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 - 05/08/2011

Nueva Aldea Biomass Power Plant Phase 1
UNFCCC 0258
Monitoring Period #5: 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 30 MW biomass cogeneration power plant located inside a new forestry complex by Arauco: the Nueva Aldea Industrial Complex or the Nueva Aldea Project.

The project activity is designed to use own and third party biomass for steam and electric power generation. Biomass from industrial and forestry operations in Chile is normally dumped in piles for natural decay. The project activity is presented by Celulosa Arauco y Constitución S.A. (from now on, Arauco), a leading forestry and pulp-producing company in the world.

It must be noted that since the common practice in the Sawmill and Plywood industries does not include the cogeneration of electric power, the entire net electric power generation capacity of the new power plant in Phase 1 represents a net increase of clean energy in the SIC, and therefore considered part of the project activity.

The proposed project activity will 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 project activity 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 1 project activity helps promoting the development of renewable energy sources in Chile, in particular the use of biomass generated as a byproduct of the forestry industry, which has a significant potential in the country. The proposed project is a good example to demonstrate the viability of electricity generation as a source of revenue not only in the Plywood and Sawmill industries, but in all forest-related industries. It is worthy to highlight, however, that none of the wood panel mills in Chile (and very few –if any- in the world) has power generation capacity, making the Nueva Aldea Power Plant Phase 1 quite unique and particular in its type. Although this technological improvement is consistent with the internal policies of energy efficiency by Arauco; it must be recognized as an initiative that goes far beyond the common practice of the Sawmill/ Plywood mill industries in Chile.

Relevant dates for the project activity:

Date (DD/MM/YY)	Key events
June 2004	Approval permits to start construction activities
29/09/2003	Commissioning start date
01/01/2005 to 30/09/2006	The 1st monitored period
01/10/2006 to 30/09/2007	The 2nd monitored period
01/10/2007 to 30/09/2008	The 3rd monitored period
01/10/2008 to 31/12/2009	The 4th monitored period
01/01/2010 to 31/12/2010	The 5th monitored period (this report)

Total net emission reductions claimed in the 5th monitored period (from January 1st 2010 to December 31th 2010) are 207,442 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.
United Kingdom of Great Britain and Northern Ireland.	Inversiones Celco S.L.	No
Switzerland.	Cantor Fitzgerald Europe	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 project activity is located in the Nueva Aldea Industrial Complex site. The Nueva Aldea Industrial complex is located near the Nueva Aldea community area, Commune of Ranquil, in the province of Ñuble. It is 30 km. west of the Chillan city and 28 km. southeast of the Coelemu city in the VIII Region (Bío-Bío Region), Chile. The project site is located 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 30 MW biomass cogeneration power plant located inside a new forestry complex by Arauco: the Nueva Aldea Industrial Complex or the Nueva Aldea Project.

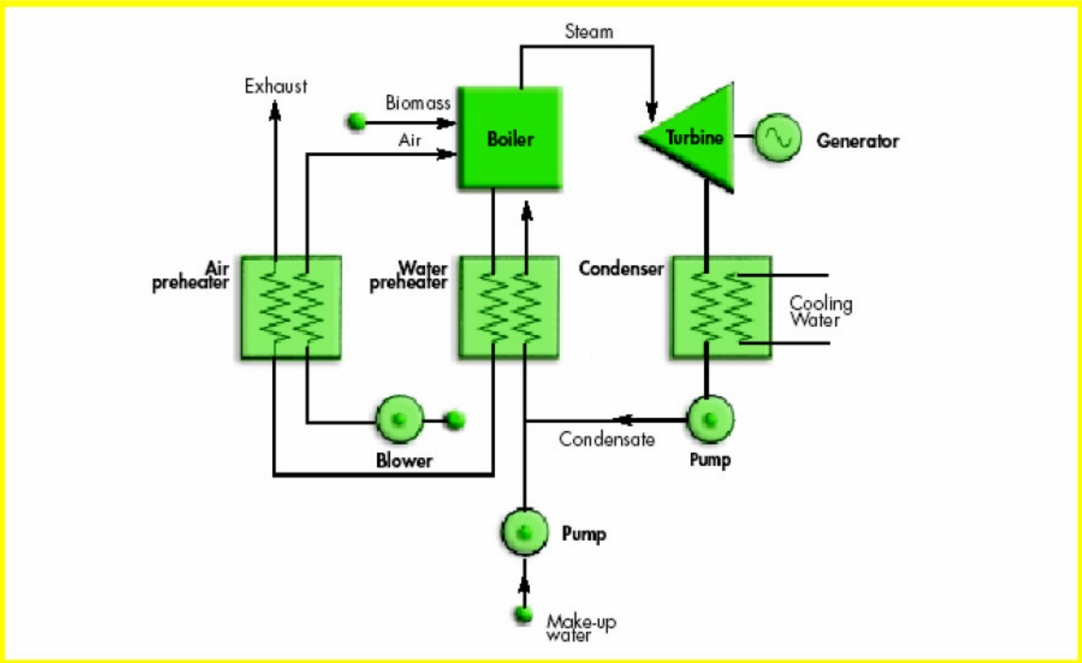
The project activity is designed to use own and third party biomass for steam and electric power generation. Biomass from industrial and forestry operations in Chile is normally dumped in piles for natural decay. The project activity is presented by Celulosa Arauco y Constitución S.A. (from now on, Arauco), a leading forestry and pulp-producing company in the world.

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 flue 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 3). 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.

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 01): "Consolidated methodology for grid-connected electricity generation from biomass residues". Applied baseline scenario for the project activity: Nº 3.

The project activity also relies on the following methodology:

ACM0002 (Version 04): "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 March 31, 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:	01/01/2005
End date of the first crediting period:	31/12/2011
Length of the first crediting period:	Seven (7) years
Maximum length of the crediting period:	3 x Seven (7) years

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 Bioenergía 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

(*) During year 2010, Arauco Generacion S.A. changed its name to Arauco Bioenergía S.A.

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 01/01/2005 and it has operated as described in the CDM PDD.

Description of the plant operation during the 5th monitoring period (Jan 01, 2010 – Dec 31, 2010)

An earthquake with an intensity of 8.8° in the Righter scale occurred 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. Though the earthquake caused significant damage in the affected area nearby the project plant, specialized engineers checked on every structure, and no mayor structural damage was found. After a short period of time (5 weeks), basic services were re-established. Nevertheless, some sawmills in the

nearby area were shut down during March, 2010. In that time, Nueva Aldea Phase 1 used biomass from its internal operation and from other Arauco facilities that stopped operating as a result of the earthquake.

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

Out of service day	Starting day	Number of days shut down/stopagges	Comments
27/02/2010	28/02/2010	2	**Earthquake**
01/03/2010	12/03/2010	12	**Earthquake**
09/07/2010	11/07/2010	2	Maintenance stoppage
13/08/2010	15/08/2010	2	Maintenance stoppage
24/10/2010	25/10/2010	2	Operation stoppage
5/12/2019	20/12/2010	14	Shutdown

B.2. Revision of the monitoring plan

The monitoring plan was revised and approved by the EB in 17/08/2008. It must be noted that monitoring plan was revised due to the Project Participant determined the additional biomass (for electricity generation) consumed in the power boiler, by using a specific consumption factor (m^3st of biomass/MWh) calculated directly from the energy / mass balance of the project plan. The EB instructed the Project Participant to change the monitoring plan so as to use equation N°24 of the ACM0006 Version 01 to determine the additional biomass used by the project plant.

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.

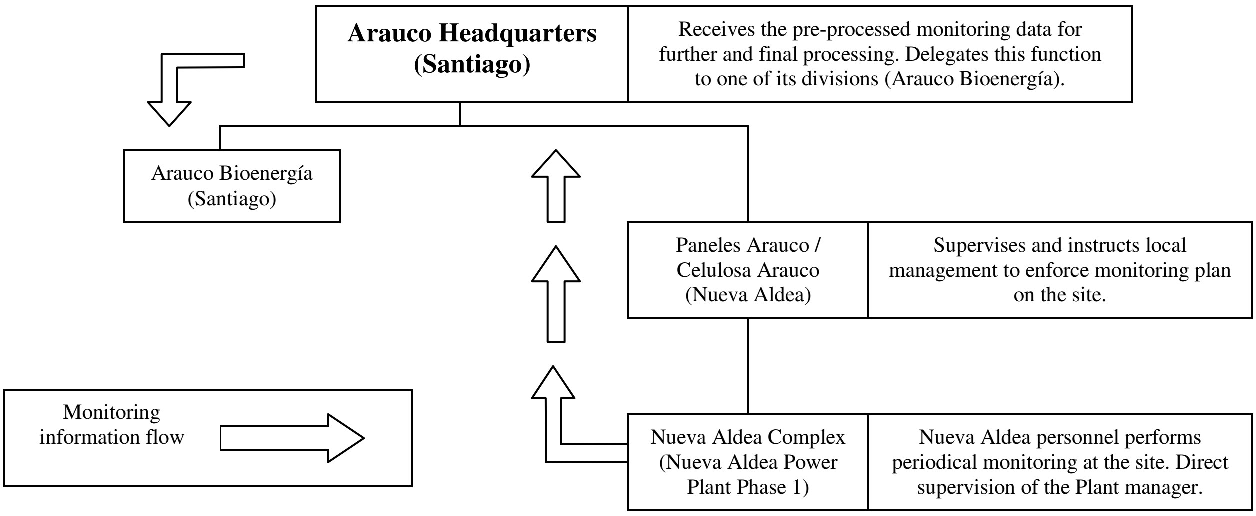
SECTION C. Description of the monitoring system

The Project Participant, 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 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. in Santiago for further and final processing (table formats, reports, etc.). With the information at this level, Arauco carries out the external verifications to verify the emission reduction of the Nueva Aldea Power Plant Phase 1 project activity periodically (i.e. once every year).

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

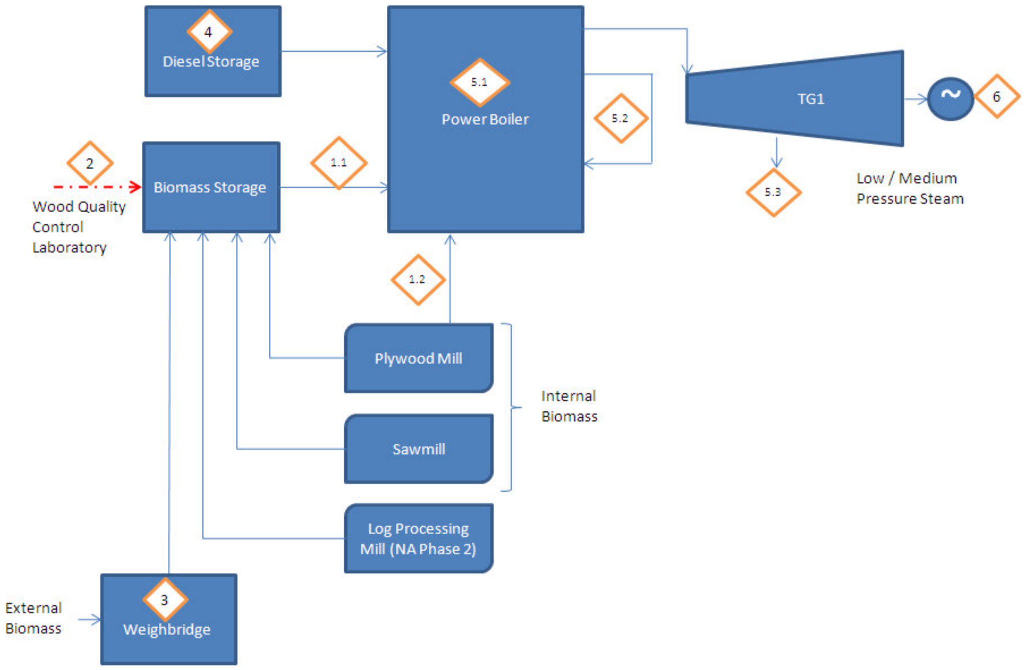
Monitoring information flow of Nueva Aldea Power Plant Phase 1 project activity



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.

This diagram shows all relevant monitoring points:

Line Diagram of the Instruments



ITEM	TAG	INSTRUMENT
1.1	431-FIQ-916	Biomass Mix Conveyor Belt weight meter
1.2	463-FIQ-174	Sander Dust Conveyor Belt weight meter
2	N/A	Electronic Moisture Analyzer
3	N/A	Weighbridge 1
	N/A	Weighbridge 2
	N/A	Weighbridge 3
4	461-LT-0460	Level Transmitter
5.1	463-PT-0106	Pressure Transmiter Feed Water
	463-TT-0110	Temperature Transmiter Feed Water
5.2	463-FT-0402	Steam Flow Meter 85 bar (Soot blower)
	463-PT-0403	Pressure Transmiter 85 bar (Soot blower)
	463-TT-0406	Temperature Transmitter 85 bar (Soot blower)
5.3	465-FT-9027	Steam Flow Meter 19 bar (Plywood Mill)
	565-FT-0965	Steam Flow Meter 19 bar (Pulp Mill)
	465-PIT-9000-A	Pressure
	465-PIT-9000-B	Pressure Transmitter 19 bar (Main line)
	465-TT-9028	Temperature Transmitter 19 bar (Pulp Mill)
	465-FT-9025	Steam Flow Meter 11.5 bar (AASA)
	465-PIT-9001-A	Pressure
	465-PIT-9001-B	Pressure
	465-TT-9026	Temperature Transmitter 11.5 bar
	465-FT-9019	Steam Flow Meter 5.5 bar (AASA)
	465-FT-9023	Steam Flow Meter 5.5 bar (Boiler)
	462-FT-9150	Steam Flow Meter 5.5 bar (Deaerator)
	465-PIT-9002-A	Pressure
	465-PIT-9002-B	Pressure
	465-PIT-9002-C	Pressure
	465-TT-9024	Temperature Transmitter 5.5 bar
6	468-PM-008	Energy Meter Switchgear 1-8
	468-PM-006	Energy Meter Switchgear 1-6

Note: Internal and external biomass (excluding sander dust, for security reasons) is deposited and mixed in the zone called "Biomass storage". The total biomass is measured by conveyor belt weight meters (in the diagram: 1.1, 1.2). The average residence time of the biomass in the storage is one week.

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:	ε_{Boiler}
Data unit:	(%)
Description:	Energy efficiency of the boiler that would be used in the absence of the project activity.
Source of data used:	This is the energy efficiency of the boiler that would be used in the absence of the project activity. This parameter is used in equation 24 of the ACM0006 (Version 01). The efficiency of the boiler that would have been installed in the absence of the project activity is 85%. This efficiency value was determined based on the efficiency calculation of a real low-pressure boiler installed in one of the Arauco industrial facilities. The efficiency was calculated in accordance with the ASME PTC 4.1 standard and was further validated by an expert opinion from a highly reputed consulting company, in the field of heat and power generation.
Value(s) :	85%
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)	Baseline emissions calculations.
Additional comment:	Until the next COP/MOP decision, it is the accepted value for emission reduction calculations in CDM project activities.

Data / Parameter:	$EF_{CH4burning,i}$
Data unit:	(tCH_4/GJ)
Description:	CH_4 emission factor for uncontrolled burning of biomass type i.
Source of data used:	Local measured value.
Value(s) :	0.6961
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions calculations.
Additional comment:	According to the baseline methodology ACM0006 (Version 01), page 33, the Project Participant may undertake measurements or use referenced default values to calculate the CH_4 baseline emissions from uncontrolled burning of biomass. Given that by the time the PDD was written there were no local measurements available, the validator

	indicated the Project Participant to use the IPCC default factor corrected by the lowest conservativeness factor (Table Nº4, page 34 of the ACM0006 Version 01). This generated extremely conservative CH_4 baseline emissions for the project activity, since when the biomass residues are burned in piles in the open air, the combustion occurs under very low oxygen conditions and therefore is very inefficient. Inefficient combustion leads to high CH_4 emissions. As a result, the Project Participant explicitly mentioned in page 67 of the registered PDD and in page A39 of the validation report that a local CH_4 measurement would be attempted in the future in order to have a more accurate and fair estimation of the baseline emissions from this source. During September 2006, the Project Participant hired the U.S. Forest Service of Missoula, USA to conduct a local measurement of the CH_4 emission factor for uncontrolled burning of biomass in the nearby area of the Power Plant. The result of this measurement indicated a CH_4 emission factor for uncontrolled burning of the same type of biomass used in the Nueva Aldea Power Plant Phase 1 of 740.5 (Kg CH_4/TJ), with an associated standard deviation of 162.2 (Kg CH_4/TJ). According to Table 4 of the ACM0006 (Version 01) baseline methodology, this led to a conservativeness factor of 0.94, resulting in an adjusted CH_4 baseline emission factor for uncontrolled burning of biomass of 696.1 (Kg CH_4/TJ). The CH_4 emission factor was measured again during March 2009, during summer time in the vicinity of the planet. The result of this measurement indicated a CH_4 emission factor for uncontrolled burning of 930 (Kg CH_4/TJ), with an associated standard deviation of 173 (Kg CH_4/TJ). Considering that the 2009 measurement was carried out under very conservative conditions (summer season, when the biomass residues are drier), the lower methane emission factor used for the emission reduction calculation in this case is certainly conservative.

Data / Parameter:	$EF_{CH4burning,i}$
Data unit:	(Kg CH_4/TJ)
Description:	CH_4 emission factor for controlled burning of biomass in the power boiler.
Source of data used:	Local measured value.
Value(s) :	15.3
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions calculations.
Additional comment:	The Project Participant requested the U.S. Forest Service of Montana to carry out a CH_4 emission factor measurement for controlled burning of biomass in two fluidized bed boilers, similar to the one used in the Nueva Aldea Phase 1 power plant (in fact, one of the boilers was the Nueva Aldea Phase 1 boiler). The results of the measurements indicated that the CH_4 concentration in the flue gases (in ppm) was actually lower than the concentration of CH_4 found in the clean air. In other words, the combustion of the biomass residues in a fluidized bed boiler was so efficient, that actually withdrew CH_4 from the clean air. Considering this result and that the Project Participant is using a positive (15.3 (Kg CH_4/TJ)) IPCC default factor for controlled burning

	of biomass to calculate this project emission source, this calculation is extremely conservative.

Data / Parameter:	
Data unit:	(Kg/l)
Description:	Density of fossil fuels used on-site.
Source of data used:	Local measured value.
Value(s) :	0.8401
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions calculation.
Additional comment:	Density values for each year were measured and obtained from reputed laboratories.

D.2. Data and parameters monitored

Data / Parameter:	$BF_{i,y}$
Data unit:	(BDt/year)
Description:	Quantity of Biomass type *i* combusted by the project plant during the year y.
Measured /Calculated /Default:	Measured.
Source of data:	Power Plant's procurement department. This variable was directly monitored using weight meters.
Value(s) of monitored parameter:	405,998 (BDt)
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)	431-FIQ-916 Type: Biomass Mix Conveyor Belt weight meter Accumass BW500 Accuracy class: +/- 1.2% Serial number: PBD/W6020051PJ Calibration frequency: Biannual Date of last calibration: 14/12/2010 Validity: 14/06/2011 463-FIQ-174 Type: Sander dust Conveyor Belt weight meter KCM/SWB-600 Accuracy class: +/- 3% Serial number: 965691 Calibration frequency: Biannual Date of last calibration: 30/12/2010 Validity: 30/06/2011
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	All instruments involved in the measurement of biomass flows received maintenance and calibration according to the manufacturer's manual and / or proper industry standards. Since the Nueva Aldea Complex (as well as most of Arauco facilities) uses the SAP systems, there are periodic and continuous consistency checks between the

	information that is loaded in SAP and the receipts from all suppliers including biomass. This is necessary not only to ensure the accuracy of the information used to calculate the Nueva Aldea Phase 1 net emission reductions, but also to ensure the good quality of the information used for accounting and tax-reporting purposes. This further ensures the good quality of the information used to calculate the emission reductions of the Nueva Aldea Phase 1 project. In addition to the above, the Project Participant carried out energy balances on a periodic basis as a consistency crosschecking measure. All biomass values were consistent with the efficiency of the power plant. The Project Participant also crosschecked the measurements through stock variations (i.e. topographic variations) and purchases, which was found to be consistent.

Data / Parameter:	$NCV_{Biomass,i}$
Data unit:	(GJ/ton)
Description:	Net calorific value of biomass of fuel type i.
Measured /Calculated /Default:	Measured or calculated.
Source of data:	Power Plant's procurement department and authorized laboratories. This variable was measured in a specialized laboratory. The measurement was carried out according to proper industry standards.
Value(s) of monitored parameter:	16.95 (GJ/ton)
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)	Not applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	During the monitored period, the NCV of the biomass type combusted in the power boiler was measured each year, presenting minimum differences from one year to another. Comparisons with corresponding IPCC default values also validated and confirmed the measured values. The measured net calorific value of the biomass was consistent with the values of net calorific values found for Wood/Wood Waste in Table 1.2, Volume 2 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Data / Parameter:	AVD_y
Data unit:	(Km)
Description:	Average return trip distance between biomass fuel supply sites and the project site.
Measured /Calculated /Default:	Measured.
Source of data:	Power Plant's procurement department. Information from the suppliers.
Value(s) of monitored	152.1 (Km)

parameter:	
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)	Not applicable.
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Since the location of each biomass supplier is known (practically 100% of the third party biomass comes from permanent type sawmills in the nearby area), distances were obtained from the transportation subcontractors and verified with regional roadmaps.

Data / Parameter:	TL_y
Data unit:	(ton)
Description:	Average truck load of the trucks used for transportation of biomass.
Measured /Calculated /Default:	Measured.
Source of data:	Power Plant's procurement department.
Value(s) of monitored parameter:	26.6 (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)	Type: Weighbridge 1: North entrance JAGXTREME Accuracy class: +/- 30 kg Serial number: 5437967-5GF Calibration frequency: Biannual Date of last calibration: 26/07/2010 Validity: 26/01/2011 Type: Weighbridge 2: South entrance JAGXTREME Accuracy class: +/- 30 kg Serial number: 5429421-5EF Calibration frequency: Biannual Date of last calibration: 26/07/2010 Validity: 26/01/2011 Type: Weighbridge 3: Truck exit JAGXTREME Accuracy class: +/- 30 kg Serial number: 5437969-5GF Calibration frequency: Biannual Date of last calibration: 26/07/2010 Validity: 26/01/2011
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Trucks that transport the biomass are all of known (recorded) sizes.

	This variable was obtained from measured data (weight and volume of the cargo). Weighbridges meters received periodic maintenance and calibration as per instructed by the equipment manufacturer and according proper industry standards.

Data / Parameter:	$EF_{Km,CO2}$
Data unit:	(tCO_2/Km)
Description:	Average CO_2 emission factor for transportation of biomass with trucks.
Measured /Calculated /Default:	Calculated.
Source of data:	Average fuel consumption was obtained from the transportation subcontractors, which was then used to calculate the corresponding CO_2 emission factor. For net calorific values and CO_2 emission factors: reliable national default values or, if not available, (country-specific) IPCC default values.
Value(s) of monitored parameter:	1.347 (tCO_2/Km)
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)	Not applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Local values were used whenever possible. In cases in which they were not available, IPCC factors were used instead.

Data / Parameter:	$F_{Trans,i,y}$ (in the PDD, this variable appears as $OF_{i,y}$)
Data unit:	(l)
Description:	Fuel consumption of fuel type i used for transportation of biomass.
Measured /Calculated /Default:	Measured.
Source of data:	Power Plant's procurement department.
Value(s) of monitored parameter:	54,516 (l)
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)	Not applicable.
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.

QA/QC procedures applied:	Front loaders fuel consumption was crosschecked against hourly fuel consumption rates.

Data / Parameter:	$COEF_{CO2,i,}$
Data unit:	(tCO_2/ton)
Description:	CO_2 emission factor for the fuel type i.
Measured /Calculated /Default:	Measured or calculated.
Source of data:	Power Plant's procurement department and IPCC manual. The emission factor was determined using the net calorific value, carbon content and fraction of carbon oxidized of the corresponding fossil fuel.
Value(s) of monitored parameter:	3.173 (tCO_2/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)	Not applicable.
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Local values were used whenever possible. In cases in which they were not available, IPCC factors were used instead.

Data / Parameter:	$FF_{project\ plant,i,y}$ (in the PDD, this variable appears as FF_y)
Data unit:	(l)
Description:	On-site fossil fuel consumption of fuel type i for co-firing in the project plant.
Measured /Calculated /Default:	Measured.
Source of data:	Power Plant's procurement department.
Value(s) of monitored parameter:	673,453 (l)
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)	461-LT-0460 Type: Level transmitter 264HCHRBEFSSA1/E6/L1/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6404010868 Calibration frequency: Annual Date of last calibration: 15/09/2010 Validity: 15/09/2011
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Fuel meters received periodic maintenance and calibration as per instructed by the equipment manufacturer and according proper

	industry standards 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:	Power Plant electric meters. This variable was monitored using electric meters that are standard in the electric power industry in Chile.
Value(s) of monitored parameter:	193.2 (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)	468-PM-006 Type: Energy Meter Switchgear (1-6) Power Measurement ION 7330 V277 Accuracy class: +/- 0.5% Serial number: PB-0401A178-11 Calibration frequency: 7 years Date of last calibration: 21/01/2004 Validity: 21/01/2011 468-PM-008 Type: Energy Meter Switchgear (1-8) Power Measurement ION 7330 V277 Accuracy class: +/- 0.5% Serial number: PB-0401A161-11 Calibration frequency: 7 years Date of last calibration: 28/01/2004 Validity: 28/01/2011
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. In addition, the Nueva Aldea Phase 1 administration performed periodic (monthly) consistency checks in the substation electric bus where the Nueva Aldea Biomass Power Plant Phase 1 connects to the SIC grid. The consistency of metered net electricity generation was also crosschecked with receipts from electricity. Finally, the plant manager also performed consistency checks between the net electricity generated by the cogeneration plant and the amount of fuels combusted in the power plant during the monitored period (e.g. check whether the electricity generation divided by the quantity of biomass fired results in a reasonable efficiency that is comparable to previous years). All values were comparable to previous years.

Data / Parameter:	Q_y
Data unit:	(GJ)
Description:	Net quantity of heat generated from firing biomass in the project plant.

Measured /Calculated /Default:	Measured.
Source of data:	This variable was measured by the Project Participant. The measurement was carried out according to proper industry standards.
Value(s) of monitored parameter:	2,264,826 (GJ)
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)	462-FT-9150 Type: Steam flow meter 5.5 bar (Deaerator) ABB 264DSGSSB2A3/V1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 64004006181 Calibration frequency: Annual Date of last calibration: 08/12/2010 Validity: 08/12/2011 463-FT-0402 Type: Steam flow meter 85 bar (Soot blower) ABB 264DSHSSB2A3/V1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6403015454 Calibration frequency: Annual Date of last calibration: 07/12/2010 Validity: 07/12/2011 463-PT-0106 Type: Pressure Transmitter Feed water ABB 264PSSSSB2A3V1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 64030015456 Calibration frequency: Annual Date of last calibration: 07/12/2010 Validity: 07/12/2011 463-TT-0403 Type: Pressure Transmitter 85 bar (Soot blower) ABB 264PSQSSB2A3V1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6403015454 Calibration frequency: Annual Date of last calibration: 07/12/2010 Validity: 07/12/2011 463-TT-0110 Type: Temperature Transmitter Feed water Rosemount 3244MVF1NAA01B4C2C4Q4 Accuracy class: +/- 0.10% Serial number: 458205 Calibration frequency: Annual Date of last calibration: 07/12/2010 Validity: 07/12/2011 463-TT-0406

	Type: Temperature Transmitter 85 bar (Soot blower) Rosemount 3244MVF1NAA01B4C2C4Q4 Accuracy class: +/- 0.10% Serial number: 458156 Calibration frequency: Annual Date of last calibration: 08/12/2010 Validity: 08/12/2011 465-FT-9019 Type: Steam flow meter 5.5 bar (AASA) Rosemount 3051SFADS120DCHPS2T100072AF1A2G2Q4F2 Accuracy class: +/- 0.025% Serial number: 8806 Calibration frequency: Annual Date of last calibration: 09/12/2010 Validity: 09/12/2011 465-FT-9023 Type: Steam flow meter 5.5 bar (Boiler) Rosemount 3051SFADS120DCHPS2T100072AF1A2G2Q4F2 Accuracy class: +/- 0.025% Serial number: 8807 Calibration frequency: Annual Date of last calibration: 10/12/2010 Validity: 10/12/2011 465-FT-9025 Type: Steam flow meter 11.5 bar (AASA) Rosemount 3051SFADS120DCHPS2T100072AF1A2G2Q4F2 Accuracy class: +/- 0.025% Serial number: 8808 Calibration frequency: Annual Date of last calibration: 09/12/2010 Validity: 09/12/2011 465-FT-9027 Type: Steam flow meter 19 bar (Plywood mill) Rosemount 3051SFADS120DCHPS2T100072AF1A2G2Q4F2 Accuracy class: +/- 0.025% Serial number: 8809 Calibration frequency: Annual Date of last calibration: 09/12/2010 Validity: 09/12/2011 465-PIT-9000-A Type: Pressure Transmitter 19 bar (Main line) ABB 264PSQSSB2A3/V1/L1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6404008677 Calibration frequency: Annual Date of last calibration: 10/12/2010 Validity: 10/12/2011 465-PIT-9000-B Type: Pressure Transmitter 19 bar (Main line) ABB 264PSQSSB2A3/V1/L1/B2/I2/N6/C1 Accuracy class: +/- 0.075%

	Serial number: 6404008676 Calibration frequency: Annual Date of last calibration: 10/12/2010 Validity: 10/12/2011 465-PIT-9001-A Type: Pressure Transmitter 11.5 bar (Main line) ABB 264PSPSSB2A3/V1/L1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6404008680 Calibration frequency: Annual Date of last calibration: 09/12/2010 Validity: 09/12/2011 465-PIT-9001-B Type: Pressure Transmitter 11.5 bar (Main line) ABB 264PSPSSB2A3/V1/L1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6404008679 Calibration frequency: Annual Date of last calibration: 09/12/2010 Validity: 09/12/2011 465-PIT-9002-A Type: Pressure Transmitter 5.5 bar (Main line) ABB 264PSPSSB2A3/V1/L1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6404008685 Calibration frequency: Annual Date of last calibration: 10/12/2010 Validity: 10/12/2011 465-PIT-9002-B Type: Pressure Transmitter 5.5 bar (Main line) ABB 264PSPSSB2A3/V1/L1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 64040027440 Calibration frequency: Annual Date of last calibration: 10/12/2010 Validity: 10/12/2011 465-PIT-9002-C Type: Pressure Transmitter 5.5 bar (Main line) ABB 264PSPSSB2A3/V1/L1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6404008681 Calibration frequency: Annual Date of last calibration: 10/12/2010 Validity: 10/12/2011 465-TT-9024 Type: Temperature Transmitter 5.5 bar Rosemount 3244MVF1NAA01B4C2C4Q4 Accuracy class: +/- 0.10% Serial number: 456395 Calibration frequency: Annual Date of last calibration: 11/12/2010

	Validity: 11/12/2011 465-TT-9026 Type: Temperature Transmitter 11.5 bar Rosemount 3244MVF1NAA01B4C2C4Q4 Accuracy class: +/- 0.10% Serial number: 456304 Calibration frequency: Annual Date of last calibration: 11/12/2010 Validity: 11/12/2011 465-TT-9028 Type: Temperature Transmitter 19 bar Rosemount 3244MVF1NAA01B4C2C4Q4 Accuracy class: +/- 0.10% Serial number: 456397 Calibration frequency: Annual Date of last calibration: 09/12/2010 Validity: 09/12/2011 565-FT-0965 Type: Steam flow meter 19 bar (Pulp mill) ABB 264DSMSSA2A3/V1/B2/I2/N6/C1 Accuracy class: +/- 0.075% Serial number: 6406022860 Calibration frequency: Annual Date of last calibration: 10/03/2010 Validity: 10/03/2011
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Heat quantities are directly measured by dedicated steam flow meters and pressure / temperature meters. The associated uncertainty is very low, since these parameters are key to the production processes of the Nueva Aldea Complex and therefore, receive periodic maintenance according to proper industry standards. The consistency of metered net heat generation was crosschecked with receipts from electricity sales (if available). In addition, the plant manager also performed consistency checks between the net heat generated by the power boiler and the amount of fuels combusted in the power plant during the monitored period (e.g. check whether the heat generation divided by the quantity of biomass fired results in a reasonable efficiency that is comparable to previous years). All values were comparable to previous years.

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 IPCC values.

Value(s) of monitored parameter:	775.7 (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 04), 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 Participant. However, the Project Participant 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 IPCC values.
Value(s) of monitored parameter:	809.0 (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 04), 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 Participant. However, the Project Participant 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 IPCC values.
Value(s) of monitored parameter:	742.4 (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 04). 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 Participant. However, the Project Participant 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's 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 Participant. However, the Project Participant 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 Natural Gas, Butane, Propane and Natural Gas Liquid (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) Natural Gas: 2,193 (tCO_2/MMm^3) IFO 180: 3,401 (tCO_2/000ton) Butane Gas: 3,249 (tCO_2/MMm^3) Propane Gas: 3,249 (tCO_2/MMm^3) Natural Gas Liquid: 3,249 (tCO_2/MMm^3)
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):	$COEF_{CO2,i}$= 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 Participant. However, the Project Participant calculated this emission coefficient from official and publicly available data from the CNE.

Data / Parameter:	$GEN_{j/k/n,y}$
Data unit:	(GWh/yr) 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	Not applicable.

number, calibration frequency, date of last calibration, validity)	
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 Participant. However, the Project Participant 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 Participant. However, the Project Participant 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	Not applicable.

frequency, date of last calibration, validity)	
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 Participant. However, the Project Participant 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:	0.0065068493
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 Participant. However, the Project Participant 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	Not applicable.

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 Participant. However, the Project Participant 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, 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 Participant. However, the Project Participant calculated this emission coefficient from official and publicly available data from the CDEC-SIC dispatch center.

Data / Parameter:	$BF_{i,y}$
Data unit:	(BDt)
Description:	Amount of biomass type i for which leakage could not be ruled out using one of the approaches in the baseline methodology.
Measured /Calculated /Default:	Measured.
Source of data:	The project did not cause any leakage effect during the monitored period.
Value(s) of monitored parameter:	0 (BDt)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Leakage emission calculations.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last	Not applicable.

calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually.
Calculation method (if applicable):	As per option L2 and equation N°26 of ACM0006 (Version 01).
QA/QC procedures applied:	The biomass surplus index was calculated using as much official information as possible. Consistency checks were performed whenever it was feasible (i.e. low cost biomass power plants in the influence area continue being low cost-must run power units after the Nueva Aldea Biomass Power Plant Phase 1 started operating).

Data / Parameter:	**--**
Data unit:	(BDt)
Description:	Amount of biomass type i fired in all grid-connected power plants in the region / country.
Measured /Calculated /Default:	Measured or calculated.
Source of data:	Leakage effects were duly considered following the L2 criteria of the ACM0006 (Version 01). The project did not cause any leakage effect during the monitored period.
Value(s) of monitored parameter:	See table on the leakage section of this monitoring report.
Indicate what the data are used for (Baseline/ Project/ Leakage 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):	As per option L2 and equation N°26 of ACM0006 (Version 01).
QA/QC procedures applied:	The biomass surplus index was calculated using as much official information as possible. Consistency checks were performed whenever it was feasible (i.e. low cost biomass power plants in the influence area continue being low cost-must run power units after the Nueva Aldea Biomass Power Plant Phase 1 started operating).

Data / Parameter:	**--**
Data unit:	(BDt)
Description:	Amount of biomass type i that was available in surplus in the region / country.
Measured /Calculated /Default:	Measured or calculated.
Source of data:	Leakage effects were duly considered following the L2 criteria of the ACM0006 (Version 01). The project did not cause any leakage effect during the monitored period.
Value(s) of monitored parameter:	See table on the leakage section of this monitoring report.
Indicate what the data are used for (Baseline/ Project/ Leakage 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):	As per option L2 and equation N°26 of ACM0006 (Version 01).
QA/QC procedures applied:	The biomass surplus index was calculated using as much official information as possible. Consistency checks were performed whenever it was feasible (i.e. low cost biomass power plants in the influence area continue being low cost-must run power units after the Nueva Aldea Biomass Power Plant Phase 1 started operating).

Data / Parameter:	$COEF_{CO2,j}$
Data unit:	(tCO_2/000ton)
Description:	CO_2 emission factor of the most carbon intensive fuel in the calculation of the combined margin with methodology ACM0002.
Measured /Calculated /Default:	Default.
Source of data:	Local values were used whenever possible. In cases in which they were not available, IPCC factors were used instead.
Value(s) of monitored parameter:	Since leakage was 0 during the monitored period, this parameter was not considered in the corresponding emission reduction calculation.
Indicate what the data are used for (Baseline/ Project/ Leakage 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:	Not applicable.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	The Project Participant had no need to use this variable, since it was possible to show that the project activity did not cause leakage in the influence area of the power plant.

Data / Parameter:	**--**
Data unit:	(%)
Description:	Biomass moisture.
Measured /Calculated /Default:	Measured.
Source of data:	Nueva Aldea Phase 1 Power Plant's procurement department.
Value(s) of monitored parameter:	51.8%
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculation.
Monitoring equipment (type, accuracy class, serial	Type: Electronic moisture analyser Sartorius AG. Gotingen MA100H-000230V1

number, calibration frequency, date of last calibration, validity)	Accuracy class: 0.001 Serial number: 17302238 Calibration frequency: Annual Date of last calibration: 05/05/2010 Validity: 05/05/2011
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	Electronic moisture analyser received periodic maintenance and calibration as per instructed by the equipment manufacturer and according proper industry standards. The measured data is constantly compared with historic data in order to avoid or minimize errors.

Data / Parameter:	**--**
Data unit:	Not applicable.
Description:	Biomass source identification.
Measured /Calculated /Default:	Measured.
Source of data:	Nueva Aldea Phase 1's reception bills and CONAF dispatch bills.
Value(s) of monitored parameter:	Not applicable.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Not applicable.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable.
Measuring/ Reading/ Recording frequency:	Continuously.
Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	All biomass suppliers of Nueva Aldea Phase 1 have sustainability certification (i.e. Certfor) or have signed supply contracts explicitly declaring to comply with the outstanding forest Chilean law which guarantees a sustainable origin of the biomass sold to the Nueva Aldea plant.

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 with full decimals (no rounding), this implies a decimal precision that is not carried onto word formatted tables because decimals are shown truncated and rounded down. Exact 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 year-averages were employed the calculations presented below.

E.1. Baseline emissions calculation

Since the baseline scenario is that the current practice continues, i.e. the biomass related to the project activity would be disposed and not utilized for electricity generation. The emission reductions then, result from the avoidance of biomass open-air burning and the electric power generated with fossil fuels. According to this, the baseline emissions for year *y* were calculated according to the following formula:

$$BL_{E,y} = BL_{E1,y} + BL_{E2,y}$$

Where:

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

Baseline emissions due to burning of anthropogenic sources of biomass residues are calculated according to methodology ACM0006 (version 01), equation N° 24, using the quantity of biomass residues used as a result of the project activity.

$$BE_{E1,y} = GWP_{CH4} \cdot \left[\sum_i BF_{i,y} \cdot NCV_{Biomass,i} \cdot - \frac{Q_y}{\varepsilon_{Boiler}} \right] \cdot EF_{burning,CH4,i}$$

Where:

$BE_{E1,y}$ Emissions from avoided biomass disposal (tCO_2eq/yr).
GWP_{CH4} Global Warming Potential of methane (21 tCO_2eq/tCH_4).
$BF_{i,y}$ Biomass of type *i* used by the project activity (BDt/yr).
NCV_i Net calorific value of biomass fuel type i (GJ/BDt).
Q_y Net quantity of heat generated in the cogeneration project plant during the year y (GJ).
Energy efficiency of the boiler that would be used in the absence of the project activity.

$?_{Boiler}$

$EF_{burning, CH4,i}$ CH_4 emission factor for uncontrolled burning of biomass type i (tCH_4/GJ).

The corresponding calculations for the monitored period are presented below.

Data:

	Units	2010
(1) Total biomass residues combusted.	(BDt)	405,998
(2) Net calorific value of biomass (dry basis).	(GJ/ton)	16.95
(3) Quantity of heat generated in the cogen. plant.	(GJ)	2,264,826
(4) Energy efficiency of the baseline boiler.	(%)	85%
(5) EF_{CH4} for uncontrolled biomass burning.	(Kg CH_4/TJ)	696.1
(6) CH_4 global warming potential.	(number)	21

Calculations:

(7) Biomass combusted in the baseline.	(3)/[(2)*(4)]	157,165 (BDt)
(8) Incremental biomass use.	(1)-(7)	248,833 (BDt)
(9) CH_4 avoidance baseline emissions.	**[(8)*(2)/1,000,000]*(5)*(6)**	**61,665 (tCO_2)**

Baseline emissions due to displacement of electricity are calculated according to methodology ACM0006 (Version 01), equation N° 8, by multiplying the electricity baseline emissions factor ($EF_{electricity,y}$) with the net electricity generation of the project activity:

$$BE_{E2,y} = EF_{electricity,y} \cdot EG_y$$

Where:

$BE_{E2,y}$ Baseline emissions due to displacement of electricity during the year y (tCO_2/yr).
$EF_{electricity,y}$ CO_2 baseline emission factor for the electricity displaced due to the project activity in during the year y (tCO_2/MWh).
EG_y Net quantity of electricity generated in the power plant during the year y (MWh/yr).

According to the above, the net electricity displaced by the project activity is calculated as follows:

Data:

	Units	2010
(1) Combined margin for the SIC grid.	(tCO_2/GWh)	775.68
(2) Net quantity of electricity displaced by the p.a.	(GWh)	193.2

Calculations:

(3) Total grid emission savings.	**(1)*(2)**	**149,835 (tCO_2)**

Total baseline emissions

Baseline emission sources.	**2010**
Baseline emissions due to methane avoidance.	61,665 (tCO_2eq)
Baseline emissions due to electricity displacement.	149,835 (tCO_2)
Total baseline emissions.	**211,501 (tCO_2eq)**

E.2. Project emissions calculation

The anthropogenic emissions by sources of GHGs of the project activity in year *y* ($EM_{P,y}$) can be determined as follows:

$$EM_{P,y} = P_{E1,y} + P_{E2,y} + P_{E3,y} + P_{E4,y}$$

Where:

$EM_{P,y}$ Total project activity emissions (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 Plant's power boiler (tCO_2/yr).

Methane emissions from combustion of biomass were calculated using equation N° 7 of the ACM0006 (Version 01) as follows:

$$PE_{E1,y} = GWP_{CH4} \cdot EF_{Biomass,CH4} \cdot \sum_i BF_{i,y} \cdot NCV_{Biomass,i}$$

Where:

$PE_{E1,y}$ Methane emissions from combustion of biomass (tCO_2eq/yr).
GWP_{CH4} Global Warming Potential of methane (21 tCO_2eq/tCH_4).
$BF_{i,y}$ Quantity of biomass type *i* used as fuel in the project plant during the year *y* (BDt/yr).
$NCV_{Biomass,i}$ Net calorific value of the biomass type i (TJ/BDt).
$EF_{Biomass,CH4}$ CH_4 emission factor for the combustion of biomass in the project plant (tCH_4/TJ).

Data:

	Units	**2010**
(1) Biomass related to project activity.	(BDt)	248,833
(2) Net calorific value of biomass (dry basis).	(GJ/ton)	16.95
(3) EF_{CH4} for controlled biomass burning.	(Kg CH_4/TJ)	15.3
(4) CH_4 global warming potential.	(number)	21

Calculations:

(5) CH_4 emissions.	**[(1)*(2)*(3)/1,000,000]*(4)**	**1,355 (tCO_2)**

Carbon dioxide emissions from biomass residues transportation to the power plant were calculated on the basis of distance and the number of trips (or the average truck load), using equation N° 4 of the ACM0006 (Version 01).

$$PE_{E2,y} = \frac{\sum_i BF_{T,i,y}}{TL_y} \cdot AVD_y \cdot EF_{km,CO2}$$

Where:

$PE_{E2,y}$ Carbon dioxide emissions from combustion of fossil fuels for transportation of biomass to the project plant (tCO_2/yr).

$BF_{T,i,y}$	Quantity of biomass type *i* (wet) used as fuel in the project plant during the year *y* (wet ton/yr).
TL_y	Average truck load of the trucks used (ton).
AVD_y	Average return trip distance between the biomass fuel supply sites and the site of the project plant in kilometers (km).
$EF_{km,CO2}$	Average CO_2 emission factor for the trucks (tCO_2/km).

The corresponding calculation is shown below:

Data:

	Units	**2010**
(1) Biomass brought from 3rd parties related to the p. plant (dry).	(BDt)	47,707
(2) Biomass average humidity (wet basis) (See note).	(%)	51.8%
(3) Approximate load for 1 trip.	(ton)	26.6
(4) Average distance trip.	(km)	76.1
(5) Emission factor for heavy truck transportation (See note).	(tCO_2/km)	1.347

Note: Since this parameter is reported monthly, an average was used for simplicity.

Calculations:

(6) Biomass transported (wet).	(1)/[1 – (2)]	98,971 (wet ton)
(7) Number of trips needed.	(6) / (3)	3,719 (trips)
(8) Total distance traveled.	(4)*(7)*2	565,669 (km)
(9) Total emissions.	**(5)*(8)*(1ton/1,000kg)**	**762 (tCO_2)**

Carbon dioxide emissions from on-site consumption of fossil fuels were calculated using equation N° 6 of the ACM0006 (Version 01):

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

Where:

$PEFF_y$	Carbon dioxide emissions from on-site consumption of fossil fuels.
$FF_{project\ plant,i,y}$	Quantity of fossil fuel type *i* combusted in the biomass power plant during the year *y*.
$COEF_{CO2,i}$	CO_2 emission factor of the fuel type *i*.

The project activity implies additional fossil fuel consumption due to:

- Fossil fuel consumption is due to operational reasons associated to additional biomass consumption (e.g. biomass too wet in winter, etc.).

- Fossil fuel consumption due to on-site additional biomass transportation.

Using the equation N° 6 of the ACM0006 (Version 01), the emissions from biomass transportation within the Power plant site and the emissions from fossil fuel consumption in the Power Plant's power boiler were calculated as follows:

$$P_{E3,y} + PE_{E4,y} = \sum_i OF_{i,y} \cdot COEF_{CO2,i} + \sum_i FF_{i,y} \cdot COEF_{CO2,i}$$

Where:

$P_{E3,y}$	Project emissions from biomass transportation within the Power Plant site (tCO_2/yr).
$P_{E4,y}$	Project emissions from fossil fuel consumption in the Plant's power boiler (tCO_2/yr).
$OF_{i,y}$	Fossil fuel of type i used on-site transportation of biomass (kg/yr).
$FF_{i,y}$	On-site fossil fuel consumption of type i for co-firing in the project plant (kg/yr).
$COEF_{CO2,i}$	CO_2 emission factor for the fossil fuel of type i used in the power boiler (tCO_2/kg).

Data:

	Units	**2010**
(1) Additional diesel consumption in the Power Boiler.	(l)	673,453
(2) Additional diesel consumption for on-site biomass transp.	(l)	54,516
(3) Diesel density.	(kg/l)	0.84
(4) Diesel CO_2 emission factor.	(tCO_2/ton)	3.173

Calculations:

(5) Diesel in Power Boiler.	[(1)*(3)/1,000]*(4)	1,796 (tCO_2)
(6) Diesel in on-site biomass transport.	[(2)*(3)/1,000]*(4)	145 (tCO_2)
(7) Total emissions.	**(5)+(6)**	**1,941 (tCO_2)**

Total project emissions

Project emission sources.	**2010**
Project emissions from biomass controlled burning.	1,355 (tCO_2eq)
Project emissions from biomass transportation to the power plant.	762 (tCO_2eq)
Project emissions from on-site consumption of fossil fuels.	1,941 (tCO_2eq)
Total project emissions.	**4,058 (tCO_2eq)**

E.3. Leakage calculation

Though there are no official studies in the country about the supply / demand situation of forest biomass in the relevant area, the Project Participant performed annual studies for 2010 using official bulletins from INFOR[1] as well as other (whenever available) official sources to calculate the biomass supply and demand situation in the Nueva Aldea Biomass Power Plant Phase 1 influence area[2]. This study was part of the monitoring plan of the Nueva Aldea Phase 1 project activity and was carried out according approach L2 of the baseline methodology.

A detailed Excel spreadsheet with the monitored data and the calculation of the forest biomass supply / demand situation each year was provided to the DOE to establish the quality and validity of the data sources and the accuracy of the calculated numbers. The following table provides the final results of such study:

[1] INFOR stands for "Instituto Nacional Forestal" or "National Forestry Institute" in English.

[2] The Nueva Aldea Biomass Power Plant Phase 1 influence area is clearly defined in page 63 of the registered PDD.

SUPPLY/DEMAND SITUATION
(According to the "L2" criteria to establish leakage in the ACM0006 baseline methodology)

NUEVA ALDEA PHASE 1 INFLUENCE AREA SUPPLY/DEMAND SITUATION

Biomass supply

		2010
Total supply	(m^3st/yr)	5,193,557

Biomass demand

		2010
Total demand	(m^3st/yr)	3,365,501

Total supply/total demand	**(number)**	**1.5432**

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 1 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_2eq/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 Leakage emissions (tCO_2/yr).

	Units	2010
(1) Baseline emissions.	(tCO_2)	**211,501**
(2) Project emissions.	(tCO_2)	**4,058**
(3) Leakage.	(tCO_2)	**0**
(4) Net emission reductions.	**(tCO_2)**	**207,442**

Summary of emission reductions for the monitored period

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

Net emission savings for 2010

		Baseline emissions		Project activity emissions				
	Net emission savings	Grid emissions	Methane emissions	Methane in P.B.	Fossil fuel in P.B.	Transport onsite	Transport to P. Plant	Leakage
	(tCO_2eq/yr)	(tCO_2/yr)	(tCO_2eq/yr)	(tCO_2eq/yr)	(tCO_2/yr)	(tCO_2/yr)	(tCO_2/yr)	(tCO_2/yr)
Total year 2010	207,442	149,835	61,665	1,355	1,796	145	762	0
5th verif (Jan 10-Dec 10)	**207,442.3**	**149,835.3**	**61,665.4**	**1,355.4**	**1,795.8**	**145.4**	**761.8**	**0.0**
Total emissions claimed	**207,442**	**149,835**	**61,665**	**1,355**	**1,796**	**145**	**762**	**0**

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

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)	**100,486**	**207,442**

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

The emission reductions for the monitored period were 207,442 CERs. This amount is 106 % higher than the emission reductions of 100,486 CERs estimated in the PDD. This difference can be explained by the following reasons:

1. A considerably 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 775.7 (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 hydrological situation of year 2010 is another reason to explain a higher grid emission factor for the year 2010 than originally estimated in the PDD. Very dry weather (droughts) in the last years have caused the new entrance and replacement of hydro power plants for more carbon-intensive power generation sources, mainly coal, increasing the overall GHG emissions in the SIC grid.

2. A higher CH_4 emission factor for uncontrolled burning of biomass residues than the one originally used in the PDD: 740.5 (Kg CH_4/TJ) monitored factor instead of 300 (Kg CH_4/TJ) used in the PDD. Given that by the PDD was written there were no local measurements available, the validator indicated the Project Participant to use the IPCC default factor corrected by the lowest conservativeness factor (Table N° 4, page 34 of the ACM0006 Version 01). This generated extremely conservative CH_4 baseline emissions for the project activity, since when the biomass residues are burned in piles in the open air, the combustion occurs under very low oxygen presence

[3] Argentina stopped sending natural gas in 2004.

conditions and therefore is very inefficient. Inefficient combustion leads to high CH_4 emissions. As a result, the Project Participant explicitly mentioned in page 66 of the registered PDD that a local CH_4 emission factor measurement for uncontrolled burning of biomass residues would be attempted in the future in order to have a more accurate and fair estimation of the baseline emissions from this source. The CH_4 emission factor used in this monitoring report was directly measured by the Project Participant.

3. A different way of determining the additional biomass consumed in the power boiler it was instructed by the EB as compared to the one originally proposed in the registered PDD. As a result, the Project Participant is now using equation N° 24 to calculate the baseline emissions due to the natural decay or uncontrolled burning of anthropogenic sources of biomass (as established for baseline scenario N° 3) and directly measured the additional biomass (for electricity generation) during the monitored period rather than using a specific consumption factor (m^3st/MWh) 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 IN 2010

POWER PLANT	POWER OUTPUT (MW)	PLANT TYPE	FUEL TYPE	LOW COST / MUST RUN	TOTAL ENERGY GEN (GWh/yr)	UNIT	FUEL OIL CONSUMPTION (Unit)
1 Los Molles	18	Run of the river	Hydro	Yes	28.3	N.C.	0.00
2 Sauce Andes	1.1	Run of the river	Hydro	Yes	6.3	N.C.	0.00
3 Aconcagua	74	Run of the river	Hydro	Yes	368.0	N.C.	0.00
4 Los Quilos	39.3	Run of the river	Hydro	Yes	213.6	N.C.	0.00
5 Florida	28.5	Run of the river	Hydro	Yes	118.7	N.C.	0.00
6 Maitenes	31	Run of the river	Hydro	Yes	129.7	N.C.	0.00
7 Alfalfal	178	Run of the river	Hydro	Yes	845.5	N.C.	0.00
8 Queltehues	49	Run of the river	Hydro	Yes	357.7	N.C.	0.00
9 Puntilla	22	Run of the river	Hydro	Yes	146.9	N.C.	0.00
10 Volcan	13	Run of the river	Hydro	Yes	107.7	N.C.	0.00
11 Los Morros	3.1	Run of the river	Hydro	Yes	17.4	N.C.	0.00
12 Sauzal 50Hz	76.8	Run of the river	Hydro	Yes	423.9	N.C.	0.00
13 Sauzal 60Hz	76.8	Run of the river	Hydro	Yes	0.0	N.C.	0.00
14 Sauzalito	12	Run of the river	Hydro	Yes	72.4	N.C.	0.00
15 Curillinque	89	Run of the river	Hydro	Yes	621.4	N.C.	0.00
16 San Ignacio	37	Run of the river	Hydro	Yes	122.2	N.C.	0.00
17 Loma Alta	40	Run of the river	Hydro	Yes	270.3	N.C.	0.00
18 Rucue	178.4	Run of the river	Hydro	Yes	943.2	N.C.	0.00
19 Pullinque	51.4	Run of the river	Hydro	Yes	209.8	N.C.	0.00
20 Pilmaiquén	39	Run of the river	Hydro	Yes	263.1	N.C.	0.00
21 Capullo	11	Run of the river	Hydro	Yes	72.7	N.C.	0.00
22 Peuchén	80	Run of the river	Hydro	Yes	166.5	N.C.	0.00
23 Mampil	49	Run of the river	Hydro	Yes	106.5	N.C.	0.00
24 Chacabuquito	25.5	Run of the river	Hydro	Yes	136.6	N.C.	0.00
25 Antuco	320	Run of the river	Hydro	Yes	1,448.3	N.C.	0.00
26 Abanico	136	Run of the river	Hydro	Yes	315.1	N.C.	0.00
27 Isla	68	Run of the river	Hydro	Yes	488.2	N.C.	0.00
28 Machicura	95	Run of the river	Hydro	Yes	340.6	N.C.	0.00
29 Eyzaguirre	2.1	Run of the river	Hydro	Yes	6.7	N.C.	0.00
30 Quilleco	70.8	Run of the river	Hydro	Yes	387.2	N.C.	0.00
31 El Rincón	0.28	Run of the river	Hydro	Yes	2.4	N.C.	0.00
32 Chiburgo	19.4	Run of the river	Hydro	Yes	75.8	N.C.	0.00
33 Palmucho	32	Run of the river	Hydro	Yes	232.4	N.C.	0.00
34 Hornitos	55	Run of the river	Hydro	Yes	195.6	N.C.	0.00
35 Puclaro	6	Run of the river	Hydro	Yes	24.4	N.C.	0.00
36 Ojos de Agua	9	Run of the river	Hydro	Yes	49.8	N.C.	0.00
37 Coya	10.8	Run of the river	Hydro	Yes	83.3	N.C.	0.00
38 Lircay	19	Run of the river	Hydro	Yes	121.8	N.C.	0.00
39 El Manzano	4.85	Run of the river	Hydro	Yes	27.5	N.C.	0.00
40 Pehui	1.1	Run of the river	Hydro	Yes	7.1	N.C.	0.00
41 Truful Truful	0.5	Run of the river	Hydro	Yes	0.0	N.C.	0.00
42 La Paloma	5.4	Run of the river	Hydro	Yes	4.0	N.C.	0.00
43 Trueno	5.6	Run of the river	Hydro	Yes	19.7	N.C.	0.00
44 San Clemente	5.5	Run of the river	Hydro	Yes	5.9	N.C.	0.00
45 Carbomet	0	Run of the river	Hydro	Yes	20.7	N.C.	0.00
46 La Higuera	154.7	Run of the river	Hydro	Yes	168.8	N.C.	0.00
47 Juncalito	1.5	Run of the river	Hydro	Yes	1.3	N.C.	0.00
48 El Tártaro	0	Run of the river	Hydro	Yes	0.1	N.C.	0.00
49 Guayacán	12	Run of the river	Hydro	Yes	20.8	N.C.	0.00
50 Confluencia	155	Run of the river	Hydro	Yes	3.9	N.C.	0.00
51 Mariposas	6	Run of the river	Hydro	Yes	0.0	N.C.	0.00
52 Los Corrales	0.8	Run of the river	Hydro	Yes	0.2	N.C.	0.00
53 Taltal 2 GNL	122.45	Open Cycle	LNG	No	0.0	(MM m^3-std/yr)	0.01
54 Taltal 1 GNL	122.45	Open Cycle	LNG	No	1.7	(MM m^3-std/yr)	0.50
55 Taltal 2	122.45	Open Cycle	Natural Gas	No	36.5	(MM m^3-std/yr)	11.06
56 Taltal 1	122.45	Open Cycle	Natural Gas	No	19.3	(MM m^3-std/yr)	5.84
57 Taltal	244.9	Open Cycle	Diesel	No	90.6	(000' ton/yr)	23.01
58 D. Almagro	23.8	Open Cycle	Diesel	No	0.4	(000' ton/yr)	0.19
59 El Salvador	23.8	Open Cycle	Diesel	No	0.3	(000' ton/yr)	0.10
60 Guacolda 1	152	Coal/Steam	Coal	No	1,138.2	(000' ton/yr)	438.91
61 Guacolda 2	152	Coal/Steam	Coal	No	1,109.1	(000' ton/yr)	423.28
62 Guacolda 3	152	Coal/Steam	Coal	No	1,199.1	(000' ton/yr)	437.80
63 Guacolda 4	152	Coal/Steam	Coal	No	1,036.6	(000' ton/yr)	326.27
64 Huasco TV	16	Coal/Steam	Coal	No	0.0	(000' ton/yr)	0.00
65 Huasco TG	64.23	Open Cycle	Diesel	No	0.9	(000' ton/yr)	0.62
66 Huasco TG IFO	64.23	Open Cycle	IFO 180	No	0.1	(000' ton/yr)	0.05
67 L.Verde TG	18.8	Open Cycle	Diesel	No	4.2	(000' ton/yr)	1.03
68 Los Vientos TG	132	Open Cycle	Diesel	No	49.2	(000' ton/yr)	14.01
69 Nehuenco	368.4	Combined Cycle	Natural Gas	No	3.3	(MM m^3-std/yr)	39.75
70 Nehuenco Diesel	368.4	Combined Cycle	Diesel	No	673.5	(000' ton/yr)	111.17
71 Nehuenco GNL	368.4	Combined Cycle	LNG	No	196.5	(MM m^3-std/yr)	38.71
72 Nehuenco TG 9B	108	Open Cycle	Natural Gas	No	2.9	(MM m^3-std/yr)	1.58
73 Nehuenco TG 9B Diesel	108	Open Cycle	Diesel	No	0.6	(000' ton/yr)	0.18
74 Nehuenco TG 9B GNL	108	Open Cycle	LNG	No	3.7	(MM m^3-std/yr)	1.17
75 Nehuenco II	398.3	Combined Cycle	Natural Gas	No	213.2	(MM m^3-std/yr)	139.76
76 Nehuenco II Diesel	398.3	Combined Cycle	Diesel	No	1,547.6	(000' ton/yr)	252.94
77 Nehuenco II GNL	398.3	Combined Cycle	LNG	No	765.9	(MM m^3-std/yr)	138.62
78 San Isidro	379	Combined Cycle	Natural Gas	No	31.3	(MM m^3-std/yr)	6.35
79 San Isidro Diesel	379	Combined Cycle	Diesel	No	43.6	(000' ton/yr)	7.87
80 San Isidro GNL	379	Combined Cycle	LNG	No	2,161.3	(MM m^3-std/yr)	437.27
81 San Isidro II	353	Combined Cycle	Natural Gas	No	16.9	(MM m^3-std/yr)	3.11
82 San Isidro II Diesel	353	Combined Cycle	Diesel	No	87.2	(000' ton/yr)	14.84
83 San Isidro II GNL	353	Combined Cycle	LNG	No	2,846.3	(MM m^3-std/yr)	522.33
84 Ventanas 1	120	Coal/Steam	Coal	No	914.3	(000' ton/yr)	346.79
85 Ventanas 2	220	Coal/Steam	Coal	No	1,157.3	(000' ton/yr)	450.45
86 Nueva Ventanas	272	Coal/Steam	Coal	No	1,998.1	(000' ton/yr)	745.35
87 L.Verde	54.7	Coal/Steam	Coal	No	0.3	(000' ton/yr)	0.13
88 Nueva Renca	379	Combined Cycle	LNG	No	611.5	(MM m^3-std/yr)	116.18
89 Nueva Renca Diesel	379	Combined Cycle	Diesel	No	1,300.0	(000' ton/yr)	227.20
90 Renca	100	Diesel/Steam	Diesel	No	2.7	(000' ton/yr)	0.79
91 Constitución	11.1	Biomass/steam	Biomass	Yes	51.5	N.C.	0.00
92 Constitución A.	8	Biomass/steam	Biomass	Yes	30.9	N.C.	0.00
93 Petropower	75	Petcoke/steam	Petcoke	Yes	65.5	(000' ton/yr)	26.68

POWER PLANT	POWER OUTPUT (MW)	PLANT TYPE	FUEL TYPE	LOW COST / MUST RUN	TOTAL ENERGY GEN (GWh/yr)	UNIT	FUEL OIL CONSUMPTION (Unit)
94 Laja	12.7	Biomass/steam	Biomass	Yes	44.7	N.C.	0.00
95 Bocamina	128	Coal/Steam	Coal	No	215.8	(000' ton/yr)	81.99
96 Arauco	9	Biomass/steam	Biomass	Yes	15.2	N.C.	0.00
97 San Fco. Mostazal	24	Open Cycle	Diesel	No	0.6	(000' ton/yr)	0.28
98 Cholguán	13	Biomass/steam	Biomass	Yes	81.6	N.C.	0.00
99 Licantén	4	Biomass/steam	Biomass	Yes	21.5	N.C.	0.00
100 Valdivia	61	Biomass/steam	Biomass	Yes	225.1	N.C.	0.00
101 Antilhue TG	101.3	Open Cycle	Diesel	No	71.7	(000' ton/yr)	18.53
102 Horcones TG	24.3	Open Cycle	Natural Gas	No	0.3	(MM m^3-std/yr)	0.12
103 Horcones Diesel	24.3	Open Cycle	Diesel	No	6.3	(000' ton/yr)	3.27
104 TG_Coronel	46.7	Open Cycle	Natural Gas	No	29.0	(MM m^3-std/yr)	3.21
105 TG_Coronel Diesel	46.7	Open Cycle	Diesel	No	63.2	(000' ton/yr)	16.60
106 Nueva Aldea	14	Biomass/steam	Biomass	Yes	93.9	N.C.	0.00
107 Nueva Aldea 2	10	Open Cycle	Diesel	No	0.0	(000' ton/yr)	0.00
108 Nueva Aldea 3	37	Biomass/steam	Biomass	Yes	192.9	N.C.	0.00
109 Candelaria	253.9	Open Cycle	Natural Gas	No	76.4	(MM m^3-std/yr)	28.99
110 Candelaria Diesel	253.9	Open Cycle	Diesel	No	95.1	(000' ton/yr)	26.81
111 Candelaria GNL	253.9	Open Cycle	LNG	No	11.3	(MM m^3-std/yr)	3.55
112 Curanilahue	2.1	Diesel engine	Diesel	No	0.1	(000' ton/yr)	0.00
113 Lebu	0	Diesel engine	Diesel	No	0.1	(000' ton/yr)	0.01
114 Cañete	3	Diesel engine	Diesel	No	0.7	(000' ton/yr)	0.19
115 Los Sauces	3	Diesel engine	Diesel	No	1.1	(000' ton/yr)	0.24
116 Traiguen	3	Diesel engine	Diesel	No	1.1	(000' ton/yr)	0.23
117 Victoria	0	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
118 Curacautin	3	Diesel engine	Diesel	No	1.5	(000' ton/yr)	0.36
119 Ancud	3.3	Diesel engine	Diesel	No	0.8	(000' ton/yr)	7.40
120 Collipulli	3	Diesel engine	Diesel	No	0.6	(000' ton/yr)	0.14
121 Quellon	4.99	Diesel engine	Diesel	No	0.8	(000' ton/yr)	0.00
122 Campanario Gas	180	Open Cycle	Natural Gas	No	0.1	(MM m^3-std/yr)	0.00
123 Campanario Diesel	220	Open Cycle	Diesel	No	25.9	(000' ton/yr)	6.45
124 Casablanca	1.2	Diesel engine	Diesel	No	0.2	(000' ton/yr)	0.05
125 Las Vegas	2	Diesel engine	Diesel	No	0.7	(000' ton/yr)	0.14
126 Curauma	2	Diesel engine	Diesel	No	0.5	(000' ton/yr)	0.16
127 Concon	2.2	Diesel engine	Diesel	No	0.4	(000' ton/yr)	0.18
128 Escuadrón (ex FPC)	14.2	Biomass/steam	Biomass	Yes	90.5	N.C.	0.00
129 Constitución 1	9	Diesel engine	Diesel	No	1.9	(000' ton/yr)	0.43
130 Maule	6	Diesel engine	Diesel	No	0.6	(000' ton/yr)	0.12
131 Monte Patria	9	Diesel engine	Diesel	No	0.2	(000' ton/yr)	0.04
132 Punitaqui	9	Diesel engine	Diesel	No	0.3	(000' ton/yr)	0.09
133 Esperanza	22.2	Diesel engine	Diesel	No	1.8	(000' ton/yr)	0.43
134 Degan	39.6	Diesel engine	Diesel	No	41.1	(000' ton/yr)	8.74
135 Olivos	96	Open Cycle	Diesel	No	4.0	(000' ton/yr)	0.91
136 Totoral	3	Open Cycle	Diesel	No	0.4	(000' ton/yr)	0.09
137 Quintay	3	Open Cycle	Diesel	No	0.9	(000' ton/yr)	0.21
138 Placilla	3	Open Cycle	Diesel	No	1.1	(000' ton/yr)	0.23
139 Chiloé	9	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
140 Quellon II	10	Diesel engine	Diesel	No	14.4	(000' ton/yr)	3.23
141 Colmito	55	Open Cycle	Diesel	No	1.1	(000' ton/yr)	0.33
142 Los Pinos	92.1	Open Cycle	Diesel	No	174.3	(000' ton/yr)	36.78
143 Chuyaca 1 y 2	20	Diesel engine	Diesel	No	5.5	(000' ton/yr)	1.39
144 Skretting	2.7	Diesel engine	Diesel	No	0.1	(000' ton/yr)	0.01
145 Cenizas	16.5	Diesel engine	Diesel	No	26.9	(000' ton/yr)	0.98
146 Santa Lidia	136	Open Cycle	Diesel	No	49.5	(000' ton/yr)	12.86
147 Trapén	90	Diesel engine	Diesel	No	42.7	(000' ton/yr)	8.92
148 Los Espinos	122	Diesel engine	Diesel	No	14.2	(000' ton/yr)	3.03
149 San Gregorio	0.5	Diesel engine	Diesel	No	0.3	(000' ton/yr)	0.06
150 Linares Norte	0.5	Diesel engine	Diesel	No	0.1	(000' ton/yr)	0.03
151 Biomar	2.4	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
152 Eagon	2.4	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
153 Salmofood I	1.6	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
154 Salmofood II	1.6	Diesel engine	Diesel	No	0.1	(000' ton/yr)	0.02
155 Teno	50	Diesel engine	Diesel	No	58.0	(000' ton/yr)	12.43
156 Newen	15	Diesel engine	Diesel	No	38.8	(000' ton/yr)	1.47
157 Watts	2.64	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
158 Multiexport I	1.6	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
159 Multiexport II	1.6	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
160 Tierra Amarilla	142	Diesel engine	Diesel	No	2.2	(000' ton/yr)	0.74
161 Quintero	240	Open Cycle	Diesel	No	16.8	(000' ton/yr)	4.05
162 Quintero GNL	240	Open Cycle	LNG	No	245.8	(MM m^3-std/yr)	67.84
163 Louisiana Pacific	2.9	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
164 El Peñón	80	Diesel engine	Diesel	No	57.7	(000' ton/yr)	12.25
165 San Lorenzo de D. De Almagro	60	Diesel engine	Diesel	No	0.3	(000' ton/yr)	0.18
166 Tapihue	6.4	Diesel engine	Diesel	No	1.0	(000' ton/yr)	0.25
167 Termopacífico	96	Diesel engine	Diesel	No	19.8	(000' ton/yr)	4.45
168 Quidico	0	Diesel engine	Diesel	No	0.0	(000' ton/yr)	0.00
169 Loma Los Colorados	14	Biomass/engine	Biomass	Yes	7.4	N.C.	0.00
170 Emelda	72	Open Cycle	IFO 180	No	1.2	(000' ton/yr)	0.35
171 Colihues IFO	22	Diesel engine	IFO 180	No	22.0	(000' ton/yr)	4.70
172 Colihues DIE	22	Diesel engine	Diesel	No	0.1	(000' ton/yr)	0.03
173 Curicó	0	Diesel engine	Diesel	No	0.4	(000' ton/yr)	0.00
174 Punta Colorada	16.3	Diesel engine	Diesel	No	8.0	(000' ton/yr)	1.54
175 Cabrero	11	Biomass/steam	Biomass	Yes	1.3	N.C.	0.00
176 Cem Bio Bio	13.6	Diesel engine	IFO 180	No	4.1	(000' ton/yr)	0.91
177 El Toro	450	Reservoirs	Hydro	Yes	1,784.2	N.C.	0.00
178 Rapel	377	Reservoirs	Hydro	Yes	469.7	N.C.	0.00
179 Canutillar	172	Reservoirs	Hydro	Yes	1,162.4	N.C.	0.00
180 Cipreses	106	Reservoirs	Hydro	Yes	517.3	N.C.	0.00
181 Colbun	478	Reservoirs	Hydro	Yes	1,542.4	N.C.	0.00
182 Pehuenche	570	Reservoirs	Hydro	Yes	2,091.3	N.C.	0.00
183 Pangue	467	Reservoirs	Hydro	Yes	1,630.7	N.C.	0.00
184 Ralco	690	Reservoirs	Hydro	Yes	2,220.6	N.C.	0.00
185 Canela 1	18.2	Aeolics	Wind	Yes	28.4	N.C.	0.00
186 Canela 2	60	Aeolics	Wind	Yes	122.6	N.C.	0.00
187 Lebu (Cristoro)	3.6	Aeolics	Wind	Yes	6.8	N.C.	0.00
188 Totoral (eólica)	46	Aeolics	Wind	Yes	84.7	N.C.	0.00
189 Monte Redondo	48	Aeolics	Wind	Yes	82.8	N.C.	0.00
TOTAL				(GWh/yr)	43,192.7		

OPERATING MARGIN CALCULATION

ACCORDING TO THE ACM0002 (VERSION 04)

Each year in which the project generation occurs.

		2010
Total emissions from non-low cost / must run power plants	(tCO_2/yr)	16,876,891
Total emissions from low-cost / must-run power plants	(tCO_2/yr)	76,213
Total energy generated in the SIC	(GWh/yr)	43,193
Total energy by non-Low cost / must run power plants	(GWh/yr)	20,727
Total energy by low cost / must run power plants	(GWh/yr)	22,466
Factor λ	(number)	0.0065068493
Operating Margin	**(tCO_2/GWh)**	**808.99**

Notes:

- Low cost / must run units present very low GHG emissions, since they are basically hydro plants and very few biomass plants.

BUILD MARGIN CALCULATION

ACCORDING TO THE ACM0002 (VERSION 04)

POWER PLANTS	POWER OUTPUT (MW)	PLANT TYPE	FUEL TYPE	START OPERATION	CDM PROYECT	TOTAL GEN IN 2010 (GWh/yr)	SIC EMISSION 2010 (tCO2/GWh)
Confluencia	155	Run of the river	Hydro	Dic-10	No	3.9	0.0
Mariposas	6	Run of the river	Hydro	Dic-10	No	0.0	0.0
Cem Bio Bio	13.6	Diesel engine	IFO 180	Dic-10	No	4.1	748.3
Cabrero	11	Biomass/steam	Biomass	Nov-10	No	1.3	0.0
Los Corrales	0.8	Run of the river	Hydro	Sep-10	No	0.2	0.0
La Higuera	154.7	Run of the river	Hydro	Sep-10	Yes	0.0	0.0
Juncalito	1.5	Run of the river	Hydro	Sep-10	No	1.3	0.0
El Tártaro	0	Run of the river	Hydro	Sep-10	No	0.1	0.0
Guayacán	12	Run of the river	Hydro	Sep-10	No	20.8	0.0
Carbomet	0	Run of the river	Hydro	Ago-10	No	20.7	0.0
El Salvador	23.8	Open Cycle	Diesel	Ago-10	No	0.3	1,137.3
San Clemente	5.5	Run of the river	Hydro	Jul-10	No	5.9	0.0
Curicó	0	Diesel engine	Diesel	Jul-10	No	0.4	0.0
Punta Colorada	16.3	Diesel engine	Diesel	Jul-10	No	8.0	651.9
Trueno	5.6	Run of the river	Hydro	Jun-10	No	19.7	0.0
Emelda	72	Open Cycle	IFO 180	Jun-10	No	1.2	996.7
Colihues IFO	22	Diesel engine	IFO 180	Jun-10	No	22.0	727.9
Colihues DIE	22	Diesel engine	Diesel	Jun-10	No	0.1	743.1
La Paloma	5.4	Run of the river	Hydro	May-10	No	4.0	0.0
Loma Los Colorados	14	Biomass/engine	Biomass	Abr-10	No	7.4	0.0
Quidico	0	Diesel engine	Diesel	Mar-10	No	0.0	0.0
Guacolda 4	152	Coal/Steam	Coal	Ene-10	No	1,036.6	885.6
Totoral (eólica)	46	Aeolics	Wind	Ene-10	No	84.7	0.0
Monte Redondo	48	Aeolics	Wind	Ene-10	No	82.8	0.0
Quintero GNL	240	Open Cyle	LNG	Nov-09	No	245.8	896.4
Canela 2	60	Aeolics	Wind	Nov-09	Yes	0.0	0.0
Tapihue	6.4	Diesel engine	Diesel	Oct-09	No	1.0	819.2
Termopacífico	96	Diesel engine	Diesel	Oct-09	No	19.8	760.0
Truful Truful	0.5	Run of the river	Hydro	Oct-09	No	0.0	0.0
Nueva Ventanas	272	Coal/Steam	Coal	Oct-09	No	1,998.1	1,049.5
San Lorenzo de D. De	60	Diesel engine	Diesel	Sep-09	No	0.3	1,966.4
Louisiana Pacific	2.9	Diesel engine	Diesel	Jul-09	No	0.0	747.2
El Peñón	80	Diesel engine	Diesel	Jul-09	No	57.7	716.7
Pehui	1.1	Run of the river	Hydro	Jun-09	No	7.1	0.0
Biomar	2.4	Diesel engine	Diesel	Jun-09	No	0.0	749.5
Eagon	2.4	Diesel engine	Diesel	Jun-09	No	0.0	747.5
Salmofood I	1.6	Diesel engine	Diesel	Jun-09	No	0.0	0.0
Salmofood II	1.6	Diesel engine	Diesel	Jun-09	No	0.1	743.1
Teno	50	Diesel engine	Diesel	Jun-09	No	58.0	723.4
Newen	15	Diesel engine	Diesel	Jun-09	No	38.8	128.0
Watts	2.64	Diesel engine	Diesel	Jun-09	Yes	0.0	0.0
Multiexport I	1.6	Diesel engine	Diesel	Jun-09	No	0.0	0.0
Multiexport II	1.6	Diesel engine	Diesel	Jun-09	No	0.0	0.0
Tierra Amarilla	142	Diesel engine	Diesel	Jun-09	No	2.2	1,146.3
Quintero	240	Open Cycle	Diesel	Jun-09	No	16.8	816.4
Lebu (Cristoro)	3.6	Aeolics	Wind	Jun-09	No	6.8	0.0
Guacolda 3	152	Coal/Steam	Coal	Abr-09	No	1,199.1	1,027.3
San Gregorio	0.5	Diesel engine	Diesel	Mar-09	No	0.3	765.8
Linares Norte	0.5	Diesel engine	Diesel	Mar-09	No	0.1	712.2
Chuyaca 1 y 2	20	Diesel engine	Diesel	Feb-09	No	5.5	859.2
Trapén	90	Diesel engine	Diesel	Feb-09	No	42.7	705.8
Los Espinos	122	Diesel engine	Diesel	Feb-09	No	14.2	720.7
Lircay	19	Run of the river	Hydro	Ene-09	No	121.8	0.0
Santa Lidia	136	Open Cycle	Diesel	Dic-08	No	49.5	877.3
El Manzano	4.85	Run of the river	Hydro	Dic-08	No	27.5	0.0
Skretting	2.7	Diesel engine	Diesel	Oct-08	No	0.1	743.1
Cenizas	16.5	Diesel engine	Diesel	Oct-08	No	26.9	123.2
Los Pinos	92.1	Open Cycle	Diesel	Sep-08	No	174.3	712.7
Colmito	55	Open Cycle	Diesel	Ago-08	No	1.1	1,006.6
Chiloé	9	Diesel engine	Diesel	Jul-08	No	0.0	929.3
Coya	10.8	Run of the river	Hydro	Jul-08	No	83.3	0.0
Ojos de Agua	9	Run of the river	Hydro	Jun-08	Yes	0.0	0.0
Puclaro	6	Run of the river	Hydro	May-08	Yes	0.0	0.0
Totoral	3	Open Cycle	Diesel	Abr-08	No	0.4	708.7
Quintay	3	Open Cycle	Diesel	Abr-08	No	0.9	758.5
Placilla	3	Open Cycle	Diesel	Abr-08	No	1.1	693.2
Olivos	96	Open Cycle	Diesel	Feb-08	No	4.0	764.8
Campanario Diesel	220	Open Cycle	Diesel	Ene-08	No	25.9	842.6
Quellon II	10	Diesel engine	Diesel	Ene-08	No	14.4	757.9
Nueva Aldea 3	37	Biomass/steam	Biomass	Ene-08	Yes	0.0	0.0
Canela 1	18.2	Aeolics	Wind	Sep-07	Yes	0.0	0.0
Hornitos	55	Run of the river	Hydro	Sep-07	Yes	0.0	0.0
Palmucho	32	Run of the river	Hydro	Sep-07	No	232.4	0.0
Constitución 1	9	Diesel engine	Diesel	Jul-07	No	1.9	769.7
Maule	6	Diesel engine	Diesel	Jul-07	No	0.6	626.8
Monte Patria	9	Diesel engine	Diesel	Jul-07	No	0.2	783.7
Punitaqui	9	Diesel engine	Diesel	Jul-07	No	0.3	1,073.8
Chiburgo	19.4	Run of the river	Hydro	Jul-07	No	75.8	0.0
Curanilahue	2.1	Diesel engine	Diesel	Jul-07	No	0.1	0.0
Degan	39.6	Diesel engine	Diesel	Jul-07	No	41.1	719.2
Escuadrón (ex FPC)	14.2	Biomass/steam	Biomass	Jun-07	No	90.5	0.0
Esperanza	22.2	Diesel engine	Diesel	Jun-07	No	1.8	790.2
San Isidro II	353	Combined Cycle	Natural Gas	Abr-07	No	16.9	402.6
San Isidro II Diesel	353	Combined Cycle	Diesel	Abr-07	No	87.2	574.7
San Isidro II GNL	353	Combined Cycle	LNG	Abr-07	No	2,846.3	596.1
Quilleco	70.8	Run of the river	Hydro	Abr-07	Yes	0.0	0.0
El Rincón	0.28	Run of the river	Hydro	Abr-07	No	2.4	0.0
Casablanca	1.2	Diesel engine	Diesel	Abr-07	No	0.2	762.8
Las Vegas	2	Diesel engine	Diesel	Abr-07	No	0.7	702.4
Curauma	2	Diesel engine	Diesel	Abr-07	No	0.5	1,125.9
Concon	2.2	Diesel engine	Diesel	Abr-07	No	0.4	1,495.9
Eyzaguirre	2.1	Run of the river	Hydro	Mar-07	No	6.7	0.0
Campanario Gas	180	Open Cycle	Natural Gas	Mar-07	No	0.1	0.0

POWER PLANTS	POWER OUTPUT (MW)	PLANT TYPE	FUEL TYPE	START OPERATION	CDM PROYECT	TOTAL GEN IN 2010 (GWh/yr)	SIC EMISSION 2010 (tCO2/GWh)
Los Vientos TG	132	Open Cycle	Diesel	Ene-07	No	49.2	962.3
Cañete	3	Diesel engine	Diesel	Ene-07	No	0.7	878.8
Los Sauces	3	Diesel engine	Diesel	Ene-07	No	1.1	732.5
Traiguen	3	Diesel engine	Diesel	Ene-07	No	1.1	702.9
Curacautin	3	Diesel engine	Diesel	Ene-07	No	1.5	787.0
Collipulli	3	Diesel engine	Diesel	Ene-07	No	0.6	735.7
Nueva Aldea 2	10	Open Cycle	Diesel	2006	No	0.0	0.0
Ancud	3.3	Diesel engine	Diesel	2006	No	0.8	29,960.6
Quellon	4.99	Diesel engine	Diesel	2006	No	0.8	3.1
Antilhue TG	101.3	Open Cycle	Diesel	2005	No	71.7	872.5
TG_Coronel	46.7	Open Cycle	Natural Gas	2005	No	29.0	242.4
TG_Coronel Diesel	46.7	Open Cycle	Diesel	2005	No	63.2	886.7
Nueva Aldea	14	Biomass/steam	Biomass	2005	Yes	0.0	0.0
Candelaria	253.9	Open Cycle	Natural Gas	2005	No	76.4	831.9
Candelaria Diesel	253.9	Open Cycle	Diesel	2005	No	95.1	952.0
Candelaria GNL	253.9	Open Cycle	LNG	2005	No	11.3	1,020.0
L.Verde TG	18.8	Open Cycle	Diesel	2004	No	4.2	826.2
Licantén	4	Biomass/steam	Biomass	2004	No	21.5	0.0
Valdivia	61	Biomass/steam	Biomass	2004	Yes	0.0	0.0
Horcones TG	24.3	Open Cycle	Natural Gas	2004	No	0.3	841.7
Horcones Diesel	24.3	Open Cycle	Diesel	2004	No	6.3	1,764.4
Ralco	690	Reservoirs	Hydro	2004	No	2,220.6	0.0
Nehuenco II	398.3	Combined Cycle	Natural Gas	2003	No	213.2	1,437.0
Nehuenco II Diesel	398.3	Combined Cycle	Diesel	2003	No	1,547.6	552.1
Nehuenco II GNL	398.3	Combined Cycle	LNG	2003	No	765.9	588.0
Cholguán	13	Biomass/steam	Biomass	2003	Yes	0.0	0.0
Chacabuquito	25.5	Run of the river	Hydro	2002	Yes	0.0	0.0
Nehuenco TG 9B	108	Open Cycle	Natural Gas	2002	No	2.9	1,184.8
Nehuenco TG 9B Dies	108	Open Cycle	Diesel	2002	No	0.6	1,048.3
Nehuenco TG 9B GNL	108	Open Cycle	LNG	2002	No	3.7	1,026.5
San Fco. Mostazal	24	Open Cycle	Diesel	2002	No	0.6	1,526.0
Peuchén	80	Run of the river	Hydro	2000	No	166.5	0.0
Mampil	49	Run of the river	Hydro	2000	No	106.5	0.0
Taltal 2 GNL	122.45	Open Cycle	LNG	2000	No	0.0	833.0
Taltal 1 GNL	122.45	Open Cycle	LNG	2000	No	1.7	977.9
Taltal 2	122.45	Open Cycle	Natural Gas	2000	No	36.5	664.2
Taltal 1	122.45	Open Cycle	Natural Gas	2000	No	19.3	664.1
Taltal	244.9	Open Cycle	Diesel	2000	No	90.6	857.8

TOTAL GEN. PER YEAR	(GWh / yr)	43,192.7
20% OF GEN. PER YEAR	(GWh / yr)	8,638.5

BUILD MARGIN	(tCO2/GWh)	742.37

COMBINED MARGIN CALCULATION

ACCORDING TO THE ACM0002 (VERSION 04)

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)	808.99
Build Margin	(tCO_2/GWh)	742.37
Combined Margin	**(tCO_2/GWh)**	**775.68**

Monitoring information

NAME	DATA VARIABLE MONITORED (ID number)	MANUFACTURER	MODEL	TAG	SERIAL NUMBER	ACCURACY	CALIBRATION FREQUENCY	CALIBRATION DATES
Biomass Mix Conveyor Belt weight meter	BFi,y	Siemens	Accumass BW500	431-FIQ-916	PBD/W6020051PJ	+/- 1,2%	Biannual	15/12/2009 14/06/2010 14/12/2010
Sander Dust Conveyor Belt weight meter	BFi,y	Siemens	KCM / SWB-600	463-FIQ-174	965691	+/- 3%	Biannual	15/12/2009 30/06/2010 30/12/2010
Weighbridge 1: North Entrance	BFi,y; TLy	METTLER TOLEDO	JAGXTREME	N/A	5437967-5GF	+/- 30kg	Biannual	18/10/2009 14/04/2010 26/07/2010
Weighbridge 2: South Entance	BFi,y; TLy	METTLER TOLEDO	JAGXTREME	N/A	5429421-5EF	+/- 30kg	Biannual	18/10/2009 14/04/2010 26/07/2010
Weighbridge 3: Trucks Exit	BFi,y; TLy	METTLER TOLEDO	JAGXTREME	N/A	5437969-5GF	+/- 30kg	Biannual	18/10/2009 14/04/2010 26/07/2010
Energy Meter 1-6 Switchgear	EGy	Power Measurement	7330 ION V277	468-PM-006	PB-0401A178-11	+/- 0,5%	7 years	21-01-2004
Energy Meter 1-8 Switchgear	EGy	Power Measurement	7330 ION V277	468-PM-008	PB-0401A161-11	+/- 0,5%	7 years	28-01-2004
Level Trasmiter	FFy	ABB	264HCHRBEFSSA1/ E6/L1/I2/N6/C1	461-LT-0460	6404010868	+/- 0,075%	Annual	16/09/2009 15/03/2010 15/09/2010
Electronic Moisture Analyzer	Moisture content of the BFi,y	Sartorius AG. Gotingen	MA100H-000230V1	N/A	17302238	0.001	Annual	30/11/2009 05/05/2010
Steam Flow Meter 5.5 bar (Deaerator)	Qy	ABB	264DSGSSB2A3/V1/B2/I2/N6/C1	462-FT-9150	6404006181	+/- 0,075%	Annual	16/12/2009 08/12/2010
Steam Flow Meter 85 bar (Soot blower)	Qy	ABB	264DSHSSB2A3 V1/L1/B2/I2/N6/C1	463-FT-0402	6403015454	+/- 0,075%	Annual	15/12/2009 07/12/2010
Pressure Transmiter Feed Water	Qy	ABB	264PSSSSB2A3V1/B2/I2/N6/C1	463-PT-0106	6403015456	+/- 0,075%	Annual	09/05/2009 18/06/2010 07/12/2010
Pressure Transmiter 85 bar (Soot blower)	Qy	ABB	264PSQSSB2A3 V1/B2/I2/N6/C1	463-PT-0403	6403015460	+/- 0,075%	Annual	16/12/2009 07/12/2010
Temperature Transmiter Feed Water	Qy	ROSEMOUNT	3244MVF1NAA01B4C2C4Q4	463-TT-0110	458205	+/- 0.10 %	Annual	15/12/2009 07/12/2010
Temperature Transmitter 85 bar (Soot blower)	Qy	ROSEMOUNT	3244MVF1NAA01B4C2C4Q4	463-TT-0406	458156	+/- 0.10 %	Annual	16/12/2009 08/12/2010
Steam Flow Meter 5.5 bar (AASA)	Qy	ROSEMOUNT	3051SFADS120DCHPS2T100072AF1A2G2Q4F2	465-FT-9019	8806	+/- 0,025 %	Annual	14/12/2009 09/12/2010
Steam Flow Meter 5.5 bar (Boiler)	Qy	ROSEMOUNT	3051SFADS120DCHPS2T100072AF1A2G2Q4F2	465-FT-9023	8807	+/- 0,025 %	Annual	10/08/2009 17/06/2010 10/12/2010
Steam Flow Meter 11.5 bar (AASA)	Qy	ROSEMOUNT	3051SFADS120DCHPS2T100072AF1A2G2Q4F2	465-FT-9025	8808	+/- 0,025 %	Annual	11/12/2009 09/12/2010
Steam Flow Meter 19 bar (Plywood Mill)	Qy	ROSEMOUNT	3051SFADS120DCHPS2T100072AF1A2G2Q4F2	465-FT-9027	8809	+/- 0,025 %	Annual	11/12/2009 09/12/2010
Pressure Transmitter 19 bar (Main line)	Qy	ABB	264PSQSSB2A3/V1/L1/B2/I2/N6/C1	465-PIT-9000-A	6404008677	+/- 0,075%	Annual	14/12/2009 10/12/2010
Pressure Transmitter 19 bar (Main line)	Qy	ABB	264PSQSSB2A3/V1/L1/B2/I2/N6/C1	465-PIT-9000-B	6404008676	+/- 0,075%	Annual	15/12/2009 10/12/2010
Pressure Transmitter 11.5 bar (Main line)	Qy	ABB	264PSPSSB2A3/V1/L1/B2/I2/N6/C1	465-PIT-9001-A	6404008680	+/- 0,075%	Annual	15/12/2009 09/12/2010
Pressure Transmitter 11.5 bar (Main line)	Qy	ABB	264PSPSSB2A3/V1/L1/B2/I2/N6/C1	465-PIT-9001-B	6404008679	+/- 0,075%	Annual	15/12/2009 09/12/2010
Pressure Transmitter 5.5 bar (Main line)	Qy	ABB	264PSPSSB2A1/V1/L1/B2/I2/N6/C1	465-PIT-9002-A	6404008685	+/- 0,075%	Annual	09/05/2009 10/03/2010 10/12/2010
Pressure Transmitter 5.5 bar (Main line)	Qy	ABB	264PSPSSB2A1/V1/B2/I2/N6/C1	465-PIT-9002-B	6404027440	+/- 0,075%	Annual	09/05/2009 10/03/2010 10/12/2010
Pressure Transmitter 5.5 bar (Main line)	Qy	ABB	264PSPSSB2A1/V1/L1/B2/I2/N6/C1	465-PIT-9002-C	6404008681	+/- 0,075%	Annual	09/05/2009 10/03/2010 10/12/2010
Temperature Transmitter 5.5 bar	Qy	ROSEMOUNT	3244MVF1NAA01B4C2C4Q4	465-TT-9024	456395	+/- 0.10 %	Annual	17/12/2009 11/12/2010
Temperature Transmitter 11.5 bar	Qy	ROSEMOUNT	3244MVF1NAA01B4C2C4Q4	465-TT-9026	456304	+/- 0.10 %	Annual	11/12/2009 11/12/2010
Temperature Transmitter 19 bar (Pulp Mill)	Qy	ROSEMOUNT	3244MVF1NAA01B4C2C4Q4	465-TT-9028	456397	+/- 0.10 %	Annual	11/12/2009 09/12/2010
Steam Flow Meter 19 bar (Pulp Mill)	Qy	ABB	264DSMSSA2A3/V1/B2/I2/N6/C1	565-FT-0965	6406022860	+/- 0,075%	Annual	12/08/2009 10/03/2010