SVILOCELL EAD
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5250 Svishtov, West Industrial Zone, tel. +359 631 41141, fax: +359 631 41141, e-mail: svilocell@svilosa.bg, web site: www.svilosa.bg

MONITORING REPORT
for the period January 1st – October 31st 2012

rev. 3

PROJECT: Investment program for energy efficiency in Pulp Mill Svilocell EAD, Svishtov, Bulgaria

Project proponent: Svilocell EAD, Svishtov, Bulgaria
Verification period: January 1st, 2012 – October 31st, 2012
Emission reductions: 173 709 t CO_2
Type of verification: Third periodic verification under JI Track 1

Prepared by: Mrs Diana Ganeva

Project Manager: Mr Dimitar Dimitrov

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1. General information

The energy efficiency investment program in Svilocell EAD was approved by the Republic of Bulgaria as Joint Implementation project in accordance to art. 6 of Kyoto Protocol. The Project design documentation was validated by TÜV Industrie Servise GmbH, TÜV SÜD Group, and a validation report No 763 718, rev.01 dated May 3rd, 2006 was issued. On November 1st, 2006 the Ministry of Environment and Waters of Bulgaria issued a Letter of Approval.

In July 2006 Svilocell EAD and European Bank for Reconstruction and Development (EBRD) concluded an Emission Reductions Purchase Agreement (ERPA) on the accounts of the Netherlands.

In August 2010 the PDD rev. 2 dated March 2006 was published on UNFCCC web site and the project was registered as JI project under Track 1 with ITL BG1000177.

The JI crediting period included the period January 1st 2008 – December 31st 2012. The project also covers non JI crediting period starting on January 1st, 2007 until December 31st, 2007. The expected emission reductions by the project are 767 983 t CO_2.

The project consists of the following energy efficiency measures:

1. SVP-01 "Replacement of cyclone evaporator with a new super concentrator for Soda Recovery Boiler (SRB)";
2. SVP-02 "Replacement of barometric condensers with plate heat exchangers in evaporating systems for black liquor";
3. SVP-03 "Installation of frequency control drives on electric motors";
4. SVP-04 "Installation of a back pressure steam turbine";
5. SVP-05 "Installation of a blow down heat recovery system";
6. SVP-06 "Shift of production from pulp blocks to pulp sheets".

Emission reductions are result of:

- More efficient usage of steam and electricity;
- Steam and electricity generation.

The main factors influencing the emission reductions generation are as follows:

- Increasing the DS content in the liquor up to 70% prior feeding in the recovery boiler for firing (SVP-01);
- Improvement of the burning process and boiler efficiency (SVP-01);
- Decreasing the need for usage of additional energy for evaporation of the water in the liquor(SVP-01);
- Usage of the heat from the steam condensation for heating of the water for production needs (SVP-02);
- Achievement of accurate modulation of flow based on the process demand; Variable speed drives efficiency decreases the electricity consumption in the production (SVP-03);
- Introduction into operation of back pressure steam turbine and utilization of the waste heat for generation of electricity (SVP-04);
- The warm condensate from the boiler blow down is fed for heating of the water for production demands (SVP-05);

- Elimination of diesel fuel usage (SVP-06).

In 2011 the initial and first periodic verification was conducted under JI Track 1 (in conjunction with a verification of year 2007 as Pre-JI Project. The first on-site audit was performed on June 7th - 8th 2011, and the post audit was performed on July 7th – 8th, 2011. The final verification report No. 600500586 was issued on September 30th, 2011. It sets the emission reductions generated within the JI period January 1st, 2008 – December 31st, 2010, and the non JI crediting period January 1st, 2007 – December 31st, 2007. The total amount of the verified emission reductions is 308 922 t CO_2, of which 6 004 AAUs generated in 2007 and 302 918 t CO_2 ERUs for the period 2008 – 2010. Compared to the values stated in the PDD for the period 2008 – 2010 ERUs generated within this period are 27% lower.

The second periodic verification was conducted in March 2012 on the basis of the data reported in the Monitoring Report for the period January 1st, 2011 – December 31st, 2011. The total amount of verified emission reductions for 2011 is 195,438 t CO_2. In comparison to the values stated in the PDD (134,267 t CO_2) the emission reductions are 45% higher. The final verification report No. 600500587 was issued on July 4th, 2012.

All sub-projects of the energy efficiency program as described in the PDD were introduced into operation and generate emission reductions. In 2007 only SVP-06 was introduced into operation, in 2008 were started SVP-01, SVP-02 and SVP-03, in 2010 – SVP-05, and finally in 2011 was introduced into operation SVP-04.

Within the monitoring period January 1st – October 31st, 2012 were produced 77 265 t pulp. Compared to the relevant period of 2011 pulp production is approximately 25% less. The emission reductions generated within the monitoring period amount to 173 709 t CO_2. In comparison with the relevant period stated in the PDD, emission reductions are approximately 44,8% higher. However, compared to the relevant period of 2011, emission reductions are 11% lower.

2. Monitoring reports history

During the preparation of the initial and first verification for the period 2007 – 2010, carried out in June-July 2011 several versions of the Monitoring report were prepared. The final one – Annual Monitoring Report 2007 – 2010 rev. 4 dated September 20th, 2011 was the base for issuance of Verification report No. 600500586 dated September 30th, 2011.

During the preparation of the second verification for 2011, carried out in March 2012 two versions of the Monitoring report were prepared. Monitoring Report 2011 rev. 1 dated June 14th, 2012 was the base for issuance of Verification report No. 600500587 dated July 4th, 2012.

For the third periodic verification the following Monitoring reports were prepared:

- Monitoring Report for the period January 1st – September 30th, 2012 rev. 0 dated November 2nd, 2012
- Monitoring Report for the period January 1st – October 31st, 2012 rev. 1 dated November 12th, 2012

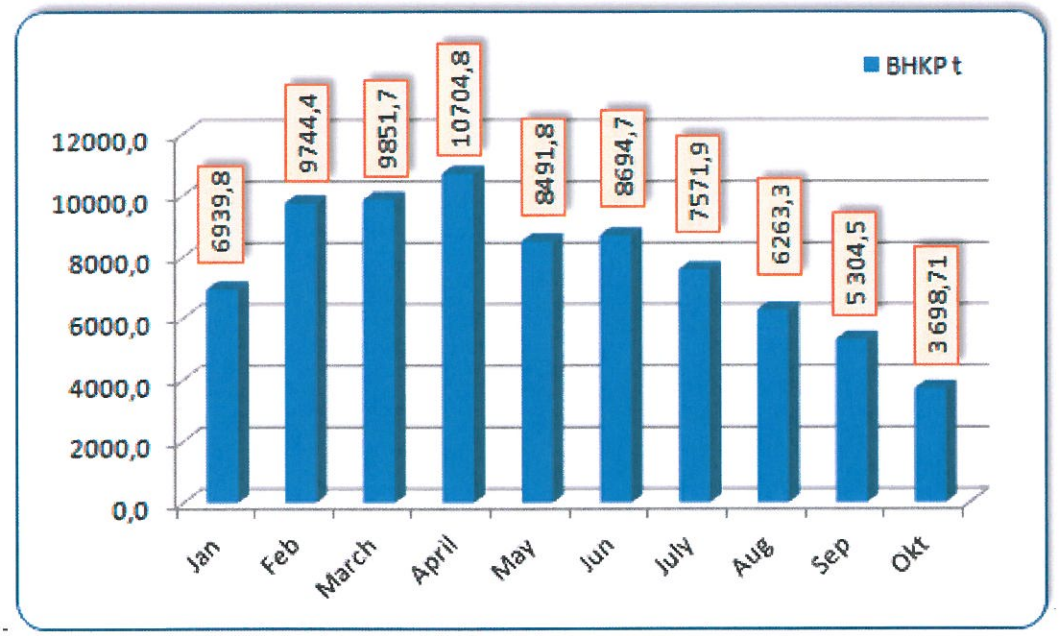
- Monitoring Report for the period January 1st – October 31st, 2012 rev. 2 dated December 5th, 2012

3. Production overview

Below there is a short explanation concerning the operation of the mill within the monitoring period of 2012.

Once the annual overhaul in the end of 2011 – beginning of 2012 was completed, Svilocell EAD restarted its production on January 7th, 2012. In the Graph 1 below the data for the pulp produced within the period January 1st – October 31st, 2012 is presented.

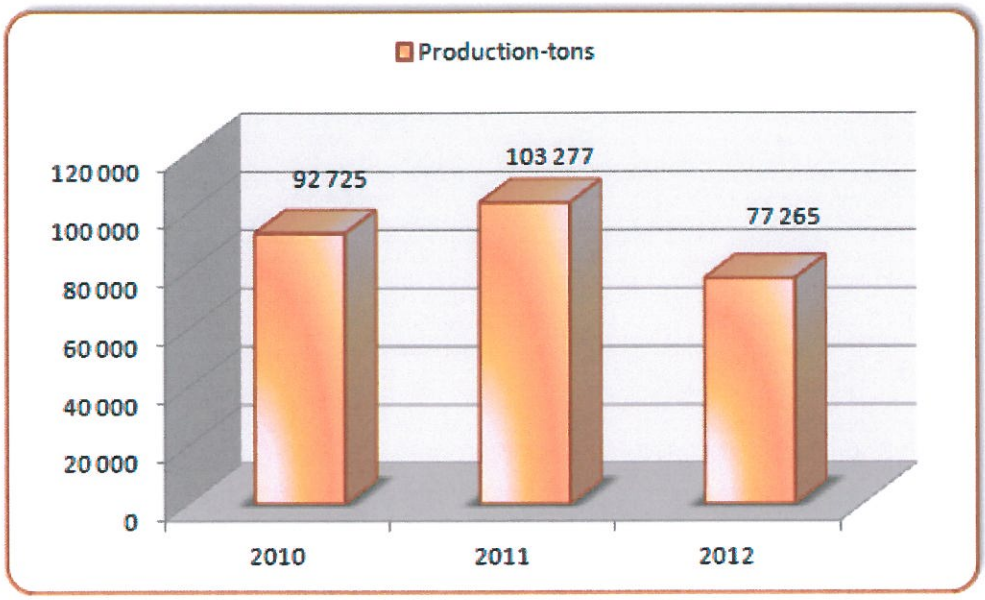
Graph 1. Pulp production during the monitoring period of January 1st – October 31st, 2012.



Within the period January – April 2012 the mill has stable operation and increased gradually the production volumes. The pick of production was in April 2012 when 10 705 t of pulp were produced.

Since May 2012 up to the present moment in the wood logging sector and on the wood market as a whole, serious disturbances have occurred. They are result of the omissions in the newly adopted Forest Law and the Regulation for the law application. The situation was deteriorated additionally by the export of wood to Greece and Turkey, as well as due to the supplying of Bulgarian population with the firewood for the winter period. This led to the lack of wood on the market as a whole. As a result the company decreased its production. In comparison to the period January – October 2011 the pulp production was approximately 25 000 t less.

Graph 2. Comparison of pulp production during the period January – October of 2010-2012



4. Maintenance stops, breakdowns and other production interruptions

The production stops during the nine months of 2012 are described in the Table 1 below:

Table 1

Date	Downtime type	Downtime (h)	Department	Reasons for the problem
January 10th, 2012	Emergency	26:30 hours	SRB (SVP 01, 02, 05)	Welding leakage
January 15th, 2012	Emergency	2 hours	Fibre line (SVP 03)	Damaged bearing
January 16h, 2012	Emergency	28 hours	SRB (SVP 01, 02, 05)	Welding leakage
January 19th, 2012	Emergency	0:40 hours	Fibre line (SVP 03)	Damaged inverter
January 21st, 2012	Emergency	4:15 hours	Caustization and lime regeneration	Process
January 23rd, 2012	Emergency	3 hours	SRB (SVP 01, 02, 05)	Damaged inverter
February 10th, 2012	Planned	23:30 hours	Whole mill	

February 12th, 2012	Emergency	2 hours	SRB (SVP 01, 02, 05)	Damaged inverter
March 1st, 2012	Emergency	4:30 hours	DDP department (SVP 06)	Damaged hydraulic pump
March 11th, 2012	Planned	43 hours	Whole mill	
March 18th, 2012	Emergency	10 hours	Fibre line (SVP 03)	Broken wire
April 10th, 2012	Planned	22:20 hours	Whole mill	
May 1st, 2012	Emergency	1:50 hours	DDP department (SVP 06)	Damaged gauge
May 4th, 2012	Planned	25 hours	Whole mill	
May 5th, 2012	Emergency	7 hours	SRB (SVP 01, 02, 05)	Damaged safety valve
June 11th, 2012	Planned	20:30 hours	Whole mill	
August 24th, 2012	Emergency	18 hours	Fibre line (SVP 03)	Broken shaft
September 11th, 2012	Planned	44:20 hours	Whole mill	
September 12th, 2012	Emergency	5 hours	Biomass boiler	Damaged driving chain
September 16th, 2012	Emergency	2:05 hours	DDP department (SVP 06)	Failure in the motor
October 27th, 2012	Emergency	8 hours	Biomass boiler	Damaged paddles of the fuel conveyor
Total hours in downtime		301:30		

5. Emission reductions calculations

A short description of the energy efficiency measures is presented below:

- SVP-01 "Replacement of cyclone evaporator with a new super concentrator for Soda Recovery Boiler (SRB)" – installation of a super concentrator to increase the liquor dry substance concentration to 70% before the incineration in the SRB
- SVP-02 "Replacement of barometric condensers with plate heat exchangers in evaporating systems for black liquor" – in order to increase the efficiency and capacity of the evaporating installations the two barometric condensers were replaced with two new surface heat exchangers with indirect heat exchange. As a result the concentration of the weak black liquor is increased and heat consumption is decreased at the final step of the installation.
- SVP-03 "Installation of frequency control drives on electric motors" – some of the electric motors are equipped with VFDs to allow accurate modulation of flow based on the process demand.
- SVP-04 "Installation of a back pressure steam turbine" – back pressure steam turbines have the ability to generate useful electricity while reducing the steam pressure.
- SVP-05 "Installation of a blow down heat recovery system" – the blow-down condensate is used to preheat the boiler feed water or to heat water for technological uses.
- SVP-06 "Shift of production from pulp blocks to pulp sheets" – ceasing the production of pulp blocks and increasing the production of pulp sheets resulted in energy savings. The main benefit for energy saving is determined by reducing electricity and steam consumptions, as well as eliminating diesel oil as fuel for the drying furnace for pulp blocks line.

The amount of the generated carbon emissions (t CO_{2e}) are presented in Table 2:

Table 2

Year	Generated carbon emissions according to Svilocell's monitoring report							Emission Reductions according to the PDD
	SVP 01	SVP 02	SVP 03	SVP 04	SVP 05	SVP 06	Total	
	t/CO_{2e}	t/CO_{2e}	t/CO_{2e}	t/CO_{2e}	t/CO_{2e}	t/CO_{2e}	t/CO_{2e}	t/CO_{2e}
2007[1]	-	-	-	-	-	6,005	6,005	85,840
2008	86,822	11,762	343	-	-	16,194	115,121	143,608
2009	16,427	1,621	52	-	-	1,393	19,493	137,200
2010	108,514	28,488	469	-	945	29,888	168,305	135,136
2011	111,429	32,329	391	19,847	1,030	30,412	195,438	134,267

[1] Emission reductions generated in 2007 refer to non-JI crediting period and should be treated as AAUs. The DFP of Bulgaria has transferred emission reductions generated in 2007 as AAUs.

Jan – Oct 2012	103, 955	28,254	331	20,395	819	19,954	173,709	131,932
Jan – Oct 2012 Baseline estimations	35,656	30,532	1,015	31,862	2,120	18,753	119,938	

Within the third monitoring period the mill has lower emission reductions, i.e. about 11% lower than the relevant period of second periodic verification. Compared to the total value stated in the PDD for the relevant period emission reductions are approximately 44,8% higher.

The reasons for the total increase in general are as follows:

- Optimal combustion process in the recovery boiler as well as efficient operation of the mill.
- The lower coal calorific value and significantly lower thermal efficiency of the Power Plant compared to the previous year led to emission reductions increase. Compared to the previous year the coal emission factor is slightly lower, as a result of which the decrease in the emission reductions is insignificant.
- The BL calorific value (2 601 kcal/kg) is much higher (+44%) than the initially stated in the PDD (1 805 kcal/kg), causing an increase in CO2 emission reductions. However, compared to the previous year (2 588 kcal/kg), BL calorific value is higher with about 13 kcal/kg, which is relevant to 0,5% increase.

6. Project management

6.1. Management and Monitoring System

For defining the responsibilities of collecting, registration and documentation of the information required for the emissions' calculation and facilitating the processes for implementation of the verification and for certification of the reached reduced emissions a Management and Monitoring System is set up. The staff responsible for the management of the process data is aware with the procedures of the Management and Monitoring System. The responsibilities are clearly stated. A project manager, who controls the tasks' implementation, is defined. A quality manager controls the procedures' implementation and the data's quality.

6.2. Data management

All the required data for the calculation of the emission reductions are entered on annual basis in the workbook. All regulations for data collection in the company's database and the principles for collection of information are observed.

On an annual basis the Power Plant submits to Svilosa AD the required information for the emission reductions calculation, i.e. coal emission factor, coal calorific value and thermal efficiency.

All reports are stored by the Project manager.

6.2.1. Data used in each electronic workbook sheet

In the EF NCF Sheet is entered data used in all sheets for calculation of the carbon emission reductions. Their determination is performed according to the PDD, section D "Monitoring methodology and plan".

- TPP Svilosa AD submits an annual report for the coals' emission factor, coal' calorific value and thermal efficiency of the Station;
- Emission factors and Net Calorific Values for the other fuels (diesel and heavy oil) are taken from *2006 IPCC Guidelines for National Greenhouse Gas Inventories*;
- Electricity transmission losses from the grid are fixed at 10% as a conservative assessment;
- According to the PDD, the grid emission factor is evaluated ex-ante and is taken from the latest version of the "Baseline study of joint implementation projects in the Bulgarian energy sector". The latest version of this study was prepared by NEK on May 5th, 2005, as a request to the Ministry of Environment and Water of Bulgaria and is attached to the PDD as Appendix 4. This approach for the evaluation of the CO_2 emission factor for JI projects is widely accepted and adopted by other projects which have already been issued of ERUs. Details on how these values are calculated are given below.

The methodology used for Baseline Determination is developed on the basis of merit order dispatch analysis and does not consider the build margin. However, in case of Bulgaria, it is appropriate to only consider the operating margin, because the combined margin concept was developed for CDM projects in developing countries where electricity demand exceeds electricity supply, and a CDM project will thus also potentially displace the construction of new power plants (reflected by the build margin). This is not the case of Bulgaria where electricity exports are higher than imports[2].

Two analyses are performed by the NEK:

1. Baseline emission factor for all plants, including nuclear and hydro-power plants;
2. Baseline emission factor for generation plants, less Nuclear, Pumped-Storage and Hydro-Power Plants;

The first approach is too imprecise to analyze the reduction of CO_2 emissions in a Joint-Implementation Project, because the operation of nuclear power plants and, to less extent, the operation of the four large hydro-power cascades of the power system are not influenced by the implementation of such projects. The second analysis has been considered in the current Monitoring Report. The next table summarizes the latest emission factors published by the NEK for two scenarios: minimum demand and maximum demand.

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[2] http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=BG

Table 3

Scenarios	UoM	2007	2008	2009	2010	2011	2012
Scenario Stagnation – Minimum Demand	$tC0_2/MWh$	1.100	1.078	0.956	0.917	0.902	0.899
Scenario Prosperity - Maximum Demand	$tC0_2/MWh$	1.156	1.059	0.947	0.908	0.884	0.833

Dispatch data adjusted operating margin emission factor (latest emission factors)

In order to be conservative the maximum demand scenario, which is resulting in lower carbon emission factors, has been considered. A similar approach has been approved by other Bulgarian JI projects which have already been issued of ERUs, e.g. the Track 2 JI "Sreden Iskar Cascade HPP Portfolio Project".

The defined values for 2012 are presented in Table 4.

Table 4

Emission factors	**UoM**	**2012**
Coal	t CO_2/t	2,426
Electricity purchased by the Power Plant	t CO_2/MWh	0,833
Diesel	t CO_2/t	2,994
Heavy oil	t CO_2/t	3,328
Fuels' calorific value	**UoM**	**2012**
Coals	MWh/t	6,778
Diesel	MWh/t	11,944
Heavy oil	MWh/t	11,222
Efficiency factors for energy conversion	**UoM**	**2012**
Thermal efficiency of the Power Plant	%	31,02
Electricity transmission losses	%	10

Emission Factors and Net Calorific Values of the fuels have been updated according to *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Chapter 2 and Chapter 1 respectively.

Calculating the average steam and water enthalpy in recovery boiler

1. The hourly values of the temperature and pressure are entered into the daily log of recovery boiler. Then the average values for the shift are calculated, i.e. for 24 hours there are 3 average values for the temperature and pressure.

2. These values are entered into the workbook of the head of department.

3. The temperature and pressure average values for the whole month are calculated. From these values the enthalpy of the steam and water is defined.

4. The source for calculation the enthalpy is the book "Thermodynamically properties of the water and steam" – S.L.Rivkin and A.A. Alexandrov – published by Energy publishing house in 1975.

6.2.2. Data used for the determination of the emission reductions

For the baseline emissions calculation, a single entry of the values was performed. These values remain unchanged for the whole crediting period.

❖ **SVP-01 "Replacement of cyclone evaporator with a new super concentrator for Soda Recovery Boiler (SRB)"**

The baseline values are presented in Table 5.

Table 5

Index	UoM	Baseline values
Black Liquor (BL) calorific value in 60% DS	kcal/kg	1,747
SRB efficiency	%	67
BL concentration after the cyclone evaporator	%	60

For the calculation of the emissions of the project activities monthly and annual data are entered in the workbook as follows:

- BL flow;
- Operating hours for SRB;
- Outlet steam temperature;
- Outlet steam pressure;
- BL concentration at the super concentrator inlet;
- BL concentration at the super concentrator outlet;
- BL calorific value;
- SRB annual efficiency;
- Steam purchased by the Power Plant.

The project activity values for 2012 are presented in Table 6.

Table 6

Index	UoM	2012
BL flow	t/h	33,61
Operating hours for SRB	hours	5 484
Outlet steam temperature	^{0}C	434
Outlet steam pressure	bar	39

BL concentration at the super concentrator inlet	%	61,04
BL concentration at the super concentrator outlet	%	72,39
BL calorific value	kcal/kg	2 601
SRB annual efficiency	%	65
Steam purchased by the Power Plant	MWh	16 521

The main parameters that influence the emission reductions generation are:

- Black liquor amount burned in the recovery boiler;
- Black liquor calorific value;
- Recovery boiler efficiency.

The increase in the emission reductions for SVP-01, compared to 2011, is due mainly to the decreased consumption of heat energy by the Power Plant as well as to the Power Plant decreased thermal efficiency.

During 2012 in the recovery boiler were fed 184 317 t thick black liquor with calorific value 2601 kcal/kg.

The TBL calorific value is analyzed once per year in a laboratory of the Pulp and paper institute. The laboratory is accredited and owns an accreditation certificate №8ЛИ/05.06.2008. A protocol from the analysis 26.03.2012 was prepared.

The black liquor flow was measured with flow meter 11 – FIC – 418, located on a pipe for TBL from recovery boiler. In 2010 an inspection of the flow meter was conducted and Protocol No 113 R – ДД – OP/01.10.2010 was issued.

Since March 2012 Svilocell produces such an amount of heat energy to fully comply with its demands. The heat energy sources are recovery boiler and biomass boiler in a ratio 75:25. Due to that reason recovery boiler is extremely important unit responsible for significant part of the mill independence regarding the heat energy. In order to improve the combustion process, thus achieving also high steam generation, the process mode and technical specifications of the super concentrator allows black liquor with high concentration to be produced and burnt into the boiler. In this regard the higher value of the black liquor concentration at the super concentrator inlet could be explained. However, the above described does not influence the amount of emission reductions generated, but only the energy independence of the mill.

Recovery boiler efficiency was defined in a report prepared by Energy Max EOOD during the conducted Study and optimization of the burning process in the recovery boiler.

Total emission reductions from SVP-01 are 103 955 tCO_2.

❖ **SVP-02 "Replacement of barometric condensers with surface condensers in evaporating systems for black liquor"**

The baseline values are presented in Table 7.

Table 7

Index	UoM	Baseline value
BL concentration after washing	%	13
BL concentration after evaporation plant	%	54

For the calculation of the emissions of the project activities monthly and annual data are entered in the workbook as follows:

- BL volumes as 100% DS content;
- Annual operating hours;
- Steam temperature;
- Steam pressure;
- BL concentration after washing;
- BL concentration after heat exchanger.

The project activity values for 2012 are presented in Table 8.

Table 8

Index	UoM	2012
BL volumes as 100% DS content	t/d	306
Annual operating hours	hours	10 446
Steam temperature	^{0}C	157
Steam pressure	bar	4
BL concentration after washing	%	17
BL concentration after evaporation plant	%	61

The main parameter influencing the emission reductions generation is black liquor volume after the evaporation plant defined at 100% DS, as well as the BL concentration after washing.

The weak black liquor consumption at the inlet of evaporation plant was measured through ultrasonic flow meter FUP 1010 with calibration certificate №1 – РФ/24.03.2009. In 2011 a metrological measurement of Aqua – 90 Engineering OOD was prepared for which Protocol dated January 13th, 2011 was issued.

The BL concentration is defined through direct measuring at place with a portable unit – aerometer. The measurements are made hourly and the data are written in process records in the control room of Evaporation plant.

Total emission reductions from SVP-02 are 28 254 tCO_2.

❖ **SVP-03 "Installation of frequency control drives on electric motors"**

As baseline values for calculation of the expected emission reductions were used the data for the nominal power of the pumps' motors defined in Table 9.

Table 9

Pump	70.0480	60.0460	08.0406	70.0485
Motor nominal power, kW	132	160	200	160

For the calculation of the emissions of the project activities monthly and annual data are entered in the workbook as follows:

- Actual power consumed;
- Operating hours;
- Average power consumed;

Motor efficiency reported by Schneider Electric graphs that presents the connection between the load factor and motor efficiency.The pumps included in the project activity are as follows:

- 70.0480 MC pulp pump;
- 60.0460 black liquor MC pump
- 08.0406 filtrate pump;
- 70.0485 pulp pump.

The project activity values for 2012 for each pump are presented in Table 10 below:

Table 10

Year	**2012**			
Pump	70.0480	60.0460	08.0406	70.0485
Pump serial number	*EL 0733054 361*	*EL 0733054 364*	*EL 0733054 362*	*EL 0733054 358*
Actual power consumed, kWh	316 000	567 000	815 000	324 000
Operating hours, h	5 389	5 377	5 431	5 430
Average power consumed, kW	59	105	150	60
Motor efficiency, % defined by Schneider Electric graphs	83	86	87	82

The main parameter influencing the emission reductions generation is the flow of the fluids going through the pumps connected to the motors equipped with frequency control drives. The VFDs were installed in substations D and E in the Fibre line. The data measured are operating hours and power consumed. The values are being accumulated and on the first day each month is recorded in process records.

Total emission reductions from SVP-03 are 331 tCO_2.

❖ **SVP-04 "Installation of a back pressure heat turbine"**

For the emission reductions calculations the data for the electricity purchased from the grid and the one produced by the steam turbine are used. The data is measured by energy meters and at the end of each month are reported in the Energy protocols.

The project activity' values for 2012 are presented in Table 11:

Table 11

Index	**UoM**	**2012**
Electricity purchased from the grid	MWh	45 377
Electricity generated from steam turbine	MWh	22 036

Total emission reductions from SVP-04 are 20 395 tCO_2.

❖ **SVP-05 "Installation of a blow down heat recovery system"**

As baseline value for calculation of the anticipated emission reductions is used blow down rate 3%, which is defined according to the PDD.

For calculation of the emission reductions the following data are entered in the workbook on monthly and annual basis:

- Average annual steam production;
- Annual working hours;
- Heat recovery.

The project activity' values for 2012 are presented in Table 12:

Table 12

Index	**UoM**	**2012**
Average steam production	t/h	67
Annual working hours for SRB	h	5 484
Heat recovery	MWh	709

The heat energy, measured in MWh, utilized for heating the water to the recovery boiler, is measured directly from the indications of the heat energy meter Multidata S3 type.

Total emission reductions from SVP-05 are 819 tCO_2.

❖ **SVP-06 "Shift from block pulp to sheet pulp"**

For the calculation of the baseline emissions a single entry of the data, stated as baseline values according to the PDD. These values are presented in the Table 13 and remain unchanged.

Table 13

Index	UoM	Baseline values
Diesel specific consumption in block line	t /t pulp	0,0383
Steam specific consumption in block line	MWh / t pulp	0,9569
Electricity specific consumption in block line	MWh / t pulp	0,2791
Block pulp production	t /y	58 % of the total production

For the calculation of the emissions of the project activities monthly and annual data are entered in the workbook as follows:

- Total pulp production;
- Diesel specific consumption in sheet line;
- Steam specific consumption in block line;
- Electricity specific consumption in block line.

The project activity' values for 2012 are presented in Table 14:

Table 14

Index	UoM	2012
Total pulp production	t/y	77 265
Diesel specific consumption in sheet line	t/t pulp	0,00
Steam specific consumption in sheet line	MWh/t pulp	0,7885
Electricity specific consumption in sheet line	MWh/t pulp	0,1364

The main parameter influencing the emission reductions is the amount of the pulp produced. The pulp is measured at electronic scale TOLEDO. It has a certificate for periodic inspection since May 22nd, 2012.
The steam consumption for the sheet pulp production is measured by heat energy meter Endress+Hauser, RMS-621-21aaa1211, located in the control room.
The steam specific consumption is defined from the Raw materials and consumables balance prepared by the deputy head of DDP department.
The electricity specific consumption is defined from the Energy protocols.

Total emission reductions from SVP-06 are 19 954 tCO_2.

7. Comparison of real achieved with estimated emission reductions

Year	Total	Emission Reductions according to the PDD
	t/CO_{2e}	t/CO_{2e}
2008	115,121	143,608
2009	19,493	137,200
2010	168,305	135,136
2011	195,438	134,267
Jan – Oct 2012	173,709	119,938*

Within the period January – October 2012 were generated 173,709 t/CO_{2e}. Compared to the values stated in the PDD (January – October 2012) which are 119,938 t/CO_{2e} this represent an increase of 44.8%.

However, during the whole period 2008 – 2012 (Jan – Oct) the total ERUs achieved by the Project are 672,066 tCO_{2e} and the same amount for the period 2008 to 2012 (Jan – Oct) as estimated in the PDD is 670,149 tCO_{2e}. In conclusion the monitored ERUs are a little bit higher than predicted ones with 1,917 tCO_{2e} or 0,29% increase.

* Baseline estimations within the period Jan – Oct 2012