
Table 50: River Systems of Evros CA



Map 35: Mapping of the project under consideration and the nearest surface river systems.



Map 36:Area hydrographic network

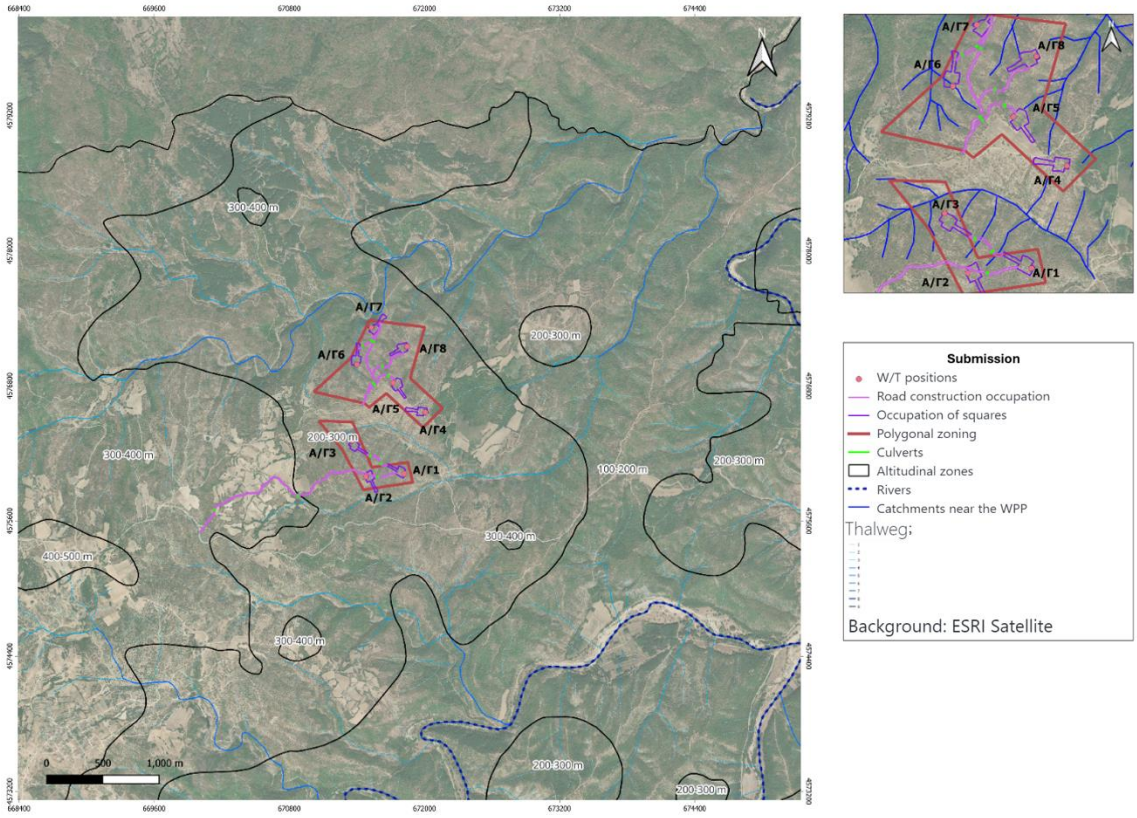


Map 37:Chemical status of river systems

As shown on the map below, a ravine/misgangia falls within the square of W/T 6. As mentioned above, according to No. 762/2020 Decision of the Council of State, it is not necessary to delimit such Thalweg.

The ravine/misgangia is numbered 1 in the Strahler classification, which means that it receives no water from smaller Thalweg, only rainwater.

In conclusion, the location of the square on it will not affect the hydrographic network of the area.



Map 38: Mapping of the project under consideration and the Thalweg of the area

8.13.2.2. Description of existing statutory and actual uses and pressures of surface water resources

The surface waters of the study area are under pressure from point and diffuse sources of pollution of anthropogenic activities. The pollutant that can cause pressure on water bodies can come from many sources. The most common classification of pollution pressures is made between diffuse and point sources.

The sources of pollution are related to:

- industrial activity,
- leachate from landfills,
- mines – quarries,
- aquaculture,
- agricultural activity,
- tourist activity,
- stabled livestock farming

The main use of water in the MoD is irrigation, as in most areas of Greece. Demand for hydroelectric production is also significant. Compared to the above demands, the demands for the other uses of water, industry and livestock are much lower.

The total average annual demand from anthropogenic uses is 1,303 hm3. The largest water demand in the water district comes from irrigation, which amounts to 660.34 hm3 (50.7%). Relative to consumer

uses, irrigation accounts for 91.5% of total demand. Hydropower production in the Nestos basin uses 582 hm3 (44.6%) and constitutes non-consumer water use.

For other uses, demand is 43.0 hm3 for water supply (3.3%), 15.5 hm3 for industry (1.2%) and 2.4hm3 for livestock (0.2%). The figure below illustrates the distribution of demand in the TM between the different uses.The figure gives the distribution of demand in the TM between the different uses.

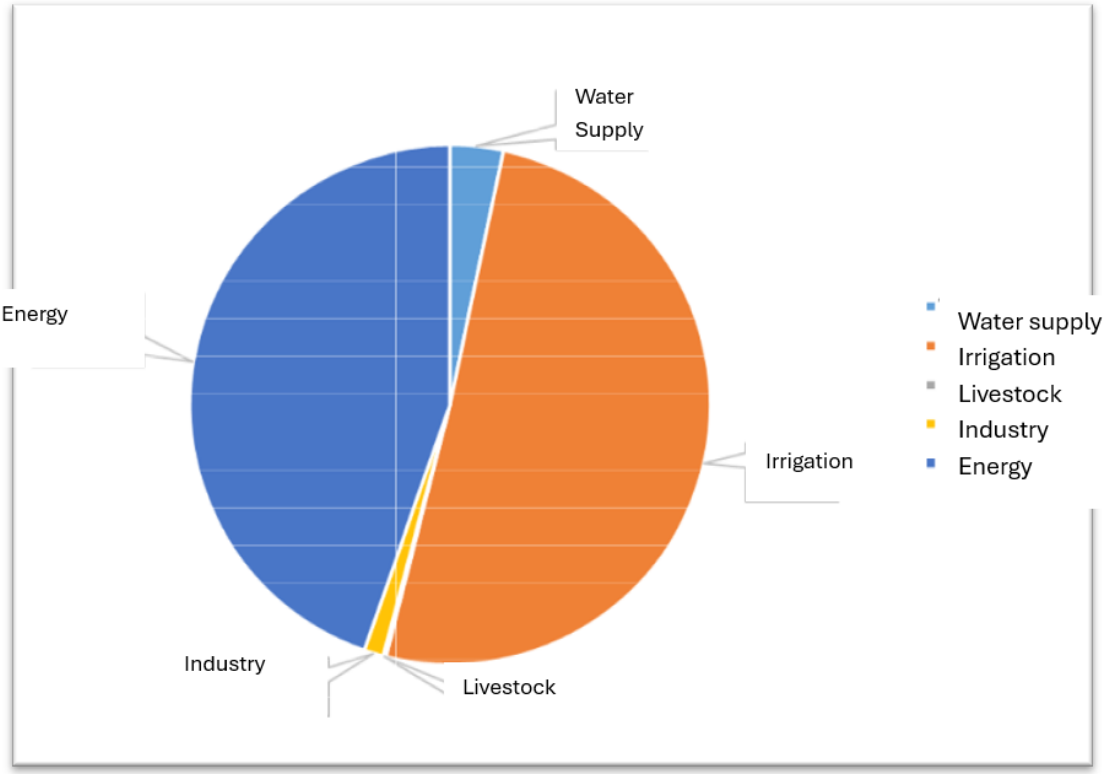


Image 52: Percentage distribution of water demand for the various uses in the Water District of Thrace

In the Evros CA (EL1210), the total annual water abstractions for all activities and uses were estimated at 243.93 m3, based on the annual needs of the LAP. Agriculture (irrigated land), which is the main water user, consumes 94.12% (229.58 m3) of total water needs, water supply 5.20% (12.69 m3), livestock farming 0.21% (0.51 m3) and industry 0.47% (1.15 m3).

8.13.3 Groundwater

8.13.3.1 Description of the hydrogeological characteristics of the site

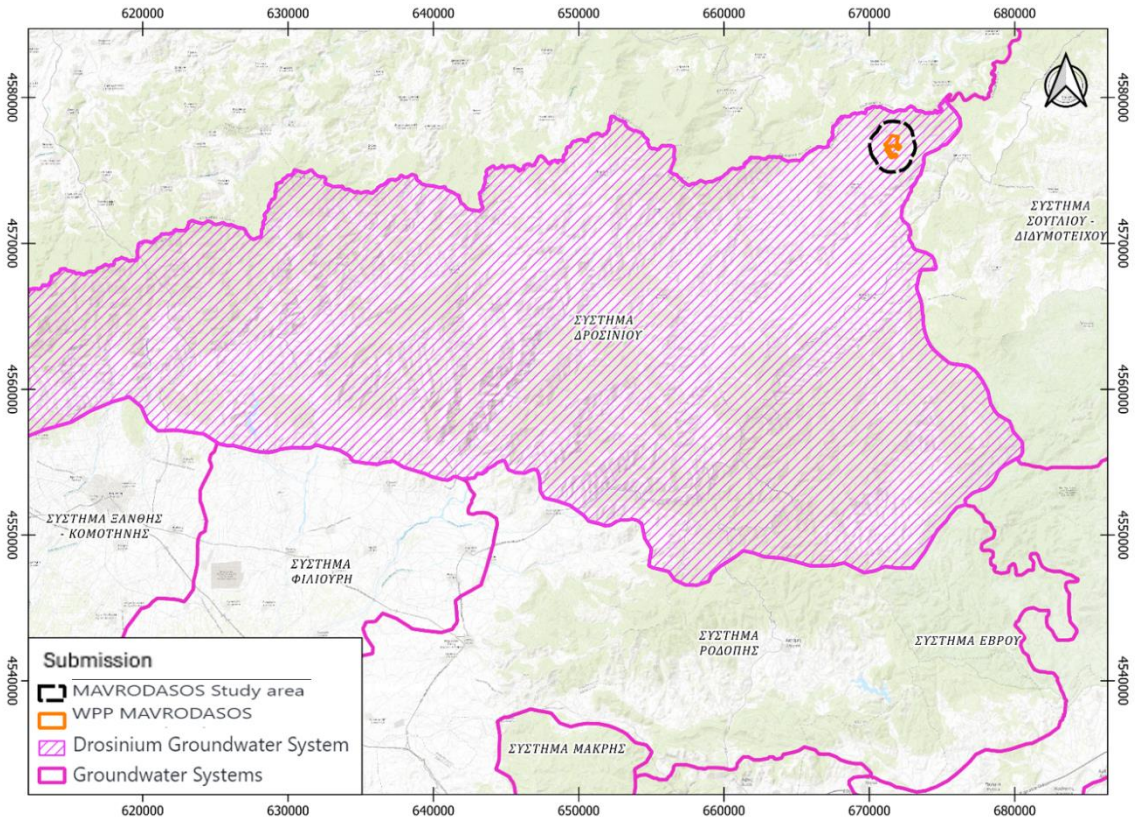
Eighteen (18) Groundwater Bodies (GS) were identified and delimited in the Thrace Water District YD12, of which three (3) belong to the Nestos river basin (EL07), one (1) belongs to the R. Xanthi – Xirorema river basin (EL08), four (4) belong to the R. Komotini – Loutro Evros river basin (EL09), six (6) belong to the Evros river basin (EL10) and four (4) belong to the Thassos – Samothrace river basin (EL42).

The projects examined fall under the Drosinio Ministry (EL120B100) as shown in the map below.

The cracked groundwater body of Drosini has code EL120B100, is located for the most part in the catchment area of R. Komotini-Loutro Evros (LAP GR09), while a small part of it is in the catchment area of R. Xanthi - Xirorema (LAP GR08). It belongs to the Water District of Thrace (M.D.12). It has an area of 976.53 km2, a maximum length of 86 Km and a maximum width of 20 Km.

The Drosinio GS consists of metamorphic rocks consisting mainly of gneiss, amphibolites, amphibolitic schists and marbles with slate layers. Volcanic rocks consisting of rhyolites, dacites, conglomerates, sandstones, tuffs and tuffs are found in places. Small plutonic appearances, of shallow depth, of monzodiorites and monzonites, as well as of ultrabasic rocks (metadunites and metahajburgites) are scattered in the eastern part of the GS. Metamorphic rocks are characterized by low water permeability. More favorable aquifer conditions develop in the local appearance of marbles, which usually have a small thickness but a high degree of karstification. Throughout the surface spread of the system, branches and cracks are detected. The waters of the Ministry of Health are used to cover mainly the water supply needs of the settlements of the mountainous zone. The Drosini MoH does not belong to any part of the national groundwater monitoring network.

The HS borders to the north with Bulgaria, to the south with the alluvial system of Xanthi – Komotini (EL1200050) and the alluvial system of Filiouri (EL1200040) and to the west with the mixed system of Potamoi – Stavroupoli (EL120B090). It is geographically related to the rivers Filiouris and Erythropotamos, with the streams Melissorema, Damaskinies, Livadia, Diavolorema and Ardanio. With terrestrial ecosystems - protected areas spatially correlated: with SCI GR1130006 (e.g. Filiouris), SPA GR1130012 (Elegant valley), SPA GR1110010 (Mountain Evros - Dereios Valley), SPA GRSPAGR1130011 (Filiouri valley), SPA GR1110002 (Dadia Forest – Soufli), SPA EL1110008 (Northern Evros riverside forest and Arda), SCI GR1110003 (three Vrysses), and SCI GR1110005 (Evros Mountains).



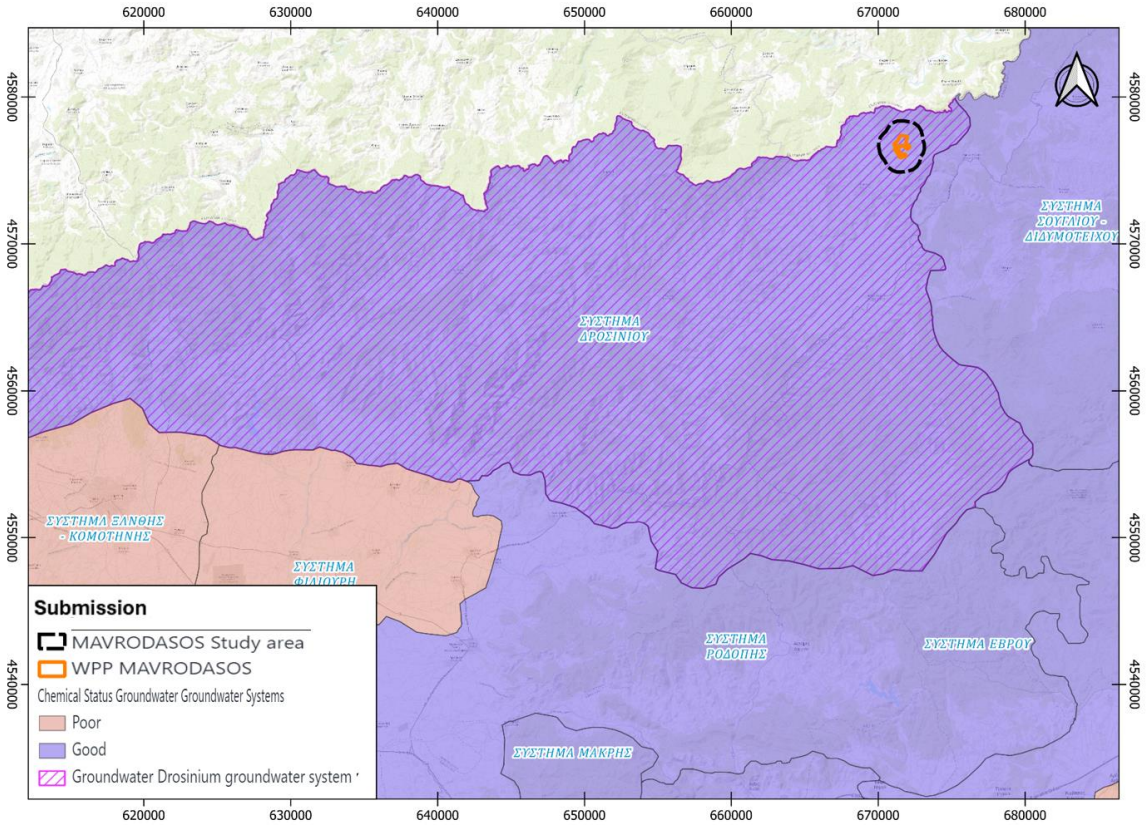
Map 39: GS Drosinios

8.13.3.2 Presentation of existing statutory and actual uses of groundwater resources

In the MoS, very small-scale point sources of pollution from urban wastewater and from livestock and quarrying activity and small-scale diffuse sources of pollution from urban wastewater are identified. Quarrying activity is associated with marble.

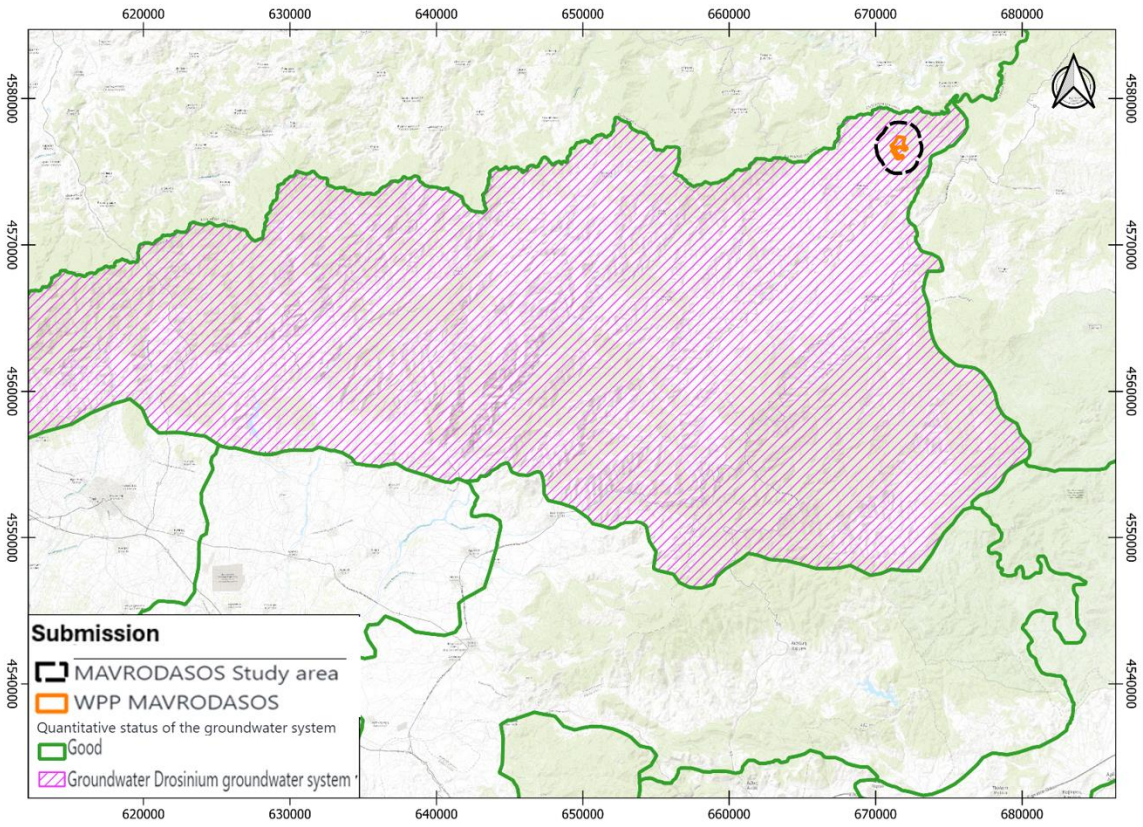
No qualitative parameter exceeded the higher acceptable quality values (HAQA). There is no pollution trend in the MoH, and its qualitative and quantitative status is considered good.

For the Drosini HS, no pollution trend from anthropogenic activities has been diagnosed that is substantiated by the concentrations of quality parameters. In the Drosini GS no exceedances of the quality parameters are detected.



Map 40: Classification based on the chemical status of groundwater bodies

The description of the hydrogeological conditions and the recording of existing water points do not indicate over-abstraction of the groundwater body. The underground aquifer that develops is not systematically exploited and is manifested by the appearance of spring water supplies. The assessment of existing data combined with good chemical status of the body assesses that the quantitative status of the water body is good.



Map 41: Classification based on the quantitative status of groundwater bodies

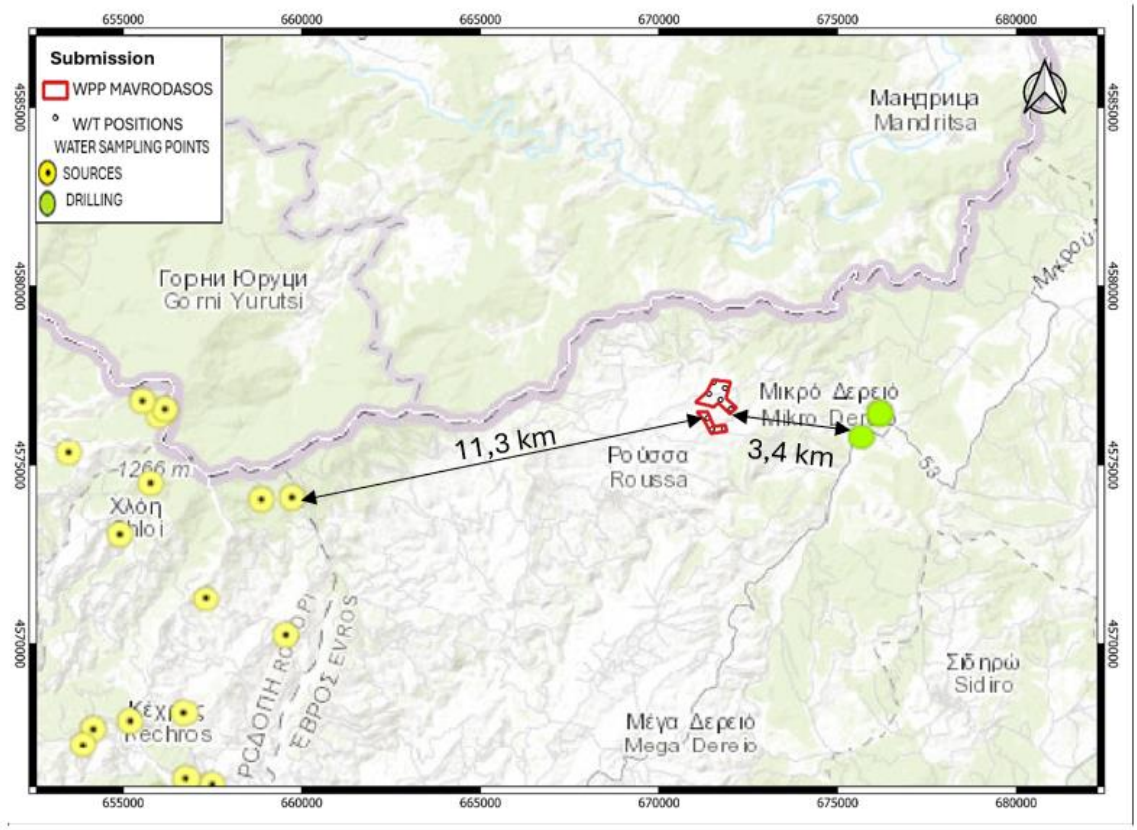
Below is a table of the impact of human activities on the Drosinio GWB:

CODE	NAME	ESTIMATED TOTAL NUMBER OF BOREHOLES	AVERAGE DRILLING FLOW RATE	ESTIMATED TOTAL NUMBER OF WATER SUPPLY BOREHOLES	AVERAGE ANNUAL INSTALMENTS	EXISTING CONDITIONS OF OVEREXPLOITATION
EL120B100	DROSINIO SYSTEM	2 boreholes	15	1	-	NO
		6 wells	-	3		
		51 sources	35-200	14		

Map 42:Impact of human activities of the GWB

According to the Special Secretariat for Water and as reflected on the website of the Viewing of Water Abstraction Points (http://lM.V..ypeka.gr/public_view.html), water abstraction points (boreholes, springs) are depicted near the project under consideration.

The following map shows the nearest boreholes and sources to the project.



Map 43: Mapping of the nearest springs and boreholes in relation to the project under consideration (Source: http://lM.V..ypeka.gr/public_view.html).

8.13.3.3 Presentation of available quantitative and qualitative data to the main and underground aquifers, as well as to those affected by the project

The following tables show the distribution of groundwater use by activity as well as its quantitative and qualitative status.

GS	NAME	AVERAGE ANNUAL FEED (106m3)	AVERAGE ANNUAL ABSTRACTIONS ((106m3)	WATER SUPPLY	IRRIGATION	FARMING	INDUSTRY	QUANTITATIVE SITUATION
EL1200040	FILIOURI SYSTEM	56,98	50,68	1,65	44,92	0,12	4,00	GOOD
EL1200110	MARONEIA SYSTEM	21,72	14,81	0,25	14,53	0,04	0,00	GOOD
EL1200120	RODOPI SYSTEM	61,10	7,48	1,18	6,03	0,22	0,05	GOOD
EL120B100	DEW SYSTEM	131,89	4,36	1,16	2,57	0,64	0,00	GOOD

Table 51: Abstractions and quantitative status of the HS project area

GS	NAME	QUANTITATIVE SITUATION	LEVEL DROP VOLTAGE	CHEMICAL STATUS	QUALITY PROBLEMS	POLLUTANT VOLTAGE
EL1200040	FILIOURI SYSTEM	GOOD	NO	BAD	Increased Cl concentrations due to overpumping and trapped brackish brackish Waters. Local charge for NO3 due to anthropogenic Pressures. Local charge in Al due to natural Background	NO
EL120B100	DEW SYSTEM	GOOD	-	GOOD	NO	-
EL1200110	MARONEIA SYSTEM	GOOD	-	GOOD	Local NO3 burden due to anthropogenic pressures	-
EL1200120	RODOPI SYSTEM	GOOD	-	GOOD	Locally elevated EC, Cl and SO4 concentrations due to brackish water	-

Table 52:Quantitative and Qualitative Status of the HS project area

8.14 Risks to human health, cultural heritage and/or the environment mainly due to accidents or disasters (according to UNHCR 1915/2018)

This section analyzes the risks to human health, cultural heritage and/or the environment due to natural disasters or technological accidents/disasters that are likely to occur in the study area and cause adverse effects on the environment.

According to UNHCR No. Eco. 1915 (Government Gazette 304/B'/2018) applies that the "expected significant negative effects" of the project on the environment resulting from the vulnerability of the project to risks of major accidents and/or natural disasters related to the project must be assessed.

Risks during the construction of the project or the operation of the project may occur due to accidents or natural disasters.

The project under study is not subject to the provisions of Joint Ministerial Decision 172058/2016 (Government Gazette 354/B/2016) laying down measures and conditions due to the presence of dangerous substances, in compliance with the provisions of Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances" of the European Parliament and Council of 16 December 2003.

The term natural disaster is defined as "those elements of the natural environment that are harmful to the environment and to humans and are caused by foreign powers and unknown to it".

According to the World Health Organization and the EM-DAT (Emergency Events Database), natural disasters are classified into different categories.

- Geophysical, such as earthquakes, volcanic eruptions and landslides
- Hydrological, such as floods and liquid landslides (e.g. avalanches)
- Meteorological, such as storms, thunderstorms
- Climatic, such as extreme temperatures, droughts and forest fires
- Biological, such as epidemics, caused by the exposure of living organisms to pathogenic microorganisms.

Risks during the **construction of the project** may occur due to accidents or natural disasters.

(A) ACCIDENTAL HAZARDS

- ✓ Fire: Fire can be caused during the operation phase by electrical or mechanical damage involving friction or high heat dissipation that can lead to fire in the naselle of the wind turbine. These types of fires are usually of short duration and are not easy to extinguish due to their location. If the fire develops, the hot sections may lead to local fires in the wider area of the works (with possible expansion and causing a major accident, absence or not of vegetation).
- ✓ Electrical or mechanical damage to substations of the project or damage to overhead power cables
- ✓ Clipping of fins and parts thereof: This accident can be caused in the event of damage to the fastening system.
- ✓ In this case, the system will stop and at the same time the wind turbine will stop working as soon as vibration is detected and before serious damage occurs
- ✓ Excessive rotor speed: In case of excessive acceleration of the rotor there is the rare case of the aircraft breaking in some places (eg blades).It is a phenomenon that is rare to occur as there is a system for shutting down the aircraft. However, the possibility of causing a smaller or larger accident should be considered.
- ✓ Fin damage. Lightning can damage the blades.
- ✓ Corrosion: Corrosion in the project is very difficult to cause. The materials used are mainly copper, resins, carbon and glass fibers, aluminum, concrete which may show some degree of corrosion over the years. However, in this case too, a minor accident must be considered.
- ✓ Human accident: A human accident may occur during the transport of objects, negligence during maintenance, incorrect action or tampering with control systems. In this case too, there is a possibility of a minor or major accident.
- ✓ Substances: During the maintenance of the M/W and specifically during their lubrication, volatile substances (resins) will be used which may ignite with increasing temperature. In this case, it is almost impossible to cause a major accident provided that large quantities of chemicals are not kept in a place for maintenance or repair.

B) RISKS FROM NATURAL DISASTERS

<u>Natural disasters that are likely to occur are</u>:

- ➢ Severe thunderstorms/winds
- ➢ Temperature extremes
- ➢ Fires

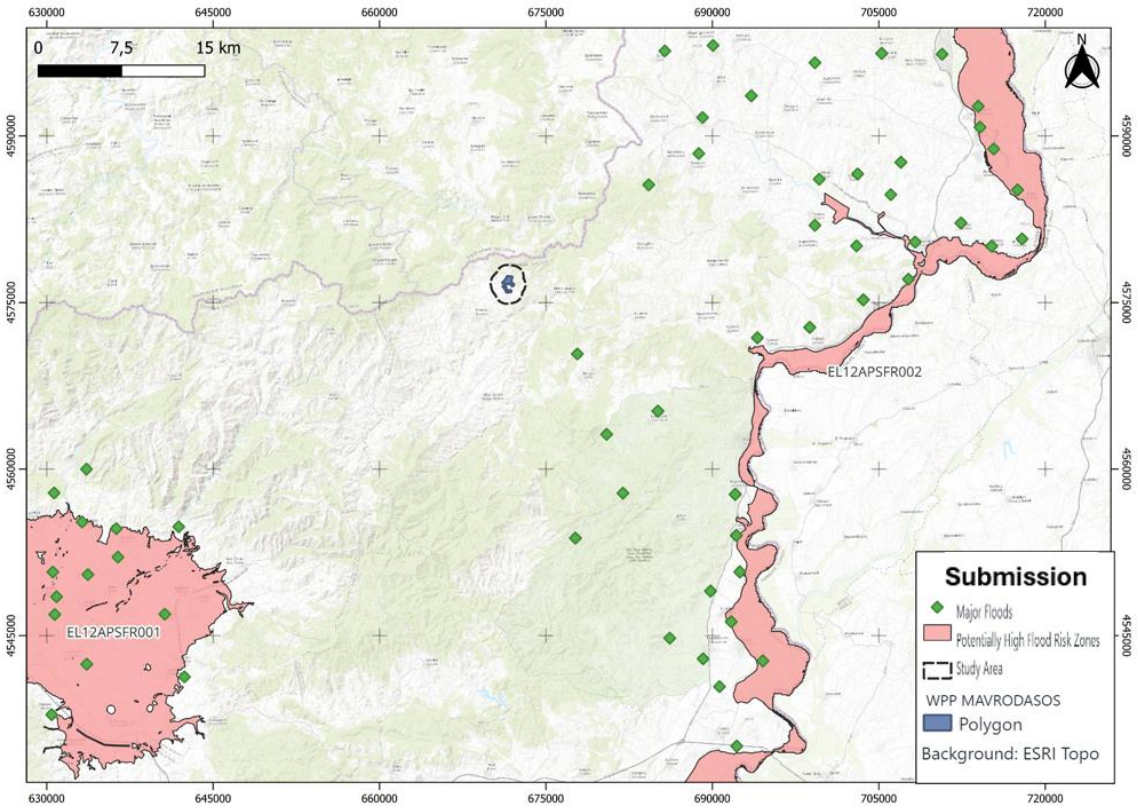
- Water scarcity – Drought
- Floods
- Avalanches
- Landslides
- Earthquakes

The study area, according to the analysis made in previous sections, does not fall within protected landscapes, aesthetic environmental areas, archaeological sites of absolute protection or within Residential Development Zones. Also, within the study area, no part of a settlement is located and there are no settlements that are characterized as traditional or remarkable based on the Government Gazette delimitation and characterization.

1) Risks from Natural Disasters

A) Risk from storms/floods

Storm and flood are considered among the most important natural hazards worldwide.
The likelihood of a storm or flood hazard occurring in the study area depends on the local conditions of the study area and on other factors such as humidity or temperature changes. The project under consideration is also located outside Potentially High Flood Risk Zones.



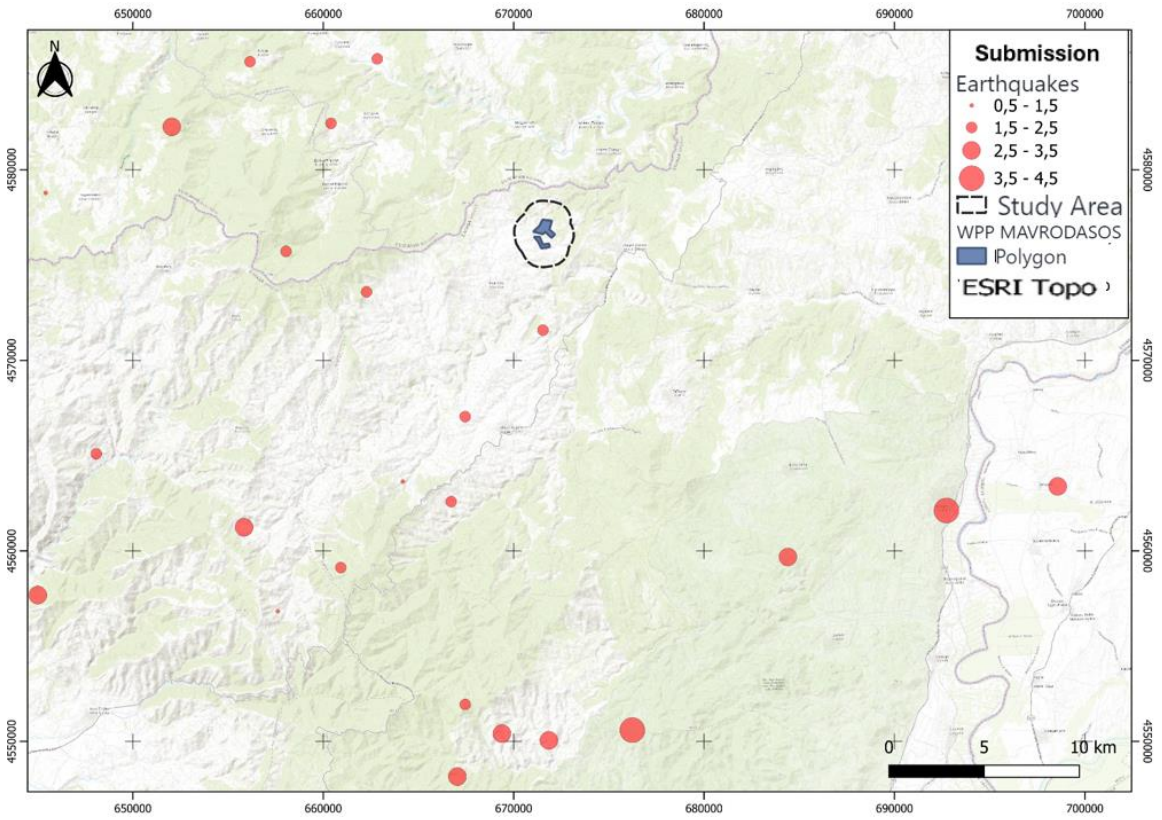
Map 44: Potentially High Flood Risk Areas and Significant Floods (http://wfdver.ypeka.gr/el/home-gr/)

b) Earthquake Risk

Earthquake hazards are not likely to occur as the project study area belongs to a low seismic hazard area (Category I) according to the section mentioned in this chapter (Seismicity).
According to the Institute of Geodynamics, the map shows that no high-power earthquake has occurred near the study area in the last 10 years.

According to the data of the Institute of Geodynamics, the map shows that near the study area in the last 40 years there has been no high or low power earthquake. The largest earthquake detected in Eastern Macedonia & Thrace took place in 1984, with a magnitude of 4.9 on the Richter scale, at a depth of 41 km and at 43.2 km SSE of Alexandroupolis. The nearest major earthquake in installation of the WPP under study was located at a distance 25 km southeast, with a magnitude of 3.6 on the Richter scale, at a depth of 10 km. **The nearest earthquakes are shown on the map below**

Map



45:Earthquakes in the wider region from 1984 to 2024 (Source: http://www.gein.noa.gr/el/seismikotita/xartes).

#	Χρόνος Γένεσης	Τοποθεσία	Γεωγραφ. Πλάτος [°N]	Γεωγραφ. Μήκος [°E]	Βάθος (χμ)	Μέγεθος
474	29/07/1984 01:58:41	43.2 χμ ΝΝΑ της Αλεξανδρούπολης	40.52	26.15	41	4.9
408	27/06/2004 15:31:46	5.4 χμ ΝΝΔ της Αλεξανδρούπολης	40.8	25.86	5	4.3
422	05/03/2002 05:23:44	27.0 χμ ΝΔ της Αλεξανδρούπολης	40.71	25.61	21	4.3
457	28/05/1991 18:26:50	57.4 χμ ΑΝΑ της Αλεξανδρούπολης	40.56	26.44	29	4.3
468	05/01/1985 22:20:42	30.3 χμ Ν της Κομοτηνής	40.85	25.4	5	4.3
470	29/07/1984 22:22:26	44.1 χμ ΝΝΑ της Αλεξανδρούπολης	40.49	26.1	51	4.3
465	30/05/1988 17:36:43	38.7 χμ Α της Αλεξανδρούπολης	40.8	26.33	30	4.2
450	18/04/1995 05:36:27	18.2 χμ Ν της Κομοτηνής	40.96	25.37	5	4.1
405	27/06/2004 22:37:18	7.6 χμ ΝΔ της Αλεξανδρούπολης	40.8	25.81	9	4.0
440	28/02/1999 07:05:10	40.8 χμ ΝΝΑ της Αλεξανδρούπολης	40.5	26.03	16	4.0
441	28/02/1999 03:14:14	62.1 χμ ΑΝΑ της Αλεξανδρούπολης	40.54	26.49	5	4.0
477	23/06/1984 21:10:58	17.7 χμ ΝΔ της Αλεξανδρούπολης	40.74	25.72	30	4.0
395	13/08/2004 15:13:44	44.2 χμ Α της Αλεξανδρούπολης	40.84	26.4	29	3.9
404	29/06/2004 10:15:13	14.0 χμ ΝΔ της Αλεξανδρούπολης	40.75	25.77	5	3.9
425	17/02/2001 10:19:20	55.5 χμ ΝΑ της Αλεξανδρούπολης	40.51	26.36	32	3.9
429	27/01/2000 00:03:22	26.1 χμ ΒΒΑ της Σαμοθράκης	40.69	25.64	5	3.9
461	04/05/1990 22:01:48	39.3 χμ ΝΑ της Αλεξανδρούπολης	40.58	26.18	72	3.9
467	08/03/1986 20:44:39	37.9 χμ Α της Σαμοθράκης	40.49	25.97	5	3.9
473	29/07/1984 04:30:51	45.3 χμ Α της Αλεξανδρούπολης	40.81	26.41	5	3.9
347	11/01/2009 15:08:27	37.2 χμ ΒΔ της Σαμοθράκης	40.73	25.24	25	3.8
376	14/03/2006 08:06:52	27.4 χμ ΒΒΔ της Κομοτηνής	41.33	25.22	16	3.8
418	30/09/2002 20:44:00	22.6 χμ ΑΒΑ της Σαμοθράκης	40.55	25.77	19	3.8
432	20/11/1999 02:01:18	56.0 χμ ΝΑ της Αλεξανδρούπολης	40.53	26.39	28	3.8
466	03/09/1986 18:42:50	27.4 χμ ΔΒΔ της Σαμοθράκης	40.58	25.23	7	3.8
469	30/07/1984 00:12:56	52.5 χμ ΑΝΑ της Αλεξανδρούπολης	40.65	26.44	46	3.8
471	29/07/1984 12:58:27	37.9 χμ ΝΑ της Αλεξανδρούπολης	40.62	26.21	5	3.8
476	30/06/1984 06:04:28	20.9 χμ ΔΒΔ της Σαμοθράκης	40.57	25.31	5	3.8
367	09/03/2007 13:43:58	52.6 χμ ΝΑ της Αλεξανδρούπολης	40.55	26.36	40	3.7

Image 53: Earthquakes detected in the region of Eastern Macedonia and Thrace for the period 20/06/1984 to 20/06/2024 in descending order of earthquake magnitude

(c) Fire hazard

Fires and especially forest fires are considered one of the most important risks to natural ecosystems, property and human lives in Greece. Fire can be caused by some agricultural activity such as burning dry grass, discarding burning cigarettes, dumping garbage in forests and woodlands and burning them as a method of management, lightning strike, malicious actions (arson), accidents. The Ministry of Climate Crisis & Civil Protection issues Daily Fire Risk Forecast Maps to inform citizens in live time about fire-sensitive areas. Indicatively, the map for the date 22/08/2023 is presented, which is considered an extremely dangerous month for the occurrence of fires.

The map is dynamic, and the forecast is constantly changing, but the area is at increased risk due to the high wind potential and temperatures prevailing during the summer months. Therefore, continuous monitoring of the region is extremely important. In the case of licensing and installation of the wind farm, monitoring becomes easier since fire detection systems will be installed in the wind turbines by the company.

Moreover, the accompanying works for the opening and improvement of forest roads that will be carried out will facilitate access of the Fire Brigade in case of fire.

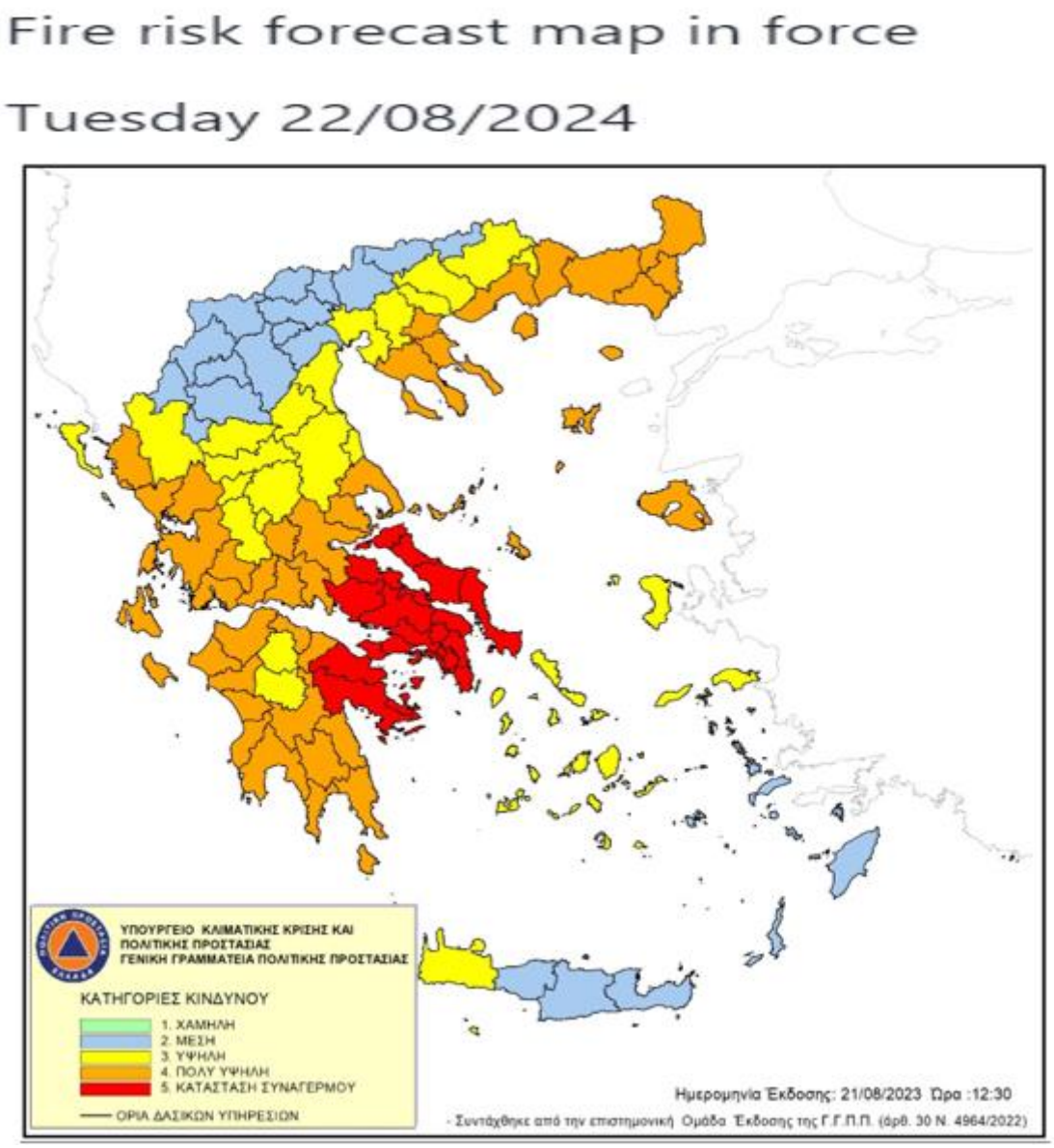


Image 54: Daily Fire Risk Forecast Map for 22/08/2024 (source: Ministry of Climate Crisis and Civil Protection, https://civilprotection.gov.gr/arxeio-imerision-xartwn)

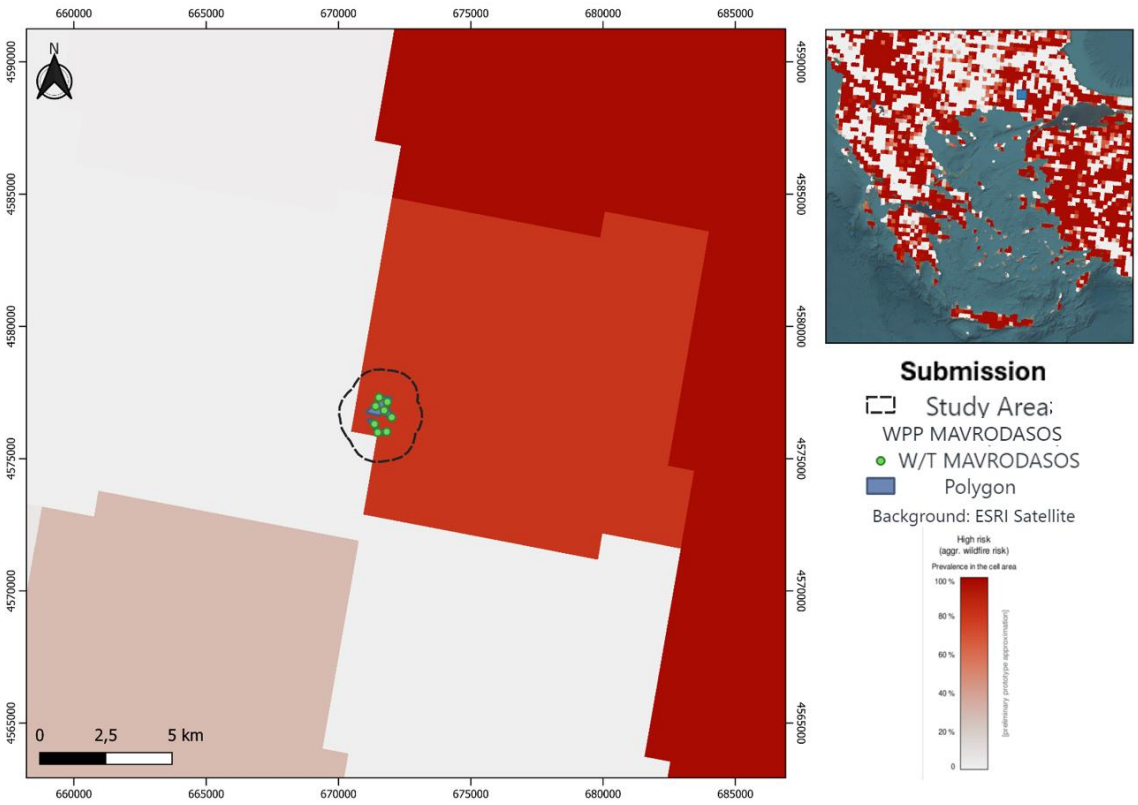


Image 55: Aggregated fire risk indicator: prevalence of the highest risk category in the spatial cell (percentage), modelling of forest fires and consideration of any other typology of vegetation fires only for the potential risk of turning into a forest fire (preliminary prototype approach (https://forest fire.emergency.copernicus.eu/apps/fire.risk.viewer/).

According to the map above, the probability of a forest fire occurring in the study area is about 60-70%. However, the nature of the WPP project is not expected to create favorable conditions for forest fires during its operational phase. The project will not cause emissions of flammable materials nor is it expected to occur emissions of pollutants or hazardous materials in general during its lifetime. The maintenance of the project as well as the occasional measures that will be carried out will help prevent accidents. There will be a presence of staff where in case of observation of fire or strange activity, they will inform the competent authorities immediately. The forest road will also be cleaned to make it accessible for fire trucks in case of emergency.

d) Avalanche and Landslide or Ice Hazard

Avalanche and landslide hazards are difficult to occur in the area due to the morphology and geology of the area. According to Chapter 8 data, the probability of erosion in the study area is low as the project under consideration belongs to a category where erosion is moderate to none. Landslides occur mainly in areas with steep slopes. In the study area, the probability of a landslide phenomenon is negligible, as the area to which the project belongs is of mild slope.

There is also a possibility of ice appearing on the blades of the aircraft and causing ice fragments to fall on the ground. This, however, is also being considered as a possibility of causing a smaller accident.

e) Drought Risk - Water Scarcity

Drought is a period of reduced rainfall (below average) in a given area, resulting in prolonged water shortageshttps://el.wikipedia.org/wiki/%CE%9D%CE%B5%CF%81%CF%8C, whether in its atmospheric, surface or underground form. The duration can last for months or years or even 15 days. Periods of high temperatures can significantly worsen drought conditions, accelerating evaporation https://el.wikipedia.org/wiki/%CE%95%CE%BE%CE%AC%CF%84%CE%BC%CE%B9%CF%83%CE%B7 of water vapor. A consequence of drought is water scarcity, i.e. lack or scarcity of water. In the study area, based on the climatic conditions mentioned above in the section of climatic factors, no problems of the phenomenon are identified.

Risks to cultural heritage

A disaster or accident is likely to affect points of archaeological interest only if they are located near the study area. In the project under consideration,the nearest archaeological monument named "10 Megalithic Monuments (Dolmen)" is located 1.3km southwest of the nearest wind turbine W/T2. The distance, the morphology of the landscape as well as the forest road construction that will be constructed for the needs of the project, in case of fire in the wider area of the project will prevent its spread. The proximity of the monument to the project has been examined in the attached compatibility issue.

C) Accidental hazards to human health and the environment

1) **Danger due to pollution that may result from an accident.**

According to the data of the 2nd Revision of the River Basin Management Plan of the Ministry of Eastern Macedonia and Thrace, point and diffuse sources of pollution are identified in the project area.

Point sources of pollution include Wastewater Treatment Plants (WWTPs), large hotel units, industrial activities, large livestock units, aquaculture - fish farming, leaks from illegal landfills and landfills.

The diffuse sources of pollution of the Ministry of Eastern Macedonia and Thrace concern agricultural activities, industrial activities, urban wastewater that does not end up in WWTP, pastoral livestock farming and water pollution from other sources.

The map below shows the point sources of pollution in the MoD of Eastern Macedonia and Thrace. Potential risks to the environment and/or human health may arise from existing plants located in the surrounding area and may create an episode of pollution due to diffusion into the environment. Pollution can come from an installed plant either during the transport of their waste or when they transport the waste for final disposal.

In such a case, the operator of the installation concerned shall be responsible for limiting pollution.

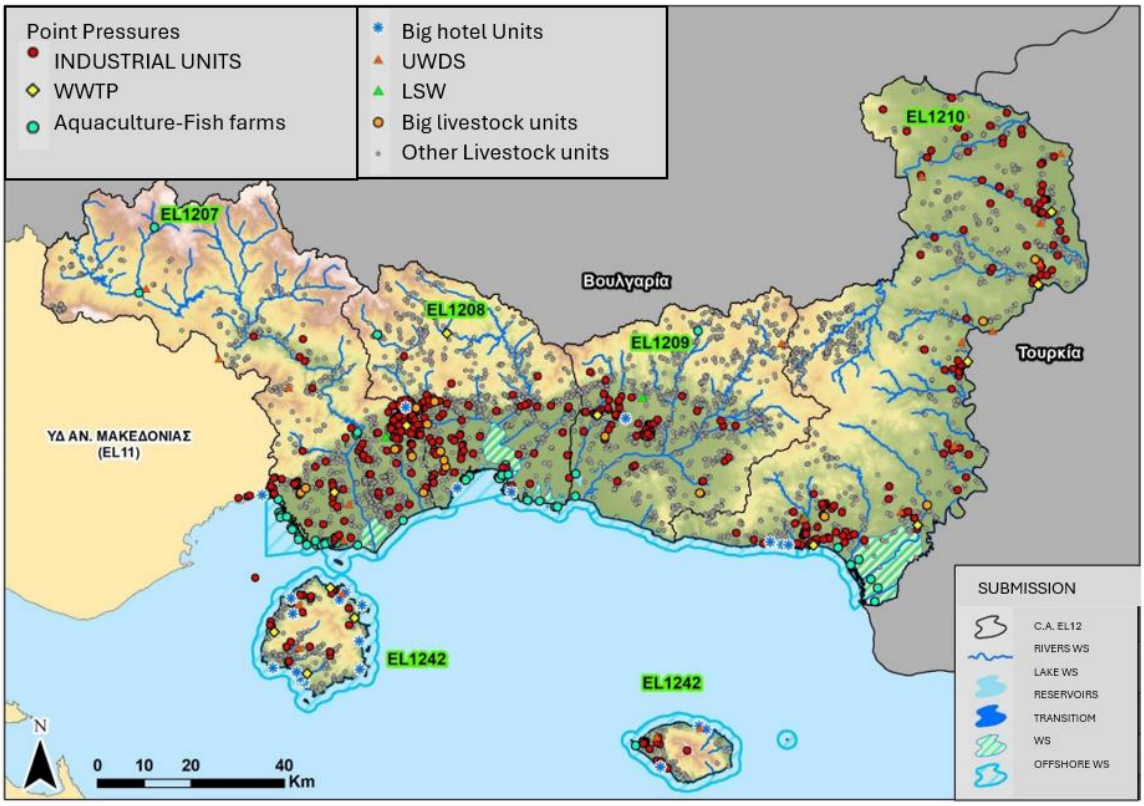


Image 56: Point-sources of pollution located in the Water District of Eastern Macedonia and Thrace

2) **Risk from a technological accident.** Risk is also likely to arise from technological accidents (industrial accidents (e.g. explosion, oil spill), with potentially significant effects on people and the environment. A Major Technology Accident (AMIF) is defined as an event, such as a major leak, fire or explosion resulting from uncontrolled developments during the operation of a facility as defined in the European Directive SEVESO III (JMD 172058/2016), Government Gazette 354/B/17-02-2016), which causes serious risks, immediate or delayed, to human health or the environment, inside or outside the installation and is related to one or more dangerous substances. Such accidents can pose a significant risk to human health and safety, the natural environment and cultural heritage.

Greece has adopted in its current legislation, relevant directives for the prevention and avoidance of major accidents as well as response measures in case they occur. The relevant decision is Joint Ministerial Decision 172058/2016 (Government Gazette 354/B/17-02-2016), which harmonizes Directive 2012/18/EU, known as Seveso III and concerns the definition of rules, measures and conditions to deal with major-accident hazards in installations or plants due to the presence of dangerous substances, in compliance with the provisionsof Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC of the European Parliament and of the Council of 4 July 2012 and is a replacement for No. 12044/613/2007 (B' 376), (Seveso II).

A technological accident cannot occur during the construction or operation of an WPP as it does not fall within the scope of the above legislative framework. Therefore, it is unlikely that an accident will

occur in the study area as there are no other facilities or units near the area that can create a technological accident.

8.15 Environmental evolution trends without the project

In the future, if the project is not built, the conditions of the environment and human activity will not change significantly. The project development area is mountainous and forested and is not suitable for agricultural, livestock and industrial facilities. The local population, natural environment and land use will not change significantly.

As far as land use in the project area is concerned, it will remain unchanged. The state of the natural environment will not change particularly, and the study area will not be differentiated, compared to the situation as it would be shaped independently of the implementation of the project.

According to the attached noise study, the noise produced by the aircraft at less than 200 meters (isonoise curve 1), an area in which no point of interest is located, is the same as that heard during a normal conversation. Therefore, the noise that will reach the nearest settlement of Roussa at 3,174 meters will be negligible.

In case the project is constructed, the WPP complex

- ✓ will not change noise levels (The change in noise levels will be negligible)
- ✓ Land use changes will only take place at the territorial coverage points of the projects.
- ✓ It will help in the effort to tackle climate change.

If the project is not implemented, there may be negative effects due to the continued use of conventional forms of energy, resulting in a continued increase in pollution at country level, a continued increase in greenhouse emissions as well as the burden of water with an additional load of cooling water.

CHAPTER 9 - ASSESSMENT AND EVALUATION OF ENVIRONMENTAL IMPACTS

Environmental impact is defined as the change in environmental conditions or, respectively, the change in environmental parameters (natural and man-made) prevailing in an area because of one or more activities. This change may be positive or negative (i.e. upgrading or downgrading the quality of the environment), long or short term, permanent or temporary, indirect or direct.

The institution of Environmental Impact Assessment is one of the basic tools of environmental planning. The purpose of the institution is to assess the future adverse effects on the environment that may result from activities on the site, with a view to minimising or redesigning them. The potentially significant impacts that the project or activity may cause to the environment using natural resources, the emission of pollutants, the creation of nuisances and the disposal of waste are assessed and evaluated. It shall also provide the data set, and a description of the methods used to predict and assess the effects on the environment, with reference to the reliability of the methods and an indication of any difficulties or lack of appropriate information encountered in gathering the required information.

This means that their effects should be considered as a whole and not in isolation. Therefore, the impacts arising from the construction and operation of the studied WPP relate to the whole of the main and accompanying projects.

This chapter will assess and evaluate the environmental impacts that the project may cause in the study area, and in the study area synergistic impacts where appropriate as discussed in Chapter 8, as well as the project in synergy with the existing and pending licensed WPP in the study area.

The most important positive element from the development - exploitation of wind energy is the reduction of anthropogenic impacts (because of air pollution) by replacing the combustion of conventional fuels for electricity generation, which until now is not sufficiently valued.

The main environmental parameters associated with the construction and operation of wind farms are the natural environment (flora and fauna), the topography and the landscape. Factors such as the size of the WPP, the type and size of the wind turbine, the size of road works and the characteristics of the site (e.g. installation near environmentally sensitive areas) play an important role in determining the degree of pressure on the environment.

9.1 Methodological requirements

This chapter assesses the potential environmental impacts that will be caused by the construction of the project during both the construction/installation and operation phases.

The assessment of the environmental parameters that are likely to be affected or changed by the construction and operation of the project (impact assessment) and the identification of the identity of the impact for each of the changes identified, focuses mainly on the following properties of the environmental impacts :

- Character of impacts (positive, negative, neutral) and type of impacts.
- Magnitude of impact (significant, moderate, weak). This characterisation is directly related to the consideration of the above-mentioned environmental impact assessment and evaluation parameters.
- Duration of effects (short term, long term). Refers to the duration over which the impacts take place.
- Possibility of recovery by natural means (reversible, partially reversible, irreversible). It relates to the potential for the environmental impacts caused to be reversed by natural processes.
- Ability to cope with artificial means (treatable, partially treatable, untreatable). It relates to the potential to address the environmental impacts caused by the construction of appropriate technical works/applications (anti-pollution technologies, environmental restoration works, etc.).
- Geographical reference level for environmental impact assessment/evaluation (local, study area, wider region).
- Intensity, with reference to the magnitude of the change, and its comparison with the relevant limit values.
- Probability of occurrence.
- Complexity of impacts, with reference to the mechanism of occurrence (direct or indirect impact, description of stages in the latter case), the components of the phenomenon (to distinguish simple from complex impacts), and intensity and magnitude dependencies on non-project factors, if any.

- Characteristic timescales (time horizon of occurrence of effects, duration, recurrence).
- Opportunities for prevention, avoidance, reversal or minimisation.
- Synergistic or cumulative effects with other impacts from the project itself or from other projects or activities developed or environmentally permitted in the area.

In general, the nature of wind energy projects aims to reduce anthropogenic impacts by replacing the combustion of conventional fuels for electricity generation. Most impacts are mainly caused during the construction phase but can be reduced by taking appropriate measures. Impacts during the construction phase construction phase will last if the construction of the wind farm and will be limited to the area where the project will be located.

It should also be noted that negative impacts are assessed in terms of whether they need to be addressed, but also in terms of the potential of the mechanism of occurrence of each impact to prevent or subsequently reverse it. In this way, the most appropriate stage for taking the necessary measures is explored. A diagnosis is made of the causes of each impact and whether measures to prevent one impact will have a positive effect on other impacts.

For the assessment - evaluation of the induced environmental impacts of the studied WPP, the following main determining parameters are considered and co-evaluated:

- ✓ An institutional framework for environmental protection, as specified by the adoption of measures for different environmental instruments.
- ✓ Characteristics of the area where the installation is located: Refers to the type and sensitivity - vulnerability of the environmental media that are subject to environmental pressures from the installation.
- ✓ Design of the technical-functional characteristics of the project: Refers to the type, size as well as the way of construction and operation of the project.
- ✓ Applicable measures for the prevention and mitigation of environmental impacts and environmental restoration.

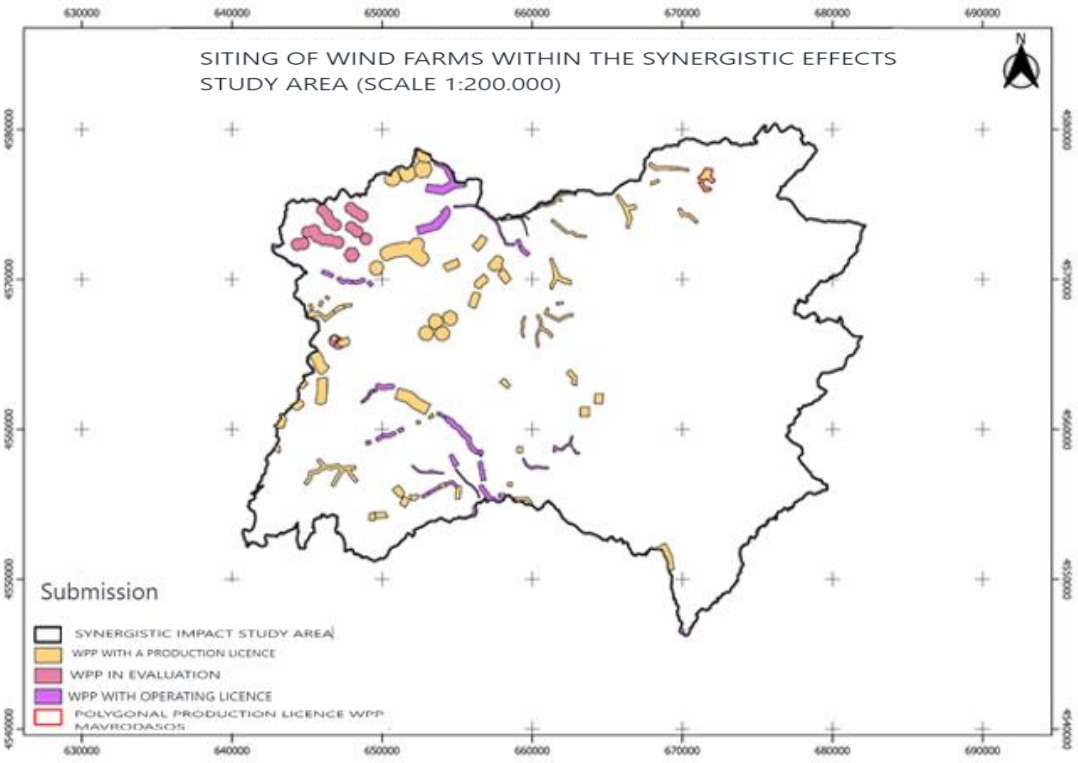
Finally, for those environmental media where no impacts are expected from the construction and/or operation of the project or activity as indicated by the information in the project description (Chapter 6), then only a simple statement that no impacts are expected is made and no development of the corresponding section is required.

Specifically, with regard to the protected areas under study, and in order to better address the synergistic impacts of the project under study, it has been determined in the Special Ecological Assessment to take into account the wider boundaries of the entire area enclosed within the main Special Protection Area under study GR1130011 and the nearest Greek SPA GR1110010, as almost all of the already installed WPP (operating license) of the wider area are located within it.

Therefore, the area resulting from combining the boundaries of the above two areas is referred to as **the "synergistic impact study area" (SISA).**

Within the SISA, there are 14 WPP (nine inside and five partially inside) licensed to operate, which have a total capacity of 314.2 MW, occupying a total area of 1,053.88 ha (total area of polygons within the SISA - of which five WPP are partially located within the SISA, they amount to 44 WPP (including the one under study) in the licensing stage under production (production license), while for WPP under assessment within the SISA, amounting to 4, i.e. a total of 48 WPP. The following map depicts the

boundary of the synergistic impact study area as defined in the SEA. Based on the above, the environmental impacts have also been extensively analysed.



Map 3: Map showing the location of wind farms within, partially within and on the boundaries of the "synergistic impact study area" (licensing stage in operation and under production)

9.2 Impact on Climatic and Bioclimatic Characteristics

The role of regulating the climate of a wider area is to some extent played by altitude factors, distance from the sea and the local conditions prevailing in a region. Such conditions include, for example, large mountain ranges, prevailing local winds and other possible factors that shape the microclimate of a particular area.

Given the nature of the WPP and its accompanying projects, it follows that it will not result in any change to the climatic and bioclimatic characteristics of the area.

Sustainable development is directly related to the effort to reduce the consumption of non-renewable natural resources and is a global priority. Air pollution and greenhouse gas emissions from the consumption of fossil non-renewable resources for energy production pose a significant threat to the environment and sustainable development.

In particular, the production of electricity from wind turbines exploits the wind potential of the region without emitting air pollutants from this activity, unlike the process of producing energy from the combustion of fossil resources. Therefore, a wind installation not only does not affect the climate but also contributes to the mitigation of pollutants that are responsible for significant climate and environmental changes on a global scale. A typical example is the greenhouse effect, the result of which

is an increase in global warming and hence the occurrence of extreme weather events (floods, fires, hurricanes, etc.).

Long-term energy planning and the promotion of Renewable Energy Sources projects (including the exploitation of wind potential through the creation and operation of wind farms) are the central tool for mitigating the impacts of climate change. The path towards a low greenhouse gas emissions economy must involve all sectors of economic activity, both energy consumption and energy production.

According to the current National Plan for Energy and Climate (NPEC), the central objective is set as a central target until 2030, the total reduction of greenhouse gas (GHG) emissions in our country in relation to the year 1990 to be more than 40% in relation to the year 1990, while in relation to the year 2005, which is more comparable, based on the level of the Greek economy and the relevant emissions at European level, the reduction target exceeds 55%.

Regarding the penetration of Renewable Energy Sources (RES), the national target for their participation in gross final energy consumption is to achieve a share of RES of at least 35%.

In addition, targets are set to increase the share of RES in gross final electricity consumption to at least 60%, the share of RES for heating and cooling to more than 40% and the share of RES in the transport sector to more than 14% according to the EU's calculation methodology.

The production of energy from renewable energy sources (RES), apart from the fact that it enhances energy security (as the country's dependence on imports is reduced), also contributes to the reduction of environmental pollutant emissions associated with conventional energy production (fossil fuels). Given that most forms of renewable energy, such as wind energy, do not produce greenhouse gases or other pollutants such as SO2, NOx or particulate matter since there are no combustion processes for energy production, they are expected and should form the basis of any long-term planning for sustainable development and energy production.

Based on Greece's energy mix, each KWh produced by wind energy eliminates approximately 1 Kg (0.85-1.06) of CO2 in the atmosphere. In addition, it results in fewer emissions of other hazardous pollutants (such as particulate matter, nitrogen oxides, sulphur compounds, etc.). It compensates for up to 8.3kg SO2, 1.7Kg NO_x and 0.7 Kg of particulate matter.

An ordinary 1,000kW (1MW) power plant produces on average in a relatively good wind potential position in Greece 3 million kWh per year and thus prevents the release of about 3,000 tons of carbon dioxide (CO2), i.e. as much CO2 as 4,000 acres of forest or 200,000 trees annually as follows.

Therefore, the project under consideration cannot cause negative changes either during the construction phase or during its operation in the climate of the surrounding area, but on the contrary will have positive effects at local and national level, while by optimally exploiting the available wind potential of the area, it will help achieve the environmental objectives and international obligations of the country, but also the satisfaction of the principles of sustainable development.

9.2.1 Project Construction Phase

The construction of the overall project, due to the nature of the works, cannot cause a change in the climatic and bioclimatic characteristics of the study area. It is not expected that under any circumstances

will the construction works affect any climatic parameter such as temperature, rainfall, hail, snowfall or humidity in the project development area.

For the foundation and installation works of the wind turbines, for the maintenance of the existing roads as well as for the opening of ditches for the laying of electricity transmission cables in the eight positions of the A/F, construction machinery (cranes, trucks, graders, diggers, etc.) with diesel engines will be used. The operation of these machines is expected to release into the atmosphere a quantity of greenhouse gases as well as particulate matter (PM_{10}, PM2.5) due to the combustion of liquid fuels (diesel, gasoline). Thus, these works will cause some carbon dioxide emissions alone. These quantities of CO2 will be produced exclusively during the construction of the project and will then cease to be produced.

Therefore, any greenhouse gas impacts from the construction of the project will be weakly negative – practically negligible, very weak, short-term and completely reversible from the operation of the project itself, mainly due to the minimum quantities of emissions, which will come from a limited number of mechanical means in relation to the area of the project. However, compliance with existing legislation on exhaust emissions from construction machinery and vehicles is required.

Synergistic/Cumulative effects:

No synergistic effects are expected in terms of temporary and limited weak impact on the atmospheric environment during the construction phase as the projects are unlikely to be built all together at the same time. The worst-case scenario is that there will be simultaneous emission of greenhouse gases from the vehicles to be used throughout the duration of the works, which, however, are expected to be extremely low, firstly, due to the fact that the road network cannot support a load on its road traffic due to its nature, and secondly because the exhaust gases come from vehicles whose emissions do not exceed the delimited and legal limits as defined by the Directive 2007/46/EC.

9.2.2 Project Operation Phase

Wind farms by their nature do not have any negative impact on the climatic and bioclimatic characteristics of the area in which they are located. Wind turbines use a small fraction of the kinetic energy of the wind to produce energy without changing its intensity or direction. The operation of wind turbines does not produce heat, gases or other pollutants that could potentially alter the climatic and bioclimatic characteristics of the installation area. Consequently, during the operation phase of the R/P, it is also not expected to cause any impact on the climatic and bioclimatic characteristics of the area under consideration in which the proposed WPP will be installed (8 M/F).

As far as the production of greenhouse gases is concerned, not only will such gases not be produced, but on the contrary, the production of greenhouse gases and other harmful pollutants in the atmosphere will be reduced, because of the operation of the proposed project.

It is therefore obvious that the project under study is expected to have a significant positive impact on the climatic characteristics of the territory, through the significant participation in shaping the country's energy mix, the decentralization of energy production and the contribution to the significant reduction in greenhouse gas production.

Regarding the underground electricity transmission network that is planned to be constructed to serve the interconnection needs of the planned project, during its operation it is not expected to produce gaseous or other pollutants that could potentially alter the climatic and bioclimatic characteristics of the area. The heat generated by medium voltage and extra high voltage transmission lines is negligible, is induced over an extensive area and does not affect the thermal balance of the atmosphere, more so in this case where the entire power lines will be underground.

Summing up, the effects of the overall project during the operation phase on the climatic – bioclimatic characteristics of the wider study area will be positive, medium intensity, hyperlocal character, long-term and permanent.

Synergistic/Aggregate effects

The project is not related during its operation to greenhouse gas emissions. On the contrary, the operation of the project contributes to the reduction of greenhouse gases, compared to the zero solution. Consequently, in the case of the worst-case scenario where all licensed and licensed production projects of the study area will operate simultaneously, they will not have negative effects but positive ones on the climatic and bioclimatic characteristics of the study area.

Climatic and bioclimatic features						
Phase of the project	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	/	/	/	NO	/	/
OPERATION	/	/	/	NO	/	POSITIVE
CLOSURE	/	/	/	NO	/	NEGATIVE

Table 53: Climate and bioclimatic impact assessment matrix

Explanation of Table Contents:

Impact phase: This refers to the individual time phases of the project's life. **Construction**: construction of the project up to and including the issuance of the operating permit. **Operation**: The duration of operation of the project and **Closure**: It concerns the closure of the project and the restoration of the environment.

The remaining columns refer to the individual impacts and take the following values:

Column	Prices			
Kind	Direct	Indirect		
Possibility of occurrence	/	LOW	MODERATE	HIGH
Intensity	/	LOW	MODERATE	HIGH
Synergistic action	YES	NO		
Reversibility	/	YES	NO	
Effect	/	POSITIVE	NEGATIVE	

/: No impact or negligible impact

Reversibility: concerns prevention, avoidance, reversal, minimization of impacts and is supplemented with / when there is no expediency or reason for treatment and with "YES" or "NO" when: In the column "Likelihood of occurrence" and/or in the column "Intensity" the assessment has concluded even a low probability of occurrence of effects.

*The explanation in the table also applies to the impact assessment tables below in this chapter.

9.3 Impact on Morphological and Landscape Features

The impact on the morphological - landscape characteristics of the immediate and wider study area depends mainly on the change in its visual value that may occur due to the construction and operation of the project under study (WPP and its accompanying works). The degree of deterioration of a landscape depends first on all on its degree of sensitivity - vulnerability, which is indicated by the characteristics of each landscape and the extent of intervention in it.

The project does not fall within protected landscapes, while no such area is found in the wider area of their location. According to the above, it is concluded that the area of WPP is not located in locations where interesting landscape features are located.

9.3.1 Project construction phase

Impact on soil morphology

Geomorphologically, steep slopes prevail in the WPP under examination and the area is characterized as semi-mountainous. Most of the land is covered by forests, while agricultural land is few and located mainly in the coastal area of the unit.

During the construction of the project, the changes that will occur in the relief and morphology of the ground will be moderate and resulting from the excavations to make the foundation of the M/W, the opening of the internal road network as well as the construction of the underground Medium Voltage transmission line.

However, these structural works are small-scale and cannot cause erosion or significant changes in the terrain. All works that take place in installation of the wind power plant are restored after the completion of the works, except for the plateaus from the wind turbines and the internal road construction.

For the creation of the internal access network to the project under consideration, construction squares as well as for the underground MV interconnection line, excavations and backfills will be carried out, while for the opening of the trench, the underground MV wiring will be laid with the removal of topsoil and topsoil.

The earthworks will be limited to the occupation zone of the project, while they will be carried out under the parallel supervision of the competent Forestry Authority. A significant volume of excavations is expected to be used in backfilling works, resulting in an immediate reduction of the degree of landscape deterioration.

The final road construction as well as the axis of the HV and MV interconnection lines will generally follow the slope of the existing terrain, to ensure the least possible earthworks.

The interventions that will be made on the ground of the installation sites and along the new branches and the route of the M.V. underground interconnection will be restored for the most part either by phytotechnical restoration interventions or in a natural way.

Impact on soil topology

The impact on the landscape ***will be small-scale and weak*** as the construction of the project under consideration will be carried out in sections (zones) and not simultaneously throughout its entire range of development. There will be virtually a slight deterioration in the aesthetics of the landscape due to the increased mobility of vehicles transporting materials, the operation of mobile construction sites during the construction of accompanying works of the underground interconnection.

In addition, the locations where landscape alteration is expected in the majority are located at long distances from places where anthropogenic activity is carried out (residential network, workplaces, primary sector productive activities, tourist facilities, etc.)

Good practices, proper project planning as well as the implementation of appropriate measures (elements discussed in Chapters 10 and 11) will result in the reduction of impacts on landscape features as construction works will be ***low intensity, short-term and local in nature.***

The impact on morphology, during the construction phase of the project, is generally characterized as low as it follows the technical characteristics set in the opening of forest roads, which consequently help access fire trucks, shepherds and wildlife.

Synergistic / Cumulative effects:

Synergistic and cumulative effects during the construction phase will not occur as it is unlikely that ***all neighboring wind farms with a production license (nearest Lefki and Ammoudes projects) will be built simultaneously.*** The choice of its interconnection ***to an already existing environmentally licensed station*** reduces the intervention areas of the project.

In conclusion, during the construction phase of the project, the impact on the morphology of the area is assessed ***as medium scale, partially reversible and can be limited - after the strict implementation of appropriate measures - to a low scale.***

In case all licensed and licensed production projects are constructed simultaneously, the impact on the morphological characteristics will concern the accompanying works as there will be an intervention in the forest road. This will have a positive outcome as the improvement intervention and the use of the existing forest road construction will take place only once during the construction phase of the projects.

In general, the impact on the landscape, during the construction phase of a wind farm, could be characterized as moderate, short-term and partially reversible as after the end of the construction works of the project, a large percentage of the occupation area will be restored, while in its entirety it will be restored after the end of operation of the project.

9.3.2 Project Operation Phase

Impact on soil topology.

During the operational phase, changes in the landscape concern the visible parts of the projects (Motorways and road construction), while during the operation of the projects no impact on the morphology of the terrain is expected.

The main impact of the project on the landscape arises from the way it is visually integrated into the natural environment. The degree of deterioration of a landscape depends first on all on its degree of sensitivity and vulnerability. The more aesthetically interesting a landscape is, the more sensitive it is to alterations – interventions. The process of integrating a wind farm into the environment is based on the dynamic visual coupling of the wind turbines with the landscape elements of the installation area.

These landscape features may be characterised by:

- the flat character of a lowland area
- the slightly wavy relief of a hilly area
- the intense relief of a ridge or massif
- the urban and suburban landscape of a town, village or city
- The strongly industrial and strictly arranged profile of an industrial zone
- combinations of the above.

Based on the above parameters, the intended visual coupling of landscape and wind farm can be achieved through the application of aesthetic rules, based on ensuring harmony in the relationships of lines and / or volumes. This is achieved using techniques of integration, agreement or counterpoint with the existing dominant features of the landscape, so that, despite the intervention, no discomfort or confusion is caused to the eye of the observer and the aesthetic result is visually acceptable.

Due to the topography of Greece, most of the time the scale of wind farms is compatible with the scale of the landscape dominated by large massifs. Also, modern wind turbines are characterized by greater visual acceptance capabilities compared to those of older technology, because:

(a) they are slim and elegant in their design, compared to early models that were bulky or supported by metal trusses.

(b) the angular rotational speed of their blades is lower, which creates a more pleasant visual effect, and

c) are placed at greater distances from each other, thus achieving more sparse distributions compared to the denser groupings presented by older wind farms.

The sparse location of the Motorways of the project under study limits to a minimum any visual change. The aircraft have a color that is part of the landscape (usually light color) and consist of three fins, an element that causes symmetry to the human eye and reduces visual disturbance which is anyway subjective and not clearly defined by environmental legislation.

The following photographs depict the visual disturbance caused by the Aircraft to the field of view of the human eye from distances of 500, 1,000, 2,500, 5,000, 7,500 and 10,000 m from the base of the aircraft.

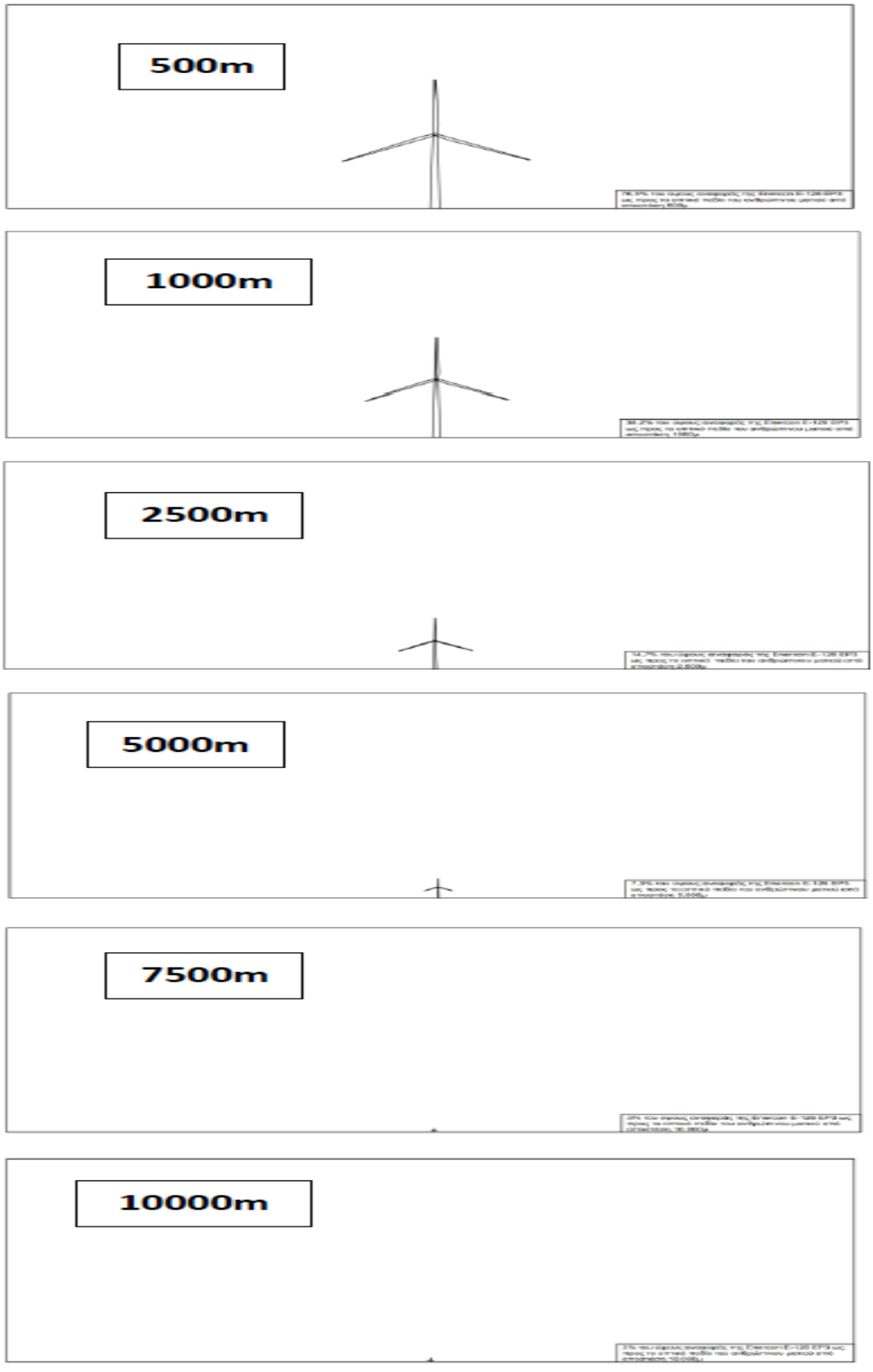


Image 57: Visual disturbance from different distances

In the case of the project under study, the following can be highlighted:

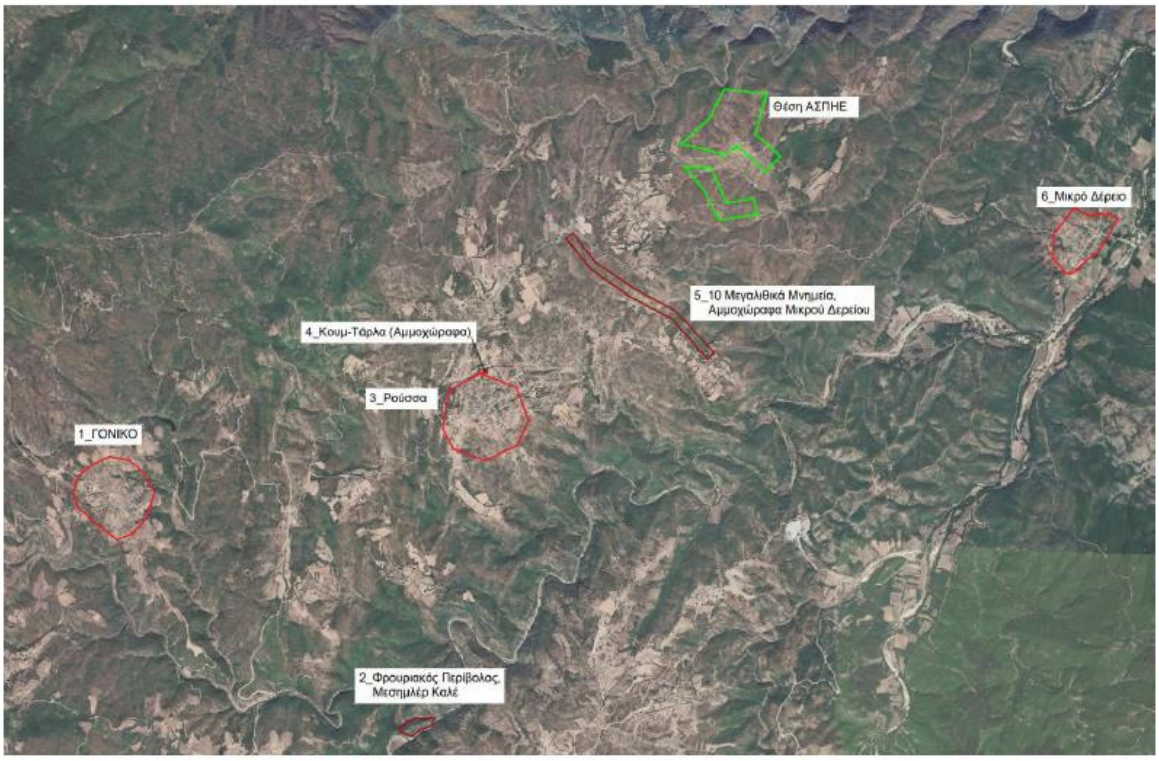
- The adoption of simple tubular towers, the three-blade propeller and the coloring of the wind turbines with color that is integrated into the environment give a harmonious and elegant aesthetic result to a wind farm and increase its visual acceptance.
- In the area of development of wind farms, the view to or from a unique monument of nature or cultural heritage is not altered.
- The distances and altitude differences of the installation sites of the wind turbines from the residential areas are such that they do not create problems of shading houses or other common areas, while the restrictions set by the ESDP for RES are strictly observed.
- The painting of the wind turbines (pillar and rotor) is "absorbent", and no reflections of incident lighting are created.

The aesthetics of a WPP is a purely subjective factor, which depends, as relevant studies show, not so much on the image of the wind installation itself, but on the general image formed by the observer about its use.

The effort to quantify as objectively as possible the visual disturbance of an WPP led to the adoption of rules based on the SSPSDF for RES. It is also emphasized that the Aircraft are **located outside the exclusion zones of the area and meet the criteria for inclusion in the landscape.**

In any case, however, the project itself, after the installation of the wind turbines, will change to a small extent the landscape characteristics of the area. For the assessment of the visual disturbance, photorealistic depictions of the WPP were carried out to assess whether they will be visible from the nearest points of interest in the wider area. such as settlements and archaeological sites. The following photographs present the photorealistic depictions of the aircraft from different viewing angles.

The shots from the points of interest towards the wind farm were taken from the average human height (1.70m). During the photorealistic imaging, the relief of the ground was considered and not the visual obstacles (eg buildings, vegetation) in the study area, thus concluding that the visual disturbance depending on the viewing angle will be even weaker.



Map 46: Locations of photorealistic illustrations

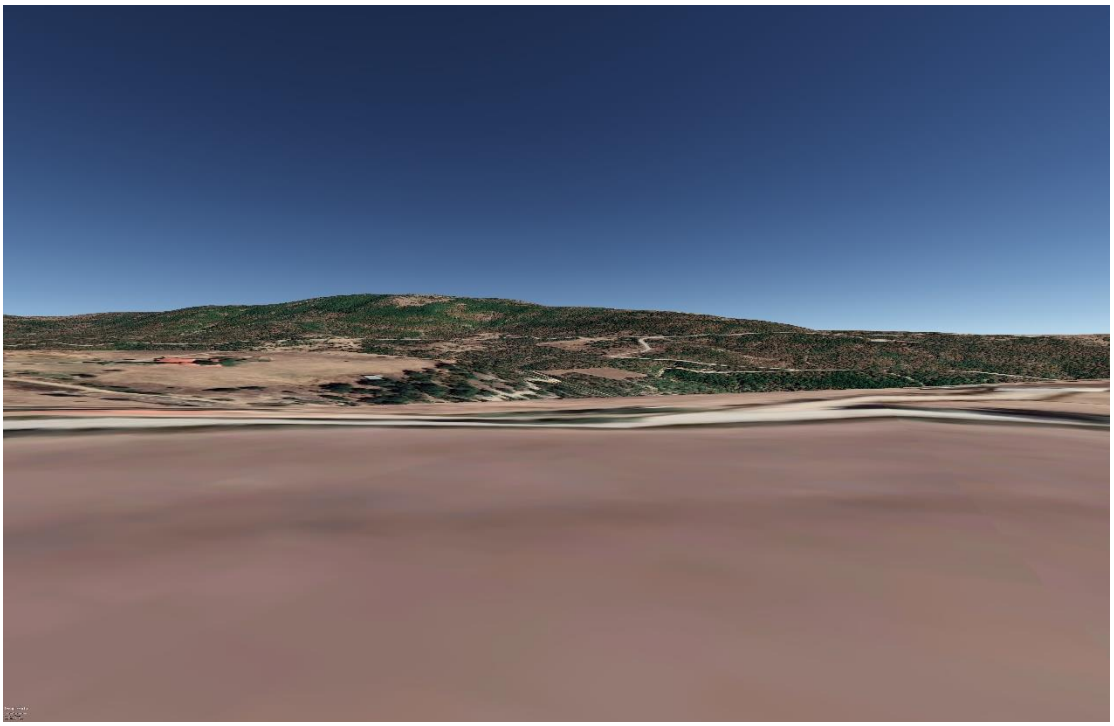


Image 58: View of WPP from the settlement "Goniko". No visual disturbance

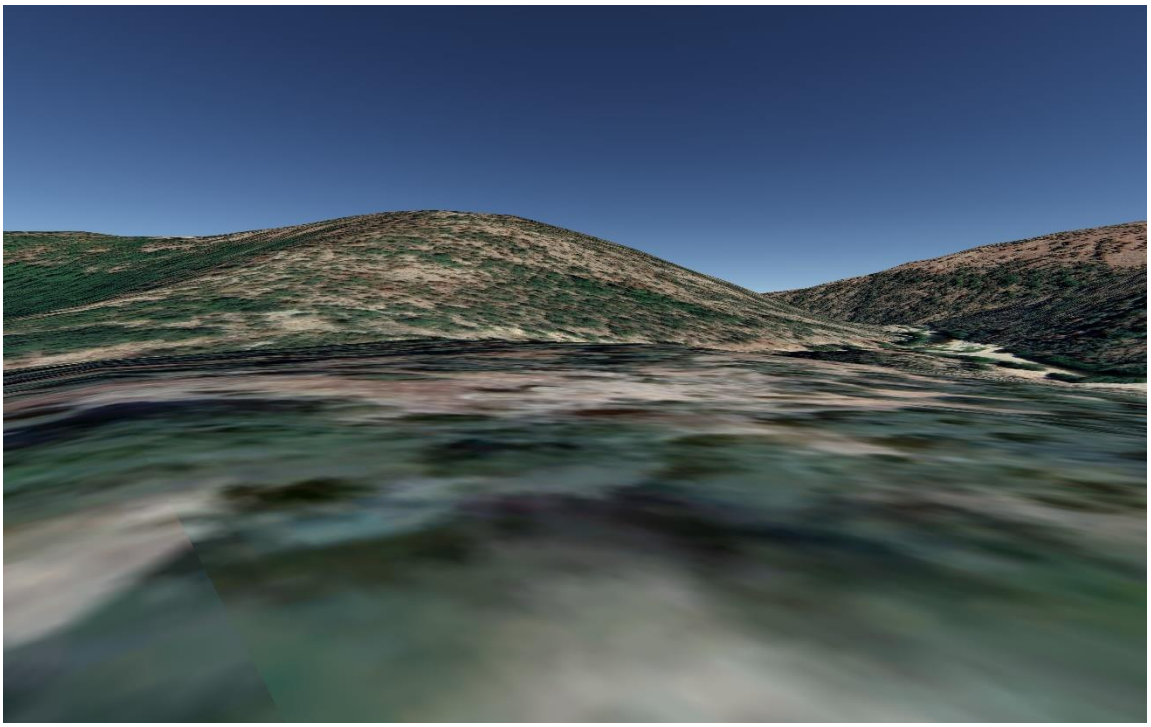


Image 59:View of WPP from the archaeological site "Fortress Precinct, Mesimler-Kale". There is no visual disturbance.

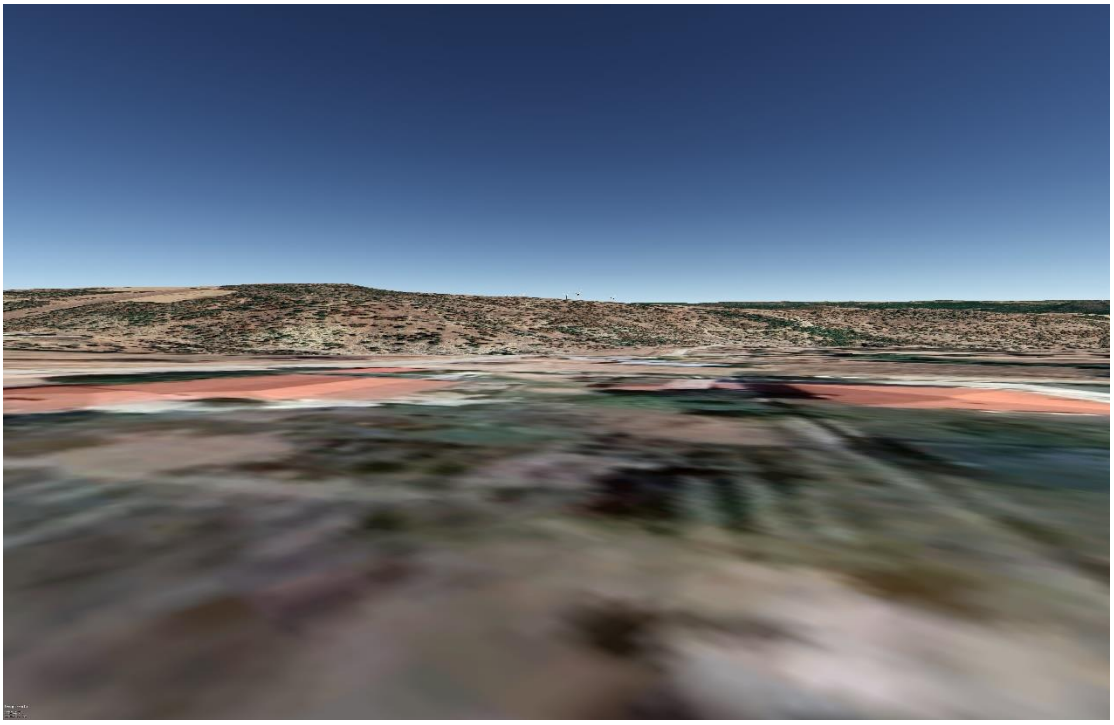


Image 60: View of WPP from the settlement "Roussa".

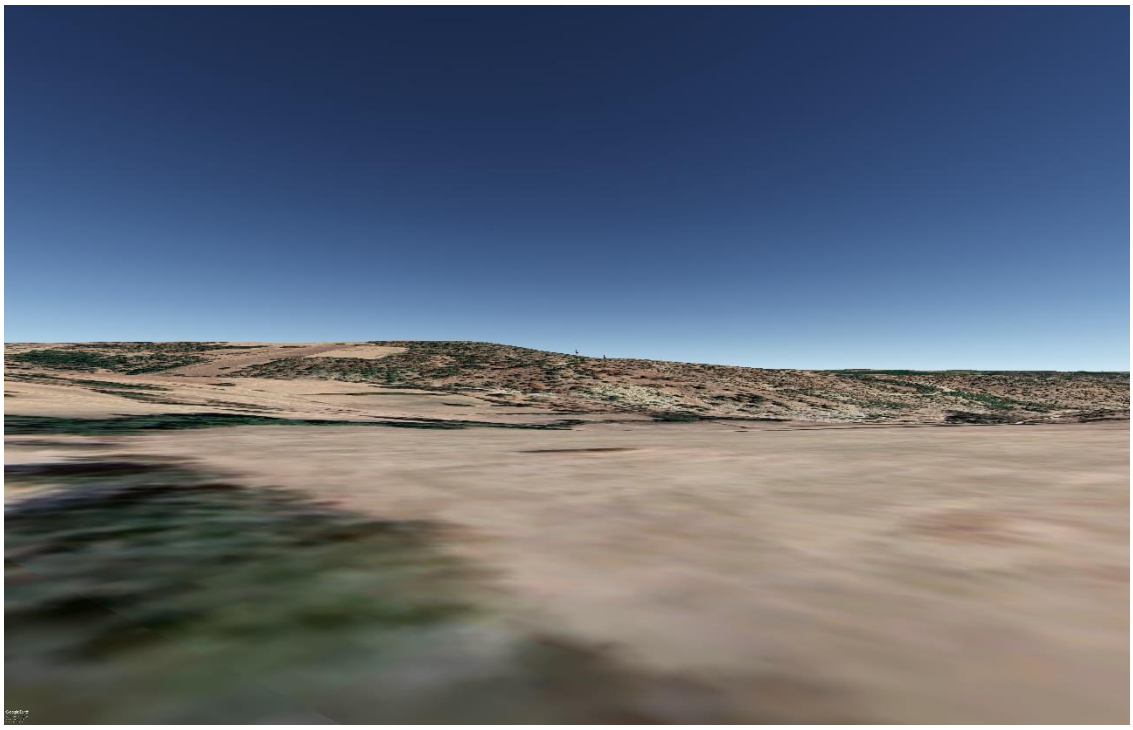


Image 61: View of WPP from the archaeological site "Koum-Tarla (Ammohora)".

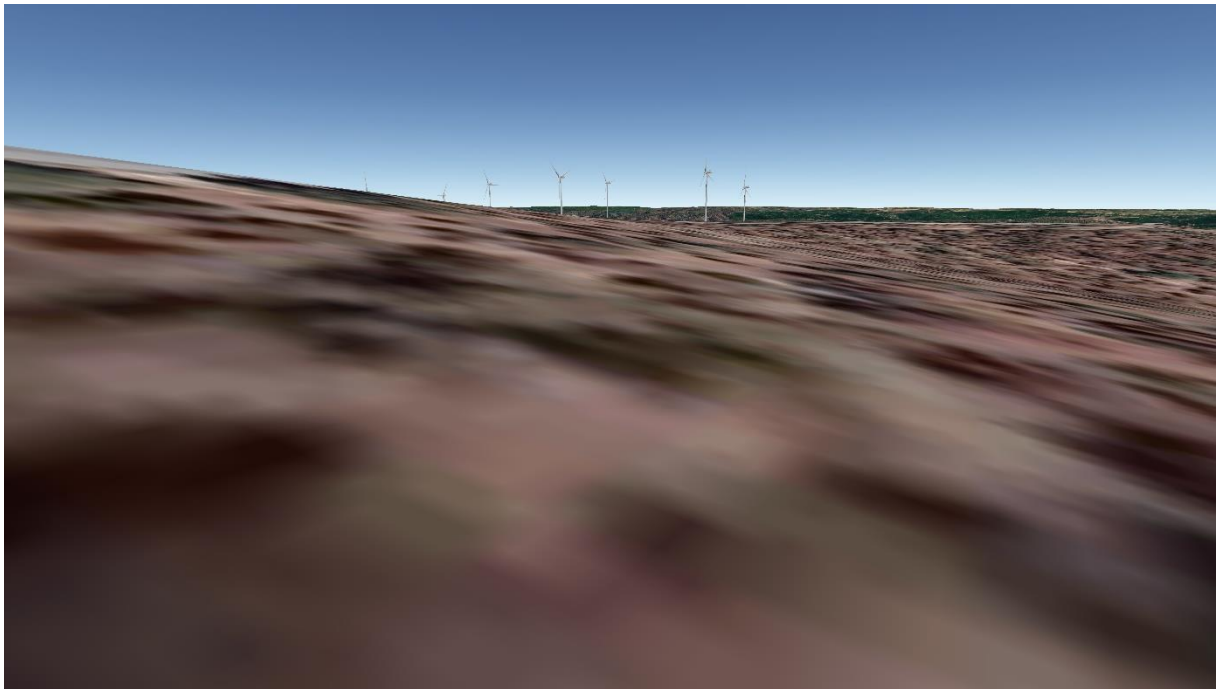


Image 62: View of WPP from the archaeological site "10 Megalithic Monuments, Sand Fields of Mikro Dereio".

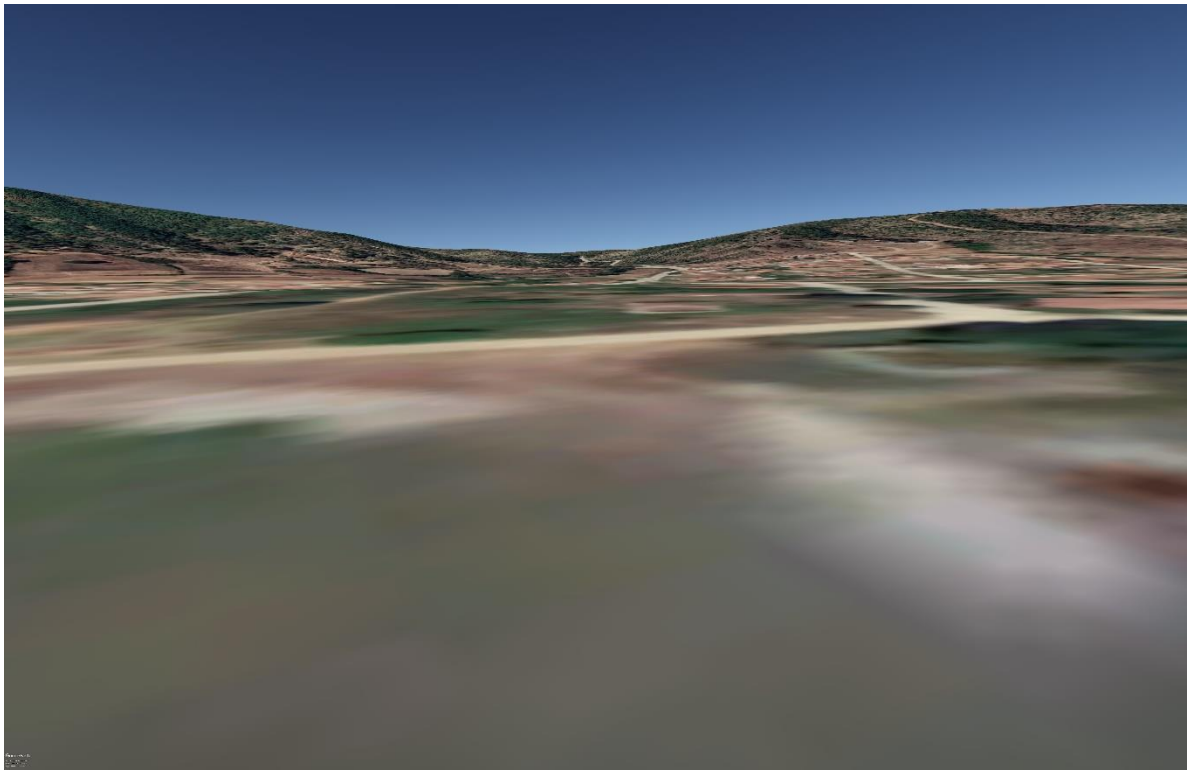


Image 63: View of WPP from the settlement "Mikro Dereio". There is no visual disturbance.

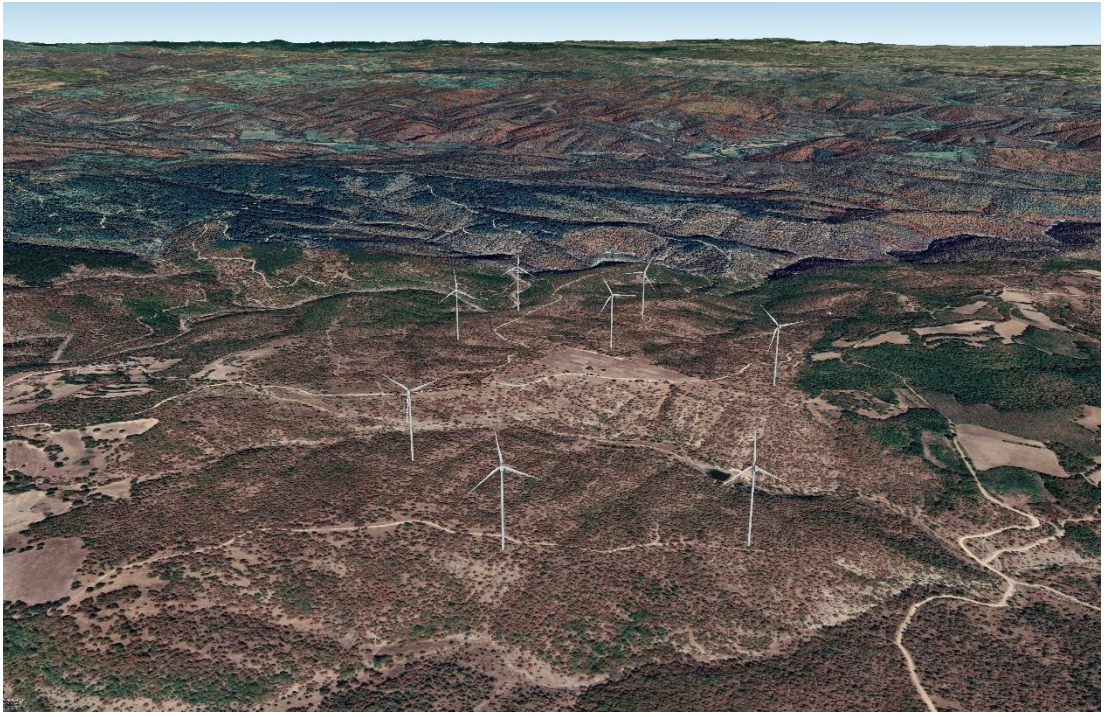


Image 64: Panoramic view of WPP in a direction of shooting to the north.

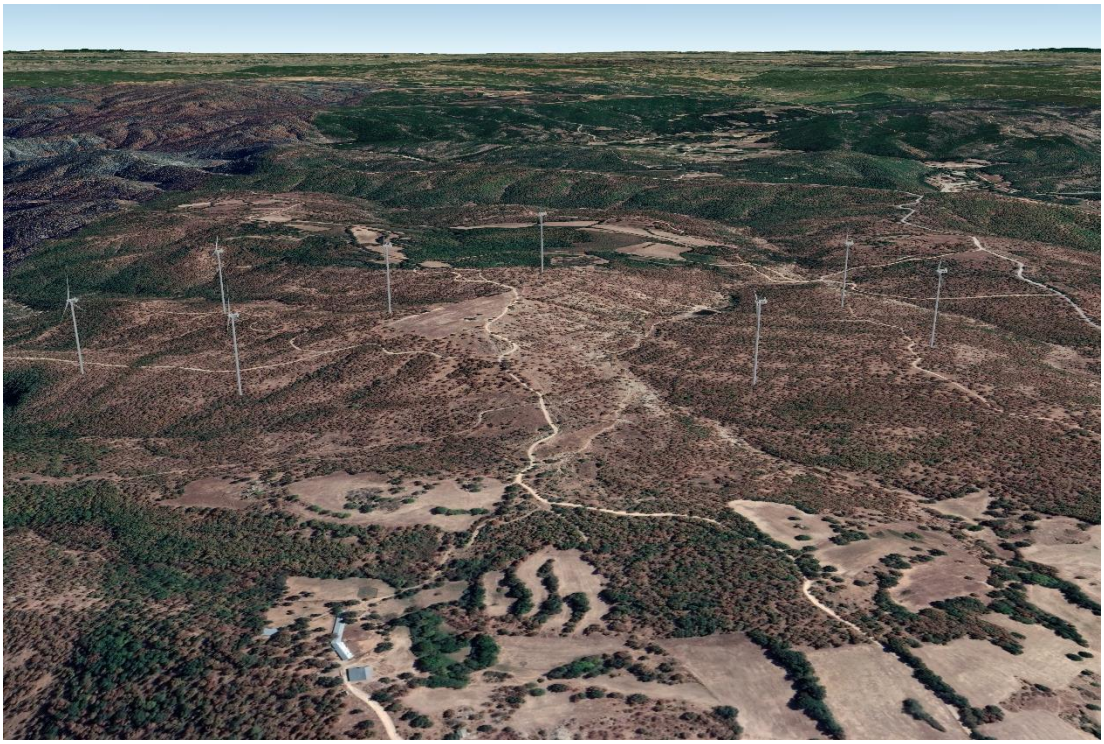


Image 65: Panoramic view of WPP in the direction of shooting east.

Image 66: Panoramic view of WPP in direction to the south.

Image 67: Panoramic view of WPP in a direction of shooting to the west.

Based on the above photorealistic descriptions, it is confirmed that the changes in the landscape of the area are estimated as medium scale as the W/T of the project will be partially visible from a long distance from most settlements.

Also, the fact that the M.V. interconnector will be underground, significantly reduces the impact of the WPP on the landscape, as well as the choice to locate the existing submarine at the "Patriarch" site will be made in a suitable stadium where it will not be in visual contact with the settlements of the area, as it is located at more than 17 km from the planned project.

The project is compatible with the criteria for the inclusion of wind installations in the landscape set out in Annex IV of the Special Spatial Plan for RES (JMD 49828/2008 - Government Gazette 2464 B') and the relevant analysis is presented in **Annex II of this study.**

In conclusion, the effects of the studied WPP during its operational phase on the landscape and morphological characteristics of the area can be considered **moderately negative, long-term and partially reversible.**

Accompanying works

Road Construction

In addition, the impact of the improvement of the existing road construction mainly concerns issues of visual intervention in the wider landscape of the area. However, the fact that on the one hand the existing road construction is exploited and that there is not much possibility of viewing these roads

from the settlements of the area minimizes the intensity of the impact on the landscape and the aesthetic environment.

The road surface of the entire road construction of the studied WPP will be dirty and the traffic load will be minimal. The final shape of the roads will be as compatible as possible with the immediate natural environment and for this reason no asphalt paving is foreseen.

Therefore, the impact on the landscape and morphological characteristics of the road construction of the project is considered neutral as it does not introduce any new point in the landscape of the area, where an expanded network of forest roads is located.

Underground transmission line

Regarding the underground transmission line, for the "MAVRODASOS" site, it will have a length of 39,304.24 meters and will start from the fuselage of each wind turbine and will end at an existing substation named "PATRIARCHIS", as shown in the attached interconnection map.

As it is understood, the effects on the landscape and morphology of the UN transmission network on the characteristics of the area are **weak, negative and completely reversible.**

Conclusions

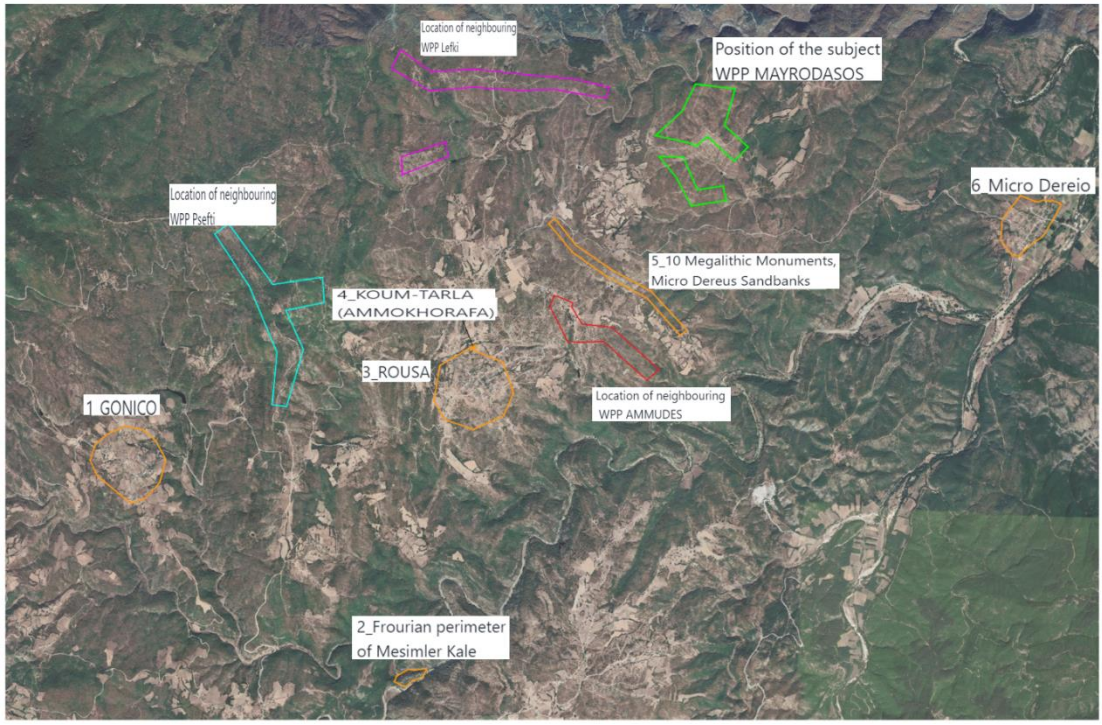
According to the above data, the impact of wind farms on the morphological and landscape characteristics of the area will be negative but ***fully reversible after the end of the life of the investment*** and concern only the visual disturbance during the life of the project and the temporary

Synergistic effects/Cumulative effects:

In the nearest area of installation of the studied WPP and in the study area of 10 km, WPP with production license and operating license are located. It is emphasized that in the context of the examination of the compatibility of the studied project with the SSPSDF for RES (JMD 49828/2008), the project was evaluated in terms of its integration into the landscape, in synergy with the potentially nearest WPP (WPP at Lefki and PSEFTIS) and ***was found to be compatible with the visual interference criteria of the above specific framework.***

The following images present the photorealistic depictions of the Motorways and the neighboring WPP from different viewing angles to assess whether they are visible from the ***nearest points of interest such as settlements and archaeological sites.***

The shots from the points of interest towards the wind farm were taken from the average human height (1.70m). During the photorealistic imaging, the relief of the ground was considered and not the visual obstacles (eg buildings, vegetation) in the study area, thus concluding that the visual disturbance depending on the viewing angle will be even weaker.



Map 47:Locations where photorealistic imagery is taken

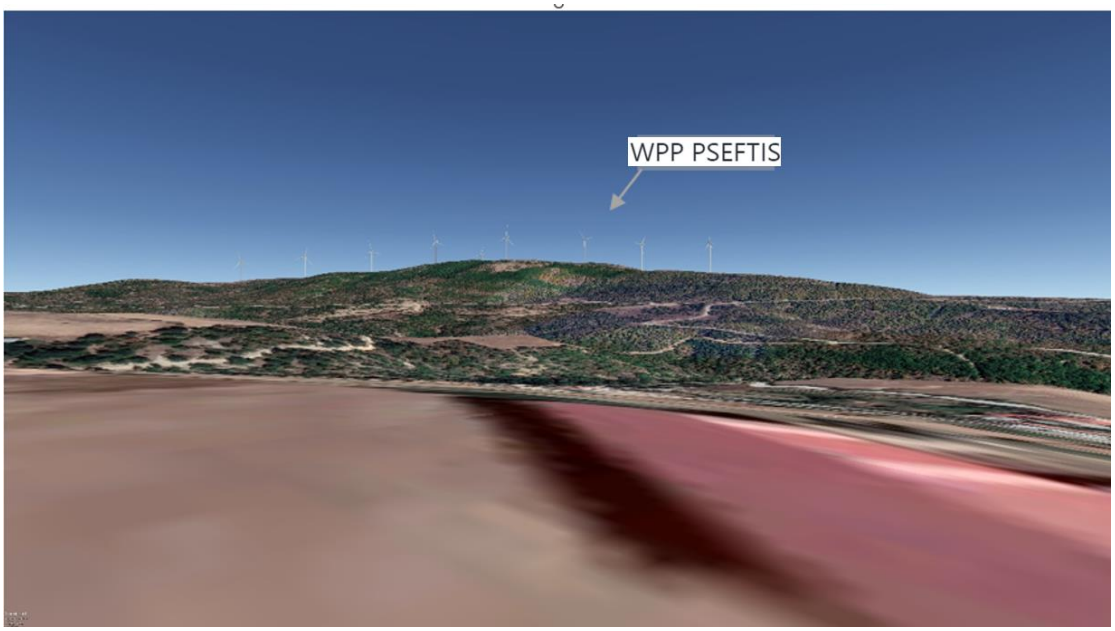


Image 68: View of the WPP from the settlement "Goniko".

There is visual disturbance only from the neighboring WPP at the "PSEFTIS" site and not from the studied WPP at the "Mavrodasos" site.

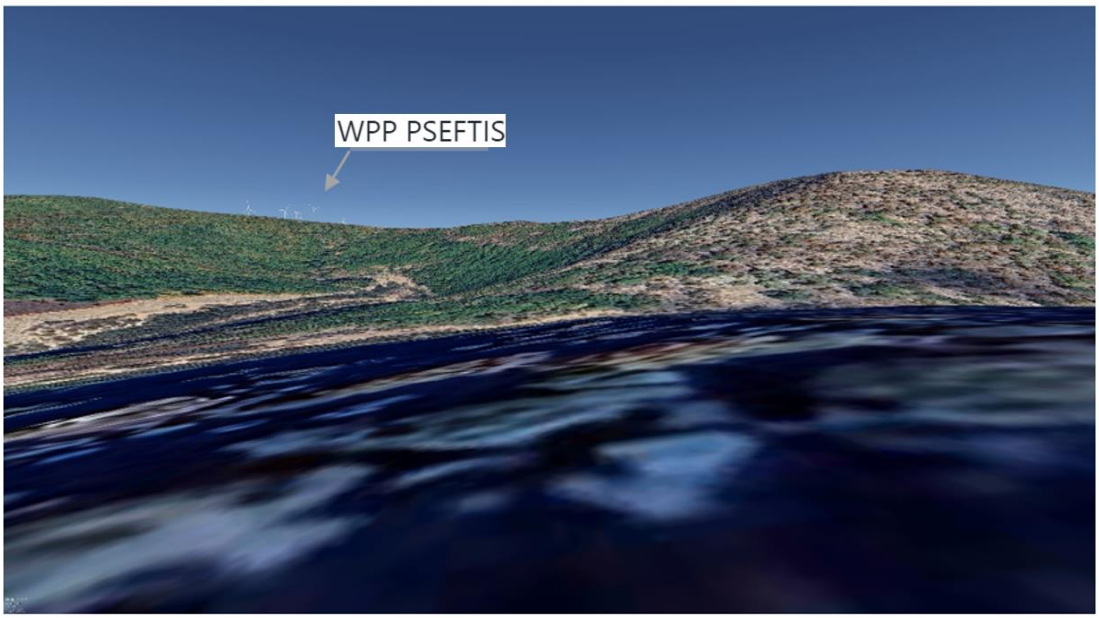


Image 69: View of the WPP from the archaeological site "Fortress Precinct, Mesimler-Kale".

There is visual disturbance only from the neighboring WPP at the "PSEFTIS" site, not from the studied WPP at the "Mavrodasos" site.

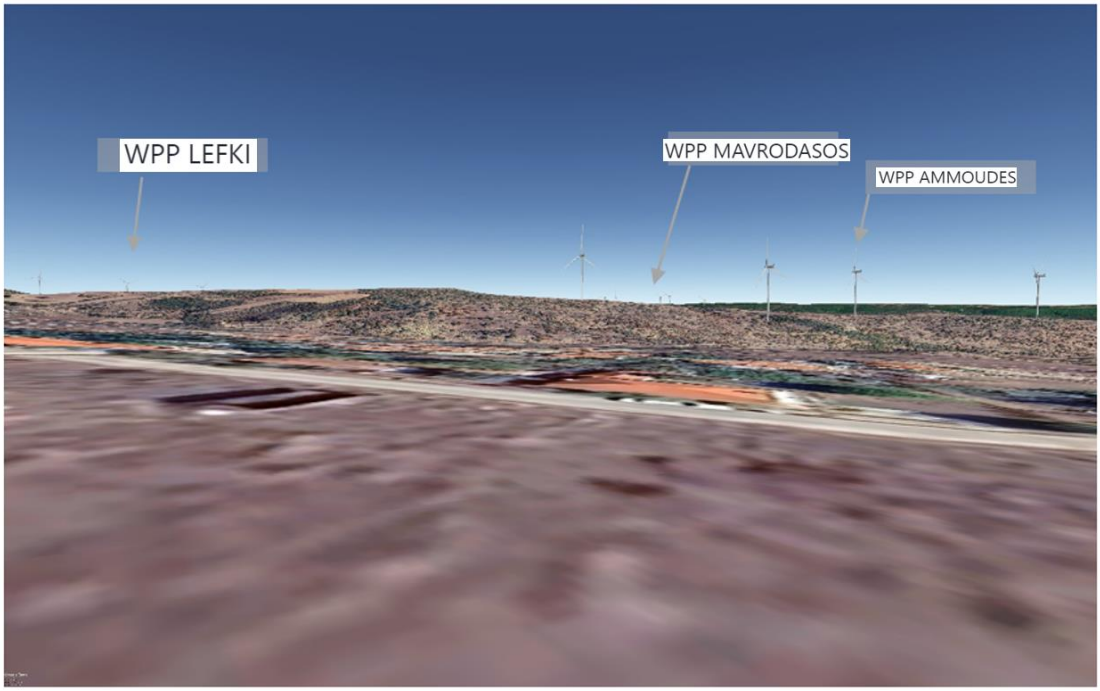


Image 70: View of the WPP from the settlement "Roussa".

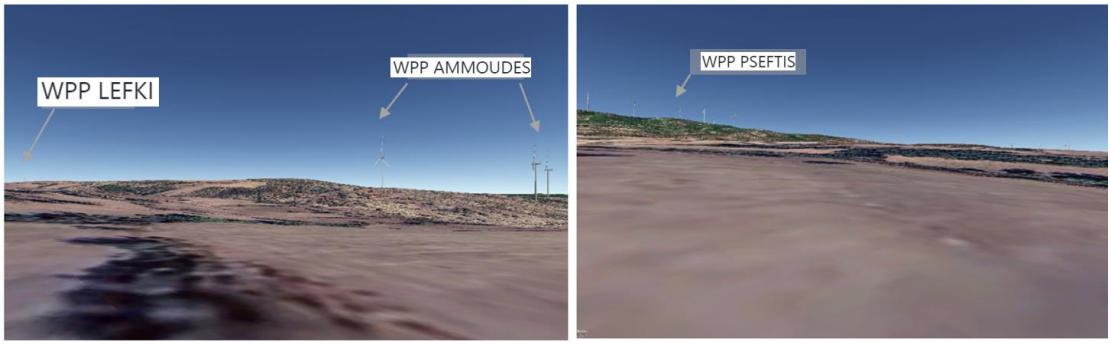


Image 71: View of the WPP from the archaeological site "Koum-Tarla (Ammohora)" in the NE and NW direction respectively.

There is visual disturbance only from the neighboring WPP at the sites "Ammoudes", "PSEFTIS" and "Lefki" and not from the WPP under study at the "Mavrodasos" site.

Image 72: View of the WPP from the archaeological site "10 Megalithic Monuments, Sand Fields of Mikro Derio" in the NE and SW direction respectively.

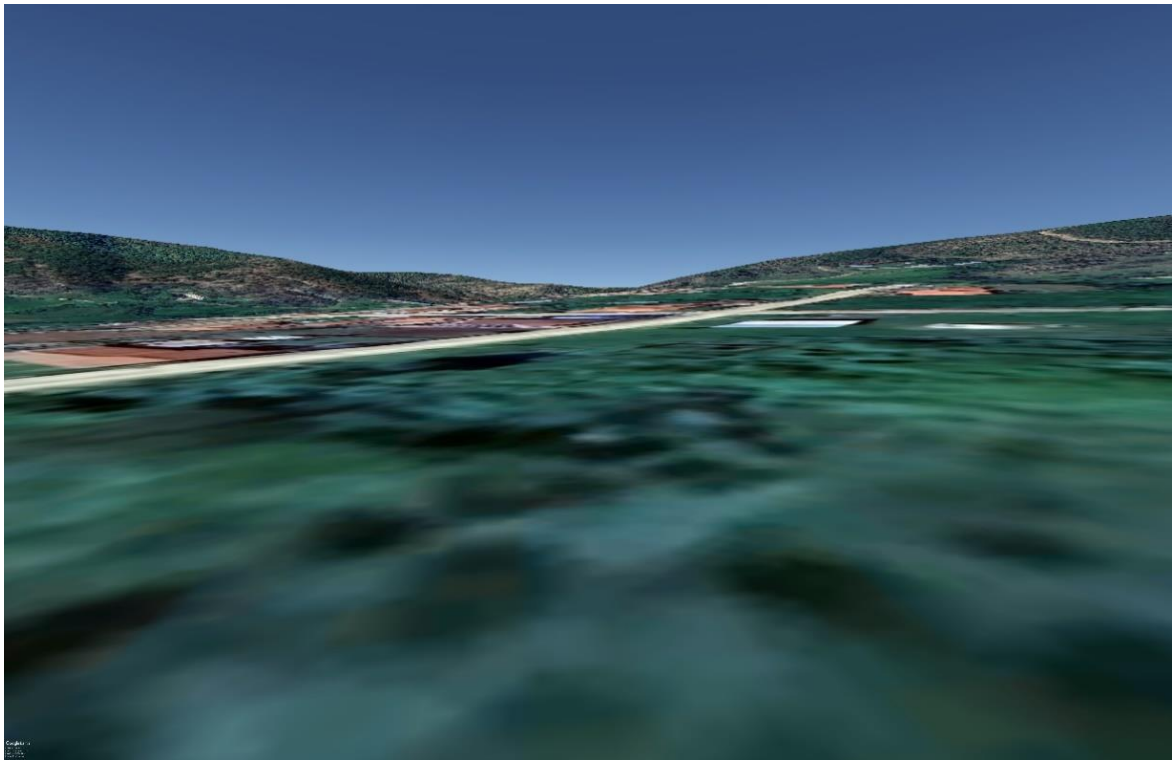


Image 73: View of the WPP from the settlement "Mikro Dereio".

There is no visual disturbance from any WPP.

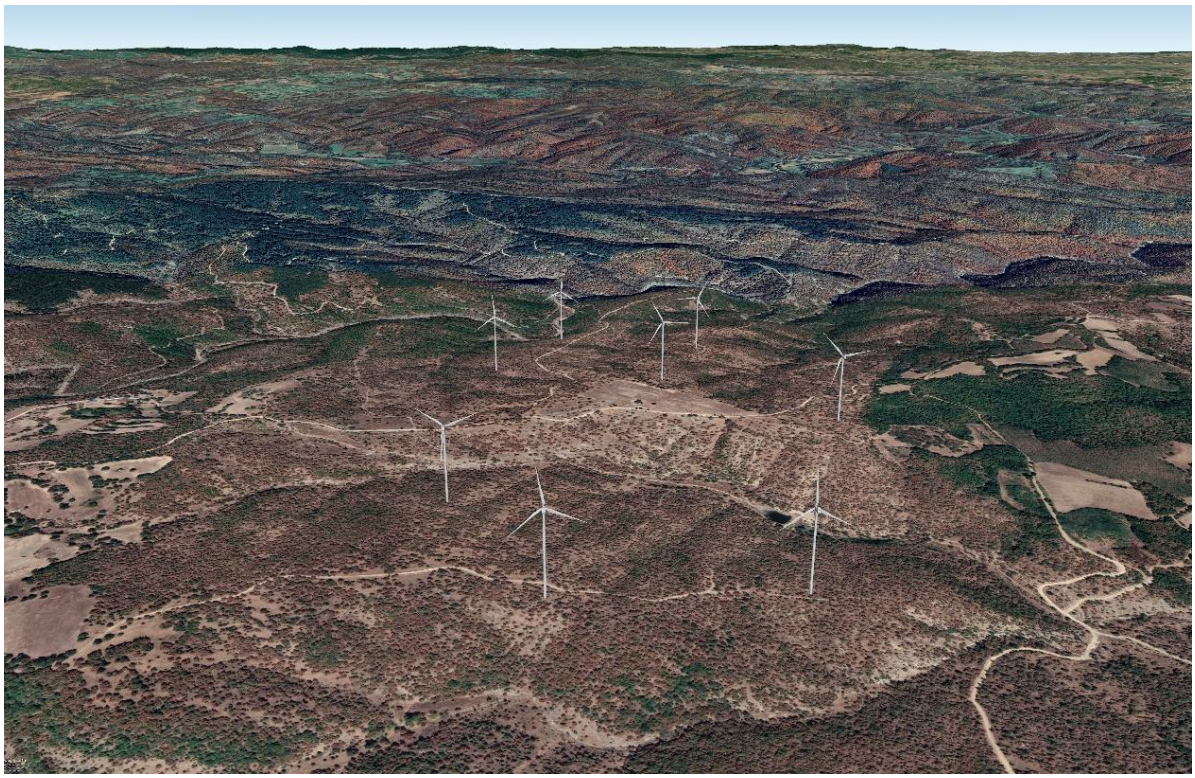


Image 74: Panoramic view of the studied WPP at the location "Mavrodasos" in a direction to the north.

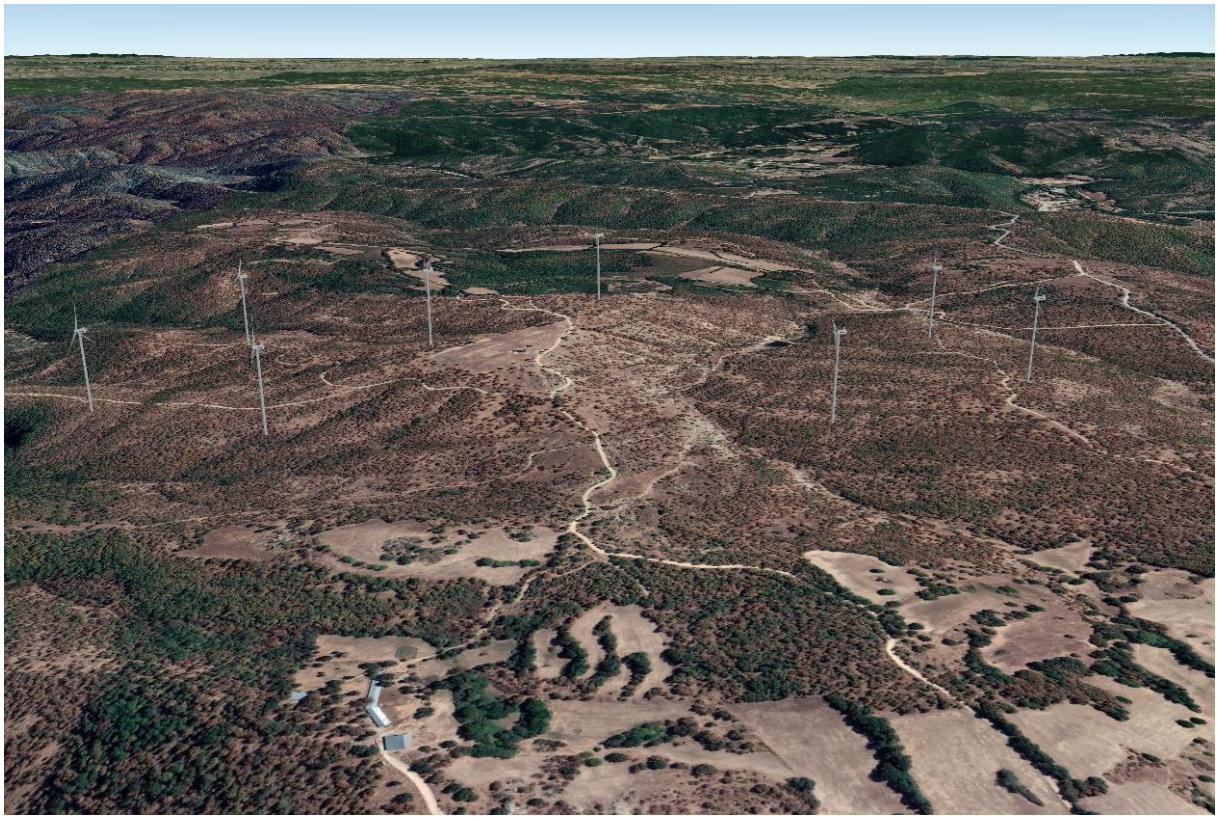


Image 75: Panoramic view of the studied WPP at the location "Mavrodasos" in an eastward direction.

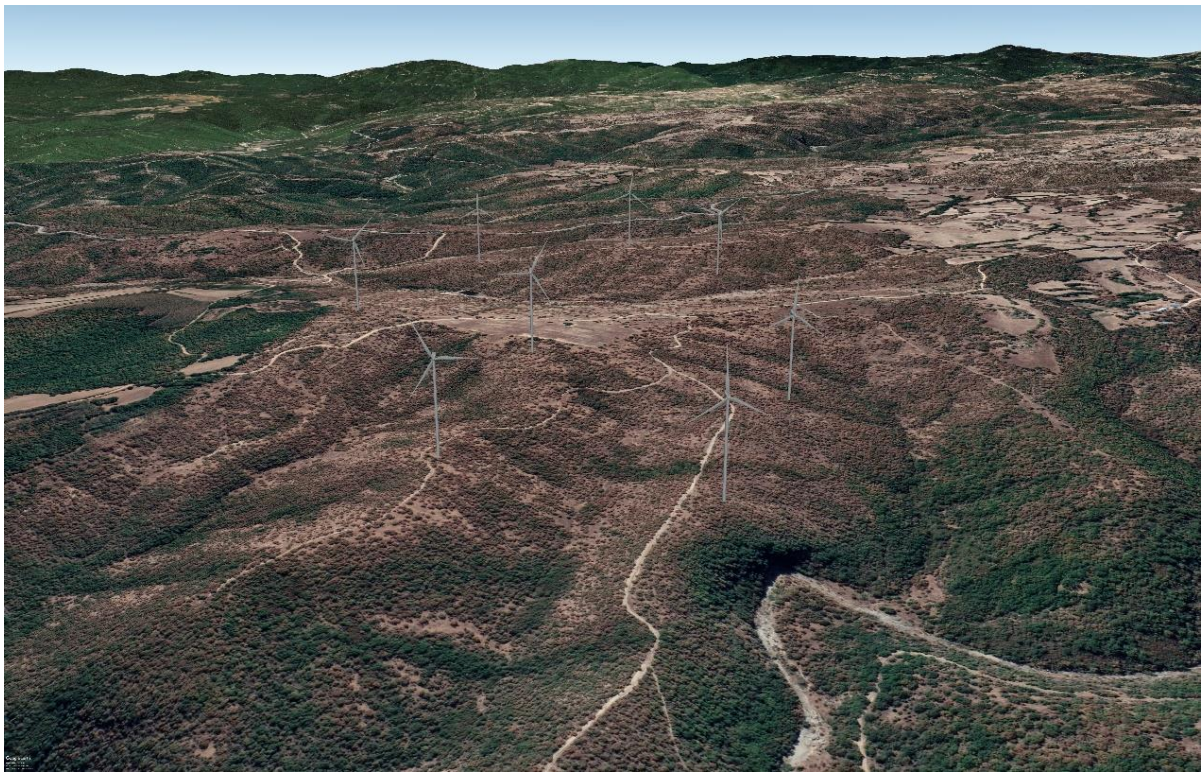


Image 76: Panoramic view of the studied WPP at the location "Mavrodasos" in a direction of shooting to the south.

Image 77: Panoramic view of the studied WPP at the location "Mavrodasos" in a direction of shooting to the west.

Considering all the above data, it is concluded that the studied project together with the neighboring WPP at the sites "PSEFTIS", "Lefki" and "Ammoudes" will not introduce any new element into the landscape of the area, since other Aircraft will already be visible from various points of the wider study area. The additional introduction of aircraft into the landscape is difficult to evaluate, since the acceptance of Aesthetically Disabled Persons is subjective. However, it is estimated that the small number of aircraft to be installed in relation to the already existing number and with the satisfaction of the carrying capacity **(Special Compatibility Issue)** will not be significantly perceived. Visually, it is considered that the Aircraft of the project together with the neighboring Aircraft of the WPP at the location "PSEFTIS", "Ammoudes" and the location "Lefki" will not affect the landscape to a significant extent.

The synergistic/cumulative impacts on the landscape are expected to ***be of medium intensity cumulative impact*** since in the project area there are already constructed WPP projects in operation. The impact is estimated to be low intensity given the photorealistic imaging with the neighboring WPP at the sites "PSEFTIS", "Lefki" and "Ammoudes" as the geomorphology of the area is such that the W/T of all four projects will not be visible at the same time beyond a few viewing positions and therefore the view of remarkable landscape elements or monuments will not be obstructed.

Project Closure:

After the termination of the operation of the wind farm (period of approximately 20 to 25 years) the wind turbines are dismantled and the equipment is transferred outside the installation site, to special areas for recycling / disposal. This obligation of the project operator is generally explicitly mentioned in the Environmental Terms of each wind farm, as well as in the SSPSDF for RES (Article 26). Thus, after the end of operation of a wind farm, the only interventions that remain in the environment are the squares (which are mostly restored), the foundations of the wind turbines and the underground electrical interconnection cables that remain buried within the ground, as well as the interconnection roads. If it is judged that a road is no longer necessary, it can be cleaned up with appropriate methods and returned for redevelopment. Therefore, any impact on landscape aesthetics is largely reversible after the end of the operation of the WPP under consideration.

Morphological and Landscape features						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	IMMEDIATE	MODERATE	MODERATE	YES	YES	/
OPERATION	IMMEDIATE	MODERATE	MODERATE	YES	YES	/
CLOSURE	/	LOW	LOW	/	YES	/

Table 54: Table for assessing the impact on morphological characteristics

9.4 Impact on Geological, Tectonic and Soil Characteristics

The expected effects on the above intervention sites mainly concern the soil characteristics of these sites and not the geotectonic. The construction works of the project do not estimate any impact on the tectonic characteristics of the immediate and wider study area, given the surface character of the interventions (shallow depths of excavations).
The total impact on the soil characteristics of the intervention sites concerns only the construction phase, since the operational phase of the project is not related to any additional intervention on the ground.

The construction of the planned project includes:

- Construction of a new road of 935.31 m length and improvement of a road of 3.363.61 m length. for access to the site "Mavrodasos", with a total length of 4.298,92 m.
- Opening of underground channels for the passage of medium voltage cables to interconnect the wind turbines with the substation of total length.
- Excavations for the foundation of the bases of the W/T.
- Construction of squares for the construction of the W/T.

9.4.1 Project Construction Phase

The changes that will take place geologically, tectonically and pedologically are mainly related to the activities that will take place during the construction of the project but will be small and will be limited to the nearby area.

The interventions for the installation of the wind turbines and the construction of the WPP such as the configuration of the squares, the opening of new internal roads and the improvement of the existing roads, in order to ensure access to the wind turbines, the interconnection of the wind turbines with the voltage lifting substation were described in detail in the description of the project under study (Chapter 6) of this study. The impact of these interventions on soil in general most of them are characterized as negative in character, with varying size (intensity) and duration, partially or fully treatable and local character in terms of their geographical range without however causing changes in the lower geological strata and tectonic characteristics of the study area.

The soil will be restored to return to its previous condition and its original height using most of the embankments created by the excavations. As the ground where the wind turbines are to be installed is mainly rocky, extensive clearing of vegetation is not expected except at specific points without causing soil erosion. There will be a temporary impact only on the soil (and not on the lower geological strata and tectonics) during the construction phase due to the presence of the construction sites and the machinery for transporting, assembling and installing the W/T and the construction of accompanying works. This effect will be weak, negative, short-term and completely reversible.

After the completion of the works regarding the foundation of the wind turbines, the opening of roads, etc., it is planned to configure the area to return to its original condition and the changes that will take place to be limited to the squares of the W/T. This is planned to be paved with the products of the earthworks so that the intervention will be limited to the internal road construction and the foundation area of the wind turbines. This also reduces the amount of waste generated and limits any further disturbances to the site.

Thus, as far as the restorations of disturbed sites are concerned, these will have as main objectives:

- The restoration of the natural environment from the damage that will be caused due to the construction of the project and the harmonious integration of the road into the landscape.
- Protection from erosion of the soil surface of embankments caused mainly by the effect of rainwater, by removing various particles from the body of the embankments and the maximum percentage of this (about 75%) is usually carried out in the first autumn and winter period after the completion of earthworks. The areas proposed to be restored are the embankment surfaces, which will be filled with topsoil.
- The restoration of vegetation which is to be removed during excavation works.

Regarding the routing trenches of the UN cables, it is planned that these surfaces will be partially coated with the materials that will be extracted during the excavation process and therefore will return to their original level. The impact on the ground from the laying of the cables is estimated to be particularly weak and local, as the works will be mild and of limited duration. They are also classified as reversible, since the entire connecting line is underground.

In addition, we can mention here that the aircraft can be installed even on seismic ground, since the dimensioning for its survival in normal stresses received by the blades and the tower during its operation is stronger than the stresses that usually occur in the event of an earthquake. All equipment withstands large earthquakes without showing damage.

It follows that the effects that are going to be caused on the relief and morphology of the soil will be weak, negative in the short term and will not cause soil instability or change in the geological arrangement of the rocks since no deep excavations will be carried out.

9.4.2 Project Operation Phase

During the operational phase of the project, no impact on the soil, geological and tectonic characteristics of the immediate and wider study area is expected. The modus operandi of the WPP is not related to any additional intervention on the ground. In addition, the operation of the project is not related to the production of hazardous liquid or solid waste, which in case of an accident could diffuse to the surface layers of the soil, causing alterations of the composition and cohesion of the surface soil mantle.

Project Closure

During the dismantling of a wind farm, the surface soil should be removed at those points where, according to the initial design, it is planned to install the cranes and temporarily store the components and other materials. The dismantling of wind turbine parts and the temporary storage of components and materials requires the formation of suitable flat plateaus. Earthworks will be carried out and the soil that will be removed from the surface of the area will be guarded for repositioning. This space will be covered superficially with gravel. At the end of the procedure, the laid gravel will be removed. The soil will be decompacted and the soil will be replaced and repositioned so that it is identical to the original composition before any intervention in the area.

Therefore, the closure of the project will have positive direct and indirect effects since restoration interventions will be carried out.

Synergistic/Synergistic effects

As far as synergistic effects during the construction phase are concerned, they are unlikely to occur as the simultaneous construction of all licensed plants is impracticable. Regarding the case of simultaneous operation of the projects under license and with a producer certificate of the study area, as well as the network of forest roads in the nearest area of installation of the W/T, during the operation phase of the project, it is not expected to have any synergistic impact on the geological, tectonic and soil characteristics of the nearest area of the project, given that, that the WPP in its operational phase, as well as its accompanying projects, do not interact with the specific abiotic factors.

Geological, tectonic and soil characteristics						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**

CONSTRUCTION	IMMEDIATE	MODERATE	MODERATE	YES	YES	/
OPERATION	/	/	/	NO	/	
CLOSURE	/	/	/	NO	/	

Table 55: Geological, tectonic and soil impact assessment matrix

9.5 Impact on the Natural Environment

9.5.1 Project construction phase

9.5.1.i Flora

The occupation of the land in the area where the wind farms will be located is the most direct impact of the construction of the WPP under study on the vegetation of the Field Research Area (ROP). The area to be covered concerns the squares, the improvements to the existing road construction and the construction sites.

The impact on vegetation comes mainly from the construction phase of the project and specifically from the removal of plant species in the area for the construction of the bases and squares of the R/F. However, as already mentioned, the area of installation of the project is occupied by oak, bushes and juniper and meadow areas. The direct impact of the construction of the wind power plants results from the occupation of part of the territories of the areas where the technical works servicing the project are located, such as the occupation zone of the internal road construction and the cables and plateaus of the wind farms. as it is necessary to clear and shape the soil within their occupation zone.

The removal of vegetation will take place at the locations where the R/W will be located and the squares around it will be formed to serve the movement of the mechanical equipment that will work for their erection and maintenance.

The removal of vegetation on the surfaces where the WPP under study is to be installed and according to the data presented in Table 78, is considered negligible both in terms of the type of vegetation and in relation to the objective of the specific project. The WPP in question falls under oak and agricultural crops. The interconnection falls within the abovementioned areas as well as areas with beech, juniper and meadows with sparse woody vegetation, while the "PATRIARCHIS" substation falls within an area of meadows.

No particularly important vegetation species is destroyed in either of the two cases examined.

The interventions to be made on the surface will be small and will be restored soon as the affected areas will be embanked, and the endemic species of the area will cover the ground again. Also, the flora of the protected area and the other areas where the wind power plants will be located is not expected to be exposed for a long time to the gaseous pollutants of the mechanical equipment and the dust that will be produced by the construction processes that will take place on the construction site, as these will be of limited duration and low concentration, since all the necessary measures will be taken, such as wetting the surfaces in order to reduce dust release, maintenance of used equipment, etc.

Vegetation, however, can potentially be affected by the discharge or leakage of liquid toxic waste such as oil and fuel from the construction site and construction machinery, which will also affect the soil, causing pollution of it and consequently of existing vegetation. For this reason, **all necessary**

measures must be taken, and the necessary equipment must be available, e.g. adsorbents, to deal with possible leaks that may occur. Overall, the Vegetation in the area under consideration is expected to be moderately adversely affected.

Overall, the vegetation of the area under consideration is expected to be negatively affected to a moderate extent. For these effects not to be characterized as permanent and irreversible, taking all appropriate protective measures detailed in Chapter 10, they are manageable and partially reversible. Regarding the time of their appearance locally they are considered long-term as the life of the project is long, However, in the wider region they are considered short-term. ***Therefore, minimal impacts on the flora of the area are expected to be caused at a point during the construction phase of the project. since Annex I of Joint Ministerial Decision 14849/853/E103/4.4.2008 are not affected, as mentioned below.***

Thus, it should be noted that the study area is not a (Special Area of Conservation) of SAC and/or SCI (Site of Community Importance) and for this reason **no habitat types of Annexes I of JMD 14849/853/E103/4.4.2008 (Government Gazette B' 645) are recorded.**

The above assessment shows that there is no substantial change in the environmental impacts compared to those examined and evaluated in the environmentally licensed project.

Synergistic / Cumulative effects

Synergistic / Cumulative effects will not occur during the construction phase as it is unlikely that all adjacent WPP will be constructed simultaneously – **worst case scenario.**

In case only the project under consideration is licensed in synergy with the existing WPP **(Synergistic Impact Study Area)** will be the limitation of the areas that will be suitable for use by bird species, such as areas or sites suitable for nesting, perches, cover, foraging, etc.

All projects, or more correctly the most significant in terms of creating negative effects, are usually located within the two polygons of the WPP, although accompanying projects, such as the access road, may extend for several kilometers outside them.

However, the already dense road network of forest roads installed within productive forests, the road construction connecting mountain settlements, villages, etc., the road network serving other purposes, such as the network of rural roads, the network serving livestock needs, etc., which often pre-exist in areas where new WPP are installed, is not easy to distinguish in terms of the impact it causes in relation to the parts of it used and as road construction of access to WPP.

9.5.1.ii Fauna – except avifauna

The impact on fauna comes mainly from the construction works of the wind farms and specifically from the earthworks, the required road improvements, the assembly of electrical installations and the erection of the W/T. The characteristics of these works are not expected to disturb the habitats of reptiles, mammals and amphibians. The interventions in the areas where the wind turbines are to be installed will be spot and cannot affect the local fauna to a significant extent.

The increased noise levels due to the works that will take place on the construction site will cause their rearrangement as they will be temporarily moved from the project area due to nuisance from the noise produced and the presence of people. However, the effects are limited to this extent and are fully

reversible and transient without leading to habitat fragmentation. **At the end of the works, however, the areas that were disturbed will be used again by the local fauna for its colonization.**

In addition, it is noted that this area does not belong to the Natura 2000 sites that are designated as SACs, SCIs and there is no record of species of Directive 92/43/EP in their Standard Data Forms. However, indicative sampling was carried out for the other fauna species of the area (except the avifauna, which is the protected object of the SPAs, and for which detailed records were made), and the presence of the species found is reflected in the Table below, with reference to their protection status.

STATUS AND STATUS OF FAUNA SPECIES OBSERVED IN THE INVESTIGATION AREA			
Latin Name	**Common name**	**Status**	
		IUCN EU	**ELL(KB)**
MAMMALS			
Order Carnivora			
Canidae			
Vulpes vulpes	Fox	LC	NE
Ferrets (Mustelidae)			
Martes foina	Petrokounavo	LC	NE
Meles meles	Badger	LC	NE
Felids (Felidae)			
Felis silvestris	Wildcat	LC	NE
Order Lagomorpha			
Lagidae (Leporidae)			
Lepus europaeus	Hare	LC	NE
Order Etartiodactyla			
Suidae			
Sus scrofa	Wild boar	LC	NE
Cervidae			
Capreolus capreolus	Roe	LC	VU
Order Rodents (Rodentia)			

Squirrels (Sciuridae)			
Sciurus vulgaris	Squirrel	LC	NE
REPTILES			
Order scaly (Squamata)			
Suborder Lizards			
Horse mackerel (Lacertidae)			
Lacerta viridis	Prasinosaurus	LC	LC
Podarcis muralis	Wallosaur	LC	LC
Anguidae			
Pseudopus apodus	Fidosaurus	LC	LC
Suborder Snakes			
Psammophiidae			
Malpolon insignitus	Sapitis	LC	LC
Order Turtles (Testudines)			
Turtles (Testudinidae)			
Testudo graeca	Graikologona	VU	LC
Testudo hermanni	Mediterranean turtle	NF	VU
AMPHIBIANS			
Order Anura			
Phrynidae (Bufonidae)			
Bufotes viridis	Green toad	LC	LC

Legend

IUCN Threat Status
EX: Extinct, EW: Extinct from their natural habitat, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern, DD: Not Well Known, NE: Not Assessed
Directive 92/43/EOK
I belongs to Annex I of the Directive (types of natural habitats of Community interest whose conservation requires the designation of sites as Special Areas of Conservation)
II: included in Annex II to the Directive (animal and plant species of Community interest whose conservation requires the designation of Special Areas of Conservation)
III: included in Annex III to the Directive (criteria for the selection of sites that may be recognized as sites of Community interest and designated as Special Areas of Conservation)
IV: included in Annex IV to the Directive (animal and plant species of Community interest requiring strict protection)
V: included in Annex V to the Directive (animal and plant species of Community interest whose capture in the wild and exploitation may be subject to management measures)
Berne Convention
II: included in Annex II of the Treaty (fully protected species and their capture, possession and killing, damage or destruction of their breeding or resting places, disturbance during the breeding, dependence and hibernation period, destruction, collection or possession of their eggs and the possession or trade in these species, whether alive or dead, are prohibited)
III: belongs to Annex III of the Treaty (protected species and establishes periods of prohibition of hunting, temporarily or locally prohibits exploitation, and regulates the sale, possession, transport or offering for sale of these species, whether alive or dead)

Bonn Convention
I: included in Annex I to the Treaty (migratory species in danger of extinction)
II: included in Appendix II to the Treaty (migratory species benefiting from international cooperation on conservation and management measures)
International Convention CITES
I: included in Appendix I to the Convention (species threatened with extinction and affected or likely to be affected by trade)

II: included in Appendix II of the Convention (species which, although not currently threatened with extinction, may become threatened in the future if trade is not strictly regulated)

III: included in Appendix III to the Convention (species for which a Contracting State declares that they are subject, within the limits of its competence, to regulation aimed at preventing or restricting the exploitation of these species and requiring the cooperation of the other Contracting States)

Table 56: Presence of species observed with reference to their protection status.

Therefore, the fauna of the area identified in the area is not significantly affected by the construction of the project and the impact of the construction of the WPP on the fauna of the area can be considered ***weak, of short duration and partially reversible after the completion of the works.***

Synergistic / Cumulative effects

During the construction phase there will be no synergistic effects on fauna as it is not feasible to build all wind farms at the same time.

9.5.1.iii Avifauna

During the construction phase of the WPP and due to the increased noise level, the increased human presence and the emission of dust and pollutants, the bird species in the immediate vicinity of the project will be forced to move to adjacent areas, which occupy a large area in the wider area and have similar habitat characteristics. At the end of the construction phase of the project, the bird species will return to the W/T area.

The impact during the construction phase on avifauna will mainly come from:

- **direct habitat loss** assessing the magnitude of the impact of direct habitat loss of significant birds on those populations. During the construction phase, habitat loss is not expected to occur as the availability of such habitats is high in the project site.
- **disturbance and barriers to movement** where it is assessed based on an assessment of the magnitude of the impact on populations that live at least for some time (reproduction, wintering, feeding area) in establishment from the possible displacement of some individuals. During the construction phase it is estimated that the disturbance to the avifauna will be weak as

- The intervention within the production license polygons will be less than their total area and only the areas within it that will be used for the installation of each wind turbine (foundation A/F, infrastructure works) will be affected.

- The opening of access roads will not be particularly large due to the use of the existing road network of the wider area and will be limited only to the parts of the new openings to connect the existing network with the locations of the wind turbines.
- Its wider area will not be fenced, the nuisance will be of short duration and intensity and finally reversible after the completion of the works.

Impact assessment of accompanying projects

Regarding the accompanying works, the works that are placed within the two polygons of construction of the WPP, such as the control center that will be constructed in the area of the two polygons for the installation of the wind turbines, it is considered that no special mention is required since the important construction in the area is the wind turbine itself and any effects mentioned in the bibliography concern them.

The effects that can be created on the environment by accompanying works are caused by wiring and power lines, which can hinder the movement and flight of different bird species and cause bumps. Based on studies of the international bibliography, accidents and losses of individuals of avifauna species from collisions with power cables have been recorded. Most of the incidents recorded concern cases of collisions with high-voltage cables or collisions with pillars of high-voltage cables rather than medium-voltage cables. In this wind farm, it is proposed to connect underground to the grid or, if this is not technically feasible, to connect it to existing power lines passing near the wind farm under study. In any case, in this wind farm, the option of underground connection is given, as the underground cables are always proposed as a measure to prevent impacts on avifauna and the environment in general.

Based on the above data, it is estimated that the wiring for the transmission of the generated electricity will not create any risk to the avifauna of the installation area and to the species that comprise it and will not harm the conservation objectives of the site and its integrity.

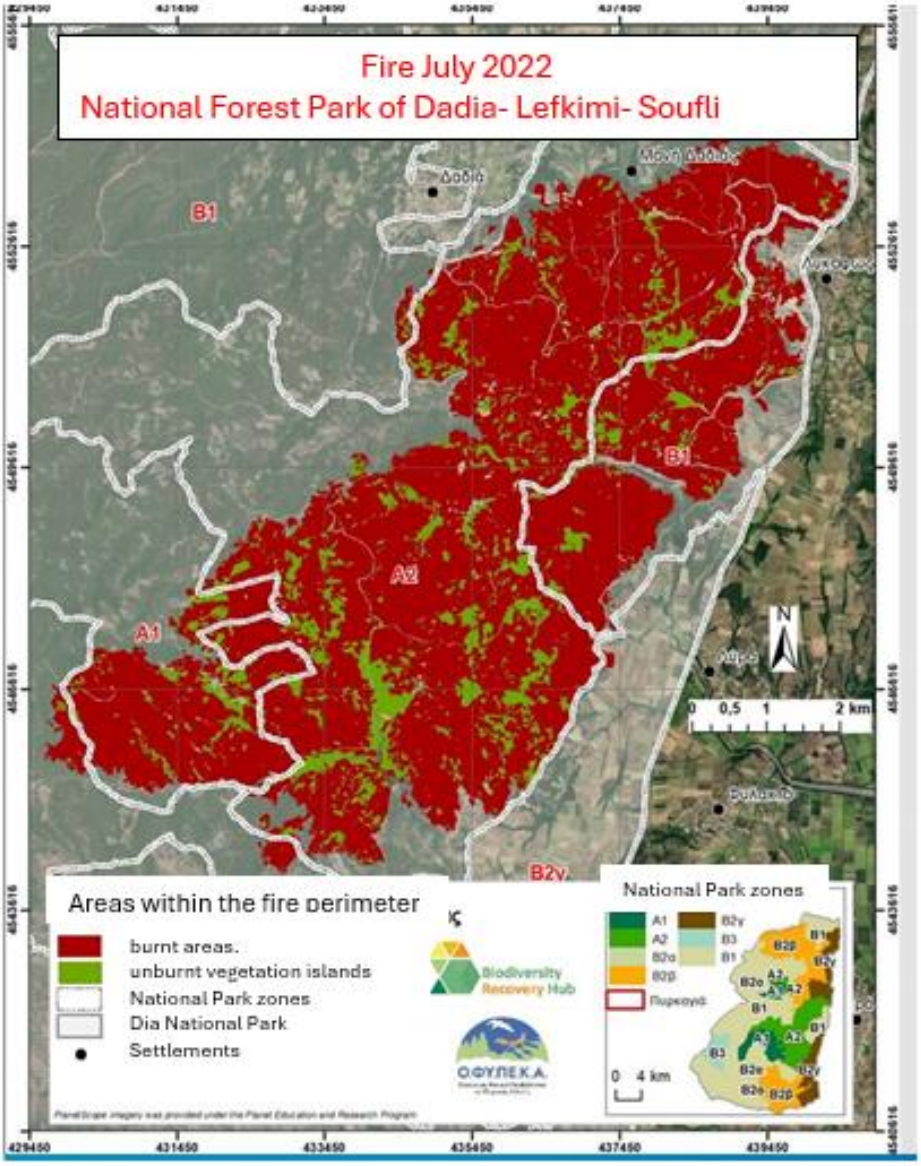
As far as the access road is concerned, it is true that the existing road network of the area will be used and very small internal network openings will be made for access to wind turbines, while the improvements of the existing road network will be very small, as it is a developed network mainly due to livestock farming (Map 109 of the SEA).

Therefore, the accessibility of the site will not be burdened with the installation of WPP and will not be less than the situation before the construction of the project. For the new opening section, however, measures will be proposed in order (although its length is clearly limited) to avoid any additional burden from the movement of the public that includes any work without significant reason in WPP.

Assessment of the impact of forest fires

The results of the 2022 fire season find Dadia National Park almost 46,000 acres poorer. During the forest fire of Evros, part of the National Park was burned despite the large extinguishing operation of the fire brigade.

The zones of the National Park that were most affected were A2 with 26,367 acres burned, while in the critical zone A1 with the highest density of Black Vulture nesting sites, the fire affected 4,590 acres.



Map 48:Mapping of the forest fire in Dadia National Park in 2022 of OFYPEKA (source: https://necca.gov.gr/nea-anakoinoseis-deltia-typou/i-epexergasia-doryforikon-eikonon-poly-ypsilis-chorikis-analysis-3-metra-apo-to-post-fire-biodiversity-recovery-hub-tou-o-fy-pe-k-a-meta-tin-katasvesi-tis-pyrkagias-sto-ethniko-parko-dadias/)

The big fire destroyed a large part of the SPA area GR1110002 called Dadia – Soufli Forest, but because it was mostly creeping, several trees were saved. About half of the acres (22,500 acres) were burned to the ground, while the rest concerned the vegetation located on the forest carpet, so the trees were not affected. The destruction of the strict protection zone of the SPA amounts to 80%.

Based on the relevant interview given to iEidiseis (23-07-23) we conclude that the mapping of the damage to the avifauna is expected to be significant, although the Golden Eagle's nest within the burnt area was not affected, the habitat of large raptors has changed radically. The breeding and cover areas have been stripped down, while foraging is also a problem as there is no assessment of the impact of the fire on the rest of the fauna in the area.

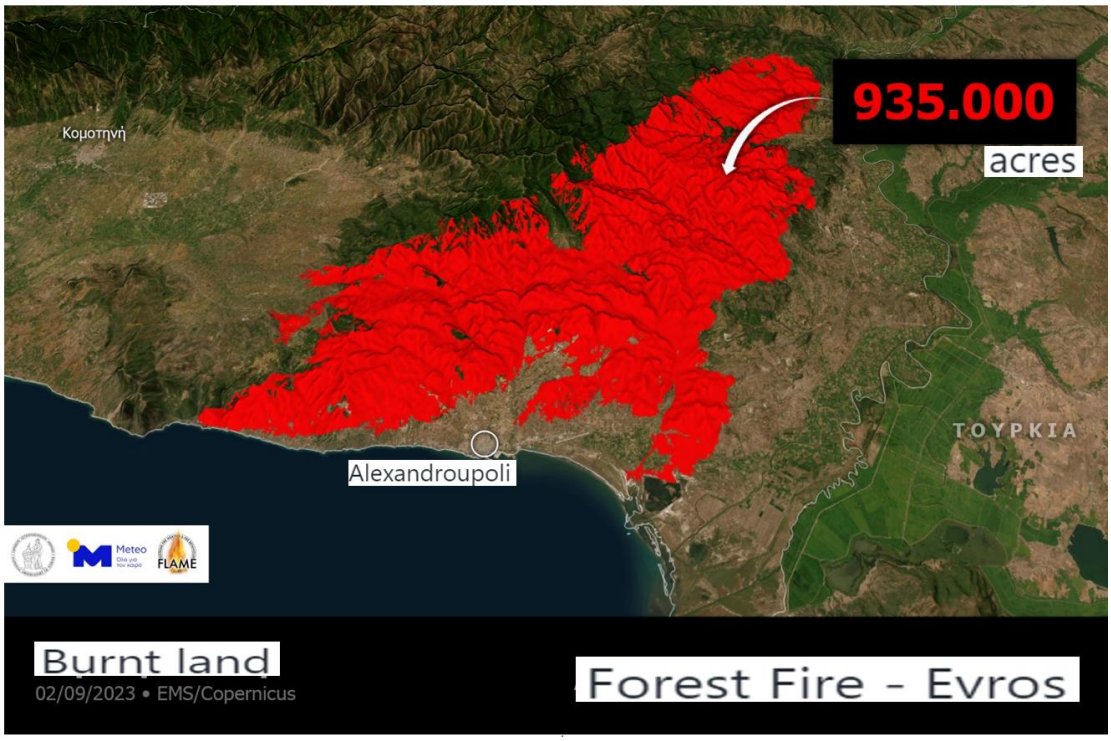
The planned project is not expected to burden the study area with further impacts. During its construction phase, the continuous presence of human resources can contribute to case of a fire, since they will be able to immediately perceive it and inform the competent services, while the accompanying works of WPP, such as the opening and improvement of the forest road, will be able to help the work of the fire brigade in access to the forest.

It is important to refer to the incalculable ecological disaster that hit Alexandroupolis and Dadia in August 2023 with the burned areas being from the total 935,000 acres of burned area, approximately:

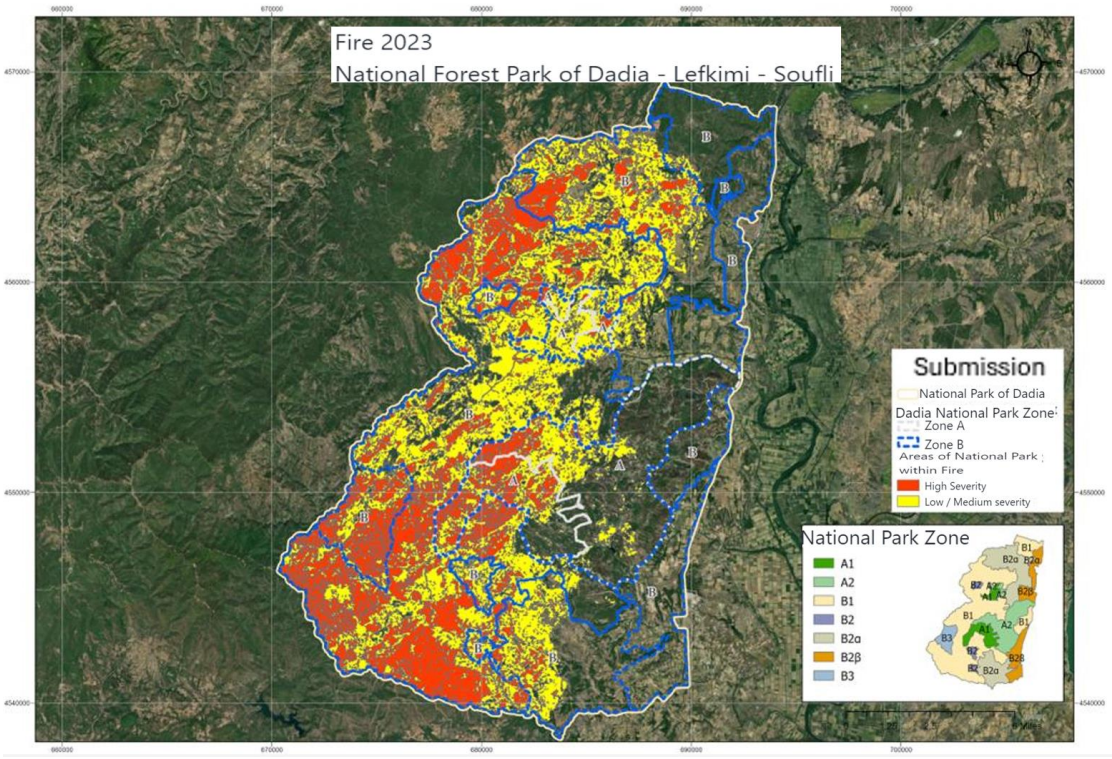
- 440,180 acres concern forest areas (47%).
- 318,700 acres concern shrubland (34%).
- 81,140 acres concern agricultural land (9%).

The Evros forest fire was recognized as the largest mega-fire of the last 21 years in Greece. The black pine forest that was destroyed was an important habitat for birds of prey, the pleasant scenario is that they have fled while the worst is that they have burned. It takes 100 to 150 years for the unique forest of Dadia to recover, since the soil composition of the burned area is expected to change, as mud and ash will subsidence with rain, while erosion and flooding will be a major problem, and the reduction of soil quality will be inevitable. Anti-flood and anti-corrosion measures are a necessity to have as little impact as possible.

The complete destruction of the habitats of the Black Vulture, the Egyptian Vulture and the Griffon Vulture will lead to the radical redistribution of the species, with the most plausible scenario being their departure to the northernmost forests of the Balkans, mainly Bulgaria, which provide similar habitats. Due to the spatial nature of the above species and the large territories they reach, it is almost certain that they will not be integrated into the neighboring SPAs GR1130011 and GR1110010, whose influence from the adjacent forest fire will be a temporary change in air quality due to smoke and soil due to ash. The overall assessments and the future condition of the affected area will have a significant negative impact on the Northern lung of Greece, such as the forests of Evros. A forest fire increases by 7 times the risk of flooding, by 4 times the risk of soil erosion and by 3 times the risk of landslides, while all this contributes to the advance of desertification and of course to the further acceleration of temperature increase. In other words, a vicious circle whose speed of development is constantly increasing.



Map 49: Burnt areas from the fire in Evros (source: https://www.meteo.gr/article_view.cfm?entryID=2907)



*Map 50: Impact of the fire in the Dadia - Lefkimi - Soufli Forest National Park (source: https://necca.gov.gr/nea-anakoinoseis-deltia-typou/o-ofypeka-sti-sxedia-2-2/)***Finally, it is noted that the project under examination does not belong to the above-mentioned burnt areas and is located at a very long distance, namely about 14 km in a straight line, while various geomorphological elements are inserted. The project will not affect the habitats of the**

Dadia Forest area. Therefore, the fact of fire does not need to be considered in the impact assessment of the study.

Synergistic / Cumulative effects:

If all the licensed WPP are licensed in synergy with the existing *WPP (worst case scenario),* the consequences are related to the construction works of these and their accompanying infrastructure. The nuisance effect will last for a limited period, so any potential impact will be ***short-term, non-periodic and reversible.***

9.5.2 Operational phase

As can be seen from all the above, the construction phase of the WPP under study will have overall small to moderate negative impacts, direct and indirect, both on the ecosystem, on the ecosystem functions in the flora and fauna of the area. However, all these impacts **are expected to be localised, not to fragment priority habitats and vital for maintaining ecosystem cohesion; since they have a short-term character (for as long as the construction of the WPP lasts) and are mostly immediate**. Some of them have a permanent character, such as the construction of the squares of the A/F. Finally, some of the consequences are manageable after taking the necessary measures.

9.5.2.i Flora

During the operation phase of a wind power plant, no emissions of gaseous, liquid or solid waste are expected to have a negative effect on the flora and fauna of the area.

The areas that underwent changes during the restoration of the project will be restored to their original condition by phytotechnical interventions. The habitats of the area will not be negatively affected as, as mentioned above, it will be possible to repopulate the species of the area in almost the entire area affected in the immediate study areas and not occupied by technical works.

From the surfaces that will be disturbed, the embankment slopes will be restored, the temporary interventions (widenings, etc.) and specifically, out of the 106.993.22 sq.m., 35.369.89 sq.m., which constitute 33.05% of the total disturbed surface, will be restored, while the 71.623.33 sq.m., which constitute 66.95%, will remain landscaped, therefore without forest vegetation.

Therefore, neutral impacts on flora and habitats are expected during the operational phase of the project.

Synergistic/Cumulative effects

In order to carry out the assessment of this paragraph, certain assumptions were used, such as that the total area located within the polygons of the WPP under licensing of the area, is an area that will be lost to avifauna (very strict approach) despite the fact that the habitat loss sizes will be much smaller than these as the intervention within the polygons occupying the WPP will be much smaller (about 5-10% of the polygons). The above was considered appropriate to assess with this strict approach, as it was not possible to accurately estimate the percentage of responsibility of each WPP in increasing the density of the road network (since it is not known which route will be followed for each planned WPP, whether it will follow an existing road construction or a new opening, etc.).

Best case scenario - Estimation of habitat loss calculation (in ha), in case that out of all the WPP under authorisation (under production) only the project under study is authorised, in synergy with the existing WPP, within the examined overall synergistic impact study area.

In case only the project under consideration is licensed in synergy with the existing WPP with an operating license, the flora and vegetation species will be deforested in the areas that will be occupied by the project under study (best case scenario).

The following table illustrates the low percentages of area that may be affected due to habitat loss in the whole synergistic impact study area.

Corine land cover 2018 codes explained	Corine land cover codes 2018	Coverage area throughout the synergistic impact study area (ha)	Area of habitat coverage of the polygons of the existing WPP and the polygon of the WPP under study within the entire synergistic impact study area (ha)	Estimated percentage of area likely to be affected by habitat loss (% of each habitat of the entire synergistic impact study area)
Discontinuous urban fabric	112	51,93	0,00	0,00
Industrial and commercial zones	121	109,29	20,82	19,05
Non-irrigated arable land	211	2017,77	0,00	0,00
Meadows	231	195,32	0,00	0,00
Compound crops	242	375,62	0,00	0,00
Land mainly used for agriculture along with significant parts of natural vegetation	243	9953,51	24,56	0,25
Broadleaf forest	311	23385,54	223,35	0,96
Coniferous forest	312	5979,40	83,57	1,40
Mixed forest	313	7500,77	0,08	0,00
Natural pastures	321	6899,88	471,38	6,83
Sclerophyllous vegetation	323	25092,14	100,56	0,40
Transitional woodland and shrublands	324	2316,61	77,51	3,35

Beaches, dunes, sandy beaches	331	56,16	0,00	0,00
Areas with sparse vegetation	333	2407,08	121,09	5,03

Table 57: Estimation of habitat loss in (ha), in case that out of all the licensed WPP (under production), only the project under study is authorized, in synergy with the existing WPP, within the examined overall synergistic impact study area (best case scenario).

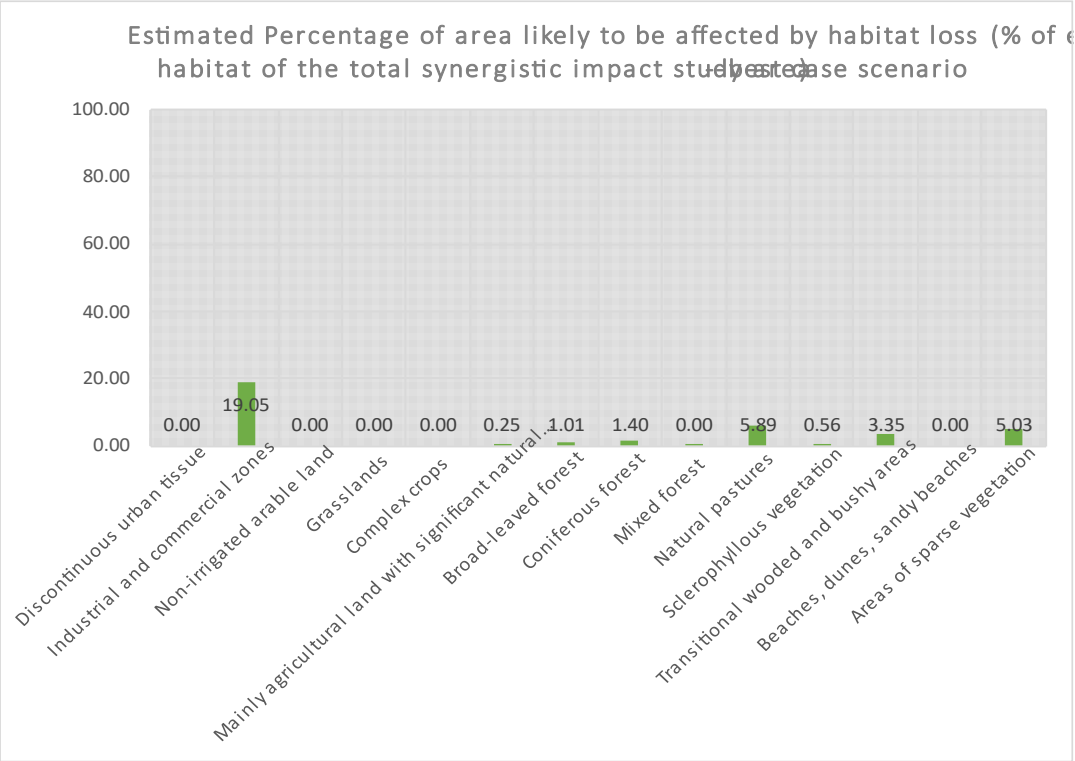


Image 78: Estimated percentage of area likely to be affected by habitat loss (% of each habitat of the total synergistic effect study area).

As can be seen from the graph above, the estimated percentages of area that may be affected due to habitat loss are low and are observed only in specific habitats such as industrial and commercial zones, natural pastures, sparse vegetation areas, transitional woodland and shrubland, coniferous forest, broadleaf forest, sclerophyllous vegetation, land mainly used for agriculture together with significant parts of natural vegetation and mixed forest. Given that after the end of the construction works the areas are expected to be restored to some extent by natural processes as well as that the project is located within habitats that abound throughout the synergistic impact study area, there will be little impact on habitat degradation in the study area and the wider area.

Worst case scenario - Consideration of habitat loss calculation in case of approval of all authorised WPP (licensing phase under production), in synergy with existing synergistic effects study within the considered overall area

As far as habitat types are concerned, if all adjacent WPP are authorised **(worst-case scenario) (see EDA), the impacts could be more aggravating.** Specifically, according to the following table, which is also reflected in the Special Ecological Assessment, the contribution to habitat losses is calculated,

in case the project under consideration will operate in synergy with the adjacent WPP under licensing (existing and under production).

Corine land cover 2018 codes explained	Corine land cover codes 2018	Coverage area throughout the synergistic impact study area (ha)	Area of habitat coverage of all polygons of existing and licensed WPP (under production) within the entire synergistic impact study area (ha)	Estimated percentage of area likely to be affected by habitat loss (% of each habitat of the entire synergistic impact study area)
Discontinuous urban fabric	112	51,93	0,00	0,00
Industrial and commercial zones	121	109,29	20,82	19,05
Non-irrigated arable land	211	2017,77	129,37	6,41
Meadows	231	195,32	0,00	0,00
Compound crops	242	375,62	0,00	0,00
Land mainly used for agriculture along with significant parts of natural vegetation	243	9953,51	756,72	7,60
Broadleaf forest	311	23385,54	1134,54	4,85
Coniferous forest	312	5979,40	406,71	6,80
Mixed forest	313	7500,77	38,61	0,51
Natural pastures	321	6899,88	730,49	10,59
Sclerophyllous vegetation	323	25092,14	1046,69	4,17
Transitional woodland and shrublands	324	2316,61	157,38	6,79
Beaches, dunes, sandy beaches	331	56,16	0,00	0,00
Areas with sparse vegetation	333	2407,08	563,99	23,43

Table 58: Estimation of habitat loss (in ha), in case of approval of all authorised WPP (licensing stage under production), in synergy with those existing within the considered overall synergistic impact study area (worst case scenario)

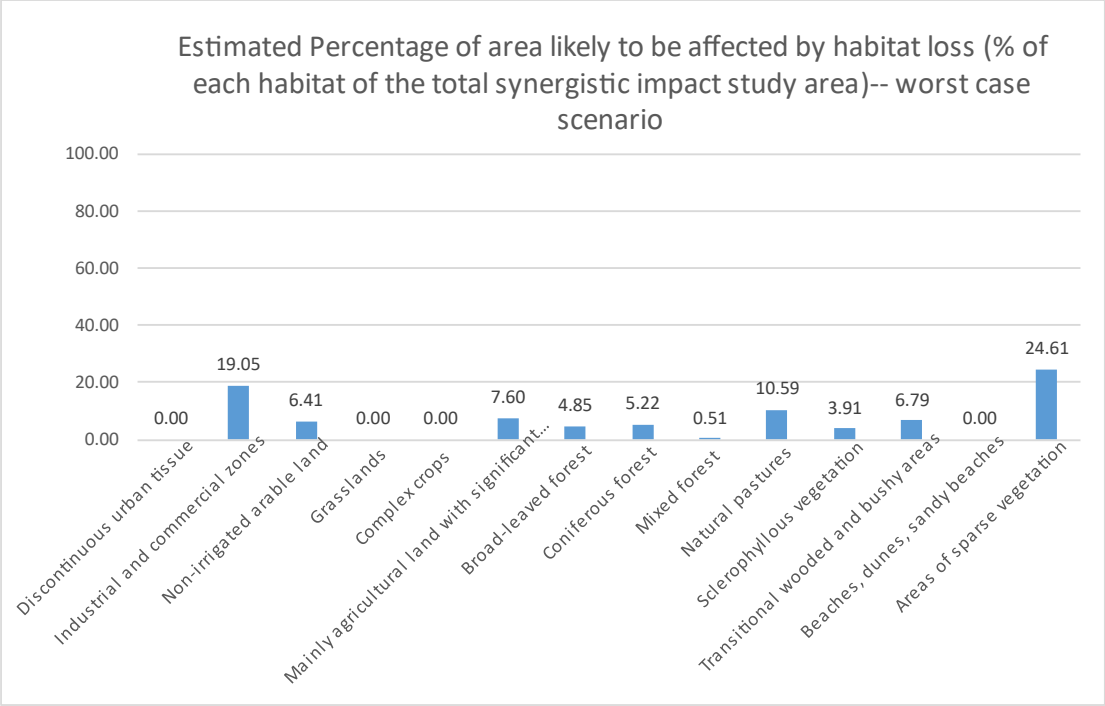


Image 79: Estimated percentage of area likely to be affected by habitat loss (% of each habitat in the total synergistic impact study area)

As can be seen from the graph above, **the estimated percentages** of area that may be affected due to habitat loss **are higher than in the previous scenario - best case scenario**. The percentages of land again observed are only in specific habitats such as sparse vegetation, industrial and commercial zones, natural pastures, transitional woodland and shrubland, coniferous forest, broadleaf forest, sclerophyllous vegetation, land mainly used for agriculture along with significant parts of natural vegetation and mixed forest.
However, most of the habitats abound in the study area and the wider area and given that the WPP is located within these habitats, the project will have very little impact on habitat loss/degradation in the study area and the wider area in general.

9.5.2.ii Fauna – excluding avifauna

During the operation phase of the wind farm, the noise production from the wind turbine and its lighting for flight safety reasons may cause the removal of part of the fauna from the station area. However, as the area where the wind turbine is installed is not fenced, there can be no isolation or reduced mobility of terrestrial fauna in the area. The removal of small mammals and reptiles is expected.

Therefore, we can consider that the potential impacts that will arise during the operation phase of the project on the fauna of the area are ***moderate, short-term and partially reversible.*** It is expected to remove sensitive species, such as small mammals, and rearrange them at short distances from the sites of noise and light sources, as they are nuisance factors for these animal populations.

9.5.2.iii Avifauna

Assessment of the impact on the main species

Here, it should be noted that the evaluation, measurements and calculations of habitat losses that took place in the SEA and in the present EIA, were based on the initial design of the project, which provided for one (1) polygon with a design of ten (10) A/Γ, according to no. 995/2022 Decision amending No. 2000/2021 Producer Certificate (License Registration No. RAE AD-07000). Thus, following the then estimates for the wider environment and more specifically the impact on the avifauna of the area, the results are reflected more fully and reliably. Therefore, the quality of the final information provided by the attached SEA leads to the conclusion that the issue of impacts is covered more multifaceted, resulting in more reliable environmental impact assessments.

Therefore, the data resulting from the investigation regarding the specific criteria for the WPP can be considered magnified, resulting in the understanding and management of the issue of biodiversity protection, which consists of a complex network of factors of ecological, social, technological, economic and cultural nature. What we ultimately know is the conclusion that the degree of influence of avifauna depends significantly on the characteristics of the area, such as the habitats of the species, the weather conditions, its community, its size and the seasonal dynamics and the position of the area in relation to the migratory routes. In conclusion, therefore, the large, quantified conclusions regarding the magnitude of the impact on the avifauna of the area and not only, are capable of leading to safe estimates of the effects under examination, ultimately providing sufficient information.

From the analysis of the field recordings listed in the attached SEA, and summarized in the following paragraphs, it is considered that the construction and operation of this WPP, theoretically, may have an impact on bird species that are sensitive to such constructions and projects.

Below is a Table presenting the recordings of raptor species as well as the species considered as ***"important" for the field research area***, the frequency with which these species were observed in the survey and study area and the months during which they were recorded. It is noted that the Table results from the daily and monthly logbooks of the field research.

As important species for the area, the species observed in the field research area are recorded in the table below and are either species of characterization or delimitation of the main SPA under study GR1110010, or of the SPPE GR003 under study (within which the project under study is located), or are species of characterization of the nearest Greek SPA GR1130011 and the nearest SPA GR008, either they are species of interest (as they were selected in a previous section from all the protected areas under study) or are included in Annex I of Directive 79/409/EEC, as codified by Directive 2009/147/EC.

Field measurements show that 14 species belonging to Annex I of Directive 2009/147/EC were identified in the area. Of the above species, 11 are species of interest, while the species ***Curruca crassirostris, Curruca melanocephala, Oenanthe hispanica, Picus viridis*** and ***Strix aluco*** were also observed which, although not species listed in Annex I of the above Directive, are included in the table below, as they are species of interest **(types of characterisations of the SEA under study).**

Thus, for the assessment of the impact on birds, the following Table was compiled, which presents the estimates of the sensitivity of avifauna in wind farms based on EU guidelines and data (European Commission 2010). **The assessment based on the observations and field recordings mentioned in the attached EDA is also presented**. The assessment results from all field data and their analyses, as presented in the EDA section "Analysis of recordings of important species (species listed in Table 30 of the EDA) - Impact risk assessment".

Kind	Total item recordings	Months (numerically: e.g. 1=January)
Aegypius monachus	16	7/2020, 8/2020, 9/2020, 3/2021, 4/2021, 6/2021
Aquila chrysaetos	2	4/2021, 5/2021
Caprimulgus europaeus	2	5/2021, 6/2021
Ciconia nigra	1	8/2020
Circaetus gallicus	9	7/2020, 8/2020, 9/2020, 4/2021
Circus cyaneus	1	11/2020
Clanga pomarina	2	8/2020, 4/2021
Coracias garrulus	1	5/2021
Falco peregrinus	2	11/2020
Gyps fulvus	14	7/2020, 8/2020, 10/2020, 3/2021, 4/2021
Hieraaetus pennatus	5	7/2020, 4/2021, 6/2021
Lanius collurio	7	7/2020, 8/2020, 6/2021
Lullula arborea	5	11/2020, 12/2020, 2/2021, 6/2021
Pernis apivorus	3	8/2020, 5/2021
Curruca crassirostris	1	5/2021
Curruca melanocephala	3	7/2020, 4/2021, 6/2021
Oenanthe hispanica	2	7/2020, 6/2021
Picus viridis	1	12/2020
Strix aluco	2	10/2020, 11/2021

Table 59: Important bird species meeting the criteria for further analysis

Kind	Number of individual journeys	Person crossings per hour of raptor observation	Crossings within Zone A (Outside the Direct Impact Zone)	Crossings within Zone B	Crossings within Zone C	**Crossings within a Direct Impact Zone**
*Aegypius monachus**	24	0,148148148	7	2	5	3

Kind	Number of individual journeys	Person crossings per hour of raptor observation	Crossings within Zone A (Outside the Direct Impact Zone)	Crossings within Zone B	Crossings within Zone C	**Crossings within a Direct Impact Zone**
*Aquila chrysaetos**	2	0,012345679	1			
Ciconia nigra	6	0,037037037	6			
*Circaetus gallicus**	14	0,086419753	3	5		
Circus cyaneus	1	0,006172839			1	
Clanga pomarina	2	0,012345679	2			
Falco peregrinus	2	0,012345679		2		
*Gyps fulvus**	20	0,123456790	5	10	2	
*Hieraaetus pennatus**	5	0,030864197		1		1
*Pernis apivorus**	3	0,018518518		1	1	

Seven individual crossings of Aegypius monachus, one individual crossing of Aquila chrysaetos, six individual crossings of Circaetus gallicus, three individual crossings of fulvus, three individual crossings of Hieraaetus pennatus and one individual crossing of Pernis apivorus, were made outside the Zones of Impact with the wind turbines of the WPP under study (distance more than 2 km from the installation site of the nearest wind turbine of the project under study).

Table 60: Data from flight analysis of major predators in the area.

The graph below records for the important species of raptors and other large species observed in the area, the number of their passages, the number of their passages per hour of observation of raptors (and other large birds), as well as the number of their recorded movements per zone of influence A, B and C and the number of their movements in the zone of direct influence.

- **Zone A,** *which covers 250 meters* on either side of the project's development axis and within this area, *predators may be negatively affected by the project because it increases the chances of nuisance and impact.*
- **Zone B**, *which starts at 250 meters and reaches up to 1000 meters* from the development axis of the project, with avifauna being *less affected within it than in Zone A.*
- **Zone C,** *which starts from 1,000 meters and reaches up to 2,000 meters* from the development axis of the project, which in terms of risk and nuisance gradation is even milder than that of Zone B, is however estimated for large or birds of prey *as their territories are large and can be affected by the project theoretically and within it.*

The Direct Impact Zone was defined as the zone of radius 100 m from the installation site of each wind turbine, at a height of 30 to 150 m, which is the height at which the blades of wind turbines rotate and is considered the zone of highest risk of impact of birds of prey.

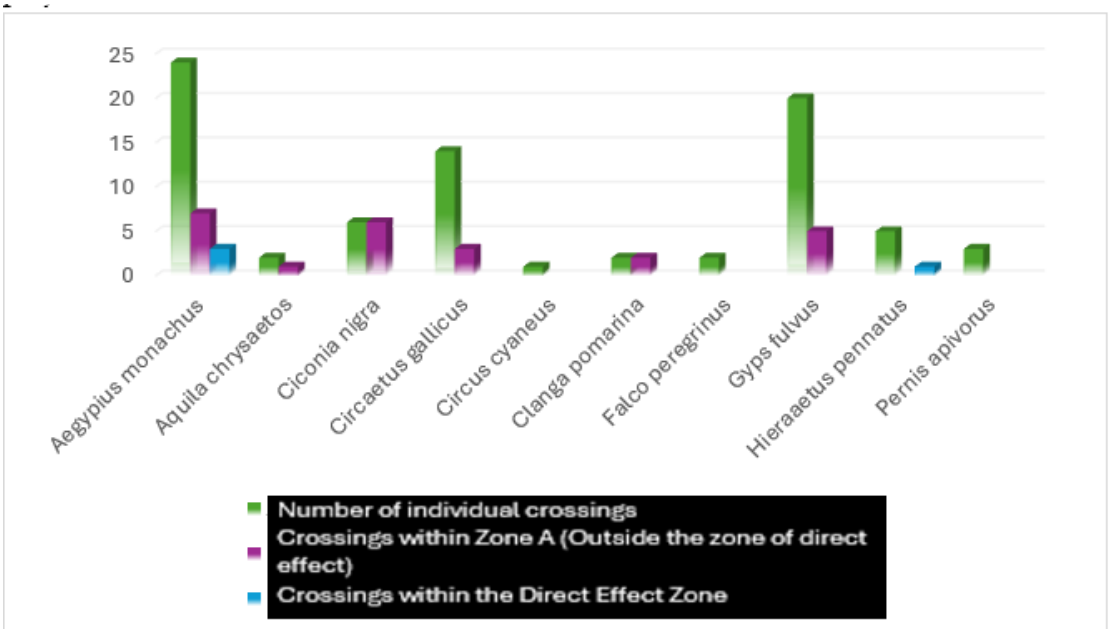


Image 80: Total number of movements of significant predators and movements in Zone A and the Direct Impact Zone of WPP.

The mapping and results from the above diagram for each species are recorded in detail in the Special Ecological Assessment.

Even though the research and drafting study team of the SEA, due to the sensitivity of the wider neighboring area of the Dadia-Lefkimi-Soufli Forest, extended the duration of the measurements, it was still not possible to calculate for some raptors the probability of collision with the wind turbines to be installed due to their zero passage through the zone of direct impact. This fact, although it clearly indicates the very low probability of collision of the above predators in the WPP to be installed, in no way makes the above probability zero.

For this reason, the recording of the impact assessment by the study group for the studied WPP is more rigorous than that which would result from the individual analysis of the field data.

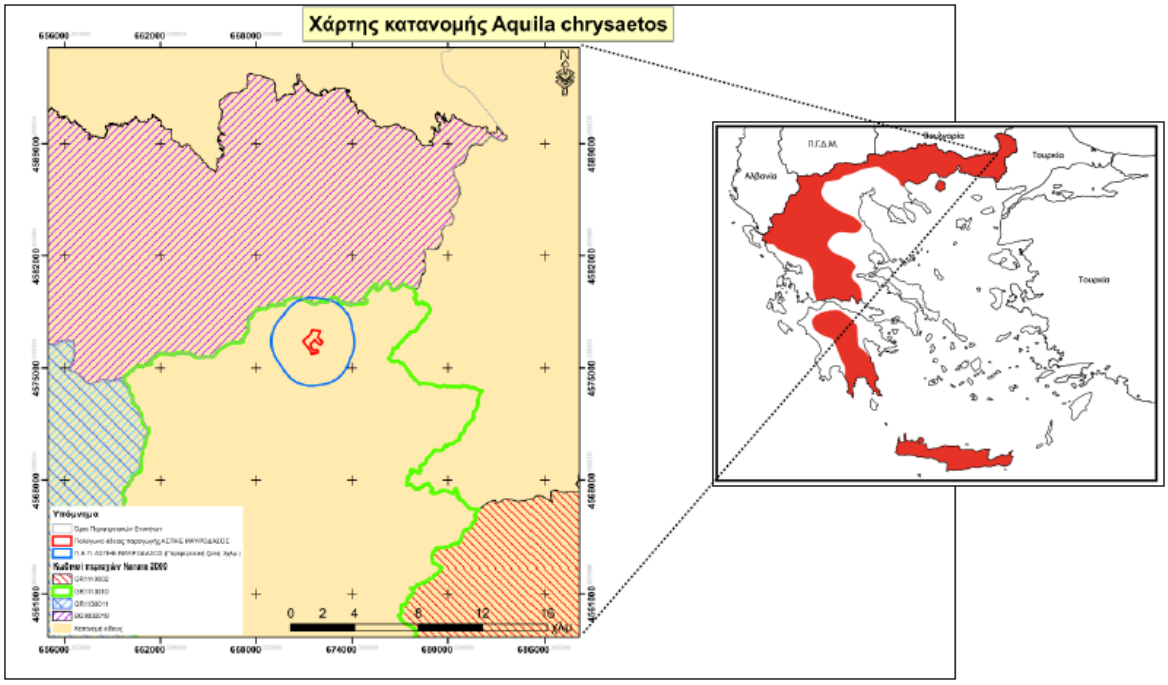
The Table below lists species included in the EU Guide (European Commission 2010) and in addition the black vulture for which the EU does not give instructions but is considered as an important species for the wider region of Eastern Thrace, as well as the other species listed in the list as important species, based on the criteria they meet.

Kind	EU Designation	Assessment in the studied WPP

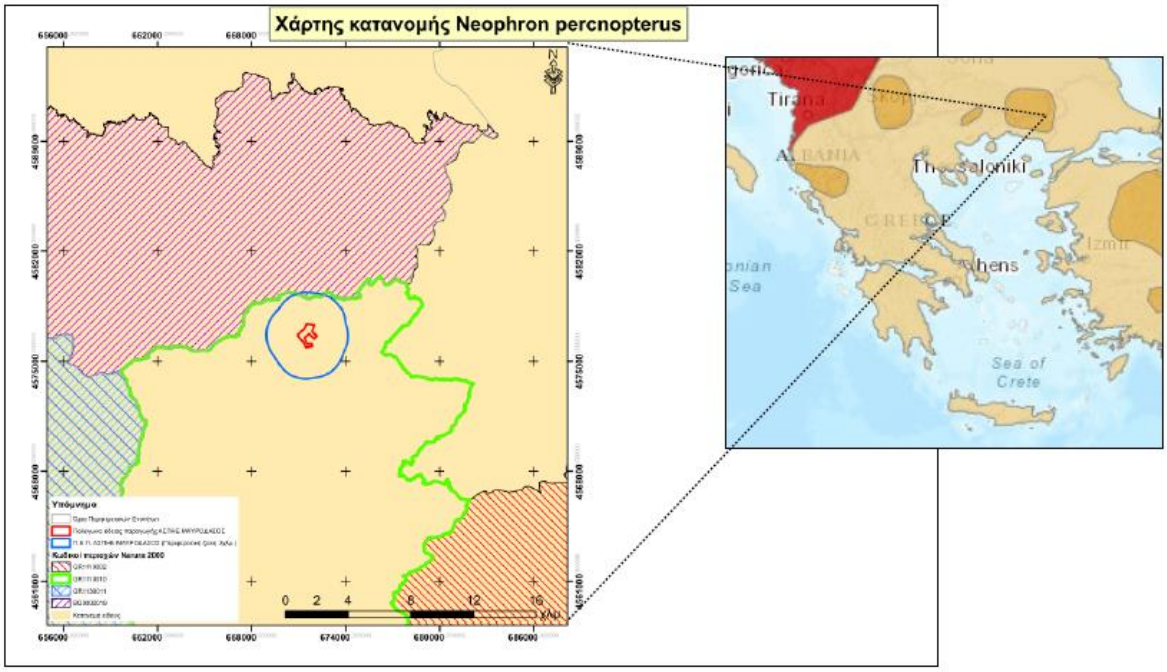
	Habitat loss	Bump	Dam formation	Habitat loss	Bump	Dam formation
Aegypius monachus (Black vulture)	-	-	-	O	XX	O
Aquila chrysaetos (Golden Eagle)	X	XXX		O	O	O
Ciconia nigra (Black stork)			O	The	The	The
Circaetus gallicus (Snake eagle)	X	XXX	X	The	The	The
Circus cyaneus (Winter Harrier)	XX	X	O	The	O	The
Clanga pomarina (Screaming Eagle)		XX		The	O	The
Falco peregrinus (Peregrine falcon)	X	X	O	O	The	O
fulvus (Griffon vulture)	X	XXX	X	O	X	O
Hieraaetus pennatus (Falconer)	-	-	-	The	X	The
Pernis apivorus (Wasp)			O	The	O	The
Caprimulgus europaeus (goat)	X	X			O	
Lanius collurio (Eagle fighter)	-	-	-		O	
Lullula arborea (Tree wheat)	-	-	-		O	
Coracias garrulus	-	-	-		O	
Curruca crassirostris	-	-	-		O	
Curruca melanocephala (Warbler)	-	-	-		O	
Oenanthe hispanica (Asprocolina)	-	-	-		O	
Picus viridis (Green woodpecker)	-	-	-		O	
Strix aluco	-	-	-		O	
Passeriformes		X	X	Recorded on a case-by-case basis		

Table 61: Impact assessment on avifauna recorded in the area, in relation to EU designations and data (European Comission 2010) for those of the above.

Legend: XXX = indications of significant impact risk, XX = indications of impact risk, X = potential impact risk, O = minor or no significant impact risk, Where the dash (-) exists, the species is not mentioned in the EU Guide.



Map 51: Distribution map of the golden eagle (Aquila chrysaetos) in the wider study area



Map 52: Distribution map of the Egyptian vulture (Neophron percnopterus) in the wider study area

Impact assessment

From the above data, therefore, it is concluded that from the species of raptors-scavengers, **the black vulture** is considered to **theoretically face a potential risk of impact,** as according to the SEA it was classified in the risk category **"indications of impact risk"** which was carried out given the importance of the wider area for the species, the use of the area (foraging), its size, as well as the fact that the above species, like most large – scavenger birds, is a K-species – selection in terms of its evolutionary growth strategies. The most correct would be to classify the impact in the milder category **"potential impact risk",** as the impact rates per year estimated were not very high although they were calculated with the strictest possible criteria (acceptance that all recorded flights are flights indicating use of space and not random passages through the area).

As far as the species of the falconer is concerned, it appears that the characteristics of its flights, the probability of impact on the wind turbines of this project, is infinitesimal (the species was observed in only five individual crossings during the entire duration of the field works, with only one of them taking place within the Zone of Direct Impact). However, due to its presence in the area, the possibility of impact cannot be excluded by the team Study. The above type would be more appropriate to be classified in the milder category **"small or not significant impact risk",** however, due to the importance of the area and the even small probability of impact resulting from its flights, it was preferred to be classified in the **category "potential impact risk".**

Regarding **the vulture**, based on the characteristics of its flights, from the field recordings in the study area, the probability of impact on the wind turbines of the examined WPP did not emerge. However, the possibility of impact could not be ruled out again by the study group and its classification category is **'potential impact risk';** given the importance of the wider area for the species, the use of the area (foraging), its size, as well as the fact that the above species, like most large – scavenger birds, is a K-species of selection in terms of the evolutionary growth strategies it follows.

Also, regarding the other important predatory-scavenger species, such as the golden eagle, the snake eagle and the screaming eagle, **the probability of impact on the wind turbines of the *project under study, based on field recordings, is zero*.**

However, given the importance of the wider area for these species, their low but existing presence, even ***outside the Zone of Direct Impact, their size*,** as well as the fact that the above species, such as the black vulture and the vulture, are K-species of choice in terms of the evolutionary growth strategies they follow, it is considered the basis of the SEA that there is always the possibility of a risk of impact. This possibility exists, mainly if other factors act in combination in the area that will increase, even for a limited period, the activity of the above species in the field research area, such as the presence of a dead animal near the area of installation of WPP.

For the above reason, and in order to minimize the already low probability of risk of the above kind from collision effects (due to their passages through the area), additional measures are proposed in section 8 of the SEA to deal with the possible effects, ***the most important of which is the obligation of the project promoter to install an optical system for automated cessation of wind turbines in case of detection in close proximity of a species of interest, to minimise the likelihood of a collision***.

The other species of important predators such as the **peregrine wasp and the winter harrier** are classified in the same category and their total individual crossings are minimal. Although these species do not appear to be directly related to the study area and to the project site, the fact that they make random crossings over the area cannot be excluded and therefore there is also a possibility of impact for them, which, however, is far too small. For the above reasons, the study group preferred these species to be classified in the category **"low or no significant impact risk".**

The same data apply in the case **of the black stork**, as the species was observed only once (six individual crossings) throughout the field work with these crossings taking place at a very high height (about 500 m).

For the other **important bird species** of smaller body size (passerines, woodpeckers, etc.) it is considered that there can be no significant impact as they are species that move over short distances, usually making low flights and in addition to the field research area no large concentrations were recorded.

Assessment of habitat loss impacts

Regarding the **impact of habitat loss** for most of the 46 species of interest, it ***is not estimated as real*** for the area of installation of the wind farm under study, due to the very small area of occupation of the project and the large coverage that the respective habitats have both inside and outside the study area.

However, regarding the types of characterization and delimitation of the main SPA GR1110010 area under study **,** for which critical habitats for the study area have been presented (available on the website of the Ministry of Environment for 76 SPAs of the country https://ypen.gov.gr/perivallon/viopoikilotita/diktyo-natura-2000/), it is stated that the critical habitats of one of the three designation species (as there are no critical habitats, according to the above source, for the type of characterization of the black vulture, while the critical habitat of the screaming eagle is located outside the two polygons of the production license of the project) is within the two polygons of the production license of the project under study.

- Regarding the critical habitat of the designation species ***Clanga pomarina,*** as mentioned above, it is within the polygon of the project's production permit, with the percentage of critical habitat area covered being negligible and amounting to only 0.34% (total area of critical habitat *Clanga pomarina*: 23.111,20 ha, area of the critical habitat covered by the polygon of the operation permit of the project under study: 78,85 ha).

- As far as the critical habitat of the designation species ***Neophron percnopterus*** is concerned, it is within the production permit polygon of the project, with the percentage of the critical habitat area covered being negligible and amounting to only 0.52% (total area of critical habitat *Neophron percnopterus*: 15.255,57 ha, area of the critical habitat covered by the operating permit polygon of the project under study): 78,85 ha).

- For critical habitats of the demarcation species ***Ciconia nigra*** **and** ***Hieraaetus pennatus,*** these shall be located outside the production authorisation polygon, while for the demarcation species *Circaetus gallicus* and *Aquila chrysaetos,* the percentages of the area of critical habitats

covered shall be negligible and shall be 0,15 % for *Aquila chrysaetos* (total area of critical habitat *Aquila chrysaetos*: 51,929.86 ha, area of critical habitat covered by its production permit polygon. project under study: 78,85,47 ha) and 0,17 % for *Circaetus gallicus (*total critical habitat area of *Circaetus gallicus*: 47,082 ha, area of critical habitat covered by the polygon of the planned project: 78,85 ha).

Assessment of the impact of barrier building

Regarding the impact of the creation of barriers, the wind farm under study *occupies a small area and therefore cannot have a similar type of impact on the above species.*

Also, given the proposal to install an automated wind turbine pause system, each wind turbine will be stopped when birds of interest pass through the area and the already minimum size of the barrier surface will be further reduced.

It is important to note that this system can be set to operate without deterring birds but only by stopping each wind turbine, and the problems that may exist due to the morphology of the relief can be overcome by choosing the right angle of placement of the cameras, so that the case of a bird coming from a lower altitude than the level of the cameras is adequately covered.

This proposed automated wind turbine cessation system has not been installed in almost all wind farms located in the wider area, where the passage of significant predators is done without stopping the wind turbines. The above proposed system will differentiate the wind farm under study from almost all wind farms in the wider area and will minimize the possibility of collision of important species, which in any case does not appear to be high, raising the bar of environmental protection high for the rest of the wind parks in the wider area **(detailed description is made in Chapter 10.4).**

It is also important to note that the field measurements ***did not record concentrations or significant group movements of migratory birds*** that could be affected by the presence of wind turbines, even though the wider study area is an important migratory corridor. Also, the relief of the area where the wind farms are to be installed as well as the morphology of the area does not create narrow passages that could direct the species to a passage from the installation point of the specific wind farm. ***For this reason, it is estimated that possible effects on migratory species cannot arise.***

According to the above data, the following paragraph summarizes the impact of wind farms on avifauna

1) Impact of impacts

By bird species and considering the data from the flight analysis of the important raptors of the area, it is reported that:

- **Black vulture**: the intensity of the incidence is expected to be high for this species in the absence of mitigation measures.
- **Vulture:** the intensity of the impact is expected to be moderate for this species in the absence of mitigation measures.

- **Snake eagle & other eagle species**: the intensity of the impact for the Snake Eagle is expected to be moderate while for the remaining eagle species it is small, in the absence of mitigation measures.
- **Wasp:** the intensity of the impact is expected to be small for the predator species, in the absence of mitigation measures.
- **Black stork: the intensity of the impact is expected to be small or non-significant, in the absence of mitigation measures.**
- **Falcons**: the intensity of the impact is expected to be small, in the absence of mitigation measures.
- **Nocturnal species**: the intensity of the incidence is expected to be small for Buffo and negligible for other nocturnal species.
- **Migratory species**: the intensity of the impact is expected to be negligible, in the absence of mitigation measures.

2) Impacts of direct habitat loss (and change in habitat structure)

As reported in the literature, the scale of direct loss or change in habitat structure due to the construction of an WPP (and accompanying infrastructure) is generally usually low (Rydell et al. 2012, Bright et al. 2009, Percival 2000). Specifically, the project under study for the installation of WPP at the "Mavrodasos" site is a project that will be installed within habitat types that abound in the area, as the availability of similar habitats to the existing ones in the wider area is high. Therefore, the intensity of the impact on habitat species is expected to be small or negligible.

3) Impact of nuisance-barriers

Regarding the impact of the creation of barriers, the WPP under study will not create an impact, as based on the EIA and the proposals/measures presented in the SEA the cessation of the installation works of the WPP is foreseen during the breeding season of birds. In addition, the high availability of corresponding habitat types in the area and the small size of the intervention area excludes habitat fragmentation and discontinuity. **Therefore, based on the above data *, the passage of birds is not obstructed and therefore they cannot cause a similar type of impact on the species of the area.***

Synergistic / Cumulative effects

For the assessment and assessment of the effects of this project on bird populations, the synergistic effects of **already existing, approved or planned projects** as assessed in the interpretative guide for the management of Natura 2000 sites under Article 6 of Council Directive 92/43/EEC of 21 May 1992 shall be considered."*on the conservation of natural habitats and of wild fauna and flora* (OJ L 206/22.07.1992).

For the assessment of synergistic effects on avifauna according to the Special Ecological Assessment**, a synergistic impact study area was designated, as mentioned at the beginning of Chapter 9 (definition of *a synergistic effects study area par. 4.3.4).***

Specifically, an analysis of the synergistic effects was carried out in case the project under consideration is licensed in synergy with the existing stations (operating license) - ***(best case scenario)*** and the case that the project under examination is licensed, the adjacent under license WPP with a production license in synergy with the existing ones was analyzed ***(worst case scenario).***

The following paragraphs summarize the synergistic effects of impacts, habitat loss and degradation and disturbance, displacement and barrier creation for both worst-best scenarios.

A) Impacts: In terms of impact impacts, according to the SEA the expected impact of the cumulative impact of impact loss of individuals, in the absence of mitigation measures, **will be of high importance mainly for scavenger large predatory species (black vulture and vulture)** as well as for raptors operating in the SPA, the corresponding large other bird species such as storks, Pelicans, swans, herons and to a lesser extent will be the medium-sized predators.

Specifically, based on the calculations made in the Special Ecological Assessment (the calculations were based on the search program for collision victims in 9 existing WPP in the region of Thrace in the period 2009-2010), the estimated adjusted mortality rate of birds of prey was estimated at 0.152 and 0.173 for raptors and vultures respectively, per year and per wind turbine.

- In the case of licensing of the WPP under consideration in synergy with existing ones (best case scenario), mortality rates amounted to 25.69 and 29.23 for raptors and vultures respectively.
- In the worst-case scenario, the estimated percentages will increase to 62.47 and 71.10 raptors and vultures respectively. The percentages can be characterized as high and can cause losses to the populations of the above species.

However, actual mortality within the entire ***"synergistic effect study area"*** may vary significantly (estimated as much lower), as the above estimates refer to a ***wider geographical area with a significantly higher presence of scavenger and predatory species.***

In conclusion, as far as the WPP under examination is concerned, the contribution that the construction of the 8 aircraft may have to the overall cumulative impact due to impact on energy infrastructure of the species of interest (with emphasis on scavenger large predators) but also on other large species of interest, such as the black stork) **is estimated to be initially high in the worst-case scenario.**

In the above it should be taken into account that the installed wind farms in which the research was carried out from which the adjusted mortality rates of birds of prey were derived (0.152 and 0.173 for raptors and vultures respectively) were located in a wider geographical area with a significantly higher presence of scavenger and predatory species, and operated ***with almost no measures to address the possible negative effects***, while in order to avoid conflicts in the project under study, a series of measures ***are proposed that are analyzed in para. 10.4.1 of Cap. 10.***

The contribution that the construction of the project under consideration may have to the overall cumulative impact of impact on energy infrastructure ***following the implementation of the mitigation measures*** proposed ***is substantially low in relation to all existing and licensed energy infrastructure.***

B) Habitat loss and degradation:

- The contribution of direct habitat loss or degradation from the project under consideration, compared to the total coverage **area of the synergistic impact study area if all WPP are**

constructed and approved, is recorded as significant. This is evidenced by the corresponding EDA tables analyzed in the previous subchapter, which record high rates of habitat loss and (worst case scenario).

- In case only the project under consideration is licensed (WPP at Mavrodasos) the impacts on habitats will be ***weak, long-term and reversible*** as habitat loss rates are recorded as low (best case scenario)

(C) Nuisance, displacement and barrier building:

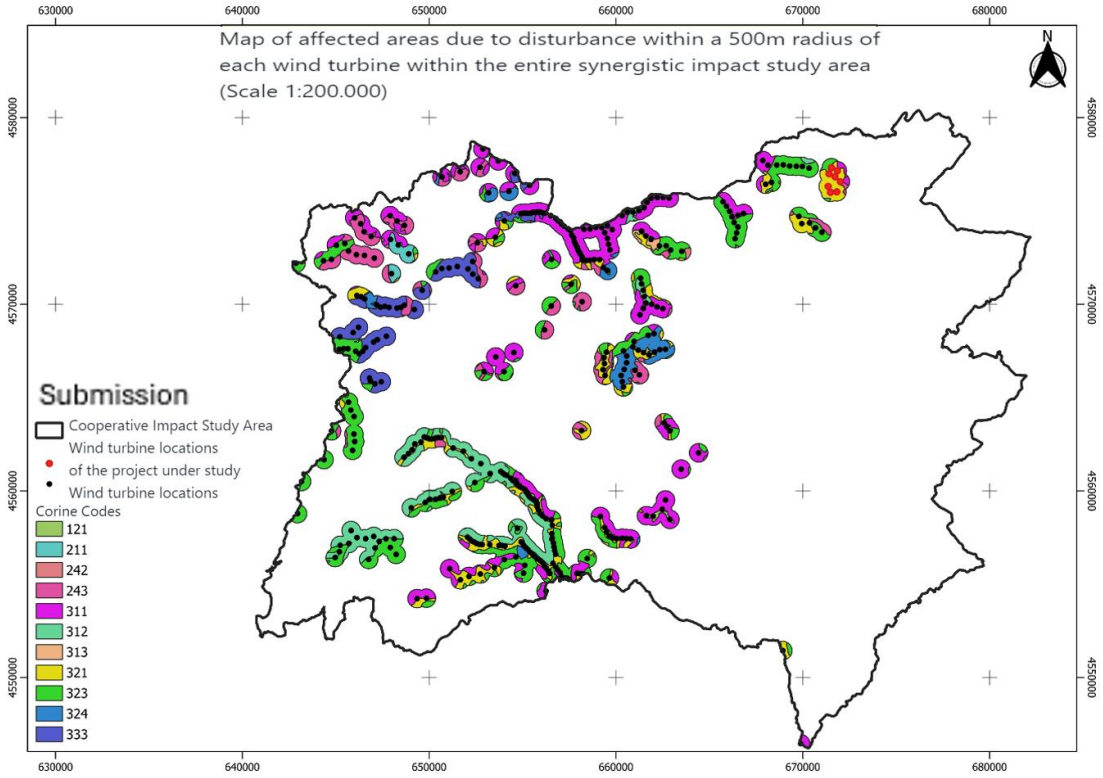
If all adjacent (under license) WPP are licensed in synergy with the existing WPP ***(worst case scenario***), the consequences are related to the operation of the WPP and to the use of accompanying works (e.g. road construction), all of which have been associated with the displacement of species due to nuisance and the effort to avoid them.

Impact assessment of nuisance-displacement and barrier building:

The assessment of the cumulative effects due to displacement, either as an indirect effect of the nuisance or to avoid the WPP and its accompanying projects that may be affected by bird species, was carried *out on the assumption that the total activity of the species is halved within a radius of 500 m from the installation sites of the wind turbines by the WPP. Based on this, the total areas within which the activity of species of interest is expected to be halved was calculated, which were considered to include* areas with scattered located necessary resources for avifauna, such as suitable nesting, cover, perching, feeding, etc.

A) Approval case of all WPP under authorisation (licensing stage under production), in synergy with existing WPP, within the examined synergistic impact study area (worst case scenario)

As mentioned above, in any areas/locations of suitable habitats included within the above areas where disturbance and displacement impacts are expected to occur, ***there will be no total cessation of bird species' activity, therefore there is no question of loss of all these habitats.***

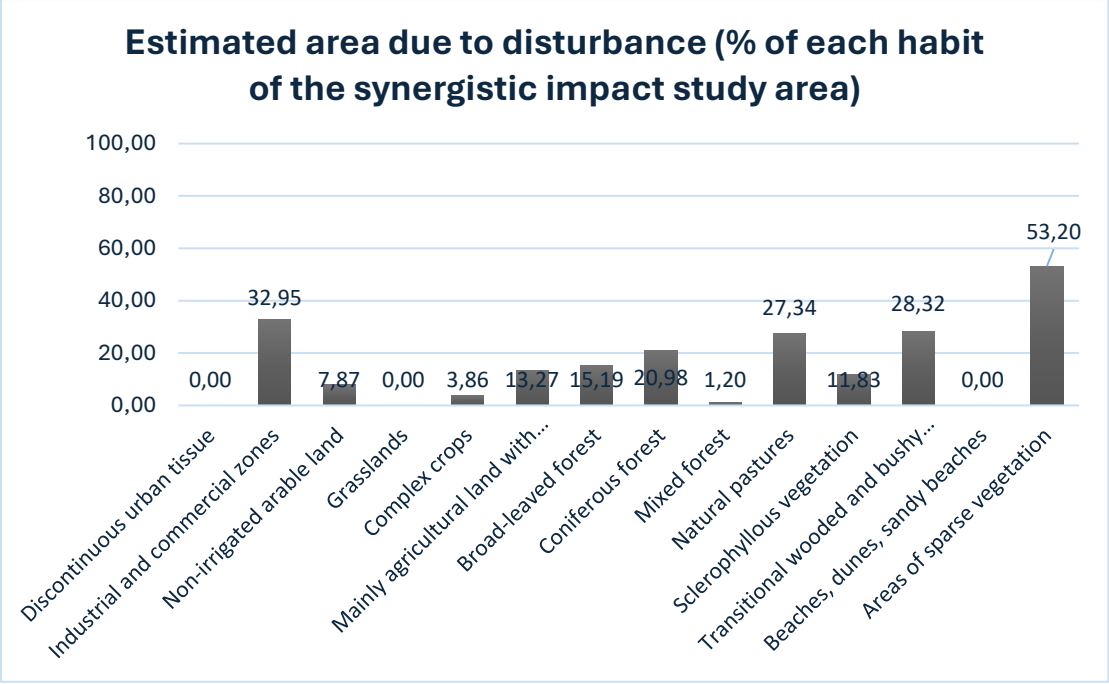


Map 53: Map of the affected area of habitats due to disturbance within a radius of 500 meters from each W/T, in case of approval of all licensed WPP (licensing stage under production) in synergy with the existing ones, within the examined area of a synergistic impact study (worst case scenario).

Corine land cover 2018 codes explained	Corine land cover codes 2018	Coverage area throughout the synergistic impact study area (ha)	Estimated area of affected habitat of species of interest around all existing and under authorisation W/T (radius 500 m) within the entire synergistic impact study area (ha)	Estimated percentage of area likely to be affected by disturbance (% of each habitat of the synergistic impact study area)
Discontinuous urban fabric	112	51,932	0	0,00
Industrial and commercial zones	121	109,29	36,015	32,95
Non-irrigated arable land	211	2017,774	158,878	7,87
Meadows	231	195,324	0	0,00
Compound crops	242	375,621	14,516	3,86
Land mainly used for agriculture	243	9953,505	1322,04	13,28

along with significant parts of natural vegetation				
Broadleaf forest	311	23385,539	3457,739	14,79
Coniferous forest	312	5979,404	1615,98	27,03
Mixed forest	313	7500,768	61,096	0,81
Natural pastures	321	6899,878	1830,998	26,54
Sclerophyllous vegetation	323	25092,139	3174,686	12,65
Transitional woodland and shrublands	324	2316,607	651,065	28,10
Beaches, dunes, sandy beaches	331	56,15726465	0	0,00
Areas with sparse vegetation	333	2407,083	1182,454	49,12

Table 62: Calculation of the affected area (in ha) of disturbance degradation within a radius of 500 meters from each R/F, in case of approval of all licensed WPP (licensing stage under production), in synergy with existing WPP, within the examined worst-case scenario area.



In the graph and table above, there are high relative rates of habitat loss due to displacement, in terms of the total available suitable habitats within the synergistic impact study area (SIS.). In descending order, they are sparse vegetation land, natural grassland, industrial commercial zones, transitional

wooded and shrubland, coniferous forest, broadleaf forest, sclerophyllous vegetation, land mainly used for agriculture, mixed forest, compound crops and non-irrigated arable land.

The species that are likely to face minor effects on populations operating within the study area in the above scenario are large birds of prey-scavenger as well as other large species of interest such as the black stork.

Results of synergistic effects on avifauna - worst case scenario.

In the theoretical case that the above scenario is verified, although the synergistic effects are expected to be relatively high, it is not expected that the additional effect of the eight wind turbines of the project under study, based on the above analysis, will be such that they will negatively affect the protected objects of the protected areas concerned, their conservation status, their conservation objectives, etc. given that, in the above direction, all the mitigation measures proposed for the project under study mentioned in relevant sections of the attached SEA will also help.

B) Approval of only the project under consideration, in synergy with the existing WPP, within the best-case scenario.

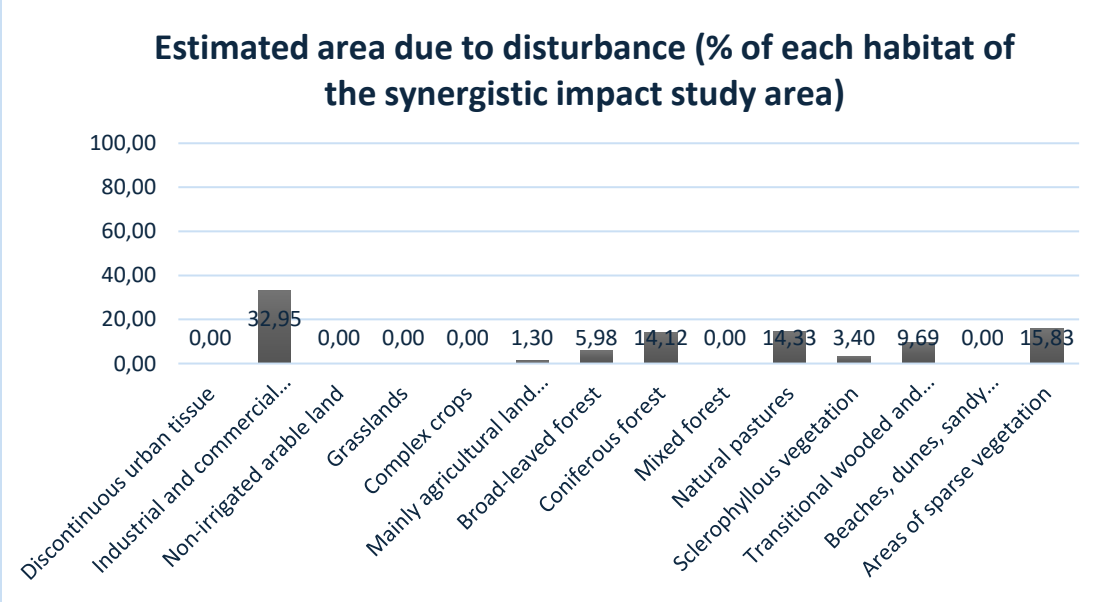
According to the table below, the estimated percentages of areas that may be affected by disturbance are lower than in the previous worst-case scenario. However, here too there is a decrease in the activity of bird species, the activity recorded through field research of each species and their susceptibility to disturbance and displacement phenomena.

Corine land cover 2018 codes explained	Corine land cover codes 2018	Area of coverage throughout the protected area (ha)	Estimated area of affected habitat of species of interest around the licensed W/T of the project under study in synergy with the existing ones (radius 500 m) (ha)	Estimated percentage of area likely to be affected by disturbance (% of each habitat of the synergistic impact study area)
Discontinuous urban fabric	112	51,93	0	0,00
Industrial and commercial zones	121	109,29	36,02	32,96
Non-irrigated arable land	211	2017,77	0,07	0,003
Meadows	231	195,32	0	0,00
Compound crops	242	375,62	0	0,00
Land mainly used for agriculture along with significant parts of natural vegetation	243	9953,51	140,42	1,41
Broadleaf forest	311	23385,54	1323	5,66
Coniferous forest	312	5979,4	828,17	13,85
Mixed forest	313	7500,77	0,25	0,003
Natural pastures	321	6899,88	1142,53	16,56
Sclerophyllous vegetation	323	25092,14	633,51	2,52
Transitional woodland and shrublands	324	2316,61	224,45	9,69
Beaches, dunes, sandy beaches	331	56,16	0	0,00

Corine land cover 2018 codes explained	Corine land cover codes 2018	Area of coverage throughout the protected area (ha)	Estimated area of affected habitat of species of interest around the licensed W/T of the project under study in synergy with the existing ones (radius 500 m) (ha)	Estimated percentage of area likely to be affected by disturbance (% of each habitat of the synergistic impact study area)
Areas with sparse vegetation	333	2407,08	381,59	15,85

Table 63: Calculation of the affected area (in ha) of the degradation due to nuisance within a radius of 500 meters from each R/F, in case of approval only of the project under study, in synergy with the existing WPP, within the synergistic impact study area (best case scenario).

According to the SEA and the documentation maps, the above habitats of the table dominate, according to the database and mapping for land cover (Corine land cover 2018) (see map 7 of the EDA), covering a total of more than 99% of the area of the synergistic impact study area.



However, due to the fact that the project under study is located as mentioned above within habitats that abound throughout the synergistic impact study area (but also outside it) and due to the fact that the contribution of this project to the cumulative/synergistic effects is small (consisting of eight wind turbines), this project will have a very small impact on disturbance and displacement from important habitats for species of interest in the study area and in general in the wider area.

Results of synergistic effects on avifauna - best case scenario)

Given all the above data, it appears *that significant synergistic effects from the installation and operation of the project under study compared to the existing ones in the wider area,* **are not expected (the nearest of them is more than 9 km away).).**

Conservation objectives of the Natura 2000 site concerned parameters that contribute to the conservation value of the site.

By setting the conservation objectives for the bird species included in the decision of the Ministers of Finance, Economy, Competitiveness and Shipping, and Environment, Energy and Climate Change (B' 1495) under reference 37338/1807/E.103/1.9.2010 in the Special Protection Areas (SPAs) of the national ecological network NATURA 2000, pursuant to per. b' of para. 3 of article 21 of Law 1650/1986 (A' 160) can better evaluate the monitoring of the evolution of the protected object of each Natura site.

The conservation objectives for bird species of para. 1 and 2 of article 4 of Directive 2009/147/EC for all Special Protection Areas (SPAs) of the national ecological network NATURA 2000 of Greece were established by *decision ΥΠΕΝ/ΔΔΦΠΒ/50146/1786 (Government Gazette 3118/B'/10-05-2023)* of the Deputy Minister of Environment and Energy.

The above decision also includes the annex concerning SPAs GR1110010, GR1130011 and GR1110002 (for the SPA BG0002019 no Management Plan has been prepared), within or near which **the study area is located, which define the conservation objectives depicted in the tables below.**

Conservation objectives for the Mountainous Evros – Dereios Valley SPA (GR1110010)							
Species referred to in para. 1 and 4 of Article 4 of 2 under reference 37338/1807/E.103/01.09.2010 Joint Ministerial Decision							
Code	**Appellation**	**Press**	**Parameter**	**Parameter unit of measurement**	**Guide price**	**Specific objective**	**Comments**
A402	***Accipiter brevipes***	**r**	**Population**	**Couples**	**Insufficient data**	***Insufficient data***	
A223	Aegolius funereus	P	Population	Couples	Insufficient data	Insufficient data	
A079	Aegypius monachus	P	Population	Couples	Insufficient data	Insufficient data	
A229	Alcedo atthis	P	Population	Couples	Insufficient data		
A255	Anthus campestris	r	Population	Couples	Insufficient data	Insufficient data	
A226	Apus apus	r	Population	Couples	Insufficient data	Insufficient data	
A091	**Aquila crhysaetos**	**P**	**Population**	**Couples**	**7**	**Obtainment**	
A404	Aquila heliaca	c	Population	Persons	Insufficient data	Insufficient data	
A028	Adrea cinareaa	c	Population	Persons	Insufficient data	Insufficient data	
A215	Bubo bubo	P	Population	Couples	Insufficient data	Insufficient data	
A087	Buteo buteo	r	Population	Couples	Insufficient data	Insufficient data	

A403	Buteo rufinus	c	Population	Persons	Insufficient data	Insufficient data	
A243	Calandrella brachydactylla	r	Population	Couples	Insufficient data	Insufficient data	
A224	Caprimulgus europaeus	**r**	Population	Couples	Insufficient data	*Insufficient data*	
A031	Ciconia ciconia	c	Population	People	Insufficient data	Insufficient data	
A030	**Ciconia nigra**	**r**	**Population**	**Couples**	**6**	**Conservation**	**Given the general picture of the species in Evros and the existence of habitats (forests and nesting of rivers of permanent flow for foraging), the population is estimated to be larger than recorded, ETA is defined as the number of 6 pairs, which is the highest historical estimate.**
A080	Circaetus gallicus	c	Population	People	Insufficient data	Insufficient data	
A081	Circus aeruginosus	r	Population	Couples	Insufficient data	Insufficient data	
A082	Circus cyaneus	w	Population	People	Insufficient data	Insufficient data	
A083	Circus macrourus	c	Population	People	Insufficient data	Insufficient data	
A084	Circus pygargus	c	Population	People	Insufficient data	Insufficient data	
A859	Clanga clanga	c	Population	Persons	Insufficient data	Insufficient data	
A858	**Clanga Pomarina**	**r**	**Population**	**Couples**	**6**	***Obtainment***	
A231	Coracias garullus	r	Population	Couples	Insufficient data	Insufficient data	
A113	Coturnix coturnix	R	Population	People	Insufficient data	Insufficient data	
A212	Cuculus canorus	c	Population	Couples	Insufficient data	Insufficient data	
A212	Cuculus canorus	r	Population	Couples	Insufficient data	Insufficient data	
A738	Delichon urbicum (urbica)	r	Population	Couples	Insufficient data	Insufficient data	
A239	Dendrocopus leucotus	p	Population	Couples	Insufficient data	Insufficient data	
A429	Dendrocopus syriacus	p	Population	Couples	Couples	Insufficient data	
A236	Dryocopus martius	p	Population	Couples	Insufficient data	Insufficient data	
A447	Emperiza caesia	r	Population	Couples	Insufficient data	Insufficient data	

A379	Eperiza hortulana	r	Population	Couples	Insufficient data	Insufficient data	
A098	Falco columbarius	c	Population	People	Insufficient data	Insufficient data	
A100	Falco eleonorae	c	Population	People	Insufficient data	Insufficient data	
A095	Falco naumani	c	Population	Persons	Insufficient data	*Insufficient data*	
A103	Falco peregrinus	p	Population	Couples	Insufficient data	Insufficient data	
A097	Falco vespertinus	c	Population	Persons	Insufficient data	Insufficient data	
		r	Population	Couples	Insufficient data	Insufficient data	
A321	Ficedula albicollis	c	Population	Persons	Insufficient data	*Insufficient data*	
A320	Ficedula parva	c	Population	Persons	Insufficient data	*Insufficient data*	
A442	Ficedula semitorquata	r	Population	Couples	Insufficient data	***Insufficient data***	
A078	Gyps Fulvus	c	Population	People	Insufficient data	Insufficient data	
A078	Gyps Fulvus	w	Population	Persons	Insufficient data	Insufficient data	
A707	Hieraatus fasciatus(Aquila fasciata)	c	Population	Persons	Insufficient data	*Insufficient data*	
A092	Hieraaetus pennatus (Aquila pennata)	c	Population	People	Insufficient data	Insufficient data	
A439	**Hippolais olivetorum**	**r**	**Population**	**Couples**	**6**	**Obtainment**	
A251	Hirundo rustica	r	Population	Couples	Insufficient data	Insufficient data	
A233	Junx toquillas	r	Population	Couples	Insufficient data	Insufficient data	
A338	Lanius collurio	c	Population	Couples	Insufficient data	Insufficient data	
A338	Lannius collurio	r	Population	Couples	Insufficient data	*Insufficient data*	
A339	Lanius minor	r	Population	Couples	Insufficient data	Insufficient data	
A433	Lanius nubicus	r	Population	Couples	Insufficient data	Insufficient data	
A868	Leiopicus medius	p	Population	Couples	Insufficient data	*Insufficient data*	
A246	Lullula arborea	p	Population	Couples	Insufficient data	Insufficient data	
A242	Melanorypha calandra	r	Population	Couples	Insufficient data	Insufficient data	
A230	Merops apiaster	r	Population	Couples	Insufficient data	Insufficient data	

A073	Milvus migrans	c	Population	People	Insufficient data	Insufficient data	
A074	Milvus milvus	c	Population	Persons	Insufficient data	Insufficient data	
A260	**Motacilla flava**	**c**	**Population**	**Persons**	**Insufficient data**	***Insufficient data***	
A260	Motacilla flava	r	Population	Couples	Insufficient data	Insufficient data	
A077	**Neophron percnopterus**	**r**	**Population**	**Couples**	**2**	**Obtainment**	
A533	Oenanthe pleschanka	c	Population	Couples	Insufficient data	Insufficient data	
A337	Oriolus oriulus	r	Population	People	Insufficient data	Insufficient data	
A094	Pandion haliaetus	c	Population	People	Insufficient data	Insufficient data	
A355	Passer hispaniolensis	p	Population	Couples	Insufficient data	Insufficient data	
A072	Pernis apivorus	r	Population	Couples	Insufficient data	Insufficient data	
A234	Picus canus	P	Population	Couples	Insufficient data	Insufficient data	
A210	Streptopelia turtur	r	Population	Couples	Insufficient data	*Insufficient data*	
A210	Streptocella turtur	c	Population	People	Insufficient data	Insufficient data	
A307	Sylvia nisoria	r	Population	Couples	Insufficient data	Insufficient data	
A228	Tachymarphis melba	r	Population	Couples	Insufficient data	Insufficient data	
A282	Turdus toruatus	c	Population	People	Insufficient data	Insufficient data	

Table 64: Species referred to in paragraphs 1 and 4 of article 4 of 2 under items 37338/1807/E.103/01.09.2010 common; Ministerial decision.

Conservation objectives for Filiouri Valley SPA (GR1130011)							
Species referred to in para. 1 and 4 of Article 4 of 2 under reference 37338/1807/E.103/01.09.2010 Joint Ministerial Decision							
Code	**Appellation**	**Press**	**Parameter**	**Parameter unit of measurement**	**Guide price**	**Specific objective**	**Comments**
A402	Accipiter brevipes	r	Population	Couples	Insufficient data	Insufficient data	
A079	Aegypius monachus	c	Population	Persons	Insufficient data	Insufficient data	
A229	Alcedo atthis	p	Population	Couples	Insufficient data	Insufficient data	
A255	Anthus campestris	r	Population	Couples	Insufficient data	Insufficient data	

A226	Apus apus	r	Population	Couples	Insufficient data	Insufficient data	
A091	**Aquila crhysaetos**	**p**	**Population**	**Couples**	**3**	**Obtainment**	
A404	Aquila heliaca	c	Population	Persons	Insufficient data	Insufficient data	
A215	Bubo bubo	p	Population	Couples	Insufficient data	Insufficient data	
A087	**Buteo buteo**	**r**	**Population**	**Couples**	**12**	**Conservation**	
A403	**Buteo rufinus**	**p**	**Population**	**Couples**	**1**	**Conservation**	
A224	Caprimulgus europaeus	**r**	Population	Couples	Insufficient data	Insufficient data	
A031	Ciconia ciconia	c	Population	People	Insufficient data	Insufficient data	
A030	Ciconia nigra	r	Population	Couples	Insufficient data	Insufficient data	
A080	**Circaetus gallicus**	**r**	**Population**	**Couples**	**8**	**Conservation**	
A081	Circus aeruginosus	c	Population	People	Insufficient data	Insufficient data	
A082	Circus cyaneus	c	Population	People	Insufficient data	Insufficient data	
A083	Circus macrourus	c	Population	People	Insufficient data	Insufficient data	
A084	Circus pygargus	c	Population	People	Insufficient data	Insufficient data	
A858	Clanga clanga	c	Population	Couples	Insufficient data	Insufficient data	
A858	**Clandga pomarina**	**r**	**Population**	**Couples**	**2**	**Obtainment**	
A231	Coracias garrulus	r	Population	Couples	Insufficient data	*Insufficient data*	
A738	Delichon urbicum (urbica)	c	Population	People	Insufficient data	Insufficient data	
A738	Delichon urbicum (urbica)	r	Population	Couples	Insufficient data	Insufficient data	
A429	Dendrocopus syriacus	p	Population	Couples	Insufficient data	Insufficient data	
A236	Dryocopus martius	P	Population	Couples	Insufficient data	Insufficient data	
A379	Emperiza hotulana	r	Population	Couples	Insufficient data	Insufficient data	
A100	Falco eleonorae	c	Population	Persons	Insufficient data	Insufficient data	
A095	Falco naumanni	c	Population	People	Insufficient data	Insufficient data	
A103	Falco peregrinus	p	Population	Couples	Insufficient data	Insufficient data	
A321	Ficedula albicollis	c	Population	Persons	Insufficient data	Insufficient data	

A320	Ficedula parva	c	Population	Persons	Insufficient data	Insufficient data	
A442	Ficedula semitorquata	r	Population	Couples	Insufficient data	*Insufficient data*	
A076	**Gypeatus barbatus**	**p**	**Population**	**Couples**	**1**	**Obtainment**	**The species has suffered a great historical decline both locally and in the country. In this case, the population of the species in the SPA before extinction was calculated as ETA.It is considered that if anthropogenic threats (poisoned baits) are eliminated, there is a suitable habitat and food for the SPA. The target at SPA level is to increase to at least 1 pair of the species.**
A078	**Gyps fulvus**	**p**	**Population**	**Persons**	**15**	**Conservation**	**Due to the biology of the species and the social way of life, the conservation goal will be the minimum population of individuals to establish a colony. As of the individuals in a colony, 10% to 50% of individuals likely to nest is set as a target at SPA level will be to increase to 15 adult individuals of the species.**
A092	**Hieraatus pennatus (Aquila pennata)**	**r**	**Population**	**Couples**	**8**	**Obtainment**	
A439	Hippolais olivetorum	r	Population	Couples	Insufficient data	Insufficient data	
A251	Hirundo rustica	c	Population	Persons	Insufficient data	Insufficient data	
A251	Hirundo rustica	r	Population	Couples	Insufficient data	Insufficient data	
A338	Lanius collurio	r	Population	Couples	Insufficient data	Insufficient data	
A339	Lanius minor	r	Population	Couples	Insufficient data	Insufficient data	

A868	Leiopicus medius	p	Population	Couples	Insufficient data	Insufficient data	
A246	Lullula arborea	p	Population	Couples	Insufficient data	*Insufficient data*	
A230	Merops apiaster	r	Population	Couples	Insufficient data	Insufficient data	
A260	Motacilla flava	r	Population	Couples	Insufficient data	Insufficient data	
A077	**Neophron percnopterus**	**r**	**Population**	**Couples**	**2**	**Obtainment**	
A337	Oriulus Oriulus	r	Population	Couples	Insufficient data	Insufficient data	
A072	Pernis apivorus	r	Population	Couples	Insufficient data	Insufficient data	
A210	Streptopella turtur	r	Population	Couples	Insufficient data	Insufficient data	
A307	Sylnia nisoria	r	Population	Couples	Insufficient data	Insufficient data	

Table 65: Conservation objectives for the Natura "Fliouri Valley" area.

Conservation objectives for the Dadia Forest – Soufli SPA (GR111002)							
Species referred to in para. 1 and 4 of Article 4 of 2 under reference 37338/1807/E.103/01.09.2010 Joint Ministerial Decision							
Code	**Appellation**	**Press**	**Parameter**	**Parameter unit of measurement**	**Guide price**	**Specific objective**	**Comments**
A402	Accipiter brevipes	r	Population	Couples	6	Obtainment	
A168	Acitis hypoleucos	c	Population	People	Insufficient data	Insufficient data	
A079	Aegypius monachus	r	Population growth rate	Couples per year	0.7	Obtainment	The trend of the species at local (and therefore national) level is medium and long-term positive, the conservation objective is defined as maintaining the growth rate (0.7 pairs/year) until the final stabilization of the population and achievement of the carrying capacity of the SPA.
A247	Alauda arvensis	r	Population	Couples	Insufficient data	Insufficient data	
A229	Alcedo atthis	p	Population	Couples	Insufficient data	Insufficient data	
A053	Anas platyrhynchos	r	Population	Persons	Insufficient data	Insufficient data	

A255	Anthus campestris	r	Population	Couples	Insufficient data	Insufficient data	
A226	Apus Apus	r	Population	Couples	Insufficient data	Insufficient data	
A091	Aquila chrysaetos	p	Population	Couples	Insufficient data	Insufficient data	
A404	Aquila heliaca	w	Population	Persons	Insufficient data	Insufficient data	
A215	**Bubo bubo**	**p**	**Population**	**Couples**	**5**	**Obtainment**	
A087	**Buteo buteo**		**Population**	**Couples**	**128**	**Obtainment**	
A403	**Buteo rufinus**	**r**	**Population**	**Couples**	**3**	**Obtainment**	
A243	Calandrella brachydactylla	c	Population	People	Insufficient data	Insufficient data	
A224	Caprimulgus europaeus	**r**	Population	Couples	Insufficient data	*Insufficient data*	
A031	Ciconia ciconia	r	Population	People	27	Obtainment	
A030	**Ciconia nigra**	**r**	**Population**	**Couples**	**32**	**Conservation**	
A080	Circaetus gallicus	r	Population	Couples	41	Obtainment	
A081	Circus aeruginosus	c	Population	Persons	Insufficient data	Insufficient data	
A082	Circus cyaneus	c	Population	People	Insufficient data	Insufficient data	
A083	Circus macrourus	c	Population	People	Insufficient data	Insufficient data	
A084	Circus pygargus	c	Population	People	Insufficient data	Insufficient data	
A859	Clanga clanga	w	Population	Persons	4	Conservation	
A858	**Clanga Pomarina**	**r**	**Population**	**Couples**	**22**	**Obtainment**	
A231	Coracias garullus	r	Population	Couples	Insufficient data	Insufficient data	
A113	Coturnix coturnix	r	Population	Couples	Insufficient data	Insufficient data	
A738	Delichon urbicum (urbica)	r	Population	Couples	Insufficient data	Insufficient data	
A239	Dendrocopus leucotus	p	Population	Couples	Insufficient data	Insufficient data	
A429	Dendrocopus syriacus	p	Population	Couples	Couples	Insufficient data	

A236	Dryocopus martius	p	Population	Couples	Insufficient data	Insufficient data	
A026	Egretta garzetta	c	Population	Persons	Insufficient data	Insufficient data	
A447	Emperiza caezia	r	Population	Couples	Insufficient data	Insufficient data	
A379	Emperiza Hortulana	r	Population	Couples	Insufficient data	Insufficient data	
A101	Falco biarmicus	p	Population	Couples	1	Obtainment	
A098	Falco columbarius	c	Population	Persons	Insufficient data	*Insufficient data*	
A100	Falco eleonorae	c	Population	Persons	Insufficient data	Insufficient data	
A095	Falco naumanni		Population	Persons	Insufficient data	Insufficient data	
A103	Falco peregrinus	p	Population	Couples	3	*Obtainment*	
A099	Falco subbuteo		Population	Couples	11	*Conservation*	
A097	Falco vespertinus	c	Population	Persons	Insufficient data	Insufficient data	
A321	Ficedula albicollis	c	Population	People	Insufficient data	Insufficient data	
A320	Ficedula parva	c	Population	Persons	Insufficient data	Insufficient data	
A442	Ficedula semitorquata	r	Population	Couples	Insufficient data	Insufficient data	
A125	Fulica atra	r	Population	Couples	6	Obtainment	
A076	**Gypaetus barbatus**		**Population**	**Couples**	**1**	**Obtainment**	
A078	Gyps fulvus	c	Population	Persons	115	Conservation	
A078	Gyps fulvus	p	Population	Couples	11	Insufficient data	
A075	Haliaeetus albicilla	w	Population	People	Insufficient data	Insufficient data	
A707	Hierraaetus fasciatus (Aqila fasciata)	r	Population	-	Insufficient data	Obtainment	
A092	Hierraaetus pennatus (Aquila pennata)	r	Population	Couples	24	Insufficient data	
A439	Hippolais olivetorum	r	Population	Couples	Insufficient data	Insufficient data	
A251	Hirundo rustica	r	Population	Couples	Insufficient data	*Insufficient data*	
A233	Junx torqilla	r	Population	Couples	Insufficient data	Insufficient data	
A338	Lanius collurio	r	Population	Couples	Insufficient data	Insufficient data	
A339	Lanius minor	r	Population	Couples	Insufficient data	Insufficient data	

A433	Lanius nubicus	r	Population	Couples	Insufficient data	Insufficient data	
A868	Leiopicus medius	p	Population	Couples	Insufficient data	Insufficient data	
A246	*Lullula arborea*	*p*	*Population*	*Couples*	*Insufficient data*	*Insufficient data*	
A242	Melanorypha calandra	r	Population	Couples	Insufficient data	Insufficient data	
A230	Merops apiaster	r	Population	Couples	Insufficient data	Insufficient data	
A875	Microcarbo pygmaeus	c	Population	People	Insufficient data	Insufficient data	
A073	Milvus migrans	r	Population	Couples	2	Obtainment	
A073	Milvus migrans	w	Population	People	Insufficient data	Insufficient data	
A074	Milvus milvus	c	Population	Persons	Insufficient data	Insufficient data	
A260	Motacilla flava	r	Population	Couples	Insufficient data	Insufficient data	
A077	Neophron percnopterus	r	Population	Couples	12	Obtainment	
A077	Neophron percnopterus	c	Population	People	Insufficient data	*Insufficient data*	
A023	Nycticorax nyctirorax	c	Population	Couples	Insufficient data	Insufficient data	
A337	Oriolus oriolus	r	Population	Couples	Insufficient data	Insufficient data	
A094	Pandion halliaetus	c	Population	Persons	Insufficient data	Insufficient data	
A355	Passer hispaniolensis	r	Population	Couples	Insufficient data	Insufficient data	
A072	Pemis apivorus	r	Population	Couples	28	Insufficient data	
A391	Phalacrocorax carbo sinensis	c	Population	Persons	Insufficient data	Insufficient data	
A234	Picus Canus	p	Population	Couples	Insufficient data	Insufficient data	
A249	Riparia riparia	r	Population	Couples	Insufficient data	Insufficient data	
A210	Streptopella turtur	r	Population	Couples	Insufficient data	Insufficient data	
A307	Sylvia nisoria	r	Population	Couples	Insufficient data	Insufficient data	
A228	Tachymarptis melba	r	Population	Couples	Insufficient data	Insufficient data	
A282	Turdus torquatus	c	Population	Persons	Insufficient data	Insufficient data	
A142	Vanellus vanellus	w	Population	Persons	Insufficient data	Insufficient data	

Table 66: Conservation objectives for the Natura site "Dadia Forest – Soufli".

In conclusion, the above tables show that for most species there is insufficient data, so it is not possible to set the relevant targets accordingly.

The conclusions on the conservation objectives and impact assessment of the plant concerned are analysed in paragraph 10.4.1 (Chapter 10).

Impact assessment of accompanying projects

As far as the accompanying works of this WPP are concerned, it is estimated that they will not cause any negative impact on the installation area and the integrity of the area nor on the species living in it, due to the proposed underground cabling for the transmission of the electricity produced.

As far as the drilling for the installation of wind turbines is concerned, this will be very short and will also not have negative effects on the Natura 2000 site and its protected objects, due to the correct location (and the relevant proposals herein).

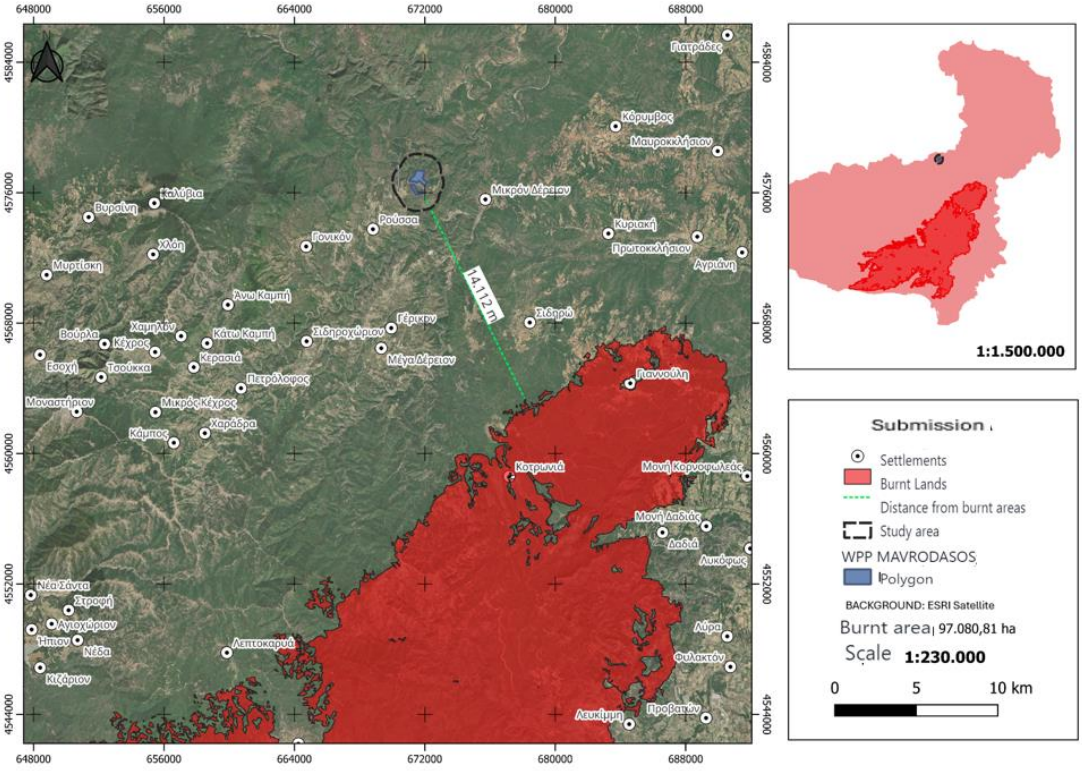
The impact of the project synergistically with other projects in the vicinity of the area (projects under authorisation) will be small provided that **the measures to address the potential impacts mentioned in the attached SEA will be implemented.**

Assessment of the impact of forest fires

The nature of the WPP project is not expected to create favorable conditions for forest fires during its operation phase. The project has no emissions of flammable materials nor are emissions of pollutants or hazardous materials expected to occur in general during its lifetime. The expected maintenance of the project as well as the occasional measurements that will be carried out will contribute positively as there will be a presence of a human factor that in case of fire or strange mobility will inform the competent authorities immediately. The access of the crews will ensure that the forest road is cleared so that it is also accessible for fire trucks in case of emergency. The viability of the project and its protection by the company does not only concern the project itself but also the surrounding area, which is a forest area of great ecological value. In addition to the use of renewable energy sources to optimize the quality of life of all organisms on the planet and eliminate the negative effects of the use of fuels so far, it is important to preserve the natural environment in its entirety, as it is the natural lungs of the earth but also houses the unique biodiversity necessary for the life cycle that each organism has. The harmonization of RES projects with the environment is a successful bet as the development of technology has allowed the complete coexistence of projects with the natural environment. It is also worth mentioning that the wind turbines have a fire detection system installed for fire safety which is placed on the naselle of each wind turbine and with appropriate, advanced technology and high-definition IRPanoramic cameras so that it can detect fire (even small-scale, when it is at an early stage) with a range of up to 5 km.

In case the forest area has been declared reforestable due to a fire wound, the project operator, in cooperation with the competent Forestry Authority, will carry out the necessary protection and restoration measures, such as reforestation, flood protection and anti-erosion works, while the necessary measurements will be carried out in the study area of the WPP during its operation phase per time period, can be combined with the preparation of a report on the development of the area and the progress of natural or technical reforestation, always in full consultation and cooperation with the competent Forestry Authority.

Finally, it is noted that the project under examination does not belong to the burnt areas and is located at a very long distance, namely about 14.11 km in a straight line, while various geomorphological elements are inserted. The project will not affect the habitats of the Dadia Forest area. Therefore, the fact of fire does not need to be considered in the impact assessment of the study.



Map 54: Mapping of the burnt areas of the Dadia Forest and the distance of the WPP under study from them

Assessment of the impact on the well-being of populations

As a company fully aware of the state of the forests of Evros and because we consider the biodiversity of the area where we plan our projects important, we would like to express and express our views and intentions for our future participation in actions aimed at indirect benefit to the conservation of endangered species of scavenger species, but also the rest of the avifauna of the area.

While our projects aim to establish energy independence and address the planet's ecological problems by solving the problem of non-renewable fossil fuel reserves, this does not mean that combating local ecological problems is not our priority. On the total environmental value of each project study area and its future conservation to benefit from a cleaner planet through the installation of the project, we can contribute to actions that will ensure the survival and reproduction of these species in their distribution zone.

For example, as we know, based on the National Action Plan for the Egyptian Vulture in Greece, the abandonment of traditional livestock practices and the legislation that requires strict sanitary and

veterinary rules, is one of the determining factors that have led to the reduction of the available food for the Egyptian vulture, and not only it. Therefore, providing "safe food" to Egyptian vultures through the creation of a network of feeding areas for birds of prey is essential and this is what we intend to move on.

Our aim is therefore to contribute to the efforts so that there is stable food for both breeding couples and wandering individuals so that they can colonize abandoned territories as well.

Thus, one of the measures examined is the provision of complementary food to artificial feeding stations, the so-called "feeders", which have been recognized as a good management tool for the conservation of populations of all species of vultures including the Egyptian vulture. It has been found that these complementary food programs usually provide carcasses, in fixed locations and in areas with insufficient food, aim to support scavenger raptor populations by increasing their reproductive capacity thus ensuring a high survival rate in their juveniles and reducing the risk of poisoning the species, while at the same time helping to maintain large concentrations. However, it should be noted that there is a risk that the use of these feeders will be minimal due to the inappropriate location, the reduced food supply and the inadequate protection of wildlife in neighboring areas, while it is emphasized that the Egyptian Vulture is very sensitive to disturbance during its breeding season, which requires the strict planning of various activities (road construction, leisure activities, army exercises, forestry work, etc.).

From the above, and since vulture species are in a critical condition, it becomes necessary to evaluate and design a strategy for the enhancement of the natural population in the country using the method of breeding individuals in captivity. Since the natural recovery of the wild population of these birds is extremely difficult due to the low number of individuals left in Greece, as well as due to the strong presence of specific threats with difficult eradication (poisoned baits, etc.), early planning and preparation for action to enhance the natural population will interrupt population decline through the creation of safe breeding areas with reduced risk of poisoning and increased availability Food.

A comprehensive population model has shown that boosting the population with captive-bred individuals would reduce the likelihood of extinction by 2049 from 48% to < 1% if 12 or more birds were released each year for 30 years. The model and a feasibility study suggest that a 4% improvement in wildlife survival combined with the release of 9 birds per year for 20 years or 6 birds per year for 30 years would lead to a stable population while releases continue. Thus, an optimal goal is the release of at least 9 individuals per year on average. To achieve this objective, however, a set of actions should be implemented to increase the size of the captive breeding tank and the successful breeding of pairs of scavenger species in captivity, to ensure the abovementioned required number of birds per year.

Test releases have shown that the delayed release method is the most successful approach leading to longer survival of released individuals compared to the survival of wild juveniles during the first 6 months. Therefore, late release can be applied as the main method aimed at enhancing the population of scavenger species and the Egyptian vulture.

Thus, taking into account the above, our company intends to cooperate with all relevant bodies (RIS, OFYPEKA, Forest Services, etc.) contributing to direct actions to increase the reproductive rate of vultures (e.g. captive breeding, participation in feasibility studies for reintroduction programs of the

species, creation of feeders, etc.) which will indirectly benefit the conservation and increase of this species and will serve the conservation goals of the critical avifauna, as they have been institutionalized.

9.6 Impact on the anthropogenic environment

9.6.1 Spatial Planning

The siting of the WPP will take place in an isolated mountainous area and specifically in a Wind Priority Area as, according to the Special Spatial Framework for RES, these areas have comparative advantages for the installation of wind power plants (such as the existence of exploitable wind potential, increased demand for wind turbine installation, etc.). The areas on which the wind turbines will be installed have different land cover designations. Specifically, the WPP under examination and the wind turbines at the "Mavrodasos" site fall into areas with "Coniferous Forests", "natural pastures", an area with "sclerophyllous vegetation" and an area with "land mainly used for agriculture together with significant parts of plant vegetation".

The land use of the wider area will not change as the area where the WPP will be built is essentially small compared to the available unexploited areas of the wider area.

For the part of the areas that will be affected during the construction phase, a special landscape restoration and reforestation study will be carried out after the completion of the works, under the instructions of the relevant Forestry Authority, and therefore the study area will not undergo any change in land use.

It is important to note that the proposed locations of the W/T facilities are located outside exclusion areas and incompatibility zones, according to the article. 6 of the SSPSDF for RES.

Synergistic/Cumulative effects

Table 27 of the SEA presents the habitat loss calculation in case of construction **of only the project under authorisation** at the "Mavrodasos" site in the **synergistic impact study area (best case scenario**). The percentages calculated in terms of estimated habitat losses are small, therefore the impact of the project under consideration on habitats and therefore land use will be minimal and there will be no permanent change in land use.

To better assess the impact in the case *of simultaneous licensing of all wind farms* within the ***considered worst-case scenario,*** habitat loss has been calculated in the Special Ecological Assessment (table 26 of the SEA). Habitat loss rates, as is normal, will be higher than rates of habitat loss in the best-case **scenario. The effects can therefore be recorded as more evident.**

As far as the synergistic/cumulative effects of the project under consideration for Spatial Planning are concerned, they do not arise as the compatibility issue is carried out only for the WPP under examination, while for the other projects under licensing (near the one under consideration "PSEFTIS", "Lefki" and "Ammoudes") will be carried out in separate issues by the competent companies, as required.

Spatial Planning – Land Use						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	IMMEDIATE	LOW	LOW	NO	/	/
OPERATION	INDIRECT	MODERATE	MODERATE	YES	YES	POSITIVE
CLOSURE	/	/	/	NO	/	/

Table 67: Impact assessment matrix for spatial planning – land use.

9.6.2 Structure and functions of the anthropogenic environment

The GEs will be installed at a great distance from the nearest settlement and from anthropogenic activities and as has been thoroughly analyzed in Chapter 5 of this study, the **distances set by Joint Ministerial Decision 49828/08** (Government Gazette 2464B'/03.12.2008) by which the **EPSM&RD for RES was approved in Annex II, Table D, are generally met. from residential activities.**

From the construction and operation of the project under consideration, no changes are expected in the main characteristics of the settlements of the wider area (Goniko Roussa and Mikro Dereio). Chances of disruption of the urban fabric do not arise, nor do tendencies to deteriorate. No settlements of any category are located at less than 500m. from the location of the examined WPP, nor are there traditional settlements or any other type of organized construction in the immediate study area of the project.

Therefore, the implementation of the project is not expected to change the residential environment of the area.

In addition, according to the Noise Propagation Study carried out for WPP, noise levels will not exceed the limit of 45 db in any settlement and point of interest (see centers for the declaration of archaeological sites).

Specifically, the noise produced by the Motorways that reaches the nearest settlements of Roussa, Goniko and Mikro Dereio is lower than the maximum permitted limit and is reflected in the following table.

Landmarks	Nearest M/W	Distance (m)	Noise level dB(A) Produced by the WPP at the location "Mavrodasos"
Settlement – Roussa	W/T2	3.174 m	30,26

Settlement – Mikro Dereio	W/T4	3.404 m	29,05
Settlement – Parental	W/T2	7.293 m	19,64

Table 68: Distances from the boundaries of the settlements for the noise level for the WPP at the location "Mavrodasos".

Synergistic / Cumulative effects

In addition to the examination of the noise level for the WPP under examination at the "Mavrodasos" site for the settlements, a calculation of the noise level from the ***cumulative operation of all four WPP at the sites "Lefki", "PSEFTIS" and "Ammoudes" was carried out***. It should be noted that the other WPP at the "Ammoudes" site is not calculated synergistically as it appears that it does not meet, as it stands, the compatibility criteria of JMD 49828/2008 and therefore cannot be calculated.

Thus, the noise level towards the nearest settlements of Roussa, Goniko and Mikro Dereio is again ***below the maximum permitted limit and is reflected in the following table (Table 5.3, Noise Study).***

Landmarks	Nearest M/W	Distance (m)	Noise level dB(A) Produced by the WPP at the location "Mavrodasos"	Noise level dB(A) Produced by the cumulative operation of three (3) WPP*.
Settlement – Roussa	W/T2	3.174 m	30,26	41,01
Settlement – Mikro Dereio	W/T4	3.404 m	29,05	30,61
Settlement – Parental	W/T2	7.293 m	19,64	38,31

*Table 69: Distances of settlements from M/W (measured from the nearest point to the R/W) and noise level with wind speed 10 m/s. (*The cumulative operation of four (4) WPP includes the WPP under study at the "Mavrodasos" site and three (3) neighboring WPP at the "Lefki", "PSEFTIS" and "Ammoudes" sites.)*

The conclusions of the evaluation of the impact of the project on the structure and functions of the anthropogenic environment are summarised in the following table.

Structure and functions of the anthropogenic environment						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	IMMEDIATE	LOW	LOW	NO	/	/
OPERATION	/	/	/	NO	/	/
CLOSURE	/	/	/	NO	/	/

Table 70: Impact assessment matrix on the structure and functions of the man-made environment.

9.6.3 Cultural heritage

In the study area of the northern polygon of WPP there are two archaeological sites named **"10 Megalithic monuments (Dolmen)"** which is 1.3km away from the nearest wind turbine (W/T 2)

and the archaeological site **"Koum-Tarla"** which is located at 3.3km from the nearest wind turbine of the project. At 6.8km south of the WPP "Mavrodasos" is also located the archaeological site "Fortress enclosure, **Mesimler Kale."**

The WPP under examination in relation to the archaeological sites has been examined **as a Compatibility Document in Annex II** and is **compatible**. Therefore, no impact on historical monuments or other sites of historical and cultural interest is expected during the operation and construction phase of WPP.

Synergistic / Cumulative effects

As regards archaeological sites, no cumulative effects of the project are identified compared to other projects. According to the photorealistic depiction carried out for the project under consideration and for the WPP closest to it (WPP at the location "Lefki", "PSEFTIS" and "Ammoudes"), it is noted that the archaeological sites "**10 Megalithic monuments**", **"Koum-Tarla"** and "Fortress enclosure, will not be affected, **Mesimler Kale."** However, the W/T of the mentioned WPP will be partially visible. Therefore, the synergistic/cumulative effects regarding archaeological sites will be **of low intensity.**

Project closure: No impact on cultural heritage is expected during the closure of the project, nor at a synergistic level.

The evaluation conclusions are summarised in the table below.

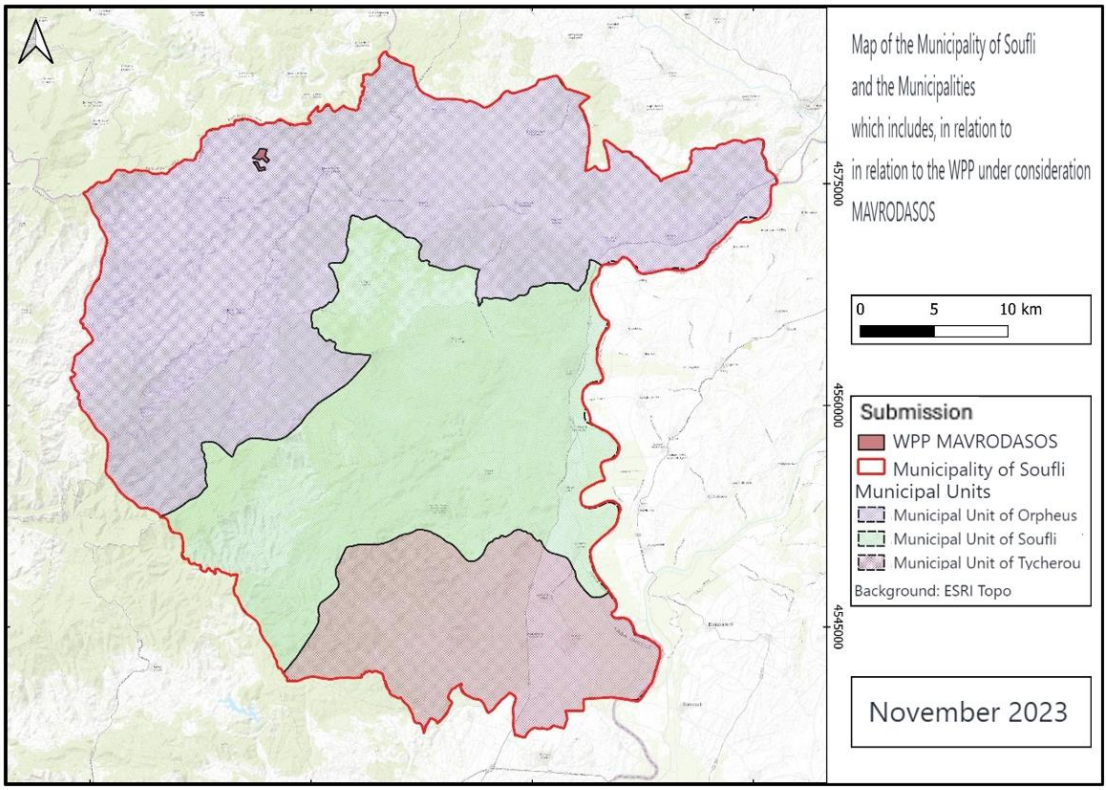
Cultural heritage						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	IMMEDIATE	LOW	LOW	NO	YES	/
OPERATION	IMMEDIATE	LOW	LOW	YES	YES	/
CLOSURE	/	/	/	NO	/	/

Table 71: Cultural Heritage Impact Assessment Matrix.

9.7 Socio-economic impact

9.7.1 Demographic situation

The construction and operation of WPP will not affect the demographic situation of the Municipality of Soufli.



Map 55: Demographic depiction of the location of the studied project

9.7.2 Productive structure of the local economy

During the construction phase of the project, temporary jobs will be created as local labour will be recruited for the infrastructure projects.

The above actions will bring significant help to the local economy of the region. The increase of local income and local employment, with the implementation of the project, will lead to the preservation of the local population and at the same time to the development of the living standards of the area.

During the operation phase of the project, there will be personnel responsible for monitoring the proper operation of the system (wind turbines, voltage lifting substations, metering collection system and systems installed by O.G.E.D.N.), for the immediate disconnection or reconnection of wind power plants to the grid, in cases of emergency, as well as for the maintenance of all equipment. The staff that will be employed during the operation of the project do not need to have any specialization but must have a basic technical concept.

Finally, with the direct financial benefit provided to Local Government Organizations, according to Law 3468/06 (Government Gazette 129A'/27.06.2006), as amended by Law 3851/10 (Government Gazette 85A'/04.06.2010) and Law 4555/2018 (Government Gazette 133 A'/19.07.2018), they will be supported towards the development of other activities and the promotion of infrastructure projects, such as sewerage, internal road works, cultural and tourism upgrading projects, with the aim of further increasing jobs and improving per capita income.

Therefore, positive effects on the economy from the creation of new jobs are expected but also on the local economy in general (indirect effect).

Socio-Economic Environment						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	/	/	/	NO	/	POSITIVE
OPERATION	INDIRECT	MODERATE	LOW	NO	/	POSITIVE
CLOSURE	/	/	/	NO	/	

Table 72: Impact assessment matrix for the socio-economic environment.

9.8 Impact on Technical Infrastructure

9.8.1 Impact on roads

During the construction and operation phase of the project, the technical infrastructure networks of the area are not expected to be affected, only the local road network. During the construction of the project, there will be an increase in road traffic in the area due to the movement of vehicles, construction site machinery, the transport of vehicles and other equipment. At the same time, all necessary safety measures (construction site markings, etc.) will be taken for traffic safety.

During the operation phase of the project, there will be no burden on the road traffic of the area as the movements of vehicles that will take place due to repairs of faults in the facilities of the Motorways or emergencies will be almost negligible.

9.8.2 Impact on the water supply network

During the construction phase of the project as already calculated and analyzed in the corresponding section of Chapter 6, approximately 21 m3/day will be required for their construction. The coverage of water needs will be carried out by tanker vehicles (water tankers). Therefore, there will be no changes in the water supply network of the wider region.

9.8.3 Impact on the collecting system

During the construction phase of the project, chemical toilets will be installed to serve the staff.

The works cannot be connected to the sewage network of the Municipality, so there will be no changes in relation to the current state of the sewerage network, which is located at a great distance from the 8 W/T positions.

During the operation phase of the project, given that it will not be possible to connect to the sewage network, the construction of a cesspool system (septic and absorbent or chemical toilet) is foreseen, in accordance with the current urban planning provisions.

9.8.4 Impact on energy resources

During the construction phase of the two projects, there will be no change in energy resources, only the connection of the energy transmission network through the proposed substation at the "PATRIARCH" site.

During the operation phase of the proposed WPP, the available wind potential will be exploited and therefore electricity production will take place, thus helping to achieve the environmental goals and international obligations of the country.

9.8.5 Impact on the telecommunications network

No impact on the telecommunications network is expected during the construction phase, and in the operational phase. The change that will be made will be the connection of the two projects through fiber optics, which will be placed within the installation channels of the M.V. cables.

The only infrastructure that is expected to be changed to support the main project is the road network (e.g. through the new road openings/improvements) and the electricity transmission network (through the "Patriarch" Voltage Raising Substation and the medium and high voltage network).

As mentioned in section 9.3, significant benefits arise from the improvement/expansion of the infrastructure, such as improving accessibility for residents engaged in activities, improving accessibility for grazing, improving accessibility for the relevant Forest Services, improving accessibility to deal with emergency situations such as fire suppression and upgrading electricity transmission infrastructure.

The possibility of a negative cumulative/synergistic effect does not arise from the proposed project design with other licensed projects.

Technical Infrastructure						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	/	/	/	NO	/	/
OPERATION	/	/	/	YES	/	POSITIVE
CLOSURE	/	/	/	NO	/	/

Table 73: Technical infrastructure impact assessment matrix

9.9 Correlation with anthropogenic pressures on the environment.

The proposed interventions that will be made by the project under consideration (roads, squares, etc.) will not reinforce the existing anthropogenic pressures. The small pressures that will arise will have a specific time frame (different impact in each phase: construction, operation, shutdown and rehabilitation). However, by using appropriate preventive measures, medium-scale impacts can be reduced to low-scale ones.

The creation of the plant under study is not expected to cause additional harm to the environment either during its construction or during its operation.

Synergistic effects

The isolation of the study area to date, has resulted in the main land uses and generally anthropogenic activities in the area remaining traditional - extensive (agriculture, livestock farming) with the result that no significant problems or pressures on the environment have arisen. Overgrazing and poaching in some cases create pressures on this area. Cumulative effects on the environment may result from a

series of projects and activities with similar interacting impacts on the ecological integrity of the Natura protected area.

The possibility of significant cumulative/synergistic action from the proposed project design with other projects of similar nature mainly concerns its operational phase. However, as analyzed in the supporting study of the Special Ecological Assessment of the Special Protection Area, GR1110010 the possibility of moderate significance of synergistic/cumulative effects emerges in case of licensing of all adjacent WPP in relation to the existing ones in the study area (refer to paragraphs 9.5.1 and 9.5.2).

It is estimated, however, that the contribution of the WPP under review is expected to be low, following the implementation of mitigation measures.

Correlation with anthropogenic pressures on the environment						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	IMMEDIATE	LOW	LOW	YES	YES	/
OPERATION	IMMEDIATE	MODERATE	MODERATE	YES	YES	/
CLOSURE	IMMEDIATE	/	/	NO	YES	/

Table 74: Assessment Table on anthropogenic pressures on the environment

9.10 Impact on air quality

9.10.1 Construction Phase

Negative impacts on air quality are limited only to the construction phase of wind farms.

During construction, atmospheric stresses occur which include the following:

- Dust from the movement of vehicles-trucks, machinery, management and processing of materials and earthmoving products during the configuration of access roads, internal road construction, the configuration of the base squares of the wind turbines and the excavation of the ground for the underground interconnection of the wind turbines with the substation
- Exhaust gases from the movements of trucks and construction machinery at the project site
- Exhaust gases from the means of transport that will transport the construction materials and the W/T to and from the construction site

These emissions are set to increase in the project area due to the operation of construction sites, earthworks, excavations and material deposits. Cumulatively to these factors acts the wind drift of dust particles. These effects will be local and with appropriate measures can be characterized as negative and negligible. Their duration is directly related to the construction period of the project since it is estimated that the time that the construction of the project will last will be short and the number of vehicles and machinery that will take part in its construction will also be small.

9.10.2 Operational phase

During the operation phase of the project, no negative effects on air quality are expected, as the project does not emit any kind of air pollutant. It also does not emit dust particles (breathable or not) and odors. Also, power plants do not cause thermal pollution of the atmosphere, as they do not emit hot gases or use the ambient air to cool parts and circuits. The exploitation of wind potential does not include any form of chemical, physical or biological process from which gaseous pollutants of any kind arise and are released into the environment as final or intermediate products. On the contrary, the project under study is expected to have a positive effect on the general state of the atmospheric environment, as its operation will contribute to the increase of electricity production through renewable, environmentally friendly energy sources. The amount of electricity produced by the WPP under study will contribute positively to the country's energy deficit, by developing energy production from renewable resources and covering part of the annual energy demand.

Finally, any impact from vehicle movements to perform maintenance or repair works is considered negligible. Considering the size and nature of the projects under study, it is estimated that the effects during the operation phase of the project under study on the atmospheric environment will be **moderately positive and long-lasting.**

Synergistic/Cumulative effects

As regards synergistic effects, there is no possibility of significant cumulative synergistic effect from the proposed project design with other projects of a similar or different nature.

During the construction phase, there is no question of cumulative/synergistic effects as the simultaneous construction of all adjacent WPP under licensing is unlikely to take place. Even in the case of simultaneous operation of the adjacent WPP under license, you will not emit any air pollutants but on the contrary the installation of the projects will greatly reduce the air pollutants in the wider area of the study.

Wind power plants produce electricity by utilizing renewable energy sources, such as the wind potential of the Rhodope and Evros regions, substituting polluting sources such as lignite and oil, etc. The contribution of these projects is considered important in addressing global environmental phenomena such as the greenhouse effect and climate change, etc.

The conclusions of the air quality impact assessment are summarised in the table below.

Air quality						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	IMMEDIATE	MODERATE	MODERATE	YES	YES	NEGATIVE
OPERATION	INDIRECT	HIGH	HIGH	YES	/	POSITIVE
CLOSURE	/	/	/	NO	/	/

Table 75: Air Quality Impact Assessment Matrix.

9.11 Effects of Noise or Vibration

In general, wind turbines are generally silent machines, which do not cause noise pollution and disturbance to the residents of the wider area. The sound level at 40 meters from a wind turbine is 50-

60 dB(A), which is equivalent to the volume of a discussion (European Commission, 1999). At 200 metres, the noise level drops to 44 dB(A) in the windward of the wind turbine for a wind speed of 8 m/s. The aerodynamic noise generated by the rotating blades of the engine is particularly low and can in no way be compared to the noise level of similar conventional power stations. Technological studies carried out by educational institutions and organizations (National Technical University of Athens, Centre for Renewable Energy Sources, Danish Ministry of Energy, etc.) show that the noise level of a modern wind turbine of average size does not exceed 45.3 dB within a radius of 150 m.

Thus, in this section a brief presentation of the effects of noise and vibration is made. Subsequently, the data analyzed below during the construction and operation of the proposed WPP have been drawn from the Special Noise Study, which is attached to the Annex of the M.P.E., in combination with bibliographic data.

9.11.1 Construction phase

The first and main source of noise during the construction of an WPP is the machinery used on the construction site (machinery for excavating or loosening soils, loading excavation products, laying and compaction of materials, etc.) and the second source is noise from the traffic of heavy vehicles transporting excavation materials to the construction site's deposition sites. Noise coming from vehicles is likely to affect areas away from the construction site, as vehicles use the local road network to reach their destination.

However, the nuisance created by heavy vehicles and construction site machinery will be of short duration and reversible as vehicles will use the local road network only during construction.

Those who will be affected by the noise produced will be the project workers. The duration of the nuisance will also be temporary as it will apply only during the construction of the WPP under study. If necessary, for the safety of employees, earplugs will be provided to them under the responsibility of the company that constructs the projects. More information regarding the noise section is presented in the attachment to the Annex of the EIS.

At this stage it is not possible to record the operation data of the construction site (types of machinery, actual operation times, etc.), so the noise impact assessment will be carried out approximately.

We consider a mobile construction site of 12-hour operation with the following composition:

- 1 excavator
- 1 loader
- 1 grader
- Trucks
- 1 roller

The results of the prediction of the Leq(12) noise level for a receiver at distances of 15 to 400 m from the source are presented in the following table:

Tuner distance (m)	**15**	**30**	**50**	**100**	**200**	**400**
Leq(12) dBa (rural area)	81	75	71	65	59	53
Leq(12) dBa(urban area)	84	78	74	68	62	56

Table 76: Noise level measurements for receiver located between 15 and 400 m

The noise that will be caused by the operation of the vehicles and machinery that will be used for the foundation and erection of the Motorways and the road construction project will not be more than 50 dB(A) (at more than 500m) as defined by the relevant legislation on the urban environment (P.D. 1180/1981). In more detail according to Article 2, Fri. 5, of Presidential Decree 1180/81 determines the maximum permissible noise limit emitted by installations – activities which you measure on the boundary of the property on which the installation – activity area is located.

n/a	AREA	CEILING NOISE IN dB(A)
1	Statutory Industrial Areas – Quarry Areas	70
2	Areas where the industrial element prevails	65
3	Areas where industrial and urban elements prevail equally	55
4	Areas where the urban element prevails	50

Table 77: Maximum permissible noise from installations

Any impact from the operation of construction sites is local and can be significantly reduced by taking appropriate remedial measures, proposed in the relevant section of Cap. 10 to minimise the impact on the acoustic environment.

Indicatively, the following are mentioned:

- Location of construction sites at the greatest possible distances from settlements and anthropogenic activities.
- Use of machinery and construction site vehicles with strict noise emission specifications.
- Implementation of the strictest regulations, both Greek and EU.
- Selected route of heavy vehicles.

Finally, any impact on the acoustic environment is considered fully reversible, since they last as long as the construction phase of the project.

From the above data it follows that the acoustic disturbance of the project will be minimal, as shown by the acoustic map of the attached Special Noise Study, since the nearest settlement is 3.17 km (settlement Roussa) from the nearest wind turbine.

The same applies during the construction of medium-voltage transmission lines. Finally, appropriate measures will be taken so that vehicles carrying all the necessary equipment of the project (foundations, cables, etc.) pass as little as possible through sensitive points (residential areas, settlements) so that noise nuisance is as small as possible and zero during quiet hours.

Another feature of noise during the construction of such works is its variation in time. Construction sites usually operate from 7 a.m. to 3 p.m., so there is no problem in the afternoon, evening and night hours. Usually, if there is no need to expedite work, on weekends work is not carried out at the construction site of a wind farm.

Therefore, it is estimated that the impact on the acoustic environment of the area during the construction phase of the project will be **practically negligible, short-term and completely reversible.**

In conclusion, the assessment of the impact from the construction of the projects (main and attendant) could be considered as medium scale, in the light of the fact that in the current situation no noise emissions are detected – i.e. these are semi-mountainous areas that do not host civil engineering works or facilities and are surrounded by small settlements. **However, with the adoption of the above mitigation and/or other preventive measures, the impact is estimated to be low scale.**

Synergistic effects

During the construction phase of the project, there will be no possibility of cumulative/synergistic action as it is impossible to construct all the projects at the same time. Therefore, the impact on the acoustic environment of the project area will be practically negligible, short-term and completely reversible.

9.11.2 Operational phase

Wind turbines are machines that do not cause noise nuisance to the surrounding area. The noise produced during the operation of a wind turbine is the aerodynamic noise created due to the rotating blades of the engine, which compared to the noise levels of other power plants is quite low. Also, the mechanical noise caused by the operation of the bearing and generator has been greatly reduced thanks to new technologies.

The aerodynamic noise produced by wind turbines is only noticeable at low wind speeds. When the wind speed exceeds 8 m/s, then the aerodynamic noise of the air conditioning is exceeded.

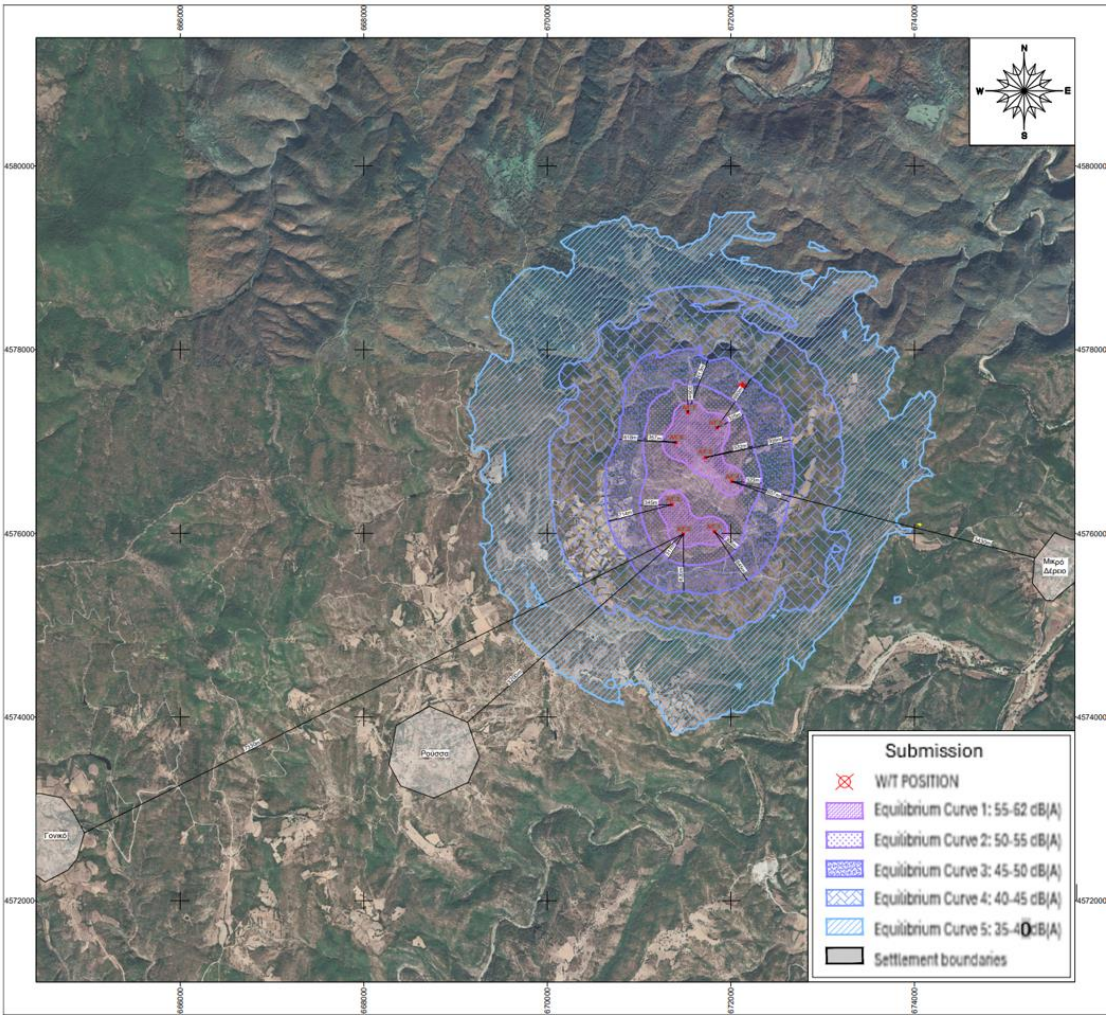
The wind turbines to be installed in the Wind Park under study are of the latest technology and have all the required certificates of quality and operation (IEC 61400, IEC WT 01 IEC, ISO 2813 etc.). More specifically, the M/W that will be used will be of the company Vestas, type V136, with a nominal power of 4.5 MW, with a rotor diameter of 136 m and with a hub height of 105 m.

For the estimation of the noise produced by the wind farm under examination and by extension of the 8 wind turbines, as well as the delineation of the isonoise curves, the logarithmic law of sound transmission was used. This determination was made using the specialized software WindPro of the Danish company EMD International A/S. The calculations are based on the approved standard ISO 9613-2, which is widely the most used standard for predicting noise levels.

The basic parameters of the model were the positions of the aircraft, the dimensions of the aircraft and mainly the height of the pillar (hub height), as well as the noise emission at the source (LW, ref) at a specific wind speed.

Based on the technical data sheet provided by the manufacturer, the noise level at source for adverse wind speeds (>9m/s) is 103,9 dB(A).
The following map shows the isonoise curves of the Noise Study for the plot at the location "Mavrodasos".

Thus, after the analysis described in the attached Special Noise Study, isonoise curves were obtained which are depicted in the map below:



Map 56: Equilibrium curves in relation to the nearest settlements for WPP at Mavrodasos.

From the above, the following conclusions can be drawn:

- The equilibrium curves exceeding the maximum permissible noise limit of 45dB(A), as set out in the Special Spatial Plan for RES and in the Presidential Decree 1180/81 (Government Gazette 293/A/6-10-1981), extend to radii less than 939m from the centers of the wind turbines.
- The closest settlements to the wind farm are Roussa, Mikro Dereio and Goniko where the noise produced by the wind farms is lower than the maximum permissible limit. The exact noise levels that will reach the above settlements are presented in detail in the following *table*
- The noise produced by the W/T at less than 200 m (isonoise curve 1), an area in which no point of interest is located, is the same as that heard during a normal conversation.

The following tables 111 and 113 describe the minimum distance of isonoise curves 1, 2 and 3 from the WPP in question at the location "Mavrodasos". (e.g. It is observed that isonoise curve 1 (55-62dB(A)) extends approximately 200m around all the W/T of the examined WPP.) (e.g. isonoise curve 2 (50-55dB(A)) is at least 305m away from W/T7 and 306m from W/T1 of the examined WPP and so on) The same is described in Table 113 with the difference that it refers to the cumulative study of the WPP under study and the three (3) adjacent WPPs. Also, the attached maps ("Isonoise Curve Plan" and "Isonoise Curve Aggregate Plan") indicate and specify the distances.

Landmarks	**Nearest M/W**	**Distance (m)**	**Noise level dB(A)** *Produced by the WPP at the location "Mavrodasos"*
Settlement – Roussa	W/T2	3.174 m	30,26
Settlement – Mikro Dereio	W/T4	3.404 m	29,05
Settlement – Parental	W/T2	7.293 m	19,64
Settlement – Great Lawn	W/T2	9.570 m	12,03
Settlement – Kissos	W/T2	9.728 m	12,30
Settlement – Mikraki	W/T2	10.477 m	9,78

Table 78: Distances of points of interest from M/W (measured from nearest point to M/W and noise level at wind speed 10 m/s.

Noise contours Curves	W/T	Minimum Distance (m)	Produced noise (dB(A))
Noise contours Curves 1	W/T 1-8	0-200	55-62
Noise contours Curves 2	W/T 1	306	50-55
	W/T 2	317	
	W/T 3	345	
	W/T 4	323	
	W/T 5	532	
	W/T 6	357	
	W/T 7	305	
	W/T 8	325	
Noise contours Curves 3	W/T1	645	45-50
	W/T2	620	
	W/T3	714	
	W/T4	657	
	W/T5	939	
	W/T6	618	
	W/T7	613	
	W/T8	660	

Table 79: Distances of Equilibrium Curves from W/T and noise produced by the operation of the studied WPP at the "Mavrodasos" site.

According to the limits of the Special Spatial Framework for RES and the limits defined by P.D. 1180/81, it is concluded that although the worst-case scenario for the implementation of the study was considered, the installation of the WPP with a total capacity of 34.5MW will not create any acoustic impact on the surrounding area as the noise levels produced are expected to be negligible. During the operational phase of the project, there is no risk of exposing people to a high level of noise. It should be remembered that the usual sound level of noise in a quiet room without human activity exceeds 60dB(A), a value that appears only in the narrow core of each M/W separately.

Synergistic/Cumulative effects

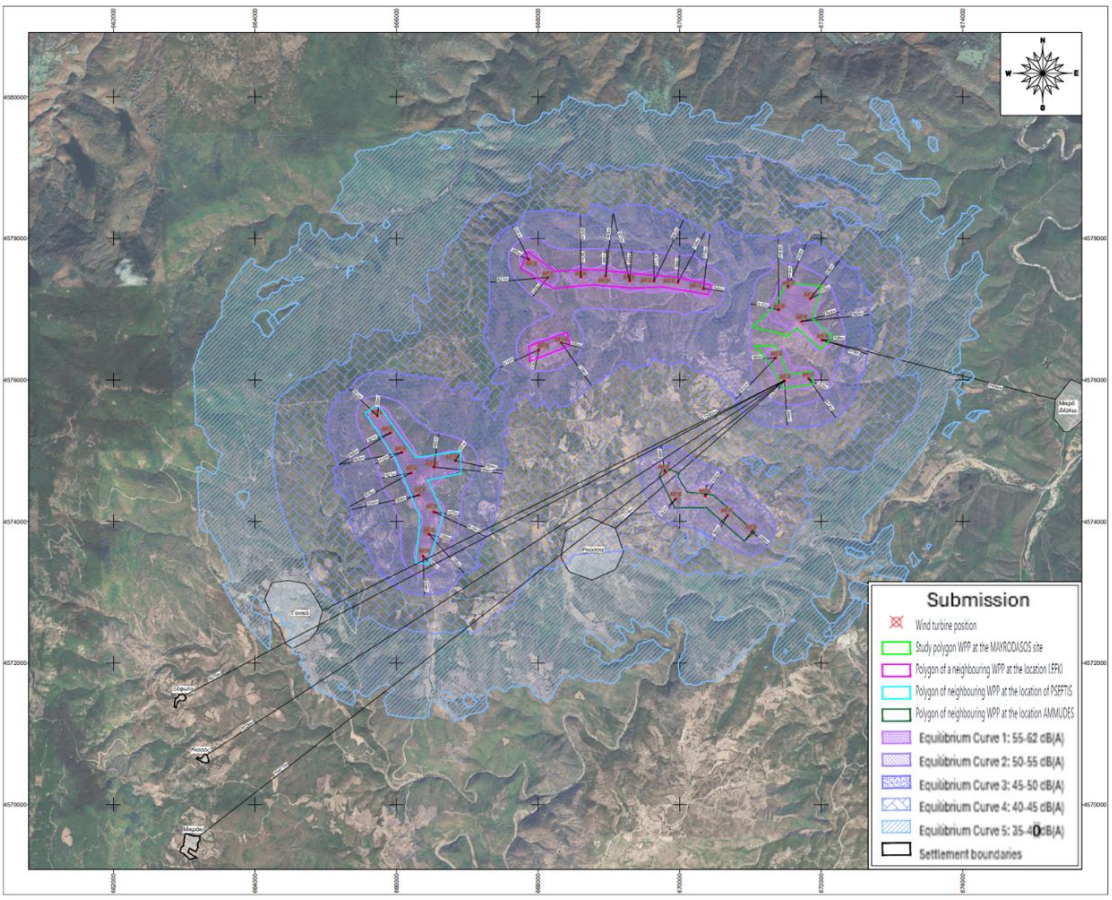
In addition to the examination of the noise level for the WPP under examination at the "Mavrodasos" site, the noise level from the ***cumulative operation of the other three adjacent WPP at the "Lefki", "Ammoudes" and "PSEFTIS" sites was also calculated.***

The noise levels from the cumulative operation of the WPP under study at the "Mavrodasos" site and the three (3) neighboring WPP at the "Lefki", "PSEFTIS" and "Ammoudes" sites have been calculated,

as presented in table 5.3 of the attached Noise Study. According to this cumulative study, isonoise curves exceeding the maximum permissible noise limit of 45dB(A), extend to radii less than **1008m** from the centers of the wind turbines.

The noise produced by the aircraft is at less than 200 m (isonoise curve 1), an area in which no point of interest is located and is the same as that heard during a normal conversation.

The following maps and tables depict the results of the cumulative study of the four WPPs, to illustrate the above.



Map 57: Cumulative design of equilibrium curves. (Considering the cumulative operation of the studied WPP at the "Mavrodasos" site and the three (3) neighboring WPP at the "Lefki", "PSEFTIS" and "Ammoudes" sites).

Landmarks	**Nearest W/T**	**Distance (m)**	**Noise level dB(A)** *Produced by the cumulative operation of three (3) WPP*.*
Settlement – Roussa	W/T2	3.174 m	41,01
Settlement – Mikro Dereio	W/T4	3.404 m	30,61
Settlement – Parental	W/T2	7.293 m	38,31

Settlement – Great Lawn	W/T2	9.570 m	31,48
Settlement – Kissos	W/T2	9.728 m	30,54
Settlement – Mikraki	W/T2	10.477 m	28,38

Table 80: Distances of points of interest from M/W (measured from nearest point to M/W and noise level at wind speed 10 m/s.

Noise contours Curves	W/T	Minimum Distance (m)	Produced noise (dB(A))
Noise contours Curves 1	W/T 1-8	0-200	55-62
Noise contours Curves 2	W/T 1	310	50-55
	W/T 2	323	
	W/T 3	360	
	W/T 4	328	
	W/T 5	544	
	W/T 6	412	
	W/T 7	316	
	W/T 8	330	
Noise contours Curves 3	W/T1	672	45-50
	W/T2	640	
	W/T3	810	
	W/T4	679	
	W/T5	965	
	W/T6	1008	
	W/T7	658	
	W/T8	686	

*Table 81: Distances of Isonoise Curves from W/T and noise produced by the cumulative operation of the studied WPP at the "Mavrodasos" site and the three (3) neighboring WPP at the "Lefki", "PSEFTIS" and "Ammoudes" sites.*The cumulative operation of four (4) WPP includes the WPP under study at the "Mavrodasos" site and three (3) neighboring WPP at the "Lefki", "PSEFTIS" and "Ammoudes" sites.*

Noise and Vibration						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	IMMEDIATE	LOW	LOW	YES	YES	/
OPERATION	IMMEDIATE	LOW	LOW	YES	YES	/
CLOSURE	/	/	/	NO	/	/

Table 82: Noise or vibration impact assessment matrix.

9.12 Effects Related to Electromagnetic Fields

During the construction phase no electric and magnetic fields are expected to be generated and therefore no impact will occur.

During the operation phase of the proposed WPP, the parts of the installation that will emit low-level electromagnetic radiation are the generator and the M/S which is located inside the generator. The electromagnetic field of the generator produced will be at low levels and will be limited to the engine shell, which is located at a height of 105 meters from the ground.

Regarding the energy transmission and interconnection projects of the two projects, it is noted that the Medium Voltage (M.V.) connection lines of each project will be underground as they will be placed within channels that will follow the route of the internal road construction of the wind farms. In addition, the interconnection of WPP with the energy transmission network will be carried out through underground medium voltage lines of 33kV that will start from the fuselage of each wind turbine and will end at the proposed substation. Therefore, in none of the above energy transmission and interconnection works of the proposed WPP will there be an electromagnetic field emission.

From the above, it is concluded that no increase in the level of electromagnetic radiation will occur from the installation and operation of the proposed project (WPP).

Synergistic / Cumulative effects

In case of simultaneous construction of all WPP in the study area, there is not expected to be an effect on electromagnetic fields. During the respective simultaneous operation of all WPP in the study area (with an operating license and/or producer certificate), there will be no correlations with electromagnetic fields.

Electromagnetic Fields						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	/	/	/	NO	/	/
OPERATION	INDIRECT	LOW	LOW	YES	YES	/
CLOSURE	/	/	/	NO	/	/

Table 83: Electromagnetic Field Impact Assessment Table

9.13 Impact on water

Both during the construction phase and during the operation of the project, no disturbance of the hydrological condition of the immediate and wider study area is foreseen due to the mild nature of the project.

9.13.1 Construction phase

As far as surface waters are concerned, not much variation is expected in the water balance of the area since excavations and other works will take place outside the aquifer, and therefore will not affect groundwater. During the construction works of the A/P and the accompanying works, special attention should be paid to possible leaks of small quantities of liquid waste from the construction site to be installed in the project area, which are mineral oils from the maintenance of vehicles and machinery, oil or gasoline from the movement of vehicles, liquid waste from the washing of concrete vehicles and household sewage of construction site personnel.

There will be no changes in the movement of surface water, nor will the current situation in terms of water absorption rate or soil leaching change. There are also no plans for projects (e.g. large earthworks) that could affect the course of flood waters or indirectly create risks of exposing people or property to flood wave disasters.

9.13.2 Operational phase

During the operation of the wind farm, no activity capable of affecting the flow of water is also foreseen. The wastewater produced during the operation of the wind farm is summarized in oils from the maintenance of the wind turbines and urban wastewater from the personal cleanliness of the staff. No negative effects are expected from surface rainwater runoff on roadways. The proposed sewerage engineering works (tubular culverts – box culvert) aim, on the one hand, at the extraction of rainwater at points of intersection of roads and the drainage of drainage ditches (piezobreakers) to ensure the good hydraulic operation of the road.

The operation of a WPP does not include liquid waste from a production process, nor does it pose risks of thermal pollution of neighboring surface or groundwater receivers, since no cooling water is used. Any effects from liquid waste can only arise from accidental oil leakage due to damage or during maintenance of the generators. All circuits of the generators are closed, so they are immediately switched off in case of failure, without any oil leakage. As for the liquid waste resulting from the scheduled replacement of the oils of these devices, their management will be carried out in accordance with the provisions of the applicable environmental legislation by specialized technicians of the manufacturing company. The solid waste expected during the operation phase is minimal and mainly concerns urban type waste that will be produced by the staff and will necessarily be collected in special metal bins that will be placed in appropriate locations inside the installation site of the A/P.

In the wider area of installation of the wind turbines, ravines / misganges are located, one of which passes through the square of W/T 6. It is a ravine/misgangia that cannot receive water from any other body of water, except rainwater. Consequently, the hydrographic network will not be affected during the operational phase of the project.

In conclusion, as there are no watercourses in the project area, as defined in Law 4258/2014, and therefore the proposed projects cannot de facto lead to the reduction of the amount of water available to the public and will not affect existing abstractions.

Synergistic / Cumulative effects

The possibility of significant cumulative/synergistic action is not apparent from the proposed project design with other projects of similar or different nature.

During the construction phase there is not expected to be an impact as the adjacent WPP under license are unlikely to be built at the same time. During the operation phase, in case of licensing of all WPP with a production license, there is no possibility of reducing the quality and quantity of surface and groundwater in the wider area

Waters						
Project phase	**Kind**	**Possibility of occurrence**	**Intensity**	**Synergistic action**	**Reversibility**	**Effect**
CONSTRUCTION	/	/	/	NO	/	/

OPERATION	/	/	/	NO	/	/
CLOSURE	/	/	/	NO	/	/

Table 84: Water Impact Assessment Table

9.14 Impact of Project Vulnerability and Accident Occurrence

The vulnerability levels of the project and its accompanying projects are very low due to the nature of the project and its characteristics. The chances of a serious accident occurring are also very small, while there is no possibility of causing a domino-type accident. There will be no hazardous materials (fuel or toxic substances) or waste in the project. Its construction and operation are designed to be completely safe.

This security shall be ensured by:

- The distances between wind turbines that follow the current legislation
- The construction of an underground interconnection with the 33 kV Medium Voltage Network
- The foundation of wind turbines on reinforced concrete bases
- The assembly of individual parts of wind turbines in accordance with international standards and manufacturer's instructions.
- Installed operation monitoring system
- Regular maintenance by special crews
- Implementation of the terms of the AET.
- Fire protection and fire detection system within a radius of 5km

In any case, the safety of the project and its environment is of paramount importance to the company.

The project under study is not subject to the provisions of Joint Ministerial Decision 172085/2016 (Government Gazette 354/B/2016) on the "Determination of measures and conditions for dealing with risks from major accidents in installations or units, due to the presence of dangerous substances, in compliance with the provisions of Directive 2003/105/EC "amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances" of the European Parliament and of the Council of 16 December 2003.
This chapter analyses the impact arising from the vulnerability of the project to natural disaster or major accident risks.

Vulnerability is defined as the characteristics and conditions of a community, system or asset that make it vulnerable to the harmful effects of risk. **Vulnerability is the degree of loss of a given item or group of elements at risk because of the occurrence of a natural phenomenon of comparable magnitude.**
The project under study is not subject to the provisions of Joint Ministerial Decision 172085/2016 (Government Gazette 354/B/2016) on the "Determination of measures and conditions for dealing with risks from major accidents in installations or units, due to the presence of dangerous substances, in compliance with the provisions of Directive 2003/105/EC "amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances" of the European Parliament and of the Council of 16 December 2003.

The methodology followed includes the identification of hazards, the type of risk to the project and the environment, the likelihood of occurrence of the risk and its impact on the project and the natural and man-made environment.
A quantitative assessment of the materiality of each risk is then carried out using the following evaluation criteria:

Probability – Frequency of occurrence of the phenomenon

High probability	**3**
Moderate Probability	2
Low probability	1

Table 85: Probability – Frequency of Phenomenon

Project vulnerability

High	**3**
Moderate	2
Small	1

Table 86:Project vulnerability

Severity – magnitude of risk impact

Large-scale	**3**
Medium Range	2
Small-scale	1

Table 87:Severity – magnitude of risk impact

The sum of all criteria constitutes the overall score of the threat and accordingly they are prioritized into high, medium and low importance.
For a score equal to or greater than 8, it is considered a serious threat of high importance and immediate response measures should be taken.
For a score of 5 to 7 inclusive, it is considered a medium size and significant threat, and actions and controls are required soon.
Finally, for a score of 3 to 5, it is considered a low-level threat, and no measures and actions are required immediately.

Initially, scenarios that could potentially cause serious impacts on the project and the natural environment of the area are identified.
The potential risks that the project may face are:

- Floods
- Earthquakes
- Forest Fires
- Explosion
- Accidental pollution

Below is a detailed presentation of the impact of the above risks.

Floods

The floods that are the most serious and dangerous type are flash floods. They usually occur after little or no warning and last for a very short time. They result from the sharp and rapid rise in water level, which is accompanied by high speeds. They occur especially in hilly or mountainous areas with steep slopes of terrain. The surface runoff they cause is very important for the duration of the flood and poses a serious threat to the structural integrity of buildings and infrastructure. Important factors in this type of floods are the intensity and duration of rainfall, the morphology and slope of the terrain of the area as well as the surface conditions that prevail. The installation area of the station is outside **the potentially high flood risk zone.** This is a part of land with slight slopes. It is also important to note that in the studied project there are no watercourses, however small misganges have been found near the project.

According to paragraph 2 of article 1 of Law 4258/2014 (Government Gazette A' 94/14.4.2014), misgangeias are defined as *"recipients of surface runoff water with a catchment area of less than or equal to 1.0 sq.x., when located outside the boundaries of a residential area, or less than or equal to 0.50 sq.x. for those within the boundaries of a residential area".*

According to paragraphs 6.8 and 8.14, there is no question of delimitation of a watercourse, since in this case there are reasons to ensure the unhindered runoff of surface waters and the environmental protection of the watercourse, which does not arise in the study area.

Earthquakes

An earthquake is a phenomenon that usually occurs without clear warning, cannot be prevented and, despite its short duration, can cause great material damage to human infrastructure. The impact that an earthquake is likely to have on the area and consequently on the project depends on its intensity but also on how prone the natural environment is in that area.

The area where the project is to be located belongs to an area of low seismic risk, so the chances of a catastrophic earthquake occurring are minimal. Due to the low vulnerability of the construction site to earthquakes, the potential damage in the event of a large earthquake is expected to be very small without significant impact on the environment.

Forest Fires

Forest fires are a large-scale natural phenomenon that falls into the category of natural disasters and can have catastrophic consequences.

The causes of fires could be classified into the following cases:

A) Natural causes

This category includes fires from lightning and volcanoes.

Natural fires are few and do not exceed 3%.

B) Arson by negligence

This category includes fires from cigarette dumping, burning garbage and weeds, lighting fires in forests, engine sparks, etc. Arson by negligence is also the main cause of forest fires with a confirmed percentage of cases greater than 50%.

C) Intentional arson

This is the most devastating cause of forest fires. It accounts for about 30% of forest fires.

D) Unknown causes

They make up the remaining 17% and these are the causes that cannot be explained logically or proven. Human activities very often cause the occurrence of fire, thus reducing the resilience of the ecosystem and consequently its ability to regenerate and maintain.

In a fire, the wind and its speed play a decisive factor in the range of its spread. The consequences that are going to arise from the outbreak of a fire are:

- Fragmentation of the ecosystem of the area where the fire took place
- It degrades air quality causing health effects
- It negatively affects the surrounding areas

The vulnerability of the project to fire is low, as mentioned above in paragraph 8.14 of Chapter 8, the nature of the WPP project is not expected to create favorable conditions for forest fires during its operation phase. The project will not create hazardous emissions of gaseous pollutants due to the absence of flammable materials during the construction phase and during its operation phase. The maintenance of the project as well as the occasional measurements that will be carried out will help to prevent accidents. There will be a presence of personnel where in case of observation of fire or strange activity, the competent authorities will be informed, and the forest road will be cleaned to make it accessible for fire trucks in case of emergency.

Explosion Challenge

An explosion is not feasible as no flammable substances will be used either during the construction phase or during the operation phase of the project.

Leakage of hazardous liquids into the soil or groundwater of the area.

The hazards that may cause material leaks are almost non-existent since during its operation the project will manage wastewater appropriately.

During the construction phase, particular attention should be paid to possible leaks of small quantities of liquid waste from the construction site to be installed in the project area, which are mineral oils from the maintenance of vehicles and machinery, oil or gasoline from the movement of vehicles, liquid waste from washing concrete vehicles and domestic sewage of construction site personnel.

During the operation phase of the project as already mentioned in paragraph 9.13, any effects from liquid waste may arise only from accidental oil leakage due to damage or during maintenance of the M/F. All circuits of the generators are closed so that they are immediately switched off in case of failure, without any oil leakage. As for the liquid waste resulting from the scheduled replacement of the oils of these devices, their management will be carried out in accordance with the provisions of the applicable environmental legislation by specialized technicians of the manufacturing company.

The measures for dealing with accidental leakage of hazardous wastewater during the construction and operation phase are detailed in paragraph 10.12.

It is important to note that under paragraph 6.8 there are no water courses for which demarcation is required, only misgages in the vicinity of the project.

The project cannot de facto lead to the reduction of the quantity of water available to the public and will not affect existing abstractions as water needs will be covered by aquifers.

DANGER-THREAT	PROBABILITY-FREQUENCY OF OCCURRENCE OF A PHENOMENON	PROJECT VULNERABILITY	SEVERITY - MAGNITUDE OF IMPACT ON THE ENVIRONMENT	COMPREHENSIVE RISK ASSESSMENT	THREAT SIZE	JUSTIFICATION
NATURAL DISASTERS						
Floods	1	1	2	4	Low	The project is free of streams and other types of hydrological runoff as there are no watercourses but only misganges. Therefore, there is no need to delimit a watercourse as detailed in paragraph 6.8
Earthquakes	1	1	1	3	Low	According to the Greek Antiseismic Regulation (EAK 2000) as amended by the decisions of the Minister of Public Works. D17α/67/1/ΦΝ275/03 (ΦΕΚ 781/Β/16-6-03) and Δ17α/115/9/ΦΝ275/03 (ΦΕΚ 1154/Β/12-8-03), the area is included in the seismic hazard zone I. The earthquake detected in the wider area of the project took place in 2005, with a magnitude of 3.6 on the Richter scale, at a depth of 10 km and at 25 km from the study area of the project.
Fire	1	1	3	5	Low	The project is not particularly at risk of fires, since it is in an area with sparse vegetation. In addition, during the design of the project, all fire protection and fire safety measures have been taken.
MAJOR ACCIDENTS						
Pollution from leakage of hazardous liquids (mineral oils from maintenance or from accidental leakage of oils due to damage or	2	1	1	4	Low	The project does not produce liquid waste. During the construction phase they may arise from the maintenance of vehicles and machinery, diesel or gasoline from the movement of vehicles.During the operation phase they may arise only from accidental leakage of oils from damage or during maintenance of the M/F. **The vulnerability of the project to such leakage is considered negligible since all necessary**

during maintenance of windmills						**preventive measures have been taken in paragraph 10.12.**
Explosion - Fire	1	3	3	7	Moderate	The cause of fire – explosion. Fire can be caused during the operation phase by electrical or mechanical damage involving friction or high heat dissipation that can lead to fire in the wind turbine nasela. These types of fires are usually of short duration and are not easy to extinguish due to their location. If the fire develops, the hot sections may fall and lead to local fires in the wider area of the works (with possible expansion and causing a major accident, absence or not of vegetation). During the maintenance of the M/W and specifically during their lubrication, volatile substances (resins) will be used, which may ignite with increasing temperature. In this case, it is almost impossible to cause a major accident provided that large quantities of chemicals are not kept in a place for maintenance or repair. **The vulnerability of the activity is considered moderate as all prevention measures have been taken during the planning of the activity to minimize the likelihood of occurrence of such phenomena.**

Table 88: Vulnerability assessment of the project from natural disasters and accidents

9.15 Impact of the project on climate and vulnerability of the project to climate change, vulnerability and adaptation of the project (climate resilience)

An assessment of the adaptation of renewable energy projects to climate change should consist of two phases, pre-screening and detailed analysis. During the pre-screening, the vulnerability analysis of the project to climate change is carried out. The vulnerability analysis decides whether a detailed analysis is required or not.

Where required, such as for RES projects, the detailed analysis shall include the risk analysis of each significant hazard identified in the vulnerability analysis. The risk analysis assesses each hazard, which is now the inherent risk, in terms of its materiality level.

Significant inherent risks require consideration of climate change adaptation measures that reduce each significant inherent risk to an acceptable level of residual risk.

Therefore, climate vulnerability assessment and risk analysis will be integrated from the beginning of its development process, as this usually ensures the widest possible range of possibilities for selecting the best adaptation options.

A detailed presentation of the expected change in climate parameters can be found in the National Information Web Portal on Adaptation to Climate Change (https://adaptivegreecehub.gr) developed in the framework of the LIFE-IP AdaptInGR (www.adaptivegreece.gr) project. The data of the Node have been used for the analysis methodology in the Project Evaluation Framework.

The climate resilience assessment of the project is discussed in Chapter 5.2.1.

9.16 Summary of impact in tables

ENVIRONMENTAL PARAMETERS	DIRECT (A) / INDIRECT (E)	POSITIVE (I) / NEGATIVE (A)	SHORT TERM (B) / LONG TERM (M)	REVERSIBLE	TREATABLE	SHORT TERM / POSITIVE - NEGATIVE
CLIMATIC & BIOCLIMATIC CHARACTERISTICS						
MORPHOLOGICAL & LANDSCAPE	A	A	B	PARTIALLY	PARTIALLY	I
GEOLOGICAL, TECTONIC & SOIL	A	A	B	PARTIALLY	PARTIALLY	
NATURAL ENVIRONMENT	A & E	A	B	PARTIALLY	PARTIALLY	A
ANTHROPOGENIC ENVIRONMENT						
SOCIO-ECONOMIC ENVIRONMENT	A	I	B			
TECHNICAL INFRASTRUCTURE	A	A	B	YES	PARTIALLY	
ANTHROPOGENIC PRESSURES ON THE ENVIRONMENT	A	A	B	PARTIALLY	PARTIALLY	I
ATMOSPHERIC ENVIRONMENT - AIR QUALITY	A	A	B	PARTIALLY	PARTIALLY	I
ACOUSTIC ENVIRONMENT AND VIBRATION	A	A	B	PARTIALLY	PARTIALLY	
ELECTROMAGNETIC FIELDS						
WATERS	A	A	B	YES	PARTIALLY	

Table 89: Environmental impact during the construction phase of the project

ENVIRONMENTAL PARAMETERS	DIRECT (A) / INDIRECT (E)	POSITIVE (I) / NEGATIVE (A)	SHORT TERM (B) / LONG TERM (M)	REVERSIBLE	TREATABLE	SHORT TERM / POSITIVE - NEGATIVE
CLIMATIC & BIOCLIMATIC CHARACTERISTICS	E	I	M			

MORPHOLOGICAL & LANDSCAPE	A	A	M	PARTIALLY	PARTIALLY	I
GEOLOGICAL, TECTONIC & SOIL				PARTIALLY	PARTIALLY	
NATURAL ENVIRONMENT	A & E	A	M	PARTIALLY	PARTIALLY	A
ANTHROPOGENIC ENVIRONMENT						
SOCIO-ECONOMIC ENVIRONMENT	A & E	I	M			
TECHNICAL INFRASTRUCTURE						
ANTHROPOGENIC PRESSURES ON THE ENVIRONMENT	A	A	M	PARTIALLY	PARTIALLY	I
ATMOSPHERIC ENVIRONMENT - AIR QUALITY	E	I	B	PARTIALLY	PARTIALLY	I
ACOUSTIC ENVIRONMENT AND VIBRATION						
ELECTROMAGNETIC FIELDS						
WATERS						

Table 90: Environmental impact during the operational phase of the project.

CHAPTER 10 - ADDRESSING ENVIRONMENTAL IMPACTS

The impacts from the operation of the project are expected to be largely positive. Some weak, mostly negative impacts, which are temporary and reversible, will occur during the construction of the proposed WPP and its accompanying engineering works, mainly due to dust and possibly difficulties for vehicles to cross the construction sections along existing roads. However, by taking appropriate measures, any adverse impacts will be minimized and addressed.

Based on the previous chapter, which has provided a detailed description of the impacts of the construction and operation of the proposed projects, this chapter proposes, where necessary, additional measures to prevent or mitigate any potential adverse impacts on the parameters of both the natural and man-made environment

Thus, the proposed measures are aimed, in order, at the following ways of addressing environmental impacts:

- Prevention - Avoidance
- Prevention - Prevention - Mitigation Reduction of intensity and extent
- Mitigation, reduction, mitigation, reduction, mitigation and compensation

10.1 Addressing impacts on climate and bioclimatic features

The project will not result in adverse changes to climatic conditions both in the area where the works are located and in the wider area. No impacts are identified in either phase of the project (construction, operation), therefore no mitigation or protection measure is required. On the contrary, the project contributes to the reduction of greenhouse gas emissions, thus contributing to the mitigation of climate change.

10.2 Addressing impacts on morphological and landscape features

10.2.1 Construction phase

This section will analyze the mitigation measures to address the impacts of the projects on the morphological and landscape features of the study area during the construction and operation phase. The impacts that construction sites may cause are short term and for the most part reversible after the end of the construction phase.

Regarding the impacts caused by construction machinery and site facilities, the following measures are proposed:

- The extent of occupation of the works should be limited to that which is strictly necessary for the construction of the project.
- Facilities such as offices, workshops, warehouses, etc. will need to be moved after the construction phase is complete and the site will need to be restored.
- Any permanent paving or cementing of surfaces where not necessary will be prohibited.
- Waste and wastes (solid, liquid hazardous and non-hazardous) generated from site activities will be managed appropriately to avoid causing any kind of pollution to the environment.
- Household waste bins will be provided for the urban type of waste generated by the workers and to avoid accumulation of waste, it should be disposed of periodically under the responsibility of the works contractor.

- Solid waste should not include debris or materials that are hazardous and should be disposed of in accordance with the applicable legislation.
- The management of used mineral oils should be carried out in accordance with the provisions of Decree 82/2004 (Government Gazette 64/A/2.3.04) on "Determination of measures and conditions for the management of used mineral oils", which replaced KYA 98012/2001/96.
- Waste lubricating oils and fluids of each type will be collected separately by category in special tanks or drums and temporarily stored in a covered area.
- The management of toxic and hazardous waste should be carried out in accordance with the provisions of the KYA HP 13588/725/2006 (Government Gazette 383B/28-3-2006) "Replacement of KYA 19396/1546/97 (Government Gazette 604B/18-7-1997)", as amended by Y.A. 8668/2007, (Government Gazette 187/B/2.3.2007), Y.A. 146163/2012, (Government Gazette 1537/B/8.5.2012), Law 4042/2012, (Government Gazette 24/A/13.2.2012) and H.A. 62952/5384/2016, (FEK 4326/B/30.12.2016).
- The deposition of excavated materials should be done in such a way as to avoid erosion and leaching of materials and should be covered with special plastic covers and wet to avoid dispersion of materials.
- If required by the competent forestry authority, a study of horticultural interventions should be carried out with the aim of a) restoring the natural environment and integrating the roads into the landscape b) protecting the soil surface of the embankments from erosion caused mainly by the effect of rainwater c) restoring the vegetation to be removed during excavation work.
- The harmonious integration of roads into the landscape.

10.2.2 Operation phase

During the operational phase of the projects under study, there will be no risk of hazardous substances escaping. The only hazardous wastes present in the installation of a GIS plant are the lubricating oils of the transformers and the hydraulic systems of the Gensets. Even in the event of abnormal operation of the electrical systems located inside the enclosure of the Genset, such as overheating of the electrical system, these devices are automatically shut down.

Regarding the risk of fire occurrence, all necessary fire safety and firefighting measures will be implemented in accordance with the legislation and the directions of the Fire Service.

Appropriate disposal systems (septic tank and absorption tank system) will be constructed for the management of staff wastewater.

For the management of solid waste from the packaging of materials/maintenance of the facilities and staff cleaning and hygiene materials, bins will be placed within the control house. In addition, waste will be taken off-site at frequent intervals.

Waste resulting from maintenance (parts of electrical or mechanical equipment, batteries, etc.) will be taken outside the installation under the responsibility of the technical maintenance staff.

The management of hazardous waste (collection, transport, storage, treatment, recovery or disposal) must be carried out by a natural or legal person (public or private law, licensed or the hazardous waste must be delivered, under the authority of the project contractor, to approved alternative waste management systems.

The temporary storage of hazardous waste (on the premises of the ASWR until collection) should be carried out using special packaging of UN specifications (for solid waste) or special tanks with an

integrated leakage collection system for liquid waste. The collection containers should be in an area specifically marked for hazardous waste, with adequate ventilation and lighting and at a distance from other activities in the installation.

In addition, it is noted that it is possible to adopt simple tubular towers (rather than trusses), with a three (3) blade propeller, while the coloring is done in a color that blends in with the environment. It has been shown to give a harmonious and elegant aesthetic effect and increase visual acceptance and integration into the wider field.

Finally, any form of additional lighting of wind turbines should be prohibited except those required by flight safety and CAA and Naval Air Force directives.

10.3 Addressing impacts on geological, tectonic and soil characteristics

10.3.1 Construction phase

Based on the impact analysis, the project appears to have no significant impact on the geologic, tectonic, and soil characteristics of the project site. The impacts on soil morphology and soil characteristics are mainly due to the construction - improvement of access roads, wind turbine squares and their foundation bases.

The following mitigation measures are proposed for these impacts:

- The excavations that will take place for the construction of the plazas, foundations and the opening or improvement of the roads will be limited to the minimum possible zone to be used and the minimum possible network of forest or rural roads.
- The project occupancy zone to be limited to the minimum possible.
- Site facilities erected during the construction phase of the project to be removed at the end of the construction phase and the site restored.
- Maintain the natural slopes of the land so that there is no change in the flow of surface water from rainfall.
- Safeguard the earthworks temporarily deposited for reuse to secure them from erosion and leaching phenomena. These deposits should be formed into gentle slopes, covered with appropriate plastic covers and wet to limit the spreading of material.
- The quantities of aggregates stored for the needs of the project should be limited to those strictly necessary at any one time, used as soon as possible and not allowed to accumulate.
- Disposal of unsuitable excavated material should be carried out in legally operated disposal sites so that it can be reused in other projects.
- Transport of excavated material with appropriate covers to avoid accidents on the roads.
- Most of the excavated material will be reused in the form of fill to form the platforms, to fill the excavation cones, to shape the surfaces in the project and to cover all the excavations for the cabling after the quantities necessary for the backfilling have been temporarily deposited in areas within the site boundary.
- Avoid earthworks on days with high rainfall and strong winds.

- The disposal of materials at points on the watercourse is prohibited.
- Implement appropriate management for waste and waste generated by the construction activities to avoid pollution of the site and soil from uncontrolled disposal.
- The management of used mineral oils shall be carried out in accordance with the provisions of Decree 82/2004 (Government Gazette 64 A'/02-03-04) on "*Determination of measures and conditions for the management of used mineral oils*", having regard to Article 101§4: Article 73§b of Law 4819/2021. Waste lubricating oils and fluids of each type will be collected separately by category in suitable tanks with a capacity of 0,50^{m3} and temporarily stored in a covered area.
- The management of toxic and hazardous waste shall be carried out in accordance with the provisions of the KYA 13588/725/2006 (Government Gazette 383 B'/28-03-2006) "*Replacement of KYA 19396/1546/97 (Government Gazette 604 B'/18-7-1997)*", as amended by Y. A. 8668/2007 (Government Gazette 187 B'/2.3.2007), M.A. 146163/2012 (Government Gazette 1537 B'/8.5.2012), Law 4819/2021, (Government Gazette 129 A'/13.2.2012) and M.A. *οικ*. 62952/5384/2016, (FEK 4326/B/30.12.2016)
- Regular maintenance and inspection of mechanical means to protect the soil from spills of mineral oils, fuels and other petroleum products from construction machinery. Their refueling will not take place within the construction sites and will be carried out at legally operating petrol stations and garages in the area, except in case of emergencies (breakdown, accidental leakage, etc.). All spillage and fire safety measures will be observed.
- Appropriate materials such as sawdust or sand should be available to be used in the event of oil spillage incidents to avoid extensive soil soaking. After use, these materials will be carefully collected and disposed of to appropriate hazardous waste management companies.

Regarding the impact on morphology from the improvement works on existing roads and the opening of new roads it is envisaged that:

- The restoration of the natural environment to its previous state and the harmonious integration of the surfaces affected by the project into the landscape.
- Protection against erosion of the ground surface of the embankments caused mainly by the effect of rainwater.
- The restoration of vegetation to be removed during excavation work, where this is deemed necessary by the competent forestry authority.

10.3.2 Operation phase

During the operational phase of the plant no additional measures are required other than the maintenance of the whole project. The common wastes that may be generated are those from the packaging of maintenance materials and staff cleaning materials. For this type of waste, it is foreseen that bins will be placed and collected regularly at regular intervals under the responsibility of the municipality. Any solid waste resulting from maintenance (parts of mechanical equipment, electrical equipment, etc.) will be removed under the responsibility of the maintenance technicians.

For the safe management of hazardous waste, each holder is obliged to deliver the waste to a natural or legal person (public or private) for collection, transport, storage, processing, treatment, recovery or disposal to which a license has been granted or to be delivered, under its authority, to approved alternative management systems for such waste, in accordance with the conditions laid down in the relevant provisions. The delivery and legal possession of hazardous waste shall be evidenced by the Identification Form which shall accompany the hazardous waste. Upon transfer of the identification form, the responsibility of the previous holder ceases, and the new holder becomes responsible. The final holder (management entity or alternative management system) is responsible for the various procedures for the proper management of the waste, including regeneration, re-refining, recycling, decontamination, burial, incineration, etc.

The following are the management methods for the main categories of waste materials expected to be generated during the operation of the WEEE:

1. EN.DI.PE. A.L.E. (formerly EL.TE.PE S.A.) is an approved National Collective Alternative Management System for Waste Lubricating Oils (WLO). The primary collection of WEEE from the holder's facility must be carried out by a collector with a WEEE collection and transport license who cooperates with EL.TE.PE. and who is required to issue an "*Identification Form - WEEE Acceptance Certificate*". The holder of the WEEE (i.e. the owner of the WEEE) is obliged to keep a Hazardous Materials Record Book.

2. Collection of lubricant packaging: The operator of the collective packaging management system in Greece is the Joint Stock Company "CENTRE FOR ALTERNATIVE ENVIRONMENTAL MANAGEMENT" (CAEM.), which has received the relevant approval from the Ministry of Environment (A.P. 105857/2003). The packaging of lubricants managed by the collective system CAEM concerns plastic packaging, metal drums, cartons and pallets.

3. Collection of other hazardous waste**.** At each collection, the collector must provide an "*Identification Form - Receipt Certificate*" and after the final disposal of the waste, a Certificate of Disposal must be provided.

4. Collection of batteries**:** For the collection and management of batteries, a contract is concluded with SY.DE.SYS S.A., which is the nationwide body approved by the Ministry of Environment for the collection, transport and alternative management of used batteries weighing more than 1.5 kg, and AFIS S.A., which is the operator of the collective system for the alternative management of portable batteries and accumulators.

5. Other waste**:** The disposal of other (non-hazardous waste) is carried out in consultation with the Local Authorities as well as with bodies such as Appliance Recycling S.A. and in accordance with the general provisions governing waste management and recycling of paper, glass, aluminium, etc. And always based on the provisions of Law 4819/2021.

In addition, the impacts from the construction and use of the access road mostly relate to issues of visual intrusion into the wider landscape of the area. To mitigate the above impacts as well as to ensure the least possible morphological or landscape intervention in the area, it is

the company's standard practice to prepare a special horticultural restoration study of the intervention sites. This study makes special provision for the planting of trees with species that are predominant in the area, along the open roads on the side of the embankment slopes. In this way, the visual intrusion of the road from a distance is virtually eliminated.

Lastly, the internal road network, the underground cable duct and the control tower have no impact on the landscape and morphological features of the area. The M.V. cable duct of the W/T will run along the slopes of the existing roads and will be covered after construction is completed. Consequently, no alteration of the landscape and morphological characteristics of the area is expected during the operation of the project.

Finally, the use - operation of the underground road is considered to have no impact. Therefore, during the operational phase, the impact of the underground line is negligible on the morphological and landscape characteristics of the area.

10.4 Addressing impacts on the natural environment

Mitigation measures to address impacts to vegetation, flora and fauna during construction of the project are summarized as follows:

- The extent of the project occupation zone to be limited to the extent strictly necessary for the construction of the project.
- The spatial planning of the project should be as clear and detailed as possible to minimize the impact on woodland. The felling and uprooting of bushes and trees and the disposal of the products must be carried out in accordance with the provisions of forestry legislation and the instructions of the competent forestry department.
- Provision will be made for all necessary measures to protect workers or visitors to the forest area. In this connection, it is necessary to place elegant signs warning of the possible risks involved at appropriate distances.
- Fire protection measures will be taken to protect the vegetation in the vicinity of the works to be constructed, which will be maintained by providing fire protection during its operation.
- No uncontrolled dumping of debris, lubricants and other waste or refuse will be allowed at any location within or outside the two polygons of the APSE installation nor within the immediate siting areas of the other parts of the project under study.
- The extent of roadway excavation to be limited to the extent of roadway excavation. The extent of clearing for the installation of the wind turbines shall be limited to the area of each wind turbine considering the necessary size of the plazas. In general, the areas where existing vegetation will be cleared will be limited to those necessary. For this reason, the construction works will be preceded by a precise delimitation of these areas by a team of surveyors. A special tape will be placed on these boundaries so that the deforestation area is clearly identifiable.
- The width of the road network will not exceed the width specified in the relevant road construction study.
- The installation in the project promoter, since it is a forested area under the classification acts, will be carried out in accordance with the legislation in force, with the issue of an installation protocol by the competent forestry department and under its supervision and instructions.

It is also proposed to implement horticultural interventions which will have as their main objective:

- The restoration of the natural environment from the alterations to the natural vegetation caused by the construction of the project and the harmonious integration of the roads into the landscape.
- The restoration of the vegetation to be removed during the excavation works. In the event of the removal of trees or dense stands of shrubs, it is proposed to replace them, possibly in the form of tree planting on the boundaries of the intervention area.

- Protection against erosion of the soil surface of the embankments, which is mainly caused by the effect of rainwater, with the drifting of various particles from the embankment body, the maximum percentage of which (around 75 %) usually takes place in the first autumn and winter period after the end of earthworks.

- To this end, earthworks will be followed by erosion control works to prevent the loss of valuable soil and the creation of furrow erosion before sufficient vegetation has developed. Vegetable land existing in the area where the project is to be carried out will be collected and stored for use during the restoration work.

- The planting of the embankment slopes and deposits will be carried out in a single layer of lightly compacted vegetated soil with a minimum thickness of 0,20 - 0,30 m.

- The direct covering of the vegetative soil will have the effect of slowing down the evaporation of water used in the construction of the embankments. The presence of moisture in the embankments will aid rapid natural regeneration and thus both the sparse vegetation, which will emerge immediately, and the root system of the plants, which will grow later, will exert a stabilizing effect on the surface of the embankments.

- Regarding the planned plantings, it is proposed to prepare a study on the horticultural restoration of the intervention areas, which will be submitted in accordance with the procedure provided for in GD 15277/2012 (Government Gazette 1077 B'/09-04-2012), considering any relevant recommendations of the competent Forestry Authority.

- Any planting work will begin immediately in each part of the project where the earthworks are completed, and the final surfaces are formed. The planting work will include the preparation of the sites for the plants (final shaping of the ground surface, covering of the soil with planting soil) and the supply, installation and maintenance of the plants.

- Planting soil existing in the project area will be collected and stored for use in the restoration works. In the event of excess plant land in one area, quantities may be transferred from one area or part of the project to another.

- The proposed landscaping is intended to provide plantings on the surfaces of embankments and road slopes to protect against surface erosion and reduce surface moisture and water evaporation.

- As regards the species to be used for planting, they must meet the following requirements:

    1. They must be species which are adapted to the climatic conditions of the area.

    2. They must meet the requirements of the intended purpose.

- The final species selected (and the method of restoration) will be finalized in cooperation with the competent Forestry Office and the preparation of a study. In general, the purpose of the restorations is as follows:

    1. Restoration of disturbed natural surfaces.

2. To restore (to the maximum extent possible) the landscape and vegetation balance to their original state.

3. To better harmonize and adapt the new road network to the natural environment.

4. To protect the soil from leaching, surface water runoff by creating woodland.

- Any vegetation damage to be limited to the minimum possible and always in accordance with the instructions of the competent Forestry Department.
- During the earthworks, dust dispersion by wetting the soil in the event of adverse weather conditions.
- Any natural vegetation that may be altered and not covered by infrastructure will be restored after completion of the works. An appropriate restoration program will be implemented after approval by the competent Forestry Department and preference will be given to native species of the area. The care of the plants will be continued for at least 2 years after planting.
- Once the wind farms and their accompanying works have been completed, all construction sites will be removed. The site will be landscaped and restored to its previous condition, where possible, by planting.
- Prior to the granting of the operating license, a Vegetation Restoration Study shall be submitted to the competent Forestry Department, both for the areas where the access roads cross and interconnect to the trenches and their embankments, and for the landscaped construction squares.

During the operational phase of the project, all measures should be taken to maintain the plantations, as they contribute to the improvement of the landscape of the area. In the first year after planting, any gaps that may occur due to the death of seedlings will be filled in.

The project design already incorporates measures and precautions to ensure that any impact on the area's birdlife is minimized.

Some of the main points are briefly highlighted:

- The total area occupied by the wind turbines is small. The area ultimately left free within the boundaries of the wind farm after the works are completed will clearly be re-used by the birds and other fauna of the area, thus ensuring minimal change to the existing habitats in the area.
- The electricity generated will be transported entirely by underground medium-voltage lines.
- It is proposed to establish a mandatory post-construction monitoring program and assessment of vulture mortality and displacement from the project by applying a specific methodology/establishing it as an Environmental Condition (in DAEC of electricity generation and transmission projects, e.g. WPP)

Regarding waste and wastes (solid and liquid, hazardous or non-hazardous) resulting from the site activities during construction and operation of the works, appropriate management should be applied to avoid pollution of the area (soil, subsoil, surface and groundwater) from uncontrolled disposal or spills. When restoring the vegetation in the installation area, the possible attraction or repulsion of bird species should be considered.

For example, it is important that there is no large area of bare ground on ridges, as this creates strong thermal updrafts and encourages predator hunting, thus attracting more species to exploit these

currents or for foraging. Removal of dead animals given the presence of livestock activity in the area, dead animals (dogs, sheep, goats, horses, cows, etc.) found within 400 m of the base of the W/Ts should be removed. In general, to protect the natural environment of the study area, the following should be carried out.

- The proposed environmental conditions of the project under study should be strictly adhered to,
- Provide detailed information to workers involved in both the construction and operation phases, so that all environmental conditions, particularly those relating to the natural environment, are respected.

10.4.1. Addressing mortality of avian fauna

Avian mortality is one of the key ecological concerns in the development of the WPP raising concerns particularly regarding bird impacts on the W/T.

In the context of legal compliance with both domestic law and EU Directives and ecological awareness in general, the obligation to protect wild birds and habitats with the help of technology, thus preventing birds from colliding with the W/T, has arisen. One way of meeting this obligation is to install systems to prevent birds from colliding with aircraft. Thus, it was decided to use such a system, namely the Bird Monitoring System (BMS) using Artificial Neural Networks and Machine Learning, owned by Digisec, which consists of both hardware and software, and will be installed on the W/T pylons.

Therefore, special high-resolution cameras and reflection horns (speakers) will be installed on the outside of the aircraft, on the tower, at a height of approximately 10 m, to prevent birds heading towards the aircraft.

This Bird Monitoring System uses high-tech cameras that continuously scan the covered area, detect birds far enough away and decide, with unprecedented accuracy, whether they are on a collision course. The high-tech cameras continuously scan the covered area for birds. The bird detection system uses advanced artificial intelligence and a Machine Learning algorithm to identify birds and other objects. The bird detection system can continuously improve its detection capabilities using Machine Learning video content analysis algorithms. It uses advanced classifiers and large databases to achieve its performance. Also, in this system images and video sequences can also be recorded and further use.

Thus, after birds are detected flying in the high-risk collision area they receive acoustic warnings through special sounds. The behaviour of the birds is monitored during and after the warning and if their flight direction is not adequately diverted, the sound is applied again until the birds leave the protected area. If this is not successful, the system automatically switches off the W/T to protect the birds from a possible fatal collision. However, advanced detection technology minimizes the incidents of W/T shutdown.

Figure 93: Installation of a Bird Monitoring System at the JWPPr Energy Wind Farm in Stavros Evia

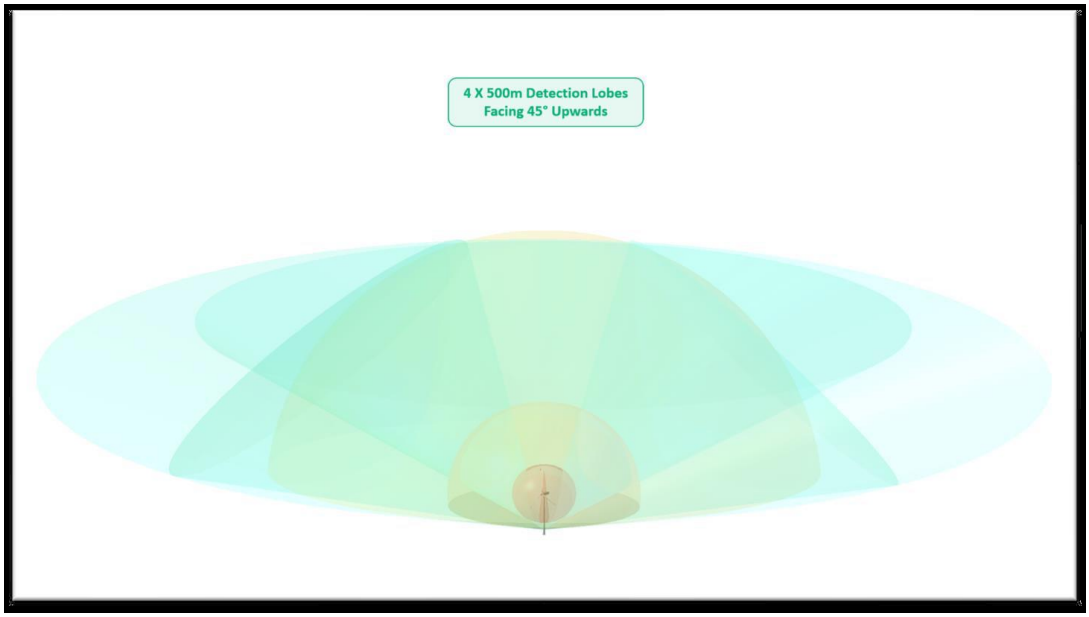


Figure 94: Detection field of view lobes

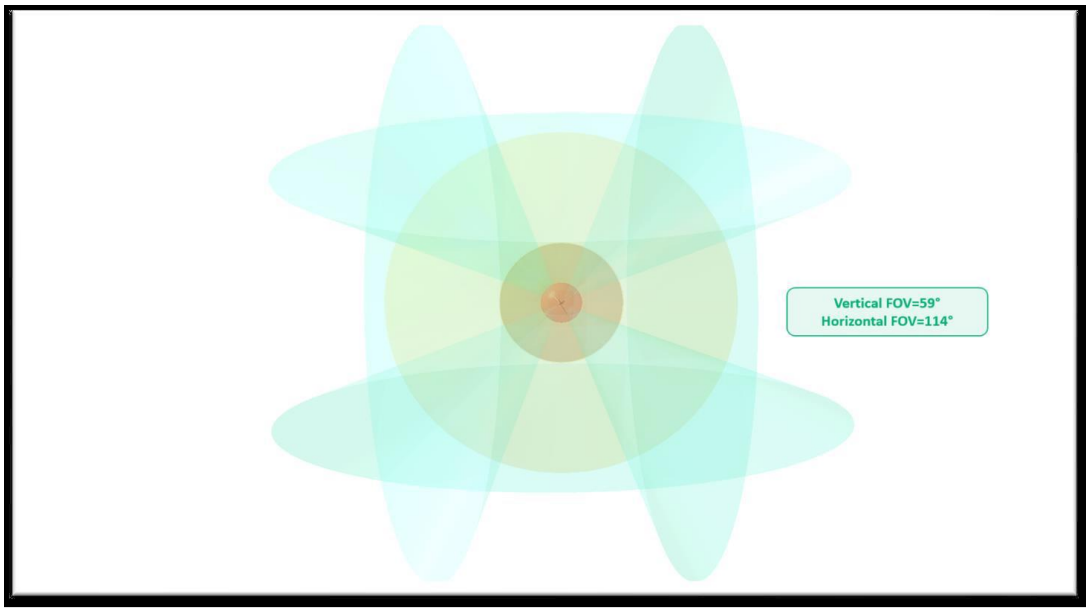


Figure 95: Vertical and horizontal field of view

For the system, a team of the Faculty of Engineering of the University of Western Macedonia carried out a research of this system, which was carried out for six months in the period between July 1 and December 31, 2021 in a specific location (WPP "Orfeas - Eptaendros" in Alexandroupolis), and prepared a related Research Report for the investigation, evaluation, reliability and effectiveness of the system for the prevention of bird collision in W/T using Artificial Neural Networks and Machine Learning. This Research Report is attached in the Annex to this RIS.

According to the conclusions of the research, it is concluded that the effectiveness of the DIGISEC system to be used was found to be satisfactory in detecting and deterring birds to reduce their risk of collision, with expected deviations in its performance depending on weather conditions, which are not noticeable. Also, as regards the shutdown of the W/T as a last resort to deter bird impact, it was found to be effective.

It is worth noting that the BMS technology to be used has the following operating principles:

1. *Surveillance phase* where high resolution cameras continuously scan the covered area for the presence of birds. The BMS uses advanced Starlight Cameras / Thermal Cameras configuration combined with Artificial Intelligence to identify them. It can distinguish the differences between birds and other flying or moving objects. The BMS can continuously improve detection capabilities using the Machine Learning Algorithm and Video Content Analysis algorithm. It uses classifiers and large databases to achieve its performance. Images and video sequences can also be captured and stored for future use.

2. *Deterrence phase* where birds flying in high-risk areas are detected. The collision area receives audible warnings via directional speakers with the behaviour of the 'treated' birds monitored during and after the warning. If the direction of the flight path is not diverted sufficiently to avoid a collision, the sound is reapplied until the birds leave the protected area.

3. *Shutdown phase* where further actions are taken, and the System automatically shuts down the turbine to protect the bird from a potentially fatal collision. However, advanced detection technology minimizes the occurrence of Wind Turbine shutdown.

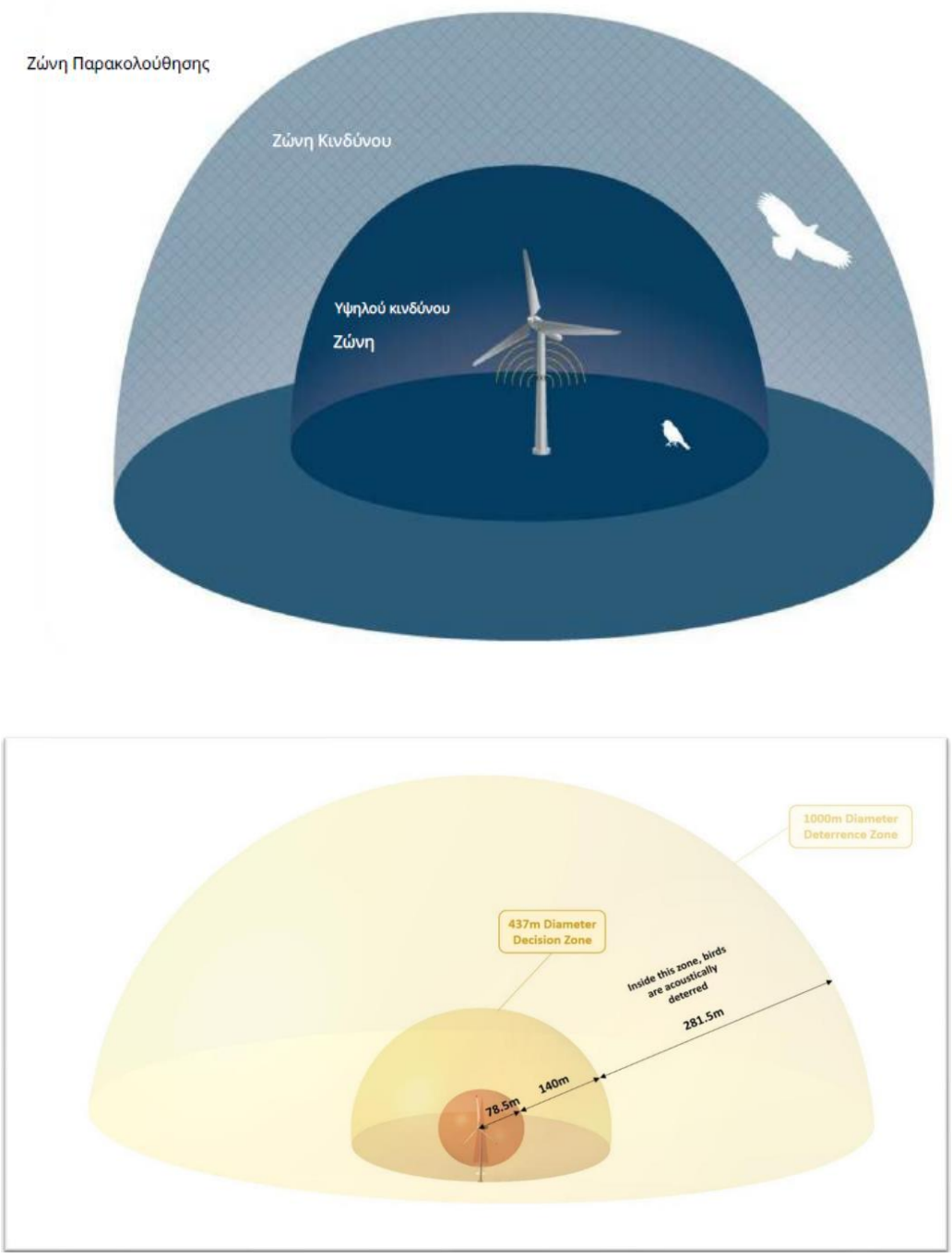


Figure 96: Schematic illustration of Deterrence and Detection Zones

Consequently, the BMS system in use is an effective means of reducing the risk of birds colliding with the W/T.

It is worth noting that the BMS technology to be used has the following operating principles:

Software engine

Use of state-of-the-art Artificial Intelligence algorithms to detect birds in danger zones. This system can continuously improve its detection and has capabilities that use Machine Learning technology.

Deterrence module

Based on the detection and classification process, advanced acoustic driver module is used to deter birds from entering the danger zone of the turbine. This system uses adjustable directional sound emission, minimizing noise pollution.

Detection unit

Use of Ultra High-Definition cameras combined with thermal imaging technology to achieve 24-hour all weather detection and operation. The system can detect birds from distances up to 1 Km.

Stop Turbine Unit

In the extreme scenario that a bird enters the critical zone, the turbine receives signals in various forms to stop its operation and thus prevent collision.

The advantages offered by this system are set out below:

- Artificial intelligence detection algorithm
- Computer Vision & Machine Learning technology
- Minimum sound pollution - Adjustable directional sound
- Operation in all-weather condition
- Operation in all weather conditions
- Bird classification
- Zero false positives
- Minimum downtime - Maximum turbine operation
- Advanced Cloud monitoring, reporting and management platform.
- Support GPS/GIS Geofencing, for tagged birds
- Integrated CCTV surveillance

Thus, from the above bird monitoring system, the following services are discharged:

Reporting of bird/bat events

Generation of a report on bird and bat activity which can be submitted at any time to the local environmental authorities and any other competent authority. Reports include raw data events, statistics, graphs and tool tables.

System health status report

Report health status reports, thus indicating the availability of systems at the selected period, documenting the final submitted report in the most effective way.

System health status monitoring

Use of advanced software to continuously monitor system health status. Also, alarms and alerts are received automatically, thus enabling remote troubleshooting of any problems as well as restoring functionality.

Service level agreement

A service level agreement may take place, focusing on day-to-day operations and support processes to ensure efficient and reliable services for the operation of the system.

Figure 97: Bird monitoring system software

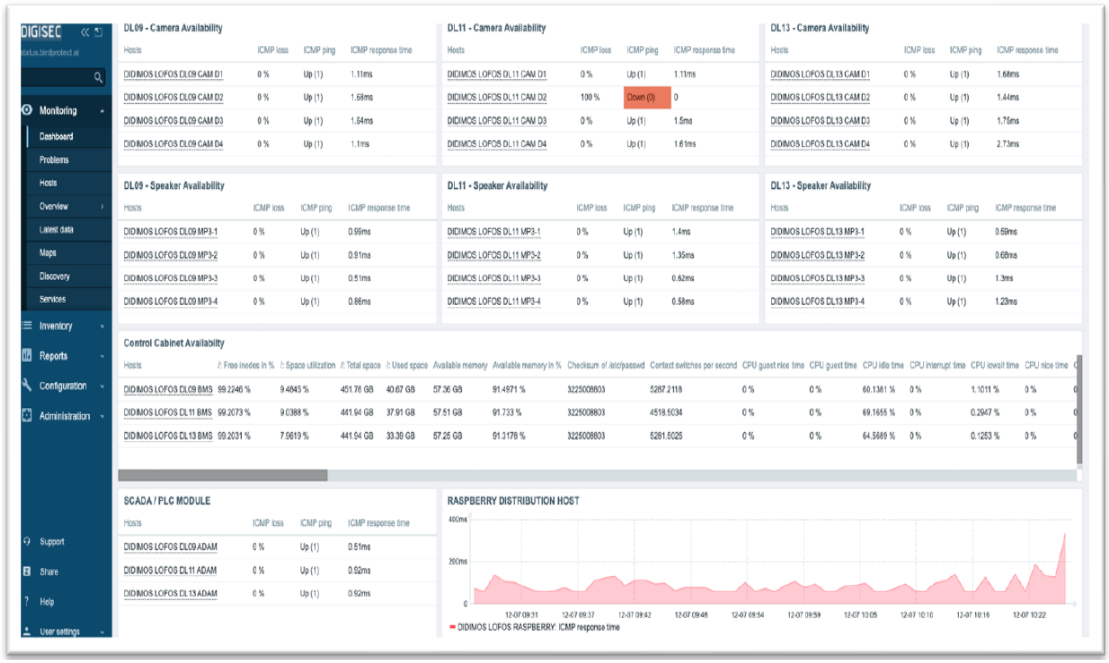


Figure 98: Real-time system monitoring and graphs

Finally, to protect the external bird monitoring system during the winter months, ice deflectors will be installed, as shown in the image below:

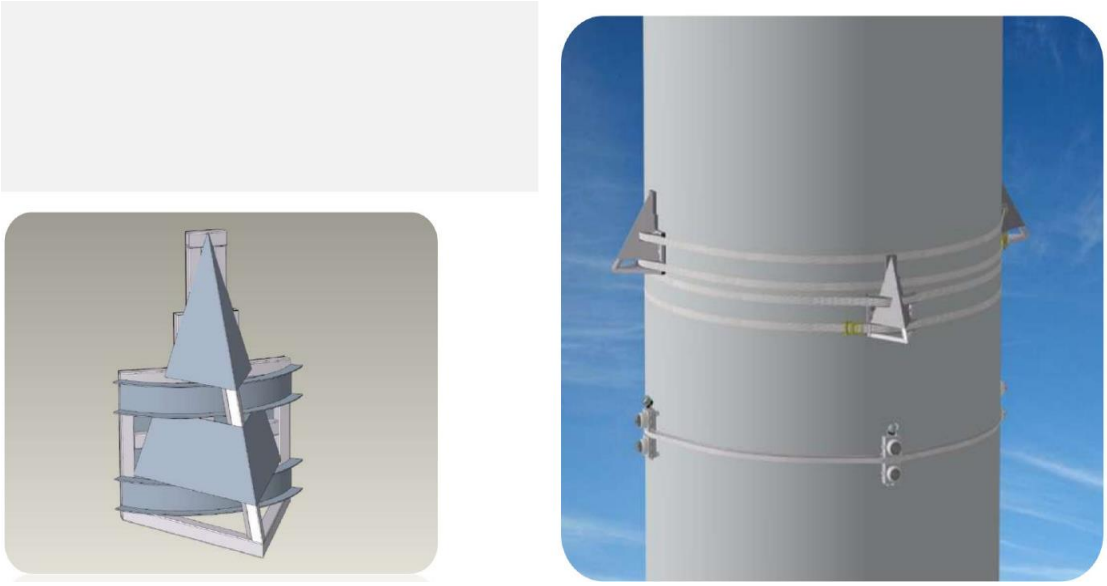


Figure 99: Placement of ice deflectors

In addition, it should be mentioned that the system also considers the conservation objectives of species set by the Decree of the Ministry of Environment and Natural Resources/ΔΦΠΒ/50146/1786/2023 (Government Gazette 3118 B'/10-05-2023) for the examined areas ZEP GR1110010, ZEP GR1130011 and ZEP GR1110002 regarding the species for which there is currently data and are presented in detail in Chapter 9.

In conclusion, the proposed system to be used is very effective both in terms of detecting and preventing the risk of collision with the W/Ts under study and in terms of reporting correct monitoring and understanding results.

Additional measures conditions and constraints are presented below and are also discussed in detail in the Special Ecological Assessment Document, i.e:

A) Measures proposed for implementation

- ✓ **Installation of an optical system for automated wind turbine shutdown**. In the present project it is proposed to make the installation of the optical system mandatory from the start of the project due to the importance of the area. The system is proposed to be set up in such a way that it will operate without bird deterrence (**sound repulsion**) during the breeding season and during the chick-plucking period but only by stopping the wind turbines so that there is no possibility of disturbance to the species and displacement of the species from the study area. Given the morphology of the terrain and the possibility of the passage of species of interest perpendicular to the axis of the project from a low height (presence of a 'blind spot'), it is **compulsory to draw up a preliminary study** for the **correct positioning of the camera angles**. For those turbines where this cannot be covered by the installation of four cameras mounted on each turbine, it is proposed that a second set of cameras (eight tracking cameras on each turbine instead of four) should be mandatory to fully cover the detection of the object of interest from all directions of the horizon and from all possible heights.
  During the **periodic or permanent shutdown of any wind turbine(s)**, for whatever reason, the operation of the automated systems will also be interrupted to avoid any disturbance and displacement of species due to the emission of repulsion sounds.
  The system shall also cover at least the activity of medium-sized and large birds of prey and scavengers at more than 500 m and enough cameras to detect birds on the ascent from locations at lower altitudes than the W/Ts.
  Other important parameters to be adjusted are proper parameterization according to the biometric characteristics of the species in the area and short response time from species detection to complete stop of the turbine, data that are subject to modification in most of the commercial models of automated turbine stopping system. It is also proposed that the installation of the above system should be measured by at least three ground observers who will also stop the turbine if dangerous flight of species of interest is detected, until such time as the above automated stopping system is properly configured.
- ✓ **Rest or supervision positions.** Any installation of floating structures that allow birds to sit and congregate will be prohibited.
- ✓ **Pausing of the project during conditions of limited visibility due to cloud cover and extremely adverse weather conditions.** During severe weather events such as intense foggy conditions or extreme weather events (thunderstorms), incidents of impacts have been observed as visibility is significantly reduced. Shutting down the turbines in this case will help to reduce the risk of birds colliding with the turbines. Consideration will also be given to implementing a measure with appropriate programming of the software of the automated systems while keeping records that will be communicated to the Evros and Dadia Delta National Park Management Unit. Semiannual reports will also be made with the prevailing climatic conditions and the corresponding periods of shutdown of the W/Ts.

- ✓ **Avoidance of constant lighting of wind turbines to reduce the risk of bird strikes**. Consider using white strobe flashing lighting which will be less attractive to birds.
- ✓ **Undergrounding cables to avoid the risk of electrocution and birds colliding with them**. Electricity transmission infrastructure (in general, but also in the case of wind farms) should be underground. The wind farm in question is proposed to be connected underground to the grid.
- ✓ **Removal of dead animals** such as mammals, dogs, sheep, goats, horses, cows, etc. found within a radius of at least 500 m from the base of the wind turbines. These dead animals should be transported to safe locations away from the wind farm, while remaining available for scavenging birds and carnivorous omnivores. This will reduce the risk of scavenging species colliding with the wind turbines when they spot each dead animal and will not affect the availability of their food. The responsibility for the collection, transport and removal of dead animals will be the responsibility of our company, as the project proponent, and in particular the personnel hired during the operational phase of the project who will have been trained and informed on environmental protection issues (fire protection, waste management, dead animal management) and on the detection of dead or injured animals. It is also proposed to place signs for other users or visitors to inform them of the above situations and to provide useful contact numbers for the relevant bodies.

  In the event of a dead animal being found, the company, as the project proponent, should dispose of them at existing licensed raptor feeding sites (in cooperation with the Management Unit after checking that they are not poisoned). If the dead animals are checked and found to be poisoned, then the poisoned bait detection team should be notified and managed appropriately. Any animal species found (hand-fly, bird) will be recorded on a special form (protocol for recording the checks carried out).

  In parallel with the above actions, ***the competent forestry authority and the Management Unit*** must be notified. For the correct recording of the data of the finding, the dead animal should not be moved, to reliably assess the actual date, its condition, the exact weather conditions and the correlation or not with the operation of the W/Ts. If an injured bird is found and cannot fly, the competent authority shall be notified immediately so that the appropriate procedure can be followed, and the bird can be provided as soon as possible

  In addition, construction work **shall not be carried out during critical periods for the fauna of the area (breeding season for fauna species or nesting and rearing of young birds). Investigate incidents of bird or bat collisions.**

  It is important to note that in addition to the search for dead animals, bird and bat collision surveys will also be carried out. For best results (in case the terrain and/or vegetation cover of the field survey area makes the search task difficult), it will be carried out with the help of a specially trained dog. It is proposed to estimate mortality by applying mathematical models such as Genest to better estimate impacts and to record the results in relevant annual reports/reports.

  Furthermore, actions to inform residents as well as other supporting actions to deal with poisoned baits will be supported in cooperation with the Management Unit and/or as part of the implementation of the local action plan.
- ✓ **In case of detection of a nest of a species listed in Annex I** of Directive 2009/147/EU, it is proposed that the W/Ts located at a distance < 1 km from a nesting site should remain out of operation from half an hour before sunrise to half an hour after sunset from 15 March to 15 July. To assess nests in the project area and implement the measure, field surveys will be conducted weekly in the second half of March and April.
- ✓ **Restoration of the surrounding area.** Following the construction phase, it is proposed that all roads and encroachments that have been made will be restored to return the area to its previous

condition and reduce disturbance. The quantities of surplus materials resulting from road widening will not remain in the project area but will be collected and transported to a specially licensed site. It is also proposed that upon completion of the project construction, a barrier be placed at the beginning of the sections of the new openings, and that only the personnel responsible with the maintenance and operation of the project and of course the relevant agencies that have the study area as their area of responsibility will have access. In addition, it is important to keep the width of the road deck to a minimum for post-construction maintenance needs only, given that the needs of the project after construction are much less than during the construction phase, it is proposed that the width of the road deck after construction be kept to the minimum required for the maintenance and operation needs of the project.

- ✓ **Provision for mitigation of herpetofauna mortality during the construction phase.** In the wider construction area of the project under study, individuals of the gray turtle (Testudo graeca) and the Mediterranean tortoise (Testudo hermanni), which are species listed in Annex II of Directive 92/43/EEC and at the same time species with limited ability to avoid anthropogenic hazards due to their low speed of movement, were observed. To protect these species, it is proposed that during the construction phase of the project and its accompanying works, a specialist should carry out daily monitoring of the areas likely to be affected by earthworks (e.g. new sections of openings) and the movement of individuals of these species that may be found outside the area occupied by the above-mentioned works. This will also prevent the accidental mortality of individuals of the above species during the construction phase of the project.
- ✓ **Monitoring of possible impacts on avifauna – fauna**

  Our company, as the project proponent, will be required to monitor the impacts on avifauna and other terrestrial fauna after construction, and during the pre-construction and construction period, for a minimum period of at least four (4) years (monitoring program) in total. The monitoring will be carried out by a team of expert scientists, following a specific monitoring protocol so that there is a continuous acquisition of data which will be available to all stakeholders and interested parties. Monitoring will be applied during the preparatory and construction phases as well as during the first two years of operation of the project:

In detail, the monitoring program will include

- Regular recordings (proposed at 15-day intervals (twice a month) of the

critical periods and every 20 days (3 times every 2 months) the rest of the time) related to the risk of impact and the detection of nests in the area. Project site use data logging program and recording of flights of important species in the project area and their interaction with wind turbines (potential disturbance and displacement from specific feeding area or nesting sites, assessment of impacts related to displacement, barrier and impact). The monitoring program for the recordings will also apply to the type of handlers by qualified scientists to ensure the correct selection of methods - monitoring, based on the standards of corresponding international - research programs, the correct evaluation of impacts and by extension the correct selection of mitigation measures.

- Map illustration of the above to assess the situation.
- Monitoring and recording of potential mortality in a special protocol to be maintained by the company and available to the relevant agencies for the control of impact incidents in the area.
- Training of the employees of the WPPs to deal with incidents of injured birds and immediate notification of the competent services - agencies.

- Training of the employees of the WPP for the sweeping of the area of the wind turbines to find dead birds and check the correct application of the procedure by means of inspections.
- Assessment of the situation based on the information gathered.

B) Measures whose feasibility will be examined in the subsequent monitoring stages

If, during the subsequent monitoring stages, a change in the frequency of passage of important bird species is observed and it is considered that, based on the new data obtained, there is an increased risk of collision or accident, **the following measures are proposed and, after documenting them, the most effective measures may be proposed.**

After the construction of the wind farm, it is possible to actively manage the habitats in and around the wind farm so that birds are not attracted to the zone of influence of the wind turbines and move to places that do not provide impact sites. The responsibility for the design and implementation of the management actions will be the responsibility of the wind farm operator.

- ✓ **Active management of habitats under the wind turbines.**
  In cases where certain impacts (increased concentration or mobility of species on the site, incidents of impact of specific species) on specific wind turbines are identified after construction, it is proposed to design active management actions for the areas underneath them (creation of undesirable habitats for birds) after appropriate studies.
- ✓ **Active management of habitats around the periphery of the wind farm.**
  In cases where the wind farm is in an area where there is a need for bird protection measures, habitat management will take place around the periphery of the project to create suitable habitats to attract birds away from the turbines.

- ✓ **Increase the starting speed of wind turbines.**
  If the installation and operation of the WPP causes an impact on the chironomids (finding of a significant number of chironomids killed by the operation of the wind turbine), it is proposed to implement the measure of increasing the starting speed of the wind turbines. When implementing this measure, it is suggested, to avoid wind conditions with the highest bat activity, to increase the wind turbine starting speed and blade rotation to avoid rotation of the wind turbine rotor at low wind speeds of 3.5 m/sec (Fric et al. 2018). Wind turbines "spin freely" at wind speeds less than the activation wind speed (i.e. the minimum speed at which the turbines produce energy). The unnecessary wind turbine activity described above can be reduced in three ways: a) by sweeping the blades (so that they are parallel to the direction of the prevailing wind, in effect reducing their surface area), b) by increasing the activation wind speed, and c) by implementing methods that prevent the blades from rotating at lower wind speeds (Rodrigues et al. 2015, Arnett 2017). Evidence from Europe and North America suggests that trimming and increasing wind activation speeds are the only proven ways to reduce bat mortality due to impact (Rodrigues et al. 2015, Behr et al. 2017).
- ✓ **Monitor potential impacts to hand flaps.**
  If an impact from the installation of the studied ESRP on chironomids occurs as soon as it is identified, it is recommended that in addition to monitoring potential impacts on avifauna and other terrestrial fauna, a corresponding monitoring of impacts on chironomids is also recommended.
  This monitoring should be carried out by experts in order to ensure the correct selection of monitoring methods based on the standards of relevant international/national research programs, the correct assessment of impacts and, consequently, the correct selection of additional mitigation

measures (if any), e.g. e.g. even avoiding activities during periods when bats are most sensitive to disturbance (e.g. breeding, hibernation), as well as during transits and foraging based on local knowledge, etc. (Fric et al. 2018).

- ✓ **Wind turbine blade base in black.**
  A recent study has shown that painting the blade part of wind turbines with black or red paint will help reduce the mortality rate compared to wind turbines where this activity does not take place, specifically for raptor species that are considered species of interest in the Special Ecological Assessment as they have been shown to have high visual acuity and sharp vision over long distances.
- ✓ **Complete cessation of the operation of the WPP during sensitive periods**. If the processing of the monitoring system recording data after the installation of the project under study shows that the risk of bird impact is high and cannot be reduced through periodic shutdowns, then a **full shutdown of the project may be proposed for as long as necessary.**

C) Mitigation measures to reduce potential future cumulative impacts

In accordance with the SEA, this section presents a proposal for mitigation measures for possible future cumulative impacts, based on the recommendations of the European Action Plans, which are based on the following actions that could be adopted in case all the planned RES projects are located within the protected areas under study.

In the SEA, potential significant impacts have been assessed in the case of the construction of all the WPPs under licensing within the protected areas under study, however **the contribution of the WPP to this survey is assessed as minor.**

For both this and the other projects under licensing to mitigate any negative impact on the ecologically sensitive area under consideration, it is proposed that they contribute to a broader action plan of cumulative impact mitigation interventions in line with the recommendations of the National Scavenger Species Action Plan (Xirouhakis 2019).

The European (EuroSaps) Action Plans have been extensively analyzed in Chapter 5 and in the Specific Ecological Assessment, which list the threats faced by species, targets and proposed measures to address them by country, as well as the (2) **National Action Plans for Birds**, which set out specific targets and measures for threatened species.

The following tables detail the proposed measures of the two (2) National Action Plans in relation to the existing threats

Targets	Measure/ Actions	Dependence on existing threats
Improving knowledge and documenting the impact of the use of pesticides and other banned toxic substances in poison baits on the viability of vultures	Implementation of a unified information collection system with specific protocols for the recording of poisoning incidents and the collection of dead animals by public services (D/Veterinary Directorate of the Ministry of Veterinary Affairs of the Ministry of Agriculture, Forestry and Environment). Issue of a circular.	Illegal use of poisoned baits
	Develop an easy to use, standardised and seamless system for the storage and transport of samples of dead vulture tissues/organs through the competent services and certified procedures for toxicological analyses.	

	Strengthen and operate the Veterinary Centre (CVC) of Athens. ΔCarry out necropsies, histopathological examinations and toxicological analyses on poisoned/dead vultures	
Reduction of mortality of vultures due to consumption of poison baits.	Amendment and implementation of the Joint Ministerial Decision "Local Action Plan to combat the illegal use of poisoned baits" (Government Gazette 3793/B/3-9-2018) and drafting of a new relevant KIA in cooperation with the Ministry of Public Works to cover errors and legislative gaps that have already been identified in its implementation. Adoption of a Strategy/Roadmap and establishment of a working group for the horizontal implementation of measures in local action plans	
	Establishment and operation by the Forestry Services (or other relevant agencies) of seven regional teams of specially trained dogs in the detection of poisoned baits/ Systematic patrols/inspections in critical high-risk areas	
Reduction of interactions/competition between carnivorous mammals and human activities	Implementation of methods to prevent and reduce losses in crop and livestock production (e.g. subsidies for electric fencing, etc.) and piloting of new techniques (e.g. fladry technique)	
Reduction of interactions/competition between carnivorous mammals and human activities	Improvement of the compensation scheme of the Hellenic Agricultural Insurance Organisation (simplification of the declaration and autopsy procedure for compensation, reduction of the minimum number of animals required, reduction of payment time, compensation of 100% of the value of the damage, etc.) and linking compensation schemes to preventive measures in areas of high risk of attacks and high risk of livestock losses.	1.Illegal use of poisoned baits
	Maintain high densities of wild ungulates (mainly Wild Goat, Deer) to ensure food sufficiency for wild carnivores with appropriate management actions (e.g. reintroductions, empowering low size populations, regulating grazing by livestock, ensuring access to water bars, guarding populations)	1.Illegal use of poisoned baits 2. Food insufficiency 3. Degradation of feeding habitat.
Minimisation of vulture mortality due to consumption of NSAIDs.	Study and monitor use/licensing of non-steroidal anti-inflammatory drugs (NSAIDS) veterinary formulations hazardous to vultures in their critical areas/ Inform users of their harmful effects through seminars on vulture population management.	Use of harmful veterinary preparations
Assessment of mortality due to electrocution and impact on electricity generation and transmission infrastructure	Establishment of protocols and drafting of guidelines on systematic monitoring (dead bird census) in existing electricity transmission networks near breeding and roosting sites of vultures.	Electrocution & Impact on man-made structures & infrastructure.

	Establishment of mandatory post-construction monitoring programmes and assessment of vulture mortality and displacement from power generation and transmission infrastructure using a specific methodology. Establishment of an Environmental Condition (in DAEC of electricity generation and transmission projects, e.g. WPP) for free access to information and implementation of a uniform information collection system with specific protocols for recording incidents of collisions and collection of dead animals by the forestry services.	
Assessment of mortality due to electrocution and impact on electricity generation and transmission infrastructure	Mapping and assessment of the effects of electrocution and impact (and their cumulative effects) on electricity generation and transmission infrastructure in relation to the flight behaviour and biology of vultures	
	Application of mitigation techniques for mortality due to electrocution or impact on LNG or transmission cables electricity transmission (insulation pylons, undergrounding cables and/or use of twisted insulated cable wire, marking of cables, selective termination W/T)	
Reduction of vulture mortality due to collision with power generation infrastructure	Integration of maps sensitivity maps in the new spatial plan RES for proper zoning generation infrastructure and electricity production and transmission	
	Implementation of mitigation measures in WPPs where at least one vulture impact incident has been recorded. Mandatory introduction of a condition in the DAEC to implement an immediate shutdown system, in line with best international practice, which includes the employment of field ornithologists on a permanent basis, to notify in case of Vulture - Large carnivores (Aquila spp., Haliaeetus albicilla, Clanga spp.) are approached. and shutdown of W/T based on a specific protocol. Permanent cessation of operations of Vessels in the event of repeated incidents of collision and where mitigation measures have not been effective	
Zero mortality due to poaching	Increased patrols in areas with documented cases of poaching of Vultures/Harvesters	Immediate human pursuit/killing.
Minimisation of illegal trade and movement of vulture samples	Recording incidents of illegal trafficking and investigation of electronic trade (stuffed vultures, live specimens, eggs) and assessment of the problem / Cooperation with Cybercrime for prosecution	Trade and Embalming

Optimisation of artificial feeding practices	Mapping of dangerous water reservoirs in island and continental areas / Development of guidelines for safe construction for wildlife in artificial water bodies	Other causes
Optimisation of artificial feeding practices	Elaboration of technical and sanitary specifications for the establishment of feeding areas for birds of prey (FABP) and operation of FABP at national level / Proposed siting with assessment of existing food abundance and availability in vulture distribution zones and assessment of potential feeding of regional FABP in critical areas for vulture conservation	Food Insufficiency
	Creation and operation of a network of feeding areas for birds of prey (FABP) at regional level, with the development of cooperation between public services, Protected Area Management Bodies and their successor Protected Area Management Units of NECCA, NGOs and social partners (e.g. producers) in optimizing the disposal of dead biomass produced in FABP/ Promotion of cross-border cooperation in border areas and their parallel monitoring with simultaneous counts	
Optimisation of artificial feeding practices	Monitor the use of FABP and study the behaviour of scavenging species for potential negative effects of their operation (e.g. interspecific competition, low juvenile dispersal, etc.) and the interactions between pet (dog) and vulture populations and the risk of transmission of anthrozoonoses through the operation of FABP	
Adaptation of European directives/regulations on the disposal of fallen stock in the open air	Harmonisation with EU legislation and development of the appropriate institutional framework for the implementation of EU regulations on the free disposal of fallen stock within the SPAs.	
	Promote (information campaign, introduction of incentives such as the exemption of the payment of a fee for the collection of fallen stock for compulsory cremation) all traditional vulture-friendly practices for the disposal of fallen stock and institutionalise them within the SPAs at local level	
	Pilot design and operation of small, scattered feeding sites, cooperation with livestock farms, transport of fallen stock, information	
Promotion of traditional/extensive forms of livestock farming	Promotion of agri-environmental policies for the development and promotion of extensive/nomadic livestock farming (implementation of EU regulations, sustainable management of mountain pastures, management plans for	

	grazing/improvement of products from free-range animals)	
Increase the genetic diversity of vulture populations and reduce the impact of inbreeding	Renewal and updating of the legislative framework for the licensing and operation of breeding centres and the establishment by the Ministry of Environment and Natural Resources of captive breeding programmes on their premises	Small population size - Low genetic diversity
	Establishment and institutionalisation of a supervisory authority in the Ministry of Environment and Natural Resources (along the lines of the CITES Committee) with specific responsibilities for enrichment programmes under the coordination of the Ministry of Environment and the cooperation of public bodies and NGOs/ Development of Memoranda of Understanding between the Supervisory Authority, Protected Area Management Bodies and Care Centres	
	Support and participation/cooperation with existing European captive breeding programmes (EEZA, LIFE, breeding centres, etc.)	
Restoring vulture populations locally by recolonising critical areas	Create and support appropriate infrastructure per region for reintroduction and empowerment programmes for vultures with state supervision (e.g. acclimatisation cages, vulture maintenance) in SPAs with small or isolated vulture populations/ Release of individuals from Greek Care Centres	Small population size - Low genetic diversity.
Facilitate communication and linking of vulture metapopulations	Develop telemetry and ringing programmes to identify feeding and dispersal areas of juveniles and combine data with mapping of critical vulture conservation priority areas.	
Facilitate communication and connectivity of vulture metapopulations	Establish "connectivity corridors" between vulture metapopulations by managing foraging habitat and siting and operating FABP.	
Increase the reproductive success of populations	Delineation of sensitivity zones near colonies and nesting territories/ Proposals for the issuance of an IBA to regulate and restrict (spatially and temporally) human activities (climbing, aerial flying, hunting, logging, rock lighting, etc.) in the vicinity of critical vulture areas	Disturbance at breeding sites
	Promote silvicultural management in selected forest stands/maintain and increase suitable nesting sites for the Black-tailed Godwit/reduce accumulated biomass in selected stands by mechanical means, cutting and crushing/spreading of riparian and shrub vegetation to screen Black-tailed Godwit nesting sites	Destruction of breeding habitat
	Maintain vulture accessibility to natural water bodies and streams by restricting horizontal spread of forest to small areas along streams.	

	Implementation/implementation of other specific protection/management measures for black grouse in accordance with the EIS 35633/13-10-2006, the 10-year Special Management Plan for Zone A of the Forest of Dadia Forest EP already being implemented and the proposed actions of the EAP of the area	
Increase the viability and productivity of the breeding population of vultures	Construction of suitable water reservoirs (including the installation of metal structures where no other option is available) for use by vultures during periods of maximum water shortage in critical island areas	Degradation of foraging habitat
Improve our knowledge of the distribution and population status of vultures	Creation and updating of the National Database on Vultures (NDV) regarding their distribution and population status/ Parallel recording of all mortality events	Gaps in knowledge about distribution, status, productivity and mortality of vultures in Greece
	Establishment of a single, standardised fieldwork protocol for the recording and monitoring of vulture populations	
	Programme implementation national vulture census (3 times in 6 years, to assess population trends) - Mapping of all vulture populations active and historical Mapping of all active and historical colonies/annual fieldwork in selected colonies/territories and assessment of vulture breeding success	
Improving our knowledge of the effects of lead use on vulture populations	Implementation of direct and reliable techniques for the detection of mumps in laboratory tests analyses (in certified public laboratories)/ Sampling tests lead in scavengers predators in centres care centres/ Quantification of quantification of the incidence of lead poisoning in vulture populations by means of sampling controls	

		Lack of knowledge about the level exposure of vultures to toxic substances substances and bioaccumulation
	Research on mortality from infectious diseases / Development and implementation of a biomedical protocol for the collection and preservation of dead scavenging raptors	
Assess/evaluate the cumulative effects of the operation of the WPP on vulture populations.	Study to assess the cumulative impact of operational and planned W/T (habitat degradation/ displacement/impact on Vulture populations) on vulture populations.	Lack of assessment of the cumulative effects of electrocution and impacts on energy infrastructure on vulture populations.
Study/develop a species recovery plan on a national or regional scale	Feasibility study for the implementation of a feasibility study for the enhancement of natural populations of vultures in Greece/ Preparation of a release strategy at national or national level regional scale.	Lack of a plan to restore vulture populations for reintroduction or enrichment.
	Development of models Habitat suitability and potential distribution of vultures (habitat suitability)	
Increase the viability and reproductive success of Vultures.	Rationalising the criminal framework for dealing with	Mortality due to exposure to toxic substances.
	Promotion of legislative measures Regulations to prohibit the prohibition of the prohibition of the use of lead and reducing the risks of lead exposure to wildlife and public health / Extend the implementation of the EIS banning lead pits in wetlands throughout the country.	
	Promotion of legislative measures Promote legislative regulations to reduce the use of dangerous NSAIDs for wildlife from the veterinary market	
	Implement legislation on environmental liability/damage in vulture killing incidents	Mortality due to electrocution or impact with infrastructure

	(addressing complaints, speeding up procedures, calibration of incidents, penalties)	
	Establishment and legal legal consolidation of the operation Establishment and operation of a FABP for scavenging species at national level. Need institutionalisation of a study FABP specifications	Food shortage
Integration of the national AP into the regional policies	Incorporation of provisions of the SA conservation of vultures in the management plans Protected Areas and monitoring	Lack of integration of the conservation of vulture conservation in the national environmental national policy.
	Monitoring and assessment of the implementation of the PA	
Prioritising conservation of vultures in the daily on the agenda of responsibilities / responsibilities actions of public authorities of public services	Conduct at least 4 local seminars for the officials of the forestry and veterinary services, the environmental sectors of the regions, the game wardens of the hunting associations, the forestry and veterinary services and the environmental departments of the regions. and the supervisors of protected area management bodies (FAPPs) concerning management of vulture populations (Monitoring methods population monitoring, tools management tools, management tools, ecosystem vulture ecosystem services, illegal use of poisoned vulture baiting, administrative issues regarding the implementation of mitigation techniques infrastructure impacts)	1.Low priority implementation of conservation actions vulture conservation measures by the relevant public authorities 2.Electrocution & Impact on man-made structures & infrastructure 3.Lack of information/training of Lack of information and training of competent public services on vulture conservation actions in Greece
Reduction of negative impact of human activities on the vulture populations	Information/awareness raising land users and social stakeholders (farmers, beekeepers, hunters, (e.g. hunters, hunter-gatherers, tourism operators, etc.) and the public in critical areas for the Vultures management issues of their populations (ecosystemic and environmental issues) vulture ecosystem services, effects of the use of vulture species, the impact of the use of poisoned baits, single-use methods to mitigate and control damage to livestock by carnivorous mammals, etc.) / Provision of information material on the conservation and ecological value of vultures	Lack of awareness among stakeholders/ land users on the conservation status and threats to vultures.
Dissemination of information on the need to preserve the vulture population	Specific themes for ecological value and the need to conserve vultures in the Information Centres of the Management Entities (Protected Areas and Protected Areas) Protected Areas where species occur	Low dissemination of information on the conservation of vultures in Greece.

	vulture species).	

Table 126: List of protection measures and actions in Annex III of the Action Plan for Scavengers (Black vulture, Vulture, Gyrfalcon)

PILLAR	TARGET	ACTION
Population conservation	Reducing the Risk of Poisoning due to the Illegal Use of Poison Bait	Intensification of patrols/controls
		Recording of poisoning incidents and creation of risk maps
		Provision of electric fences to land users operating within the areas where the Egyptian vulture occurs
	Reduction of the risk of collision with wind turbines	Establishment of risk sensitivity maps and exclusion zones from wind turbines around nests and roosting sites
	Reduction of the risk of electric shock and collision with power transmission and distribution network cables	Insulation of dangerous pylons and marking of power cables around nests, roosting sites and migration routes
	Increase in food availability	Establishment and operation of a network of feeding areas for birds of prey
	Reduction of disturbance during nesting	Establishment of protection zones around nests
		Seasonal (March-September) exemption for sports & activities through IACS
		Ban on lighting of cliffs with Meteora nests
Improvement monitoring and research of population research Egyptian Vulture in Greece	Systematic monitoring	Monitoring using standard protocol monitoring
	Research on mortality	Bird ringing
		Telemetry of chicks and where appropriate and where feasible adult individuals and spatial mapping of habitat use and migration routes
		Creation and implementation of a biomedical protocol of dead birds
	Study of the viability of the species	Development of suitability models habitat suitability/species distribution
		Development of analysis models Population Viability Analysis (PVA)
	Evaluation of the risk assessment of the bioaccumulation risk of lead in the food chain	Lead sampling on large birds of prey in the centres care centres
	Research on the strengthening the population	Feasibility study for reintroduction-strengthening of the natural population in Greece

Legislation and Policy	Reducing the risk of poisoning due to the illegal use of poisoned baits.	Elaboration of the project "National Action Plan for Poisoned Animals Decoys"
	Reducing the risk of poisoning.	"Use of alternatives to diclofenac with comparable results, which proven not to harm scavenging birds.
Communication and Education	Training of stakeholders to improve the response to poisoned bait incidents	Conducting information and training seminars for officials of the Forestry Services, the environmental sectors of the regions, game wardens of hunting organisations and supervisors of protected area management bodies
		Conducting training seminars for officials of the veterinary services
	Awareness raising and sensitisation of stakeholder groups.	Raising awareness among land users (farmers, hunters, beekeepers) on the protection of the Egyptian vulture and the problem of poisoned baits
		Raising awareness among stakeholders in sensitive breeding areas of the species, providing them with information on the protection of vultures
	Public awareness raising	Public information and awareness campaign on poisons in the application areas
		Distribution of Programme information material at target locations.

Table 127: List of measures and actions in the Table of Annex III of the National Action Plan for the Egyptian Vulture.

Following the approval of the 2021 Action Plan for scavengers, a report was published in January 2023 by the Hellenic Ornithological Society entitled **"Identification of critical habitats (mapping of sensitivity) of the Vulture in Greece - Determination of management guidelines "** in the framework of the implementation of action C.1 "Pilot implementation of Action Plans for species and habitat types" of the project "LIFE-IP 4 NATURA. The report lists a number of measures to mitigate the impact of the various threats to the Vulture species, however, the measures are proposed and have not yet been adopted.

Since the M.A. 68086/2149/2021 and the M.A. 43236/1053/3760B/25.10.2017, measures have been proposed to address the impacts of the W/Ts on endangered species which are partially in line with the proposed measures of the existing Environmental Impact Assessment and the Special Ecological Assessment. However, no **exclusion zones and/or sensitivity zones** have yet been established for **AERs** as the said Ministerial Decision refers to their inclusion in **the Renewable Energy Land Use Plan under review**, while **references are made to post-construction monitoring of AERs with protocols for recording collision incidents and collection of dead animals.**

It is also important to note that the consultation of the Special Environmental Study of the Evros and Rhodope Region has been completed.

According to Article 47 of Law 4685/2020, the Special Environmental Study is the ***"scientific study to document the Presidential Decree of one or more protected areas and the Management Plan***

***of each protected area*".** In particular, it focuses on the characterization of protected areas, the zones defined within them, the necessity or not of establishing regional zones, ecological corridors, as well as the proposal for the regulation of activities and functions and the provision of appropriate measures and actions for the preservation of the protected object of each protected area, which, however, must first be established in order to be implemented as such.

The Legislative Management Plans have not been prepared and therefore no relevant Legislative Decree (e.g. Presidential Decree) has been adopted.

Considering the above data, the field observations of the Special Ecological Assessment (July 2020 - June 2021) and the prerequisites for the implementation of all the mitigation measures mentioned in detail above, it is estimated that the project.

- It is not likely to delay or interrupt the progress in achieving the conservation objectives of the Natura 2000 sites concerned.
- It is not likely to impede the achievement or maintenance of the objectives for the bird species of par. 1 and 2 of Article 4 of Directive 2009/147/EP on the conservation of wild birds Special Protection Areas (SPAs) of the national ecological network under consideration NATURA 2 000 of Greece were established by the Decision of the Deputy Minister of Environment and Energy No. 50146/1786 (Government Gazette 3118/B'/10-05-2023).
- It is not likely to reduce the area or fragment habitat types of Natura 2000 sites or affect the representativeness and degree of conservation of their structure and functions.
- It shall not be likely to reduce the population size of species or affect the degree of conservation of their habitats or fragment them or affect the balance between species or affect the degree of isolation of species.
- It is unlikely to cause changes to vital parameters (e.g. nutrient balance, soil degradation from potential erosion, dynamics of relationships between biotic and abiotic parameters) that determine how Natura 2000 residential site's function.
- Not likely to have interactions with predicted or expected natural changes in Natura 2000 home sites.

10.5 Addressing the impact of the anthropogenic environment.

10.5.1 Spatial Planning - land use

As discussed in the previous chapter, no impact on existing land use is expected. The fact that the interventions will be carried out only on the necessary land and indicated by the licensing authorities does not entail any requirements for further measures.

10.5.2 Structure and functions of the anthropogenic environment

The implementation of the planned project does not affect the structure and functions of the anthropogenic environment both during the construction phase and during the operation phase. However, compliance with the following guidelines is proposed:

- Compliance with noise emission limits as provided by the current legislation
- Observance of defined routes for the passage of trucks and machinery through the settlements in order not to cause nuisance to residents and to ensure their smooth movement to and from residential areas by regulating traffic in all sections of the project where interventions are foreseen

- The location of construction sites and aggregate deposition areas should be done with the axis of the least possible disturbance to the residential environment and with the basic aim of their complete rehabilitation.
- It is necessary to take all necessary safety measures during construction (eg: appropriate night lighting, construction site signage, temporary safety barriers, etc.) of the works to minimize the risks of accidents.
- Taking all necessary fire protection measures in case of fire and minimizing the risk of its transmission to areas near the project.
- Installation of adequate light signalling depending on the requirements of the GSND and the CAA to prevent aircraft from colliding.

10.5.3 Cultural Environment

No negative impact on the historical and cultural environment is expected. The nearest archaeological sites are the "10 Megalithic Monuments" which is located at 1.3 km and the archaeological site "Koum-Tarla" which is located at 3.3 km.

The compatibility of WPP in relation to archaeological sites has been examined in the Special Compatibility Issue, for this reason there is no need to take measures for the protection of cultural heritage.

In any case, the opinions and comments of the competent services of the Ministry of Culture & Sports will be considered in the context of the environmental licensing process of WPP and the following measures will be implemented:

- Informing the competent archaeological services before the start of the works
- Carrying out the excavation works under the supervision of a qualified archaeologist
- Interruption of works in case of discovery of antiquities.

10.6 Coping with socio-economic impacts

Recently (May 2022) the European Commission presented an extremely important package of policies and recommendations on RES. According to the Commission's "REPowerEU Action Plan", renewables are at the core of Europe's energy security. The committee proposed increasing the European RES target for 2030 to 45% (from 40%). Among the actions announced in this direction are the strategy for solar energy with emphasis on buildings and the drastic acceleration of wind energy, so that wind power reaches 480,000 MW within 8 years from 190,000 MW today.

To this end, the Commission has submitted a new legislative proposal to accelerate authorisation procedures, which should be incorporated into the ongoing revision of the RES Directive. The new legislation is foreseen to include three (3) important axes:

1. The establishment of the principle that renewable sources serve the supreme public interest. This means that in any case their installation must be weighed and proceeded as a matter of priority, during the current energy crisis and until climate neutrality is achieved.
2. The obligation for Member States to define, following a strategic environmental assessment, wider areas where RES will be allowed from the outset. In these areas, investments should be able to start construction within one year of their request.

3. The obligation, in the remaining areas, for RES to be licensed within two (2) years, while clarifying that within this deadline a final decision must be issued on all permits required for the construction of an investment.

As it is understood, the directives described above, with their imminent adoption by EU countries, will constitute the best practices for the licensing of RES, throughout Europe, with the primary purpose of recognizing these projects as an overriding public interest.

10.6.1 Construction phase

The construction of RES projects favors regional development. They have positive but short-term effects during the construction phase, since the construction of the project requires human resources, resulting in the creation of jobs and employment opportunities. Every effort should be made to absorb labour from the local Municipal Units, so that the positive effect in terms of employment (direct and indirect) can be disseminated throughout the local economy.

Regarding the roads (access and internal road interconnection of the Motorways), it is noted that their opening - based on the design of the project (as a companion project of permissible intervention under the current forest legislation) primarily serves access to the WPP. However, these roads, after their opening, potentially and after their evaluation and evaluation by the competent forest service, may be included in a wider planning of a network of roads within the framework of the fire protection plan for the area (if this is consistent with the overall fire protection plan). In addition and correspondingly, the opening of the project's roads - although, as mentioned, they have no other main purpose than to provide access to the WPP as a companion project of permissible intervention - may nevertheless contribute (by providing access to the area) to the execution of vegetation regeneration works or even the carrying out of any reforestation works deemed (competent and at any time) to be required.

Regarding the measures for the impacts expected both during the construction phase and during the operation phase on the atmospheric and acoustic environment, these are thoroughly analyzed in Sections 10.8 and 10.9 respectively.

The installation and operation of the project under study is not expected to have any negative impact on the social and economic environment of the area, nor to disturb any of the existing anthropogenic activities and uses. On the contrary, it is expected to have a positive impact on the economic and social profile of the region.

10.6.2 Operational phase

Throughout the operation of the project, people are required who will be responsible for monitoring the smooth operation of the project and guarding the equipment. These needs will create jobs for a small number of workers to be filled by the local population.

10.7 Technical infrastructure

10.7.1 Construction phase

To reduce the impact on the telecommunications network and the electricity network, no measures will be implemented as there will be no impact on the technical infrastructure from the construction and operation of the WPP consisting of 8 wind turbines.

To reduce the impact on the road network that will be used by trucks transporting earthmoving materials during the construction phase, the following measures will be implemented:

- Maintenance of roads in case of damage to the network and restoration of road slopes.
- Informing residents of the nearest settlements about the transit times of trucks.
- The materials transported by earthmoving vehicles should be covered with plastic films to avoid diffusion of materials to nearby settlements and along the road network.

For the management of solid waste that will arise from the construction site during the construction phase of the project, the following measures will be applied.

- Waste such as garbage, waste materials, components and/or oils should be collected and removed from the project site and their disposal should be based on the current legal provisions on hazardous waste
- There should be special bins for municipal waste to be transported to an approved disposal site, an approved disposal site (landfill).
- Packaging waste should be collected and delivered to a licensed collector for alternative management (packaging recycling program).

The management of waste streams falling within the scope of Law 2939/0 (Government Gazette 179 A'/01.08.2001), as amended and in force, should be carried out in accordance with the provisions of this law, the regulatory acts issued under its authorization and in accordance with the requirements and specifications of the respective approved alternative management systems.

10.7.2 Operational phase

During the operation phase of the WPP Aircraft, no measures are required as according to Cap. Amendment No 9 is not expected to have a substantial impact on the technical infrastructure of the study area.

10.8 Correlation with anthropogenic pressures on the environment

In the environment where wind power plants will be installed, the only anthropogenic pressures are agricultural and livestock activities. The projects under study will not have effects related to the excessive enhancement of one or more of the anthropogenic pressures on the environment recorded in the relevant section of this study.

In relation to the cumulation of projects, due to the existence of several neighboring projects of similar technology in the area, the scale of the project and the offsets from its operation, combined with the implementation of all the measures proposed herein, and the observance of the environmental conditions to be determined when the AET is issued, will smooth the cumulative nature of the presence of WPP in the area.

10.9 Air quality

10.9.1 Construction phase

According to Ch. 9 From the assessment and evaluation of the impact on air quality, it has been observed that the effects on the atmosphere during the construction phase of the project come mainly from dust formation and less from the exhaust gases of vehicles and machinery.

The impact on air quality from exhaust gases from vehicles and machinery will be negligible, so no special measures need to be taken to deal with exhaust gas impacts. The only measure that can be carried out is the maintenance and inspection of vehicles and machinery.
Therefore, the measures that need to be taken to address dust emissions during the construction phase of the project are:

- Wetting the roads where vehicles will move to and from the construction site, to avoid dust diffusion to nearby settlements.
- Introduction of a maximum speed limit for dirt roads.
- The existence of special signage for the entire route of transportation of materials as well as for the construction site.
- Avoid overfilling bulk carriers and use a special plastic cover during transport or storage.
- For the movement of trucks, choose roads that do not pass through settlements, if possible. If the route of trucks must be through settlements, then it is recommended to wet the roads.

10.9.2 Operational phase

During the operational phase of the project, no deterioration to air quality is foreseen, so no response measures are required.

10.10 Dealing with the Effects of Noise or Vibration

10.10.1 Construction Phase

Given that the WPP under study are located quite far from anthropogenic activities and that the noise source mainly affects the immediate construction site of the project and is significantly weakened by removal from it, the related effects are expected to be mild.

In Greece, legislation is in force concerning noise emanating from construction sites, picks, etc. More specifically, in the context of protection from construction noise, it is the obligation of both the developer and the constructor to implement the current legislative framework, which concerns:

- the use of silenced picks,
- the use of construction site machinery and appliances bearing the EU marking (CE) limit value for the noise level they emit,
- noise level limit values for hydraulic excavators, etc. and
- determination of the sound emission of construction site machinery and equipment (Leq(T)).

It is recommended to use modern machinery and construction vehicles as well as to avoid their passage through the settlements during quiet hours. Regarding noise levels in the area where the work will be carried out, they will remain below the limit of 90 Db(A) (noise exposure limit of workers above which

the use of personal audio-protective equipment is required, Presidential Decree 85/91 (Government Gazette 38 A΄/18.3.91)) and whenever and if required, there will be appropriate personal protective equipment for employees.

10.10.2 Operation Phase

The noise emitted by modern wind turbines is practically zero. However, their regular maintenance and the earliest possible replacement of defective parts are required to avoid producing the minimum mechanical noise that may occur in the event of damage.

From the analysis of noise during operation, it appears that the existence of any form of nuisance is not expected from the operation of the WPP under study as the nearest settlement of Roussa, which is located at 3.3 km from the nearest wind turbine of the WPP under examination.

In any case, the noise limits should be met by appropriate adjustment of the operating capacity of the machinery by interfering with the mode of operation of the W/T.

10.11 Dealing with effects related to electromagnetic fields

10.11.1 Construction phase

Based on what was mentioned in Chapter 9, no effects related to the electromagnetic fields of the area are expected from the construction of the project and therefore there is no need for appropriate mitigation measures.

10.11.2 Operational phase

The design of the whole studied project and the selection of electromechanical equipment was based on compliance with the limits of safe exposure of the public and employees, as defined in Joint Ministerial Decision 3060 (FOR) 238/02 (Government Gazette 512B'/25/04/2002) "*Measures to protect the public from the operation of low frequency electromagnetic field emission devices*" and in the relevant European Directive 2013/35 / EU.

10.12 Addressing water impacts

This section analyses the impact on water during the construction and operational phase of the project. The projects due to their nature cannot cause impacts on the surface and groundwater of the area, as no water resources will be required from the area and moreover no waste is produced to create impacts on them. Measures should be taken for accompanying activities during the construction and operation phase.

10.12.1 Construction phase

By their very nature, the projects do not have a significant impact on surface and groundwater in the area and therefore no special measures are required.

During the construction of the project, the response measures that can be taken concern the protection of surface water and groundwater quality and are the following:

- Prohibition of the disposal of materials near points of the hydrographic network of the immediate or wider area.
- Avoid earthworks on days with heavy rainfall or strong winds to reduce the emission of particulate matter into the environment.
- Rehabilitation of runoff routes so that rainwater drains in approximately the same way as before the project.
- Deposit materials in such a way

Accident response should also be provided in the manufacturer's programme. Thus, the contractor should provide the construction site with the appropriate absorbent materials (e.g. sawdust, sand) in sufficient quantities through which adsorption and consequently the containment and limitation of dispersion of leaking fuels and lubricants will be sought. After use, these absorbents should be carefully collected and disposed of to appropriate hazardous waste management companies.

In any case, of course, proper and systematic maintenance of vehicles and machinery should be ensured, to avoid as much as possible any cases of accidental pollution.

The liquid waste expected to be generated during the operation of the project is minimal and is limited:

- The fluids of the hydraulic systems of the wind turbines and transformers, which for maintenance reasons should be renewed at specified intervals).
- In the urban wastewater of the staff sanitary area in the control building, there will be a septic cesspool.

10.12.2 Operational phase

During the operation phase, no special measures are required as no negative impact on the hydrological network, surface and underground systems of the area is expected.

However, for there to be a smooth runoff of the water of the area, the road culverts should be maintained and cleaned from sediment and waste so that they can supply their design supply.

As far as the hydraulic systems of the W/T are concerned, their fluids should be changed by special personnel of the installation. When changing liquids, the risk of pollution due to leaks is small and can only be caused by an accident or material failure. To deal with fluid leakage or accident, the contractor should have special absorbent materials (e.g. sawdust, sand) in appropriate quantities to contain and limit the dispersion of liquid waste and lubricants.

After use, absorbent materials should be collected and landfilled.

10.13 Assessment and evaluation of the expected impact of the vulnerability of the project and its accompanying project support to major accident or disaster risks

According to the assessment carried out for the WPP and their accompanying projects, no serious or significant impacts linked to the vulnerability of the project to potential risks of major accidents or

disasters are foreseen. It is important to mention that for the construction and operation phases of WPP and its accompanying projects, the following measures are proposed:

- The excavations carried out for the needs of the project should be carried out using mechanical means and coordinated so that there are no prolonged periods of nuisance.
- If explosives are used due to local conditions (topography), this should be done in accordance with the following restrictions:
    - Implementation of existing legislation on the use of explosives
    - Strict adherence to standards for people's safety
    - Implementation of the conditions applicable to the use of explosives in relation to the avifauna of the area.
- Taking all necessary measures such as placing warning signs, fencing parts of the works of increased risk to avoid accidents, to protect workers in the area or those passing through it, from the risks that will be created by the operation of the project.
- During the construction phase, work should be assigned to crews with special experience. All health and safety regulations will be complied with, while special works such as transport of aircraft in sections with special trucks, erection of W/T pillars, assembly of blades, etc. will be implemented by domestic or foreign firms that comply with all the required technical specifications and operating standards.
- Taking the necessary measures to protect citizens passing through the project area from hazards that are likely to arise from works during the construction phase or during the operation phase: introduction of warning signs, fencing of high-risk parts of a project, and restriction of public access to parts of the project
- During the operation phase of the project, the necessary fire protection measures will be taken in case of fire and to reduce the risk of its spreading to the wider area of the project. The fire protection will be checked and approved by the competent Fire Service.
- During the operation phase of the project, under the responsibility of the company, as an organization, trainings will be carried out by all competent authorities, to inform and prevent the risk of causing smaller or larger accidents.
- Application of appropriate lightning protection.

Thus, in this Chapter the proposed measures during the construction and operation phase of the project have been analyzed to reduce the intensity of the negative impacts and restore the environment to its original state.

According to Chapter 9, the main environmental parameters that are important during the construction of the project are:

- The reduction of pollutant emissions into the atmosphere
- Protection of neighbouring natural ecosystems in case of fire
- Protection of the soil from accidental leakage of liquid hazardous waste during the construction phase and during maintenance works during the operation phase.
- However, the potential negative effects of the project concern the natural environment and soil characteristics.

In this regard, you should:

- Implement the proposed measures on construction sites to reduce the impact of dust emissions on site.
- Proper maintenance and systematic control of the proper operation of the installation and the means of fire extinguishing
- Implementation of preventive soil protection measures and implementation of the limitation of interventions exclusively within the occupation zone of the project so that the impact on soil characteristics becomes almost negligible.

10.14 Measures to enhance adaptation to climate change

Based on the results of the risk analysis, it is assessed that the RES project needs to take (additional) adaptation measures which are detailed in **chapter 5.2.1.**

CHAPTER 11 - ENVIRONMENTAL MANAGEMENT AND MONITORING

11.1 Environmental Management

In chapter 9 of the present study that preceded it, a detailed assessment and evaluation of the impact of the project under study on the environment was carried out, while a series of preventive, remedial and compensatory measures were proposed.

Within the framework of the environmental licensing legislation (Law 4014/2011), an Environmental Management Plan is provided to ensure the effective protection of the environment and the implementation of the proposed measures.

The main objective of an Environmental Management System is the continuous improvement of the environmental performance of the body that implements, the recording and maintenance of documentation of the proposed measures as well as the provision of information to public authorities. It also enables the environmental issues arising from the operation of the entire project to be addressed.

The design of the environmental management and monitoring system includes the following phases:

- Definition of the relevant legislation
- Defining environmental policy
- Identification of environmental objectives
- Environmental monitoring programme
- Application and Operation
- Audits and corrective actions
- Management Review

11.1.1 General principles

According to the relevant environmental legislation, it is appropriate to create an Environmental Management Plan (EMP) that will be implemented to ensure the effective protection of the environment and the implementation of the proposed measures, and which will include the proposed monitoring program.

The environmental management monitoring program of WPP and its escorts in the D.C. of Mikro Dereio, the Municipality of Soufli, the Region of Eastern Macedonia and Thrace, concerns those actions that ensure the accurate assessment and monitoring of the state of the environmental aspects estimated to be affected by the construction and operation of the project.

Implementation monitoring is a key factor both for the successful implementation of the Environmental Management Plan and for taking measures to correct imperfections, where necessary.

The key elements of environmental management that concern the project design are the identification of environmental objectives and the environmental management program.

With the implementation of the environmental monitoring program, the assessment of the accuracy, impacts and effective measures and the degree of achievement provided by the EIA is achieved, as well as the provision of data on the environment in the studied area.

The environmental parameters that will be monitored are the following:

1. Climatic & Bioclimatic
2. Morphological & Landscape
3. Geological, Tectonic and Pedological
4. Natural Environment
5. Anthropogenic Environment
6. Atmospheric Environment
7. Acoustic Environment
8. Aquatic Environment
9. Land use

All program data is registered in special software for data management, which will be kept on the premises of the WPP facilities and will be available to be given to any competent authority that requests them.

Measurements and analyses of environmental parameters follow internationally accepted standards and are recorded in files electronically to ensure continuous monitoring of the project. Specifically, the proposed environmental management plan will follow the standards of the ISO 14001 Environmental Quality System or the EMAS Environmental Management System of the European Regulation (EC) No. Regulation (EC) No 1221/2009/EC of 25 November 2009 allowing voluntary participation by organisations in a community eco-management and audit scheme.

The main purpose of environmental management is to ensure in all phases of the project (construction phase and operation phase) the effective protection of the environment and the implementation of environmental terms. The setting of specific objectives and continuous and accurate knowledge of the state of the environment enables the assessment of the effectiveness of the terms, measures, restrictions and interventions proposed to minimize the effects caused by the construction and operation of the studied WPP as well as its accompanying projects.

The environmental management plan is developed based on:

- The proper implementation of the project according to its proposed design.
- The design of the project includes measures and conditions to ensure the minimization and / or prevention of its impact on the natural and man-made environment of its development area, both during the construction phase and during the operation phase.
- Identifying the project's effects on the environment.

- The adoption and implementation of the existing Environmental Legislation. Compliance with legislative and regulatory requirements (emission limits, water quality, atmospheric and acoustic environment limits, etc.).
- The implementation and observation of preventive measures for the protection of the environment both during the construction phase and during the operation phase of the project that will be included in the Environmental Terms Approval Decision (AET).

Chapter 10 of this study presents proposed measures to prevent and deal with any kind of impacts that may be caused and concern both the natural and anthropogenic environment.
It is necessary to define all actions related to the prevention and reduction of impacts on the environment, compliance with all laws and regulations related to the construction and operation of WPP (National European and International Legislation).

The implementation and operation of the environmental management system is proposed to be implemented through the preparation of the necessary procedures for undertaking the following actions:

- Definition of structures and responsibilities for the implementation of the system
- Description of education, awareness and competence topics
- Definition of internal communication procedures
- Environmental management system documentation
- Definition of document control procedures
- Definition of operational control procedures
- Description of emergency preparedness and response

11.2 Upcoming legislation

The project promoter must maintain, in an organized and systematic manner, an updated file with all applicable relevant provisions and regulations and train the personnel responsible for its implementation for the proper observance of the prescribed obligations. The information of the Agency regarding the applicable provisions can also be found on the websites of the Ministry of Environment, the National Printing Office, etc. The basic legislation governing this project is the following:

- ⇨ Law 4014/21.09.2011 (Government Gazette 209/A/2011) "environmental licensing of projects and activities, regulation of arbitrary in connection with the creation of an environmental balance and other provisions of competence of the Ministry of Environment" and relevant interpretative circulars issued for its implementation.
- ⇨ Law 1650/1986 (Government Gazette 160/A/18.10.1986) "For the protection of the environment" as amended by Law 3010/2002 (Government Gazette 91/A/25.4.2002) and in force.
- ⇨ Joint Ministerial Decision 69269/5387/24.10.90 (Government Gazette 678/B/90).

- ⇨ Ministerial Decision 1958/13.01.2012 (21/B/13.01.2012) on the classification of public and private projects and activities into categories and subcategories according to article 1, paragraph 4 of Law 4014/19.09.2011.
- ⇨ Joint Ministerial Decision 37111/2021 (Government Gazette 1391/B/29.09.2003) determining the way of informing and participating the public during the process of approving environmental terms of projects and activities, in accordance with paragraph 2 of article 5 of Law 1650/86, as replaced by paragraphs 2 and 3 of article 3 of Law 3010/02.
- ⇨ Law 3937/2011 (Government Gazette 60/A/2011) on biodiversity conservation and other provisions.
- ⇨ Presidential Decree 148/2009 (Government Gazette 190/A/29.09.2009) on environmental liability for the prevention and remedying of damage to the environment – harmonization with Directive 2004/35/EC.

11.2.1 Environmental policy

The project promoter is committed to contribute to the maximum possible extent to the creation of a sustainable and sustainable future for the area of operation of the project and activity, through continuous improvement actions that will include:

- Control of the impact of construction and operation, in accordance with the terms hereof.
- Reliable and with sufficient frequency monitoring of the magnitudes characterizing the environmental impacts of the project under study.
- Minimization or, where possible, prevention of impacts on the environment and local communities.
- Implementation of the environmental terms of the Environmental Terms Approval Decision of the project and all preventive, remedial and compensatory measures proposed in this study.
- Compliance with all environmental laws and regulations of National and European legislation.
- Prevention and/or control of the effects of exceptional occurrences.
- Promotion of open discussions with social stakeholders on the environmental aspects of the construction and operation of the project.
- Decision making regarding the development, expansion or operation of the project considering the impact on the environment and society.
- Training, support and motivation of the employees of the operator towards understanding and adhering to the environmental terms of the project and activity.
- Definition of specific measurable environmental objectives and indicators.
- Publication of recordings, impact control actions and figures that constitute environmental performance indicators, to citizens and stakeholders or Services, both via the internet and through the submission of a periodic annual restart.
- Continuous improvement of environmental performance.
- Implementation and adherence to the monitoring programme proposed in this study.

International standards and procedures can be used to ensure proper design and effective implementation of the EMS. The proposed Environmental Management Plan is proposed to follow the standards of the ISO 14001 Environmental Quality System or the EMAS Environmental Management System of the European Regulation (EC) No. Regulation (EC) No 1221/2009/EC of 25 November 2009 allowing voluntary participation by organisations in a community eco-management

and audit scheme. In this way, the continuous environmental monitoring of the project is ensured, while every year a relevant informative restart will be prepared by a competent environmental researcher with the main results of the monitoring program and proposals for dealing with possible problems. The environmental restart will be sent to the competent Environmental Service of the Ministry of Environment for information purposes and confirmation of compliance with the environmental terms of the project.

11.3 Environmental objectives

The preparation of the environmental objectives of the Environmental Management Plan includes as a starting point the identification of the most important environmental parameters that are expected to be affected by the construction and operation activities of the project and activity under consideration, as well as the expected impacts on each of them, as assessed and evaluated in Chapter 9 of this study.

The table below presents the proposed environmental parameters to be monitored that were the most important to ensure the protection of the environment and the proper operation of the project, following the adoption of appropriate response measures, as described in Chapter 10 hereof. At the same time, the main objectives are identified, the implementation of which will lead to the improvement of environmental performance and the minimization of the impact from the construction and operation of the project.

N/A	Environmental aspect	Effects	Target
1	Climatic & Bioclimatic	Positive effects, medium intensity, supralocal, long-term and permanent	It does not need to be targeted as the effects are already positive
2	Morphological & Landscape	Change of visual value that will occur with the installation of the project	Visual coupling of landscape and wind farm that can be achieved through the application of aesthetic rules, based on ensuring harmony in the relationships of lines and / or volumes
3	Geological, Tectonic and Pedological	Impact only on soil characteristics at the intervention points of the project.	Configuration of the space to return as close to the original state as possible, limited intervention only where necessary
4	Natural Environment	Immediate minor and reversible interventions only at the intervention points of the project.	Measures and precautions to ensure minimization of any impact and restoration where feasible (e.g. phytotechnical interventions)
5	Anthropogenic Environment	There is no impact as the project is at a great distance.	It does not need to be targeted
6	Atmospheric Environment	Temporary (only during the construction phase) dust and exhaust emissions of trucks and machinery	Maintenance and control of vehicles and machinery to minimize impact.
7	Acoustic Environment	The aerodynamic noise produced by wind turbines is perceived only at low wind speeds, due to the	Regular maintenance and the earliest possible replacement of defective parts

		distance of the project from settlements no disturbance arises.	to avoid the production of minimal mechanical noise.
8	Aquatic Environment	Possible accident with liquid waste leakage only during the construction phase	Proper and systematic maintenance of vehicles and machinery, to avoid as much as possible any cases of accidental pollution. Taking protective measures.
9	Land use	There is no change as the extent of intervention is small and unexploited	It does not need to be targeted

Table 91:Monitoring of environmental parameters

To ensure the proper environmental behavior of the project, it is proposed to implement an Environmental Monitoring Program of the above parameters and to take improvement-management measures in case of deviation from the set objectives of the program and the environmental terms of the project.

11.4 Environmental Monitoring Program

The main objectives of the Environmental Monitoring Program are:

- The monitoring of all significant environmental parameters related to the impacts of the project, as assessed in Chapter 9, as well as the effectiveness of the implementation of the proposed mitigation measures analyzed in Chapter 10 hereof,
- The recording and maintenance of data documenting the implementation of the proposed measures and allowing the control of their effectiveness,
- The provision of information to public authorities and the public is based on current legislation.

The process of environmental monitoring concerns the systematic periodic measurement of key indicators for different environmental parameters that may be affected by the construction and operation activities of the project. The implementation of the monitoring program of these indicators in the context of the environmental management of the project will contribute to:

- The observation of the environmental terms and measures of the project as proposed by this EIA.
- Ensure up-to-date data on the state of the environment.
- Assessment of possible changes in environmental media because of the construction and operation of the project.
- Assessment of the accuracy of the impacts predicted in EIA and AET
- The provision of important information for the evaluation of the effectiveness of the proposed remedial measures with this EIA and terms by the AET, depending on the evolution trends of the monitored parameters and their expected changes.
- The timely notification of potential problems and their treatment at their initial stage, reducing environmental and economic costs, as well as the size of the necessary interventions.

- The creation of an important database of scientific information on the status of important habitats and species hosted in the area, which can be used as a tool in any decision-making process of the competent services for the area.
- Assessment of the degree of achievement of environmental objectives as well as statutory conditions and thresholds for the characteristics and properties of environmental media.

The following list concerns the proposed monitoring indicators in the context of the implementation of the environmental management plan of the project during the design and construction phase:

1. Soil: As far as soil is concerned, the volume of excavations should be calculated as well as the way they are disposed of.
2. Landscape: The area to be restored should be estimated towards the total area where interventions will be made.
3. Ecosystems: Restoration projects.
4. Avifauna: Bird monitoring.
5. Human health: Noise assessment both during construction and during operation of the park.
6. Atmosphere: Estimation of emissions of carbon dioxide and any other gas harmful to the environment.
7. Disasters: Assessment of accident avoidance in the construction and operation of the studied project.

11.4.1 Biodiversity monitoring

About Chapter 9 of the SEA, which was drafted by a scientific team, during the operation of the WPP at the "MAVRODASOS" site, it is proposed to assign the monitoring and recording of the effects of its operation to specialized personnel who will be regularly on site and will be able to act as a source of basic information and continuous basic observation. This personnel should consist of specialized relevant scientists, who will check the accuracy of the predictions of the specific study, possible variations in the use of the field research area by the important bird species of the area that may be due to accidental or unpredictable factors (e.g. the occurrence of a forest fire in the wider area that will create "open areas") differentiating its degree of use from the various species of avifauna, the effectiveness of the proposed measures and the impact during the construction and operation phase of the project. During the bird monitoring programme, it is also proposed to implement (if necessary, based on what has been mentioned above) an appropriate similar programme for bats (limited in time to the duration of activity of this group of mammals, both 24 hours a day and during the year).

It is recommended that the monitoring and recording of the impacts to be carried out should last at least 4 years and be carried out both during the pre-construction and construction phases, but also during the first two years of operation of the project and include the following:

- Regular surveys (recommended every 15 days (2 times a month) during critical periods and every 20 days (3 times every 2 months) the rest of the time) related to the risk of impact and the detection of nests in the area.
- Recording of project area usage data and recording of flights of important species in the project area and their interaction with wind turbines.
- Illustration of the above on a map to assess the situation.

- Control and recording of possible mortality in a special protocol that will be maintained by the company and will be at the disposal of the competent services – bodies for the control of collision incidents in the area.
- Training of WPP employees to deal with incidents of injured birds and the immediate briefing of the competent services – bodies.
- Training of WPP employees to scan the area of wind turbines to find dead individuals of avifauna and check the correct implementation of the procedure with checks.
- Assessment of the situation based on the information gathered

Based on the above program, it will be possible to assess the progress of the project's operation and determine the necessity or not of taking additional measures or modifying the proposed ones to minimize any possible impacts.

11.5 Evaluation of Data and Results

The monitoring parameters to be checked during the construction phase of the project consist of the organization of the construction site, the management of waste (solid and liquid) and gaseous emissions as well as emissions to the acoustic environment (noise).

During the operation phase, the main criterion is the proper operation of the WPP and its accompanying projects, without any impact on the natural environment. Thus, the process of restoring the vegetation of the intervention surfaces due to the excavations in the area should be monitored, and the plantings carried out should be checked. At intervals during each year of operation of the stations, a possible growth of vegetation in parts from which it must be removed must be checked, to maintain the proper and safe operation of the WPP.

The effectiveness of a monitoring programme lies in the reliability and timeliness of the data and conclusions drawn from it. As mentioned above, the planned program will comply with the principles of the Environmental Management Plan according to the standards of ISO 14001 or EMAS environmental quality systems.

The Monitoring Program monitors the environmental indicators that are or may be affected by the project. This ensures continuous environmental monitoring of the project.

The results of the environmental monitoring will be included in an annual Environmental Monitoring RAETrt, which will be prepared by an environmental studies office and may be supervised by the environmental licensing authority.

The management and the project operator, to ensure the continuous improvement, suitability and effectiveness of the EMS and thus its performance, should review and evaluate the system at predetermined intervals. For this reason, it is proposed to develop a system review process that includes at least:

- Inspection results
- The extent to which the objectives and objectives have been met

- The continued suitability of the environmental management system in relation to changing conditions and information
- Any reservations of interested parties (staff, etc.)

A periodic review by the competent Environmental Service of the project operator is required to ensure its continued relevance, adequacy and effectiveness, as well as the possible need for changes in the policy, objectives and other elements of the environmental management system in relation to inspection results, changes in conditions and commitment to continuous improvement.

In addition, no additional general and specific environmental objectives are currently identified in the context of the environmental management of the project.

CHAPTER 12 - CODIFICATION OF RESULTS AND PROPOSALS FOR THE ADOPTION OF ENVIRONMENTAL CONDITIONS

This chapter presents a Draft Decision for the Approval of Environmental Terms (AET) of the projects under study.
The presentation of the Draft Decision for the Approval of Environmental Terms (AET) follows the structure provided by the Ministerial Decision 48963/12 (Government Gazette 2703B'/05.10.2012) "Content specifications of Environmental Terms Approval Decisions (AET) for projects and activities of category A of No. 1958/13.1.2012 decision of the Minister of Environment, Energy and Climate Change (B' 21), as in force, according to article 2 par. 7 of Law 4014/2011 (A' 209)".

AET PLAN

1. SUBJECT MATTER OF DECISION

1.1 Type of Decision: AET of a new project or activity

1.2 Project name: (1) A 34.5 MW Wind Power Plant at the location "Mavrodasos" of the Regional Unit of Evros, Municipality of Soufli, Municipal Unit Orfeas, Municipal Community of Dereio as well as its accompanying works (opening of forest roads, road improvement and 33kV Medium Voltage electrical connection network of WPP).

1.3 Name of the institution: "Aliki Energy SINGLE MEMBER P.C."

1.4 Project location

The WPP and most of the interconnection of the project belongs administratively to the Region of Eastern Macedonia and Thrace, the Regional Unit of Evros, the Municipality of Soufli, the Municipal Unit of Orfeas, the Municipality of Soufli, while the accompanying project (part of the interconnection) belongs administratively within the Region of Arrian, Regional Region of Rodopi, Regional Unit of Eastern Macedonia and Thrace.

2. PREAMBLE

2.1 Legislation related to the environmental permitting process of the project and key regulatory acts. The legislative framework shall be established considering:

1. Law 4014/2011 (Government Gazette 209/A/21.9.2011) "Environmental licensing of projects and activities, regulation of arbitrary in connection with the creation of an environmental balance and other provisions of competence of the Ministry of Environment".
2. Law 4685/2020 (Government Gazette A'92/7-5-2020) "Modernization of environmental legislation, incorporation into Greek legislation of Directives 2018/844 and 2019/692 of the European Parliament and of the Council and other provisions".
3. Law 4819/2021 (Government Gazette 129 A΄ / 23-7-21) "Integrated framework for waste management Incorporation of Directives 2018/851 and 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste and Directive 94/62/EC on packaging and packaging waste, framework of organization of the Hellenic Recycling Agency, provisions on plastic products and protection of the natural environment, town and country planning, energy and related emergency regulations'
4. The MD YPEN/DIPA/63951/4418/2024 (Government Gazette 3867/B/3-7-2024) "*Amendment of the ministerial decision under elements CYPA/oik.37674/2016 (B' 2471) for the reclassification of onshore wind*

power generation projects and onshore photovoltaic power generation projects in the categories and subcategories of Law 4014/2011".

5. MD 15277/2012 (Government Gazette 1077/B/9.4.2012) "Specification of procedures for the incorporation in the Environmental Terms Approval Decisions or the Standard Environmental Commitments of the intervention approval provided for by the provisions of the Forest Legislation, for projects and activities of categories A and B of the ministerial decision no. 1958/2012 (Government Gazette 21/B/13.1.2012), in accordance with article 12 of Law 4014/2011".

6. Joint Ministerial Decision 21398/2012 (Government Gazette 1470/B/3.5.2012) "Establishment and operation of a special website for the posting of decisions approving environmental terms (AET), decisions renewing or amending AET, in accordance with article 19a of Law 4014/2011 (Government Gazette 209/A/2011)".

7. Joint Ministerial Decision 48963/2012 (Government Gazette 2703/B/5.10.2012) "Content specifications of Environmental Terms Approval Decisions (AET) for projects and activities of category A' of No. 1958/13.1.2012 decision of the Minister of Environment, Energy and Climate Change (B' 21), as in force in accordance with article 2 par.7 of Law 4014/2011 (A/ 209)".

8. Joint Ministerial Decision 167563/EYPE/15.4.2013 (Government Gazette 964/B/19.4.2013) "Specification of the procedures and specific criteria for environmental permitting of the project and activities of articles 3, 4, 5, 6 and 7 of Law 4014/2011, in accordance with the provisions of article 2, paragraph 13 thereof, of the special forms of the above procedures, as well as of any other matter related to these procedures".

9. Joint Ministerial Decision 1649/45 (Government Gazette 45/B/15.1.2014) "Specification of the procedures for opinions and the way of informing the public and the participation of the interested public in the public consultation during the environmental licensing of projects and activities of Category Aof its decision

Minister of Environment, Energy and Climate Change No. 1958/2012 (Government Gazette A' 21), in accordance with Article 19(9) of Law 4014/2011 (Government Gazette A' 209), as well as any other relevant detail.

10. UNHCR 170225/14 (Government Gazette 135B'/27.01.2014) "Specification of the contents of the environmental licensing files of projects and activities of Category A of the decision of the Minister of Environment, Energy and Climate Change no. 1958/2012 (B' 21) as in force, in accordance with article 11 of Law 4014/2011 (A' 209), as well as any other relevant detail".

2.2 Documents and data for the submission of the dossier for the environmental permitting of the project

It will be completed by the Agency before the adoption of the relevant AET.

2.3 Opinions − views of services, bodies and citizens and any views of the project promoter on these opinions and opinions.

It will be completed by the Agency before the adoption of the relevant AET.

OPERATIVE PART OF THE JUDGMENT

Type of Decision: AET of a new project or activity.

The following environmental terms and restrictions are approved for the construction and operation of the project: One (1) Wind Power Plant (WPP) with a capacity of 34.5 MW at the "Mavrodasos" site as well as its accompanying works (access roads and 33kV Medium Voltage electrical connection network of WPP), in the Regional Unit of Evros, in the Municipality of Soufli, Municipal Unit Orfeas, Municipal Community of Dereio.

The implementation of the terms hereof is a prerequisite for its construction and operation and is borne by the project operator.

Name of the institution: "Aliki Energy SINGLE MEMBER P.C."

2.4 Geographical location of the project: The WPP and a small part of the interconnection belong administratively to the Region of Eastern Macedonia and Thrace, the Regional Unit of Evros, the Municipality of Soufli, the Municipal Unit Orfeas, the Municipal Community of Dereio. The largest part of the interconnection as well as the substation "PATRIARCHIS" is administratively located in the Municipality of Arrian, in the Regional Unit of Rodopi, in the Regional Unit of Eastern Macedonia and Thrace.

A. DESCRIPTION OF THE PROJECT OR ACTIVITY

"General data – Classification Project operator data: "Aliki Energy SINGLE MEMBER P.C.»

Project size:

Eight (**8**) three-bladed wind turbines (M/F) of the construction company Vestas, indicative type V136-4.5MW, power 4.5MW with power regulation of 4.3125 MW each, total power output 34.5MW.

- The interconnection of WPP with the system will be achieved with an underground line with a total length of 39,304.24 m.
- For the construction and operation of the project, road construction interventions will be carried out with a total length of 4,298.92 m, of which 3,363.61 m concern improvement and 935.31 m concern the opening of new roads.

Project classification:

According to MD YPEN/DIPA/63951/4418/2024 (Government Gazette 3867/B/3-7-2024), WPP falls under Group 10 (Renewable Energy Sources – n/a 1a: Electricity production from onshore wind energy) and is classified in Subcategory A2 ($5 < P \leq 50$ regardless of N and $L < 20$ or $8 < P \leq 50$ and $N = 1$ and $L < 20$ or $5 < P \leq 35$ and within Natura 2000 and $L < 20$ network areas), since its total capacity amounts to 34.5 MW. However, the project falls within a Natura 2000 area, which is a Special Protection Area and has a GR1110010 code named Oreinos Evros and Koilada Filiouri, the maximum classification limit is 35 MW ($5 < P \leq 35$ and within Natura 2000 and $L < 20$ network areas) and therefore the project under consideration remains in Subcategory A2.

Escort Ranking:

- Forest Roads: According to the MD YPEN/DIPA/17185/1069/2022 (Government Gazette 841 B΄/24-02-2022), forest road construction falls under Group 1 (Land and Air Transport Projects) and is classified in category B.
- Underground power transmission line: According to MD YPEN/DIPA/17185/1069/2022 (Government Gazette 841 B΄/24-02-2022), the electricity transmission line is not classified environmentally.

Nuisance category: Medium nuisance (item 303.e of Joint Ministerial Decision oik.3137/191/F.15/2012)

'Brief description of the project'.

The wind power plant will consist of eight (8) wind turbines of type Vestas V136-4,5MW, nominal power 4,5 MW with power regulation of 4,3125 MW each with impeller of three (3) blades, impeller diameter 136 m, with pylon height 105 m, within polygons as depicted in the attached Topographic Diagram accompanying the study: Below is a table of vertex coordinates of the installation polygons, in the EGSA '87 system

α/α	X	Y	Z
Α/Γ1	670335.72	4577290.81	308.60
Α/Γ2	669974.70	4577380.47	300.10
Α/Γ3	669655.49	4577393.11	321.50
Α/Γ4	669294.74	4577403.22	345.70
Α/Γ5	668955.44	4577464.35	362.50
Α/Γ6	668604.93	4577456.65	380.10
Α/Γ7	668135.86	4577447.13	434.00
Α/Γ8	667857.94	4577700.07	449.00
Α/Γ9	668010.17	4576427.40	392.50
Α/Γ10	668323.82	4576528.90	377.70

Coordinates of W/T location

HGRS'87

Α/Γ1	41° 19' 53.9251"	26° 02' 14.2905"
Α/Γ2	41° 19' 57.1051"	26° 01' 58.8592"
Α/Γ3	41° 19' 57.7573"	26° 01' 45.1475"
Α/Γ4	41° 19' 58.3581"	26° 01' 29.6472"
Α/Γ5	41° 20' 00.5957"	26° 01' 15.1198"
Α/Γ6	41° 20' 00.6104"	26° 01' 00.0419"
Α/Γ7	41° 20' 00.6549"	26° 00' 39.8640"
Α/Γ8	41° 20' 09.0609"	26° 00' 28.1665"
Α/Γ9	41° 19' 27.7025"	26° 00' 33.4443"
Α/Γ10	41° 19' 30.7562"	26° 00' 47.0295"

Table 92: Peak coordinates in HGRS '87 view

For the construction and operation of WPP, the necessary accompanying infrastructure projects will be implemented, which include the following*:*

- New opening of a road construction with a total length of 935.31 m for the access of vehicles necessary for the installation and for the internal road construction to the W/T of the project at the location "Mavrodasos".
- Improvement of a total length of 3,363.61 m for access to the project at the "Mavrodasos" site.
- Construction of a medium voltage network of 33KV where through underground cables the transmission of the generated electricity from the wind turbines is achieved through the control house to the existing, substation lifting voltage of 150/33KV. The length of the underground cables amounts to 54,992.11 m for the WPP at the location "Mavrodasos" (Transmission of produced energy to the Electricity Transmission System).

The coordinates of the center of the positions of the aircraft in the EGSA '87 system are given in the table below:

Coordinates of W/T location

HGRS'87

α/α	X	Y	Z
ΑΓ1	671820.70	4576019.89	286.50
ΑΓ2	671481.22	4575994.39	307.65
ΑΓ3	671357.48	4576312.36	298.00
ΑΓ4	672009.41	4576565.25	306.50
ΑΓ5	671723.95	4576826.90	296.50
ΑΓ6	671401.41	4576990.01	269.50
ΑΓ7	671529.45	4577316.91	259.90
ΑΓ8	671846.84	4577149.10	268.80

Table 93: Position coordinates W/T HGRS΄87

- Motorways and the road construction and electrical interconnection works are depicted in the attached topographic diagrams, road construction study, electrical interconnection map.
- A detailed description of the construction and operation of the wind power plant of the subject can be found in the Environmental Impact Study and the topographic diagrams, plans and maps accompanying it. These elements shall form an integral part of this Decision.

B. ESTABLISHED BASIC CHARACTERISTICS OF THE PROJECT AREA & SENSITIVE ELEMENTS OF THE ENVIRONMENT.

- The project of WPP is located within the Wind Priority Area of the Special Framework for Spatial Planning & Sustainable Development for RES (no. 49828/2008 Decision (Government Gazette 2464 / Β΄ / 3-12-2008).
- The location of the project falls within the Natura area "Orinos Evros - Dereios Valley" and most of the interconnection. However, part of the interconnection and the substation "PATRIARCHIS" fall within the Natura area "Filiouri Valley" with code "GR1130011".
- The Regional Framework for Spatial Planning and Sustainable Development of the Region of Eastern Macedonia and Thrace (UNHCR with number YPEN/DHORS/68605/1092 (Government Gazette 248/A.A.P/2018) "Approval of revision of the regional spatial framework of the Region of Central Macedonia and its Environmental approval" applies.

C. EMISSION LIMIT VALUES FOR POLLUTANTS AND MAXIMUM CONCENTRATIONS OF POLLUTANT LOADS IN AIR, WATER, SOIL, NOISE AND VIBRATION LEVELS AND ENVIRONMENTAL QUALITY

C. 1. Gaseous Waste

The limit and guide values for concentrations of pollutants in the atmosphere are set in Joint Ministerial Decision U.S.14122/549/E.103/2011 (Government Gazette 488/Β΄/30-3-2011), in Joint Ministerial Decision 22306/1075/E103/2007 (Government Gazette 920/Β΄/8-6-2007) as in force after the publication of Joint Ministerial Decision U.S.14122/549/E.103/2011. For particulate emissions

(dusts) the emission limits are defined in the Presidential Decree 1180/81 (Government Gazette 293 A΄ / 06-10-81).

C.2. Wastewater

The operation of wind farms does not cause the emission of liquid waste, provided that the relevant legislation on lubricant management is complied with, namely Presidential Decree 82/2004 (Government Gazette 64/A/2-3-2004) in conjunction with Joint Ministerial Decision 13588/725/2006 (Government Gazette 383/B/28-3-2006) and MD 24944/1159/2006 (Government Gazette 791/B/30-6-2006) for issues that may not be covered by the above Presidential Decree. as well as Law 4819/2019.

C.3. Electromagnetic fields

The basic restrictions and reference levels of the Council Recommendation of 12 July 1999 on the limitation of exposure of the public to electromagnetic fields (0Hz – 300GHz), in accordance with the ICNIRP/1998 Guidelines for limiting exposure to time – varying electric magnetic and electromagnetic fields (Health), apply to the electric and magnetic fields and voltage transformers. Physics, April 1998, Vol. 74 No. 4), as amended with regard to the low frequency section (1Hz -100kHz (Health Physics 99(6): 818-836, 2010)) and those mentioned in the Joint Ministerial Decision No. 3060/(FOR)/238/2002 (Government Gazette 512/B΄/25-04-2002) "Measures to protect the public from the operation of low frequency electromagnetic field emission devices" [(Error Correction (Government Gazette 759/B΄/19-06-2002)].

It should be noted that if stricter conditions are established or adopted in each case, they prevail and the project promoter must comply, regardless of the expiry or non-expiry of this decision.

C.4. Specific noise and vibration level limit values in accordance with existing provisions A.

A. Machinery used during construction works and machinery used externally during the operation of the project must be equipped with a CE marking accompanied by a guaranteed sound power level. The limit values for noise emission from the construction site equipment and from the machinery used externally during the operation of the project are set out in decisions JMD 37393/2028/2003 (Government Gazette 1418/B΄/1-10-2003) and JMD 9272/471/2007 (Government Gazette 286/B΄/2-3-2007) B. During the operation of the project, the limit values referred to in Presidential Decree 1180/81 (Government Gazette 293 A΄/81) apply to the noise level.

D. CONDITIONS, MEASURES AND RESTRICTIONS TO BE TAKEN TO MINIMISE AND ADDRESS POTENTIAL ENVIRONMENTAL IMPACTS.

D.1 General arrangements

1. The project promoter, as well as any legally obligated party, shall bear full responsibility for compliance with the environmental conditions, measures and restrictions imposed by this Decision.
2. The project promoter shall be required to designate a person responsible, with appropriate training, to monitor compliance with the environmental conditions, measures and restrictions imposed by this Decision. The details of the person responsible should be communicated to our Service with a solemn declaration of the company.
3. The project promoter shall not be released from compliance with existing environmental legislation, irrespective of the express reference to that effect in the specific environmental conditions imposed by this Decision.

4. The project promoter shall be liable for any possible damage caused to third parties. Also, any kind of modification or intervention in existing infrastructures within the framework of the project, to be implemented in cooperation with the competent bodies, and in such a way as to minimize the impact on their operation. To repair any damage as well as to modify any infrastructure, the developer is obliged to secure the relevant funding.
5. Before the commencement of construction and operation of the activity, the entity must be provided with all the necessary permits and approvals required for the construction and operation of the WPP. Also, for any individual activity or installation necessary for the construction – operation of the WPP, all the permits and approvals required by the applicable legislation must have been granted beforehand.

D.2 Construction Phase

6. Before the commencement of the construction of the project, the competent Archaeological Services should be notified in writing to arrange for the supervision of the works by qualified officials, who will be recruited upon the recommendation of the co-competent Ephorates of Antiquities. In case antiquities are found, work will be suspended, and systematic excavation will follow. The costs of hiring a supervisor and carrying out the costs shall be borne by the project promoter.
7. In case antiquities are found or revealed during the works, the works will be immediately interrupted to carry out excavations. The further progress of the project will depend on the results of the research, following the opinion of the competent bodies of the Ministry of Culture & Sports.
8. The cost of the excavation, including the remuneration of the necessary personnel, which will be recruited at the suggestion of the competent Services, as well as the cost of conservation, study and publication of the findings will be borne by the budget of the project under the provisions of article 37 of Law 3028/2002 (Government Gazette 153/A/28.06.2002) "For the protection of Antiquities and Cultural Heritage in general".
9. The operation of the aircraft will be immediately interrupted if problems occur in the systems and generally in the operation of the Armed Forces.
10. For the areas of the project that fall under the provisions of forest legislation and before the start of the implementation of the project, the provisions of M.D. 15277/2012 (Government Gazette 1077 B΄ / 09-04-2012) as in force from time to time, for the determination of the use consideration. For the determination of the consideration for use, all areas of use of main and accompanying works will be considered. For the issuance of the establishment protocol of the interested company in the area, the provisions of article 4 of M.D. 15277/2012 (Government Gazette 1077/B') must be complied with.
11. For the entire project and during the construction phase, the demarcation of the occupation zones (M/F, road construction, M.V. ditch, etc.) should be made, so that any excavations of foundations and technical works that will be carried out will be limited to what is necessary and unnecessary openings, clearances and deforestations will be avoided. In general, any damage to forest and non-forest vegetation, during the construction of the project, should be limited to the necessary extent and interventions in the landscape to the necessary. The felling or uprooting of forest vegetation and the disposal of its products should be done in accordance with the provisions of forest legislation and the instructions of the competent Forest Service.
12. The alignment of the forest road construction (improvements – openings) will be formed in accordance with the applicable specifications for category C forest roads and the permitted derogations. In any case, the forest road study should be prepared based on the specifications and approved by the competent Forest Service. Similarly, the location of the construction site, the exact

locations of temporary deposit of materials or unsuitable excavation products and the way these areas are configured will be indicated by the competent Forest Service.
13. The asphalt or cement of existing or new roads is not allowed.
14. The construction of the control building should be done with such materials and in such a way that it fits harmoniously into the natural environment of the area.
15. Excavation work during the construction of works shall be carried out in the mildest possible manner and preferably by minimising the use of explosives where necessary.
16. During the earthworks carried out (excavation of squares, excavation of foundations, opening of roads, opening of trenches for laying cables, etc.) excavation materials should be placed next to the trenches and used for their refill. The layer of soil containing the topsoil should be collected and stored separately to be used in environmental restoration work.
17. Take all necessary remedial measures to avoid soil erosion.
18. Avoid serious earthworks during the period of heavy rainfall.
19. During earthworks, it is necessary to reduce dust dispersion by wetting the soil in case of adverse weather conditions.
20. The aggregates required for the construction of the project must be secured either from the excavations that will be carried out in the context of the construction of its various sections, or from existing legally operating quarries.
It is forbidden to create a loan room or extract materials from riverbeds or streams for materials that may be required for the construction of the project.
21. Trucks transporting materials must be fitted with a special cover, in accordance with the existing provisions.
22. The temporary deposit of any materials related to the construction of the project should take place exclusively within its occupation zone. It is forbidden, even temporarily, to deposit materials in places that affect the surface area
water flow, covered by forest vegetation or in protected areas outside the two polygons of the project.
23. The excavation material products from the construction of the project that cannot be used for its needs (surplus excavation products) to be managed in accordance with the provisions of J.M.D. 36259/1757/E103/2010 (Government Gazette 1312/B΄/24-8-2010) "Measures, terms and program for the alternative management of waste from excavation, construction and demolition" or as defined in art. 30 of Law 4819/2021.
24. The pollution of surface water, groundwater and soil by oils or fuels of any kind shall be prohibited. The developer is obliged to dispose of adsorbents (sand, wood chips, geotextiles, etc.) in the construction site to deal with any leakage of oil or fuel into the ground, and to use them immediately to deal with leaks. Materials should be checked regularly, so that if for any reason they have absorbed increased moisture levels and their effectiveness decreases, they are replaced immediately.
25. Any waste generated during the construction of the project to be collected and managed in accordance with the applicable provisions and terms hereof referred to in the relevant section hereof entitled "Waste management".
26. During the construction and operation of the project, road transport between residential areas should not be obstructed. Also, the regular passage of trucks and other vehicles used in the construction of the project through settlements within quiet hours should be avoided.
27. Take all appropriate practical measures to reduce pollution (dust, noise, waste) during the construction phase. For site staff to install chemical toilets for service during the construction phase.
28. It is forbidden to wash any kind of equipment on site, including construction vehicles.

29. The discharge of residues of concrete mixers must be carried out at the site of the ready-mixed concrete supply site, which must have appropriate treatment of liquid waste.
It is forbidden to evacuate residues of concrete mixers outside the project site.
30. It is prohibited to remain on site and use machinery without the EEC type-approval certificate relating to noise in accordance with paragraph C.4 hereof.
31. During the construction and operation of the project, all fire protection measures must be taken in case of fire and the minimization of the risk of its transmission to adjacent areas. The way of organizing fire protection should be checked and approved by the competent Fire Service, if required, before the start of works.
32. To take all necessary measures to protect those passing through the project area from risks that may be created by works carried out in its context or operation, such as: installation of warning signs and generally taking measures to block public access to parts of the project of increased risk.
33. After the completion of the construction of the WPP and the accompanying works, all kinds of construction sites will be removed. The space will be configured and restored to its original state.
34. In intervention areas, including the slopes of roads opened, plant technical restoration shall be carried out in accordance with an approved special phytotechnical study. The plant species to be used must be indigenous and not alien to the natural plant society of the area. Planting works should begin immediately in each section of the project where earthworks have been completed and the final surfaces have been formed and should be proportional to the characteristics of the intervention area of the project.
Maintain significant areas with low height vegetation cover within the installation polygons. Earthworks should be followed by anti-erosion works that will prevent the loss of valuable soil and the creation of grooved erosion even before sufficient vegetation grows. All plantings should be done while ensuring irrigation for fast growth and maintenance of vegetation. The care of the plants should continue for at least two (2) years from their planting under the responsibility of the developer.
35. Grazing should be prohibited at the sites of the restoration works, at least for two (2) years, for their protection.
36. For works, activities and installations that will arise during the subsequent technical design, such as construction sites, etc. for which a general impact assessment has been carried out and conditions and restrictions are laid down in this Decision, may be submitted and approved in accordance with the procedure laid down in Art. 6 of Law 4014/201, as in force.

D.3 Operation Phase

Saving natural resources and energy
37. Use electronic and electrical equipment with low energy consumption (e.g. lamps). Also, according to the manufacturer's instructions, preventive checks and maintenance works of all mechanical equipment of the Wind Power Plant (WPP) should be carried out at regular intervals.

Management of waste and urban wastewater from personnel
38. The uncontrolled disposal of liquid and solid waste into the environment is prohibited.
Personnel wastewater should be collected in an underground septic-absorbent tank system.
39. The management of non-hazardous solid waste should be carried out in accordance with the provisions of Law 4685/2020 (Government Gazette 92 A΄/2020) as in force, and under the responsibility of the operator. Municipal solid waste, litter and other non-recoverable waste that does

not belong to the list of hazardous waste must be collected in waste bins and collected by the garbage trucks of the cleaning service of the relevant municipality, or by a collection contractor who has a relevant solid waste management license.

40. The management of waste falling under the provisions of Law 4819/2021 on an integrated framework for waste management, to be carried out in accordance with the provisions of this law and the regulatory acts issued under its authorization and in accordance with the requirements and specifications of the respective alternative management systems approved by the Ministry of Environment and Energy.

Especially:

- The packaging of various materials used during the operation of the project should be collected and stored in a way that avoids their dispersion in the environment and then delivered to licensed companies for recovery, through approved alternative management systems in accordance with Law 4819/2021 (Government Gazette 129 A').
- Waste lubricating oils resulting (from equipment maintenance works) must be managed in accordance with the provisions of Presidential Decree 82/04 (Government Gazette 64/A/2-03-04). Temporarily stored in special watertight containers, which should be stored in a special sealed and covered area, not exposed to adverse weather conditions (rain, snow, etc.), which should be ventilated, checked and kept clean from any leaks. This waste should be delivered to special companies that are contracted with an alternative management system and have a relevant management license. Upon delivery, a completed identification form for waste lubricating oils must be submitted, copies of which should be kept for at least three (3) years. Keep a record book of quantity, quality, origin, disposal, delivery dates, etc. used lubricating oils.
- The collection of electrical and electronic equipment to be withdrawn, used batteries and accumulators and used vehicle tires should be carried out through approved alternative management systems, in accordance with the applicable provisions (Presidential Decree 116/04 (Government Gazette 81/A/05-03-2004) as amended and in force, M.D. 23615/651/E.103/2014 (Government Gazette 1184/B/9-5- 2014), as amended by M.D. YPEN/DNEP/36928/2227/2018, (Government Gazette 5459/B/6.12.2018) and Y.A. YPEN/ΔΔΑ/81490/1650/2021 (Government Gazette 4382/B' 22.9.2021) as well as Joint Ministerial Decision 41624/2057/E103/10 (Government Gazette 1625/B/11-10-2010) as amended by M.D. 39200/2015, (Government Gazette 2057/B/18.9.2015) and M.D.D./81492/1651/2021 (Government Gazette 4382/B' 22.9.2021). Keep the relevant disposal documents.

41. The treatment and disposal of hazardous waste shall be prohibited. All hazardous and potentially hazardous waste (e.g. waste lubricating oils, residues of adsorbents, etc.), to be managed in accordance with the provisions of Joint Ministerial Decision 13588/725/2006 and Joint Ministerial Decision 62952/5384/2016 (Government Gazette 4326/B/30-12- 2016), as in force from time to time. Store temporarily in closed containers with special marking, in a properly designed area, protected from weather conditions, with an impermeable floor.

42. For the delivery of waste to third parties, the relevant documents must be available to monitor the further management of waste outside the facility. In the case of hazardous waste, the "Identification Form for the collection and transport of hazardous waste" must be duly completed in accordance with the provisions of Joint Ministerial Decision 24944/1159/06.

43. Keep the records and registers of article 62 of Law 4819/2021 (Government Gazette 129/A/2021) as in force and keep them for as long as provided. Waste generation data should be registered in the electronic system of article 53 of Law 4819/2021 as in force.
44. The incineration of solid waste both outdoors and in a covered area is prohibited according to JMD 11535/93 (Government Gazette 328 B΄/93), as well as the burning of used oils (MD 189533/2011, (2654 B΄ / 09-11-2011).

Limitation of emissions to the atmosphere, vibration, noise and EMF radiation
45. The limit values for pollutant emissions and maximum concentrations of pollutant loads in the atmosphere, noise and vibration levels shall be as set out in paragraphs C.1 and C.4 hereof.
46. For the limitation of electromagnetic radiation, the provisions of paragraph C.3 hereof apply.
47. During the operation of the project, periodic inspections of noise levels from the operation of the R/W should be carried out to ensure that noise levels in neighboring settlements and residences do not exceed the permissible limits (≤45dB).
48. The measured noise level at the boundaries of the installation fields must not exceed the permissible noise limits, as defined in Presidential Decree 1180/1981 (<65dBA). To this end, all appropriate sound insulation measures must be taken
building installations housing electromechanical equipment, while outdoor electromechanical installations must be of appropriate noise emission specifications and, if possible, placed on an anti-vibration base.
49. Installations of stationary refrigeration/air conditioning equipment containing controlled substances with a refrigerant load exceeding three kilograms are inspected in accordance with Joint Ministerial Decision 37411/1829/E103/2007 (Government Gazette 1827/B΄/2007).
50. Adequate lightning protection must be provided.

Reduction of the impact on the natural environment, as well as on the fauna and flora of the area
51. The night lighting of the project, in addition to the signage of the R/F, i.e. the control house, etc., should be minimized and limited to what is strictly necessary for the safety of the facilities and for the identification of risks to the safety of the public, to limit the impact on the fauna and avifauna of the area. Also use lighting that does not attract insects so as not to attract bats.
52. The restriction of unwanted vegetation and weeds should be done exclusively by mechanical means and/or approved biological preparations. The use of chemical herbicides is prohibited.
53. Periods of downtime (e.g. for maintenance) should be minimised to reduce the risk of their use by birds as roosting or nesting sites.
54. Carry out regular inspections at the site of the wind farm (at least weekly) and remove any dead animals, the presence of which could attract birds of prey.

Terms for other matters related to the operational phase
55. Access roads to serve the project shall be maintained in common use and maintained in good condition.
56. To carry out preventive maintenance of the A/W and maintenance works of all the mechanical equipment of the WPP by a team of trained technicians and assistants. In case parts of the aircraft are destroyed, they should be replaced as soon as possible.
57. Access by non-project parties to potentially risky areas (transformers, medium and low voltage pipelines, etc.) will be prevented by appropriate means (fences, warning signs).

In general, provision should be made for all necessary measures to protect employees or visitors. In this regard, it is necessary to place elegant signs warning of possible dangers run by the above, in appropriate positions.
58. The day and night photo-marking of the aircraft should be carried out in accordance with the instructions of the HCAA and the HNDGS and considering at the same time the following restrictions: "The lights should have the lowest possible number of flashes per minute and the shortest duration of flash". "Under no circumstances will incandescent lamps and fixed-beam lights be used both in the S/W and in the other infrastructure of the WPP."
59. Transformers of all types, if dry transformers are not used, as well as any containers for the storage of used or new lubricating oils, must be placed in watertight safety olive oil tanks of an effective volume in relation to the volume of oil content.
60. At the substations of the WPP installation, the equipment (transformers, capacitors, etc.) must meet the specifications of the current legislation and especially about the use of substances subject to special regulations, such as PCBs, PCTs.
61. To deal with possible accidents resulting in the leakage of non-biodegradable substances and soil and water pollution, the necessary measures should be in place to reduce liquid pollutants such as sawdust, oil binders, various specific biodegradables, etc. Materials should be checked regularly, so that if for any reason they have absorbed increased moisture levels and their effectiveness decreases, they are replaced immediately.
62. To take all necessary measures for the fire protection of the facilities and to have a fire extinguishing network installed, according to a special study, duly approved (if such approval is provided for by the current legislation).
63. Appropriate lightning protection must be always installed throughout the project.
64. Take care of the proper management of rainwater and its proper drainage so as not to create problems in the surrounding area.
65. During winter, during periods of very low temperatures and after snowfall, monitor the S/W for ice accumulation that can cause accidents. To place signs informing and prohibiting the public from approaching during the winter season.
66. The terms of this Decision shall apply to the construction and operation of the project, irrespective of the owner or its constructor or operator. In case of change of owner or entity or addition of a new owner or operator of the project, the provisions of this decision apply to the new owner or entity (par. 8, article 1 of Law 4014/2011).
67. To implement (by a specialized scientist appointed by the company) an integrated environmental monitoring program during the operation phase of the wind farm, which includes a monitoring plan for the populations and distribution of bird species found in the project area. In addition, in cases where during the environmental monitoring program injured bird individuals are identified (due to collision with the S/F, G/M, etc.), which are unable to fly, then these birds should be collected and referred for examination and rehabilitation – care to appropriate organizations. This program will be defined in cooperation with the Environmental Planning Department of the Ministry of Environment for continuous monitoring.
68. It is proposed to install an automatic system of high-definition cameras for interception and collision prevention in the aircraft with the most crossings

D.4 Rehabilitation, partial, gradual or permanent closure

69. After the definitive closure of all or part of the project, restore the installation site and return it to original use. The space will be configured and restored to its previous condition, where possible, with plantings.
70. The issues related to the works during the closure will be specified in the Technical Environmental Study (TEPEM) which the developer must prepare and submit for approval, no later than six months before the closure of all or part of the project, to the competent Environmental Licensing Authority.
71. The cost of uninstalling and removing the equipment as well as the rehabilitation of the site will be the main responsibility of the project beneficiary, who will be borne exclusively.
72. The conditions set out in this Decision shall apply as regards the operation of a construction site, earthworks, etc. mentioned in the section entitled "Construction Phase" hereof.
73. The conditions set out in this Decision shall apply to waste management issues referred to in the section entitled 'Waste Management' herein.

D.5 Emergencies of pollution or degradation of the environment

74. In the event of an emergency incident causing any pollution or other degradation of the environment, those responsible are obliged to take the necessary measures for the restoration and/or prevention in accordance with the provisions of Presidential Decree 148/2009.
75. The promoter of the project must inform the competent authority for issuing the decision approving environmental conditions, the Department of Environment &
Hydroeconomy of the competent O.E. and, where appropriate, other competent Service in any case of failure and pollution not provided for herein.

D.6 Environmental Management - Monitoring programme and reports

76. Implement a permanent environmental management plan - monitoring program (see M.D. 170225/2014 Annex 2, Paragraph 11.2 and Annex 3.2.1 Paragraph 5), in which all procedures / obligations arising from this Agreement will be incorporated. Where the project has an approved environmental management system (EMAS or ISO 14001), the procedures of the environmental management and monitoring plan may be integrated into it.
77. To keep diaries – registers and document records, in the context of monitoring the effective protection of the environment and the implementation of the imposed measures and terms: i. Maintenance calendar of electro-mechanical equipment WPP ii. Diary for checking / searching for dead animals iii. Archive of documents for the disposal of liquid and solid hazardous and non-hazardous waste iv. Register of article 62 of Law 4819/2021 (Government Gazette 129/A/2021) – Register of hazardous waste (paragraph 4.a. of article 11 of JMD 13588/725) as in force, and registration of the project operator in the Electronic Waste Registry (EHR).
v. Archive of urban wastewater disposal documents
78. The annual monitoring reports of the monitoring programme for avifauna should be submitted to the competent services of the Region of Eastern Macedonia and Thrace and the Ministry of Environment and Energy.
79. The company must comply with all the above as well as any other appropriate information, based on which its compliance with the terms hereof will be demonstrated. These details should be located at the project site and at the company's headquarters.

D.7 Other conditions, measures and restrictions

80. The cost of all projects, actions and interventions resulting from environmental conditions, restrictions and regulations shall be borne by the project promoter.
81. The activity in question may be established or continue to operate, if it adapts to the requirements and complies with any prohibitions or other commitments arising from the revision of the existing legislative framework concerning the activity or its area of establishment.
82.Before the commencement of construction works, the project manager must inform the competent environmental inspection authorities (article 20 of Law 4014/2011) of the date of commencement of works, in accordance with the document number RIS / GRSEE / 31009 / 685 / 23-5-2018 of the Special Secretary of the Body of Inspectors and Auditors RIS.

E. PERIOD OF VALIDITY – CONDITIONS FOR GRANTING APPROVAL OF ENVIRONMENTAL CONDITIONS

83. The validity of this Agreement is fifteen (15) years from the date of its issuance in accordance with the provisions of para. 8a of no. 2 of Law 4014/2011 as replaced by para. 1 of article 1 of Law 4685/2020 and if there is no change in the data based on which it was issued.
84. The project promoter must submit within the deadline (at least two months before the expiry of the above date, in accordance with paragraph 4 of article 5 of Law 4014/2011) a request accompanied by an AET renewal file to the relevant Environmental Licensing Authority, to comply with the provisions of article 5 of Law 4014/2011.
85. This Agreement shall remain provisionally valid after its expiry, until a new renewed or amended decision is issued, provided that the obligated party has requested its renewal in time. If the renewal of this Agreement is not done on time, as specified above and its validity period expires, then the project operator is obliged to re-submit an M.P.E. to the competent Authority, to be environmentally licensed.
86. For the modernization, improvement, expansion or modification of the project, as described in the M.P.E. and implemented under the terms and restrictions of this AET decision, compliance with article 6 of Law 4014/2011, as in force, is required.
87. If during the inspections referred to in article 20 of Law 4014/2011 it is found that serious environmental degradation problems are caused or effects on the environment are observed that have not been foreseen by this decision and the study accompanying it, additional environmental conditions may be imposed or this may be amended, as provided for in par. 9 of article 2 in conjunction with article 6 of Law 4014/2011, not excluding any compensatory measures or fees within the meaning of paragraph 1 of article 17 of Law 4014/2011. Also, the project promoter is obliged to take the necessary measures for the restoration and / or prevention in accordance with the provisions of Presidential Decree 148/2009.

F. OTHER PROVISIONS

88. This Decision does not cover safety aspects of major accidents or the safety and health of workers, nor does it exempt the
obligated entity from the obligation to obtain other permits or approvals provided for by the applicable legislation. This document is issued without examining the title deeds of the project or activity area as well as the terms and restrictions of the construction of the land and does not imply legalization or settlement of any arbitrary existing constructions for which the provisions of the current legislation on arbitrary ones apply. The above data have been examined and are listed in its EIS. under the responsibility of the project promoter.
89. This applies subject to the fact that it does not conflict with any town planning and other special provisions that may prevail over it.

90. This decision is granted based on the data presented in the study and the plans accompanying it, which form an integral part thereof, without carrying out the preventive checks referred to in Article 20 of Law 4014/2011. If it is found that this information is untrue, the validity of this Agreement is automatically revoked.

G. MONITORING COMPLIANCE WITH ENVIRONMENTAL CONDITIONS

91. This AET decision, the relevant validated accompanying studies as well as the file and the data accompanying them (monitoring programme data, files, documents, etc.), must be available at the project site and presented to any competent control body, in accordance with the applicable legislation.
92. The project promoter is obliged to: Keep records (invoices, contracts, various supporting documents, data logs, etc.) based on which compliance with the conditions set out in this Decision will be demonstrated. These elements should be located on site. Allow entry to any competent control body. Provide all required data and information. To facilitate the audit and comply with the recommendations – suggestions of the competent control bodies in compliance with the provisions of the applicable environmental legislation.
93. Any issues that arise during the implementation of the AET decision and are not covered by its terms, are resolved based on the applicable legislation (national and EU) and, where this is not possible, based on the relevant validated EIA, the modification studies and the file accompanying it.
94. In case of any pollution or other degradation of the environment or violation of the terms hereof, the penalties provided for by the provisions of articles 28, 29 and 30 of Law 1650/86 as amended by Laws 3010/2002, 4014/2011, 4042/2012 and 4409/2016 shall apply and in addition those responsible are obliged to take the necessary measures for the restoration and / or prevention in accordance with the provisions of Presidential Decree 148/2009.

H. PUBLICATION OF THE RESULTS OF THE CONSULTATION AND OF THE AET

I. The results of the consultation, the opinions – opinions of services, bodies and citizens, in the context of the implementation of the Joint Ministerial Decision No. 167563/EYPE/2013 in conjunction with the Joint Ministerial Decision No. 1649/45/2014, were incorporated into the environmental terms approved by this decision.
II. The publication of this Decision approving environmental terms required by law is carried out by posting it on the special website, at www.AET.ypeka.gr internet address (in accordance with article 19a of Law 4014/2011, as well as in the joint ministerial decision 21398/2012).

I. APPEAL AGAINST THE AET

A special administrative appeal may be filed against this Agreement by anyone who has a legitimate interest only for reasons of legality, in accordance with the applicable legislation [article 25 of Law 2690/1999 (Government Gazette 45 / A) in conjunction with article 1 par. 2 of Law 2503/97 (Government Gazette 107 A) and article 8 of Law 3200/1955 (Government Gazette 97 A'), within (30) thirty days from the date of posting of the decision on the internet.

CHAPTER 13 - PHOTOGRAPHIC DOCUMENTATION

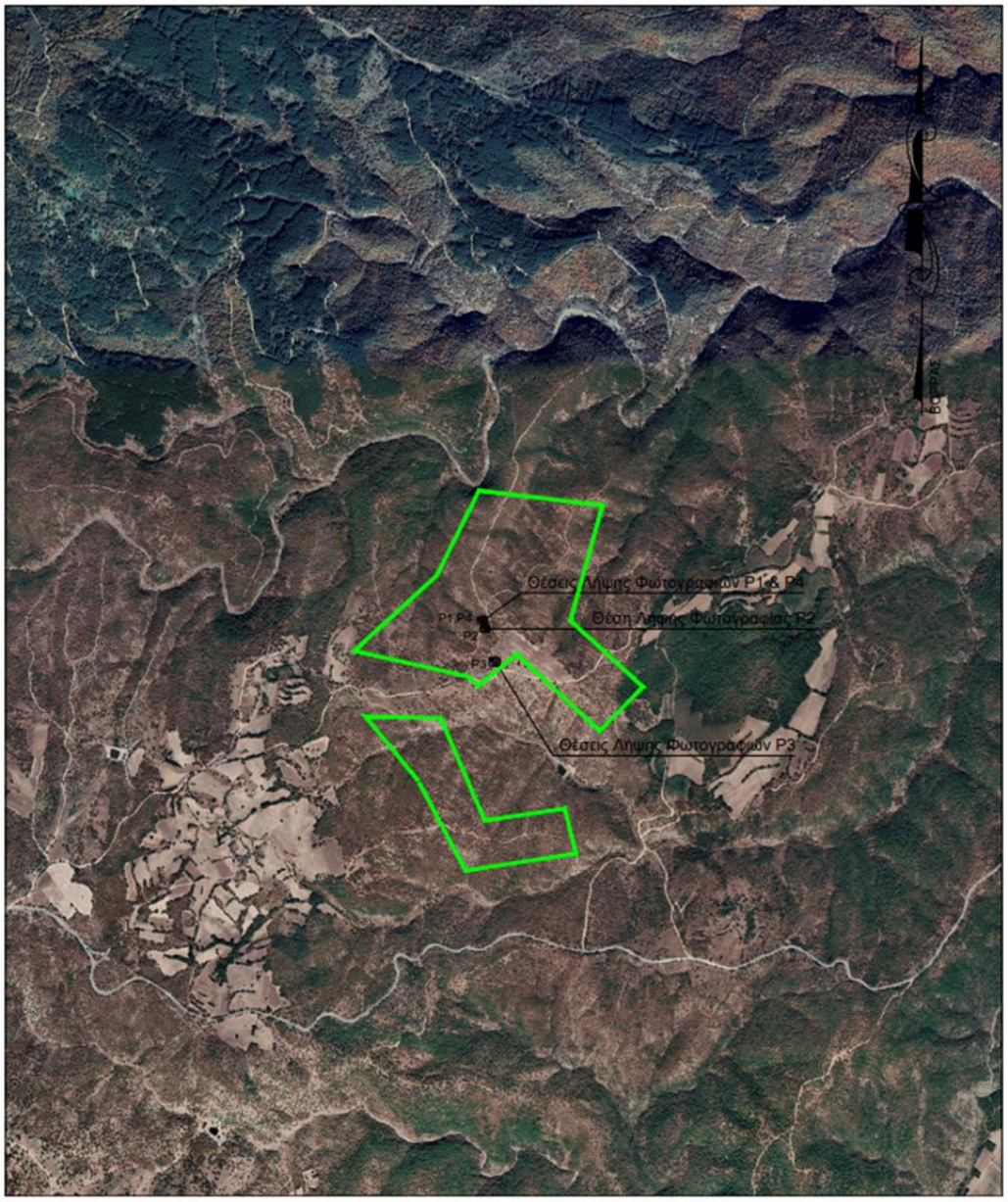


Image 81:Photo location map

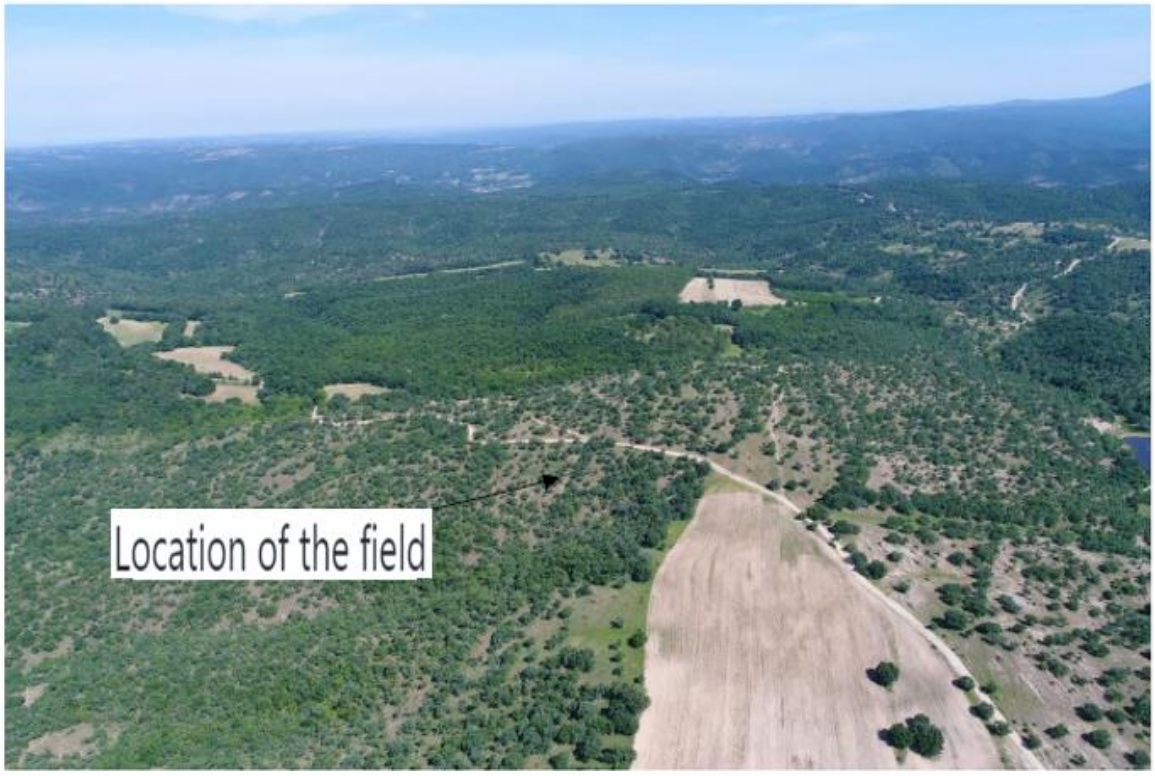


Image 82: Photo Shooting Location 1 (Shooting to B/W 4-5)

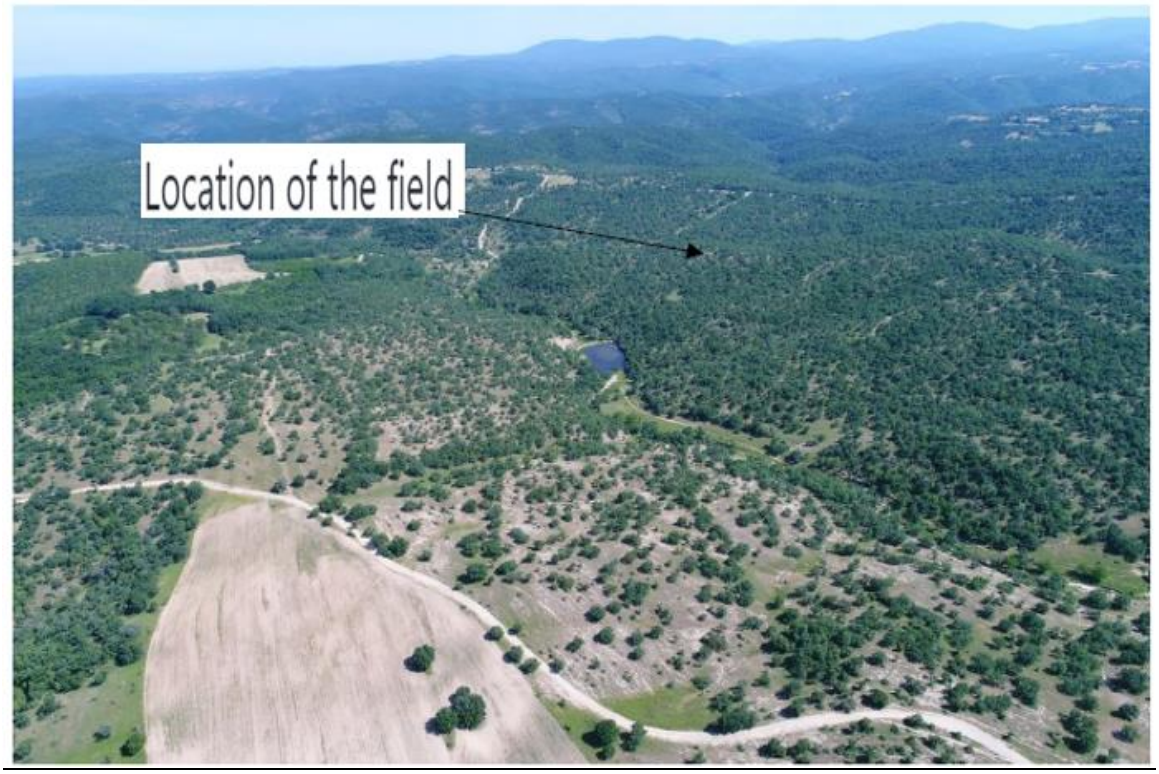


Image 83: Photo Location 2 (Shooting to M/W 1)

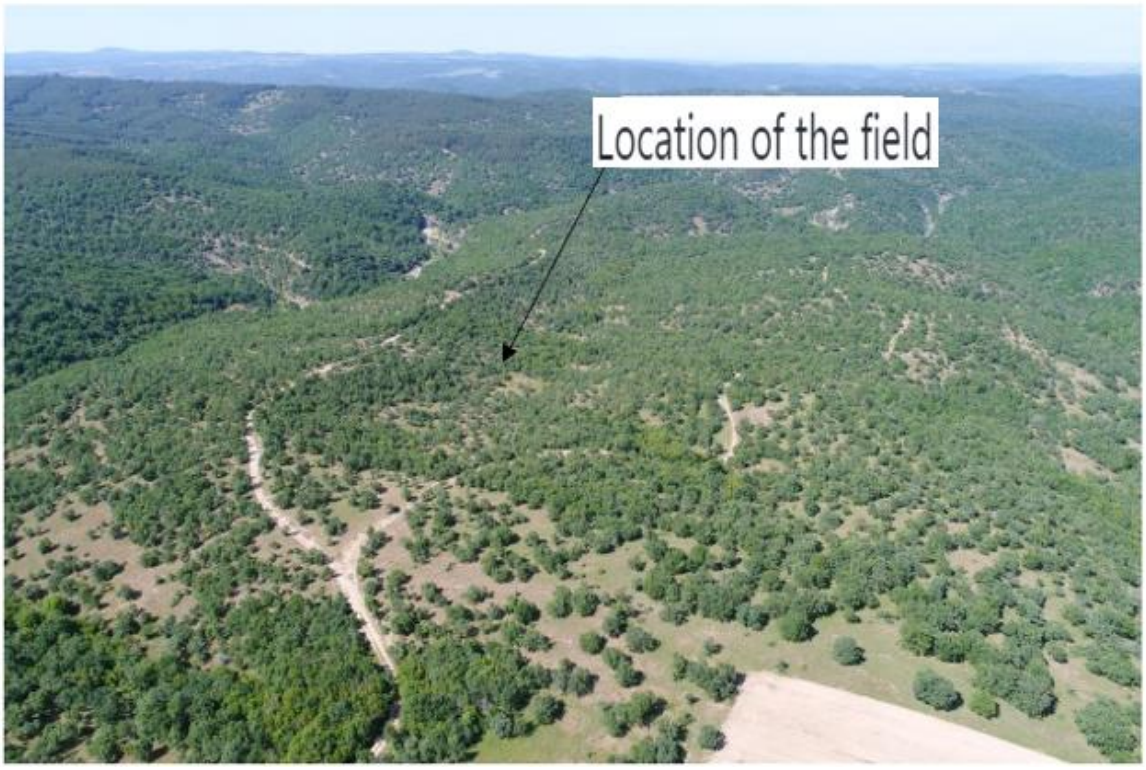


Image 84: Photo Location 3 (Shooting to W/T 1 6-8)

Image 85: Photo Capture Location 4 (Shooting to W/T 1-3)

CHAPTER 14 - ADDITIONAL DATA

14.1 Specialized studies

A noise study has been carried out to analyze the noise levels to be produced by the installation of the studied WPP

14.2 Elaboration problems and ways solved

During the preparation of the study, no substantial difficulties or problems arose.

CHAPTER 15 - MAPS

1. COMMON TOPOGRAPHIC
2. ORIENTATION MAP
3. OCCUPATION ZONES
4. MAP OF THE WIDER PROJECT AREA
5. INTERFACE MAP
6. MAP OF ALTERNATIVE LOCATIONS
7. HABITAT MAP
8. LAND USE MAP
9. PHOTO LOCATION MAP
10. ROAD CROSS-SECTIONS
11. SQUARE SECTIONS
12. ROAD LENGTHS
13. SQUARE LENGTHS

14. ISONOISE CURVE DISPLAY SCHEME

CHAPTER 16 - ANNEX

ANNEX I: TECHNICAL DESCRIPTION OF ACCOMPANYING WORKS AND FOREST ROADS
ANNEX II: COMPATIBILITY DOCUMENT
ANNEX III: NOISE STUDY
ANNEX IV: PHOTOREALISTIC DEPICTION
ANNEX V: DESIGN DEGREES

CHAPTER 17 - BIBLIOGRAPHY - SOURCES

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