VALIDATION REPORT

VALDIVIA BIOMASS POWER PLANT IN CHILE

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DET NORSKE VERITAS

VALIDATION REPORT

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Summary:

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Valdivia Biomass Power Plant" project in Chile on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the "Valdivia Biomass Power Plant", as described in the project design document version 3 of 11 March 2009, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0006 (version 05 of 18 May 2007). Hence, DNV requests the registration of the "Valdivia Biomass Power Plant" project as a CDM project activity.

Report No.: 2007-1195	Subject Group: Environment	
Report title: Valdivia Biomass Power Plant in Chile		
Work carried out by: Felipe Lacerda Antunes, Luis Filipe Tavares, Hendrik Brinks		
Work verified by: Ramesh Ramachandran, Michael Lehmann		
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Abbreviations

CAR	Corrective Action Request
CDEC-SIC	Economic Dispatch Center in the Central Interconnected System
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CIS	Central Interconnected System
CL	Clarification request
CNE	National Energy Commission
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environmental Impact Assessment
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
RCA	Resolución de Calificación Ambiental – Environmental Qualification Resolution
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

Celulosa Arauco y Constitución S.A. has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "Valdivia Biomass Power Plant" project, located in the commune of San Jose de la Mariquina, Province of Valdivia, Chile. This validation report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr. Felipe Lacerda Antunes	DNV Brazil	Team leader, CDM validator
Mr. Luis Filipe Tavares	DNV Brazil	CDM validator
Mr. Hendrik Brinks	DNV Norway	Energy sector expert;
Mr Ramesh Ramachandran	DNV India	Technical reviewer (applicant)
Mr Michael Lehmann	DNV Norway	Technical reviewer

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against Kyoto Protocol criteria for the CDM, the CDM rules and modalities as agreed in the Marrakech Accords and relevant decisions by the CDM Executive Board, including the baseline and monitoring methodology ACM0006. The validation team has employed, based on the recommendations in the Validation and Verification Manual a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Description of Proposed CDM Project

The "Valdivia Biomass Power Plant" project activity consists of the construction and operation of a new 61 MW biomass cogeneration power plant located inside a new pulp mill by Arauco located in the X Region of Chile. The project activity is designed to use black liquor and biomass from forest operations (bark and sawdust) for power cogeneration in the new pulp mill facility. The project activity is presented by Celulosa Arauco y Constitución S.A., a leading forestry and pulp-producing company in Chile. The Valdivia pulp mill was designed to generate a surplus power to the grid.

The estimated amount of GHG emission reductions from the project is 2 247 311 tonnes CO_2 equivalents (tCO_2e) over a 21 years crediting period, resulting in estimated average annual emission reductions of 107 015 tCO_2e.

2 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents;
II follow-up interviews with project stakeholders;
III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the to the Validation and Verification Manual The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The initial validation protocol for the “Valdivia Biomass Power Plant” project is enclosed in Appendix A to this report.

Findings established during the validation can be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CARs) are issued, where:

i) mistakes have been made with a direct influence on project results;
ii) validation protocol requirements have not been met; or
iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term request for *clarification* (CL) is used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below).A request for **Clarification (CL)** is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	***Ref. to Table 2***	***Summary of project participants' response***	***Final conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

2.1 Review of Documents

The PDD (version 3 of 11 March 2009) /3/ submitted by Arauco, the previous version of the PDD /1//2/, as well as other supporting documents submitted by the project developer /4/ - /24/ were assessed by DNV as a part of the validation.

2.2 Follow-up Interviews

On 15 and 16 August 2007 DNV performed a site visit and interviews with project stakeholders /29/ - /33/ to confirm selected information and to resolve issues identified in the document review.

The main topics of the interviews are summarised in Table 1 and persons interviewed are listed in the "References" section of this report.

Table 1 Interview topics

Interviewed organisation	Interview topics
Arauco	➢ Baseline scenario
	➢ Information about main equipments
	➢ Credit period starting date
	➢ Additionality
	➢ Monitoring plan
	➢ Emission reduction calculations
	➢ Environmental Licenses and legal compliance
	➢ Stakeholders consultation process: interviews and related comments

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues, which needed to be clarified for DNV's positive conclusion on the project design.

The initial validation of the project identified some requests for *clarification.* The project participant's response to DNV's validation findings and the PDD final version 3 of 11 March 2009 addressed the corrective action requests and requests for clarification to DNV's satisfaction.

To guarantee the transparency of the validation process, the concerns raised and the response provided by the project participants are documented in more detail in the validation protocol in Appendix A.

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

3.1 Participation Requirements

The Project participants are Celulosa Arauco y Constitución S.A. of Chile and Inversiones Celco SL. The host Party Chile and the Annex I Party United Kingdom meets all relevant participation requirements.

Chilean DNA has issued the LoA on 22 September 2004 authorizing Celulosa Arauco y Constitución S.A. as project participant and confirming that the project contributes to Chilean sustainable development /23/.

The United Kingdom DNA has issued LoA on 29 August 2007, authorizing Inversiones Celco SL as project participant /24/.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Chile.

3.2 Project Design

The “Valdivia Biomass Power Plant” project involves the construction and operation of a new 61 MW biomass cogeneration power plant located inside a new pulp mill by Arauco located in the X Region of Chile. The project activity is designed to use black liquor and biomass from forest operations (bark and sawdust) for power cogeneration in the new pulp mill facility. The Valdivia pulp mill was designed to generate a considerable amount of surplus power to the grid. This power surplus is generated by burning black liquor in the recovery boiler and biomass from forest operations from own and third party sources in a power boiler, both inside the pulp mill facility. The additional electric power generation capacity of the pulp mill is a result of particular modifications of the mill that enable it to generate additional power to the grid. The reduction in greenhouse gas emissions is therefore accomplished through the displacement of energy from the SIC grid by the carbon neutral surplus electric power generation of the new biomass power plant.

The project involves the installation of a high-pressure boiler and a steam turbine, employing the Steam-Rankine cycle technology for generating electricity. The applied technology essentially comprises direct combustion of biomass in a boiler to generate steam, which is subsequently expanded through a turbine to generate electricity. The technology is being successfully used since many years for steam turbines.

The Valdivia pulp mill has a design capacity of 550,000 tons/year and was designed to produce two types of pulp alternatively, from Pine (long fiber pulp) or from Eucalyptus (short fiber pulp). The baseline pulp mill (or reference pulp mill), in the first case, is capable of producing all the electric power for internal consumption; however, in the second case, the mill is not able to do so and must marginally rely on the grid for power purposes. This happens because under a conventional pulp mill design, the Kraft cycle for Eucalyptus does not produce enough black liquor to generate all the electric power required by the mill. It is foreseen, however, that the

Valdivia pulp mill will only produce pulp from Eucalyptus 35% of the time, leaving the remaining 65% of the time devoted exclusively to Pine pulp production, so the baseline design would still be almost self-sufficient in electric power generation during the year. For conservative reasons it will be assumed that the baseline pulp mill would have been completely self-sufficient in electric power generation. The pulp mill capacity is 550,000 ton/year.

A renewable 7-year crediting period is selected (with the potential of being renewed twice), starting on 1 July 2008, the expected date of registration. The starting date of the project activity is 01 February 2002 (date in which the purchase of the recovery boiler, a major equipment of the pulp mill, was formalized) and the project started its operation at the beginning of 2004. The expected operational lifetime of the project is a minimum of 30 years.

The project is expected to improve energy use efficiency and power generation from renewable sources, thus contributing to sustainable development objectives of the Chilean Government. The contribution of the project to the sustainable development of Chile was confirmed by the DNA of the Country /23/.

The project does not involve any public funding and the validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Chile.

3.3 Baseline Determination

The project applies the approved consolidated baseline methodology ACM0006 (version 05 of 18 May 2007) - “Consolidated baseline methodology for grid-connected electricity generation from biomass residues” in combination with ACM0002, (version 06 of 19 May 2006), “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”

This methodology is applicable to the “Valdivia Biomass Power Plant” project as this project consists of a renewable energy generation plant for supplying electricity to the Chilean grid (SIC). The project meets the applicability conditions of ACM0006 as i) only black liquor from its pulping process and forest residues (bark and sawdust) from its own and third party forest operations are used in the cogeneration plant; ii) the biomass generated in the Valdivia pulp mill is determined by the processing capacity of the pulp mill; iii) only the necessary amount of biomass to keep the plant running are stored (always less than three days) and iv) biomass residues do not require any preparation before being used as fuel. During the site visit DNV was able to confirm that all biomass fuels come have a sustainable origin, and come from local forests or suppliers located in a distance up to 100 km from the project site.

The project activity in fact involves the construction of a new grid-connected biomass power plant, which is a result of the implementation of two project initiatives in a new pulp mill facility. Both project initiatives are aimed at making the new pulp mill a net power exporter to the grid. The two project initiatives are described below:

1) The installation of a biomass (sawdust and bark) power boiler in a new pulp mill that generates high-pressure steam used to cogenerate surplus power to the grid. The biomass boiler that would have been installed in a baseline situation would have had a lower biomass firing capacity and thus a lower biomass consumption and would have generated saturated (low pressure) steam, not suitable to cogenerate electric power in the mill. In the baseline scenario the incremental quantity of biomass residues (additional quantity of biomass used in the project

compared to the quantity of biomass that would have been used in the baseline situation) would be dumped or left to decay under mainly aerobic conditions.

2) The construction of a new pulp mill with a high electric power efficiency, so as to make it a net power exporter to the grid. The higher efficiency is possible due to the installation of a high steam pressure recovery boiler and two high-capacity turbogenerators. As in the previous initiative, these efficiency improvements allow the pulp mill to cogenerate surplus power to the grid, but in this case, without increasing the amount of biomass (black liquor, dry basis) that would be fired in the recovery boiler in a baseline scenario.

Both CDM project initiatives were implemented at the same time, during the construction phase of the new pulp mill facility. The two project initiatives share the same turbogenerators, through which heat is obtained (extractions) and power is generated (generator). As a result of these two initiatives, the project proponent has chosen two (compatible) baseline scenarios of the baseline methodology, that clearly reflect the circumstances under which these two project initiatives were implemented: scenarios 3 and 4. Since ACM0006 does not allow the use of more than one baseline scenario, the project proponent requested a deviation from ACM0006. The CDM Executive Board accepted the request for deviation in its 36th meeting, considering the baseline as a combination of two scenarios.

Given that the proposed project activity implies the construction of a new pulp mill, the following options present different project alternatives that can be considered plausible baseline scenarios for the proposed project plant:

i) *Conventional self-sufficient pulp mill, without surplus power generation capacity*: This is the standard practice in the pulp industry in Chile; the pulp mill would be self-sufficient in heat and electric power generation and would have to rely on the external grid for start-ups and other contingencies. Power would be generated in the cogeneration plant inside the pulp mill, and the surplus would have to be generated by power plants in the grid. The same amount of black liquor and a lower amount of biomass from forest operations would be used as fuel in this case, compared to the amounts used in the project plant. The unused biomass residues from forest operations would be burned in the open-air or left in piles to natural decay.

ii) *Conventional self-sufficient pulp mill, with a conventional fossil fuel power unit as a back up*: Power would be generated in the cogeneration plant inside the pulp mill, but additional power could be occasionally generated with the fossil fuel unit. A significant fraction of the surplus power generated by the project plant would still have to be generated by power plants in the grid. The same amount of black liquor and a lower amount of biomass from forest operations would be used as fuel in this case, compared to the amounts used in the project plant. The unused biomass residues from forest operations would be burned in the open-air or left in piles to natural decay.

iii) *Pulp mill designed to generate additional electric power at a lower efficiency or at a later stage, not undertaken as a CDM project activity*: This does not constitute the usual practice. Power would be generated in the cogeneration plant inside the pulp mill, and some electricity would be exported to the grid. Since the surplus power capacity of the pulp mill in this case would be lower than the surplus power capacity of the project mill, in the absence of the proposed project activity the difference

would have to be generated in power plants in the grid. The same amount of black liquor and a lower amount of biomass from forest operations would be used as fuel in this case, compared to the amounts used in the project plant. The unused biomass residues from forest operations would be burned in the open-air or left in piles to natural decay.

iv) *Conventional pulp mill, but with surplus power generation capacity based on other type of biomass*: In the pulp industry it is usual to have a relatively small bark boiler to supply thermal energy to the pulp mill for start-ups and / or as a supplementary steam source unit. However, installing a larger high-pressure bark boiler to generate surplus electric power to the grid is not part of the business as usual practice in the pulp industry. Power would be generated in the cogeneration plant inside the pulp mill. A lower surplus power generation capacity compared to the one of the project plant would be available to the grid. The difference between the surplus power capacity of the project plant and this plant would have to be generated by power plants in the grid. The same amount of black liquor as the one used in the project plant would be used as fuel in the cogeneration plant inside the pulp mill. The amount of biomass residues from forest operations used in this case compared to the ones used in the project plant would depend on the surplus electric power capacity of this alternative pulp mill.

v) *Conventional pulp mill, but with a deficit in electric power generation:* This is also part of the business-as-usual practice in the pulp mill industry in Chile. However, given that modern pulp mills tend to be self-sufficient in electric power generation, this alternative does not seem to be a conservative baseline scenario for the proposed project activity. Part of the power required by the pulp mill would be generated in the cogeneration plant inside the pulp mill and the rest would be sourced from the grid. The same amount of black liquor would be used in the cogeneration plant inside the pulp mill compared to the one used in the project plant. A lower amount of biomass from forest operations (sawdust and bark) would be used in this case, compared to the one used in the project plant. In the absence of the proposed project activity, the unused biomass residues from forest operations would be burned in the open-air or left in piles to natural decay.

As for heat generation, using the same type of biomass residues as those used in the project plant is a common practice. As a result, the proposed project activity does not imply any displacement of heat and, therefore, does not claim emission reductions due to this source.

Considering the business as usual practice in the pulp industry and the level of feasibility and the conservativeness of the alternatives, the most likely and conservative alternative is the construction of a conventional pulp mill without surplus electric power generation capacity. The chosen baseline is a combination of the following baseline scenarios given in ACM0006:

For power generation: The generation of power in existing and/or new grid-connected power plants (P4);

For heat generation: The proposed project activity (installation of a cogeneration power plant), fired with the same type of biomass but with a different thermal energy efficiency (e.g. an efficiency that is common practice in the relevant industry sector) (H2) and the generation of heat in boilers using the same type of biomass residues (H4);

For biomass use: The incremental biomass (incremental quantity of biomass in the project compared to the biomass quantity used in the baseline) is dumped or left to decay under mainly aerobic conditions (B1) and the remaining biomass residues are used for heat and/or electricity generation at the project site (B4)

The main reason for using baseline scenarios 3 and 4 in the proposed project activity instead of using each scenario in the corresponding CDM project initiative is because of the possibility to monitor the total net additional electric power generated by the two project initiatives simultaneously in the new power plant. Doing so for each project initiative would imply a far more complex and sophisticated monitoring methodology than the one currently proposed by the baseline methodology ACM0006, since it would require to determine and monitor the exact amount of additional electric power attributable to each individual project initiative in the power plant. Since at the end, it is only the total additional net amount of electric power generation that is relevant, there is no gain in monitoring separate additional electric power generations in the same power plant. Therefore, the two chosen baseline scenarios are applied simultaneously. It must be noted however, that both scenarios 3 and 4 are perfectly compatible in this case, and allow monitoring all the variables and parameters identified by each scenario separately and without conflict.

The selected baseline scenario is the construction of a conventional “business as usual” power plant utilising biomass residues which will co-generate heat and electricity to meet the pulp mill’s energy demand without surplus electricity generation. This “reference plant”, which was characterised based on a design study for an alternative power plant design (power plant without surplus capacity), would employ steam of lower pressure, would have two turbo generators with a capacity of 45 MW each. The “reference plant” would have utilised the same amount of biomass residues and would have generated the same amount of heat as the project power plant. However, the “reference plant” would have only generated electricity for internal use.

In accordance with ACM0006, an electricity baseline emission factor is calculated in accordance with ACM0002 as a combined margin emission coefficient, consisting of the combination of a simple adjusted operating margin (OM) emission coefficient and a build margin (BM) emission coefficient (see section 3.6). Both, the OM and BM emission coefficient will be updated based on ex-post monitoring. The electricity system selected to determine the combined margin emission coefficient is the SIC grid system in Chile.

3.4 Additionality

It was demonstrated that CDM benefits were taken into account before a final decision to proceed with the process was made. Project starting date was verified to be in February 2002 (date of the purchase order of the recovery boiler) /6/. Moreover, in parallel with the project’s implementation, actions were taken to secure CDM status for the project. It must also be mentioned that although the validation of the project started only in July 2007, Arauco contacted DNV the first time in July 2003 and requested a quotation for the validation of several project activities (Arauco’s initiative in the CDM), including the “Valdivia Biomass Power Plant” project.

The following evidence was provided to demonstrate the prior consideration of the CDM by means of a detailed timeline of the real and continuing actions to secure CDM status for this project activity:

1. Arauco first considered the emission reduction in cogeneration initiatives in 1998, through a study carried out by SERCOR S.A. /7/ that explicitly considered the benefits related to power cogeneration: mainly higher efficiency and lower CO_2 emissions.
2. Arauco first considered the incentives of the CDM in 1999, evaluating and actually implementing a reforestation program /8/ in the coastal dry lands in the south part of the country.
3. During 2002, SERCOR S.A. developed a study about the Kyoto Protocol, the CDM and the Carbon Market possibilities available at that time /9/. This study was presented to members of the Arauco board and contributed to foster the interest in the CDM and the Kyoto Protocol.
4. On 16 December 2002 Arauco appointed a CDM Consultant (Urquidi, Riesco & Cía.) in order to present the Valdivia project as a CDM project activity /10/.
5. On 9 May 2003 Arauco received a paper about the carbon market from Urquidi, Riesco & Cía /11/.
6. On 29 May 2003 Arauco scheduled a meeting with Urquidi, Riesco & Cía in order to start working with the carbon market possibilities for Arauco, including the Valdivia project /12/.
7. On 18 June 2003 Arauco had its first meeting with Cantor CO2e.com to explore the possibilities of selling the CERs from Arauco's CDM project initiative.
8. During July 2003 Arauco contacted SGS by phone for a quotation on validation services from CDM projects. This information request was answered via email on 23 July 2003 /13/.
9. On 22 July 2003 Arauco contacted TÜV Anlagentechnik GmbH (member of the TÜV Rheinland Berlin Brandenburg GroupTUV) via email to request information about validation and verification services for Arauco's project initiative in the CDM.
10. On 23 July 2003 Arauco contacted Ecosecurities to request information about CDM services (PDD writing) for Arauco's project initiative in the CDM. There was subsequent follow-up involving some technical information about Arauco's CDM biomass projects which was used later on by Ecosecurities to prepare a proposal for Arauco to develop the PDDs and selling the corresponding emission reductions.
11. On 22 July 2003 Arauco contacted DNV requesting information for validation and certification services for Arauco's CDM project activities in the CDM.
12. On 30 July 2003 Arauco contacted Ecofys to request information for validation and certification services for Arauco's biomass project activities in the CDM (Arauco's CDM project initiative).
13. On 30 July 2003 Arauco received the first proposal for PDD development and CER sales from Ecosecurities /14/.
14. On 31 July 2003 Arauco received DNV's validation proposal for its biomass project activities in the CDM (Arauco's CDM project initiative). This proposal for Arauco's CDM projects (Arauco's initiative in the CDM, including the Valdivia CDM project) was finally signed on 27 October 2004. The considerable delay (more than 1 year) was due to the fact that the first PDD (for the Trupan project activity) and baseline methodology (NM 0081) was not written before this date.
15. On 7 August 2003 Arauco received Ecofys's CDM service proposal for its biomass project activities in the CDM (Arauco's CDM project initiative) /15/.
16. On 8 August 2003 Arauco received a bundled proposal for developing Arauco's project activity initiative in the CDM /16/. The proposal covered the following areas:

a. Strategic guidance in the CDM process. Urquidi, Riesco & Cia. (Chile).
b. Technical development of CDM studies. Fundación Chile (Chile).
c. Sale of credits (CERs): CO2e.com (International broker)

17. During August 2003 Arauco sent information about its project initiative to potential buyers through CO2.com. As a result of this information, Arauco started negotiating a Term sheet for the sale of CERs from Arauco's biomass projects (Arauco's initiative in the CDM) with Tepco and Mitsui by the end of September, 2003 /17//18/.
18. On 9 October 2003 Urquidi, Riesco & Cia. (strategic CDM consultant) sent a proposal for assisting Arauco in going through the CDM with its initiative in the CDM (Arauco's biomass projects) /19/. After a negotiation process, this contract was signed by both parties on 5 December 2003. The contract formalized the work relationship between Arauco and Urquidi that had started in 2002.
19. On 10 October 2003 Fundación Chile sent a proposal to Arauco for developing the technical studies required by Arauco's CDM project activities (Arauco's initiative in the CDM) /20/. Arauco did not accept this proposal.
20. On 10 November 2003, Poch Ambiental sent a proposal to Arauco for developing the technical studies required by Arauco's CDM project activities (Arauco's initiative in the CDM) /21/. After a negotiation process, this contract was signed by both parties on 5 December 2003. However, this contract was unilaterally terminated by Arauco on 6 December 2004 (there is an official and signed document terminating the services), since the consultants proved to be unable to develop the baseline methodology and the PDDs for Arauco's biomass projects.
21. During February, 2004, Arauco started preparing the information required to obtain the LOA for the Trupan and the Valdivia CDM project activities (both projects, part of Arauco's project initiative in the CDM). The two projects were presented to the Chilean DNA on 25 May 2004 and the corresponding LOA was finally obtained on 22 September 2004.
22. Arauco presented the first grid-connected baseline methodology for biomass projects in Chile (the NM0081) in October 2004. Arauco began the construction of its first CDM biomass cogeneration project in April 2001, the "Trupan Biomass Power Plant in Chile" (Ref. Nº 0259). After that, Arauco implemented similar cogeneration initiatives in subsequent industrial projects. The "Nueva Aldea Biomass Power Plant Phase I" (Ref. Nº0258) and the "Nueva Aldea Biomass Power Plant Phase II" (Ref. Nº 0346), were both successfully registered as CDM project activities during 2006.

In accordance with ACM0006, the additionality of the project is demonstrated through the "*Tool for the demonstration and assessment of additionality*" /28/ which includes the following steps:

Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations: According to section 3.3, the possible scenarios identified, are: i) a conventional self-sufficient pulp mil without surplus power generation capacity; ii) a conventional self-sufficient pulp mill with a conventional fossil fuel power unit as back-up; iii) a pulp mill designed to generate additional electricity at lower efficiency or at a later stage, not undertaken a CDM project activity; iv) a conventional pulp mill, but surplus power generation capacity based on other type of biomass; v) conventional pulp mill, but with a slight deficit in electricity generation.

Step 2 - Investment analysis: Not selected.

Step 3 - Barrier analysis:

a) *Investment Barriers:* As a member of the CDEC-SIC dispatch centre, Arauco is exposed to fines applied to power generators by the national authority. DNV confirmed (Economy Ministry: Law 18 410, modified on 19 May 2005) that there are fines applied to power generators by the national authority. According to the law, these fines are applied in proportion to the installed capacity of each electric power company. According to the law, these fines are applied in proportion to the installed capacity of each electric power company /5/. This higher risk exposure prevents companies whose core business is not power generation from investing in power cogeneration projects. Arauco has paid to the date around US$ 130,000 in fines to the authority because of power contingencies.

b) *Technological Barriers:* The Valdivia pulp mill was specially designed to generate additional electric power, which implies some modifications and technology improvements that are not standard in the pulp mill industry – the standard practice is not to generate additional electric power to the grid. Consequently, a pulp mill with surplus electric power generation: i) must have more equipment; ii) requires skilled and trained labour in order to operate the mill in a way that both the pulp production and power generation are optimized; iii) tends to work with higher steam data (i.e. 85 bar and 480°C); iv) may interferes with the normal operation of the pulping processes. Besides that, the engineering as well as most of the technology employed in the design of Arauco's pulp mills (and particular the cogeneration plant) is imported from northern European countries, particularly Sweden and Finland. DNV confirmed during the site visit (on-site inspection and interview with plant managers) that the Valdivia pulp mill faces specific characteristics due to the project activity (surplus of electric power generation) that are not usual in the pulp mill industry. Those characteristics are: i) more equipment; ii) skilled and trained labour required in order to operate the mill in a way that both the pulp production and power generation are optimized; iii) work with higher steam data (i.e. 85 bar and 480°C); iv) may interferes with the normal operation of the pulping processes.

c) *Barriers due to prevailing practice:* DNV was able to confirm that large scale surplus electric power generation is not a normal practice in the pulp mill industry. DNV confirmed with the CDEC-SIC (Economic Dispatch Center in the Central Interconnected System in Chile) that there is no other large scale surplus electric power generation in the pulp mill industry other than the CDM registered project Nueva Aldea pulp mill.

d) *Cultural Barriers:* The production and commercialization of pulp and paper is the principal business of Celulosa Arauco y Constitución S.A. as a consequence the internal culture strongly influenced by the commodity market, which differ from the culture in the electric power sector. DNV confirmed during the site visit that the production and commercialization of pulp and paper is the principal business of Arauco.

e) Barriers to entry to the electric power industry: In Chile, there are not a legal framework for grid connected small power generators from non conventional renewable energy and the project developer are not able to define the convenient regulatory scheme to dispatch to the grid. Furthermore, the project faces an operational barrier compared to power units. A dual penalization system is induced by the Chilean power dispatch for power generators that also produce power for their proper demand in case of dispatch failure. In Chile there are not several incentives to implement cogeneration units from non conventional renewable energy to generate electricity. The current initiatives do not make this kind of project financially attractive in the

traditional electricity price context. DNV confirmed that the project faces barriers in the electric power industry with the following sources: i) CDEC-SIC Internal Regulation, Article 118; ii) Ministry Resolution RM 40; iii) Ministry Resolution RM 17.

Step 4 - Common practice analysis: Although cogeneration is widely applied in the pulp industry, it is limited to electricity generation for internal use only. Arauco is the only company who has developed biomass cogeneration to the point to become a relevant net energy generator in the SIC. Very few pulp mills in the world and no pulp mill in Chile have been deliberately designed to generate surplus electricity. The CDEC-SIC data that confirm this information is presented in the annex 3 of the PDD /3/.

The above mentioned arguments demonstrate that the project is not a likely baseline scenario and that emission reductions from the project are additional.

3.5 Monitoring Plan

The project applies the approved consolidated monitoring methodology ACM0006 (version 05 of 18 May 2007) - "Consolidated baseline methodology for grid-connected electricity generation from biomass residues". The project also applies ACM0002 ("Consolidated baseline methodology for grid-connected electricity generation from renewable sources") for calculation of the grid emission factor.

The proposed monitoring methodology adopted is applicable and justified as the project activity is a greenfield co-generation project using biomass residues and is grid connected.

Most of the data necessary to calculate baseline and project emissions will be directly monitored at regular intervals. The following parameters are to be monitored:

• Net electricity generated by the biomass power plant;

• Net heat generated by the biomass power plant;

• Quantity of biomass combusted in the project plant;

• Average return trip distance between biomass supply sites and the project site;

• Average truck load of the trucks used for transportation of biomass;

• On-site use of fuel for transportation of biomass;

• Fossil fuel used in power boiler.

Moreover, the OM and BM emission coefficient will be updated annually based on data provided by CDEC-SIC.

Detailed responsibilities and authorities for project management, monitoring procedures and QA/QC procedures have been presented. The monitoring practices are considered appropriate.

Details of the data to be collected, its certainty, and format and location to be filed are correctly described.

The PDD describes the responsibility for project management, monitoring and reporting project activities.

3.6 Calculation of GHG Emissions

The various algorithm/formulae for calculating baseline and project emissions have been transparently documented in line with the requirements of ACM0006.

The emission reductions are calculated as the difference between the emission reductions through substitution of electricity generation with fossil fuels, project emissions, emissions due to leakage and baseline emissions due to the natural decay or burning of anthropogenic sources of biomass residues.

The project emissions are hence due to biomass transportation, on-site consumption of fossil fuels, consumption of electricity and combustion of biomass residues.

The main potential source of leakage is related to local sawdust and shaving market depletion. The project proponent has performed a detailed research of the biomass supply / demand situation in the area influenced by the project. According to the information obtained (approach L2 of ACM0006), the Valdivia biomass power plant counts with sufficient biomass locally and has not caused other biomass plants in the area to switch from biomass to fossil fuels so far. Therefore, leakage emissions are considered to be nil.

According to ACM0006 scenario 4, the net quantity of increased electricity generation as a result of the project activity is calculated as follows:

$$EG_y = EG_{project\ plant} - \varepsilon_{el,\ other\ plant(s)} * (1/3.6) * \sum (BF_{k,y} * NCV_k)$$

The biomass from forest operations (bark and sawdust) is higher in the project scenario than in the baseline scenario. However, the above equation considers all the biomass (from the pulping process and from forest operations) consumed in the project pulp mill. This translates into a conservative calculation of the the additional power generation.

The system boundary for the grid electricity system affected by the project is defined as the system of the Chilean grid. The combined margin emission coefficient for the grid is estimated *ex-ante* and will be monitored *ex-post* in accordance with ACM0002 version 06 of 19 May 2006. The ex-ante calculations are based on electricity generation estimates provided by the Central Interconnected System of Chile (SIC) for the electricity generated in grid in the year 2007. The build margin emission coefficient (BM) was calculated considering the most recent 20% power plants capacity additions (in MWh) in the electricity system. The operating margin (OM) emission coefficient is calculated using the simple adjusted method, and is found to be 0.70367 tCO_2e/MWh and the build margin (BM) emission coefficient is 0.2395 tCO_2e/MWh, resulting in a combined margin emission coefficient of 0.47160 tCO_2e/MWh (weighted average of the build and operating margin).

All calculations are transparently documented /22/ and have been verified by DNV to be appropriate.

The estimated amount of GHG emission reductions from the project is 2 247 311 tonnes CO_2 equivalents (tCO_2e) over a 21 years crediting period, resulting in estimated average annual emission reductions of 107 015 tCO_2e.

3.7 Environmental Impacts

Arauco has conducted an Environmental Impact Assessment (EIA) for the pulp mill, in line with Chilean regulations. The EIA was approved in October 30, 1998 by Resolution N° 279/98 /4/.

DNV has also verified that the plant has received all authorisations/permits for operation in accordance with Chilean environmental legislation.

3.8 Comments by Local Stakeholders

In addition to the legal requirements imposed by the Environmental Impact System procedure, such as, publications in local newspapers and community meetings, stakeholders involvement was organized through the following channels: technical staff of Arauco met with local community and authorities; meetings with the communities of the Valdivia province and the management of the Company, presentation of the project (the EIA) to different institutions and organizations like local universities, corporations of different nature and research centers, and representatives of different communities and local authorities were invited to visit the construction site. The Valdivia project was also announced in different CDM seminars in Chile.

The comments related to the project activity were related to the emissions of the project and waste management. All technical and environmental aspects were resolved at the EIA and approved by the environmental authorities /4/.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD version 1 of 17 July 2007 was made publicly available on DNV's climate change website* and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 19 July 2007 to 17 August 2007. No comments were received.

* http://www.dnv.com/focus/climate_change/projects/projectlist.asp?

5 VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Valdivia Biomass Power Plant" project in Chile. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The project participants are Celulosa Arauco y Constitución S.A. and Inversiones Celco SL. The host Party Chile and the Annex I Party United Kingdom meet all relevant participation requirements and have provided written approval of voluntary participation in the project. The DNA from Chile confirmed that the project assists in achieving sustainable development.

The project activity involves the construction and operation of a new 61 MW biomass cogeneration power plant located inside a new pulp mill by Arauco. The project activity is designed to use black liquor and biomass from forest operations (bark and sawdust) for power cogeneration in the new pulp mill facility and generate a surplus power to the grid.

The project correctly applies ACM0006 (version 05 of 18 May 2007) and the baseline is well elaborated. Detailed responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.

By generating renewable energy, which will displace fossil fuel based grid electricity, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 107 015 tCO_2e over the selected 7 year crediting period. The emission reduction forecast has been checked and is deemed likely that the state amount is achieved given that the underlying assumptions do not change.

Local stakeholders were invited initially through public discussion during the EIA process and comments addressed.

In summary, it is DNV's opinion that the "Valdivia Biomass Power Plant" project, as described in the revised and submitted project design document version 3 of 11 March 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0006 (version 05 of 18 May 2007). Hence, DNV requests the registration of the "Valdivia Biomass Power Plant" project as a CDM project activity.

REFERENCES

Documents provided by the project proponent that relate directly to the project:

/1/ Celulosa Arauco y Constitución S.A. Project Design Document for the "Valdivia Biomass Power Plant". Version 1 of 17 July 2007.

/2/ Celulosa Arauco y Constitución S.A. Project Design Document for the "Valdivia Biomass Power Plant". Version 2 of 24 August 2007.

/3/ Celulosa Arauco y Constitución S.A. Project Design Document for the "Valdivia Biomass Power Plant". Version 3 of 11 March 2009.

/4/ Environmental Regional Commission: Environmental License (Resolution 279/98) issued in 30 October 1998.

/5/ CNE: Ministerial Resolution 119, issued on 4 November 2001

/6/ Celulosa Arauco y Constitución S.A.: Purchase Order for the recovery boiler, dated 01 February 2002

/7/ SERCOR S.A.: Feasibility study of cogeneration in Chile, January 1998.

/8/ RNT: Carbon capture project from Radiata Pine plantation in the VI and VIII regions, Chile, December 1999.

/9/ SERCOR S.A.: Carbon bonds study, January 2003.

/10/ Conference call notes between Urquidi, Riesco & Cía. and Arauco dated 16 December 2002

/11/ E-mail message from Urquidi, Riesco & Cía. dated 9 May 2003.

/12/ E-mail message from Urquidi, Riesco & Cía. dated 29 May 2003.

/13/ E-mail message from SGS dated 23 July 2003

/14/ Proposal from Ecosecurities dated July 2003

/15/ Proposal from Ecofys dated August 2003

/16/ Bundled proposal dated 8 August 2003

/17/ Term sheet with Tepco dated 22 September 2003

/18/ Term sheet with Mitsui dated 22 September 2003

/19/ Proposal from Urquidi, Riesco & Cia. dated 9 October 2003

/20/ Proposal from Fundación Chile dated October 2003

/21/ Proposal from Poch Ambiental dated November 2003

/22/ Celulosa Arauco y Constitución S.A.: Spreadsheets with emission reduction calculation – "Valdivia em9valid", dated 28 August 2007.

/23/ Letter of Approval of Chilean's Environmental National Commission of 22 September 2004.

/24/ Letter of Approval of UK's Department for Environment, Food and Rural Affairs of 29 August 2007.

Background documents related to the design and/or methodologies employed in the design or other reference documents:

/25/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/26/ CDM-EB: *Approved Consolidated Baseline and Monitoring Methodology ACM0006 - "Consolidated baseline methodology for grid-connected electricity generation from biomass residues"*, version 05 of 18 May 2007.

/27/ CDM-EB: *Approved Consolidated Baseline and Monitoring Methodology ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, version 06 of 19 May 2006.

/28/ CDM EB: *Tool for the demonstration and assessment of additionality*. Version 04 of EB36.

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

/29/ Arauco: Christian Patrickson – Development Sub manager

/30/ Arauco: Hector Araneda – Production Sub manager

/31/ Arauco: Manuel Gonzalez – Liquor Superintendent

/32/ Arauco: Fernando Moralez – Electric Control Superintendent

/33/ Arauco: Victor Otárola – Technical Superintendent

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APPENDIX A

VALIDATION PROTOCOL
FOR CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference/ Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK	Chile: Letter of Approval of 22 September 2004 UK: Letter of Approval of 29 August 2007.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Chile.

Requirement	Reference	Conclusion	Cross Reference/ Comment
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	The DNA of Chile is the National Environmental Commission CONAMA. The DNA of UK is the Department for Environment, Food and Rural Affairs.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	Chile ratified the Kyoto Protocol on 28 August 2002. UK ratified the Kyoto Protocol on 31 May 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The UK assigned amount is 92% of the emissions in 1990.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	The validation has not in detail assessed UK's compliance with articles 5 and 7 of the Kyoto Protocol. The UK has in place a national system for estimating GHG emissions and annually submits is most recent inventory to UNFCCC.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1

Requirement	Reference	Conclusion	Cross Reference/ Comment
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD version 1 of 17 July 2007 was made publicly available on DNV's climate change website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 19 July 2007 to 17 August 2007. No comments were received.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	The PDD is in conformance with the UNFCCC CDM-PDD format.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/3/	DR	Yes. The project is located in the commune of San Jose de la Mariquina, Province of Valdivia, Chile.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/3/	DR	Project boundary is defined as: 1) baseline energy grid: the Chilean grid (SIC), 2) baseline cogeneration plant: the whole site where the cogeneration facility is located, 3) transportation of biomass residues to the project site and 4) the site where the biomass residues would have been left in piles for uncontrolled burning..		OK
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	/3/	DR	Yes. The project design engineering reflects good practice applying the Rankine technology for steam rising and power generation.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/3/	DR	The project involves the installation of a high-pressure boiler and a steam turbine, employing the Steam-Rankine cycle technology for generating electricity. The applied technology essentially comprises direct combustion of biomass in a boiler to generate steam, which is subsequently expanded through a turbine to generate electricity.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/3/	DR	The technology is being successfully used since many years for steam turbines and so it is unlikely to be substituted by other more efficient technologies, at least during the project lifetime.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/3/	DR	Yes. The plant has implemented an ISO 9001 based quality management system.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/3/	DR	See A.2.4		OK
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/3/	DR	Yes. The project participants are requested to provide documentation of approval of the EIA.	~~CL 8~~	OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/3/	DR	The written confirmation by the DNA of Chile that the project assists in achieving sustainable development was received.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.3.3. Is the project in line with sustainable development policies of the host country?	/3/	DR	See A.3.2.		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/3/	DR	The project is expected to improve energy use efficiency and power generation from renewable sources, thus contributing to sustainable development objectives of the Chilean Government.		OK
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/3/	DR	The project applies the approved baseline methodology ACM0006 - "Consolidated baseline methodology for grid-connected electricity generation from biomass residues" (version 05 of 18 May 2007) and ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/3/	DR	Yes, the project fulfils the conditions under which ACM0006 is applicable as i) only black liquor from its pulping process and forest residues (bark and sawdust) from its own and third party forest operations are used in the cogeneration plant; ii) the	~~CL 1~~ ~~CL 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			biomass generated in the Valdivia pulp mill is determined by the processing capacity of the pulp mill; iii) only the necessary amount of biomass to keep the plant running are stored (always less than three days) and iv) biomass residues do not require any preparation before being used as fuel. DNV requests evidence that the implementation of the project will not increase the biomass production in the facility. DNV requests evidence that the biomass stored at the project facility will not be stored for more than one year.		
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/3/	DR	Yes. The project activity consists in the construction of a new grid-connected biomass power plant, which is a result of the implementation of two CDM project initiatives in a new pulp mill facility: 1) The installation of a biomass (sawdust and bark) power boiler in a new pulp mill that generates high-pressure steam used to cogenerate surplus power to the grid. The biomass boiler that would have been	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			installed in a baseline situation would have had a lower biomass firing capacity and would have generated saturated (low pressure) steam, not suitable to cogenerate electric power in the mill; 2) The construction of a new pulp mill with a high electric power efficiency, so as to make it a net power exporter to the grid. These efficiency improvements allow the pulp mill to cogenerate surplus power to the grid, but without increasing the amount of biomass (black liquor, dry basis) that would be fired in the recovery boiler in a baseline scenario. As a result of these two initiatives, the project proponent has chosen two (compatible) baseline scenarios of the baseline methodology: scenarios 3 and 4. The chosen baseline is a combination of the following baseline scenarios given in ACM0006: For power generation: The generation of power in existing and/or new grid-connected power plants (P4); For heat generation: The proposed project activity (installation of a cogeneration power plant), fired with the same type of biomass but with a different thermal energy efficiency (e.g. an efficiency that is common practice in the relevant industry sector) (H2) and the generation of heat in boilers using the same type of biomass residues (H4);		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			For biomass use: The biomass is dumped or left to decay or burned in an uncontrolled manner without utilising it for energy purposes (B1) and the biomass residues are used for heat and/or electricity generation at the project site (B4). The PDD in section B.4 establishes that the baseline scenario for biomass is to be burned in an uncontrolled manner (scenario B3). However, in section B.6 the baseline scenario for biomass is presented as scenario B1. The selected baseline scenario is the construction of a conventional "business as usual" power plant utilising biomass residues which will co-generate heat and electricity to meet the pulp mill's energy demand without surplus electricity generation. This "reference plant" would employ steam of lower pressure and would have two turbo generators with a capacity of 45 MW each. The "reference plant" would have utilised the same amount of biomass residues from the pulping process, just as per indicated in scenario Nº4. (please see last part of scenario 4). However, the "reference plant" would have only generated electricity for internal use. It is thus assumed that the electricity that is supplied to the grid by the project power plant is additional to the amount of electricity generated by the "reference plant".		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			An electricity baseline emission factor is calculated in accordance with ACM0002 as a combined margin emission coefficient, consisting of the combination of a simple adjusted operating margin (OM) emission coefficient and a build margin (BM) emission coefficient. Both, the OM and BM emission coefficient will be updated based on ex-post monitoring. The electricity system selected to determine the combined margin emission coefficient is the SIC grid system in Chile.		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/3/	DR	See B.2.1		OK
B.2.3. Has the baseline been established on a project-specific basis?	/3/	DR	Yes.		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/3/	DR	Yes.		OK
B.2.5. Is the baseline determination compatible with the available data?	/3/	DR	See B.2.1		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/3/	DR	See B.2.1		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/3/	DR	The additionality of the project is demonstrated through the "*Tool for the demonstration and assessment of additionality*": *Step 1 - Identification of alternatives to the project activity consistent with current laws*	~~CL 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			and regulations: The possible scenarios are identified, i.e. i) a conventional self-sufficient pulp mil without surplus power generation capacity, ii) a conventional self-sufficient pulp mill with a conventional fossil fuel power unit as back-up, iii) a pulp mill designed to generate additional electricity at lower efficiency or at a later stage, not undertaken a CDM project activity, iv) a conventional pulp mill, but surplus power generation capacity based on other type of biomass, v) conventional pulp mill, but with a light deficit in electricity generation. *Step 2 - Investment analysis:* Not selected. *Step 3 - Barrier analysis:* a) *Investment Barriers:* in Chile there is a higher risk exposure for being a big (visible) player in the electric power generation industry. As a member of the CDEC-SIC dispatch centre, Arauco is exposed to fines applied to power generators by the national authority. According to the law, these fines are applied in proportion to the installed capacity of each electric power company. This higher risk exposure prevents companies whose core business is not power generation from investing in power cogeneration projects. b) *Technological Barriers:* the Valdivia pulp mill was specially designed to generate additional electric power, which implies		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			some modifications and technology improvements that are not standard in the pulp mill industry. The engineering as well as most of the technology employed in the design of Arauco's pulp mills (and particular the cogeneration plant) is imported from northern European countries, particularly Sweden and Finland. c) *Barriers due to prevailing practice:* DNV is able to confirm that large scale surplus electric power generation is not a normal practice in the pulp mill industry. d) *Cultural Barriers:* The production and commercialization of pulp and paper is the principal business of Celulosa Arauco y Constitución S.A. as a consequence the internal culture strongly influenced by the commodity market, which differ from the culture in the electric power sector. *e) Barriers to entry to the Electric power industry*: In Chile, there are not a legal framework for grid connected small power generators from non conventional renewable energy and the project developer are not able to define the convenient regulatory scheme to dispatch to the grid. Furthermore, the project faces an operational barrier compared to power units. A dual penalization system is induced by the Chilean power dispatch for power generators that also produce power for their proper demand in case of dispatch failure.		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			In Chile there are not several incentives to implement cogeneration units from non conventional renewable energy to generate electricity. The current initiatives do not make this kind of project financially attractive in the traditional electricity price context. *Step 4 - Common practice analysis:* although cogeneration is widely applied in the pulp industry, it is limited to electricity generation for internal use only. Arauco is the only company who has developed biomass cogeneration to the point to become a relevant net energy generator in the SIC. Very few pulp mills in the world and no pulp mill in Chile have been deliberately designed to generate surplus electricity. DNV requests evidences that support the additionality discussion: 1) Evidence of common practice and the business-as-usual in Chile; 2) Evidence of the barriers presented; 3) Evidence that CDM was considered before the starting of the project.		
B.2.8. Have the major risks to the baseline been identified?	/3/	DR	The baseline does not have any major risks.		OK
B.2.9. Is all literature and sources clearly referenced?	/3/	DR	Yes, all sources are clearly referenced.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/3/	DR	The project start date is 01 February 2002 with an expected lifetime of 30 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/3/	DR	A renewable 7-year crediting period (with the potential of being renewed twice) was selected, starting on 1 July 2008.		OK
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/3/	DR	Yes. The project applies the approved consolidated monitoring methodology ACM0006 (version 05 of 18 May 2007) - *"Consolidated monitoring methodology for grid-connected electricity generation from biomass residues".*		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/3/	DR	Yes. See B.1.2		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/3/	DR	The proposed monitoring methodology adopted is applicable and justified as the project activity is a greenfield co-generation project using biomass residues and is grid connected.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/3/	DR	Yes.		OK
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/3/	DR	See D.1.3.		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/3/	DR	See D.2.1.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/3/	DR	See D.2.1.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/3/	DR	See D.2.1.		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/3/	DR	See D.2.1.		OK
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the	/3/	DR	The project proponent does not consider the		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
collection and archiving of all relevant data necessary for determining leakage?			proposed project activity will generate leakage. However, parameters related to the approach L2 of ACM0006 will be monitored in order to confirm this.		
D.3.2. Are the choices of leakage indicators reasonable?	/3/	DR	See D.3.1.		OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/3/	DR	See D.3.1.		OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/3/	DR	See D.3.1.		OK
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/3/	DR	Yes.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/3/	DR	Yes, The baseline emissions are estimated in terms of emissions from grid electricity displacement and from avoided biomass disposal.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/3/	DR	The following parameters are to be monitored: • Net electricity generated by the biomass power plant; • Net heat generated by the biomass power plant; • Quantity of biomass combusted in the	~~CL 7~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			project plant; • Average return trip distance between biomass supply sites and the project site; • Average truck load of the trucks used for transportation of biomass; • On-site use of fuel for transportation of biomass; • Fossil fuel used in power boiler. Moreover, the OM and BM emission coefficient will be updated annually based on data provided by CDEC-SIC. The PDD states in section B.7.1 that all data and parameters to determine the grid electricity emission factor, as required by ACM0002, will be included in the monitoring plan. However, those parameters were not included.		
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/3/	DR	Yes		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/3/	DR	The baseline and monitoring methodology ACM0006 and the Chilean DNA do not require the monitoring of social or environmental indicators.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	/3/	DR	See D.5.1.		OK
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	/3/	DR	See D.5.1.		OK
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/3/	DR	See D.5.1.		OK
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	/3/	DR	Yes. Arauco is responsible for project management.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/3/	DR	Yes. There are specific personnel in charge of day-to-day management of the project activity and the monitoring and the register of the parameters.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/3/	DR	Yes. The plant has a QMS ISO 9001 implemented.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/3/	DR	The procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been identified in the monitoring plan. DNV requests further clarifications about the procedures.	~~CL 10~~	OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/3/	DR	Yes. See D.6.3		OK
D.6.6. Are procedures identified for maintenance of	/3/	DR	Yes. See D.6.3		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
monitoring equipment and installations?					
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/3/	DR	Yes. See D.6.3		OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/3/	DR	Yes. See D.6.3 ACM0006 requires all data collected as part of the monitoring to be kept at least for two years after the end of the last crediting period. However, the PDD doesn't make any reference to that.	~~CL 6~~	OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/3/	DR	Yes. See D.6.3		OK
D.6.10. Are procedures identified for review of reported results/data?	/3/	DR	Yes. See D.6.3		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/3/	DR	Yes. See D.6.3		OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/3/	DR	Yes. See D.6.3		OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/3/	DR	Yes. See D.6.3		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Project GHG Emissions *The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/3/	DR	The project emissions are due to biomass transportation, on-site consumption of fossil fuels, consumption of electricity and combustion of biomass residues.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/3/	DR	Yes. See E.1.1.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/3/	DR	Yes. See E.1.1.		OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/3/	DR	Yes. See E.1.1.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/3/	DR	Yes. See E.1.1.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/3/	DR	According to scenario 3 of ACM0006 the most likely baseline scenario is that the biomass residues are dumped or left to decay or burnt in an uncontrolled manner without utilizing it for energy purposes. In this case, the main potential source of leakage is related to local sawdust and shaving market depletion. The project proponent has performed a detailed research of the biomass supply / demand situation in the Valdivia influence area. According to the information obtained (approach L2 of ACM0006), the Valdivia biomass power plant counts with sufficient biomass locally and has not caused other biomass plants in the area to switch from biomass to fossil fuels so far. Therefore, leakage emissions may be considered to be zero. DNV requires a clear definition of the geographical boundary of the region considered in the analysis of leakage.	~~CL 5~~	OK
E.2.2. Have these leakage effects been properly accounted for in calculations?	/3/	DR	See E.2.1.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	/3/	DR	See E.2.1.		OK
E.2.4. Are the calculations documented in a complete and transparent manner?	/3/	DR	See E.1.1 and E.2.1.		OK
E.2.5. Have conservative assumptions been used when calculating leakage?	/3/	DR	See E.2.1.		OK
E.2.6. Are uncertainties in the leakage estimates properly addressed?	/3/	DR	See E.2.1.		OK
E.3. Baseline Emissions *The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/3/	DR	According to ACM0006 scenario 4, the net quantity of increased electricity generation as a result of the project activity is calculated as follows: EGy = EGproject plant – □el, other plant(s)*(1/3.6) * Σ(BFk,y * NCVk) The system boundary for the grid electricity system affected by the project is defined as the system of the Chilean grid. The combined margin emission coefficient for the grid is estimated ex-ante and will be monitored ex-post in accordance with ACM0002 version 06 of 19 May 2006. The calculations are based on electricity generation estimative data provided by the Central Interconnected System of Chile (CIS) for the electricity generated in grid in the year 2007. The build margin emission		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			coefficient (BM) was calculated considering the most recent 20% power plants capacity additions (in MWh) in the electricity system. The operating margin (OM) emission coefficient is calculated using the simple adjusted method, and is found to be 0.70367 tCO2e/MWh and the build margin (BM) emission coefficient is 0.2395 tCO2e/MWh, resulting in a combined margin emission coefficient of 0.47160 tCO2e/MWh (weighted average of the build and operating margin).		
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/3/	DR	The system boundary includes the electricity supplied to grid, the electricity system of grid (In reference to OM and BM) and the site where the biomass residues would have been burned in an uncontrolled manner.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/3/	DR	Yes.		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/3/	DR	See E.3.1.		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/3/	DR	See E.3.1.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/3/	DR	Yes.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.4.Emission Reductions *Validation of ex-ante estimated emission reductions*.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/3/	DR	The estimated amount of GHG emission reductions from the project is 2 247 311 tonnes CO_2 equivalents (tCO_2e) over a 21 years crediting period, resulting in estimated average annual emission reductions of 107 015 tCO_2e.		OK
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/3/	DR	The project proponent submitted an Environmental Impact Assessment (EIA) for the pulp mill, in which the project activity is realized, in order to comply with the Chilean regulation. The EIA was approved in October 30, 1998 by Resolution N°279/98. The plant where the CDM project activity is located went through the Environmental Impact Assessment procedure successfully receiving all the corresponding authorizations in order to operate in accordance with the environmental legislation. The project participants are requested to provide documentation of approval of the EIA.	~~CL 8~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/3/	DR	See F.1.1	~~CL 8~~	OK
F.1.3. Will the project create any adverse environmental effects?	/3/	DR	The operation of the plant will generate sewage water that will be treated in a sewage treatment plant in accordance with the Chilean regulations. Very low amounts of residues, like ashes, plastics and other industrial waste will be send to a landfill, also according with the Chilean regulations. Pulp mill effluents will receive tertiary treatment. The emissions are related to noise and particulate material. All the impacts were resolved during the environmental impact assessment procedure.		
F.1.4. Are transboundary environmental impacts considered in the analysis?	/3/	DR	See F.1.3		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/3/	DR	Yes.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/3/	DR	See F.1.1.	~~CL 8~~	OK
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	/3/	DR	Stakeholders involvement was organized through the following channels: technical staff of Arauco met with local community and authorities; meetings with the	~~CL 9~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			communities of the Valdivia province and the management of the Company, presentation of the project (the EIA) to different institutions and organizations like local universities, corporations of different nature and research centers, and representatives of different communities and local authorities were invited to visit the construction site. The Valdivia project was also announced in different CDM seminars in Chile. The comments related to the project activity were related to the emissions of the project and waste management. All technical and environmental aspects were resolved at the EIA and approved by the environmental authorities. DNV requests evidence of the stakeholders' consultation process.		
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/3/	DR	Yes. See G.1.1.	~~CL 9~~	OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/3/	DR	Yes. See G.1.1.	~~CL 9~~	OK
G.1.4. Is a summary of the stakeholder comments received provided?	/3/	DR	Yes. See G.1.1.	~~CL 9~~	OK
G.1.5. Has due account been taken of any stakeholder comments received?	/3/	DR	Yes. See G.1.1.	~~CL 9~~	OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 1 DNV requests evidence that the implementation of the project will not increase the biomass production in the facility.	B.1.2	The proposed project activity consists in the construction of a more energy-efficient pulp mill that is capable of generating surplus power to the grid. Since the production of power uses biomass streams that are by-products of the pulping process, there is a direct relation between the amount of electric power generated on-site and the amount of pulp produced by the pulp mill each year. A higher production of biomass in the facility could only happen if the pulp mill produced more pulp during the year. However, the production capacity of the pulp mill is fixed, since it was established when the mill was designed and built and cannot change due to the implementation of the project activity or any other circumstantial reason. The capacity of a pulp mill as well as the capacity of other industrial facilities is determined by the availability of the raw materials in the nearby area; in this case, Radiata pine and Eucalyptus forest plantations. According to the above, the best evidence that can be shown in this case is the pulp mill facility itself. The recovery boiler, the evaporators, the presses, etc are all dimensioned to produce a certain (maximum) amount of pulp during a year. The mill cannot process more wood than the amount for which it was designed for, therefore it is not possible for the mill to increase the generation of biomass on site to generate more power.	It was confirmed that the production capacity is limited by 550,000 ton/year by the RCA. The annual production is attending the established limits. Therefore this CL is closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 2 DNV requests evidence that the biomass stored at the project facility will not be stored for more than one year.	B.1.2	There is a dedicated area in the Valdivia pulp mill to store the biomass from forest operations (sawdust and bark) used in the power boiler. The maximum capacity of this site is 10,000 m^3 st, which is equivalent to one week of biomass stock, approximately. A detailed lay-out of the storing place will be provided to the validator. This information can be later checked during the on-site visit of DNV to the Valdivia pulp mill.	OK, the information was confirmed in the site visit. Therefore this CL is closed.
CL 3 DNV requests evidences that support the additionality discussion: 1) Evidence of common practice and the business-as-usual in Chile; 2) Evidence of the barriers presented; 3) Evidence that CDM was considered before the starting of the project.	B.2.7	Evidence to support the additionality discussion: 1) The project proponent presented the Executive Summary of the EIA of the construction of the second line (780,000 ADT/yr) of a pulp mill owned by the main competitor of Arauco in Chile. This project is of comparable size to the Valdivia pulp mill project, uses the same technology and it is a more recent (modern) project than the Valdivia mill. However, unlike the Valdivia pulp mill, the new pulp line is not self-sufficient in electric power generation. Some of the other pulp mills owned by the same competitor in Chile are not self-sufficient in electric power generation either. An easy way to check this is the extremely low number of biomass power plants connected to the SIC grid in Chile (see the list of power plants in the SIC, in Annex 3). If other pulp mills from other competitors generated surplus power to the grid in the way the Valdivia mill does, they would appear as power plants in the power plant list of the SIC grid. Since this is not the case (see table in page 32 of the PDD), the generation of surplus power to the grid is not the common	Evidences were provided to DNV's satisfaction. Therefore this CL is closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		practice in the pulp industry in Chile. This can be further confirmed as other players in the pulp industry have began presenting CDM biomass power generation projects that allow pulp mills to become self-sufficient in power generation and generate the surplus power to the grid (see "Forestal y Papelera Concepción Biomass Residues Cogeneration Plant in Chile", recently validated by DNV in 2007). This evidence above not only confirms that surplus power generation to the grid in pulp mills is not the common practice in Chile, but also that the chosen baseline for the Valdivia mill: self-sufficiency in electric power generation, is actually a very conservative baseline 2) Most of the evidence is presented in the PDD itself; however, the project proponent will provide an electronic copy of the mentioned laws and documents to the validator. 3) Part of the evidence that shows that the CDM was seriously considered before starting the Valdivia project was already provided in section B.5 of the PDD. The rest of the evidence consists in documents that will be provided in electronic format to the validator. Evidence showing the starting date of the project activity consists in the first pages of the purchase contract of the recovery boiler of the Valdivia pulp mill. This evidence has already been provided to the validator.	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 4 The PDD in section B.4 establishes that the baseline scenario for biomass is to be burned in an uncontrolled manner (scenario B3). However, in section B.6 the baseline scenario for biomass is presented as scenario B1.	B.2.1	The real baseline scenario for the biomass from forest operations used in project initiative Nº1 of the proposed project activity is B1: biomass residues are dumped or left to decay under mainly aerobic conditions. A minor portion of the biomass is, however, burned in an uncontrolled manner to prevent forest fires (i.e. biomass from forestry operations). Section B.4 of the PDD describes the current situation of the baseline for this type of biomass and establishes that the baseline emissions for the additional biomass used in the project activity to generate surplus power would be uncontrolled burning of the biomass residues. This, although does not correspond to the real situation (baseline scenario), is consistent with what is mentioned in page 41/63 of the ACM0006 (Version 05), that states that for both baseline scenarios B1 (natural decay) and B3 (uncontrolled burning), the baseline emissions must be calculated assuming that the biomass is burned in an uncontrolled manner. This aspect is further more precisely described in section B.6 of the PDD, in which the two project initiatives and the corresponding baseline scenarios that conform the proposed project activity are presented and analyzed. Although the baseline scenario that really applies for project initiative Nº1 is B1, the baseline emissions must be calculated assuming that the biomass is burned in an uncontrolled manner. After the validation visit, the project proponent decided to further clarify this aspect in section B.4 of	It is clear stated in the revised PDD that the baseline scenario for biomass is to be dumped or left to decay under mainly aerobic conditions. Therefore this CL is closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		the PDD, and explicitly established that the baseline for the used biomass is dumping in piles to natural decay (baseline scenario B1).	
CL 5 DNV requires a clear definition of the geographical boundary of the region considered in the analysis of leakage.	E.2.1	A table in page 70 of the PDD presents the supply / demand situation of biomass from forest operations in the influence area of the Valdivia power plant for the year 2007. A footnote of the same table establishes that the influence area is defined in Annex Nº4 of the PDD. A table in Annex Nº4 named "Influence area of the Valdivia power plant" clearly establishes the communes and the country regions from which the Valdivia power plant sources the biomass that buys from third parties. This information is a clear and unequivocal definition of the boundary of the region considered in the analysis of leakage.	The geographical boundary is clearly defined in the PDD and was confirmed in the site visit. Therefore this CL is closed.
CL 6 ACM0006 requires all data collected as part of the monitoring to be kept at least for two years after the end of the last crediting period. However, the PDD doesn't make any reference to that.	D.6.8	Section B.7.2 of the PDD states: "The project proponent will implement monitoring procedures according to the monitoring methodology chosen for this project activity. (…)". The monitoring methodology chosen for this project activity is included in the ACM0006 (Version 05) and page 51/63 of the methodology clearly describes the monitoring procedures that must be observed when monitoring the data / parameters used to calculate the emission reductions of the proposed project activity. This description includes (among others) the requirement of storing all the data collected for the monitoring in electronic files for at least 2 years after the end of the last crediting period.	The PDD was revised accordingly. Therefore this CL is closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		The project proponent decided not to mention this (as well as the other) monitoring requirements in the PDD, but just to make a reference to the monitoring procedures that would be applied in the proposed project activity. This helped to avoid redundancy in the PDD. After the validation visit, the project proponent agreed with the validator to mention in section B.7.2 of the PDD that all the data collected as part of the monitoring will be stored electronically and kept for 2 years after the end of the last crediting period.	
CL 7 The PDD states in section B.7.1 that all data and parameters to determine the grid electricity emission factor, as required by ACM0002, will be included in the monitoring plan. However, those parameters were not included.	D.4.3	The parameters are included in the monitoring plan (see description of variable EFgrid,y in section B.7.1), but are not explicitly mentioned in it in order to avoid redundancy in the PDD. In case it is required to make an explicit reference to the data / parameters that need to be monitored to calculate the EFgrid,y, the project proponent will add them in section B.7.1 of the PDD. After the validation visit the project proponent agreed with the validator to include the parameters that need to be monitored according the ACM0002 (Version 06) in section B.7.1 of the PDD.	The monitoring of the parameters used to update ex-post the grid emission factor was included in PDD version 02. Therefore this CL is closed.
CL 8 The project participants are requested to provide documentation of approval of the EIA.	A.3.1 F.1.1 F.1.2 F.1.6	The project proponent will provide to the validator an electronic file with Resolution Nº 279/98, which establishes the approval of the Valdivia pulp mill project in pages 101 and 102.	Evidences were provided to DNV's satisfaction. Therefore this CL is closed.
CL 9 DNV requests evidence of the	G.1.1 to G.1.5	In Resolution Nº 279/98, point Nº6, page 5/102, there is a reference to the observations of the	Evidences were provided to DNV's satisfaction.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
stakeholders' consultation process.		stakeholders' consultation process conducted for the Valdivia pulp mill project. Subsequent sections of the Resolution make additional references to the consultation process as well.	Therefore this CL is closed.
CL 10 The procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been identified in the monitoring plan. DNV requests further clarifications about the procedures.	D.6.4	The project proponent made a reference in section B.7.2 of the PDD of the procedures for emergency preparedness that currently exist in the Valdivia mill for cases where emergencies can cause unintended emissions. As could be verified during the validation visit, the mill counts with plenty of security systems, measures and procedures in case of emergencies that might lead to unintended emissions. This particularly applies in case of on-site fires.	The PDD was revised accordingly. Therefore this CL is closed.

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Felipe Antunes

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 30 October 2007

Michael Lehmann
Technical Director, International Climate Change Services

CERTIFICATE OF COMPETENCE

Luis Filipe Tavares

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 9 & 13		

Høvik, 30 October 2007

Michael Lehmann
Techncal Director, International Climate Change Services

CERTIFICATE OF COMPETENCE

Hendrik Brinks

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3 & 12		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	*ACM0006, AM0007, AM0015, AM0036, AM0042*	Yes
ACM0004, ACM0012	Yes		

Høvik, 30 October 2007

Michael Lehmann
Technical Director, International Climate Change Services

CERTIFICATE OF COMPETENCE

Ramesh Ramachandran

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4, 5, 13		
Technical Reviewer for (group of) methodologies:			
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 22 December 2006

Einar Telnes
Director, International Climate Change Servicer

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0027*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	*AM0030*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0031*	Yes
ACM0004, ACM0012	Yes	*AM0032*	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	*AM0035*	Yes
ACM0007	Yes	*AM0038*	Yes
ACM0008	Yes	*AM0041*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0034*	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	*AM0043*	
AM0009, AM0037	Yes	*AM0046*	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	*AM0047*	
AM0014	Yes	*AMS-II.A-F, AM0044*	Yes
AM0017	Yes	*AMS-III.A*	Yes
AM0018	Yes	*AMS-III.E, AMS-III.F*	Yes
AM0020	Yes		
AM0021, AM0028, AM0034, AM0051	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director