Monitoring Report "Bark and Wood Waste to Energy at OJSC "Ilim Group" Branch in the Town of Ust-Ilimsk, Russian Federation"

Version 2.2
23 June 2010
Monitoring period: 01.01.2008 – 31.12.2009

Executed by CCGS LLC

CONTENTS

A. General project activity and monitoring information
B. Key monitoring activities
C. Quality assurance and quality control measures
D. Calculations of GHG reductions

ANNEXES

Annex 1. Selection of the emission factor for coal combustion at Ust-Ilimsk CHPP

Annex 2. Calculation of methane emissions from anaerobic decomposition of BWW at the dump

Annex 3. Regulations on the procedure for quality control of GHG emission reduction project design documents and monitoring reports at CCGS LLC

Annex 4. Calculation model (Excel-file).

SECTION A. General Project activity information

A.1 Title of the project activity:

"Bark and Wood Waste to Energy at OJSC "Ilim Group" Branch in the Town of Ust-Ilimsk, Russian Federation**".**

A.2 Short description of the project activity:

The aim of the project is to improve efficiency and to increase the usage of bark and wood waste (BWW) by means of their combustion in a fluidized bed boiler for the purposes of heat and electricity generation for auxiliary needs of the Branch. The implementation of the project leads to reduction of fossil fuel consumption and BWW disposal to the dump and, thus, to reduction of GHG emissions.

Prior to the project implementation BWW had been combusted in five utilizing boilers No.No.1-5 of KM-75-40 type, situated in the bark-fired boiler house. This type of boilers is fitted with sloping and mechanical chain grates. The boilers operation was characterized by low efficiency and insufficient output which resulted in generation of a large surplus of BWW at the production site. This BWW had to be disposed to a dump. The energy supplies from OJSC "Irkutskenergo" were considerable.

The project envisages reconstruction of the utilizing KM boiler No.1 and switching it to fluidized bed combustion of BWW using INECO technology (KM boilers No.No.2-5 after the project implementation continue their operation in the previous mode without any modification of the combustion technology).

A.3 Monitoring period:

• Monitoring period starting date: 1.01.2008;
• Monitoring period closing date: 31.12.2009.

A.4. Methodology applied to the project activity (incl. version number)

A.4.1. Baseline methodology:

The developer proposes his own approach [R1] to the baseline setting and GHG emission reductions calculation and does not agree it with any methodologies for the clean development mechanism (CDM), but he certainly makes his approach consistent with the requirements of *Decision 9/CMP.1, Appendix B* [R2].

A.4.2. Monitoring methodology:

The monitoring plan was developed following our own approach [R1] in accordance with the project specifics and requirements of *Decision 9/CMP.1*, *Appendix B* [R2] without using any approved CDM methodologies.

A.5. Status of implementation including time table for major project parts:

Activity	Date
The beginning of construction and assembling works	July 2001
The ending of construction and assembling works	November 2002

A.6. Intended deviations or revisions to the registered PDD:

There are no deviations or revisions to the registered PDD

A.7. Intended deviations or revisions to the registered monitoring plan:

There are no deviations or revisions to the registered monitoring plan

A.8. Changes since last verification:

There are no changes as this is the first monitoring verification.

A.9. Person(s) responsible for the preparation and submission of the monitoring report:

The person (s) responsible for the preparation and submission of the monitoring report are:

OJSC "Ilim Group" Branch in Ust-Ilimsk"
• Sergey Gusev, Chief Engineer of THPP

CCGS LLC
• Vladimir Dyachkov, Director of Project Implementation Department
• Evgeniy Zhuravskiy, Specialist of Project Implementation Department

SECTION B. Key monitoring activities according to the monitoring plan for the monitoring period stated in A.3.

B.1. Monitoring equipment types

The measuring devices are provided in accordance with the official rules "Electricity Metering Rules", "Heat Metering Rules" etc. The devices have to undergo regular inspection and supervision under the Federal Law "On Uniformity of Measurements". Table B.1.1. shows metrological performance of the measuring devices used for monitoring.

Table B.1.1. Data on metering devices for GHG emission reduction monitoring

Parameter	Mark and type		Serial number	Measurement range	Unit	Error, accuracy class	Last check (calibration) date
Steam production KM-1	Flow meter	22 DD Metran	66211	0-160	kPa	0.5	08.09.2008
Fuel oil consumption KM-1	Flow meter	22 DD Metran	69996	0-2500	kgf/m^2	1.0	07.11.2007
Steam production KM-2	Flow meter	22 DD Sapfir	19811	0-1	kgf/m^2	1.0	28.01.2008
Steam production KM-3	Flow meter	22 DD Metran	53863	0-10000	kgf/m^2	1.0	28.01.2008
Steam production KM-4	Flow meter	22MDD	155214	0-1	kgf/m^2	1.0	30.01.2009
Steam production KM-5	Flow meter	22MDD	216183	0-100	kPa	0.5	04.02.2008
Steam production BLRB-1	Flow meter	EJA	705684	0-1.6	kgf/m^2	0.5	21.10.2008
Steam production BLRB-2	Flow meter	EJA	705692	0-1.6	kgf/m^2	0.5	26.08.2008
Steam production BLRB-3	Flow meter	EDR-71	11694	0-15000	kgf/m^2	1.0	22.05.2008
Electricity supply from the THPP, BUSBAR-1	Electric meters	SRChU-I673M	601887	3x100B 3x5A	kW h	1.0	30.09.2008
		SAZU-И681	574727	3x100B 3x5A	kW h	1.0	07.06.2008
Electricity supply from the THPP, BUSBAR-2	Electric meters	SRChU-I673M	176458	3x100B 3x5A	kW h	2.0	13.02.2007
		SAZU-670M	11300	3x100B 3x5A	kW h	2.0	10.07.2008
Heat supply from the THPP	Flow meter	MPE-mi	1097	0-25	kgf/m^2	1.0	13.12.2007
	Flow meter	22DD Sapfir	53865	0-6300	kgf/m^2	1.0	11.05.2007
Steam parameters KM-1	Temperature meter	IPM 0196/MO	4604	0-600	^{o}C	0.25	20.11.2008
Steam parameters KM-2	Temperature meter	Sh78	2065	0-600	^{o}C	0.4	29.01.2008

Steam parameters KM-3	Temperature meter	Sh78	1111	0-600	^oC	0.4	03.03.2008
Steam parameters KM-4	Temperature meter	Sh78	673	0-600	^oC	0.4	19.11.2007
Steam parameters KM-5	Temperature meter	Sh78	3187	0-600	^oC	0.4	10.04.2007
Steam parameters BLRB-1	Temperature meter	50ER	A152	200-500	^oC	0.5	22.02.2008
Steam parameters BLRB-2	Temperature meter	50ER	B458	200-500	^oC	0.5	26.06.2008
Steam parameters BLRB-3	Temperature meter	ETR-33T	116923	0-600	^oC	0.5	21.09.2007
Steam parameters KM-1	Pressure meter	Metran -22DI-2160	69966	0-100	kg/sm^2	1.0	02.09.2008
Steam parameters KM-2	Pressure meter	MPE	1664A	0-60	kg/sm^2	0.5	08.08.2007
Steam parameters KM-3	Pressure meter	MPE-MI	858	0-60	kg/sm^2	1.0	11.02.2009
Steam parameters KM-4	Pressure meter	MPE	1619	0-60	kg/sm^2	1.0	06.08.2007
Steam parameters KM-5	Pressure meter	MPE	1583	0-60	kg/sm^2	1.0	20.04.2009
Steam parameters BLRB-1	Pressure meter	Sapfir -22 DI	36934	0-60	kg/sm^2	1.0	19.11.2008
Steam parameters BLRB-2	Pressure meter	Sapfir -22 DI	36946	0-60	kg/sm^2	1.0	05.11.2008
Steam parameters BLRB-3	Pressure meter	EPR-72	0116914	0-60	kg/sm^2	1.0	31.08.2009

B.2. Monitored data

The data were monitored in accordance with the scheme shown in Fig. B.2.1.

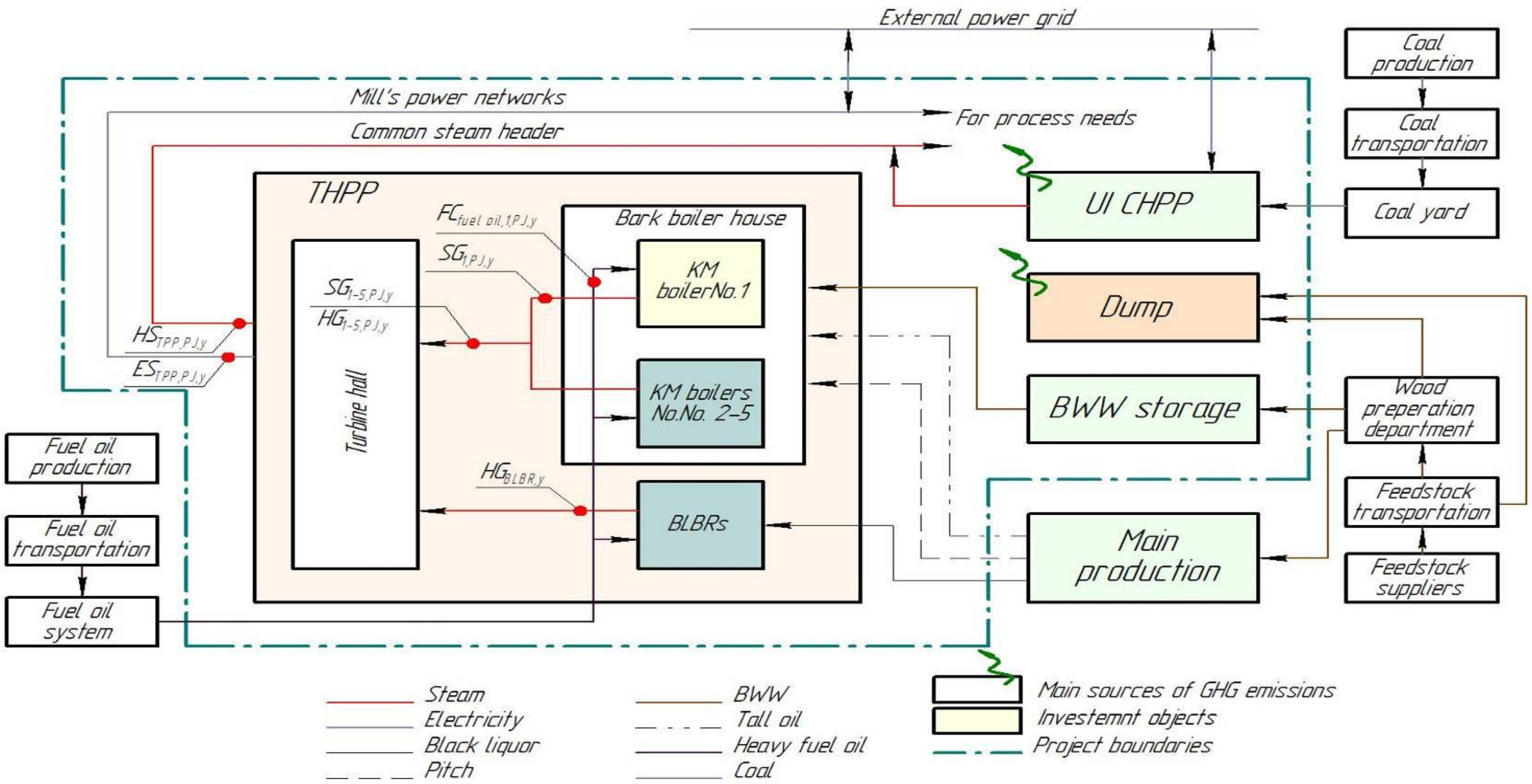

Fig. B.2.1. Location of the monitoring points

According to the emissions reduction monitoring plan, the following seven parameters should be controlled (see Tables B.2.1, B.2.2). These tables also contain parameter values for the year 2008 and 2009.

Table B.2.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Numerical value	
								2008	2009
1. $HS_{TPP,PJ,y}$	Heat supply from the THPP under the project	The Chief Power Engineer Department	GJ	m	Continuously	100 %	Electronic and paper	13 127 212	13 329 361
2. $HG_{BLRB,y}$	Total heat production by BLRBs	The Chief Power Engineer Department	GJ	m	Continuously	100 %	Electronic and paper	13 561 890	13 672 200
3. $SG_{1-5,PJ,y}$	Total steam production by KM boilers No.No.1-5 under the project	The Chief Power Engineer Department	t	m	Continuously	100 %	Electronic and paper	1 622 401	1 580 881
4. $HG_{1-5,PJ,y}$	Total heat production by KM boilers No.No.1-5 under the project	The Chief Power Engineer Department	GJ	m	Continuously	100 %	Electronic and paper	4 990 268	4 879 132
5. $SG_{1,PJ,y}$	Steam production by KM boiler No.1 under the project	The Chief Power Engineer Department	t	m	Continuously	100 %	Electronic and paper	505 066	550 818
6. $FC_{fuel\ oil,1,PJ,y}$	Heavy fuel oil consumption by KM boiler No.1 under the project	The Chief Power Engineer Department	t	m	Continuously	100 %	Electronic and paper	681	1 285

Table B.2.2. Data to be collected in order to monitor the leakage, and how these data will be archived:

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Numerical value	
								2008	2009
7. $ES_{TPP,PJ,y}$	Electricity supply from the THPP under the project	The Chief Energy Engineer Department	MWh	m	Continuously	100 %	Electronic and paper	311 142	318 338

B.3. The environmental service

The Environment and Production Control Department is in charge of industrial environmental monitoring at the Mill. It is accountable to the Health, Safety and Environment Directorate. The Directorate consists of:

- Safety and Production Control Department;
- Department of Industrial Environmental Monitoring;
- Gas Rescue Plant;
- Radiation Safety Service;
- Sanitary Industrial Laboratory.

The programme of industrial environmental monitoring currently implemented by UI PPM will not undergo any significantly changes after the project and will be fulfilled according to the scheme and schedule approved by the Committee for Natural Resources of the Irkutsk Region

Similar to the way it is now, the monitoring will be performed by the respective department of the Mill, including sanitary-industrial laboratory. The Department employs qualified specialists. The sanitary industrial laboratory is adequately equipped. Its ability to take measurements in all sectors, which fall under their responsibility, is confirmed by Calibration Certificates.

The industrial environmental monitoring covers the following:

- Analytical control of compliance with the prescribed pollutant emission standards in accordance with the laboratory control charts;
- Monitoring of the impact of waste disposal sites on underground and surface waters, atmospheric air and soil;
- Control of pollutants content in the atmospheric air on the border of the sanitary protection zone, etc.

The data retrieved by the analytical laboratory are processed and summarized in monthly and annual reports, which contain all required detailed data

The enterprise has the following reporting obligations as per official annual statistic forms:

- 2-tp (air) Data on Atmospheric Air containing information on the quantities of trapped and destroyed air pollutants, detailed emissions of specific pollutants, number of emission sources, emission reduction actions and emissions from separate groups of pollutant sources;
- 2-tp (water) Data on Water Use, containing information on water consumption from natural sources, discharges of effluents and their pollutant content, capacity of wastewater treatment facilities, etc.;
- 2-tp (wastes) Data on generation, utilization, destruction, transportation and disposal of production and consumption residues, containing an annual balance of wastes flows by their types and hazard classes.

In compliance with the Russian legislation, the enterprise annually develops and implements environment protection measures.

Quality, environment and industrial safety management systems at Ust-Ilimsk Branch comply with the international standards of ISO 9001, ISO 14001 and OHSAS 18001. The enterprise manufactures products certified for compliance with the requirements of the Forest Stewardship Council (FSC).

B.4. Data processing and archiving (incl. software used):

All data will be stored in the Mill's archive in electronic and paper form for at least 2 years after the end of the crediting period or the last issue of ERUs.

SECTION C. Quality assurance and quality control measures

C.1. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored

Table C.1.1. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:

Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
Table B.2.1. ID 1,2,4	Low	The following instruments are used for monitoring of heat production and supply: 1. Steam flow meter. Measurement accuracy 0.5-1.0% (In more details the measurement accuracy of devices is described in the table B.1.1.). Steam flow meters are regularly calibrated. 2. Temperature gauge. Accuracy class fluctuates in a range 0.25-0.5 (In more details the accuracy class of devices is described in the table B.1.1.). Temperature gauges are regularly calibrated. 3. Pressure meter. Measurement accuracy 1.0%. Pressure meters are regularly calibrated. Signals from the instruments are sent to the ADCS.
Table B.2.1. ID 3,5	Low	A steam flow meters are used for monitoring of steam production. Measurement accuracy fluctuates in a range 0.5-1.0%. (In more details the measurement accuracy of devices is described in the table B.1.1.) Steam flow meters are regularly calibrated. Signals from the instruments are sent to the ADCS.
Table B.2.1. ID 6	Low	A flow meter is used for monitoring of heavy fuel oil consumption by KM boiler No.1. Measurement accuracy 1.0%. Flow meters are regularly calibrated. Output signals from the flow meter transducers are sent to the ADCS.
Table B.2.2. ID 7	Low	The electricity supplied from the THPP is monitored by electric meters. Measurement accuracy fluctuates in a range 1.0-2.0% (In more details the measurement accuracy of devices is described in the table B.1.1.) Electric meters are regularly calibrated. Signals from the instruments are sent to the ADCS.

Actions taken during calibration period or breakdown of instruments

The measuring instruments shall be calibrated during scheduled shutdowns of the equipment. If necessary, the removed measuring instrument is replaced with a gaged back-up instrument. Operation of the equipment without measuring instruments is not allowed.

Shall any instrument fail, the respective parameters are to be monitored with a help of a duplicate instrument or, if such is not available, the failed instrument is to be replaced with a gaged back-up instrument. If the failed instrument cannot be replaced while the equipment is running, then the parameters shall be monitored for not more than 15 days in one year based on calculation of an average value of this instrument's readings taken over the three days prior to the failure. This monitoring procedure is developed based on paragraph 9.8 of "The Rules for Heat and Heat Carrier Metering". [R8]

If the equipment is operated without instrument-based monitoring of any parameter for more than 15 days, then the calculations shall be made using the most conservative (in terms of GHG emission reductions) value from the start of the project monitoring.

Internal check-out

The responsibility for collection, check-out and transfer of primary data for monitoring, and check-out GHG emission reduction calculation results lies with the following person:

- Chief engineer of THPP S. Gusev.

The responsibility of chief engineer of THPP S. Gusev is specified in Order No. FU/662 of 21.08.2009.

Cross-check

Check of the monitoring report is carried out by the Director of the Project Implementation Department of CCGS LLC, or, on his instructions, by other Specialist of the Project Implementation Department who was not directly involved in preparation of this project monitoring report;

Additional cross check is carried out by the director of the Project Development Department of CCGS LLC, or, on his instructions, by other specialist of the Project Development Department.

At CCGS LLC the procedure for verification of the monitoring reports are laid down in "Regulations on quality check and control of GHG emission reduction project design documents (PDD) and monitoring reports at CCGS LLC" (see Annex 3).

C.2 Operational and administrative structure

C.2.1. Monitoring procedures:

Collection and record of data required for calculation of GHG emission reductions will be carried out in accordance with the metering points scheme shown in Fig B.2.1.

Original request for primary GHG emission reductions monitoring data is made by the Director of the Project Implementation Department of CCGS LLC to the Central Office of ”Ilim” Group in St.-Petersburg, namely to the Director for Labour Protection, Fire Safety and Environment, who in his turn gives instructions to a certain enterprise to collect the requested data. Each enterprise that is implementing projects within the framework of the Kyoto Protocol has specific persons (a working group) that responsible for collection, control and transfer of monitoring data. The responsibility of these persons is specified in corresponding orders. At “Ilim” Group Branch in Ust-Ilimsk the responsibility of such persons are set forth in Order No. FU/662 of 21 .08. 2009.

The information collected at the enterprise is transferred to the Central Office, namely to the Director for Labour Protection, Fire Safety and Environment, who in his turn transfers it to the Director of the Project Implementation Department of CCGS LLC. All information is transferred by e-mail.

On the basis of the received data the Department of Project Implementation of CCGS LLC prepares a GHG emission reduction monitoring report and submits it for additional cross-check to the Project Development Department of CCGS LLC. As soon as all comments made by the Project Development Department are incorporated or resolved the monitoring report is submitted for verification to the enterprise where the project is implemented. At CCGS LLC the procedure for verification of the monitoring reports are laid down in “Regulations on quality check and control of GHG emission reduction project design documents (PDD) and monitoring reports at CCGS LLC” (see Annex 3).

After the report is verified and amended as necessary, the Director of the Project Implementation Department of CCGS LLC informs the Director for Labour Protection, Fire Safety and Environment of “Ilim” Group’s Central Office in St.-Petersburg about preliminary monitoring results and, if there are no comments on his part, the General Director of CCGS LLC takes the final decision to submit the monitoring report for verification to an independent expert organization.

The procedure for collection and record of data required for calculation of GHG emission reductions is described in Table C.2.1.

Table C.2.1. Monitoring procedures

Monitored parameter	Procedure for registration, monitoring, record and storage of data (including everyday monitoring)	The person responsible for the parameter monitoring
Production and supply of heat	1. Sensors and transducers, which continuously measure flow rate, temperature and pressure of steam, are used for heat production and supply monitoring. 2. The instrument readings are recorded in the ADCS and are shown on the displays of all computers with the required software installed. The data are printed in hard copy and are stored in the computer memory for three years, and then they are sent to the Mill’s electronic archive. 3. The data are recorded by operators on a daily basis in daily reports and in the instrument logs, and then summarized in monthly and annual reports. 4. Data on heat production and supply will be stored in the Mill’s archive in electronic and paper form for at least 2 years after the end of the crediting period or the last issue of ERUs.	The Department of Energy Supply Planning and Control
Steam production by the boilers of the utilizing boiler house	1. Sensors and transducers, which continuously measure the flow rate of steam, are used for steam production monitoring. 2. The instrument readings are recorded in the ADCS and are shown on the displays of all computers with the required software installed. The data are printed in hard copy and are stored in the computer memory for three years, and then they are sent to the Mill’s electronic archive. 3. The data are recorded by operators on a daily basis in daily reports and in the instrument logs, and then summarized in monthly and annual reports. 4. Data on steam production by the boilers of the utilizing boiler house will be stored in the Mill’s archive in electronic and paper form for at least 2 years after the end of the crediting period or the last issue of ERUs.	The Department of Energy Supply Planning and Control

Heavy fuel oil consumption by KM boiler No.1	1. The consumed quantity of heavy fuel oil is continuously measured by flow meters installed on the inlet and return lines. 2. The flow meter readings are recorded in the ADCS and are shown on the displays of all computers with the required software installed. The data are printed in hard copy and are stored in the computer memory for three years, and then they are sent to the Mill’s electronic archive. 3. The data are recorded by operators on a daily basis in daily reports and in the instrument logs, and then summarized in monthly and annual reports. 4. Data on heavy fuel oil consumption will be stored in the Mill’s archive in electronic and paper form for at least 2 years after the end of the crediting period or the last issue of ERUs.	The Department of Energy Supply Planning and Control
Metering of electricity supply	1. The electricity supply from the THPP is continuously measured by electric meters. 2. The instrument readings are recorded in the ADCS and are shown on the displays of all computers with the required software installed. The data are printed in hard copy and are stored in the computer memory for three years, and then they are sent to the Mill’s electronic archive. 3. The data are recorded by operators on a daily basis in daily reports and in the instrument logs, and then summarized in monthly and annual reports. 4. Data on electricity supply from the THPP will be stored in the Mill’s archive in electronic and paper form for at least 2 years after the end of the crediting period or the last issue of ERUs.	The Department of Energy Supply Planning and Control

C.2.2. Roles and responsibility:

The management of "Ilim" Group's Central Office in Saint-Petersburg is responsible for monitoring plan observance at the enterprise (director for labour protection, fire safety and environment).

The management of OJSC "Ilim Group" Branch in Ust-Ilimsk is responsible for:

- normal operation of the equipment;
- timely calibration and proper maintenance of instrumentation (chief metrologist);
- collection of all data required for calculation of GHG emission reductions under the project (chief engineer of THPP);
- arranging and holding training sessions for the Mill's personnel regarding collection of data required for the GHG emissions monitoring under the project (chief engineer of THPP).

The management of CCGS LLC is responsible for:

- arranging and holding training sessions for the Mill's personnel regarding collection of data required for the GHG emissions monitoring under the project (director of project implementation department);
- drawing up of the monitoring report (director of project implementation department);
- check of correctness of the primary data and calculations GHG emissions reductions (director of project development department);
- interaction with the independent expert organization concerning verification of GHG emissions reductions (director of project implementation department).

The roles and responsibilities of technicians and engineers of OJSC "Ilim Group" related to collection, check-out and transfer of GHG emission reduction monitoring data are shown in Fig. C.2.1. The authorities of the responsible persons are recorded in the order FU/662 of 21.08.2009.

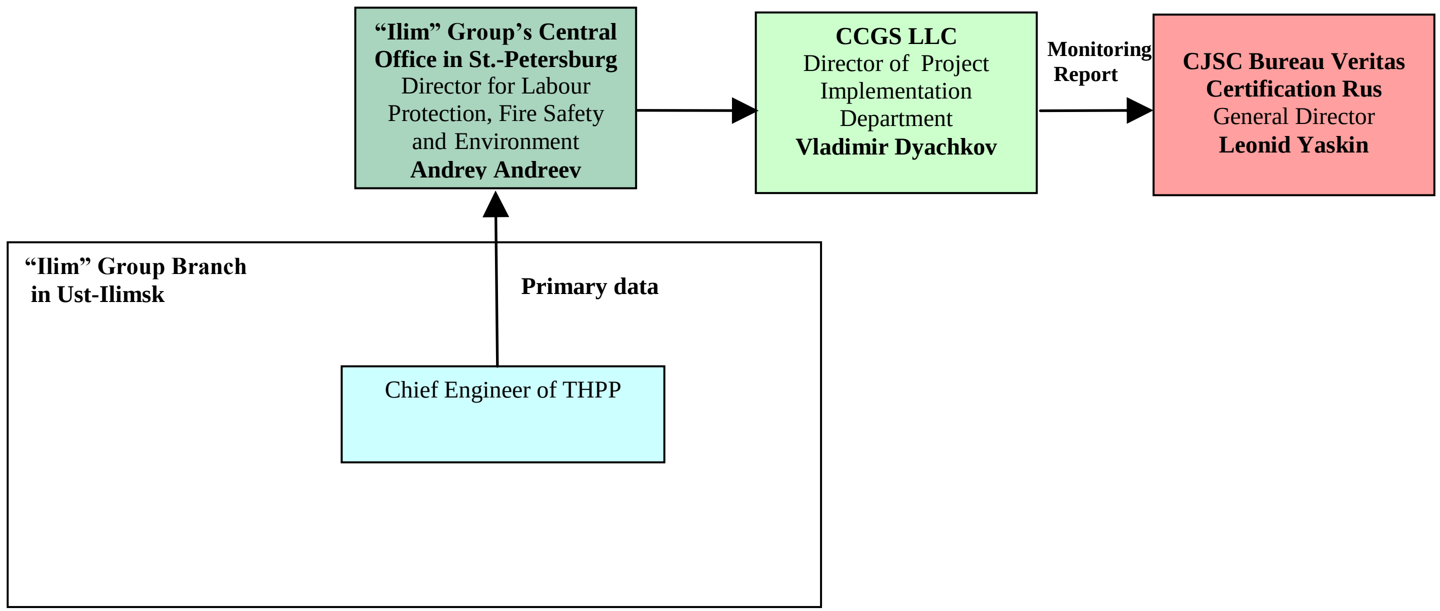

Fig. C.2.1. Data transfer scheme (from primary data to monitoring report).

C.2.3. Trainings:

All personnel of the bark-fired boiler house have undergone certification in accordance with the requirements of Rostekhnadzor.
Furthermore, in connection with the commissioning of KM boiler No.1, the personnel underwent training as provided for by the contract with the equipment supplier, "INECO", in accordance with the personnel's job content.
At least once per year CCGS LLC together with the management of OJSC "Ilim Group" Branch in the Town of Ust-Ilimsk shall arrange and hold training sessions for the boiler house personnel regarding collection of data required for the GHG emissions monitoring under the project.

Check-out of the equipment required for primary monitoring data collection and personnel training were carried out on 27-29 January 2009, 22-25 June 2009.

C.2.4. Involvement of Third Parties:

Avtomatika LLC is the Third Party involved.

C.3. Influence estimation on environment

The project helps to reduce coal combustion at UI CHPP. It results in lower emissions of both greenhouse gases and pollutants produced from coal combustion.

Table C.3.1 shows calculation data on the variation of pollutant emissions as a result of the project implementation. The calculations were made in accordance with RD 34.02.305-98 “The Methodology for Calculation of Gross Pollutant Emissions from TPP Boilers” [R5], issued by VTI.

As a result of the project the coal consumption at Ust-Ilimsk CHPP in year 2008 reduces by an average of 55 thousand tons. The emissions of sulfur dioxide reduce by 395 t/year, carbon oxide – by 178 t/year, nitrogen oxides (calculated as nitrogen dioxide) – by 195 t/year, and suspended particles – by 333 t/year. The overall reduction of gross pollutant emissions to the atmosphere amounts to 1101 t/year.

As a result of the project the coal consumption at Ust-Ilimsk CHPP in year 2009 reduces by an average of 65 thousand tons. The emissions of sulfur dioxide reduce by 465 t/year, carbon oxide – by 210 t/year, nitrogen oxides (calculated as nitrogen dioxide) – by 233 t/year, and suspended particles – by 392 t/year. The overall reduction of gross pollutant emissions to the atmosphere amounts to 1300 t/year.

Furthermore, the disposal of coal ash to the ash disposal site reduces as well.

Table C.3.1 Variation of pollutant emissions at UI CHPP, t/year

Pollutant emissions	Value	
	2008	2009
Suspended particles	-333	-392
Sulfur dioxide (SO_2)	-395	-465
Nitrogen oxides calculated as nitrogen dioxide (NO_2)	-195	-233
Carbon oxide (CO)	-178	-210
Total emissions	**-1101**	**-1300**

SECTION D. Calculation of GHG emission reductions

D.1 Calculation of the project GHG emission reductions

GHG emission reductions *without leakages* during the year y, t CO_2e:

$$ER'_y = ER_{Coal,UI\ CHPP,y} + ER_{BWW,dump,y}\ , \qquad (D.1\text{-}1)$$

where $ER_{Coal,UI\ CHPP,y}$ is the reduction of CO_2 emissions from coal combustion at UI CHPP during the year y, tCO_2e;

$$ER_{Coal,UI\ CHPP,y} = \Delta FC_{Coal,UI\ CHPP,y} \times EF_{CO2,coal} \times 10^{-3}\ , \qquad (D.1\text{-}2)$$

where $EF_{CO2,Coal}$ is the CO_2 emission factor for coal combustion, kg CO_2/GJ. For the entire project period it was assumed as follows $EF_{CO2,coal}$ = 98.92 kg CO_2/GJ. See Annex 1.

$\Delta FC_{Coal,UI\ CHPP,y}$ is the reduction of coal consumption at UI CHPP as a result of the project during the year y, GJ.

$$\Delta FC_{Coal,UI\ CHPP,y} = \frac{\Delta HG_{UI\ CHPP,y}}{\eta_{boiler,UI\ CHPP}}\ , \qquad (D.1\text{-}3)$$

where $\eta_{boiler,UI\ CHPP}$ is the efficiency of coal-fired boilers at UI CHPP. The efficiency was assumed constant over years and equal to $\eta_{boiler,UI\ CHPP}$ = 0.917 [R10, page 417];

$\Delta HG_{UI\ CHPP,y}$ is the reduction of heat production by UI CHPP’s boilers as a result of the project during the year y, GJ;

$$\Delta HG_{UI\ CHPP,y} = \frac{1.310 \times \Delta HS_{TPP,y}}{(1-q_{aux}) \times (1-q_{nw}) \times k_{HF}}\ , \qquad (D.1\text{-}4)$$

where q_{nw} is the relative losses in the heat networks (from UI CHPP to UI PPM). This value was assumed constant over years and equal to q_{nw} = 0.05 [R13, page 348];

k_{HF} is the heat flow factor. This value was assumed constant over years and equal to k_{HF} = 0.98 [R9, page 135, fig. 10.2];

q_{aux} is the relative heat consumption for auxiliary needs of UI CHPP. This value was assumed constant over years and equal to q_{aux} = 0.05 [R14, Annex 2, tabl.7];

1.310 is the factor that shows the relation between the variation of heat flow to the turbines and the variation of production steam extraction from the turbines [R11, page 95, table.4.6];

$\Delta HS_{TPP,y}$ is the increase of heat supply from the THPP as a result of the project during the year y, GJ.

$$\Delta HS_{TPP,y} = \varphi_{HS,TPP} \times \Delta HG_{TPP,y} , \qquad (D.1\text{-}5)$$

where $\varphi_{HS,TPP,y}$ is the factor of specific heat supply from the THPP in the year y, GJ/GJ;

$$\varphi_{HS,TPP,y} = \frac{HS_{TPP,PJ,y}}{HG_{TPP,PJ,y}} , \qquad (D.1\text{-}6)$$

where $HS_{TPP,PJ,y}$ is the heat supply from the THPP under the project during the year y, GJ;

$HG_{TPP,PJ,y}$ is the total heat production by the THPP's boilers under the project during the year y, GJ.

$$HG_{TPP,PJ,y} = HG_{1-5,PJ,y} + HG_{BLRB,y} , \qquad (D.1\text{-}7)$$

where $HG_{BLRB,y}$ is the total heat production by BLRBs during the year y, GJ;

$HG_{1-5,PJ,y}$ is the total heat production by KM boilers No.No.1-5 under the project during the year y, GJ.

$\Delta HG_{TPP,y}$ is the increase of heat production by the THPP's boilers as a result of the project during the year y, GJ.

$$\Delta HG_{TPP,y} = HG_{BWW,1,PJ,y} - HG_{BWW,1,BL,y} , \qquad (D.1\text{-}8)$$

where $HG_{BWW,1,PJ,y}$ is the BWW-based heat production by KM boiler No.1 under the project during the year y, GJ;

$$HG_{BWW,1,PJ,y} = \varepsilon_{steam,y} \times SG_{BWW,1,PJ,y} , \qquad (D.1\text{-}9)$$

where $\varepsilon_{steam,y}$ is the average annual factor for conversion of mass steam consumption to heat equivalent for the year y, GJ/t steam;

$$\varepsilon_{steam,y} = \frac{HG_{1-5,PJ,y}}{SG_{1-5,PJ,y}} , \qquad (D.1\text{-}10)$$

where $SG_{1\text{-}5,PJ,y}$ is the total steam production by KM boilers No.No.1-5 under the project during the year y, t.

$SG_{BWW,1,PJ,y}$ is the BWW-based steam production by KM boiler No.1 under the project during the year y, t;

$$SG_{BWW,1,PJ,y} = SG_{1,PJ,y} - \mu_{SG\ fuel\ oil,1,PJ} \times FC_{fuel\ oil,1,PJ,y}, \qquad (D.1\text{-}11)$$

where $SG_{1,PJ,y}$ is the steam production by KM boiler No.1 under the project during the year y, t;

$FC_{fuel\ oil,1,PJ,y}$ is the consumption of heavy fuel oil by KM boiler No.1 under the project during the year y, t;

$\mu_{SG,\ fuel\ oil,1,PJ}$ is the specific steam production based on heavy fuel oil combustion by KM boiler No.1 under the project, t steam/t heavy fuel oil. $\mu_{SG,\ fuel\ oil,1,PJ}$ = 11.6 t steam/t heavy fuel oil [R1, Section B1].

$HG_{BWW,1,BL,y}$ is the BWW-based heat production by KM boiler No.1 under the baseline during the year y, GJ.

Taking into account the fact that in case of decline in production the actual BWW-based heat production by KM boiler No.1 ($HG_{BWW,1,PJ,y}$) can be much lower than the planned level, and also taking into account the fact that even in case of a dramatic drop of production $HG_{BWW,1,PJ,y}$ value, in principle, cannot be less than $HG_{BWW,1,BL,y}$ value (otherwise GHG emissions reductions will be negative), certain reasonable restrictions were set on the value of BWW-based heat production by KM boiler No.1 under the baseline scenario.

$HG_{BWW,1,BL,y}$ takes on the minimum of the following three values:

- 1/4 of the maximum value of the total annual BWW-based heat production by KM boilers No.No.2-5 in the historical period 2000-2008[1];
- BWW-based heat production by KM boiler No.1 in the absence of the project provided that its annual consumption of BWW is equal to the actual consumption during this year y;
- BWW-based heat production by KM boiler No.1 under the project during the year y.

That is:

$$HG_{BWW,1,BL,y} = MIN\left\{\frac{1}{4} \times HG^{max}_{BWW,2-5}; FC_{BWW,1,PJ,y} \times \mu_{SG\ BWW,1,BL} \times \varepsilon_{steam,y}; HG_{BWW,1,PJ,y}\right\} \qquad (D.1\text{-}12)$$

[1] That is, the maximum BWW-based heat production by KM boiler No.1 that could have been achieved under the baseline scenario.

where $HG^{max}_{BWW,2-5}$ is the maximum total annual BWW-based production of heat by KM boilers No.No.2-5 in the historical period 2000-2008, GJ. $HG^{max}_{BWW,2-5}$ = 3 000 102 GJ, which is recorded in the year 2006 [R1, Section B1];

$\mu_{SG\ BWW,1,BL}$ is the specific steam production based on BWW combustion by KM boiler No.1 under the baseline scenario, t steam/t BWW. $\mu_{SG\ BWW,1,BL}$ = 2.083 t steam/t BWW [R1, Section B1];

$FC_{BWW,1,PJ,y}$ is the BWW consumption by KM boiler No.1 under the project during the year y, t.

$$FC_{BWW,1,PJ,y} = SG_{BWW,1,PJ,y} / \mu_{SG\ BWW,1,PJ} , \tag{D.1-13}$$

where $\mu_{SG\ BWW,1,PJ}$ is the specific BWW-based steam production by reconstructed KM boiler No.1, t steam/t BWW. $\mu_{SG\ BWW,1,PJ}$ = 2.326 t steam/t BWW [R1, Section B1].

$ER_{BWW,dump,y}$ is the CH_4 emission reductions from anaerobic decomposition of BWW at the dump during the year y, tCO_2e.

The numerical value of $ER_{BWW,dump,y}$ is determined using the Model "*Calculation of CO_2-equivalent emission reductions from BWW prevented from stockpiling or taken from stockpiles"* developed by "*BTG biomass technology group B.V."* based on [R3] (See Annex 2).

$$ER_{BWW,dump,y} = (1 - w_{lignin,BWW}) \times k_{BWW} \times \frac{C^{db}_{BWW}}{100} \times \left(1 - \frac{W_{BWW}}{100}\right) \times a \times \zeta \times \left(1 - \frac{\varphi}{100}\right) \times (1 - \zeta_{OX}) \times \frac{V_m}{100} \times \rho_{CH4} \times GWP_{CH4} \times \times \sum_{x=2003}^{x=y} \left(\Delta BWW_{dump,x} \times e^{-k_{BWW}(y-x)}\right) , \tag{D.1-14}$$

$\Delta BWW_{dump,x}$ is the reduction of BWW disposal to the dump as a result of the project during the year *x*, t;

$$\Delta BWW_{dump,x} = FC_{BWW,1,PJ,x} - FC_{BWW,1,BL,x} , \tag{D.1-15}$$

where $FC_{BWW,1,PJ,x}$ is the BWW consumption by KM boiler No.1 under the project during the year *x*, t;

$FC_{BWW,1,BL,x}$ is the BWW consumption by KM boiler No.1 under the baseline during the year *x*, t.

Taking into account the possibility of a decline in production and also the fact that even in case of a dramatic drop of production $FC_{BWW,1,PJ,x}$ cannot be less than $FC_{BWW,1,BL,x}$, certain reasonable restrictions were set on the value of BWW consumption by KM boiler No.1 under the baseline scenario.

$FC_{BWW,1,BL,x}$ takes on the minimum of the following two values:

- 1/4 of the maximum total annual consumption of BWW by KM boilers No.No.2-5 in the historical period 2000-2008[2];
- BWW consumption by KM boiler No.1 under the project during the year y.

That is:

$$FC_{BWW,1,BL,x} = MIN\left\{\frac{1}{4} \times FC^{\max}_{BWW,2-5}; FC_{BWW,1,PJ,x}\right\}, \qquad \text{(D.1-16)}$$

where $FC^{\max}_{BWW,2-5}$ is the maximum total annual consumption of BWW by KM boilers No.No.2-5 in the historical period 2000-2008, t. $FC^{\max}_{BWW,2-5}$ = 482 936 t, which was recorded in the year 2006 [R1, Section B1].

$w_{lignin,BWW}$ is the lignin fraction of C for BWW, it is assumed: $w_{lignin,BWW}$ = 0.25 [R3, page43];

k_{BWW} is the decomposition rate constant for BWW, year^{-1}, it is assumed: k_{BWW} = ln(1/2)/15 = 0.046 year^{-1} [R3, page42];

C^{db}_{BWW} is the organic carbon content in BWW on dry basis, %, it is assumed: C^{db}_{BWW} = 50% [R3, page45];

W_{BWW} is the moisture content of BWW, %, it is proposed to adopt the following default value for BWW: 50% [R3, page16]; we adopted a more conservative value: W_{BWW} = 60%;

it is assumed: W_{BWW} = 60% [R3, page16];

a is the conversion factor from kg carbon to landfill gas quantity, m^3/kg carbon, it is assumed: a = 1.87 m^3/kg carbon [R3, page 24];

ζ is the generation factor, it is assumed: ζ = 0.77 [R3, page41];

φ is the percentage of the stockpile under aerobic conditions, t%, it is assumed: φ = 10% [R3, page 80];

ζ_{OX} is the methane oxidation factor, it is assumed: ζ_{OX} = 0.10 [R3, page43];

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[2] That is, the maximum total consumption of BWW by KM boiler No.1, which could have been achieved under the baseline scenario.

V_m is the methane concentration biogas, S%, it is assumed: V_m = 60% [R3, page41];

ρ_{CH4} is the density of methane, kg/m^3, it is assumed: ρ_{CH4} = 0.714 kg/m^3 [R1, Section E4];

GWP_{CH4} is the global warming potential of methane, t CO_2e/t CH_4, it is assumed: GWP_{CH4} = = 21 t CO_2e/t CH_4 [R3, page 12];

y is the year for which to calculate the CO_2-equivalent reduction, year;

x is the year in which fresh biomass is utilized instead of stockpiled, year.

It should be noted that the methane emissions from anaerobic decomposition of BWW at the dump for each year *y* are calculated using BWW stockpiling reduction data starting with the year 2003. The data on reduction of BWW stockpiling for 2003-2007 were determined as of the date of baseline setting [R1, Section B1].

D.2 Calculation of the GHG Leakages

The leakages during the year y, t CO_2e:

$$L_y = L_{ES,y}, \qquad \text{(D.1-17)}$$

where $L_{ES,y}$ is the leakages from fuel combustion by power plants to offset the reduction of electricity supply to the grid as a result of the project during the year y, tCO_2e.

$$L_{ES,y} = \Delta ES_y \times EF_{CO2,grid,y} \qquad \text{(D.1-18)}$$

where $EF_{CO2,grid,y}$ is the CO_2 emission factor for grid electricity, tCO_2/MWh. According to “Operational Guidelines for Project Design Documents of Joint Implementation Projects” [R4, page 43] this factor for Russia is specified depending on the year under consideration as follows: $EF^{2008}_{CO2,grid}$ = 0.565 tCO_2/MWh, $EF^{2009}_{CO2,grid}$ = 0.557 tCO_2/MWh;

ΔES_y is the reduction of electricity supply to the grid as a result of the project during the year y, MWh.

$$\Delta ES_y = \Delta ES_{UI\ CHPP,y} - \Delta ES_{TPP,y}, \qquad \text{(D.1-19)}$$

where $\Delta ES_{UI\ CHPP,y}$ is the reduction of heat-production-based electricity supply from UI CHPP as a result of the project during the year y, MWh.

$$\Delta ES_{UI\ CHPP,y} = \frac{0.305 \times \Delta HS_{TPP,y} \times (1 - e_{aux})}{3.6 \times (1 - q_{nw})}, \qquad (D.1\text{-}20)$$

where e_{aux} is the value of relative electricity consumption for auxiliary needs of UI CHPP. This value is assumed constant over years and equal to e_{aux} = 0.05 [R9, page 18];

0.305 is the factor that describes the relation between the variation of heat-production-based electricity generation and the variation of production steam extraction [R11, page 95, table.4.6].

$\Delta ES_{TPP,y}$ is the increase of electricity supply from the THPP as a result of the project during the year y, MWh.

$$\Delta ES_{TPP,y} = \varphi_{ES,TPP} \times \Delta HG_{TPP,y}, \qquad (D.1\text{-}21)$$

where $\varphi_{ES,TPP,y}$ is the factor of specific electricity supply from the THPP in the year y, MWh/GJ;

$$\varphi_{ES,TPP,y} = \frac{ES_{TPP,PJ,y}}{HG_{TPP,PJ,y}}, \qquad (D.1\text{-}22)$$

where $ES_{TPP,PJ,y}$ is the supply of electricity from the THPP under the project during the year y, MWh.

D.3 Calculation of the project GHG emission reductions

GHG emission reductions as a result of the project during the year y, tCO_2e:

$$ER_y = ER'_y - L_y. \qquad (D.1\text{-}23)$$

The calculation method of GHG emission reductions was implemented in the computational model in the form of excel-file (Annex 4).

The calculation results are presented in the Table D.3.1.

Table D.3.1. Calculation of reduction of emissions GHG for year y

Parameter	Symbol	Unit	Value	
			2008	**2009**
Project emissions				
Reduction of CO_2 emissions from coal combustion at UI CHPP	$ER_{Coal,UI\ CHPP,y}$	t CO_2e	88 091	103 778
Reduction of BWW disposal to the dump	$ER_{BWW,dump,y}$	t CO_2e	40 661	46 801
GHG emission reductions *without leakages*	$ER_y^{'}$	**t CO_2e**	**128 752**	**150 579**
Leakages				
Reduction of electricity supply to the grid	ΔES_y	MWh	33 643	39 517
CO_2 emission factor for grid electricity	$EF_{CO2,grid,y}$	tCO_2/MWh	0.565	0.557
Leakages from fuel combustion by power plants to offset the reduction of electricity supply to the grid	$L_{ES,y}$	**t CO_2e**	**19 008**	**22 011**
GHG emission reductions				
GHG emission reductions	ER_y	**t CO_2e**	**109 744**	**128 568**

In accordance with the PDD, the projected GHG emission reductions amount to **109 746** t CO_2e for 2008.

In accordance with the PDD, the projected GHG emission reductions amount to **117 911** t CO_2e for 2009.

Higher levels of GHG emission reductions as monitored in 2009 against the PDD estimations are due to the fact that more BWW was actually fired in KM-1 boiler than it had been planned (219 338 t for PDD, 230 401 t for monitoring) and more steam production in KM-1 boiler than it had been planned (510 088 t for PDD, 550 818 t for monitoring).

CCGS LLC
23.06.2010

V. Dyachkov - Director of Project Implementation Department

Evgeniy Zhuravskiy, Specialist of Project Implementation Department

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ANNEX 1.

Selection of the emission factor for coal combustion at Ust-Ilimsk CHPP

Ust-Ilimsk CHPP is firing two grades of coal[3], their characteristics[4] are shown in the table below.

Characteristics of fuel combusted at Ust-Ilimsk CHPP

Parameter	Designation	Unit	Irsha-Borodinsky coal (Kansko-Achinsky coal field)	Zheronsky coal (Tungussky coal field)
Net calorific value on as-received basis	NCV_{Coal}	kcal/kg	3 650	4 430
		MJ/kg	15.28	18.55
Ash content on dry basis	A^d	%	11	24
Moisture content on as-received basis	W_t^r	%	33	18
Carbon content on dry ash-free basis	C^{daf}	%	71.5	80.3

GHG emission factors for fuel combustion, in general case, account for emissions of CO_2, CH_4 and N_2O. However the contribution of CH_4 and N_2O to the total amount of GHG emissions from fuel combustion is negligibly small[5] (considering their Globing Warming Potentials), therefore they are neglected in our calculations.

The $EF_{CO2,coal}$ factor shall be determined on the basis of the data available. The CO_2 emission factors directly depend on the carbon content of a fuel and can be calculated as follows, kg/GJ:

$$EF_{CO2,coal} = \frac{44}{12} \cdot K_C$$

where K_C is the factor of carbon content per energy unit of fuel on as-received basis, kg C/GJ;

$$K_C = 10 \cdot \frac{C^r}{NCV_{Coal}}$$

where NCV_{Coal} is the net calorific value of fuel on as-received basis, MJ/kg.

C^r is the carbon content of fuel on as-received basis, %,

$$C^r = C^{daf} \cdot \frac{100 - A^r - W_t^r}{100}$$

where W_t^r is the moisture content of fuel on as-received basis, %;

C^{daf} is the carbon content of fuel on dry ash-free basis, %;

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3 http://www.irkutskenergo.ru/qa/968.2.html

4 According to the Reference Book *Energy Fuel of the USSR, M. Energoatomizdat, 1991* [R6].

5 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 2, Energy [R7].

A^r is the ash content of fuel on as-received basis, %;

$$A^r = A^d \cdot \frac{100 - W_t^r}{100}$$

where A^d is the ash content of fuel on dry basis, %.

The calculation results are given in the table below.

Emission factors for coal grades combusted at Ust-Ilimsk CHPP

Emission factor	Unit	Irsha-Borodinsky coal (Kansko-Achinsky coal field)	Zheronsky coal (Tungussky coal field)
$EF_{CO2,coal}$	kgCO_2/GJ	102.31	98.92

Since the exact ratio of these coal grades is not known for each year of the crediting period, we conservatively assumed the minimum emission factor of 98.92 kg CO_2/GJ for the entire period of 2008-2012.

ANNEX 2.

Calculation of methane emissions from anaerobic decomposition of BWW at the dump

Calculation of CO_2-equivalent emission reduction from BWW prevented from stockpiling or taken from stockpiles

General input data		
Conversion factor organic carbon to biogas (a)	1,87	m^3 biogas/kg carbon
GWP CH_4	21	
Density methane	0,714	kg/m^3
Methane concentration biogas	60%	
Half-life biomass (tau)	15	year
Decomposition constant (k)	0,046	$year^{-1}$
Generation factor (zeta)	0,77	
Methane oxidation factor	0,10	
Percentage of the stockpile under aerobic conditions	10%	

Biomass specific input data	Biomass from stockpile	Fresh	
Organic carbon content (db)		50,0%	db
Moisture content		60%	wb
Organic carbon content (wb)	0,0%	20,0%	wb
Lignin fraction of C		0,25	

Year	Fresh biomass prevented from stockpiling or taken from stockpile			2008	2009
	Biomass from stockpile (ton_w)	Age of biomass (years)	Fresh (ton_w)		
2003			116 791	6 742	6 437
2004			87 982	5 319	5 079
2005			127 364	8 064	7 700
2006			99 350	6 588	6 290
2007			103 442	7 184	6 859
2008			93 009	6 765	6 459
2009			109 667		7 976
2010					
2011					
2012					
2013					
2014					
2015					
2016					
2017					
Total	**0**		**737 605**		
	Total emission prevention			**40 661**	**46 801**
	Cumulative total emission prevention			**151 580**	**198 381**

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This spreadsheet model is based on the report: "Methane and Nitrous Oxide Emissions from Biomass Waste Stockpiles", Worldbank PCF *plus* research, August 2

ANNEX 3.

Regulations on the procedure for quality control of GHG emission reduction project design documents and monitoring reports at CCGS LLC

CCGS

Approved by
Director General

M.Yulkin
December 8, 2009

REGULATIONS

on quality check and control of GHG emission reduction project design documents (PDD) and monitoring reports at CCGS LLC

1. GENERAL PROVISIONS

1.1. These regulations specify the quality control procedure for development of project design documents (PDDs) and monitoring reports for the projects aimed at GHG emission reduction from sources and/or increase of removal by sinks (hereinafter the “Projects”).

1.2. The quality control of PDDs and monitoring reports is carried out in conjunction with the structural subdivisions (departments) of CCGS LLC (hereinafter the “Company”) and the Project Owners (hereinafter the “Client”).

1.3. The quality control of PDDs and monitoring reports precedes their submission to an independent auditor for review.

2. QUALITY CONTROL OF PROJECT DESIGN DOCUMENTS

2.1. The PDD developed by a specialist of the Project Development Department shall undergo the following quality control procedure:

2.1.1. The PDD shall be checked up by the Director of the Project Development Department or, on his instructions, by other specialist of the Project Development Department who was not directly involved in development of this PDD;

2.1.2. Corrective actions shall be taken by the PDD developer and all corrections and amendments shall be agreed with the Director of the Project Development Department;

2.1.3. The PDD shall be checked up by the Director of the Project Implementation Department or, on his instructions, by other specialist of the Project Implementation Department;

2.1.4. Corrective actions shall be taken by the PDD developer and all corrections and amendments shall be agreed with the Director of the Project Implementation Department;

2.1.5. Final check-up and correction of the PDD shall be made by the Director of the Project Development Department;

2.1.6. The PDD shall be submitted to the Client for review;

2.1.7. Corrective actions shall be taken by the PDD developer and all corrections and amendments shall be agreed with the Client and the Director of the Project Development Department and if necessary with the Director of the Project Implementation Department;

2.1.8. The PDD shall be furnished to the Director General and the Client.

2.2. Upon completion of the above-described procedure and if there are no comments from the Director General and/or from the Client the PDD shall be deemed ready for determination by an independent auditor. Otherwise the procedure shall be repeated.

2.3. The Director of the Project Development Department shall check all sections of the PDD.

2.4. The Director of the Project Implementation Department shall check those sections of the PDD which describe the project monitoring plan and procedure. Other sections shall be checked by the Director of the Project Implementation Department if necessary or at his discretion.

2.5. The Director General shall take the final decision regarding submission of the PDD for determination to an independent auditor.

3. QUALITY CONTROL OF PROJECT MONITORING REPORTS

3.1. The project monitoring report prepared by a specialist of the Project Implementation Department shall undergo the following quality control procedure:

3.1.1. The project monitoring report shall be checked up by the Director of the Project Implementation Department or, on his instructions, by other specialist of the Project Implementation Department who was not directly involved in preparation of this project monitoring report;

3.1.2. Corrective actions shall be taken by the monitoring report developer and all corrections and amendments shall be agreed with the Director of the Project Implementation Department;

3.1.3. The project monitoring report shall be checked up by the Director of the Project Development Department or, on his instructions, by other specialist of the Project Development Department;

3.1.4. Corrective actions shall be taken by the monitoring report developer and all corrections and amendments shall be agreed with the Director of the Project Development Department;

3.1.5. Final check-up and correction of the monitoring report shall be made by the Director of the Project Implementation Department;

3.1.6. The monitoring report shall be submitted to the Client for review;

3.1.7. Corrective actions shall be taken by the monitoring report developer and all corrections and amendments shall be agreed with the Client and the Director of the Project Implementation Department and, if necessary, with the Director of the Project Development Department;

3.1.8. The monitoring report shall be submitted to the Director General and the Client.

3.2. Upon completion of the above-described procedure and if there are no comments from the Director General and/or from the Client the monitoring report shall be deemed ready for verification by an independent auditor. Otherwise the procedure shall be repeated.

3.3. The Director of the Project Implementation Department shall check all sections of the monitoring report.

3.4. The Director of the Project Development Department shall check those sections of the monitoring report which contain results of calculations of GHG emission reductions from sources and/or increase of GHG removals by sinks. Other sections shall be checked up by the Director of the Project Development Department if necessary or at his discretion.

3.5. The Director General shall take the final decision regarding submission of the monitoring report for verification to an independent auditor.