




**Validation report form for renewal of crediting period for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Trupan Biomass Power Plant in Chile. 0259.
Number and duration of the next crediting period	3 rd Crediting period. 01/05/2017- 30/04/2024
Version number of the validation report	Version 3.0
Completion date of the validation report	12/12/2019
Version number of PDD to which this report applies	05
Project participants	Celulosa Arauco y Constitución S.A.
Host Party	Chile
Applied methodologies and standardized baselines	ACM0006. Large-scale Consolidated Methodology: Electricity and heat generation from biomass. Version 14.0
Mandatory sectoral scopes	Sectoral scope(s): 01
Conditional sectoral scopes, if applicable	Not applicable
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	131,433 tCO ₂ e
Name and UNFCCC reference number of the DOE	E-0016 ERM Certification and Verification Services Limited
Name, position and signature of the approver of the validation report	Melanie Eddis Partner 

SECTION A. Executive summary

>> The proposed project activity consists in the installation of a new biomass cogeneration power plant in the Trupan Complex site.

The new cogeneration plant is equipped with a power boiler and a 30 MW turbo generator unit. Part of the steam produced is used internally in the Trupan plant (plywood factory), and part of the electricity is used for the process and the surplus of energy is injected to the grid.

The project activity is designed to use biomass from industrial operations (sawdust and bark, mainly from sawmills) and biomass from forestry operations (from harvesting, thinning and pruning operations) for electric power generation. In the absence of the project activity, part of this biomass would be burned uncontrollably in the open air or left in piles to natural decay.

Location: Chile, South America.VIII Region of Bio Bío, Province of Ñuble. Cholguan road (no number), Yungay.

The Trupan project activity (Ref. 0259) was successfully registered in the CDM in June 06, 2006. This PDD is developed to apply for the third crediting period renewal of the project activity and the estimated amount of annual average GHG emission reductions is 131,433 tCO₂e.

This revalidation is performed between March and November 2019 and the site visit was performed on 15th March 2019. ERM CVS concluded that the project activity meets the requirements as set out in the CDM project standard, and therefore requests the renewal of the crediting period for the project activity.

SECTION B. Validation team, technical reviewer and approver**B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	El	Labbé	Javiera	External individual contracted to ERM CVS, London	x	x	x	x

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Avis	Jonathan	ERM CVS, London
2.	Approver	IR	Eddis	Melanie	ERM CVS, London

SECTION C. Means of validation**C.1. Desk/document review**

>> A detailed desk review was undertaken prior to the site visit. The desk review included:

- A review of data and information to verify the correctness, credibility and interpretation of presented information;
- Cross checks between information provided in the PDD and information from other sources, not limited to those provided by the PPs, applying ERM CVS's sectoral or local expertise and, if necessary, with independent background investigations
- Reference to available information relating to projects or technologies similar to the proposed project activity
- Review, based on the approved methodology being applied, of the appropriateness of formulae and accuracy of calculations

Where the review of the PDD at the document review stage raised issues, these were further reviewed and validated through supporting documentation and cross-checking from other sources and interviewing the PPs and relevant personnel involved in the project during the site visit. During the document review the project team also compared the proposed project activity with available information relating to projects or technologies similar to the proposed project activity under validation. Where appropriate, the validation team assessed the appropriateness of formulae and the correctness of calculations presented by the PPs.

Documents reviewed are described in Appendix 3 and correspond to PDD, ERs Calculations, and monitored data from previous monitoring periods, internal Trupan records, laboratory reports and other public information.

C.2. On-site inspection

Duration of on-site inspection: 15/03/2019 to 15/03/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Verification of measurement method and recording system. Verification of data included in the Monitoring Plan.	On site: Trupan Plant. Yungay, Chile	15-03-2019	Javiera Labbé
2.	ER Calculations. PDD and Monitoring plan.	Headquarters. Arauco Energía Offices. Santiago, Chile.	21-03-2019	Javiera Labbé

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			

CDM-RCPV-FORM

1.	Enriquez	Roque	Control room operator	15-03-2019	Energy, steam temperature, pressure, flow.	Javiera Labbé
2.	Jaque	Cristian	Control room leader	15-03-2019	Energy, steam temperature, pressure, flow.	Javiera Labbé
3.	Troncoso	Manuel	Effluent room operator	15-03-2019	Energy, steam temperature, pressure, flow.	Javiera Labbé
4.	De la Cruz	Perla	Weighbridge operator	15-03-2019	Weight measurement procedures	Javiera Labbé
5.	Venegas	Luis	Weighbridge operator	15-03-2019	Weight measurement procedures	Javiera Labbé
6.	Duran	Cristian	Wood preparation Chief	15-03-2019	Biomass measurement	Javiera Labbé
7.	Barra	Rodrigo	Power plant Responsible	15-03-2019	Biomass measurement Power plant performance	Javiera Labbé
8.	Jeria	Fabian	Certification Chief	15-03-2019	Biomass measurement	Javiera Labbé
9.	Suarez	Matias	Prime matter analyst	15-03-2019	NCV, density and moisture analysis	Javiera Labbé
10.	Rodriguez	Christian	Climate Change Manager	15-03-2019; 21-03-2019	Calculations, Assumptions, Monitoring plant	Javiera Labbé

C.4. Sampling approach

>> Sampling approach was only used when verifying data used for ERs calculation comparing them to raw data: EF_{OM} (10% sampling performed) and biomass analysis to demonstrate that the proposed baseline is a credible alternative scenario (5% sampling).

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	1	-
Application and selection of methodologies and standardized baselines	-	1	-
Validity of original baseline or its update	1	-	-
Estimated emission reductions or net anthropogenic removals	2	2	
Validity of monitoring plan	5	-	-
Crediting period	-	-	-
Project participants	-	-	-
Post-registration changes	-	-	-
Others (parameter descriptions)	1	-	-
Total	9	4	

SECTION D. Validation findings
D.1. Compliance with PDD form

Means of validation	The PDD was compared with the latest version of CDM-PDD-FORM. ERM CVS determined whether the updated PDD has been completed using the valid version of the applicable PDD form, following the instructions therein.
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	Since the PPs had to use a later valid version of the PDD form for the updated PDD than the version of the form of the registered PDD, ERM CVS determined whether the information transferred to the later valid version of the PDD form is materially the same as that in the registered PDD.
Findings	CAR 01 is raised because the latest version of the PDD form was not used. The PDD was updated and the latest version has been used, and correctly completed following the instructions therein. The final version of the PDD uses the latest version of the CDM-PDD-FORM. CAR 01 was closed. ERM CVS also confirmed that the information transferred to the later valid version of the PDD form is materially the same as that in the registered PDD.
Conclusion	PDD v5 was updated using the latest version of the PDD template (v11.0). CAR 1 was closed. The PDD correctly applies the latest version of the PDD form. The information transferred to the later valid version of the PDD form is materially the same as that in the registered PDD.

D.2. Application and selection of methodologies and standardized baselines

Means of validation	By means of document review of the PDD and applied methodologies and tools, ERM CVS has validated whether the selected methodologies and other applied methodological regulatory documents are applicable to the proposed CDM project activity and that the selected versions are valid at the time of submission of the proposed CDM project activity for renewal of crediting period.
Findings	<p>The project applies methodology ACM0006: Electricity and heat generation from biomass - Version 14.0. This is the latest available version at the time of revalidation. Application of the methodology ACM 0006 v14 was followed in ERs calculations and in PDD section B.6.1 Explanation of methodological choices.</p> <p>The project also applies the following tools: "TOOL07: Tool to calculate the emission factor for an electricity system (Version 07.0)". "TOOL03: Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion (Version 03.0)". "TOOL09: Determining baseline efficiency of thermal or electric energy generation systems (Version 02.0)". "TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 03.0)". "TOOL16: Project and leakage emissions from biomass (Version 04.0)". "TOOL11: Assessment of the validity of the original/current baseline and update the baseline at the renewal of a crediting period (Version 03.0.1)". "TOOL12: Project and leakage emissions from transportation of freight (Version 01.1.0)".</p> <p>These are the latest versions of the applicable tools at the time of revalidation.</p> <p>ERM CVS confirmed that the proposed CDM project activity meets all the applicability conditions of the selected methodology and tools. This was done by validating the project description (see above) and by verifying that the methodology and tools are correctly quoted and interpreted in the PDD. Please see Appendix 6 for further details.</p> <p>The methodology was also confirmed to have been correctly applied with respect to the following: (a) Project boundary; (b) Baseline identification; (c) Algorithms and/or formulae used to determine emission reductions; (d) Monitoring methodology. Please see below for details.</p> <p>ERM CVS determined that the selected methodology and tools are correctly quoted and applied by comparing them with the actual text of the valid version of these documents, and relevant requirements in the "CDM project standard for project activities".</p>

Conclusion	The selected methodologies and other applied methodological regulatory documents are applicable to the proposed CDM project activity and the selected versions are valid at the time of submission of the proposed CDM project activity for crediting period renewal. The selected methodology and tools are correctly quoted and applied.
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D.3. Validity of original baseline or its update

Means of validation	<p>In accordance with the project standard, ERM CVS evaluated whether the Project Participants have assessed and incorporated the impact of national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the current baseline GHG emissions, without reassessing the baseline scenario.</p> <p>Where data and parameters used for determining GHG emission reductions are determined ex ante (and not monitored during the crediting period), ERM CVS assessed the continued validity of the values applied, and whether project participants have appropriately updated such data and parameters where needed. The validity of the baseline and the parameters determined ex-ante has been assessed in accordance with the 'Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period'. ERM CVS assessed:</p> <ul style="list-style-type: none"> • compliance of the current baseline with relevant mandatory national and/or sectoral policies; • the impact of circumstances; • whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested; • validity of the data and parameters; • whether the baseline has been correctly updated; • whether the data and parameters have been appropriately updated. <p>This included evaluating the conservativeness of the assumptions made, and evidence for the values applied.</p>
Findings	<p>The PDD discussed the tool 11 "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period", however in step 1.2 the PDD described that circumstances have not changed significantly since the first crediting period. However, Chile has implemented several new policies encouraging non-conventional renewable energy generation. CL01 was raised because step 1.2 did not identify and analyse the latest changes in national energy policy.</p> <p>In response, the PDD was revised. The PP has now evaluated the impact of changes in conditions, availability of fuels and the impact of changes in electricity and fuel prices, demonstrating that whilst there have been changes in conditions in the country, the baseline remains valid. CL 01 was closed. Please see Appendix 4 for further details.</p>
Conclusion	<p>The baseline has been reviewed as required by ACM 0006 v 14 and required tools.</p> <p>The Project Participants have assessed and incorporated the impact of national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the current baseline GHG emissions, without reassessing the baseline scenario.</p> <p>Where data and parameters used for determining GHG emission reductions are determined ex ante (and not monitored during the crediting period), ERM CVS determined that the values have been updated where needed, and confirmed the validity of the updated values.</p> <p>The validity of the baseline and the parameters determined ex-ante has been assessed in accordance with the 'Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period'. ERM CVS</p>

	<p>confirmed that:</p> <ul style="list-style-type: none"> the baseline conforms with relevant mandatory national and/or sectoral policies; the baseline is not impacted by the impact of changes in circumstances. <p>This included confirming the conservativeness of the assumptions made, and evidence for the values applied.</p>
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D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	<p>By review of the PDD, emission reduction calculation spreadsheet, grid emissions factor calculations and comparison with the applied methodology and tools, ERM CVS determined whether the description of how to undertake the ex-ante and ex-post calculations of baseline, project and leakage GHG emissions as well as GHG emission reductions to be achieved by the proposed CDM project activity is in accordance with the applied methodology and tools.</p> <p>Where the applied methodology or tools allow for selection between options for equations or parameters, ERM CVS has determined whether adequate justification has been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided) and that the correct equations and parameters have been used, in accordance with the applied methodology and tools.</p> <p>Where data and parameters have already been determined and will remain fixed throughout the crediting period, ERM CVS has determined whether all data sources and assumptions are appropriate and calculations are correct as applicable to the proposed CDM project activity, and will result in an accurate or otherwise conservative estimate of the emission reductions. Where parameters are to be monitored, ERM CVS has determined whether the estimates provided in the PDD for these data and parameters are reasonable.</p>
Findings	<p>CL02, CL09, CAR03 and CAR04 were raised.</p> <p>Further details on the validation of the emission reduction calculations is contained in appendix 5.</p>
Conclusion	<p>Estimated emission reduction calculation, data and values used were found correct. CLs and CARs were closed.</p> <p>ERM CVS has confirmed that:</p> <ul style="list-style-type: none"> (a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources; (b) All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD; (c) All values used in the PDD including GWPs are considered reasonable in the context of the proposed CDM project activity; (d) The methodologies and tools have been applied correctly to calculate baseline, project and leakage GHG emissions, as well as GHG emission reductions; (e) All estimates of the baseline GHG emissions can be replicated using the data and parameter values provided in the PDD; (f) Sampling is not applicable.

D.5. Validity of monitoring plan

Means of validation	<p>The PPs have included a monitoring plan in the PDD for validation. Based on review of the PDD and comparison with the applied methodology and tools, and a visit to the project site to check meters and records to confirm that the monitoring plan is able to be implemented, ERM CVS has determined whether the description of the monitoring plan included in the PDD complies with the applied methodology and tools and is feasible. Sampling is not applicable for the proposed project.</p> <p>To assess compliance of the monitoring plan with the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents, ERM CVS has:</p>
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	<p>(i) Identified the list of parameters required by the applied methodologies and tools, by means of document review;</p> <p>(ii) Confirmed that the description of the monitoring plan contains all necessary parameters, that they are described, and that the means of monitoring described in the monitoring plan comply with the requirements of the applied methodology and tools.</p> <p>To assess the feasibility of the monitoring plan, ERM CVS has, by means of review of the documented procedures, interviews with relevant personnel, project plans and the on-site inspection of the proposed CDM project activity, assessed whether:</p> <p>(i) The monitoring arrangements described in the monitoring plan are feasible within the project design;</p> <p>(ii) The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that GHG emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.</p>
Findings	<p>CL03, CL04, CI05, CL06, CL08 were raised.</p> <p>Further details on the validation of the monitoring plan, including monitoring parameters, is contained in appendix 5.</p>
Conclusion	<p>All CARs and CLs were closed. ERM CVS has confirmed that the description of the monitoring plan included in the PDD complies with the applied methodology and tools. Sampling is not applicable for the proposed project.</p> <p>All parameters required by the applied methodologies and tools are included in the monitoring plan. The description of the monitoring plan contains all necessary parameters, they are described, and the means of monitoring described in the monitoring plan comply with the requirements of the applied methodology and tools.</p> <p>ERM CVS confirmed that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that GHG emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified. ERM CVS believes that the PPs can implement the monitoring plan.</p>

D.6. Crediting period

Means of validation	By means of document review, including verifying UNFCCC web page, ERM CVS determined whether the type and duration of the crediting period are correctly determined.
Findings	ERM CVS determined that the type and duration of the crediting period are correctly determined.
Conclusion	The type and duration of the crediting period is found correct. The next crediting period of the project activity commences on the day immediately after the expiration of the current crediting period.

D.7. Project participants

Means of validation	ERM CVS checked that the names of the project participants included in the updated PDD are consistent with the names of the project participants in the latest version of the MoC statement, by means of verifying the MoC statement and checking the UNFCCC CDM website.
Findings	<p>The Project Participant is found to be correct Host Parties PP: Celulosa Arauco y Constitución S.A.</p> <p>United Kingdom of Great Britain and Northern Ireland: Celulosa Arauco y Constitución S.A.</p>
Conclusion	The names of the project participants included in the updated PDD are consistent with the names of the project participants in the latest version of the MoC

	statement.
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D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ¹	NA		
Corrections	NA		
Change to the start date of the crediting period	NA		
Inclusion of a monitoring plan	NA		
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	NA		
Changes to the project design	NA		
Changes specific to afforestation and reforestation project activities	NA		

SECTION E. Internal quality control

>> The validation activities and content of the report are subject to a review by an independent technical reviewer. The role of the Technical Reviewer is to provide oversight that all procedures have been followed by the verification team and all conclusions justified and supported by evidence. The Technical Reviewer will either accept or reject the recommendations made by the verification team.

SECTION F. Validation opinion

>> Celulosa Arauco y Constitución S.A. has commissioned ERM CVS to validate the crediting period renewal for the CDM project “Trupan Biomass Power Plant in Chile”, in line with all relevant UNFCCC requirements. The validation was carried out in line with the CDM Validation and Verification Standard (VVS) version 02.0. The review of the updated PDD and additional documents related to the project, the baseline and monitoring methodology, the subsequent background investigation, and follow-up interviews have provided ERM CVS with sufficient evidence to validate the fulfilment of the eligibility of the CDM project for crediting period renewal.

ERM CVS confirmed that the project participants have correctly updated sections of the PDD relating to the baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period using the valid version of the approved methodologies and other methodological regulatory documents that are applicable to the project activity. The updated PDD complies with all the requirements of the selected methodology (additionality demonstration was not reassessed, as per the CDM Project Standard for Project Activities). The methodologies and other methodological regulatory documents were applied in accordance with the applicable requirements in the “CDM project standard for project activities Version 2.0”. The baseline, the estimated GHG emission reductions, and the monitoring plan in the updated PDD comply with the applicable requirements in the “CDM project standard for project activities Version 2.0”, and the valid version of the methodologies and other methodological regulatory documents that are applied in the updated PDD.

As the project participants used a later valid version of the PDD form for the updated PDD than the version of the form of the registered PDD, ERM CVS confirmed that the information transferred to the later valid version of the PDD form is materially the same as that in the registered PDD.

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

ERM CVS confirmed the validity of the baseline through an assessment of:

(a) The impact of new relevant national and/or sectoral policies and circumstances on the baseline, taking into account relevant guidance from the Board with regard to renewal of the crediting period of a registered CDM project activity, at the time of requesting renewal of crediting period of the project activity;

(b) The correctness of the application of the approved methodologies and, where applicable, the approved standardised baselines and the other methodological regulatory documents for the determination of the continued validity of the baseline or its update, and the estimation of GHG emission reductions or net anthropogenic GHG removals for the applicable crediting period of the registered CDM project activity.

ERM CVS confirmed that the baseline is still applicable and that the estimation of emission reductions has been correctly presented.

ERM CVS therefore requests renewal of the crediting period for the project activity.

Appendix 1. Abbreviations

Abbreviations	Full texts
1. DOE	Designated Operational Entities
2. PDD	Project Design Document
3. MP	Monitoring Plan.
4. CP	Crediting Period
5. PP	Project Participant
6. IPCC	Intergovernmental Panel on Climate Change
7. NA	Not applicable
8. PA	Project activity

Appendix 2. Competence of team members and technical reviewers

Javiera Labbe is lead validator and verifier of CDM projects. She is a lead assessor for certification of EHS management systems. Javiera has acted as the auditor for more than 20 carbon offset projects in a range of sectors including power (hydro, biomass), waste management, industrial energy recovery, and agricultural projects in developing countries. Javiera also is an experienced assessor of environment (ISO 14001), health and safety (EHS) management systems (ISO 45001) in a range of sectors. Javiera also is a management system assessor and professor (Universidad de Chile). Prior to joining ERM CVS, Javiera worked as a project manager and technical reviewer at the carbon trading firm EcoSecurities Ltd. She is a Biochemical Engineer from the Universidad Catolica de Valparaiso, and she hold an MSc degree in Environmental Management and Engineering from the Ecole des Mines de Paris.

Jonathan Avis is a lead validator and verifier of CDM and Gold Standard projects and programme manager of the CDM and other carbon offsetting validation & verification programmes within ERM CVS. He is also a technical reviewer for CDM, Gold Standard and VCS projects, and a lead assessor for certification of EHS and energy management systems. Jonathan has acted as the auditor or technical reviewer for more than 150 carbon offset projects in a range of sectors including power (hydro, wind, solar, geothermal, biomass), waste management, industrial energy recovery, and household energy in developing countries. Jonathan also has substantial experience in the assessment of environmental and social impacts of energy projects, against a variety of criteria including the Gold Standard for carbon offset projects, and the World Commission on Dams for large hydro. In addition to this, Jonathan is an experienced assessor of environment (ISO 14001), health and safety (EHS) management systems (ISO 45001) and energy management systems (ISO 50001) in a range of sectors. Prior to joining ERM CVS, Jonathan worked as a researcher into clean energy in developing countries at the University of Oxford, and as a manager at the carbon trading firm EcoSecurities Ltd. Jonathan has also chaired the international forum of auditing bodies ('DOE Forum') under the UNFCCC's Clean Development Mechanism (CDM). Jonathan holds a BA in Geography (1st Class Hons) from the University of Oxford, and an MSc in Environmental Change and Management, also from the University of Oxford (Distinction).

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Arauco	PDD, first crediting period.	https://cdm.unfccc.int/Projects/DB/DNV-CUK1138289069.87/view?cp=1	UNFCCC
2	Arauco	PDD, second crediting period	https://cdm.unfccc.int/Projects/DB/DNV-CUK1138289069.87/view	UNFCCC
3	Arauco	PDD, third crediting period. V4. 26/04/2019. Submitted to revalidation. V5.03/09/2019. Final version of the PDD. 3 rd Crediting period.		Arauco
4	Meth Panel	ACM 0006, v14. Large-scale Consolidated Methodology: Electricity and heat generation from biomass.	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC
5	Meth Panel	“TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (Version 03.0)”.	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC
6	Meth Panel	“TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 03.0)”.	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC
7	Meth Panel	TOOL07: Tool to calculate the emission factor for an electricity system (Version 07.0)”.	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC
8	Meth Panel	“TOOL09: Determining baseline efficiency of thermal or electric energy generation systems (Version 02.0)”.	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC
9	Meth Panel	TOOL 11“Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” (Version 03.0.1)	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC
10	Meth Panel	TOOL12: Project and leakage emissions from transportation of freight (Version 01.1.0)”.	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC
11	Meth Panel	“TOOL16: Project and leakage emissions from biomass (Version	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	UNFCCC

		04.0)	methodologies/approved	
12	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	GrossGeneration.xls (Generacionbruta.xls). Data of gross electricity generation of power plant connected to Chilean grids. 1996-2018 Data.	https://www.cne.cl/estadisticas/electricidad/ .	CNE
13	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	InstalledCapacity.xls (Capacidad- Instalada-Generacion.xls). Data of year of commissioning of power plant injecting electricity to Chilean Grids. 1909-2018 Data.	https://www.cne.cl/estadisticas/electricidad/ .	CNE
14	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	Monthlygeneration.xls . Monthly data of gross electricity generation of power plant connected to Chilean grids. 2015-2017 Data.	https://www.cne.cl/estadisticas/electricidad/ .	Arauco
15	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	Power.xls, PotenciaSuficiencia.xls. Data of gross electricity generation of power plant connected to Chilean grids. 2015-2017 Data.	https://www.cne.cl/estadisticas/electricidad/ .	CNE
16	CEN. Coordinador Eléctrico Nacional	RealDia.xls. CEN... Hourly generation of power plants connected to Chilean grids. 2015- 2017 Data.	https://www2.coordinador.cl/sistema-informacion-publica/portal-de-operaciones/operacion-real/generacion-real-de-las-centrales/	CEN
17	Meth Panel	AM_CLA_0280. Clarifications on updating DATEBaselineRetrofit of ACM0002 and on changing the grid emission factor calculation approach from ex post to ex ante. 26 Feb -01 Mar 2019/ MP 78	https://cdm.unfccc.int/methodologies/PAmethodologies/clarifications/69901	UNFCCC
18	Arauco	Grid Emission Factor .xls. Calculation of OM Grid Emission Factor. 2015-2017 Data. Version1 and version 2 (corrected version)		Arauco
19	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	Fossilfuelconsumption.xls . Consumos-de-Combustibles- SEN.xlsx 2008-2018 Data.	https://www.cne.cl/estadisticas/electricidad/ .	CNE
20	INFOR Forestry National Institute/.Instituto Nacional Forestal	Anuario del aserrio 2018.Sawmill Yearbook 2018. Containing forestry production and residues generation information for 2017 and 2016.	https://wef.infor.cl/publicaciones/publicaciones.php#P1 .	INFOR

21	INFOR Forestry National Institute/.Instituto Nacional Forestal	Estadísticas forestales 2006. Forestry statistics 2006. Residues factors, efficiencies and other factors for different kind of wood industry. Index biomass surplus Trupan 2017 and 2016.xls. Arauco.		INFOR
22	Arauco	Biomass balance in Trupan Region.		Arauco
23	Universidad e Concepcion.	Calorific value report. 2016		Arauco
24	Arauco	Biomass Supply. Arauco. Information of amount of biomass residues and distances transported to Trupan Plant.		Arauco
25	Arauco	Excel. Biomass estimation. Using data 2013-2014.		Arauco
26	Kvaerner	Handbook Kvaerner Pulping Oy, Design Data of the boiler (BFBM- 573-1). Data used to estimate consumption of sludge in the boiler.		Arauco
27	IPCC	2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 2 Energy. Chapter 1: Introduction	http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf (last access: 15/10/2016)	IPCC
28	Arauco	March 2009 using the methodology developed by Hao et al. [1996].		Arauco
29	Arauco	Biomass transportation diagram. Trupan.		Arauco
30	Arauco	Transmissions system. 2018. Coordinador Eléctrico Nacional. National Electric Coordinator. Report informing the current capacity of the transmission system.		CEN
31	Arauco	ER calculations .xls Version1: April 2019 Version 2: September 2019.		Arauco
32	Arauco	Analysis of the current and future consumption situation of forest biomass for generation in Chile. Universidad Austral. 2014		Universidad Austral
33	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	CNE article explaining the decreasing prices in the new tendering in Chilean energy market	https://www.cne.cl/prensa/prensa-2017/11-noviembre-2017/valor-de-la-energia-mas-bajo-en-la-historia-de-las-licitaciones-en-chile/	CNE

34	Generadoras de Chile. Chilean Generators	Newsletter article explaining the decreasing prices in the new tendering in Chilean energy market	http://generadoras.cl/documentos/boletines/boletin-mercado-electrico-sector-generacion-julio-2018	Generadoras de Chile.
35	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	Resolución Extenta N°207. 2019. Informe-costos-de-generación-2019. Tables 8, 9 and 11. Figure 1. Average costs of installations and operation of several kind of energy generation plans.		CNE
36	CNE. Nacional Energy Commission /Comisión Nacional de Energía.	BNE Energy National Balance 2012		Public information. CNE

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	01	Section no.	PDD B5	Date: 09-04-2019
Description of CL				
<i>PDD has discussed the tool 11 "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" in the PDD Section B5, and in step 1.2 the PDD described that that circumstances have not changed significantly since the first crediting period. However, Chile has implemented several new policies encouraging non-conventional renewable energy generation. Please explain how this affects (or not) the conditions used to determinate the baseline scenario.</i>				
Project participant response				Date: 10/08/2019
<i>PDD was updated including in section B.5 step 1.2 Information requested.</i>				
<u>Step 1: Assess the validity of the current baseline for the next crediting period</u>				
Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies.				
As can be seen from the baseline analysis previously presented, the current baseline for electricity (P5 and P7), heat (H5) and biomass use (B5 and B1) complies with all relevant mandatory national and/or sectorial policies which have come into effect after the submission of the Trupan Biomass Power Plant for validation.				
Step 1.2: Assess impact of circumstances				
The current circumstances at the date of requesting crediting period renewal have changed to some extent to those that prevailed at the date of sending the proposed project activity to validation.				
The changes that the energy sector has experienced in recent years have been significant. At general level, the integration of very low-cost renewable energies, such as solar and wind, has contributed to transform energy matrices in many countries. In Chile, solar and wind energy became the most relevant sources among new projects, given their low costs, Chile 's natural conditions and a regulatory framework and favourable bidding. In recent years there has been a significant increase in installed capacity, especially solar and wind, displacing biomass and mini-hydro. This can be explained as energy production costs (or materials) from biomass is complex due to regional variability in the production costs and supply of raw materials and the wide variety of biomass conversion technologies.				
At sectorial level the internal and electric power generation for internal consumption is part of the BAU in the Pulp and Paper industry and therefore, conventional self-sufficient pulp mills without surplus power generation capacity is the standard practice in the pulp mill industry in Chile and geographical area.				
In conclusion, Chile's natural conditions and regulatory framework have recently been promoting the increase in the installed capacity of solar and wind projects displacing biomass to energy projects installed capacity. This can partially be explained due to the increase in costs of production and supply of raw				

material, in this case biomass residues and to the downward trend in electric energy prices. It is expected that these conditions will be maintained in the coming future.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) is the most likely scenario for the crediting period for which renewal is requested.

This assessment is not applicable; since in the case of the proposed project activity the equipment that would have been used in the baseline scenario does not exist. This equipment did not exist at the date the project activity was started.

Step 1.4: Assessment of the validity of the data and parameters

All monitored parameters have been updated according to the new monitoring methodology of the ACM0006 (Version 14.0).

Documentation provided by project participant

Up dated PDD

DOE assessment

Date: 03/09/2019

The updated PDD includes a description of the latest changes in circumstances, and how this would affect the baseline of the Trupan project.

The following information was confirmed:

During 2003-2015 several laws and new energy policies have entered into force in Chile in order to encourage the installation of new power plants of "non-conventional renewable energy" (ERNC in Spanish), mainly solar and wind energy, reducing the initial obstacles that this kind of energy had to compete in the Chilean markets. These new policies and the decreasing construction costs of these kind of power plants, have had clear effects since 2014, increasing the wind and solar participation in the Chilean electricity matrix (grossgeneration.xls, www.cne.cl) (12). This has led to energy prices in new generation contracts decreasing from 110-150 USD/MWh in 2005 to 35 USD/MWh in 2017

(<http://www.elmercurio.com/Inversiones/Noticias/Acciones/2018/02/26/Consumo-electrico-de-clientes-libres-tendria-su-ipeaki-en-2021.aspx>, <https://www.cne.cl/prensa/prensa-2017/11-noviembre-2017/valor-de-la-energia-mas-bajo-en-la-historia-de-las-licitaciones-en-chile/>, <http://generadoras.cl/documentos/boletines/boletin-mercado-electrico-sector-generacion-julio-2018>, Electric market newsletter <http://generadoras.cl/media/page-files/551/boletin-mercado-electrico-sector-generacion-julio-2018.pdf>).

Even if biomass is also considered "non-conventional renewable energy", it can be confirmed that no new biomass plant (except for biogas) has been commissioned since 2015 (installedcapacity.xls from www.cne.cl) (13), and solar and wind power has doubled since 2016 (grossgeneration.xls, www.cne.cl) (12). Trupan project had not used investment analysis for its determination of the baseline scenario, however this situation would increase the investment barrier for the construction of biomass projects.

Also, in November 2017, the two most important grids in Chile were connected. Initially the Trupan project was connected to SIC (central grid), where hydroelectric plants were an important source of energy. From November 2017 on, SIC were connected to SING (north grid), its energy mainly comes from fossil fuel sources. This means that EFcm from 2018 on is expected to increase for the effect of the SING in the project connected grid. Generating a drastic increment of the estimated emission reductions, followed for a gradual decreasing of the emission reductions due to new renewable energy plants connecting to the grid (if ex-post calculation EFcm option were chosen). However, the PP has chosen to keep EFbm and EFom fixed, therefore EFcm for Trupan will not increase by the effect of the two grid connection.

ERM CVS concluded that the new circumstances do not impact the defined baseline scenario. This is correctly explained in the PDD section B.5. Data and parameters applicable have been correctly up-dated.
CL 01 closed.

CL ID	02	Section no.	B.6.2	Date: 09-04-2019
Description of CL				

In section. B.6.2. Data and parameters fixed ex ante. $LFC_{HG,h}$. Parameter:

- $LFC_{HG,h}$ Baseline load factor of heat generator h (ratio) =0.82 is described in the first version of the PDD (3rdCP). This data remains fixed for the entire crediting period and used in equation 30 as a constraints. Further information is requested in order to justify this value.

Project participant response	Date: 03/05/2019
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The value was up-dated.

The 0.87 results from the weighted average calculation between summer (108 t/h) and winter (117.7 t/h) of steam flow generation. The designed steam flow (130 t/h) corresponds to the baseline power boiler described in the registered PDD. This calculation considers downtime due to maintenance and seasonal operational patterns.

$$[LFC]_{(HG,h)} = [108 \text{ t/h} \cdot (354/2 \text{ d}) + 117.7 \text{ t/h} \cdot (354/2 \text{ d})] / [130 \text{ t/h} \cdot 354]$$

Documentation provided by project participant
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Updated PDD.

DOE assessment	Date: 03/09/2019
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It was confirmed:

$$LFC = 0.87 = (108 \text{ t/h steam summer} + 117.7 \text{ t/h steam winter}) / (2 \cdot 130 \text{ t/h})$$

- This is considering half of working days winter and half summer.
- For summer (108 t/h) and winter (117.7 t/h) of steam flow generation in baseline case (PDD of the second crediting period, Table 2 Summary of Operational Data) (1).
- The design steam flow (130 t/h) corresponds to the baseline power boiler described in the PDD for the second crediting period, page 6 and 49 (1)
- This calculation considers downtime due to maintenance and seasonal operational patterns.

Information was corrected and explained in the updated PDD.

CL2 closed.

CL ID	03	Section no.	B.7.1	Date :	09/04/2019
Description of CL					
<p><i>Monitoring plan</i></p> <p><i>Parameter 20: Biomass categories and quantities used in the CDM project activity:</i></p> <p><i>Sludge for on-site operation:</i></p> <ul style="list-style-type: none"> • ACM0006 v14 requires weight measurement of biomass. • PP is proposing in the MP to use volume measurement and % solid and density as default values. CL is raised in order to clarify what kind of default value is being proposed: <ul style="list-style-type: none"> ○ fixed for the crediting period, or monitored annually, seasonally, monthly or other. <p><i>Please consider that the analysis of %solid is similar to the moisture analysis, that according to Tool 16 v4 Project and leakage emission form biomass, parameter 14, %moisture should be monitored for each batch.</i></p> <p><i>If using density and % solid (=1-%moisture) as default values for a period of time (to be determined), please justify if that this is possible according the variability of the parameters through the defined period.</i></p> <p><i>Please also describe the accuracy of the measurement method in the monitoring plan.</i></p>					
Project participant response					Date: 01/08/2019

Monitoring plan has been updated.

For sludge measurement method:

This variable will be monitored continuously using a dedicated weight meter(s) installed at the conveyor belt.

The accuracy class of these type of flow meters are: (+/- 0.6 kg).

The weight meter will receive periodic maintenance according to manufacturer's specifications.

The sludge measurement will be done continuously, online and fully integrated with the Distributed Control System (DCS) of the pulp mill. Data of dry solids of sludge consumption are aggregated and reported monthly in the emission reductions calculation sheet.

At the time of the revalidation the measurement method proposed to comply with monitoring requirements has not been installed yet. It is foreseen that after techno economic evaluation the project participant will take a decision.

The Project Participant would like to state that as a conservative approach, no sludge from on-site industrial operations will be claimed as attributable to the project activity until the weight meter is installed and properly measuring.

Responsible to undertake the measurement:

The Power Boiler Department will be responsible to undertake continuously measurement.

Documentation provided by project participant

Updated PDD.

DOE assessment

Date: 03/09/2019

MP in PDD v5, has been reviewed, for sludge measurement a weight meter will be installed, which is in line with the methodology. As a conservative approach no ERs will be claimed until the weight meter is installed. MP includes now accuracy.

CL03 is closed.

CL ID	04	Section no.	B.7.1	Date:	09/04/2019
Description of CL					
<p>Monitoring plan</p> <p>Parameter 20: Biomass categories and quantities used in the CDM project activity: ACM0006 v14 requires weight measurement of biomass.</p> <p>For internal biomass from onsite industrial operation, according to the MP part of the internal biomass, a mix of sawdust and bark from internal industrial operations, will be measured using a weighbridge, however it was confirmed on site that this parameter is currently measured by the volume of the containers. CL is raised in order to explain how this biomass quantity will be measured.</p> <p>Please also describe the accuracy of the measurement method in the MP.</p>					
Project participant response					Date:
The PP identified biomass residues categories in accordance with the requirements of version 14.0 of ACM0006. In this regard, particularly the internal biomass flow, transported by trucks will be weighed using proper and dedicated weighbridges located at the entrance of the Trupan plant.					01/08/2019
Documentation provided by project participant					
Up dated PDD					
DOE assessment					Date:
MP in the updated PDD now includes description of the measurement method and accuracy. The internal biomass (sawdust and bark) will be measured by weight to meet ACM 0006 v14 requirements.					03/09/2019
CL04 is closed.					

CL ID	05	Section no.	B.7.1	Date:	09/04/2019
Description of CL					
<p>Some parameters in the monitoring plan does not include: accuracy or the measurement, frequency or responsible.</p> <ul style="list-style-type: none"> a) Parameter 20: Sludge for on-site operation, Internal biomass from onsite industrial operation: accuracy not informed b) Parameter 30, $HC_{BL,y}$: Baseline process heat generation in year y (GJ). Responsible not defined. c) Parameter 31, $EL_{PJ,gross,y}$: Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y (MWh). Responsible not defined. d) Parameter 32, $EL_{PJ,imp,y}$ Project electricity imports from the grid in year y (MWh). Responsible not defined. 					

- e) Parameter 33 $EL_{P,j,aux,y}$ Total auxiliary electricity consumption required for the operation of the power plants at the project site in year y (MWh) . Responsible not defined.
- f) Parameter 34 $NCV_{BR,n,y}$ Net calorific value of biomass residue of category n in year y (GJ/tonne on dry-basis). Accuracy of the measurement method and responsible not defined in MP.
- g) Df,m , Return trip distance between the origin and destination of freight transportation activity f in monitoring period m (Kilometre). Responsible not defined in MP.
- h) FCi,j,y , Quantity of fuel type i combusted in process j during the year y. This parameter is divided in 3 parameters: where process j are: forestry operation, project site, project plant. Accuracy level and responsible not defined.
- i) Moisture content of each biomass residues type n. Responsible not defined.

Project participant response**Date:** 01/08/2019**Parameter 20:**

This variable will be monitored continuously using a dedicated weight meter(s) installed at the conveyor belt. The accuracy class of these type of flow meters are: (+/- 0.6 kg).

At the time of the revalidation process the measurement method proposed to comply with monitoring requirements has not been installed yet. It is foreseen that after techno economic valuation the project participant will take a decision.

The Project Participant would like to state that as a conservative approach, no sludge from on-site industrial operations will be claimed as attributable to the project activity until the weight meter is installed and properly measuring.

Responsible to undertake the measurement:

The Power Boiler Department will be responsible to undertake continuous measurement.

Parameter 30:

Responsible to undertake the measurement:

The Power Boiler Department will be responsible to undertake continuous measurement.

Parameter 31

Responsible to undertake the measurement:

The Power Boiler Department will be responsible to undertake continuous measurement.

Parameter 32

Responsible to undertake the measurement:

The Power Boiler Department will be responsible to undertake continuous measurement...

Parameter 33

Responsible to undertake the measurement:

The Power Boiler Department will be responsible to undertake continuous measurement.

Parameter 34

Responsible to undertake the measurement:

The Power Boiler Department will be responsible to undertake continuous measurement.

A third party will be responsible for the NCV measurement, in this case using reputed local laboratories and according to proper international standards; accuracies and calibration frequency remain under the third party management.

Monitored parameters for the tool to calculate "Project or leakage emissions from transportation of freight" (Version 01.1.0).

FRf,m Total mass of freight transported in freight transportation activity f in monitoring period:

The mix of sawdust and bark from off-site transported by trucks to the plant will be measured at the entrance of the plant by the weighbridge system, of accuracy +/- 30 kg.

Df,m , Return trip distance between the origin and destination of freight transportation activity.

Distance will be determined once for each freight transportation activity using road map, from each supply centre of biomass to the power plant.

Responsible to undertake the measurement:

The procurement department IT system will be responsible to monitor and register data as required.

Monitored parameters for the "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion" (Version 03.0)

Parameter divided in three parameters: forestry operations, project site and project plant.

FCproject site,y

No monitoring equipment accuracy as the data is given by the contractors.

Responsible to undertake the measurement: The procurement department IT system will be responsible to monitor and register data as required.

FCbiomass, processing,y

No monitoring equipment accuracy as the data is given by the contractors

Responsible to undertake the measurement: The procurement department IT system will be responsible to monitor and register data as required.

FCproject plant, y

Fossil fuel consumption in the Power Boiler:

Dedicated fuel tank level meter with accuracy of +/- 0.075% will be used to monitor Diesel and/or Fuel Oil consumption. For flow meter the accuracy of the equipment will be +/- 0.1% and +/- 0.5% for diesel. Since the instrument (s) used to measure the LPG consumption is property of the LPG's supplier, all information related to the instrument (s) will be managed externally to the plant.

Documentation provided by project participant

PPD v5 .

DOE assessment

Date: 03/09/2019

It was confirmed that the updated PDD includes accuracy of the measurement, frequency and responsible for all parameters in the MP. Only measurements performed by third parties (as external laboratories, for example) do not include accuracy.

CL05 is closed.

CL ID	06	Section no.	B.7.1 and B.6.3.	Date: 09/04/2019
Description of CL				
<p><i>Monitoring plan :</i></p> <p>21 For biomass residues categories for which scenarios B1, B2 or B3 is deemed a plausible baseline alternative, and results of calculations in section B.6.3:</p> <p>PP performed a summary of the quantity of biomass residues available and the quantity of biomass residues that are utilized in the region (for industrial biomass residues and forestry biomass residues), however some references and calculation methods were not available at the time of validation or not clearly explained.</p> <p>- 2016 and 2017. PP is stating a Consumption of Forestry Operations Biomass residues = 552.980 (m3st/yr.). Please inform where this information is sourced. No reference or calculation was presented.</p>				
Project participant response				Date: 01/08/2019
<p>The PP performed a revision of information sources and found new data for Forestry Operations Biomass Residues. As stated in "Analysis of the current and future consumption situation of forest biomass for generation in Chile" (Universidad Austral, 2014), in the VIII Region, from which biomass residues are sourced, a total of 1,234,184 BDts are consumed per year. This is equivalent to 2,854,407 m³st/y. From these figures, a unit conversion factor of 0.43 BDt/m³st can be drawn. In the same table in which these amounts can be found, the amount of forestry operations residues for the VIII Region is provided: 620,119 BDt/y. Using the unit conversion factor previously calculated, this results in 1,442,137 m³st/y, so the PP has updated the summary of the quantity of biomass residues available and the quantity of biomass residues utilized in the region accordingly.</p>				
Documentation provided by project participant				
Analysis of the current and future consumption situation of forest biomass for generation in Chile, Universidad Austral. 2014				
DOE assessment				Date: 03/09/2019

PP has submitted the document: Analysis of the current and future consumption situation of forest biomass for generation in Chile (32).

Data used are obtained from page 20 (for Region VIII).
 $620.119 \text{ BDT/yr} / 0.43 \text{ (BDT/ m3st)} = 1.442.137 \text{ m3st/yr}$

As more recent information was not found concerning forest consumption in the region, this 2014 value was applied for 2016 and 2017.

Considering that the most available type of biomass residues in the region is industrial biomass (sawdust and bark), and the forest biomass residues are more costly and operationally more difficult to extract, this balance is considered suitable.

Forest biomass residues used in Trupan power plant comes from it own forest in the region. **CL06 is closed.**

CL ID	07	Section no.	B.7.1	Date: 09/04/2019
Description of CL				
<p><i>Some parameters in the monitoring plan are not described as per AMC 0006 v14 and other methodological tools.</i></p> <ul style="list-style-type: none"> a) <i>Parameter 22, BRPJ,n,y, Quantity of biomass of category n used in the CDM project activity in year y (tonnes on dry-basis). Description not in line with the monitoring methodology.</i> b) <i>Parameter 23, BRB1/B3,n,y, Quantity of biomass residues of category n used in the CDM project activity in year y for which the baseline scenario is B1 or B3 (tonnes on dry-basis). Description not in line with the monitoring methodology.</i> c) <i>Parameter 24, BRB4,n,y Quantity of biomass residues of category n used in the CDM project activity in year y for which the baseline scenario is B4 (tonne4 on dry-basis). Description not in line with the monitoring methodology.</i> d) <i>Parameter 25 BRB5,n,y, Quantity of biomass residues of category n used in the CDM project activity in year y for which the baseline scenario is B5 (tonne on dry-basis). Description not in line with monitoring methodology.</i> e) <i>Df,m, Return trip distance between the origin and destination of freight transportation activity f in monitoring period m (Kilometre). Description not in line with tool 12 v1.1</i> f) <i>FC_{ij,y}, Quantity of fuel type i combusted in process j during the year y. This parameter is divided into 3 parameters: where process j are: forestry operation, project site, project plant. Names and descriptions not in line with tool 3v3, and some of them do not identify what j process is included in this parameter.</i> g) <i>NCV_{i,y}, Weight average net calorific value of fuel type i in year y. Description not as per tool 03 v3</i> h) <i>EF_{CO2,i,y}, Weighted average CO2 emission factor of fuel type i in year y. Description not as per tool 03</i> 				
Project participant response				Date: 01/08/2019

Parameter 22, BRPJ,n,y,

The PP has done the corrections to the description in line with the methodology.

Parameter 23, BRB1/B3,n,y,

The PP has done the corrections to the description in line with the methodology.

Parameter 25 BRB5,n,y,

The PP has done the corrections to the description in line with the methodology.

Df,m

The PP has done the corrections to the description in line with the methodology

FC i,j,y ,

For forestry operation, project site, project plant, the PP has done the corrections to names and descriptions according to the tool tool3v3.

NCV i,y,

The PP has done the corrections to names and descriptions according to the tool tool3v3.

EFCO2,i,y,

The PP has done the corrections to names and descriptions according to the tool tool3v3

Documentation provided by project participant

Updated PDD

DOE assessment

Date: 03/09/2019

The updated monitoring plan has been checked and descriptions are in line with ACM 0006 v14 and required tools.

CL07 Closed.

CL ID	08	Section no.	B.7.1	Date:	09/04/2019
Description of CL					
<i>Monitoring Plan.</i> <i>Moisture content of the biomass residues.</i> <i>Monitoring procedures and frequency meets Tool 16 v4 "Project and leakage emissions from Biomass".</i> <i>Monitoring methodology requires the % moisture of each batch to be measured, and the MP has stated this accordingly. However it was verified on site that this activity has not been performed as described. Some of the % moisture biomass are monitored several times a week, others are not being monitored or are measured as a mix but not separated as a biomass type n (for example: biomass from internal operations: moisture is measured only as a mix of sludge and sawdust and bark). Please inform how water content will be measured for each type of biomass.</i>					
Project participant response				Date: 01/08/2019	
<i>In previous monitoring periods biomass moisture content was taken from the mix of biomass entering the power boiler, in accordance with the methodology.</i> <i>In this case, the PP will proceed according to the methodology (version 14.0) by monitoring moisture content of each category type of biomass defined as required.</i>					
Documentation provided by project participant					
<i>No documentation was submitted.</i>					
DOE assessment				Date: 03/09/2019	
No change is MP is required. PP will follow the requirements of Tool 16 v4 "Project and leakage emissions from Biomass". MP is in line to required tool. CL08 Closed.					

CL ID	09	Section no.	B.6.3	Date:	09/04/2019
Description of CL					
<p><i>Data used for ex-ante ER Calculation:</i></p> <p><i>Parameter 20: Biomass categories and quantities used in the project activity:</i></p> <p><i>Please describe the origin of the values used, considering the fact that some of them were not monitored in the previous monitoring period. (Sludge, and Internal biomass from industrial operation)</i></p>					

Project participant response**Date:** 01/08/2019

In past monitoring periods the PP monitored the biomass residues mix flow using a dedicated flow meter, in accordance with the methodology. In this case, the PP shall monitor biomass categories following the updated version of the methodology, ACM0006 (Version 14.0). The following table presents each category of biomass residues defined for this project activity:

Biomass residues category (n)	Biomass residues type	Biomass residues Sources BDt	Comments
1	Sludge from industrial operations.	On-site production. 14,569	from design data
2	Mix of sawdust and bark from industrial operations.	On-site production. 96,217	monitored data from previous period (2013-2014)
3	Mix of sawdust and bark from industrial operations.	On-site production. 4,332	monitored data from previous period (2013-2014)
4	Mix of sawdust and bark mix from industrial operations.	Off-site production. 109,322	Difference between monitored data (2013-2014)
5	Mix of sawdust and bark from forest operations.	Off-site production. 106,400	avrg monitored (2013-2014) biomass from forestry

Source: previous monitored periods (2013 and 2014)

The PP would like to confirm the following:

- The PP estimated the total (wet) sludge flow using the design flow 1.57 kg/s as described in the manual, Kvaerner Pulping Oy, Design Data of the boiler (BFBM-573-1), which results in 48,562 wet tons per year or 14,569 tons/yr. using the moisture content of 70% as stated in the same document.
- Total mix of sawdust and bark from industrial operations corresponds to 100,549 BDt/yr. Part of it (96,217 BDt/yr.) would be consumed to satisfy process heat demand, the rest (4,332 BDt/yr) would be used for power generation.
- Obtained from the difference between the third-party biomass residues minus biomass from forestry operations).

BIOFUELS							
Total (Wet) In-house fuel (pine)	kg/s	12.87	12.87	0.00	13.70	12.87	0.00
Total (Wet) Purchased Pine	kg/s	8.43	7.91	16.50	0	7.66	27.4
Total (Wet) Purchased Euca	kg/s	6.21	5.57	0.00	0	5.85	0
Total (Wet) Sander dust flow	kg/s	0	0.35	0	0	0	0
Total (Wet) Sludge flow	kg/s	0	0	0.00	0	1.57	0
In-house fuel Moisture Content	w-%	52.5	52.5	0.00	56	52.5	0
Pine bark Moisture Content	w-%	59.0	59.0	56.0	0	59.0	56.0
Euca bark Moisture Content	w-%	59.0	59.0	0	0	59.0	0
Sander dust Moisture Content	w-%	0	10.0	0	0	0	0
Sludge Moisture Content	w-%	0	0	0	0	70.0	0

Documentation provided by project participant

Handbook Kvaerner Pulping Oy, Design Data of the boiler (BFBM-573-1),
Excel calculating biomass consumption using data 2013-2014.

DOE assessment**Date:** 03/09/2019

Sludge consumption: There is no data monitored in previous crediting period. Then design data is used as an estimation of the sludge consumed in the boiler. Kvaerner handbook of the boiler (26) was checked for load case 5 (page 17 of the file) and 1,57kg/s (page 18) and 70% moisture (page 11). This estimation is found to be adequate.

Excel of biomass consumption (25) was revised. This data was monitored during 2013-2014 (last periods verified). Then the 2013-2014 average biomass consumption from internal and external origin (industrial and forestall) is used. An energy balance considering the steam used for Trupan process (the same in baseline and project case) is used to cut off the biomass type 2 and 3 (same origin, different fate in baseline case). Estimation of the values used for parameter 20 is found suitable.

These parameters will be monitored ex-post.

CL09 is closed.

Table 2. CAR from this validation

CAR ID	01	Section no.	PDD	Date:	09-04-2019
Description of CAR					
Please update, PDD format to the last version of PDD format. For example: -Section: B.7. "Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities" does not exist in the latest version of the PDD template. - Document information at the end of the PDD document is not in line to the latest version of the PDD template.					
Project participant response					Date: 20/08/2019
PDD has been updated to version 11.					
Documentation provided by project participant					
Up dated PDD.					
DOE assessment					Date: 03/09/2019
PDD v5 is reviewed and meets the requirement of the latest PDD template (v11). CAR 01 is closed.					

CAR ID	02	Section no.	Version of Meths	Date:	09/04/2019
Description of CAR					
Methodology ACM0006, Version 12.0.0 or 13.0.0 is mentioned in PDD, version 14.0.0 is the last version available. There are some tools with the incorrect version number or name in the PDD: Tool 7: "Tool to calculate the emission factor for an electricity system (Version 05.0.0 of 06.00.0)". Should be version 07.0.0 Tool 9 "Tool to determine the baseline efficiency of thermal or electric energy generation systems (Version 02)". Should be "Determining the baseline efficiency of thermal or electric energy generation systems" Tool 11 "Assessment of the validity of the original/current baseline and to update of the baseline at the renewal of the crediting period". Should be "Assessment of the validity of the original/current baseline and update the baseline at the renewal of a crediting period (Version 03.0.1)".					
Project participant response					Date: 01/08/2019
The PP has corrected the PDD as follows: <ul style="list-style-type: none"> Methodology ACM0006 version 14.0.0. Tool 7: "Tool to calculate the emission factor for an electricity system". version 07.0.0 Tool 9 "Tool to determine the baseline efficiency of thermal or electric energy generation systems (Version 02)" revised to "Determining the baseline efficiency of thermal or electric energy generation systems" Tool 11 "Assessment of the validity of the original/current baseline and to update of the baseline at the renewal of the crediting period" revised to Version 03.0.1. 					
Documentation provided by project participant					
Updated PDD					
DOE assessment					Date: 03/09/2019
PDD was reviewed and references are correctly described according to last version of required tools. CAR 02 is closed.					

CAR ID	03	Section no.	B.6.3	Date:	09/04/2019
Description of CAR					

EF calculations were verified, and some differences were found :

-2017-2016 when comparing in EF calculation, the gross electricity generation (Mwh) of non-low-cost-must-run plants to raw data: monthly electricity generation.xls (14) and grossgeneration.xls (12) no match were found. Examples: Guacolda 1,2,3,4,5, Nehuecho, petropower, Taltal 1 and 2 and many others.

-2015 sic emission sheet, emission factors of each power plant it calculated using the gross electricity generation and not using the net electricity injected to the grid.

Project participant response

Date: 01/08/2019

EF calculation was corrected. Errors found for 2016, 2017 in values used for gross electricity generation was corrected. 2015 was not corrected as using the gross electricity instead of the net is still a conservative approach.

Documentation provided by project participant

EF calculation.

DOE assessment

Date: 03/09/2019

A complete revision of the spreadsheet comparing to grossgeneration.xls (12) was performed and no error was found.

EFgrid calculation are found correct (18). Values applied in ERs calculation and PDD were updated accordingly.

CAR03 is closed.

CAR ID	04	Section no.	B.7.2	Date: 09/04/2019
Description of CAR				
Df,m: Return trip distance between the origin and destination of freight transportation activity f in monitoring period m (Km), according TOOL12 Methodological tool: Project and leakage emissions from transportation of freight Version 01.1.0:				
PP has used the lineal distances instead of road distance, according to www.distanciasentreciudades.com and google maps. Also PP is requested to inform vintage period used for the ex-ante calculation of Df,m.				
Project participant response				Date: 01/08/2019
The PP made the corrections using road distance instead of lineal distances. Evidence to support this has been provided during the revalidation process. 2015-2016 was used to determine Df,m.				
Documentation provided by project participant				
Freight Biomass Trupan.xls v2				
DOE assessment				Date: 03/09/2019
Freight Biomass Trupan.xls v2 (24b) was revised, and Df,m consider now road distances as required by TOOL12 Methodological tool: Project and leakage emissions from transportation of freight Version 01.1.0. This has been updated in ER calculation and in PDD. This parameters will be monitored expost.				
CAR04 is closed.				

Table 3. FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
No FARs raised				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Appendix 5. Validation Protocol

Please see next page.

1 Validation findings –PDD

1.1 Project Design Document (PDD)

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.1.1	Has the PP updated the sections of the PDD related to the baseline, estimated GHG emission reductions, and the monitoring plan?	PP has applied the tool 11 version 3.0.1 "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period", confirming the baseline, and updated data and parameter of the baseline and the estimated GHG emission reductions. Also the Monitoring plan in line to ACM 0006 v14.0.	OK	OK
5.1.2	Is the updated PDD prepared in accordance with the latest forms and guidance required by the CDM EB? http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html	CAR 1 is raised in order to up-date the PDD format to version 10.1. PDD was updated using PDD format version 11. CAR 1 is closed.	CAR 1 Closed	OK

1.2 Project Description

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.4.6	Is there a clear description of the baseline scenario in the revised PDD?	PDD section B.2 and B.4 explain baseline scenario and updating calculations to last methodology AMC 0006 v14. Description of the baseline scenario concerning is described: <ul style="list-style-type: none"> - Electricity generation in baseline case - Fossil fuel consumption in baseline case - Disposal of biomass residues 	OK	OK

2 Validation findings – Methodology

2.1 Validity of selected methodology and methodological tools

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.1.1	<p>Are the number, title and version of the approved methodology clearly and correctly stated?</p> <p>Is the latest version of the methodology valid at the time of submission of the revised PDD for the renewal of the crediting period used?</p> <p>Is the methodology within its period of validity?</p>	<p>Number, title of the methodology is clearly stated.</p> <p>Methodology ACM0006, Version 12.0.0 or 13.0.0 is mentioned, referenced and used in PDD, version 14.0.0 is the last version available and will be within its period of validity. CAR 2 is raised</p> <p>Up dated PDD refers ACM 0006 v14. CAR 2 is closed.</p>	<p>CAR02</p> <p>Closed</p>	OK
	<p>Are all the required tools applied and fully referenced in the PDD?</p> <p>Are the version numbers applicable at the time of validation?</p>	<p>There are some tools with the incorrect version number or name in the PDD:</p> <p>Tool 7: "Tool to calculate the emission factor for an electricity system (Version 05.0.0 of 06.00.0)". Should be version 07.0.0</p> <p>Tool 9 ""Tool to determine the baseline efficiency of thermal or electric energy generation systems (Version 02)"..Should be "Determining the baseline efficiency of thermal or electric energy generation systems"</p> <p>Tool 11"Assessment of the validity of the original/current baseline and to update of the baseline at the renewal of the crediting period". Should be ""Assessment of the validity of the original/current baseline and update the baseline at the renewal of a crediting period (Version 03.0.1)". CAR 2 is raised</p> <p>The required tools were corrected in up-dated PDD. CAR 2 is closed.</p> <p>The following tools are correctly referenced: Tool 3 "Tool to calculate projector leakage CO2 emissions from fossil fuel combustion (Version 03)". Tool 12 Project and leakage emissions from transportation of freight (Version 01.1.0)". Tool 16: Project and leakage emissions from biomass (Version 04.0)</p>	<p>CAR02</p> <p>Closed.</p>	OK

2.2 Applicability of the selected methodology to the project activity

ERM CVS has assured the compliance of the project activity with each of the applicability conditions of the selected methodology and tools:

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	Applicability Conditions in methodology and/or tools	Is this condition discussed in the PDD? (yes/no)	Does the project meet this condition? (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	Applicability Conditions for ACM0006 v14 (a) Biomass used by the project facility is limited to biomass residues, biogas, RDF2 and/or biomass from dedicated plantations;	Yes	Yes	Biomass used are: - Sludge: From Trupan wastewater plant. - Industrial biomass (sawdust and bark) residues from Trupan onsite operation (board production) - Industrial Biomass generated off site (mills, board factories, and others) - Forest biomass generated off site. It was validated during the site visit, confirming the internal biomass are residues from the Trupan process, and the off-site residues were confirmed on the reception weighbridge, where every truck is recorded, including its origin, weight and volume. Transport documentation and internal records were checked confirming only biomass is used, crosschecking also some of the origins points.	OK	OK
	(b) Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired does not exceed 80% of the total fuel fired on energy basis	Yes	Yes	Fossil fuel is used in baseline and project scenario only for start-ups, and some occasions during the winter when biomass may be with a higher %moisture. This was confirmed checking the recording system of fossil fuel consumption (diesel and LPG) that is part of the control panel of the power plant. Thus, confirming the quantity of fossil fuel burnt is minor and used occasionally.	OK	OK
	(c) For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process;	Yes	Yes	The Project does not result in an increase of the processing capacity because it is a greenfield project, and there was not plywood plant before the construction of the project.	OK	OK
	(d) The biomass used by the project facility are not stored for more than one year;	Yes	Yes	The total capacity of the biomass storage is 250,000 m3 (confirmed on site). The forest residues is stored for a month (max) and sawdust is stored for a 6 months (max).	OK	OK
	(e) The biomass used by the project facility is not processed chemically or biologically (e.g. through esterification, fermentation, hydrolysis, pyrolysis, bio- or	Yes	Yes	No chemical process is used to treat any of the biomass residues types used in the project. Confirmed on site, verifying the reception of	OK	OK

	Applicability Conditions in methodology and/or tools	Is this condition discussed in the PDD? (yes/no)	Does the project meet this condition? (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	chemical degradation, etc.) prior to combustion. Thermal degradation, drying and mechanical processing, such as shredding and pelletisation, are allowed			external biomass, the transport of internal biomass, the accumulation in a storage yard and the biomass feeding to the conveyor belt that goes directly to the power plant.		
	ACM 0006 v14 includes some applicability requirements for : - fuel switching - biogas generation. -dedicated plantations	Yes	Yes	The project does not involve: - fuel switching - biogas generation. -dedicated plantations	OK	OK
	Finally, the methodology is only applicable if the baseline scenario, as identified per the "Selection of the baseline scenario and demonstration of additionality" section hereunder, is: (a) For power generation: scenarios P2 to P7, or a combination of any of those scenarios; (b) For heat generation: scenarios H2 to H7, or a combination of any of those scenarios; (c) If some of the heat generated by the CDM project activity is converted to mechanical power through steam turbines, for mechanical power generation: scenarios M2 to M5: (i) In the case of M2 and M3, if the steam turbine(s) are used for mechanical power in the project, the turbine(s) used in the baseline shall be at least as efficient as the steam turbine(s) used for mechanical power in the project; (ii) In the case of M4 and M5, steam turbine(s) for mechanical power are not allowed for the same purpose in the project;	Yes	yes	The baseline scenario involves P7 and H5 and no M scenario is included in baseline nor project activity.	OK	OK

2.3 Project Boundary

Emission sources

The emissions sources included in or excluded from the project boundary, as set out in the applied methodology are as follows:

	Source	Gas	Is this source included within the project boundary in the PDD?	Is inclusion / exclusion from the project boundary justified in the PDD?	How has this been validated?

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	Source	Gas	Is this source included within the project boundary in the PDD?	Is inclusion / exclusion from the project boundary justified in the PDD?	How has this been validated?
Baseline emissions	Electricity and heat generation	CO ₂	Included	Yes	Main emission source. In line with ACM0006
		CH ₄	Excluded	Yes	Excluded for simplification. In line with ACM0006
		N ₂ O	Excluded	Yes	Excluded for simplification. In line with ACM0006
	Uncontrolled burning or decay of surplus biomass residues	CO ₂	Excluded	Yes	In line with ACM0006
		CH ₄	Included	Yes	In line with ACM0006. Project participants has decided to include this emission source, since case B1, B2, B3 has been identified as the most likely baseline scenario.
		N ₂ O	Excluded	Yes	Excluded for simplification. In line with ACM0006
Project emissions	On-site fossil fuel consumption.	CO ₂	Included	Yes	There is some consumption of fossil fuel for start-up operations. In line with ACM0006
		CH ₄	Excluded	Yes	Excluded for simplification. In line with ACM0006
		N ₂ O	Excluded	Yes	Excluded for simplification. In line with ACM0006
	Off-site transportation of biomass residues	CO ₂	Included	Yes	In line with ACM0006
		CH ₄	Excluded	Yes	Excluded for simplification. In line with ACM0006
		N ₂ O	Excluded	Yes	Excluded for simplification. In line with ACM0006
	Combustion of biomass for electricity and heat generation	CO ₂	Excluded	Yes	Assumed no influence in LULUCF sector. In line with ACM0006
		CH ₄	Included	Yes	In line with ACM0006. This emission source is included since CH ₄ emissions from uncontrolled burning or decay of biomass residues in the baseline scenario are included
		N ₂ O	Excluded	Yes	Excluded for simplification. In line with ACM0006
	Waste water from treatment of biomass residues	CO ₂	Excluded	Yes	Not applicable to the project. In line with ACM0006
		CH ₄	Excluded	Yes	Not applicable to the project. In line with ACM0006
		N ₂ O	Excluded	Yes	Not applicable to the project. In line with ACM0006
	Cultivation of land to produce biomass feedstock.	CO ₂	Excluded	Yes	Not applicable to the project. In line with ACM0006
		CH ₄	Excluded	Yes	Not applicable to the project. In line with ACM0006
		N ₂ O	Excluded	Yes	Not applicable to the project. In line with ACM0006

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	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.1	Has the PDD justified the inclusion/exclusion of all potential sources of GHG emissions as set out in the applied baseline methodology	Yes. PP has included information needed for the inclusion and exclusion of sources in PDD.	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.2	Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary?	Chile, South America.VIII Region of Bio Bío, Province of Ñuble. Cholguan road (no number), Yungay. The project activity is located in the Trupan Industrial Complex site, located 8 km north from Yungay, a city located in the Ñuble Province, in the Bio Bío Region (VIII Region), about 120 km south east from the Region's Capital city, Concepción. The Bio Bío Region can be directly accessed from Santiago through the Panamericana Sur highway (or 5 Sur). A map determining the location of the project activity is included in the PDD.	OK	OK
	Were any emission sources identified that will be affected by the project activity and are not addressed by the selected approved methodology? If so, was clarification of, revision to or deviation from the methodology approved in accordance with required procedures.	No emission sources were identified that will be affected by the project activity and not addressed by the methodology. All sources are identified in the methodology ACM 0006.	OK	OK

3 Validation findings – Baseline and emission reductions

3.1 Baseline identification

The baseline identification has been validated as follows:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.1.1	Does the PDD identify the baseline, a scenario that represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed CDM project activity?	Yes, PDD identify baseline scenario, including all anthropogenic sources of GHG that would occur in absence of the project activity: <ul style="list-style-type: none"> - GHG emission from electricity and heat generation - GHG emission from uncontrolled burning or decay of surplus biomass residues. 	OK	OK
	Does the identified baseline conform to an allowed baseline under the applied methodology?	Yes, identified baseline is one of the alternatives given by ACM 0006.	OK	OK

3.2 Assessment of the validity of the original/current baseline

In accordance with the project standard, Project Participants shall assess and incorporate the impact of national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the current baseline GHG emissions, without reassessing the baseline scenario. Where data and parameters used for determining GHG emission reductions that are determined ex ante (and not monitored during the crediting period) are no longer valid, project participants shall update such data and parameters. The validity of the baseline and the parameters determined ex-ante shall be assessed in accordance with the 'Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period'. Each step of the tool was validated as follows:

Step 1: Assess the validity of the current baseline for the next crediting period

The Procedures for the renewal of the crediting period of a registered CDM project activity approved by the CDM Executive Board require assessing the impact of new relevant national and/or sectoral policies and circumstances on the baseline. The validity of the current baseline is assessed using the following Sub-steps:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.1	Have any new national and/or sectoral policies or regulations entered into force since the time of registration of the project activity that could have an impact on the baseline or GHG emission reductions? Please list.	PDD informed that no changes in national and sectoral policies entered into force since the time of registration. However, several new policies are in place since the first validation. CL 01 is raised in order to evaluate impact of changes in baseline or GHG Emission Reduction. Updated PDD informs new Chilean policies and evaluates possible impacts on the baseline. During 2003-2015 several laws and new energy policies have entered into force in order to encourage the installation of new power plants of "non-conventional renewable energy" (ERNC in Spanish), mainly solar and wind energy, reducing the initial obstacles that this kind of energy had to compete in the Chilean markets. These new policies and the decreasing construction	CL01 closed	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		<p>costs of these kind of power plants have had clear effects since 2014, increasing the wind and solar participation in the Chilean electricity matrix (grossgeneration.xls, www.cne.cl) (12). This has generated that energy prices in new generation contract has decreased from 110-150 USD/MWh in 2005 to 35 USD/MWh in 2017 (33, 34, 35). Even if biomass is also considered "non-conventional renewable energy", it can be confirmed that no new biomass plant (except for biogas) has been commissioned since 2015 (installedcapacity.xls from www.cne.cl) (13), and solar and wind power has duplicated since 2016 (grossgeneration.xls, www.cne.cl) (12).</p> <p>Trupan project had not used investment analysis for its determination of the baseline scenario, however this situation would increase the investment barrier for the construction of biomass projects.</p> <p>Also, in November 2017, the two most important grids in Chile were connected. Initially the Trupan project was connected to SIC (central grid), where hydroelectric plants were an important source of energy. From November 2017 on, SIC were connected to SING (north grid), its energy mainly comes from fossil fuel sources. This means that EFcm from 2018 on is expected to increase for the effect of the SING in the project connected grid. Generating a drastic increment of the estimated emission reduction, followed for a gradual decreasing of the emission reduction due to new renewable energy plant connecting the grid (if ex-post calculation EFcm option were chosen). However, PP has chosen since the second crediting period to keep fixed EFbm, and for the 3rd crediting period PP has chosen to keep fixed the EFom, then EFcm for Trupan will not increase by the effect of the two grid connection.</p> <p>Considering all changes occurred in Chile, none of them would reduce any of the barriers for construction and commissioning of new biomass energy plant. PDD now includes the step 1.2 analysis.</p> <p>CL1 is closed.</p>		
	Does the current baseline (used in the registered PDD for the first crediting period) comply with all relevant mandatory national and/or sectoral policies applicable at the time of requesting renewal of the crediting period?	Considering new policies explained previously, it can be concluded that the current baseline (used in the registered PDD) complies with the national mandatory requirement.	OK	OK
	<p>If the current baseline does <i>not</i> comply with relevant mandatory national and/or sectoral policies, have the PPs assessed, based on the examination of current practice in the country or region in which the policies apply, whether those policies are systematically not enforced and that non-compliance with those requirements is widespread in the country or region?</p> <p>How was this validated?</p>	Not applicable, as the current baseline complies the mandatory requirement.	OK	OK
	If the current baseline is not in compliance with the relevant mandatory national and/or sectoral policies or if it cannot be shown that the policies are	Not applicable, as the current baseline complies the mandatory requirement.	OK	OK

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	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	systematically not enforced and that non-compliance with those policies is widespread in the country or region, has the PP updated the baseline, as required by the tool?			

Step 1.2: Assess the impact of circumstances

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.2	<p>Have the PPs:</p> <ul style="list-style-type: none"> assessed the impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline emissions (without reassessing the baseline scenario); evaluated whether the conditions used to determine the baseline emissions in the previous crediting period are still valid assessed the availability of new fuels or raw materials and the impact of electricity or fuel prices in the identification of the current practice for the baseline emissions 	<p>PP has re-assessed the baseline according ACM 0006 version 14.0.0 (section B.5 of PDD). As mentions in paragraph 112 of the methodology: for the second and third crediting period for a project activity, the continued validity of the baseline scenario (determined during the first crediting period) shall be assessed by applying the latest version of the tool 11 "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".</p> <ul style="list-style-type: none"> PP has discussed in the PDD(B.5), the step 1.2 tool 11. As previously discusses in 7.3.1 of this report, the circumstances has changed, PDD has not informed of this in PDD. CL1 is raised. CL1 Closed PP has evaluated if condition used to evaluate baseline emissions are still valid, however this depends on previous point. Refer CL01 is closed. PP has evaluated (after CL01) the availability of new technologies (solar and wind power) and the decreasing installation prices. These are the technologies with better expectations in the Chilean market. 	CL1 Closed.	OK
	If the baseline scenario identified in the registered PDD was the continuation of the current practice without any investment, have the PPs undertaken an assessment of the changes in market characteristics on the baseline?	Not Applicable, as the baseline scenario identified in the registered PDD is the construction of a conventional pulp mill without surplus electric power generation capacity (not the continuation of previous practices with no investment).	OK	OK
	If the new circumstances make a continued validity of the current baseline not plausible, then has the PP updated the baseline for the subsequent crediting period?	Not Applicable. Since new circumstances does not affect the current baseline.	OK	OK
	How has this updated			

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	baseline been validated?			

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

This sub-step should only be applied if the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment, and the project proponents or third party (or parties) would undertake an investment later due, for example, to the end of the technical lifetime of the equipment(s) before the end of the crediting period or the availability of a new technology.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.3	<p>Is the baseline scenario in the registered PDD:</p> <ul style="list-style-type: none"> the continuation of use of the current equipment(s) without any investment; <u>and</u> the project proponents or third party (or parties) would undertake an investment later due, for example, to the end of the technical lifetime of the equipment(s) before the end of the crediting period, or the availability of a new technology? <p>If not, then the rest of this step is not applicable.</p>	Not applicable The baseline scenario identified in the registered PDD is the construction of a conventional pulp mill without surplus electric power generation capacity (not the continuation of current equipment with no investment). Greenfield project.	OK	OK
	<p>Have the PPs assessed whether the remaining technical lifetime of the equipment that would have continued to be used in the absence of the project activity exceeds the crediting period for which renewal is requested?</p> <p>How was this validated?</p>	Not applicable as noted above. According to C.1.2 of the registered PDD, the lifetime of the equipment is minimum of 30 years, considered from 14/05/2004.	NA	NA
	<p>If the baseline scenario of the project activity is the continuation of use of the current equipment(s) without any investment and the projects proponents or third party(ies) will undertake an investment later, but before the end of a crediting period, then the current baseline needs to be updated for that crediting period or the crediting of emission</p>	Not applicable	NA	NA

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	<p>reductions should be limited to the period before the baseline equipment would cease its operation.</p> <p>Has this been done in the case of the project?</p>			
	<p>Have the PPs taken into consideration the market penetration of different technologies. Have the PPs evaluated the penetration rate of different technologies that are available in the market and evaluate how they could affect the baseline?</p> <p>How was this validated?</p>	<p>Pending CL1.</p> <p>PDD v5 includes an analysis if the penetration of the new technologies, and this would not affect the baseline of the project. CL1 closed.</p>	CL1 Closed.	OK

Step 1.4: Assessment of the validity of the data and parameters

PPs are required to assess whether data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are still valid or whether they should be updated. Updates should be undertaken in the following cases:

- Where IPCC default values are used, the values should be updated if any new default values have been adopted and published by the IPCC, for example, in guidelines for national GHG inventories, IPCC assessment report or special reports by the IPCC;
- Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and can not be updated because the historical situation does not exist anymore as a result of the CDM project activity.

The validity of the data and parameters is validated in section 7.4 below.

Step 2: Update the current baseline and the data and parameters

Step 2.1: Update the current baseline

The PP is required to update the current baseline emissions for the subsequent crediting period, without reassessing the baseline scenario, based on the latest approved version of the methodology applicable to the project activity. The procedure should be applied in the context of the sectoral policies and circumstances that are applicable at the time of request for renewal of the crediting period.

Step 2.2: Update the data and parameters

If the application of Step 1.4 showed that the data and/or parameter(s) that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, project participants should update all applicable data and parameters, following the guidance in Step 1.4.

3.3 Data and Parameters set Ex-ante

Each parameter required by the methodology and tools for this project is listed and validated in detail as follows:

Parameter required as per meth / tools	Description of parameter (as per meth/ tools)	Include d in revised PDD?	Title & description in revised PDD in line with meth/ tools?	Data unit correctly expressed in revised PDD?	Value needs to be re-assessed ?	Value in revised PDD correct & provides for conservative estimate of Emission Reductions? How was this validated?	Measure ment method correctly described in revised PDD (if applicable)
CAP _{HG,h}	Baseline capacity of heat generator h (GJ/h)	yes	yes	yes	no	<p>This parameter reflects the design maximum heat generation capacity (in GJ/h) of the baseline heat generator h. In the case of this project activity, the applied value is based on plant design data for the baseline scenario:</p> <p>CAP_{HG,h}=364.23 GJ/h=130 ton/h x 2.80178 GJ/ton</p> <p>Where: 130ton/h would be the steam flow (low pressure) that would be generated in baseline scenario according initial energy balance informed in the original PPD (first crediting period) (1), Table 1: Detailed description of the Trupan power plant project activity</p> <p>The applied value for the enthalpy is determined based on thermodynamic conditions of saturated steam (or a very small degree of superheating) generated at predefined operational set points: 250 °C, pressure at 38 bar (a). This conditions are also informed by the initial energy balance used for the original PDD (first crediting period)(1). Entalpy was confirmed for 250C and 38 bar.</p>	yes
LFC _{HG,h}	Baseline load factor of heat generator h (ratio)	yes	yes	yes	CL2	<p>Information was request in order to justify the 0.82 data informed for this parameter.</p> <p>CL2 was raised.</p> <p>The value 0.87 results from the weight average calculation between summer (108 t/h) and winter (117.7 t/h) of steam flow generation (registered PDD of the first crediting period, Table 2) (1). The design steam flow (130 t/h) corresponds for baseline power boiler informed in the registered PDD.</p> <p>$LFC_{HG,h} = [108 \text{ t/h} + 117.7 \text{ t/h} / 2] / 130 \text{ t/h}$</p> <p>Information was corrected and</p>	CL2 closed

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Parameter required as per meth / tools	Description of parameter (as per meth/ tools)	Include d in revised PDD?	Title & description in revised PDD in line with meth/ tools?	Data unit correctly expressed in revised PDD?	Value needs to be re-assessed ?	Value in revised PDD correct & provides for conservative estimate of Emission Reductions? How was this validated?	Measure ment method correctly described in revised PDD (if applicable)
						explained now in the PDD. CL2 closed.	
GWP _{CH4}	Global Warming Potential for CH4.	yes	yes	yes	No	25 tCO ₂ e/tCH ₄ is the GWP according to the last COP/MOP decision	Yes
EF _{BR,n,y}	CH ₄ emission factor for uncontrolled burning of the biomass residues category n during the year y.	yes	yes	yes	No	According to monitoring methodology of ACM0006 v14 measured or default values may be used. PP measured this value and kept it fixed for the entire 2 nd and 3 rd crediting period. Measurements were performed in March 2009 using the methodology developed by Hao et al. [1996] (28) ,as informed in appendix 5 of PDD currently being validated (3). Information results and uncertainty were verified and found correct. Table 3 of ACM 0006 v14 is correctly applied. Industrial biomass 930 +/- 167 (KgCH ₄ /TJ) (according to measurement-refer 28) x 0.94 (table3 ACM 0006)= 874.2 (KgCH ₄ /TJ) 114 +/- 114 (KgCH ₄ /TJ) (according to measurement-refer 28) x 0.82 (table3 ACM 0006)= 93.48(KgCH ₄ /TJ)	Yes
EF _{CH4,BR}	CH ₄ emission factor for the combustion of biomass residues in the project plant (tCH ₄ /GJ)	yes	yes	yes	No	According to the monitoring methodology of ACM0006 v14, default values may be used. Table 4 and Table 5 of the methodology are correctly applied. EF _{CH4,BR} = 30 KgCH ₄ /TJ * 1.37=41,1 KgCH ₄ /TJ.	OK
Non- monitored parameters from Tool 7 "Tool to calculate the emission factor for an electricity system (Version 07.0)"							
EF _{grid,BM,y}	CO ₂ Build Margin emission factor of the grid. Not included in meth/tool	yes	yes	yes	No	This parameter remains fixed second and third crediting period, as per Step 5 of Tool 7. 0.4244 (tCO ₂ /MWh) Found correct.	Yes
EF _{grid OM,y}	Simple adjusted operating margin CO ₂ emission factor in year y. Not included in meth/tool	yes	Yes	Yes	Yes	PP has chosen option (a) paragraph 42. Ex-ante EFom, using 3-year generation-weighted average, based on the most recent data available at the time of re- validation. In previous crediting period PP had chosen ex-post option. This change of option is allowed by AM_CLA_280 (17). Considering that : - the North and Central grid were connected in November	CAR 3 CLosed. OK

CDM-RCPV-FORM

Parameter required as per meth / tools	Description of parameter (as per meth/ tools)	Include d in revised PDD?	Title & description in revised PDD in line with meth/ tools?	Data unit correctly expressed in revised PDD?	Value needs to be re-assessed ?	Value in revised PDD correct & provides for conservative estimate of Emission Reductions? How was this validated?	Measure ment method correctly described in revised PDD (if applicable)
						<p>2017, in a new grid (SEN grid) - North grid was mainly based on fossil fuel, Then, the EFom of the grid connected to the project (Central Grid) will increase from 2018 on. The ex-ante option (2015-2017) is a conservative option.</p> <p>Calculation are in EF Emission Factor 2015, 2016, 2017 xls (18) were verified.</p> <p>PP has chosen Simple adjusted operating margin since the first crediting period. The results of this calculation is the same than Simple margin due to λ. (λ) = 0</p> <p>The grid emissions factor has been calculated ex-ante with information available at the time of PDD submission for renewal of crediting period (2015-2017). This is in line with step 5 of the tool to calculate the EF, paragraph 72 (a).</p> <p><i>CAR 3 is raised. In the spreadsheet; 2015 Emission Factor.xls, Emission factors of each power plant it calculated using the gross electricity generation and not using the net electricity injected to the grid.</i> The rest of the calculation was checked and found correct.</p> <p>PP was decided not to change the calculation using the gross generation (instead of the net generation) as it is a conservative approach.</p> <p>Gross Electricity generation: this has been validated against the CNE records of Energy Supply (grossgeneration.xls https://www.cne.cl/estadisticas/electricidad/) (12) 2015 Gross electricity generation were compared to raw data. No difference were found for 2015. For 2016 and 2017 CAR3 is raised.</p> <p>-2017-2016. When comparing in EF calculation , the gross</p>	

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Parameter required as per meth / tools	Description of parameter (as per meth/ tools)	Include d in revised PDD?	Title & description in revised PDD in line with meth/ tools?	Data unit correctly expressed in revised PDD?	Value needs to be re-assessed ?	Value in revised PDD correct & provides for conservative estimate of Emission Reductions? How was this validated?	Measure ment method correctly described in revised PDD (if applicable)
						<p>electricity generation(Mwh) of non low-cost-must-run plants to raw data: monthly electricity generation.xls (14) and grossgeneration.xls (12) no match were found. Examples: power plants: Guacolda 1,2,3,4,5, Nehuecho, Petropower, Taltal 1 and 2 and many others.</p> <p>PP has corrected the calculation using the correct data for gross generation for 2016 and 2017. Data used was rechecked and no difference were found. CAR 03 is closed.</p> <p>Internal electricity consumption of each plant connected to the grid is obtained as a % of auxiliary consumption Potencia suficiencia.xls. (15) Data obtained for https://www2.coordinador.cl/info/documento/mercados/potencia-de-suficiencia-2/</p> <p>Several factor of internal consumption were compared to raw data for 2015, 2016 and 2017 and no difference were found.</p> <p>Lambda calculations: Data and calculation of lambda were checked. Hourly power generation data were compared to raw data (real dia.xls) (16) https://www2.coordinador.cl/sistema-informacion-publica/portal-de-operaciones/operacion-real/generacion-real-de-las-centrales/ (Cordinador Electrico Nacional , CEN) and no difference were found.</p> <p>EFco2, fossil fuel (tCO2/GJ). It is used the lower limit EF: IPCC default values at the lower limit of the uncertainty at a 95 per cent confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC</p>	

CDM-RCPV-FORM

Parameter required as per meth / tools	Description of parameter (as per meth/ tools)	Include d in revised PDD?	Title & description in revised PDD in line with meth/ tools?	Data unit correctly expressed in revised PDD?	Value needs to be re-assessed ?	Value in revised PDD correct & provides for conservative estimate of Emission Reductions? How was this validated?	Measure ment method correctly described in revised PDD (if applicable)
						<p>Guidelines on National GHG Inventories (27). This is in line to too7, v7, since values provided by the fuel supplier of the power plants and regional or national average default values are not available. Values used for natural gas, diesel, fuel oil, and coal were compared to IPCC and found correct.</p> <p>Weighed average of EF_{om} 2015-2016-2017 was performed: 0.7666 (tCO₂/MWh). This is found correct.</p>	
EF _{grid,CM,y}	CO ₂ emission factor for grid electricity during year y Not included in meth/tool	Yes	Yes	yes	Yes	<p>Calculation of EF_{CM} was calculated using W_{om}=0,25 and W_{bm}=0,75 as per Tool 7 v7 paragraph 87 (b).</p> <p>Pending CAR 3. CAR 03 closed (concerning EF_{om})</p> <p>0.25*0.7666 (tCO₂/MWh)+ 0,75*0.4244 (tCO₂/MWh) =0.5099(tCO₂/MWh). This is found correct.</p>	<p>Pending CAR3</p> <p>CAR 3 is closed.</p> <p>OK</p>
FC _{i,m,y} , FC _{i,k,y}	Amount of fuel type i consumed by power plant/unit m and k in year y.	Yes	Yes	Yes	Yes	<p>Fossil fuel consumption of power plant connected to the grid. Source: FFconsumption.xls (Consumos-de-Combustibles-SEN.xls) (19) public information from Comisión Nacional de Energía https://www.cne.cl/estadisticas/electricidad/. Fossil fuel consumption were compared to raw data, sampling 20 annual consumption (2015-2017) and no difference were found. This data was used to determine EF_{om} and EF_{CM}. As these parameters will remain fixed for the crediting period, this information will not be used again.</p>	Yes
NCV _{i,y}	Net calorific value (energy content) of fuel type i in year y.	Yes	Yes	Yes	Yes	<p>NCV_{i,j} fossil fuel: IPCC default values are used; lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories. This is in line to tool 7 v7 (EF_{grid} tool), since values provided by the fuel supplier not available , and national energy balance are not</p>	yes

CDM-RCPV-FORM

Parameter required as per meth / tools	Description of parameter (as per meth/ tools)	Include d in revised PDD?	Title & description in revised PDD in line with meth/ tools?	Data unit correctly expressed in revised PDD?	Value needs to be re-assessed ?	Value in revised PDD correct & provides for conservative estimate of Emission Reductions? How was this validated?	Measure ment method correctly described in revised PDD (if applicable)
						available since 2013. Values used for natural gas, diesel, fuel oil, and coal were compared to IPCC and found correct.	
Data and parameters not monitored for the Tool “Project and leakage emissions from transportation of freight (Version 01.1.0)”.							
EF CO _{2,f}	Default CO2 emission factor for freight transportation activity f	Yes	Yes	Yes	yes	PP has chosen option B of the Tool 12: Using conservative default values. Light vehicles 245(g CO ₂ /t km) Heavy vehicles 129(g CO ₂ /t km)	Yes

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.4.1	Have the parameters required by the methodology / tools been correctly described in the PDD? Have the values been reassessed, where appropriate, and are the reassessed values valid and applicable?	No. Not all parameters required by the methodology/tools have been correctly described in the PDD. Please refer to CL 02 CAR 03. CL02 and CAR 03 closed. All parameters required by ACM0006 v14 that remain fixed ex ante have been reassessed and found appropriate.	CL2 CAR 03 Closed.	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.2	Has the PP correctly applied all relevant calculations as required by the methodology and associated tools? Does the PDD transparently explain how the procedures provided in the Methodology and applicable Tools are applied by the proposed project activity? (i.e. are the required steps clearly followed?)	Calculation has been verified. CL 02 and CAR 03 has been raised. CL02 and CAR 03 closed. Yes, PP has applied correctly applied relevant calculations and has explained transparently in PDD, according to ACM 0006 v14 and required tools. All steps involved in methodology and tools are clearly explained in PDD (3) and ER calculations (31)	CL02 and CAR 03. Closed	OK
	Where the methodology provides for selection between different options for equations; is every choice of options for calculating project emissions, baseline emissions and leakage offered by the	ACM0006. “Consolidated Methodology: Electricity and heat generation from biomass”. Version 14. Step 1.5: Determine the efficiencies of heat generators, and efficiencies and heat-to-power ratio of heat engines.	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	methodology correctly justified in the context of the project activity and baseline scenario?	<p>Option 1 is taken: Option F in the latest approved version of the "Tool to determine the baseline efficiency of thermal or electric energy generation systems".</p> <p>η(BL,HG,BR,low pressure boiler) Low pressure power boiler 85%</p> <p>Option 2 and 3 are not applicable because they are only applicable to heat engines and heat generators that were operated at the project site prior to the implementation of the CDM project.</p> <p>This has been explained in PDD section B.6.1. Explanation of methodological choices.</p> <p>Step 1.6: Determine the emission factor of on-site electricity generation with fossil fuels. This assessment is not applicable. There is no fossil fuel based power generation identified as part of the baseline scenario.</p> <p>Step 5 :Determine the baseline emissions due to uncontrolled burning or decay of biomass residues.</p> <p>$EF_{BR,n,y}$: PP may undertake measurements of used reference default values. PP participant is using a measured value obtained at the beginning of the 1st crediting period and use during second and third crediting period. Methodology does not state a monitoring frequency for this parameter. A conservative value given in table 3 of the methodology is used as well.</p> <p>This has been explained in PDD section B.6.1. Explanation of methodological choices.</p> <p>Point 5.6.5: determination of $PE_{BR,y}$</p> <p>This parameter is included only if baseline emissions due uncontrolled burning (previous parameter) are also included.</p> <p>$EF_{CH4,BR}$: PP may conduct measurement or used default values. PP has chosen default values as per Table 4 and 5 of the methodology.</p> <p>$EF_{CH4,BR}$: $30 \times 1,37$ (kg CH₄/TJ) = 41.1 (kg CH₄/TJ)</p> <p>This has been explained in PDD section B.6.1. Explanation of methodological choices.</p> <p>Tool to calculate the emission factor for an electricity system</p> <p>Step 3: Select a method to determine the operating margin (OM).</p> <p>PP have chosen an option from paragraph 38 b Simple adjusted OM. This is the option taken since the first crediting period. As $\lambda=0$, for the third crediting period, this values results equal to Simple OM (Option a).</p> <p>According to paragraph 42 of the tool. The simple adjusted OM has the (a)ex-ante or (b)ex-post calculation. PP has chosen (a) ex-ante calculation of EF om and remain fixed for the rest of the crediting period. This is a different option than taken during first and second crediting periods. This change of option is allowed by AM_CLA_280 (17). Considering that :</p> <ul style="list-style-type: none"> - the North and Central grid were connected in November 2017, in a new grid (SEN grid) - North grid was mainly based on fossil fuel (higher EF), - Project was initially connected to the Central Grid. <p>Then, the EFom of the grid connected to the project (Central Grid) will increase from 2018 on.</p>	OK	

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		<p>The ex-ante option (2015-2017) is a conservative option.</p> <p>Step 4: Calculate the operating margin emission factor according to the selected method.</p> <p>PP used:</p> <p>EF_{grid,OM-adj,y}: Option A . Use information based on the net electricity generation and a CO₂ emission factor for each power unit.</p> <p>EF_{EL,m,y}: Option A1. Use information based on fuel consumption and electricity generation for each power unit m.</p> <p>Step 5: Calculate the build margin (BM) emission factor</p> <p>Option 2 is used. EF_{grid,BM,y} calculated ex-ante and remain fixed for the second and third crediting period. For the first crediting period, PP calculated the build margin emission factor ex post (up-dated annually). For the second crediting period, the build margin emission factor was duly updated based on the most recent information available at the time, and remains fixed for third crediting period.</p> <p>Step 6: Calculate the combined margin emission factor. For calculation of EF_{grid,CM,y} - PP uses Option (a), weighted average CM method. In line to options taken during previous crediting periods.</p> <p>Methodological tool “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion” (Version 02)</p> <p>Option B: The CO₂ emission coefficient COEF_{i,y} is calculated based on net calorific value and CO₂ emission factor of the fuel type i, as follows:</p> $\text{COEF}_{i,y} = \text{NCV}_{i,y} \times \text{EF}_{\text{CO}_2,i,y}$ <p>Methodological tool: Project and leakage emissions from transportation of freight, Version 01.1.0</p> <p>Option B: Using conservative default values for EF Emission factor (g CO₂/t km)</p> <p>All options duly explained and justified in section B.6.1 of the PDD.</p>		
	Are the formulae required for the determination of project emissions, baseline emissions and leakage correctly presented in a complete and transparent manner, enabling a complete identification of parameters to be used and / or monitored?	Yes, all equations for determination of emissions reduction, including baseline and project emission are included in Section B.6.1. Leakage emissions are not applicable for this project.	OK	OK
	<p>Are detailed calculations provided in a traceable spreadsheet showing relevant information?</p> <p>Is the table of emission reductions in the PDD (section</p>	<p>Table of emission reduction is consistent with the calculation spreadsheet given. However, it needs to be rechecked after changes concerning CLs and CARs.</p> <p>After CLs and Cars Closed, ERs calculation.xls(31) has been rechecked and found correct.</p>	<p>CLs and CARs</p> <p>Closed</p>	OK

CDM-RCPV-FORM

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	B.6.4) consistent with the calculations?			
	Can the calculation of emission reductions be replicated using the data and parameters supplied in the PDD?	<p>Yes, However, it needs to be rechecked after changes concerning CLs and CARs.</p> <p>After CLs and Cars Closed, ERs calculation.xls(31) has been rechecked and found correct.</p>	CLs and CARs	OK

4 Validation Findings - Monitoring Plan

4.1 Compliance of the monitoring plan with the approved methodology

Completeness of monitoring parameters

The monitoring parameter(s) required by the methodology and applicable tools for this type of project is/are:

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
ACM 0006 v14. "Consolidated methodology: electricity and heat generation from biomass"		
20 Biomass categories and quantities used in the project activity.	Biomass categories and quantities used in the CDM project activity.	<p>1 Sludge onsite production. Fate B5 in baseline. Verified on site: it is transported from the wastewater treatment plant in containers that are measured in cubic meters and duly recorded. PP is initially proposing in the MP to used % solid and density as default values.</p> <p>CL03 is raised in order to justify volume measurement instead of weight measurement as required by ACM0006 v14. PP is asked also to inform in the MP, accuracy of the measurement method.</p> <p>MP in PDD v5, has been reviewed, for sludge measurement a weight meter will be installed. As a conservative approach no ERs will be claimed until the weight meter is installed. MP includes now accuracy of the measurement method. CL03 is closed.</p> <p>12000 (BDt /y) is informed. CL09 is raised in order to justify this value.</p> <p>PP finally decide to used 14.569(BDt /y) for sludge. Manufacturer data is used as there is not measurement in previous period, and a weight meter was not installed at the time of the site visit.</p> <p>Kvaerner handbook of the boiler (26) was checked for load case 5 (page 17 of the file) and 1,57kg/s (page 18) and 70% moisture (page 11). This estimation of found adequate. CL09 is closed.</p> <p>2 Mix of sawdust and bark from on-site industrial operations. Fate B5 in baseline. .</p> <p>CL04 is raised. According to MP, part or the biomass: mix of sawdust and bark from internal industrial operation will be measured in weighbridge, however it was confirmed on site, this parameters is currently measured in volume of the containers. CL04 is raised in order to explain how this biomass will be measured.</p> <p>MP does not need a change in its description. The internal biomass (sawdust and bark) will be measured by weight to meet ACM 0006 v14 requirements. CL04 is closed.</p> <p>Other part of the internal biomass: sander dust from pine only will be transported directly to the power boiler using a closed pipeline due to safety reasons, and it is measured by a proper and calibrated weight meter at the entrance of the power boiler.</p> <p>Please also inform in the MP, accuracy of the measurement method. CL05 is raised. Up dated MP includes accuracy of the measurement.</p> <p>96,217 (BDt /y) is informed. CL09 is raised in order to justify this value. Excel of biomass consumption (25) was revised. This data was monitored during 2013-2014 (last periods verified). Then the 2013-2014 average biomass consumption from internal and external origin (industrial and forestall) is used. An energy balance considering the steam used for Trupan process (the same in baseline and project case) is used to cut off the biomass type 2 and 3 (same origin, different fate in baseline case). CL09 is Closed.</p> <p>3 Mix of sawdust and bark from on-site industrial operations. Fate B1-B3 in baseline</p>

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
		<p>scenario.</p> <p>The biomass corresponding to category 3 will be given by the total measurement of biomass residues (category 2 and category 3) minus the amount of biomass residues of category 2 which will be calculated from the heat demanded by the facility processes using equation 14 of the ACM0006 (Version 14.0).</p> <p>4,332 (BDt /y) is informed and found correct. This data was monitored during 2013-2014 (last period verified). See CL09 closed.</p> <p>4 Mix of sawdust and bark from off-site industrial operations. Fate B1-B3 in baseline scenario.</p> <p>The flow of the mix of sawdust and bark from off-site industrial sites transported by trucks towards the plant will be measured at the entrance of the plant by a weighbridge. This was confirmed on site, also the record system that includes: weight, volume, origin and type of biomass was confirmed on site. MP duly included accuracy, frequency and responsible.</p> <p>109,322 (BDt /y) is informed and found correct. This data was monitored during 2013-2014 (last period verified). See CL09 closed.</p> <p>5 Mix of sawdust and bark from forest operations. Fate B1-B3 in baseline scenario.</p> <p>The same measurement method that 4. Previously described.</p> <p>106,400 (BDt /y) is informed and found correct. This data was monitored during 2013-2014 (last period verified). See CL09 closed.</p>
21 For biomass residues categories for which scenarios B1, B2: or B3: is deemed a plausible baseline alternative, project participants shall demonstrate that this is a realistic and credible alternative scenario	<p>- Quantity of available biomass residues of type n in the region</p> <p>- Quantity of biomass residues of type n that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region</p> <p>- Availability of a surplus of biomass residues type n (which cannot be sold or utilized) at the ultimate supplier to the project and a representative sample of other suppliers in the defined geographical region</p>	<p>Included in Monitoring Plan.</p> <p>According to the monitoring methodology, parameter 21, project participants shall demonstrate, at the time of validation, that biomass residues categories for which scenarios B1, B2 or B3 is deemed a plausible baseline alternatives, is a realistic and credible alternative scenario. This is performed as per Tool 16 Methodological tool: Project and leakage emissions from biomass, v4. Paragraph 42 (e) (i) demonstrate that the total quantity of that type of biomass residues annually available in the project region is at least 25 per cent larger than the quantity of biomass residues which is utilized annually in the project region (e.g. for energy generation or as feedstock), including the project facility.</p> <p>This information was presented during the site visit and included in section B.6.1 of the PDD. PP performed a summary of the quantity of biomass residues available and the quantity of biomass residues are utilized in the region VIII (for industrial biomass residues and forestry biomass residues), however some references and calculation methods are not available at the time of validation or not clearly explained. CL06 Is raised</p> <p>- 2016 and 2017. PP is stating a Consumption of Forestry Operations Biomass residues = 552.980 (m3st/yr). Please inform where this information is sourced. No reference or calculation was presented.</p> <p>PP has submitted the document: Analysis of the current and future consumption situation of forest biomass for generation in Chile (32).</p> <p>Data used are obtained from page 20 (for Region VIII). $620.119 \text{ BDt/yr} / 0.43 \text{ (BDT/ m3st)} = 1.442.137 \text{ m3st/yr}$</p> <p>As there was not found most recent information concerning forest consumption in the region. This 2014 value was applied for 2016 and 2017.</p> <p>Considering that the most available biomass residues in the region is the industrial biomass (sawdust and bark), and the forest biomass residues is more costly and operationally more</p>

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
		<p>difficult to extract, this balance is considered suitable.</p> <p>Forest biomass residues used in Trupan power plant comes from it owns forest in the region. CL06 is closed.</p> <p>-For industrial residues generation, some Arauco internal data were used and referred and public statistical information from INFOR is used (Instituto Nacional Forestal, Forestry National Institute). Some sampling was performed and no error were found.</p> <p>-Anuario del aserrio 2018 (Sawmill Yearbook 2018) (20): (https://wef.infor.cl/publicaciones/publicaciones.php#P1) containing forestry production and residues generation information for 2017 and 2016. Some sampling was performed and no error were found.</p> <p>- Estadísticas forestales 2006 (Forestry statistics 2006) (21): residues factors, efficiencies and other factors for different kind of wood industry. More recent data is not available as a public information. Some sampling was performed and no error were found.</p> <p>For forest residues is was more difficult to find yearly information, then data from 2014-2016 was used for calculation 2016-2017. Calculation were performed in Index biomass surplus Trupan 2017 and 2016.xls. (22) calculation were checked and demonstration that the total quantity of that type of biomass residues annually available in the project region is at least 25 per cent larger than the quantity of biomass residues which is utilized annually in the project region.</p>
22 BR _{PJ,n,y}	<p>Quantity of biomass of category n used in the CDM project activity in year y (tonnes on dry-basis).</p> <p>Description not in line with the monitoring methodology. CL07</p>	Same as described in parameter 20 "Biomass categories and quantities used in the project activity"
23 BR _{B1/B3,n,y}	<p>Quantity of biomass residues of category n used in the CDM project activity in year y for which the baseline scenario is B1 or B3 (tonnes on dry-basis).</p> <p>Description not in line with the monitoring methodology. CI 07</p>	Same as described in parameter 20 "Biomass categories and quantities used in the project activity"
24 BR _{B4,n,y}	Quantity of biomass residues of category n used in the CDM project activity in	<p>0 tonnes</p> <p>It is not foreseen that these biomass residues types will be used in the project activity in the future. However, the Project Participant will include this parameter in the monitoring plan, in</p>

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
	<p>year y for which the baseline scenario is B4 (tonne4 on dry-basis)</p> <p>Description not in line with the monitoring methodology. CI 07</p>	case the situation changes in the future.
25 BR _{B5,n,y}	<p>Quantity of biomass residues of category n used in the CDM project activity in year y for which the baseline scenario is B5 (tonne on dry-basis)</p> <p>Description not in line with the monitoring methodology. CL07</p>	Same as described in parameter 20 "Biomass categories and quantities used in the project activity"
26 EF _{BR,n,y}	CH ₄ emission factor for uncontrolled burning of the biomass residues category n during the year y (tCH ₄ /GJ)	Required by the monitoring methodology, not included in B.7.1 however included in B.6.2. PP has conducted measurement prior to 2 nd crediting period and the value remains fixed for the crediting period.
27 EF _{FF,y,F}	CO ₂ emission factor for fossil fuel type f in year y (t CO ₂ /GJ)	<p>Not included in the MP as stated in ACM0006. It is included in the MP as stated in:</p> <ul style="list-style-type: none"> Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion. Upper limit of the IPCC is used.
28 EF _{CH₄,BR}	CH ₄ emission factor for the combustion of biomass residues in the project plant (tCH ₄ /GJ)	Monitoring methodology allows the default values or measured data using. PP is using default values, and includes this parameter in B.6.2., not in B.7.1.
29 EF _{CO₂,LE}	CO ₂ emission factor of the most carbon intensive fossil fuel used in the country (t CO ₂ /GJ)	Not applicable, as LE = 0

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
30 HC _{BL,y}	Baseline process heat generation in year y (GJ)	<p>Correctly included in the MP. Accuracy and frequency is well described in line to ACM 0006), however, responsible of the measurement is not determined. CL05 is raised.</p> <p>Data used is obtained from verified data 2011-2014, from previous monitoring report. This parameter is obtained as the difference of the enthalpy of the process heat supplied to process heat loads in the project activity minus the enthalpy of the feed-water, the boiler blow-down and any condensate return to the heat generator.</p> <p>Enthalpies were confirmed through steam tables using temperature and pressure and found correct. 1,798,198 GJ/yr.</p>
31 EL _{PJ,gross,y}	Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y (MWh)	<p>Correctly included in the MP. Accuracy and frequency is well described (in line to ACM 0006), however, responsible of the measurement is not determined. CL05 is raised. Responsible was included in final version of MP. CL05 closed.</p> <p>EL_{PJ,gross,y} =217,147(MWh) is used. Data obtained from previous verified monitoring reports.</p> <p>2011: 226,205MWh 2012: 218,151 (MWh) 2013: 211,921 (MWh) 2014: 212,309 (MWh) Average: 217,147 (MWh)</p>
32 EL _{PJ,imp,y}	Project electricity imports from the grid in year y (MWh)	<p>Correctly included in the MP. Accuracy and frequency is well described in line to ACM 0006), however, responsible of the measurement is not determined. CL05 is raised. Responsible was included in final version of MP. CL05 closed.</p> <p>For this parameter the energy import from the grid to the power plant and for Trupan process is used. This was confirmed through record during the site visit. However, this parameters is used for Baseline emission according equation 3 of the Methodology 0006 and for Project emission as equation 34, then this value cancel itself when calculating emission reduction. ER= BE-PE.</p> <p>70,501 (MWh) data monitored 2017-2018 verified on site.</p>
33 EL _{PJ,aux,y}	Total auxiliary electricity consumption required for the operation of the power plants at the project site in year y (MWh)	<p>Correctly included in the MP. Frequency and accuracy level defined and in line with ACM 0006. Accuracy and frequency is well described, however, responsible of the measurement is not determined. CL05 is raised. Responsible was included in final version of MP. CL05 closed.</p> <p>Data used 35,632 (MWh/yr) was obtained from previous verified monitoring reports: 2011: 35,586(MWh) 2012: 35,174(MWh) 2013: 35,668(MWh) 2014: 36,100(MWh). Average: 35,632 (MWh) Data was found correct.</p>
34 NCV _{BR,n,y}	Net calorific value of biomass residue of category n in year y (GJ/tonne on dry-basis)	<p>The methodology ACM 0006 includes this as a parameter not monitored (parameter 17) and also as a parameter monitored (parameter 34), indicating this parameter may be measured or based on default values in a conservative manner.</p> <p>MP define six months monitoring, taking at least three samples for each measurement in reputed laboratory. The monitoring methodology proposed by the PP, is therefore considered to be suitable.</p> <p>Accuracy of the measurement method and responsible not defined in MP. See CL05 Closed. Accuracy and responsible are now defined.</p>

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)									
		<p>NCV_{BR,n,y} (GJ/tonne of dry matter)</p> <table> <tr> <td>Sludge from industrial operations.</td><td>22.70</td><td>Data confirmed on site visit. Several samples sent to accredited laboratory. Universidad de Concepción Laboratory report. 2016 (23)</td></tr> <tr> <td>Mix of sawdust and bark from industrial operations.</td><td>18.55</td><td>Confirmed. Average of data from previous monitoring report 2011-2014</td></tr> <tr> <td>Mix of sawdust and bark from forest operations.</td><td>17.3</td><td>Confirmed. Average of data from previous monitoring report 2011-2014</td></tr> </table>	Sludge from industrial operations.	22.70	Data confirmed on site visit. Several samples sent to accredited laboratory. Universidad de Concepción Laboratory report. 2016 (23)	Mix of sawdust and bark from industrial operations.	18.55	Confirmed. Average of data from previous monitoring report 2011-2014	Mix of sawdust and bark from forest operations.	17.3	Confirmed. Average of data from previous monitoring report 2011-2014
Sludge from industrial operations.	22.70	Data confirmed on site visit. Several samples sent to accredited laboratory. Universidad de Concepción Laboratory report. 2016 (23)									
Mix of sawdust and bark from industrial operations.	18.55	Confirmed. Average of data from previous monitoring report 2011-2014									
Mix of sawdust and bark from forest operations.	17.3	Confirmed. Average of data from previous monitoring report 2011-2014									
Tool 12. Methodological tool: Project and leakage emissions from transportation of freight. Version 01.1.0											
<i>Df,m</i>	<p>Return trip distance between the origin and destination of freight transportation activity <i>f</i> in monitoring period <i>m</i> (Kilometre)</p> <p>Description not in line with the monitoring tool. CL07 Closed. Description in line with tool.</p>	<p>PP will monitor this through road maps. Methodological tool: Project and leakage emissions from transportation of freight, states once for each freight transportation activity <i>f</i> for a reference trip using the vehicle odometer or any other appropriate sources (e.g. on-line sources) (to be updated whenever the distance changes). Road maps is considered suitable for monitoring round trip distances. MP is stated as per tool 12</p> <p>Accuracy and responsible of the measurement is not determined. See CL05 Closed. Accuracy and responsible are now defined.</p> <p>PP has used the lineal distances instead of road distance, according to www.distanciasentreciudades.com and google maps. Also PP is requested to inform vintage period used for the ex-ante calculation of <i>Df,m</i>. CAR 04 is raised.</p> <p>To obtain this parameter a year 2015-2016 data was used according document and calculation presented in biomass supply. XIs (24). Road distances are used for this parameter. PDD and calculation was updated. CAR 04 is closed.</p> <p>67,4 km weightheted average (24b).</p>									
<i>FRf,m</i>	Total mass of freight transported in freight transportation activity <i>f</i> in monitoring period <i>m</i> .	<p>Data will measure in a weight scale each entrance by the PP. Accuracy, frequency and responsible defined in monitoring plan, parameter 20 (external biomass). However, units are wet tonnes and parameter 20's units are dry tonnes.</p> <p>Data used for ex-ante estimations is 523,595 t (24b).</p>									
"Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", Version 03.											
<p>FC_{i,j,y}</p> <p>FC_{i,1,project site,y}</p> <p>Project site</p> <p>Parameter name not as</p>	<p>Quantity of fuel type <i>i</i> combusted in process <i>j</i> during the year <i>y</i></p> <p>Description does not identify what <i>j</i> process is</p>	<p>This parameter is divided in 2 parameters: where process <i>j</i> are:</p> <ul style="list-style-type: none"> - Project site: <ul style="list-style-type: none"> o Forestry operation: subcontractors that process the biomass residues from forest operations consumed in the project activity o On-site transportation of the biomass : Fossil fuel used in loaders and 									

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)																		
per tool03. CL07. CL07 closed.	included in this parameter. CL07. CL07 closed. Description and name corrected.	<p>trucks or from subcontractor's transportation of biomass at the project site.</p> <p>- Project plant: fossil fuel consumed by the power plant.</p> <p>For the first parameter, forestry operation: Monitoring procedures and frequency (continuously monitored) meets "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" requirements.</p> <p>Responsible not defined. See CL05 Closed. Accuracy level not defined as it is measured by a third part.</p> <p>396 (ton/yr) of diesel (472.000 (l) x 0,84 ton/l) is informed</p> <p>Data comes from period verified 2011-2014 and 2015-2016 verified on site. 2011: 368,356 (l). 2012: 35,531 (l). 2013: 634.083 (l). 2014: 682.421 (l). 2015: 601.166 (l). 2016: 536.187 (l). Average: 476.291 (l), Considering this is an estimation, and data is to be monitored ex-post, this value was found correct.</p> <p>On site transportation: Fossil fuel used in loaders and trucks or from subcontractor's transportation of biomass at the project site. Monitoring procedures (continuously monitored) and frequency meets "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" requirements.</p> <p>265,345 (lt/yr) of diesel is used.</p> <p>Data comes from previous verified monitoring periods 2011-2014 and 2015-2016 verified on site.</p> <p>2011: 93.054 (l). 2012: 80.661 (l). 2013: 258.322 (l). 2014: 268.378 (l). 2015: 275.443 (l). 2016: 265.255 (l).</p> <p>Considering this is an estimation, and data is to be monitored ex-post, this value was found correct.</p>																		
FCi,j,y FCi,project plant,y Project plant	Quantity of fuel type i combusted in process j during the year y Description does not identify what j process is included in this parameter. CL07	<p>For the second parameter, project plant: fossil fuel consumed by the power plant. Monitoring procedures and frequency (continuously monitored) meets "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" requirements.</p> <p>Accuracy level and responsible not defined CL05 is raised. Accuracy and responsible defined. CL05 closed.</p> <p>151,321 (l/y) equivalent to 127 (ton/y) of diesel is used.</p> <p>2,500 (l/y) equivalent to 1.375 (ton/y) of LPG is used.</p> <p>Data comes from previous verified monitoring periods 2011-2014</p> <table><tr><td></td><td>2011</td><td>2012</td><td>2013</td><td>2014</td><td>Average</td></tr><tr><td>Diesel (l)</td><td>156.086</td><td>128.584</td><td>170.907</td><td>150.025</td><td>151.401</td></tr><tr><td>LPG (l)</td><td>2.014</td><td>2.854</td><td>3.840</td><td>1.206</td><td>2.479</td></tr></table> <p>Considering this is an estimation, and data is to be monitored ex-post, this value was</p>		2011	2012	2013	2014	Average	Diesel (l)	156.086	128.584	170.907	150.025	151.401	LPG (l)	2.014	2.854	3.840	1.206	2.479
	2011	2012	2013	2014	Average															
Diesel (l)	156.086	128.584	170.907	150.025	151.401															
LPG (l)	2.014	2.854	3.840	1.206	2.479															

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)									
		found correct.									
pi,y	Weighted average of density of fuel type i in year y.	<p>Values applies are:</p> <p>0.84(kg/lt) for Diesel. 0.95(kg/lt) for Fuel Oil 550 (kg/m3) for Natural Gas. 0.65(kg/lt) for LPG</p> <p>Using National Energy Commission, energy balance 2012 (last available), and verified to be correct.</p> <p>As data provided by the supplier are not available option c) is used (parameter 3 of tool 03) (5).</p>									
NCV _{i,y}	<p>Weight average net calorific value of fuel type i in year y.</p> <p>Description not as per tool03. CL07 raised and closed.</p>	<p>Included: Option d) IPCC default values at the upper limit will be used. (Option a) is not available). IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories (27).</p> <p>43.3 (GJ/ton) for diesel. 41.7 (GJ/ton) for fuel oil. 52.2 (GJ/ton) for LPG.</p>									
EF _{CO2,i,y}	<p>Weighted average CO2 emission factor of fuel type i in year y.</p> <p>Description not as per tool03. CL07</p>	<p>Option a) is not available; supplier does not provide the EF of the fuel. PP is taking option d). IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories, and it will be up-dated in case of changes. This is defined according options given in tool 3 (27).</p> <p>0.0748 (tCO2/GJ) for Diesel. =74 800 (kg/TJ) 0.0788 (tCO2/GJ) for Fuel Oil.= 78 800 (kg/TJ) 0.0656 (tCO2/GJ) for LPG = 65 600 (kg/TJ)</p> <p>This is found correct.</p>									
Tool 16. Project and leakage emissions from biomass. Version 04.0.											
Moisture content of the biomass residues	Moisture content of each biomass residues type n. (% Water content in mass basis in wet biomass residues)	<p>Monitoring procedures and frequency meets "Project and leakage emissions from Biomass". Responsible not defined. CL05 is raised. Responsible defined in updated MP. CL05 is Closed.</p> <p>Monitoring methodology stated to measured %moisture each batch, and MP stated accordingly. However it was verified on site that this activity has not been performed as described. Some of the % moisture biomass are monitored several times a weeks, others are not being monitored or are measured as a mix but not separated as a biomass type n. (for example: biomass from internal operation: moisture is measured as a mix of sludge and sawdust and bark). Please inform how water content will be measured for each type of biomass. CL08 is raised.</p> <p>No change is MP is required. PP will follow the requirements of Tool 16 v4 "Project and leakage emissions from Biomass". MP is in line to required tool. CL08 Closed.</p> <p>Data informed in the MP are:</p> <table border="1"> <thead> <tr> <th>Biomass residues category n</th><th>Biomass residues type</th><th>Moisture content (% of water in wet biomass residues)</th></tr> </thead> <tbody> <tr> <td>1</td><td>Sludge from on-site industrial operations.</td><td>(60-85) %</td></tr> <tr> <td>2</td><td>Mix of sawdust and bark from on-site industrial operations.</td><td>(42-65)%</td></tr> </tbody> </table>	Biomass residues category n	Biomass residues type	Moisture content (% of water in wet biomass residues)	1	Sludge from on-site industrial operations.	(60-85) %	2	Mix of sawdust and bark from on-site industrial operations.	(42-65)%
Biomass residues category n	Biomass residues type	Moisture content (% of water in wet biomass residues)									
1	Sludge from on-site industrial operations.	(60-85) %									
2	Mix of sawdust and bark from on-site industrial operations.	(42-65)%									

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)		
		3	Mix of sawdust and bark from on-site industrial operations.	(42-65)%
		4	Mix of sawdust and bark from off-site industrial operations.	(44-65)%
		5	Mix of sawdust and bark from forest operations.	(52-65)%
		Data confirmed during the site visit as a general range. Considering winter and summer seasons.		
		In ex-ante ER calculation the following data are used:		
		Biomass residues category n	Biomass residues type	Moisture content (% of water in wet biomass residues)
		1	Sludge from on-site industrial operations.	72,5%
		2	Mix of sawdust and bark from on-site industrial operations.	55,0%
		3	Mix of sawdust and bark from on-site industrial operations.	55,0%
		4	Mix of sawdust and bark from off-site industrial operations.	57,5%
		5	Mix of sawdust and bark from forest operations.	60,0%
		Considering this is an estimation, and data is to be monitored ex-post, this value was found correct.		

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.1.1	Are all required parameters (according to the methodology and tools) included in the monitoring plan?	No. All required parameters are included.	OK	OK

Compliance of monitoring

Monitored Parameters	Parameter Names						
	Biomass categories and quantities used in the CDM project activity.	For biomass residues categories for which scenarios B1, B2 or B3 is deemed a plausible baseline alternative, project participants shall demonstrate that this is a realistic and credible alternative scenario.	BR _{PJ,n,y}	BR _{B1/B3,n,y}	BR _{B4,n,y}	BR _{B5,n,y}	EF _{CO2,LE}
Parameter Title correct?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Description in line with methodology/tool?	Yes	Yes	CL07 Closed. Yes	CL07 Closed. Yes	CL07 Closed. Yes	CL07 Closed. Yes	Yes

Monitored Parameters	Parameter Names						
	Biomass categories and quantities used in the CDM project activity.	For biomass residues categories for which scenarios B1, B2 or B3 is deemed a plausible baseline alternative, project participants shall demonstrate that this is a realistic and credible alternative scenario.	BR _{PJ,n,y}	BR _{B1/B3,n,y}	BR _{B4,n,y}	BR _{B5,n,y}	EF _{CO2,LE}
Data unit correctly expressed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source clearly referenced?	CL03 CL04 Closed.	CL06 Closed.	Yes	Yes	Yes	CL03 CL04 Closed.	Yes
Correct value provided for ex ante estimation?	CL09 Closed. yes	CL06 Closed.	CL09 Closed.	CL09 Closed.	Yes	CL09 Closed.	Yes
How has this value been verified?	CL09 Closed. Manufacturer data (26) and monitored data.	Calculation verified and documentation referenced.	CL09 Closed. Manufacturer data (26) and monitored data.	CL09 Closed. Manufacturer data (26) and monitored data.	0	CL09 Closed. Manufacturer data (26) and monitored data.	0
Measurement method correctly described?	CL03 CL04. Closed. Yes	Yes	Yes	Yes	Yes	CL03 CL04. Closed. Yes	Yes
Measurement and recording frequency correctly described?	CL03 CL04. Closed. Yes	Yes	Yes	Yes	Yes	CL03 CL04. Closed. Yes	Yes
Correct reference to standards?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indication of accuracy provided?	CL05 Closed. Yes.	NA	CL05 Closed. Yes	CL05 Closed. Yes	Yes	CL05 Closed. Yes	Yes
QA/QC procedures described?	Yes	NA	Yes	Yes	NA	Yes	NA
QA/QC procedures appropriate/in line with methodology/tool?	Yes	NA	Yes	Yes	NA	Yes	NA

Monitored Parameters	Parameter Names						
	HC _{BL,y}	EL _{PJ,gross,y}	EL _{PJ,imp,y}	EL _{PJ,aux,y}	NCV _{BR,n,y}	FR _{t,m}	D _{t,m}
Parameter Title correct?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Monitored Parameters	Parameter Names						
	HC _{BL,y}	EL _{PJ,gross,y}	EL _{PJ,imp,y}	EL _{PJ,aux,y}	NCV _{BR,n,y}	FR _{r,m}	D _{r,m}
Description in line with methodology/tool?	Yes	Yes	Yes	Yes	Yes	Yes	CL07 Closed. Yes
Data unit correctly expressed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source clearly referenced?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Correct value provided for ex ante estimation?	Yes	Yes	Yes	Yes	Yes	Yes	CAR4 Closed. Yes
How has this value been verified?	Previous monitoring data were verified. 2011-2014	Previous monitoring data were verified. 2011-2014	Data 2017-2018 verified on site.	Previous monitoring data were verified. 2011-2014	Previous monitoring data were verified. 2011-2014. For sludge lab reports were verified.	As per parameter 20	CAR4 Closed. Road distance was confirmed by google maps.
Measurement method correctly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Measurement and recording frequency correctly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Correct reference to standards?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indication of accuracy provided?	Yes	Yes	Yes	Yes	CL05 Closed. Yes	CL05 Closed. Yes	CL05 Closed. Yes
QA/QC procedures described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
QA/QC procedures appropriate/in line with methodology/tool?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Monitored Parameters	Parameter Names						
	FC _{i,Forest,y}	FC _{i,project site,y}	FC _{i,project plant,y}	pi,y	NCV _{i,y}	EF _{CO2,i,y}	Moisture content of the biomass residues
Parameter Title correct?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Monitored Parameters	Parameter Names						
	FC _{i,Forest,y}	FC _{i,project site,y}	FC _{i,project plant,y}	pi,y	NCV _{i,y}	EF _{CO2,i,y}	Moisture content of the biomass residues
Description in line with methodology/tool?	CL07 Closed. Yes	CL07 Closed. Yes	CL07 Closed. Yes	Yes	CL07 Closed. Yes	CL07 Closed. Yes	Yes
Data unit correctly expressed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source clearly referenced?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Correct value provided for ex ante estimation?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
How has this value been verified?	Previous monitoring data were verified. 2011-2014	2016 is used.	Previous monitoring data were verified. 2011-2014	BNE.xls(36) National data	Upper limiting IPCC values was verified. table 1.2	Upper limiting IPCC values was verified. table 1.2	Range for different season was verified on site.
Measurement method correctly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Measurement and recording frequency correctly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Correct reference to standards?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indication of accuracy provided?	CL05 Closed. Yes	CL05 Closed. Yes	CL05 Closed. Yes	Yes	Yes	Yes	Yes
QA/QC procedures described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
QA/QC procedures appropriate/in line with methodology/tool?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.1.2	Are all required parameters appropriately monitored in accordance with the methodology/tools?	No. Refer CLs and CARs raised in previous section. CLs and CAR closed. All parameters required by ACM 0006 v14 and required tools are duly included in the monitoring plan.	CARs and CLs raised in previous section. CLs and CARs closed.	OK

4.2 Implementation of the monitoring plan

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.2.1	<p>Are the arrangements described in the plan feasible and practical within the project design? Please consider:</p> <p>(a) operational and management structure, including responsibilities</p> <p>(b) Plans for maintenance and calibration of equipment</p> <p>(c) Plans for QA/QC of equipment and data</p> <p>(d) Installation of monitoring equipment (whether in place, or planned)</p>	<p>a) Operational and management structure is in place and in line with description made in the PDD and as seen on site. Some responsible not clearly defined in the monitoring plan. CL05 Closed. Responsibilities of the monitoring plan defined.</p> <p>b) Plans for maintenance and calibration of equipment is part of the current practice of the project operator.</p> <p>c) Plans for QA/QC are consistent with applicable methodology and tool.</p> <p>d) Not all monitoring equipment are currently in place or planned. Also there are some measurement that were not implemented on site.</p> <ul style="list-style-type: none"> CL03: for sludge density and %solid measurement. CL03 closed. A weight meter will be installed. CERs from this biomass not measured will not be included in the calculations. CL04: for Internal biomass (onsite operational residues) measurement. CL04 closed. This biomass will be measured by weight bridges. CL08: for Moisture measurement. CL08 closed. Biomass moisture will be measured as requires by the MP and tool 16 "Project and leakage emissions from biomass" (11) 	CL 03, 04, 05, 08. Closed.	OK

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN) and version 02.0 of the “CDM project cycle procedure for project activities” (CDM-EB93-A06-PROC);• Make editorial improvements.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Renewal of crediting period
Keywords: crediting period, project activities, validation report