MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

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* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT
Version 01 - 19/03/2011

Nueva Aldea Biomass Power Plant Phase 2
UNFCCC 0346
Monitoring Period #4: 01/01/2010 - 31/12/2010

SECTION A. General description of the project activity

A.1. Brief description of the project activity:

The project activity consists in a new 37 MW grid-connected biomass cogeneration power plant located inside a forestry complex by Arauco: the Nueva Aldea Complex or the Nueva Aldea Project. The power plant consists in a new pulp mill equipped with 2 X 70 MW gross generation capacity, of which 37 MW are destined to power generation to the grid.

The project activity is designed to use black liquor[1] (biomass) for steam and electric power generation in a cogeneration power plant located inside a new bleached pulp mill site. The project activity is owned by Celulosa Arauco y Constitución S.A. (from now on, Arauco), a leading forestry and pulp-producing company in Chile.

Though modern pulp mills are currently designed to be self-sufficient in terms of steam and electric power generation, the Nueva Aldea pulp mill was deliberately designed to generate a considerable amount of surplus power to the grid. Considering the higher cost of building a pulp mill with additional power generation to the grid, the decision of building such power plant relied on the possibility of selling the excess power to the grid and on the benefits of being a CDM project activity.

The project activity assists Chile's sustainable growth by providing electricity to the Nueva Aldea Industrial Complex and to the SIC through biomass power generation, which is a clean and renewable energy source. The Nueva Aldea Phase 2 project participants believe that biomass power generation constitutes a sustainable source of power generation that brings clear advantages to mitigate global warming. Using the available natural resources in a rational way, the Nueva Aldea Phase 2 project activity helps to promote the development of renewable energy sources in Chile, in particular the use of biomass generated as a by-product of the forestry industry, which has a significant potential in the country. The project is a good example to demonstrate the viability of power generation as a source of revenue not only to the Pulp industry, but also to all forest-related industries. It is worthy to highlight, however, that very few pulp mills in Chile have this additional power generation capacity, making the Nueva Aldea Power Plant Phase 2 quite unique and particular in its type. Although this technological improvement is consistent with the internal policies of efficient energy usage of Arauco; it must be recognized as an initiative that goes beyond the common practice of the Pulp industry in Chile.

[1] Black liquor is an organic by-product of the pulp production Kraft cycle and falls under the category of *biomass residue*, according to the "Clarifications of definitions of biomass and consideration of changes in carbon pools due to a CDM project activity", Annex 8, of 20th Executive Board meeting report.

Relevant dates for the project activity:

Date (DD/MM/YY)	Key events
March 2005	Approval permits to start construction activities
31/08/2006	Commissioning start date
01/04/2007 to 30/09/2007	The 1st monitoring period
01/10/2007 to 30/09/2008	The 2nd monitoring period
01/10/2008 to 31/12/2009	The 3rd monitoring period
01/01/2010 to 31/12/2010	The fourth monitoring period (this report)

Total net emission reductions claimed in the monitored period (from January 1st 2010 to December 31st 2010) are 170,324 tCO_2e.

A.2. Project Participants

Name of Party involved	Private and / or public entity(ies) project participants (*) (as applicable)	Party involved considered as project participant
Chile (Host)	Celulosa Arauco y Constitución S.A.	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party (ies) involved is required.		

A.3. Location of the project activity:

The proposed project activity is located in the Nueva Aldea Industrial Complex site. The Nueva Aldea Industrial Project is located near the Nueva Aldea community area, Comuna of Ránquil, in the province of Ñuble. It is 30 km. west of the Chillán city and 28 km. Southeast of the Coelemu city in the VIII Region (Bío-Bío Region), Chile. The project site is centered at the geographical coordinates 36°39´18" S and 72°28´31" N.

A.4. Technical description of the project

The project activity consists in a new 37 MW grid-connected biomass cogeneration power plant, located inside a forestry complex by Arauco: the Nueva Aldea Complex. The power plant consists in a new pulp mill equipped with 2 X 70 MW gross generation capacity, of which 37 MW are destined to generate surplus power to the grid.

The project activity is designed to use black liquor[2] (biomass) for steam and electric power generation in a cogeneration power plant, located inside a new bleached pulp mill site.

Phase 2 of the Nueva Aldea Project contemplated the construction of a pulp mill, which adds approximately 37 MW to the grid. Though modern pulp mills are currently designed to be self-sufficient in terms of steam and electric power generation, the Nueva Aldea pulp mill was deliberately designed to generate a considerable amount of surplus electric power to the grid.

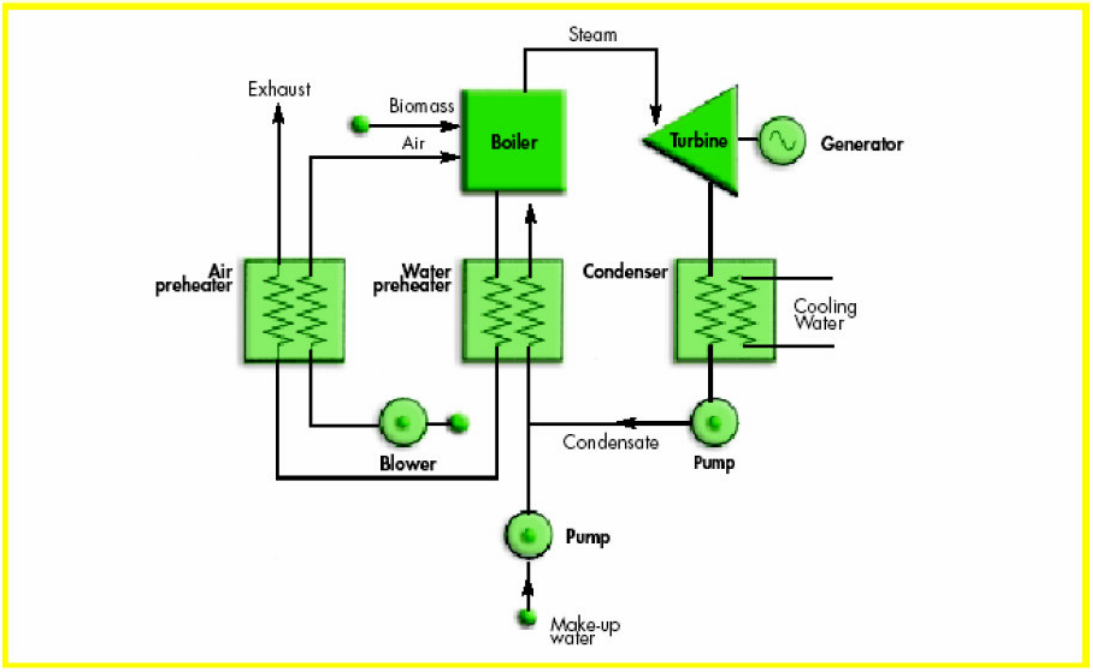
The technology used in this project (which is also the predominant technology everywhere in the world today) for generating megawatt (MW) levels of electricity from biomass is the steam-Rankine cycle, which consists of direct combustion of biomass in a boiler to generate steam, which is then expanded through a turbine. The steam-Rankine technology is a mature technology, having been introduced into commercial use about 100 years ago. Most steam cycle plants are located at industrial sites, where the waste heat from the steam turbine is recovered and used for meeting industrial-process heat needs. Such combined heat and power (CHP), or cogeneration systems provide greater levels of energy services per unit of biomass consumed than systems that generate electric power only.

The steam-Rankine cycle involves heating pressurized water, with the resulting steam expanding to drive a turbine-generator, and then condensing back to water for partial or full recycling to the boiler. A heat exchanger is used in some cases to recover heat from fuel gases to preheat combustion air, and a deaerator must be used to remove dissolved oxygen from water before it enters the boiler.

Steam turbines are designed as either “backpressure” or “condensing” turbines. CHP applications typically employ backpressure turbines, wherein steam expands to a pressure that is still substantially above ambient pressure. It leaves the turbine still as a vapor and is sent to satisfy industrial heating needs, where it condenses back to water. It is then partially or fully returned to the boiler. Alternatively, if process steam demands can be met using only a portion of the available steam, a condensing extraction steam turbine (CEST) might be used. This design includes the capability for some steam to be extracted at one or more points along the expansion path for meeting process needs (Figure 2). Steam that is not extracted continues to expand to sub-atmospheric pressures, thereby increasing the amount of electricity generated per unit of steam compared to the backpressure turbine. The non-extracted steam is converted back to liquid water in a condenser that utilizes ambient air and/or a cold water source as the coolant.

[2] Black liquor is an organic by-product of the pulp production Kraft cycle and falls under the category of *biomass residue*, according to the “Clarifications of definitions of biomass and consideration of changes in carbon pools due to a CDM project activity”, Annex 8, of 20th Executive Board meeting report.

Figure 2: Schematic diagram of a biomass-fired steam-Rankine cycle for cogeneration using a condensing-extraction steam turbine.



Source: Williams & Larson, 1993 apud Kartha & Larson, 2000, p. 101.

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

The name of the approved baseline methodology applied to the proposed project activity is:

ACM0006 (Version 02): "Consolidated baseline methodology for grid connected electricity generation from biomass residues". Applied baseline scenario for the project activity: Nº 4.

The project activity also relies on the following methodology:

ACM0002 (Version 05): "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

A.6. Registration date of the project activity:

The project was validated by DNV and registered in June 02, 2006. The Project Design Document, validation report, request for registration and registration approval are available on the UNFCCC website: http://cdm.unfccc.int/Projects/registered.html.

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

Starting date of the first crediting period:	01/04/2007 (See Note below)
End date of the first crediting period:	31/03/2014
Length of the first crediting period:	Seven (7) years
Maximum length of the crediting period:	3 x Seven (7) years

Note: The original starting date established in the registered PDD was 01/08/2006. Due to some technical problems during the start-up operation, the project proponent requested a delay of the starting date of the first crediting period of 8 months to April 1st, 2007.

A.8. Name of responsible person(s)/entity(ies):

Organization:	CELULOSA ARAUCO Y CONSTITUCIÓN S.A.
Street/P.O.Box:	El Golf 150
Building:	--
City:	Santiago
State/Region:	Región Metropolitana
Postfix/ZIP:	
Country:	Chile
Telephone:	56-2- 462 7000
FAX:	56-2-462 7003
E-Mail:	cpatrickson@arauco.cl
URL:	www.arauco.cl
Represented by:	
Title:	Development Manager of Arauco Generación S.A.
Salutation:	Mr.
Last Name:	Patrickson
Middle Name:	Albert
First Name:	Christian
Department:	
Mobile:	56-9158 3483
Direct FAX:	56-2-4623857
Direct tel:	56-2-4623795
Personal E-Mail:	cpatrickson@arauco.cl

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

The project activity has been completed as planned and described in the Project Design Document (PDD). The starting date of the operation of the project activity was 01/04/2007 and it has operated as described in the CDM PDD: It must be noted that the only change has been made to the starting date of the first crediting period (MP1) of the project activity due to some technical problems during the start-up process.

Description of plant operation during the 4th monitoring period (Jan 01, 2010 – Dec 31, 2010)

An earthquake with an intensity of 8.8 ° in the righter scale occurred approximately at 03:34 am, on February 27th of 2010 affecting the central zone and part of the south zone of the country including the project site. Even though some damage occurred, specialized engineers checked on every structure, and no mayor structural damage happened. Shortly after that, basic services were re-established. Nevertheless, a plant shutdown was done, where maintenance was done to the plant equipment. In summary, the Plant confronted the emergency correctly, and after a reasonable time, production was normal again.

The following table shows the shut down/stoppages of the project activity due to regular maintenance program during the monitoring period, and also the irregular stoppages, caused by the earthquake.

Out of service day	Starting day	Number of days shut down/stopagges	Comments
07/02/2010	13/02/2010	7	Maintenance
27/02/2010			**Earthquake**
27/02/2010	21/03/2010	23	Shutdown
22/03/2010	15/04/2010	25	Maintenance stoppage
16/04/2010	06/05/2010	22	Abnormal Operation*
	07/05/2010		Resuming of Normal Operation
14/05/2010	15/05/2010	2	Maintenance
27/12/2010	28/12/2010	2	Maintenance

* Note: Abnormal operation means the power plant was operating lower than its normal production, meaning less biomass was consumed, and less electricity was generated,

No events or situations occurred during the monitoring period, which may impact the applicability of the methodology.

B.2. Revision of the monitoring plan

The monitoring plan was revised, and has been approved by the EB in 10/10/2008. It must be noted that monitoring plan was revised due to the Project Proponent determined the net electricity displaced from the grid, by directly measuring the surplus of electric power delivered to the grid by the new biomass power plant, instead of using equation 13 of the ACM0006 Version 02. Although this approach was accepted and the project activity was successfully registered, in order to follow the guidelines or rules of the CDM, during the first verification the DOE submit a revised monitoring plan to follow the equation 13. Therefore, the revised monitoring plan was approved and is being used by the Project Proponent.

B.3. Request for deviation applied to this monitoring period

There has not been any request for deviation applied to this monitoring period.

B.4. Notification or request of approval of changes

There has not been any notification or request of approval of changes.

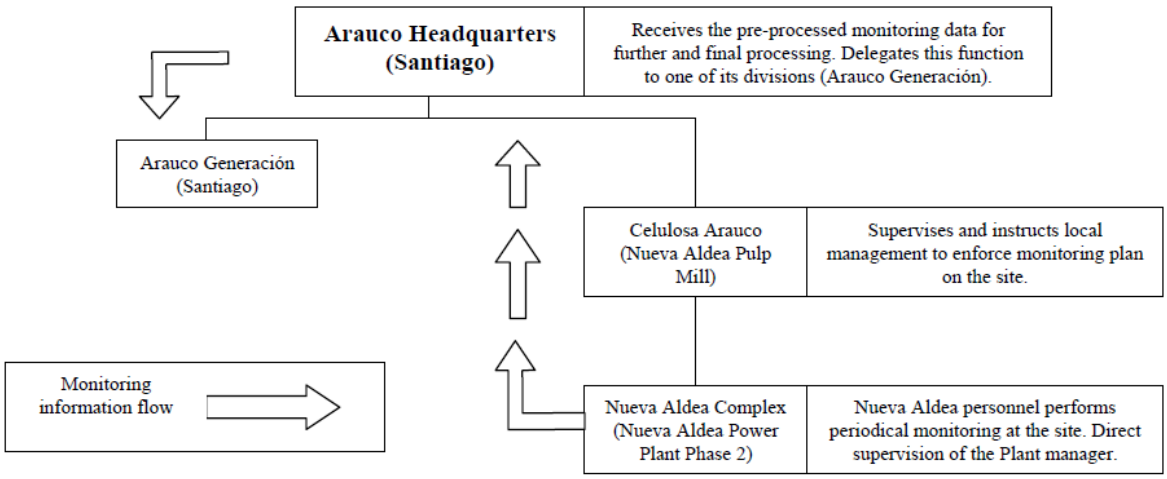
SECTION C. Description of the monitoring system

The project proponent, Arauco, has implemented monitoring procedures according to the monitoring methodology chosen for this project activity. This monitoring methodology accounts for emission reductions in an accurate and conservative manner.

Arauco counts with on-site personnel (at the project activity site), who are in charge of gathering and registering all the required information described in the monitoring plan. Such duties are incorporated to the personnel's everyday activities to ensure continuity and high-quality standards. Quantity of biomass used, fossil fuel consumption and net quantity of electricity generated data is monitored continuously and automatically by the Data Control System (DCS) the data is downloaded by the IP system and inserted automatically in an Excel spreadsheet. The data is recorded daily and then is aggregated monthly. The information is partially processed and stored on-site, and is sent periodically (monthly) to Arauco Bioenergía S.A.(ex-Arauco Generación S.A.) in Santiago for further and final processing (table formats, reports, etc.). With the information at this level, Arauco is then in condition to verify the emission reduction of the Nueva Aldea Power Plant Phase 2 project activity periodically (i.e. once every year).

The following table shows the monitoring information flow implemented by Arauco Bioenergia S.A. for the project activity.

Monitoring information flow of Nueva Aldea Power Plant Phase 2 project activity



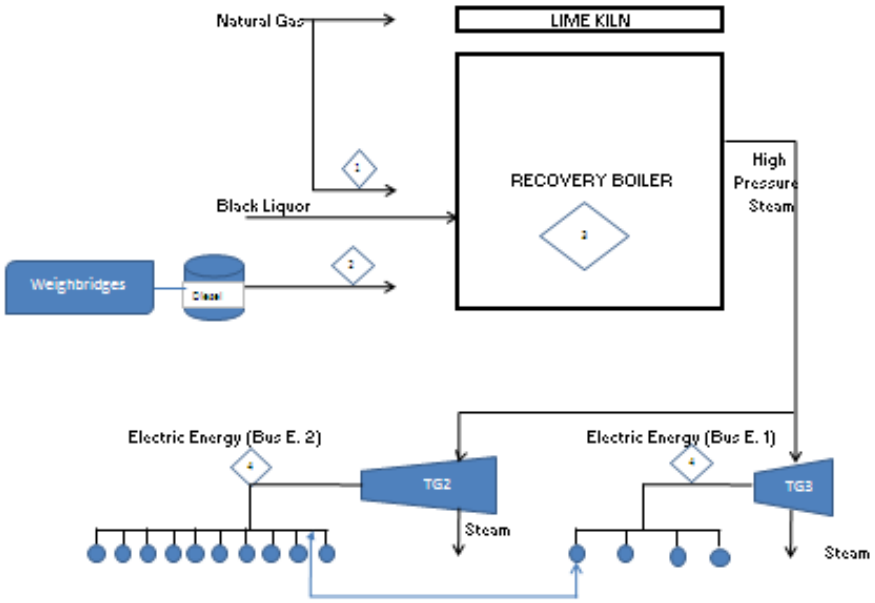
The following diagram below shows all the relevant monitoring points, including the instruments used to measure the variables that are part of the monitoring plan.

Basically, the fuels (mainly black liquor) are combusted in the recovery boiler, where high pressure steam is produced and then transported to the turbines (TG2 and TG3). The turbines generate electricity (part of it goes to supply the pulp mill processes, and part goes to the grid) and steam (used internally, for pulp production).

The amount of fuels consumed in the recovery boiler, and the electricity generated by the turbines, are directly measured, by the instruments that can be seen at the following diagram and table. The instruments are calibrated/checked according to the specification of the manufacturer or proper industry standards and all the calibration certificates are saved.

This diagram shows all relevant monitoring points:

Line Diagram of the Instruments



Item	TAG	Instrument
1	552-FT-471	Natural Gas Meter (Start-up Burners)
	552-FT-483	Natural Gas Meter (Load Burners)
2	552-FT-663	Diesel Meter (Start-up Burners)
	552-FT-668	Return Diesel Meter (Start-up Burners)
	552-FT-671	Diesel Meter (Load Burners)
	552-FT-674	Return Diesel Meter (Load Burners)
3	552-FT-378	Black Liquor Flow Meter (Nozzle) 1-3
	552-FT-380	Black Liquor Flow Meter (Nozzle) 4-7
	552-FT-382	Black Liquor Flow Meter (Nozzle) 8-10
	552-FT-384	Black Liquor Flow Meter (Nozzle) 11-14
	552-DT-370-A	Refractometer
	552-DT-370-B	Refractometer
	552-TI-365	Black Liquor Temperature Transmitter
4	568-PML-12	Energy Meter Switchgear 1-2
	568-PML-25	Energy Meter Switchgear 2-5

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	$\varepsilon_{el,\ other\ plant(s)}$
Data unit:	(%)
Description:	Average net energy efficiency of electricity generation in (the) other power plant(s) that would use the biomass fired in the project plant in the absence of the project activity.
Source of data used:	The reference pulp mill's electric efficiency of 12.31% was calculated taking into account the following considerations: • The chosen baseline scenario for the Nueva Aldea Phase 2 project activity that states that the reference pulp mill would be self-sufficient in electric and thermal power generation. This baseline scenario is consistent with the current BAT (Best Available Technology) for non-integrated bleached pulp mills, such as the Nueva Aldea Phase 2 pulp mill. According to the above, the chosen efficiency of 12.31% was deemed conservative and appropriate.
Value(s) :	12.31%
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions calculations
Additional comment:	--

Data / Parameter:	GWP_{CH4}
Data unit:	(tCO_2e/tCH_4)
Description:	Global Warming Potential for CH_4.
Source of data used:	IPCC
Value(s) :	21 for the first commitment period. Shall be updated according to any future COP/MOP decisions.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Until the next COP/MOP decision, it is the accepted value for emission reduction calculations in CDM project activities.
Additional comment:	--

D.2. Data and parameters monitored	
Data / Parameter:	$BF_{i,y}$
Data unit:	(tDS (tonnes dry solids))
Description:	Quantity of biomass type i used as fuel in the project plant during the year y in a volume or mass unit.
Measured /Calculated /Default:	Measured
Source of data:	This variable was directly monitored using dedicated flow meters. The direct measurement of the % of dry solids and the temperature of the liquid biomass flow allow determining the flow of dry solids to the recovery boiler.
Value(s) of monitored parameter:	1,295,455 (tDS)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions calculations
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	552-FT-378 Type: Black Liquor Flow Meter (Nozzle) (1-3). ABB FSM 4000 Accuracy class: +/- 0.5% Serial number: 000402556/X001 Calibration frequency: Calibration is not required; however, periodics verifications are done for this instrument. Date of last calibration: 22-08-2005 552-FT-380 Type: Black Liquor Flow Meter (Nozzle) (4-7.). ABB FSM 4000 Accuracy class: +/- 0.5% Serial number: 000402556/X003 Calibration frequency: Calibration is not required; however, periodics verifications are done for this instrument. Date of last calibration: 19-08-2005 552-FT-382 Type: Black Liquor Flow Meter (Nozzle) (8-10). ABB FSM 4000 Accuracy class: +/- 0.5% Serial number: 000402556/X002 Calibration frequency: Calibration is not required; however, periodics verifications are done for this instrument. Date of last calibration: 22/08/2005 552-FT-384 Type: Black Liquor Flow Meter (Nozzle) (11-14). ABB FSM 4000 Accuracy class: +/- 0.5% Serial number: 000402556/X004 Calibration frequency: Calibration is not required; however, periodics verifications are done for this instrument. Date of last calibration: 19/08/2005 552-DT-370-A Type: Refractometer K-Patents PR-01-S Accuracy class: +/- 0.1%DS Serial number: 2005B16-6232

	Calibration frequency: Biannual verification Date of penultimate calibration: 15/01/2009 Date of last calibration: 23/03/2010 Validity: 22/03/2012 552-DT-370-B Type: Refractometer K-Patents PR-01-S Accuracy class: +/- 0.1%DS Serial number: 2005B17-6233 Calibration frequency: Biannual verification Date of penultimate calibration: 15/01/2009 Date of last calibration: 23/03/2010 Validity: 22/03/2012 552-TI-365 Type: Black Liquor Temperature Transmitter Rosemount 3144PD1A1NAB4C4Q4 Accuracy class: +/- 0.1°C Serial number: 494356 Calibration frequency: 5 years Date of penultimate calibration: 04/12/2005 Date of last calibration: 27/03/2010 Validity: 26/03/2015
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Biomass flows were crosschecked considering two different biomass flow measurements to the recovery boiler. All instruments received proper maintenance and calibration according to the relevant industry standards. In addition, the project proponent performed an energy / mass balance of the biomass power plant that considered the biomass (black liquor in tDS) burned in the recovery boiler, the heat and the electric power generation during the monitored period. All values were found to be consistent.

Data / Parameter:	NCV_i
Data unit:	(GJ/ tDS (tonnes dry solids))
Description:	Net calorific value of biomass type i per mass or volume of biomass.
Measured /Calculated /Default:	Measured.
Source of data:	This variable was measured in a specialized laboratory. The measurement was carried out according to proper industry standards.
Value(s) of monitored parameter:	10.29 (GJ/tDS)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions calculations.
Monitoring equipment (type,	Not Applicable.

accuracy class, serial number, calibration frequency, date of last calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	The measured net calorific value of the biomass (black liquor) was consistent with the values of net calorific values found for Sulphite Lyes (black liquor) in Table 1.2, Volume 2 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Data / Parameter:	$COEF_{CO2,i}$
Data unit:	Diesel: (tCO_2/000ton) Natural Gas: (tCO_2/MMm^3)
Description:	CO2 emission factor of the fossil fuel type i used in the project plant.
Measured /Calculated /Default:	Calculated.
Source of data:	The project proponent used IPCC default factors for these coefficients.
Value(s) of monitored parameter:	Diesel: 3,179 (tCO_2/000ton) Natural Gas: 2,081 (tCO_2/MMm^3)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	$COEF_{CO2,diesel}$= NCV_{diesel} *Carbon content of diesel* Fraction of carbon oxidized* CO2 / C conversion factor $COEF_{CO2,natural\ gas}$= $NCV_{natural\ gas}$ *Carbon content of natural gas * Fraction of carbon oxidized* CO2 / C conversion factor
QA/QC procedures applied:	IPCC default factors were used in this case.

Data / Parameter:	$FF_{project\ plant,i,y}$
Data unit:	Diesel: (ton) Natural Gas: (ton)
Description:	On-site fossil fuel consumption of fuel type i for co-firing in the project plant.
Measured /Calculated /Default:	Measured.
Source of data:	Total quantities of fossil fuel per type used in the recovery boiler were constantly monitored at the Power Plant. Emissions from fossil fuel quantities associated to additional power generation were considered project emissions and deducted from the baseline emissions of the project activity. The fossil fuel associated with additional power generation was determined following the indications of section E.1. (pages 44 and 45) of the registered PDD.
Value(s) of monitored	Diesel: 1,259 (ton)

parameter:	Natural Gas: 0.7 (ton)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	552-FT-663 Type: Diesel Meter (Start-up Burners) ENDRESS & HAUSER Promass 83 F DN25 / 1” Accuracy class: +/- 0.1% Serial number: 75044102000 Calibration frequency: 5 years Date of penultimate calibration: 09/06/2005 Date of last calibration: 31/03/2010 Validity: 30/03/2015 552-FT-668 Type: Return Diesel Meter (Start-up Burners) ENDRESS & HAUSER Promass 83 F DN15 / ½” Accuracy class: +/- 0.1% Serial number: 75043E02000 Calibration frequency: 5 years Date of penultimate calibration: 08/06/2005 Date of last calibration: 30/03/2010 Validity: 29/03/2015 552-FT-671 Type: Diesel Meter (Load Burners) ENDRESS & HAUSER Promass 83 F DN25 / 1” Accuracy class: +/- 0.1% Serial number: 75044202000 Calibration frequency: 5 years Date of penultimate calibration: 09/06/2005 Date of last calibration: 31/03/2010 Validity: 30/03/2015 552-FT-674 Type: Return Diesel Meter (Load Burners) ENDRESS & HAUSER Promass 83 F DN15 / ½” Accuracy class: +/- 0.1% Serial number: 75043F02000 Calibration frequency: 5 years Date of penultimate calibration: 08/06/2005 Date of last calibration: 30/03/2010 Validity: 29/03/2015 552-FT-471 Type: Natural Gas Meter (Start-up Burners) ENDRESS & HAUSER Promass 83 F DN100 / 4” Accuracy class: +/- 0.5% Serial number: 75044302000 Calibration frequency: 5 years Date of penultimate calibration: 07/06/2005 Date of last calibration: 01/04/2010 Validity: 31/03/2015 552-FT-483 Type: Natural Gas Meter (Load Burners) ENDRESS & HAUSER

	Promass 83 F DN100 / 4” Accuracy class: +/- 0.5% Serial number: 75044402000 Calibration frequency: 5 years Date of penultimate calibration: 07/06/2005 Date of last calibration: 31/03/2010 Validity: 30/03/2015
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Fuel meters received periodic maintenance, calibration and the consistency of metered fuel consumption was checked with purchase dispatch bills.

Data / Parameter:	$EG_{project\ plant,y}$
Data unit:	(MWh)
Description:	Net quantity of electricity generated in the project plant during the year y.
Measured /Calculated /Default:	Measured.
Source of data:	This variable was monitored using electric meters that are standard in the electric power industry in Chile. In this case, since the project plant consumes the same amount of electricity as the reference plant (e.g. there is not additional electric power consumption associated to the implementation of the project activity), the net electricity generated in the project plant is the same as the total electricity generated in the project plant. The efficiency of the reference plant was determined in such a way that the electric power associated to the implementation of the project activity: EGy calculated through equation 13, is exactly the increased electricity generation (incremental to baseline generation) as result of the implementation of the project activity.
Value(s) of monitored parameter:	648,169 (MWh)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	568-PML-12 Type: Energy Meter Switchgear (1-2) Power Measurement ION 7330 Accuracy class: +/- 0.5% Serial number: PB-0502A 108-11 Calibration frequency: 7 years Date of last calibration: 08/02/2005 Validity: 07/02/2012 568-PML-25 Type: Energy Meter Switchgear (2-5) Power Measurement ION 7330 Accuracy class: +/- 0.5% Serial number: PB-0502A245-11 Calibration frequency: 7 years Date of last calibration: 21/01/2005 Validity: 03/02/2012

Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Electricity meters received periodic maintenance and calibration as per instructed by the equipment manufacturer and according proper industry standards. Total power generation takes place in two turbogenerator units at the Nueva Aldea pulp mill. To check the generation of the first unit, a power balance in the corresponding bus was carried out. To check the generation of the second unit, an operation index that considers the total energy generated, the efficiency of the turbogenerator and the total steam that goes through the turbogenerator was calculated.

Data / Parameter:	EF_y
Data unit:	(tCO_2/GWh)
Description:	CO_2 emission factor of the grid.
Measured /Calculated /Default:	Calculated.
Source of data:	Relevant dispatch center, electric power companies' public information, host country government official information and IPPC values.
Value(s) of monitored parameter:	905.81 (tCO_2/GWh)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Calculated using equation N° 10 of the ACM0002 (Version 05), as the average of the OM and BM emission factors. The calculation of this emission factor is in the Annex of this Monitoring Report.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	$EF_{OM,y}$
Data unit:	(tCO_2/GWh)
Description:	CO_2 Operating Margin emission factor of the grid
Measured /Calculated /Default:	Calculated.
Source of data:	Relevant dispatch center, electric power companies' public information, host country government official information and IPPC values.
Value(s) of monitored parameter:	896.84 (tCO_2/GWh)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Calculated using equation N° 4 of the ACM0002 (Version 05), according the simple adjusted OM method. Full year data was used to calculate each emission factor. The calculation of this emission factor is in the Annex of this Monitoring Report.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	$EF_{BM,y}$
Data unit:	(tCO_2/GWh)
Description:	CO_2 Build Margin emission factor of the grid.
Measured /Calculated /Default:	Calculated.
Source of data:	Relevant dispatch center, electric power companies' public information, host country government official information and IPPC.
Value(s) of monitored parameter:	914.79 (tCO_2/GWh)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Calculated using equation N° 9 of the ACM0002 (Version 05). In this case, the BM was calculated for each year (ex-post) and in each case,

	the weighted average of the emission coefficients of the most recent power plants responsible for 20% of the total power generation each year was used. Full year data was used to calculate each emission factor. The calculation of this emission factor is in the Annex of this Monitoring Report.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	$F_{i,y}$
Data unit:	See tables at the end of the Monitoring Report.
Description:	Amount of each fossil fuel consumed by each power source / plant.
Measured /Calculated /Default:	Measured
Source of data:	Relevant dispatch center, electric power companies' public information and host country government official information.
Value(s) of monitored parameter:	See tables at the end of the Monitoring Report.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	$COEF_i$
Data unit:	Units in ($tCO_2/000ton$) except Nat. Gas (tCO_2/MMm^3)
Description:	CO_2 emission coefficient of each fuel type i consumed by the electric power generators in the relevant grid.
Measured /Calculated /Default:	Calculated.
Source of data:	This factor was calculated using IPCC default values (Carbon content and fraction of carbon oxidized) and local national data (Net calorific values of the corresponding fossil fuels).
Value(s) of monitored parameter:	Coal: 2,814 ($tCO_2/000ton$) Petcoke: 2,857 ($tCO_2/000ton$) Diesel: 3,378 ($tCO_2/000ton$) Nat. Gas: 2,193 (tCO_2/MMm^3) IFO 180: 3,401 ($tCO_2/000ton$)
Indicate what the data are used for (Baseline/ Project/	Baseline emission calculations.

Leakage emission calculations)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	$COEF_{CO2,i}$= NCV_i *Carbon content of fuel type i * CO_2 / C conversion factor
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CNE.

Data / Parameter:	$GEN_{j/k/n,y}$
Data unit:	(MWh) See tables at the end of the Monitoring Report
Description:	Electricity generation of each power source / plant j/k or n.
Measured /Calculated /Default:	Measured
Source of data:	This information was directly obtained by the CDEC-SIC Dispatch Center.
Value(s) of monitored parameter:	See tables at the end of the Monitoring Report
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	
Data unit:	Text.
Description:	Identification of power source / plant for the OM calculation.
Measured /Calculated /Default:	Determined based on official data
Source of data:	This information was directly obtained by the CDEC-SIC Dispatch Center.
Value(s) of monitored parameter:	See tables at the end of the Monitoring Report.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.

Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	
Data unit:	Text.
Description:	Identification of power source / plant for the BM calculation.
Measured /Calculated /Default:	Determined based on official data.
Source of data:	This information was directly obtained by the CDEC-SIC Dispatch Center.
Value(s) of monitored parameter:	See tables at the end of the Monitoring Report.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	λ_y
Data unit:	Number
Description:	Fraction of time during which low-cost / must-run sources are on the margin.
Measured /Calculated /Default:	Calculated.
Source of data:	This factor was calculated from information directly obtained from the CDEC-SIC Dispatch Center.
Value(s) of monitored parameter:	0.006506849
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations.

Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	As per the corresponding methodology (ACM0002).
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	$GEN_{j/k/ll,y\ IMPORTS}$
Data unit:	(KWh)
Description:	Electricity imports to the project electricity system.
Measured /Calculated /Default:	Not applicable.
Source of data:	This information was directly obtained by the CDEC-SIC Dispatch Center.
Value(s) of monitored parameter:	Does not apply since there is no interconnection with other transmission systems.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	0 (KWh)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable.
Measuring/ Reading/ Recording frequency:	Not applicable.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	$COEF_{i,jy\ IMPORTS}$
Data unit:	(tCO_2/ton) or (tCO_2/m^3)
Description:	CO_2 emission coefficient of fuels used in connected electricity systems (if imports occur).
Measured /Calculated /Default:	Not applicable
Source of data:	This information was directly obtained by the CDEC-SIC Dispatch Center.
Value(s) of monitored parameter:	Does not apply since there is no interconnection with other transmission systems.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	0 (tCO_2/ton) or 0 (tCO_2/m^3)
Monitoring equipment (type,	Not applicable

accuracy class, serial number, calibration frequency, date of last calibration, validity)	
Measuring/ Reading/ Recording frequency:	Not applicable
Calculation method (if applicable):	Not applicable
QA/QC procedures applied:	As mentioned in the PDD, the quality control of this data is beyond the control of the project operator. However, the project proponent calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

SECTION E. Emission reductions calculation

Please note the following:

1. Differences in baseline and project emission calculations included in tables below are due to the fact that all calculations are done directly in excel spreadsheets, which implies a decimal precision that is not carried over onto word formatted tables because decimals are truncated and rounded down. Exact resulting values can be viewed directly in emission reduction calculation spreadsheet.

2. Since the emission reduction calculation for the project activity was done monthly, in some cases averages were employed in calculations cited below.

E.1. Baseline emissions calculation

The net quantity of increased electricity generation is calculated using equation N° 13 of the ACM0006 (Version 02).

$$EG_y = EG_{project\ plant,y} - \varepsilon_{el,other\ plant(s)} \cdot \sum BF_{i,y} \cdot NCV_i$$

Where:

EG_y:	is the net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year y in MWh,
$EG_{project\ plant,y}$:	is the net quantity of electricity generated in the project plant during the year y in MWh,
$\varepsilon_{el,other\ plant(s)}$:	is the average net energy efficiency of electricity generation in (the) other power plant(s) that would use the biomass fired in the project plant in the absence of the project activity, expressed in MWhel/MWh biomass
$BF_{i,y}$:	is the quantity of biomass type i used as fuel in the project plant during the year y in a volume or mass unit, and
NCV_i:	is the net calorific value of the biomass type i in MWh per mass or volume of biomass

The total emission reduction due to displacement of electricity is calculated using equation N° 8 of the ACM0006 (Version 02):

$$ER_{electricity,y} = EG_y \cdot EF_{electricity,i}$$

Where:

$ER_{electricity,y}$:	are the emission reductions due to displacement of electricity during the year y in of tCO_2
EG_y:	is the net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year y in MWh,
$EF_{electricity,y}$:	is the CO_2 emission factor for the electricity displaced due to the project activity during the year y in tCO_2/MWh.

The corresponding calculations for the monitored period are presented below.

Data:

	Units	2010
(1) Combined Margin of the grid	(tCO_2/GWh)	905.81
(2) Total net power generation	(GWh)	648.17
(3) Electric efficiency of the baseline plant	(%)	12.31 (%)
(4) Total quantity of biomass fired	(tDs)	1,295,455
(5) Net calorific value of biomass	(GJ/tDS)	10.29

Calculations:

		2010
(5) Energy displaced from the grid	(2) – (3)*[(4)*(5)]*(1 GWh)/(3,600 GJ)	192.5 (GWh)
(6) Total grid emission savings	**(1)*(5)**	**174,330 (tCO_2)**

Total baseline emissions	**(tCO_2)**	**174,330 (tCO_2)**

Note: Refer to clarification note in Section E. see bullet points 1 and 2, page 23.

E.2. Project emissions calculation

The only project emission corresponds to the consumption of some fossil fuel in the recovery boiler, which is attributable to additional power generation to the grid. This is calculated using equation N° 6 of the ACM0006 (Version 02):

$$PEFF_y = \sum FF_{project\,plant,i,y} \cdot COEF_{CO2,i}$$

The corresponding calculation is shown below:

Data:

	Units	2010
(1) Diesel consumption	(ton)	1,259
(2) Natural gas consumption	(ton)	0.7
(3) Diesel emission factor	(tCO_2/000ton)	3,179
(4) Natural gas emission factor	(tCO_2/MMm^3)	2,081
(5) Nat. gas density (gaseous phase)	(Kg/m^3)	0.791

Calculations:

		2010
(6) Diesel emissions	(1)*(1/1,000)*(3)	4,003 (tCO_2)
(7) Nat. gas emissions	[(2)*1,000/(5)]*(1/1,000,000)*(4)	1.72 (tCO_2)
(8) Total fossil fuel emissions	**(6) + (7)**	**4,005 (tCO_2)**

Note: Refer to clarification note in Section E, see bullet points 1 and 2, page 23.

Total project emissions	**(tCO_2)**	**4,005**

Note: Refer to clarification note in Section E, see bullet points 1 and 2, page 23.

E.3. Leakage calculation

As described in section E.2 of the registered PDD, no leakage is anticipated from the implementation of the project activity.

$$L_y = 0$$

E.4. Emission reductions calculation / table

As presented in the PDD and according to the baseline methodology, the net emission reduction calculation formula for the Nueva Aldea Phase 2 project is:

Project Activity Net Emission savings = Baseline Emissions – Project Activity Emissions – Leakage

or

$$PNE_y = BL_{E,y} - EM_{P,y} - L_y$$

or

$$PNE_y = (BL_{E1,y} + BL_{E2,y}) - (P_{E1,y} + P_{E2,y} + P_{E3,y} + P_{E4,y}) - L_y$$

Where:

$BL_{E1,y}$: Baseline emissions from grid electricity displacement (tCO_2/yr).
$BL_{E2,y}$: Baseline emissions from avoided biomass disposal (tCO_2eq/yr).

$P_{E1,y}$: Project emissions from biomass controlled burning in the Power Plant (tCO_2eq/yr).
$P_{E2,y}$: Project emissions from biomass transportation to the biomass Power Plant (tCO_2/yr).
$P_{E3,y}$: Project emissions from biomass transportation within the Power Plant site (tCO_2/yr).
$P_{E4,y}$: Project emissions from fossil fuel consumption in the Power Plant (tCO_2/yr).

L_y : Are the leakage emissions (tCO_2/yr).

In case of the Nueva Aldea Phase 2 project activity, the only terms of the equation above that apply are $BL_{E1,y}$ and $P_{E4,y}$ (leakage is zero), so the net emission reductions of the project can be calculated as:

$$PNE_y = BL_{E1,y} - P_{E4,y}$$

ó

		2010
(1) Baseline emissions	(tCO_2)	**174,330**
(2) Project emissions	(tCO_2)	**4,005**
(3) Leakage	(tCO_2)	**0**
(4) Net emission reductions	**(tCO_2)**	**170,324**

Summary of emission reductions for the monitored period

A table with the calculation of emission reductions is presented below.

Net emission savings 2010

Year	Net emission savings (tCO_2eq/yr)	Baseline emissions Grid emissions (tCO_2/yr)	Project Emissions Fossil fuel in R.B. (tCO_2/yr)
2.010	170.324	174.330	4.005
4th verif (Jan 10- Dec 10)	**170.324,5**	**174.329,6**	**4.005,1**
Total emissions claimed	**170.324**	**174.330**	**4.005**

Note: Net emission savings = Baseline emissions - Project activity emissions.

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO_2e)	**126,144**	**170,324**

E.6. Remarks on difference from estimated value in the PDD

The emission reductions for the monitored period were 170,324 CERs. This amount is 35.02 % higher than the emission reductions 126,144 CERs estimated in the PDD. This difference can be explained by the following reasons:

1. A higher grid emission factor for 2010 than the estimated in the PDD

   - A higher grid emission factor for the year 2010 than the one originally estimated in the PDD. The actual grid emission factor for 2010 was 905.81 (tCO_2/GWh), while the estimated grid emission factor for 2010 was 480.00 (tCO_2/GWh). The reason for the higher grid emission factor in years 2010 was the replacement of natural gas[3] used for power generation for more carbon-intensive fossil-fuels, such as coal and diesel. This increased the overall GHG emissions in the SIC grid.
   - The hydro crisis of year 2010 is another reason to explain a higher grid emission factor for the year 2010 than originally estimated in the PDD. This drought and similar past events (droughts) have caused the new entrance and replacement of hydro sources used for power generation for more carbon-intensive fossil-fuels, mainly coal, increasing the overall GHG emissions in the SIC grid.

2. A different way of determining the displaced electricity from the grid as it was originally approved in the PDD. As a result, the project proponent is now using equation N° 13 to calculate the displaced electricity (as established for baseline scenario N° 4) during the monitored period rather

[3] Argentina stopped sending natural gas in 2004.

than directly monitoring the surplus power delivered to the grid, as it would have been done according to what was established in the original PDD.

The combined effect of the reasons mentioned above resulted in higher emission reductions than the ones estimated in the PDD.

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History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory **Document Type**: Guideline, Form **Business Function**: Issuance		

ANNEX

POWER GENERATION 2010

Power plants	POWER OUTPUT (KW)	PLANT TYPE	FUEL TYPE	UNIT	FUEL OIL CONSUMPTION	LOW COST / MUST RUN	SIC EMISSION FACTOR 2010
Los Molles	18	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Sauce Andes	1,1	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Aconcagua	74	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Aconcagua Ubilanco							
Aconcagua Ujuncal							
Los Quilos	39,3	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Florida	28,5	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Maitenes	31	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Alfalfal	178	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Queltehues	49	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Puntilla	22	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Volcan	13	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Los Morros	3,1	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Sauzal 50Hz	76,8	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Sauzal 60Hz	76,8	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Sauzalito	12	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Curillinque	89	Run of the river	Hydro	N.C.	0,0	Yes	0,0
San Ignacio	37	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Loma Alta	40	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Rucue	178,4	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Pullinque	51,4	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Pilmaiquén	39	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Capullo	11	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Peuchén	80	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Mampil	49	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Chacabuquito	25,5	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Antuco	320	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Abanico	136	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Isla	68	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Machicura	95	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Eyzaguirre	2,1	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Quilleco	70,8	Run of the river	Hydro	N.C.	0,0	Yes	0,0
El Rincón	0,28	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Chiburgo	19,4	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Palmucho	32	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Hornitos	55	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Puclaro	6	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Ojos de Agua	9	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Coya	10,8	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Lircay	19	Run of the river	Hydro	N.C.	0,0	Yes	0,0
El Manzano	4,85	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Pehui	1,1	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Truful Truful	0,5	Run of the river	Hydro	N.C.	0,0	Yes	0,0
La Paloma	5,4	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Trueno	5,6	Run of the river	Hydro	N.C.	0,0	Yes	0,0
San Clemente	5,5	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Carbomet	0	Run of the river	Hydro	N.C.	0,0	Yes	0,0
La Higuera	154,7	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Juncalito	1,5	Run of the river	Hydro	N.C.	0,0	Yes	0,0
El Tártaro	0	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Guayacán	12	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Confluencia	155	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Mariposas	6	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Los Corrales	0,8	Run of the river	Hydro	N.C.	0,0	Yes	0,0
Taltal 2 GNL	122,45	Open Cycle	LNG	MM m³-std/yr	0,0	No	39,4
Taltal 2	122,45	Open Cycle	Natural Gas	MM m³-std/yr	11,5	No	25.297,9
Taltal 2 Diesel	122,45	Open Cycle	Diesel	000' tons/yr.	14,1	No	47.795,2
Taltal 1 GNL	122,45	Open Cycle	LNG	MM m³-std/yr	0,5	No	1.677,3
Taltal 1	122,45	Open Cycle	Natural Gas	MM m³-std/yr	6,1	No	13.359,9
Taltal 1 Diesel	122,45	Open Cycle	Diesel	000' tons/yr.	8,9	No	29.943,3
D. Almagro	23,8	Open Cycle	Diesel	000' tons/yr.	0,1	No	503,1
El Salvador	23,8	Open Cycle	Diesel	000' tons/yr.	0,1	No	338,1
Guacolda 1	152	Coal/Steam	Coal	000' tons/yr.	409,8	No	1.152.906,8
Guacolda 2	152	Coal/Steam	Coal	000' tons/yr.	399,3	No	1.123.445,7
Guacolda 3	152	Coal/Steam	Coal	000' tons/yr.	419,7	No	1.180.794,4
Guacolda 4	152	Coal/Steam	Coal	000' tons/yr.	362,8	No	1.020.784,1
Huasco TV	16	Coal/Steam	Coal	000' tons/yr.	0,0	No	0,0
Huasco TG	64,23	Open Cycle	Diesel	000' tons/yr.	0,3	No	1.133,5
Huasco TG IFO	64,23	Open Cycle	IFO 180	000' tons/yr.	0,1	No	174,8
L.Verde TG	18,8	Open Cycle	Diesel	000' tons/yr.	1,1	No	3.755,2
Los Vientos TG	132	Open Cycle	Diesel	000' tons/yr.	13,1	No	44.354,5
Nehuenco	368,4	Combined Cycle	Natural Gas	MM m³-std/yr	0,8	No	1.772,1
Nehuenco Diesel	368,4	Combined Cycle	Diesel	000' tons/yr.	107,5	No	363.073,1
Nehuenco GNL	368,4	Combined Cycle	LNG	MM m³-std/yr	38,7	No	125.749,6
Nehuenco TG 9B	108	Open Cycle	Natural Gas	MM m³-std/yr	0,9	No	2.025,9
Nehuenco TG 9B Diesel	108	Open Cycle	Diesel	000' tons/yr.	0,2	No	557,9
Nehuenco TG 9B GNL	108	Open Cycle	LNG	MM m³-std/yr	1,2	No	3.802,3
Nehuenco II	398,3	Combined Cycle	Natural Gas	MM m³-std/yr	43,3	No	94.908,8
Nehuenco II Diesel	398,3	Combined Cycle	Diesel	000' tons/yr.	245,7	No	829.935,7
Nehuenco II GNL	398,3	Combined Cycle	LNG	MM m³-std/yr	138,6	No	450.325,9
San Isidro	379	Combined Cycle	Natural Gas	MM m³-std/yr	6,4	No	13.929,9
San Isidro Diesel	379	Combined Cycle	Diesel	000' tons/yr.	8,1	No	25.527,8
San Isidro GNL	379	Combined Cycle	LNG	MM m³-std/yr	728,3	No	2.366.052,9
San Isidro II	353	Combined Cycle	Natural Gas	MM m³-std/yr	3,1	No	6.830,0
San Isidro II Diesel	353	Combined Cycle	Diesel	000' tons/yr.	14,8	No	50.083,1
San Isidro II GNL	353	Combined Cycle	LNG	MM m³-std/yr	959,2	No	3.116.044,6
Ventanas 1	120	Coal/Steam	Coal	000' tons/yr.	379,4	No	1.067.586,5
Ventanas 2	220	Coal/Steam	Coal	000' tons/yr.	459,4	No	1.292.671,0
Nueva Ventanas	272	Coal/Steam	Coal	000' tons/yr.	759,3	No	2.136.349,9
L.Verde	54,7	Coal/Steam	Coal	000' tons/yr.	0,1	No	375,6
Nueva Renca	379	Combined Cycle	Natural Gas	MM m³-std/yr	113,7	No	249.394,2
Nueva Renca Diesel	379	Combined Cycle	Diesel	000' tons/yr.	222,3	No	750.901,9
Renca	100	Diesel/Steam	Diesel	000' tons/yr.	1,0	No	3.270,9
Constitución	11,1	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Constitución A.	8	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Petropower	75	Petcoke/steam	Petcoke	000' tons/yr.	24,4	Yes	69.796,5
Laja	12,7	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Bocamina	128	Coal/Steam	Coal	000' tons/yr.	82,0	No	230.694,4
Arauco	9	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
San Fco. Mostazal	24	Open Cycle	Diesel	000' tons/yr.	0,2	No	646,9
Cholguán	13	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Licantén	4	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Valdivia	61	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Antilhue TG	101,3	Open Cycle	Diesel	000' tons/yr.	16,5	No	55.775,6
Horcones TG	24,3	Open Cycle	Natural Gas	MM m³-std/yr	0,1	No	257,5
Horcones Diesel	24,3	Open Cycle	Diesel	000' tons/yr.	2,2	No	7.424,9
TG_Coronel	46,7	Open Cycle	Natural Gas	MM m³-std/yr	7,1	No	15.597,8
TG_Coronel Diesel	46,7	Open Cycle	Diesel	000' tons/yr.	13,2	No	44.646,1
Nueva Aldea	14	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Nueva Aldea 2	10	Open Cycle	Diesel	000' tons/yr.	0,0	No	0,0
Nueva Aldea 3	37	Biomass/steam	Biomass	N.C.	0,0	Yes	0,0
Candelaria 1	125,3	Open Cycle	Natural Gas	MM m³-std/yr	11,1	No	24.245,4
Candelaria 1 Diesel	125,3	Open Cycle	Diesel	000' tons/yr.	13,1	No	44.335,2
Candelaria 1 GNL	125,3	Open Cycle	LNG	MM m³-std/yr	2,6	No	8.360,4
Candelaria 2	128,6	Open Cycle	Natural Gas	MM m³-std/yr	12,9	No	28.354,8
Candelaria 2 Diesel	128,6	Open Cycle	Diesel	000' tons/yr.	12,2	No	41.309,7
Candelaria 2 GNL	128,6	Open Cycle	LNG	MM m³-std/yr	1,0	No	3.360,3

Power plants	POWER OUTPUT (KW)	PLANT TYPE	FUEL TYPE	UNIT	FUEL OIL CONSUMPTION	LOW COST / MUST RUN	SIC EMISSION FACTOR 2010
Curanilahue	2,1	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Lebu	0	Diesel engine	Diesel	000' tons/yr.	0,0	No	45,7
Cañete	3	Diesel engine	Diesel	000' tons/yr.	0,2	No	597,0
Los Sauces	3	Diesel engine	Diesel	000' tons/yr.	0,3	No	904,7
Traiguen	3	Diesel engine	Diesel	000' tons/yr.	0,3	No	902,0
Victoria	0	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Curacautin	3	Diesel engine	Diesel	000' tons/yr.	0,3	No	1.148,2
Ancud	3,3	Diesel engine	Diesel	000' tons/yr.	0,2	No	682,0
Collipulli	3	Diesel engine	Diesel	000' tons/yr.	0,2	No	525,5
Quellon	4,99	Diesel engine	Diesel	000' tons/yr.	0,1	No	252,6
Campanario Gas 1	60	Open Cycle	Natural Gas	MM m³-std/yr	0,0	No	0,0
Campanario Gas 2	60	Open Cycle	Natural Gas	MM m³-std/yr	0,0	No	0,0
Campanario Gas 3	60	Open Cycle	Natural Gas	MM m³-std/yr	0,0	No	11,2
Campanario Diesel 1	60	Open Cycle	Diesel	000' tons/yr.	1,4	No	4.650,2
Campanario Diesel 2	60	Open Cycle	Diesel	000' tons/yr.	1,5	No	5.208,7
Campanario Diesel 3	60	Open Cycle	Diesel	000' tons/yr.	2,9	No	9.711,4
Campanario Diesel 4	40	Open Cycle	Diesel	000' tons/yr.	0,6	No	2.051,8
Casablanca 1	1,2	Diesel engine	Diesel	000' tons/yr.	0,1	No	172,7
Casablanca 2	0	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,3
Las Vegas	2	Diesel engine	Diesel	000' tons/yr.	0,2	No	542,6
Curauma	2	Diesel engine	Diesel	000' tons/yr.	0,1	No	443,6
Concon	2,2	Diesel engine	Diesel	000' tons/yr.	0,1	No	327,5
Escuadrón (ex FPC)	14,2	Biomass/steam	Biomass	N.C.	0,0	No	0,0
FPC + FPC 2						No	
Constitución 1	9	Diesel engine	Diesel	000' tons/yr.	0,5	No	1.797,5
Maule	6	Diesel engine	Diesel	000' tons/yr.	0,2	No	616,0
Monte Patria	9	Diesel engine	Diesel	000' tons/yr.	0,0	No	101,5
Punitaqui	9	Diesel engine	Diesel	000' tons/yr.	0,1	No	181,1
Esperanza 1	1,6	Diesel engine	Diesel	000' tons/yr.	0,3	No	1.174,8
Esperanza 2	1,8	Diesel engine	Diesel	000' tons/yr.	0,2	No	592,8
Esperanza TG	18,8	Open Cycle	Diesel	000' tons/yr.	0,0	No	11,4
Degan	39,6	Diesel engine	Diesel	000' tons/yr.	9,0	No	30.367,6
Olivos	96	Open Cycle	Diesel	000' tons/yr.	0,9	No	3.054,5
Totoral	3	Open Cycle	Diesel	000' tons/yr.	0,1	No	338,4
Quintay	3	Open Cycle	Diesel	000' tons/yr.	0,2	No	737,7
Placilla	3	Open Cycle	Diesel	000' tons/yr.	0,3	No	884,0
Chiloé	9	Diesel engine	Diesel	000' tons/yr.	0,0	No	1,0
Quellon II	10	Diesel engine	Diesel	000' tons/yr.	3,2	No	10.795,6
Colmito	55	Open Cycle	Diesel	000' tons/yr.	0,3	No	1.115,4
Los Pinos	92,1	Open Cycle	Diesel	000' tons/yr.	33,2	No	112.271,9
Chuyaca	2,5	Diesel engine	Diesel	000' tons/yr.	1,2	No	4.097,8
Chuyaca 2	17,5	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Skretting	2,7	Diesel engine	Diesel	000' tons/yr.	0,0	No	44,1
Cenizas	16,5	Diesel engine	Diesel	000' tons/yr.	6,2	No	20.872,2
Santa Lidia	136	Open Cycle	Diesel	000' tons/yr.	12,8	No	43.320,0
Trapén	90	Diesel engine	Diesel	000' tons/yr.	9,3	No	31.435,6
Los Espinos	122	Diesel engine	Diesel	000' tons/yr.	3,1	No	10.601,4
San Gregorio	0,5	Diesel engine	Diesel	000' tons/yr.	0,1	No	197,5
Linares Norte	0,5	Diesel engine	Diesel	000' tons/yr.	0,0	No	106,2
Biomar	2,4	Diesel engine	Diesel	000' tons/yr.	0,0	No	1,3
Eagon	2,4	Diesel engine	Diesel	000' tons/yr.	0,0	No	10,8
Salmofood I	1,6	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Salmofood II	1,6	Diesel engine	Diesel	000' tons/yr.	0,0	No	56,1
Teno	50	Diesel engine	Diesel	000' tons/yr.	12,8	No	43.328,8
Newen Diesel	15	Open Cycle	Diesel	000' tons/yr.	0,2	No	587,5
Newen Butano	15	Open Cycle	Butane	000' tons/yr.	0,0	No	0,0
Newen Propano	15	Open Cycle	Propane	000' tons/yr.	3,6	No	7.970,6
Newen Gas Natural	15	Open Cycle	Natural Gas	MM m³-std/yr	9,9	No	21.608,6
Newen Mezcla Butano/Propano	15	Open Cycle	Butane/Propane	000' tons/yr.	0,0	No	0,0
Watts	2,64	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Multiexport I	1,6	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Multiexport II	1,6	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Tierra Amarilla	142	Diesel engine	Diesel	000' tons/yr.	0,5	No	1.760,5
Quintero	240	Open Cycle	Diesel	000' tons/yr.	4,1	No	13.697,9
Quintero DIESEL A						No	
Quintero DIESEL B						No	
Quintero GNL	240	Open Cyle	LNG	MM m³-std/yr	67,9	No	220.416,8
Quintero GNL A						No	
Quintero GNL B						No	
Louisiana Pacific	2,9	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,3
El Peñón	80	Diesel engine	Diesel	000' tons/yr.	12,6	No	42.513,5
San Lorenzo de D. De Almagro	60	Diesel engine	Diesel	000' tons/yr.	0,1	No	379,7
San Lorenzo de D. de Almagro U1				0	0,0	No	
San Lorenzo de D. de Almagro U2				0	0,0	No	
Tapihue	6,4	Diesel engine	Diesel	000' tons/yr.	0,3	No	1.003,5
Termopacífico	96	Diesel engine	Diesel	000' tons/yr.	4,5	No	15.038,0
Quidico	0	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
Loma Los Colorados	14	Biomass/engine	Biomass	N.C.	0,0	No	0,0
Emelda	72	Open Cycle	IFO 180	000' tons/yr.	0,3	No	1.182,5
Emelda U1				0	0,0	No	
Emelda U2				0	0,0	No	
Colihues IFO	22	Diesel engine	IFO 180	000' tons/yr.	4,7	No	16.000,2
Colihues DIE	22	Diesel engine	Diesel	000' tons/yr.	0,0	No	108,1
Curicó	0	0	0		0,0	No	0,0
Punta Colorada	16,3	Diesel engine	Diesel	000' tons/yr.	1,5	No	5.213,0
Cabrero	11	Biomass/steam	Biomass	N.C.	0,0	No	0,0
Cem Bio Bio IFO	13,6	Diesel engine	IFO 180	000' tons/yr.	0,9	No	3.083,4
Cem Bio Bio DIESEL	13,6	Diesel engine	Diesel	000' tons/yr.	0,0	No	0,0
El Toro	450	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Rapel	377	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Canutillar	172	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Cipreses	106	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Colbun	478	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Pehuenche	570	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Pangue	467	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Ralco	690	Reservoirs	Hydro	N.C.	0,0	Yes	0,0
Canela 1	18,2	Aeolics	Wind	N.C.	0,0	Yes	0,0
Canela 2	60	Aeolics	Wind	N.C.	0,0	Yes	0,0
Lebu (Cristoro)	3,6	Aeolics	Wind	N.C.	0,0	Yes	0,0
Totoral (eólica)	46	Aeolics	Wind	N.C.	0,0	Yes	0,0
Monte Redondo	48	Aeolics	Wind	N.C.	0,0	Yes	0,0
SIC Total Emission							**18.869.132,8**

Total emissions from non-low cost / must run power plants **18.799.336,3**

Total emissions from low cost / must run power plants **69.796,5**

OPERATING MARGIN CALCULATION

(ACCORDING TO THE ACM0002 (VERSION 06)

Each year in which the project generation occurs.

		2010
Total emissions from non-low cost / must run power plants	(tCO_2/yr)	18.799.336
Total emissions from low-cost / must-run power plants	(tCO_2/yr)	69.796
Total energy generated in the SIC	(GWh/yr)	43.193
Total energy by non-Low cost / must run power plants	(GWh/yr)	20.826
Total energy by low cost / must run power plants	(GWh/yr)	22.367
Factor 1	(number)	0,0065068493
Operating Margin	**(tCO_2/GWh)**	**896,84**

Notes:

- Low cost / must run units present very low GHG emissions, since they are basically hydro plants and very few biomass plants.
- Registered CDM plants are included in the OM factor calculation but they do not present GHG emissions.

BUILD MARGIN CALCULATION 2010

Power plants	POWER OUTPUT (MW)	PLANT TYPE	FUEL TYPE	START OPERATION	CDM PROYECT	TOTAL GEN IN 2010 (GWh)	SIC EMISSION FACTOR 2010 tCO2/yr
Confluencia	155	Run of the river	Hydro	Dic-10	No	3,9	0,00
Mariposas	6	Run of the river	Hydro	Dic-10	No	0,0	0,00
Cem Bio Bio IFO	13,6	Diesel engine	IFO 180	Dic-10	No	4,1	748,29
Cem Bio Bio DIESEL	13,6	Diesel engine	Diesel	Dic-10	No	0,0	648,55
Cabrero	11	Biomass/steam	Biomass	Nov-10	No	1,3	0,00
Los Corrales	0,8	Run of the river	Hydro	Sep-10	No	0,2	0,00
La Higuera	154,7	Run of the river	Hydro	Sep-10	Yes	0,0	0,00
Juncalito	1,5	Run of the river	Hydro	Sep-10	No	1,3	0,00
El Tártaro	0	Run of the river	Hydro	Sep-10	No	0,1	0,00
Guayacán	12	Run of the river	Hydro	Sep-10	No	20,8	0,00
Carbomet	0	Run of the river	Hydro	Ago-10	No	20,7	0,00
El Salvador	23,8	Open Cycle	Diesel	Ago-10	No	0,3	1138,34
San Clemente	5,5	Run of the river	Hydro	Jul-10	No	5,9	0,00
Curicó	0	0	0	Jul-10	No	0,4	0,00
Punta Colorada	16,3	Diesel engine	Diesel	Jul-10	No	8,0	651,93
Trueno	5,6	Run of the river	Hydro	Jun-10	No	19,7	0,00
Emelda	72	Open Cycle	IFO 180	Jun-10	No	1,2	996,72
Colihues IFO	22	Diesel engine	IFO 180	Jun-10	No	22,0	727,88
Colihues DIE	22	Diesel engine	Diesel	Jun-10	No	0,1	743,13
La Paloma	5,4	Run of the river	Hydro	May-10	No	4,0	0,00
Loma Los Colorados	14	Biomass/engine	Biomass	Abr-10	No	7,4	0,00
Quidico	0	Diesel engine	Diesel	Mar-10	No	0,0	0,00
Campanario Diesel 4	40	Open Cycle	Diesel	Feb-10	No	2,3	898,51
Guacolda 4	152	Coal/Steam	Coal	Ene-10	No	1036,6	984,76
Totoral (eólica)	46	Aeolics	Wind	Ene-10	No	84,7	0,00
Monte Redondo	48	Aeolics	Wind	Ene-10	No	82,8	0,00
Quintero GNL	240	Open Cyle	LNG	Nov-09	No	245,8	896,59
Canela 2	60	Aeolics	Wind	Nov-09	Yes	0,0	0,00
Tapihue	6,4	Diesel engine	Diesel	Oct-09	No	1,0	955,91
Termopacifico	96	Diesel engine	Diesel	Oct-09	No	19,8	760,02
Truful Truful	0,5	Run of the river	Hydro	Oct-09	No	0,0	0,00
Nueva Ventanas	272	Coal/Steam	Coal	Oct-09	No	1998,1	1069,17
San Lorenzo de D. De Almagro	60	Diesel engine	Diesel	Sep-09	No	0,3	1227,85
Louisiana Pacific	2,9	Diesel engine	Diesel	Jul-09	No	0,0	747,18
El Peñón	80	Diesel engine	Diesel	Jul-09	No	57,7	736,37
Pehui	1,1	Run of the river	Hydro	Jun-09	No	7,1	0,00
Biomar	2,4	Diesel engine	Diesel	Jun-09	No	0,0	749,55
Eagon	2,4	Diesel engine	Diesel	Jun-09	No	0,0	747,52
Salmofood I	1,6	Diesel engine	Diesel	Jun-09	No	0,0	776,91
Salmofood II	1,6	Diesel engine	Diesel	Jun-09	No	0,1	743,13
Teno	50	Diesel engine	Diesel	Jun-09	No	58,0	746,51
Newen Diesel	15	Open Cycle	Diesel	Jun-09	No	0,6	979,58
Newen Butano	15	Open Cycle	Butane	Jun-09	No	0,0	997,32
Newen Propano	15	Open Cycle	Propane	Jun-09	No	8,3	957,43
Newen Gas Natural	15	Open Cycle	Natural Gas	Jun-09	No	29,9	723,54
Newen Mezcla Butano/Propano	15	Open Cycle	Butane/Propar	Jun-09	No	0,0	977,38
Watts	2,64	Diesel engine	Diesel	Jun-09	Yes	0,0	747,18
Multiexport I	1,6	Diesel engine	Diesel	Jun-09	No	0,0	747,18
Multiexport II	1,6	Diesel engine	Diesel	Jun-09	No	0,0	747,18
Tierra Amarilla	142	Diesel engine	Diesel	Jun-09	No	2,2	807,31
Quintero	240	Open Cycle	Diesel	Jun-09	No	16,8	817,44
Lebu (Cristoro)	3,6	Aeolics	Wind	Jun-09	No	6,8	0,00
Guacolda 3	152	Coal/Steam	Coal	Abr-09	No	1199,1	984,76
San Gregorio	0,5	Diesel engine	Diesel	Mar-09	No	0,3	746,24
Linares Norte	0,5	Diesel engine	Diesel	Mar-09	No	0,1	746,24
Chuyaca 2	17,5	Diesel engine	Diesel	Feb-09	No	0,0	709,35
Trapén	90	Diesel engine	Diesel	Feb-09	No	42,7	736,37
Los Espinos	122	Diesel engine	Diesel	Feb-09	No	14,2	746,51
Lircay	19	Run of the river	Hydro	Ene-09	No	121,8	0,00
Santa Lidia	136	Open Cycle	Diesel	Dic-08	No	49,5	874,86
El Manzano	4,85	Run of the river	Hydro	Dic-08	No	27,5	0,00
Chuyaca	2,5	Diesel engine	Diesel	Oct-08	No	5,5	749,88
Skretting	2,7	Diesel engine	Diesel	Oct-08	No	0,1	743,13
Cenizas	16,5	Diesel engine	Diesel	Oct-08	No	26,9	776,91
Los Pinos	92,1	Open Cycle	Diesel	Sep-08	No	174,3	644,09
Colmito	55	Open Cycle	Diesel	Ago-08	No	1,1	1006,60
Chiloé	9	Diesel engine	Diesel	Jul-08	No	0,0	908,64
Coya	10,8	Run of the river	Hydro	Jul-08	No	83,3	0,00
Ojos de Agua	9	Run of the river	Hydro	Jun-08	Yes	0,0	0,00
Puclaro	6	Run of the river	Hydro	May-08	Yes	0,0	0,00
Totoral	3	Open Cycle	Diesel	Abr-08	No	0,4	788,80
Quintay	3	Open Cycle	Diesel	Abr-08	No	0,9	788,80
Placilla	3	Open Cycle	Diesel	Abr-08	No	1,1	788,80
Olivos	96	Open Cycle	Diesel	Feb-08	No	1,0	760,02
Campanario Gas 3	60	Open Cycle	Natural Gas	Ene-08	No	0,1	105,83
Campanario Diesel 3	60	Open Cycle	Diesel	Ene-08	No	11,7	827,57
Quellon II	10	Diesel engine	Diesel	Ene-08	No	14,4	749,88
Nueva Aldea 3	37	Biomass/steam	Biomass	Ene-08	Yes	0,0	0,00
Canela 1	18,2	Aeolics	Wind	Sep-07	Yes	0,0	0,00
Hornitos	55	Run of the river	Hydro	Sep-07	Yes	0,0	0,00
Palmucho	32	Run of the river	Hydro	Sep-07	No	232,4	0,00
Esperanza TG	18,8	Open Cycle	Diesel	Ago-07	No	0,0	763,26
Constitución 1	9	Diesel engine	Diesel	Jul-07	No	1,9	952,56
Maule	6	Diesel engine	Diesel	Jul-07	No	0,6	952,56
Monte Patria	9	Diesel engine	Diesel	Jul-07	No	0,2	588,98
Punitaqui	9	Diesel engine	Diesel	Jul-07	No	0,3	639,84
Chiburgo	19,4	Run of the river	Hydro	Jul-07	No	75,8	0,00
Curanilahue	2,1	Diesel engine	Diesel	Jul-07	No	0,1	0,00
Degan	39,6	Diesel engine	Diesel	Jul-07	No	41,1	739,75
Escuadrón (ex FPC)	14,2	Biomass/steam	Biomass	Jun-07	No	90,5	0,00
Esperanza 1	1,6	Diesel engine	Diesel	Jun-07	No	1,0	1151,98
Esperanza 2	1,8	Diesel engine	Diesel	Jun-07	No	0,8	737,72
San Isidro II	353	Combined Cycle	Natural Gas	Abr-07	No	16,9	403,43
San Isidro II Diesel	353	Combined Cycle	Diesel	Abr-07	No	87,2	574,24
San Isidro II GNL	353	Combined Cycle	LNG	Abr-07	No	2846,3	1094,75
Quilleco	70,8	Run of the river	Hydro	Abr-07	Yes	0,0	0,00
El Rincón	0,28	Run of the river	Hydro	Abr-07	No	2,4	0,00
Casablanca 1	1,2	Diesel engine	Diesel	Abr-07	No	0,2	781,14
Casablanca 2	0	Diesel engine	Diesel	Abr-07	No	0,0	939,18

Power plants	POWER OUTPUT (MW)	PLANT TYPE	FUEL TYPE	START OPERATION	CDM PROYECT	TOTAL GEN IN 2010 (GWh)	SIC EMISSION FACTOR 2010 tCO2/yr
Las Vegas	2	Diesel engine	Diesel	Abr-07	No	0,7	805,82
Curauma	2	Diesel engine	Diesel	Abr-07	No	0,5	924,18
Concon	2,2	Diesel engine	Diesel	Abr-07	No	0,4	805,82
Eyzaguirre	2,1	Run of the river	Hydro	Mar-07	No	6,7	0,00
Campanario Gas 1	60	Open Cycle	Natural Gas	Mar-07	No	0,0	105,83
Campanario Gas 2	60	Open Cycle	Natural Gas	Mar-07	No	0,0	105,83
Campanario Diesel 1	60	Open Cycle	Diesel	Mar-07	No	5,6	830,95
Campanario Diesel 2	60	Open Cycle	Diesel	Mar-07	No	6,2	834,33
Los Vientos TG	132	Open Cycle	Diesel	Ene-07	No	49,2	901,89
Cañete	3	Diesel engine	Diesel	Ene-07	No	0,7	817,44
Los Sauces	3	Diesel engine	Diesel	Ene-07	No	1,1	817,44
Traiguen	3	Diesel engine	Diesel	Ene-07	No	1,1	816,09
Curacautin	3	Diesel engine	Diesel	Ene-07	No	1,5	743,13
Collipulli	3	Diesel engine	Diesel	Ene-07	No	0,6	817,44
Nueva Aldea 2	10	Open Cycle	Diesel	2006	No	0,0	978,90
Ancud	3,3	Diesel engine	Diesel	2006	No	0,8	817,44
Quellon	4,99	Diesel engine	Diesel	2006	No	0,8	333,36
Antilhue TG	101,3	Open Cycle	Diesel	2005	No	71,7	777,45
TG_Coronel	46,7	Open Cycle	Natural Gas	2005	No	29,0	537,17
TG_Coronel Diesel	46,7	Open Cycle	Diesel	2005	No	63,2	705,97
Nueva Aldea	14	Biomass/steam	Biomass	2005	Yes	0,0	0,00
Candelaria 1	125,3	Open Cycle	Natural Gas	2005	No	35,2	688,46
Candelaria 1 Diesel	125,3	Open Cycle	Diesel	2005	No	48,6	912,79
Candelaria 1 GNL	125,3	Open Cycle	LNG	2005	No	8,0	1045,05
Candelaria 2	128,6	Open Cycle	Natural Gas	2005	No	41,2	688,46
Candelaria 2 Diesel	128,6	Open Cycle	Diesel	2005	No	46,6	887,25
Candelaria 2 GNL	128,6	Open Cycle	LNG	2005	No	3,3	1015,81
L.Verde TG	18,8	Open Cycle	Diesel	2004	No	4,2	891,75
Licantén	4	Biomass/steam	Biomass	2004	No	21,5	0,00
Valdivia	61	Biomass/steam	Biomass	2004	Yes	0,0	0,00
Horcones TG	24,3	Open Cycle	Natural Gas	2004	No	0,3	823,70
Horcones Diesel	24,3	Open Cycle	Diesel	2004	No	6,3	1186,03
Ralco	690	Reservoirs	Hydro	2004	No	2220,6	0,00
Nehuenco II	398,3	Combined Cycle	Natural Gas	2003	No	213,2	445,09
Nehuenco II Diesel	398,3	Combined Cycle	Diesel	2003	No	1547,6	536,27
Nehuenco II GNL	398,3	Combined Cycle	LNG	2003	No	765,9	587,98
Cholguán	13	Biomass/steam	Biomass	2003	Yes	0,0	0,00
Chacabuquito	25,5	Run of the river	Hydro	2002	Yes	0,0	0,00
Nehuenco TG 9B	108	Open Cycle	Natural Gas	2002	No	2,9	692,84
Nehuenco TG 9B Diesel	108	Open Cycle	Diesel	2002	No	0,6	961,88
Nehuenco TG 9B GNL	108	Open Cycle	LNG	2002	No	3,7	1026,53
San Fco. Mostazal	24	Open Cycle	Diesel	2002	No	0,6	1043,76
Peuchén	80	Run of the river	Hydro	2000	No	166,5	0,00
Mampil	49	Run of the river	Hydro	2000	No	106,5	0,00
Taltal 2 GNL	122,45	Open Cycle	LNG	2000	No	0,0	1009,84
Taltal 2	122,45	Open Cycle	Natural Gas	2000	No	36,5	692,94
Taltal 2 Diesel	122,45	Open Cycle	Diesel	2000	No	55,7	857,98
Taltal 1 GNL	122,45	Open Cycle	LNG	2000	No	1,7	1009,84
Taltal 1	122,45	Open Cycle	Natural Gas	2000	No	19,3	692,94
Taltal 1 Diesel	122,45	Open Cycle	Diesel	2000	No	34,9	857,98

TOTAL GEN. PER YEAR	(GWh / yr)		43.192,7
20% OF GEN. PER YEAR	(GWh / yr)		8.638,5
5 MOST RECENT PLANT GEN	(GWh / yr)		9,4

EMISSION FACTOR 5 PLANTS	(tCO2/GWh)		326,86
EMISSION FACTOR 20% GEN	(tCO2/GWh)		914,79

BUILD MARGIN	(tCO2/GWh)		914,79

COMBINED MARGIN CALCULATION 2010

(ACCORDING TO THE ACM0002 (VERSION 06)

OM: Calculated ex post (Option 2, the year in which the emissions occur)
BM: Calculated ex-post (Option 2, updated annually from the date the first emissions occur)

		2010
Operating Margin	(tCO_2/GWh)	896,84
Build Margin	(tCO_2/GWh)	914,79
Combined Margin	**(tCO_2/GWh)**	**905,81**

Monitoring information

Instrument	Manufacturer	Brand	Model	Accuracy	Meter Location	Serial Number	Last Calibration Date	Calibration Dates	Calibration Frecuency (Years)
Energy Meter Switchgear 1-2	Power Measurement	Power Measurement	ION 7330	+/- 0.5%	568-PML-12	PB-0502A 108-11	08/02/2005		7
Energy Meter Switchgear 2-5	Power Measurement	Power Measurement	ION 7330	+/- 0.5%	568-PML-25	PB-0502A245-11	24/01/2005		7
Natural Gas Meter (Start-up Burners)	ENDRESS & HAUSER	ENDRESS & HAUSER	Promass 83 F DN100 / 4"	+/- 0.5%	552-FT-471	75044302000	01/04/2010	07-06-2005	5
Natural Gas Meter (Load Burners)	ENDRESS & HAUSER	ENDRESS & HAUSER	Promass 83 F DN100 / 4"	+/- 0.5%	552-FT-483	75044402000	31/03/2010	07/06/2005	5
Diesel Meter (Start-up Burners)	ENDRESS & HAUSER	ENDRESS & HAUSER	Promass 83 F DN25 / 1"	+/- 0.1%	552-FT-663	75044102000	31/03/2010	09/06/2005	5
Return Diesel Meter (Start-up Burners)	ENDRESS & HAUSER	ENDRESS & HAUSER	Promass 83 F DN15 / ½"	+/- 0.1%	552-FT-668	75043E02000	30/03/2010	08/06/2005	5
Diesel Meter (Load Burners)	ENDRESS & HAUSER	ENDRESS & HAUSER	Promass 83 F DN25 / 1"	+/- 0.1%	552-FT-671	75044202000	31/03/2010	09/06/2005	5
Return Diesel Meter (Load Burners)	ENDRESS & HAUSER	ENDRESS & HAUSER	Promass 83 F DN15 / ½"	+/- 0.1%	552-FT-674	75043F02000	30/03/2010	08/06/2005	5
Black Liquor Flow Meter (Nozzle) 1-3	ABB	ABB	FSM4000	+/- 0.5%	552-FT-378	000402556/X001	22/08/2005		Calibration is not required*
Black Liquor Flow Meter (Nozzle) 4-7	ABB	ABB	FSM4000	+/- 0.5%	552-FT-380	000402556/X003	19/08/2005		Calibration is not required*
Black Liquor Flow Meter (Nozzle) 8-10	ABB	ABB	FSM4000	+/- 0.5%	552-FT-382	000402556/X002	22/08/2005		Calibration is not required*
Black Liquor Flow Meter (Nozzle) 11-14	ABB	ABB	FSM4000	+/- 0.5%	552-FT-384	000402556/X004	19/08/2005		Calibration is not required*
Refractometer	K-Patents	K-Patents	PR-01-S	+/- 0.1%DS	552-DT-370-A	2005B16-6232	23/03/2010	15/01/2009	Biannual verification
Refractometer	K-Patents	K-Patents	PR-01-S	+/- 0.1%DS	552-DT-370-B	2005B17-6233	23/03/2010	15/01/2009	Biannual verification
Black Liquor Temperature Transmitter	Rosemount	Rosemount	3144PD1A1NAB4C4Q4	+/- 0,1 ºC	552-TI-365	494356	27/03/2010	04/12/2005	5
* However, periodics verifications are done for these instruments.									