VERIFICATION REPORT VIÑALES BIOMASS POWER PLANT

Document Prepared By Earthood Services Private Limited

Project Title	*Viñales biomass power plant*
Version	*2*
Report ID	*VCS.VER.21.134*

Report Title	*Verification Report – Viñales biomass power plant*
Client	*Maderas S.A.*
Pages	*101*
Date of Issue	*29-Apr-2024*
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Summary:

Brief summary of the project activity

"Viñales biomass power plant" is a project activity that consists in the installation of a 41 MW condensing-extracting turbo generator machine and of a biomass fluidized-bed boiler of 210 ton/hr of high pressure steam capacity. The new boiler replaces a smaller capacity (heat only) boiler and also generates electricity to feed the Viñales Sawmill and its electricity surplus is fed into the Chilean National Grid (SEN).

The project activity will achieve emission reductions by generating clean energy to the Vinãles Plant and to the Grid by burning biomass (industrial woody residues) in this cogeneration power plant and by avoiding methane emission due to biomass disposal.

The project applies the CDM approved methodology ACM0006 – Consolidated methodology for electricity and heat generation from biomass --- Version 12.1.1.

The project is located inside the Viñales Sawmil, located in Comune of Constitución, Maule Region, Chile.

The commissioning date was on July/2012 but the start of project activity was on 01/07/2014.

Scope of verification

Maderas S.A. has contracted ESPL to conduct the 3rd verification of the project "Viñales biomass power plant" for the period from 01/01/2017 to 31/12/2020 (both days included).

The scope of the verification is to establish/verify that:

- the valid version of MR template was used and correctly filled up (v.4.2);
- the project activity has been implemented and operated as per the registered PD and that all physical features (technology and monitoring equipment) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable requirements of the VCS Version 4;

- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and approved methodology;
- the data are recorded and stored as per the monitoring methodology.

This project does not refer to a grouped project and therefore, there are no new instances to be included at the present monitoring period.

Conclusion

ESPL has performed the verification of the VCS project "Viñales biomass power plant", with VCS Project ID 1186, for the monitoring period from 01/01/2017 to 31/12/2020 (both days included).

During the present VCS verification, 03 CL and 04 CARs were raised and successfully closed.

The verification team has confirmed the implementation of the project as per description in the VCS-PD, the monitoring plan of the PD and the application of the monitoring methodology (ACM0006 v.12.1.1). In addition, it was confirmed that the monitoring system is in place and the emission reductions are calculated without material misstatements.

The verified emission reductions amount to **823,322** tCO2e in the above-mentioned monitoring period.

1 INTRODUCTION

1.1 Objective

Maderas S.A. has contracted ESPL to conduct the 3rd verification of the project "Viñales biomass power plant" for the period from 01/01/2017 to 31/12/2020 (both days included) according to the requirements of the Verified Carbon Standard Version 4.5.

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- the project activity has been implemented and operated as per the registered PD and that all physical features (technology, project equipment and monitoring and metering equipment) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable VCS Version 4 requirements;
- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- the data are recorded and stored as per the monitoring methodology.

The verification of this monitoring period is based on the registered VCS-PD, MR and GHG emission reduction calculation spreadsheet and supporting documents.

1.3 Level of Assurance

The verification of this monitoring period has achieved a reasonable level of assurance. Also the materiality threshold of 5% has been achieved as per VCS Standard paragraph 4.18 from project scales (achieving less than 300,000 tCO2e/year. This materiality has been achieved as no sampling has been carried out. All information were provided and duly checked by the verification team as follows.

The verification team has identified the impact of errors observed and those were corrected by PP during verification for all monitoring parameter at individual level. The extrapolation is not applicable as 100% of data was checked.

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data (Total) Total (100%)	Sample selected for verification Sample (100%)	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
Biomass residues categories and quantities used in the project activity. For biomass residues categories for which scenarios B1: B2: or B3: is deemed a plausible baseline alternative, project participants shall demonstrate that is a realistic and credible alternative scenario	Monthly and Yearly aggregated from continuous monitoring (every load entry)	100%	100%	N/A	Impact in data	Same impact as no sampling was conducted

$BRPJ,n,y$, $BRB4,n,y$, $BRB1/B3,n,y$						
$EF_{FF,y,f}$	IPCC default	1 (100%)	100%	N/A	Impact in data	Same impact as no sampling was conducted
$EF_{CH4,BR}$	Applied methodology	1 (100%)	100%	N/A	Impact in data	Same impact as no sampling was conducted
$EF_{CO2,LF,i}$	Not applicable	N/A	N/A	N/A	N/A	N/A
$HC_{BL,y}$	Monthly and Yearly aggregated from continuous monitoring (every load entry)	100%	100%	CL 03	Impact in data	Same impact as no sampling was conducted
$EL_{PJ,gross}$, $EL_{PJ,imp}$, $EL_{PJ,aux}$	Monthly and Yearly aggregated from continuous monitoring	100%	100%	CL 03	Impact in data	Same impact as no sampling was conducted
NCV_{BR}	Aggregated every six months	100%	100%	CL 03 CAR 02	Impact in data	Same impact as no sampling was conducted
Moisture Content of the biomass residues	Monthly and Yearly aggregated from continuous monitoring	100%	100%	CAR 02	No impact	No impact

	(every load entry following internal procedure)					
Py	Yearly values obtained from sawmill	100%	100%	N/A	No impact	No impact
LOC_y	Monthly and Yearly aggregated from continuous monitoring	100%	100%	N/A	No impact	No impact
$FC_{i,y:}$	Monthly and Yearly aggregated from continuous monitoring, calculated or provided by service suppliers	100%	100%	CAR 03	Impact in data	Same impact as no sampling was conducted
NCV_i	IPCC default values applied	100%	100%	N/A	No impact	No impact
$EF_{CO2,i}$	IPCC default values applied	100%	100%	N/A	No impact	No impact
Parameters related to transport of biomass ($Df_{,m}$, $FR_{f,m,}$)	Monthly and Yearly aggregated from continuous monitoring (every load entry)	100%	100%	N/A	Impact in data	Same impact as no sampling was conducted

EF_{grid} (it includes all param. used for calculating EF_{grid} – $FC_{i,m,y}$, $FC_{i,k,y}$, $NCV_{i,y}$ $EF_{CO2,i,y}$; $EF_{CO2,m,i,y}$; $EG_{m,y}$, $EG_{k,y}$, $EF_{CO2,LE}$)	Monitored once a year	100%	100%	CAR 01	No impact	No impact

Based on the above table it can be confirmed that the materiality threshold -is not reached for the registered PA as per VCS Standard.

1.4 Summary Description of the Project

"Viñales biomass power plant" is a project activity that consists in the installation of a 41 MW condensing-extracting turbo generator machine and of a biomass fluidized-bed boiler of 210 ton/hr of high pressure steam capacity. The new boiler replaces a smaller capacity (heat only) boiler and also generates electricity to feed the Viñales Sawmill and its electricity surplus is fed into the Chilean National Grid (SEN).

The characteristics of the installed boiler and generator are as follows/08/:

Table 1: Technical description of generator

Characteristic	**Unit**	**value**
Manufacturer	-	Brush HMA b.v.
Type	-	Syncronous Generator
Serial number	-	410135
Output	KVA	51,000
Cos phi	-	0.8
Type	-	DG215ZP-04
Speed	Rpm	1500

Table 2: Technical description of Biomass Boiler

Characteristic	**Unit**	**value**
Manufacturer	-	Metso Power Oy

Type	-	Fluidized bed boiler
Serial number	-	110060
Maximum work pressure	Kg/cm²	104
Heating surface	M²	8,290

The project activity will achieve emission reductions by generating clean energy to the Vinãles Plant and to the Grid by burning biomass (industrial woody residues) in this cogeneration power plant and by avoiding methane emission due to biomass disposal.

The project is listed at VCS and can be accessed by the following link: https://registry.verra.org/app/projectDetail/VCS/1186

- Project proponent and other entities involved in the project: the project proponent is Celulosa Arauco y Constitución S.A. The entity who signed Verification Contract is Maderas S.A. Arauco Bioenergia S.A is responsible for describing the MR and ER calculations
- Project Category: Renewable energy generation from biomass grid-connected
- Methodology: ACM0006 – Consolidated methodology for electricity and heat generation from biomass --- Version 12.1.1
- Operation Start Date: July 2012
- Crediting Period: from 01/07/2014 to 30/06/2024 – 10 years – renewable;
- Project scale and Estimated GHG emission reductions: the PA is defined as a Project (< 300,000 tCO_2e/y).
- Project Location PA: located inside the Viñales Sawmil, located in Comune of Constitución, Maule Region, Chile. Coordinates the plant is/24/:

Latitude	Longitude
35.371° S	72.412° W

- Conditions prior to project initiation: The project is a greenfield power plant and prior to the project installation the electricity would be generated by Power Plants connected to the National Grid and biomass not consumed would be either left to decay in aerobic conditions or would be burned in piles.
- Project compliance with applicable laws, statutes and other regulatory frameworks: The project currently operating as per registered VCS-PD/03/. The compliance with the applicable laws and regulations can be evidenced through Environmental License issued by RCA 80/2009/08/

- Ownership and other programs: Celulosa Arauco y Constitución S.A is the project owner. The ownership is confirmed through RCA 80/2009/09/. In addition, the GHG emission reductions generated by the project have not been included in any emissions trading program or any other mechanism that includes GHG allowance trading. Moreover, the project has not received nor sought any other form of environmental credit, and neither has become eligible to do so since validation or previous verification. Finally, the project has not participated nor been rejected under any other GHG programs.
- Eligibility criteria for grouped projects: this project does not correspond to grouped project, thus this section is not applicable
- Leakage management for AFOLU projects: this project is not an AFOLU project, thus, the leakage management is not applicable. The applied methodology does not make reference to AFOLU projects.
- Commercially sensitive information: the commercial information has not been excluded from the documents made public by the PP.
- Sustainable development Goals: Three SDGs have been defined in the MR as required by VCS, taking into account the Sustainable Development contributions defined in the VCS-PD

- SDG Indicator: 7.2.1: Total Renewable energy produced. It refers to the amount of renewable energy dispatched to the grid. Refers to the parameter as $EL_{PJ,gross,y}$.
- SDG Indicator: 8.5: The indicator corresponds to the amount of jobs generated due to the project activity and to the comparison of the wage with minimum wage from country/23/. The results were provided to the verification team and are as follows/22/:

Jobs quantity during the MP	% of Jobs receiving above minimum wage
2017 - 92	2017 – 100%
2018 - 106	2018 – 100%
2019 - 103	2019 – 100%
2020 - 96	2020 – 100%

- SDG Indicator: 13.0: Tonnes of greenhouse gas emissions avoided or removed. It refers to the amount of Emission Reductions achieved during this monitoring period (refer to total ERs achieved stated in section 5 below

The project activity corresponds to the installation of a greenfield biomass power plant in Chile. The project description is complete, accurate and reflect the information stated in the evidences provided.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process is conducted as per internal CDM Quality Manual and in accordance with criteria laid down by VCS version 4. It includes the following steps:

- contract with PP for the scope and appointment of verification team and technical review team;
- completeness check of Monitoring Report version 1;
- desk review of Monitoring Report and corresponding ER sheet by verification team and planning of onsite audit (including sampling approach to be applied). The list of all documents as well as their versions are detailed in Appendix I of this report;
- on-site inspection by verification team;
- follow up activities e.g., interviews;
- reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report;
- independent technical review of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidences). The list of all documents as well as their versions are detailed in Appendix I of this report;
- reporting and closure of TR comments/findings (CARs/CLs/FARs) and final approval for the decision made;
- issuance of final verification report to contracted PP (or authorized representatives).

2.2 Document Review

A desk review was conducted by the verification team that included:

- a review of the data and information presented to verify its completeness;

- a review of the registered monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- an evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;
- supporting documents.
- A complete list of documents/evidences reviewed is included as Appendix I.

2.3 Interviews

#	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1	Loffredo	Susana	Arauco Bioenergia	08/08/2022 09/08/2022 10/08/2022	EF calculations Description of project activity On-site Inspection	Marcelo Sebben
2	Rodrigue z	Christian	Arauco Bioenergia	08/08/2022	ER calculations Data aggregation, MR description	Marcelo Sebben
3	Urrutia	Ricardo	Bioenergia Viñales Arauco	09/08/2022 10/08/2022	Project description, compilation of monitored data, Job data, no net harm and site visit	Marcelo Sebben
4	Amialea da	Carlos	Bioenergia Viñales Arauco	09/08/2022 10/08/2022	Measurement instruments Calibration and maintenance, site visit	Marcelo Sebben
5	Cáceres	Zorobab el	Bioenergia Viñales Arauco	09/08/2022 10/08/2022	Operations and management of project activity, site visit	Marcelo Sebben

6	Orellana	Eric	Bioenergia Viñales Arauco	10/08/2022	Inspection of electricity meters, site visit	Marcelo Sebben
7	Saglietto	Vicente	Bioenergia Viñales Arauco	09/08/2022	Description of project activity, technical information regarding LPG consumption	Marcelo Sebben
8	Sepulveda	Michele	Bioenergia Viñales Arauco	09/08/2022	Laboratory analysis, biomass measurement	Marcelo Sebben
9	Gamboa	Alfredo	Bioenergia Viñales Arauco	09/08/2022	Operation of biomass boiler	Marcelo Sebben
10	Lopes	Luis	Bioenergia Viñales Arauco	09/08/2022	Truck control and biomass measurement	Marcelo Sebben
11	Bustos	Nelson	Arauco y Constitución	06/10/2022*	Social aspects and continuous communication with stakeholders Grievance mechanism	Marcelo Sebben

* The interview with Mr. Nelson Bustos has been carried out remotely. He is not located at the project plant as he is corporative employee.

2.4 Site Visits

Duration of audit: 08 to 10/08/2022 and 06/10/2022				
#	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Opening Meeting: Santiago Office Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.	Santiago Office	08/08/2022	Marcelo Sebben

2.	Implementation and operation of project activity (project boundary, technology, project equipment, monitoring and metering equipment) as per registered PDD/previous verification.	Santiago Office	08/08/2022	Marcelo Sebben
3.	Management and monitoring procedures followed at project site.	Santiago Office	08/08/2022	Marcelo Sebben
4.	Download of Raw data and Monitoring parameters and relevant document (evidences and cross-check)	Santiago Office	08/08/2022	Marcelo Sebben
5.	Review of - ER calculations - biomass balance calculations - Emission Factor calculations	Santiago Office	08/08/2022	Marcelo Sebben
6.	Travel to Viñales power plant	Viñales power plant	09/08/2022	Marcelo Sebben
7.	Open meeting at the power plant	Viñales power plant	09/08/2022	Marcelo Sebben
8.	Management and operational system: Documentation, allocation of responsibilities, qualification and training, data recording &archiving, internal audit and management review and emergency procedures.	Viñales power plant	09/08/2022	Marcelo Sebben
9.	Physical inspection of the project activity: Site visit and interview of monitoring personnel - Control room - Power and recovery boiler and steam flow diagram - Biomass entrance (weighbridges, analysis Lab – moisture) - Contractors – biomass transportation (on and off-site), biomass processing, fuel consumption - Biomass storage and flow diagram - Electricity generators Fossil fuel tanks	Viñales power plant	09/08/2022	Marcelo Sebben

10.	Management and operational system: Qualification and training, data recording &archiving, Raw data and Monitoring parameters and relevant document (evidences and cross-check). ER and EF calculations	Viñales power plant	09/08/2022	Marcelo Sebben
11.	Verification of monitoring equipment o Biomass residues Categories and quantities used - weighbridges o BRPJ,n,y, weighbridges o BRB4,n,y - weighbridges o BRB1/B3,n,y- weighbridges o EFCO2,LE o HCBL,y – flow meters, pressure meters and thermocouples o ELPJ,gross: electricity meters o ELPJ,imp: electricity meters o ELPJ,aux: electricity meters o NCVBR,n,y: measured external laboratories o Moisture content: digital scale, oven, moisture analyser. - Calibration certificates	Viñales power plant	10/08/2022	Marcelo Sebben
12.	Review of any missing information, pendencies	Viñales power plant	10/08/2022	Marcelo Sebben
13.	Compilation of the audit findings.	Viñales power plant	10/08/2022	Marcelo Sebben
14.	Closing Meeting: Submission of the audit findings to the client and agreement on the issues raised and agreement on timelines.	Viñales power plant	10/08/2022	Marcelo Sebben
15.	Interview with Mr. Nelson Bustos regarding social aspects of project activity and grievance mechanism.	Virtual VideoCall	06/10/2022	Marcelo Sebben

2.5 Resolution of Findings

The findings may be of following types: CAR – Corrective Action Request, CL – Clarification Request and FAR – Forward Action Request.

During the present verification, 03 CL and 04 CARs were raised and successfully closed.

The list of findings and their resolution are presented at Appendices III of this report.

2.5.1 Forward Action Requests

No FAR was raised.

2.6 Eligibility for Validation Activities

ESPL holds the accreditation for verification of the sectoral scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity has no participation under any other GHG program.

3.2 Methodology Deviations

The project activity complies with the applied methodology ACM0006 – Consolidated methodology for electricity and heat generation from biomass --- Version 12.1.1 and all applicable tools.

No deviations were observed.

3.3 Project Description Deviations

For the present monitoring period, no change is being requested. The crediting period start date has been changed and approved in previous monitoring period. Therefore, the verification team has not assessed this change during this verification process.

3.4 Grouped Project

Not applied. This project does not correspond to a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity consists in the installation of a 41 MW condensing-extracting turbo generator machine and of a biomass fluidized-bed boiler of 210 ton/hr of high pressure steam capacity. The new boiler replaces a smaller capacity (heat only) boiler and also generates electricity to feed the Viñales Sawmill and its electricity surplus is fed into the Chilean National Grid (SEN).

There are no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology. Moreover, the project is being implemented and operating in accordance with description provided in the registered VCS-PD.

In addition, the GHG emission reductions generated by the project have not become included in an emissions trading program or any other mechanism that includes GHG allowance trading. Moreover, the project has not received nor sought any other form of environmental credit, and neither has become eligible to do so since validation or previous verification. Finally, the project has not participated nor been rejected under any other GHG programs since validation or previous verification. Moreover, it is confirmed that the project has achieved the SD contributions reported in the MR.

As per the on-site assessment, interviews and collected evidences, it was possible to assess that, in general, the project activity has been implemented as described in the VCS-PD.

4.2 Safeguards

4.2.1 No Net Harm

The power plant has its environmental License/08/ approved in accordance with Local Legislation/22-2/ where all possible environmental impacts are mitigated.

Low risk of odors associated with project activity are foreseen. Nevertheless, measurements are taken to mitigate any potential risk as included in the environmental license, such as daily consumption of bark instead of stocking in piles. Moreover, risks of failure in atmospheric emissions control systems, or diesel spills. Annual maintenance of electrostatic precipitator and installation of spill battery were used as mitigation measures respectively. Information could be duly checked during the on-site inspection.

In addition, the power plant supports and applies a set of core values in the human rights, labour, environment and anticorruption spheres:

- Support and respect the protection of internationally proclaimed human rights.
- Ensure they are not complicit in human rights abuses.
- Uphold the freedom of association and the effective recognition of the right to collective bargaining.
- Eliminate all forms of forced and compulsory labour;
- Abolish child labour;
- Eliminate discrimination in respect of employment and occupation;
- Support a precautionary approach to environmental challenges;
- Undertake initiatives to promote greater environmental responsibility;
- Encourage the development and diffusion of environmentally friendly technologies; and
- Work against corruption in all its forms, including extortion and bribery

By applying these measures, it can be concluded that any possible negative impact caused by project activity is mitigated of the project activity.

4.2.2 Local Stakeholder Consultation

The local stakeholder consultation or public audience are one of the phases of the Environmental Impact Assessment. This consultation occurred during the construction phase of the project activity and was a requirement for obtaining the operational license. The consultation was validated during the validation phase of this project activity.

As explained by project participants, the company keeps an active communication with surrounding communities. During the monitoring period, the company carried out several programmes associated with communities in areas of education, sports, potable water. It was said by the Company' social representative, that the project is constantly sought by Educational community due to generation of renewable energy through biomass, contributing with sustainable development of the Country.

Moreover, the company provides open channel through telephone and website for all members of community, employees, and stakeholders/26/. It could be observed by interviews to the project proponents and by report provided to the verification team /26/ that the grievance mechanism is currently in place and active.

4.3 AFOLU-Specific Safeguards

Not applicable, as it is not an AFOLU project.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

the approved VCS methodology ACM0006 – Consolidated methodology for electricity and heat generation from biomass --- Version 12.1.1. is applied to the project activity;

GHG emission reduction is calculated as baseline emissions minus project emissions. No leakage is accounted as per PDD, considering that there is no new biomass type being used in the project activity during this monitoring period.

Baseline emissions occur due to generation of renewable energy and displacement from grid electricity consumption and due to avoidance of methane generation due to biomass disposal

Project emissions are generated due to fossil fuel consumption in the boiler due to operational reasons, fossil fuel consumption due to biomass transportation inside the Project's plant, due to biomass freight from external biomass and due to biomass burning.

Baseline emissions are calculated as follows:

Baseline emission was calculated using the following equation (#2 from applied meth):

$$BEy = EL_{BL,GR,y}.EF_{EG,GR,y} + \sum FF_{BL,HG,y,f}.EF_{FF,y,f} + EL_{BL,FF/GR,y}.min\left(EF_{EG,GR,y}, EF_{EG,FF,y}\right) + BE_{BR,y}$$

Where:
BE_y = Baseline emissions in year y
$EL_{BL,GR,y}$ = Baseline minimum electricity generation in the grid in year y
$EF_{EG,GR,y}$ = Grid emission factor in year y
$FF_{BL,HG,y,f}$ = baseline fossil fuel demand form process heat in year y
$EF_{FF,y,f}$ = CO2 emission factor for fossil fuel type f in year y
$EL_{BL,FF/GR,y}$ = baseline uncertain electricity generation in the grid or on-site
$EF_{EG,FF,y}$ = CO2 emission factor for electricity generation with fossil fuels at project site in the baseline in year y

BE_{BR} = Baseline emissions due to disposal of biomass residues in year y

Parameters accounted for this monitoring period are:
$EL_{BL,GR,y}$: calculated as per equation 3 of the applied methodology
$EF_{EG,GR,y}$: calculated as per "tool to calculate emission factor for an electric system" version 02.1.1
$FF_{BL,HG,y,f}$: fossil fuel attributed to start-up and operational conditions of recovery boiler and auxiliary boiler as per pg 72 of the registered PDD.
$EF_{FF,y,f}$: calculated as per "tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 2
$EL_{BL,FF/GR,y}$: considered equal to zero conservatively

BE_{BR}: calculated as per equation 35 of the applied methodology as follows:

$$BEy = BE_{BR,B1/B3,y} + BE_{BR,B2,y}$$

Where
$BE_{BR,\,B1/B3,y}$ = baseline emissions due to aerobic decay or uncontrolled burning of biomass residues in year y
$BE_{BR,\,B2,y}$ = baseline emissions due to anaerobic decay of biomass residues in year y (not applicable for this project activity)

$BE_{BR,\,B1/B3,y}$ is calculated as per equation 36 of the applied methodology.

$$BE_{BR,B1/B3,y} = GWP_{CH4} \cdot \sum_{n} BR_{B1/B3,n,y} \cdot NCV_{BR,n,y} \cdot EF_{BR,n,y}$$

<u>The results are as follows for BE calculations:</u>

<u>The BEy results are as follows:</u>

BE_{2017} = 209,604

BE_{2018} = 213,375

BE_{2019} = 198,214

BE_{2020} = 232,806

BE_{total} = 853,999 tCO_2e

Project emissions

According to the applied methodology ACM0006 equation 37, project emissions were calculated as folllows (only applicable terms were included):

$$PEy = PE_{FF,y} + PE_{GR1,y} + PE_{TR,y} + PE_{BR,y}$$

Where:
PEy = Project emissions in year y
$PE_{FF,y}$ = Project emissions from fossil fuel consumption at the project site in year y
$PE_{GR1,y}$ = Project emissions due to grid electricity imports in year y
$PE_{TR,y}$ = Project emissions due to transport of biomass to the project plant
$PE_{BR,y}$ = Project emissions due to combustion of biomass during year y

For this project activity the following apply
$PE_{FF,y}$: measurement of all diesel consumption in the transportation and mechanical processing of biomass and fuel oil consumption in all boilers related to project activity
$PE_{GR1,y}$: measurement of all electricity imports from grid to the project activity

$PE_{TR,y}$: measured as per equation 40 and 41 of the applied methodology

The PEy results are as follows:

PE_{2017} = 6,611

PE_{2018} = 9,015

PE_{2019} = 7,539

PE_{2020} = 7,512

PE_{total} = 30,677 tCO_2e

Leakage emissions

As per registered PD, no leakage is to be applied to this project activity.

Therefore **LEy = 0**

Fixed parameters: The following parameter was kept fixed along the crediting period and is being used for calculation of emission reductions

- Biomass residues categories and quantities used for the selection of the baseline scenario and assessment of additionality:
- **Px**: Quantity of the main product of the production process produced in year x from plants operated at the project site.
    - 352,686 m3/yr of sawn timber from the sawmill
    - 88,203 m3/yr of processed wood products from the remanufacture plant
- **$CAP_{HG,h}$:** Baseline capacity of heat generator h (GJ/h): value applied is equal to 210 GJ/h
- **$LFC_{HG,h}$**: Baseline load factor of heat generator h. Value applied equal to 90%
- **GWP_{CH4}**: Global Warming Potential of methane valid for the commitment period: value applied equal to 25 tCO2/tCH4.
- **$EF_{burning,\ CH4,k,y}$:** CH4 emission factor for uncontrolled burning of the biomass residue type k during year y
    - Biomass residues from industrial operations (mainly sawdust and bark from sawmills): 0.0008742 (tCH4/GJ) or 874.2 (Kg CH4/TJ)
    - Biomass residues from forestry operations (mainly branches from harvesting, pruning and thinning operations): 0.00010146 (tCH4/GJ) or 101.46 (Kg CH4/TJ)
- **$EF_{CH4,BR}$:** CH4 emission factor for the combustion of biomass residues in the project plant. Value applkied is equal to 41.1 kg $_{CH4}$/TJ using conservativeness factor of 1.37 from Table 5 (maximum uncertainty).
- **$h_{BL,HG,BR,\ boiler}$**: Heat efficiency of the boiler (heat generator) that would have been installed in the baseline scenario: value applied equal to 85%
- **$EF_{CO2,f}$**: Default CO2 emission factor for freight transportation activity f
    - 245 g CO_2/t km for light vehicle
    - 129 g CO_2/t km for heavy vehicle

Monitored parameters:

All parameters are duly assessed in Appendix V of this report.

The calibration dates of each metering equipment is detailed in Appendix VI of this report

It could be observed that the emission reduction spreadsheet is transparent, traceable and correct, with no manual transposition errors. All calibration certificates have been provided. It could be observed gaps in calibration for weighbridges, moisture analyzers oven, and digital scale (for details refer to Appendix VI). For these periods not covered, conservative measures have been applied, i.e. higher value between maximum permissible error of equipment and error obtained in next calibration, in accordance with CDM VVS for PA,

paragraph 366. Measure is considered correct and accurate by the verification team and it could be duly checked in the ER calculations spreadsheet.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

- the metered parameters were checked directly at the company's system and cross-checked with technical specification and energy balances, as evidences to determine emission reduction;
- the records, data and information provided were found valid for the current verification period. The documents were verified during virtual site visit and when possible, were checked directly from its source;
- interviews were performed during virtual site visit with involved personnel and PP's representatives;
- the GHG emission reduction calculations were check step by step with PP's representatives;
- the quality of evidences was found of adequate level by the verification team to ensure an accurate quantification of the emission reductions.

4.6 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION OPINION

ESPL, contracted by Maderas S.A., has performed the independent verification of the emission reductions of the VCS project "Viñales biomass power plant", with VCS Project ID 1186, for the monitoring period 01/01/2017 to 31/12/2020 (both days included). The contractor is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology ACM0006 v.12.1.1 and the monitoring plan contained in the VCS-PD and draft Monitoring Report.

The verification is in accordance with requirements of ISO 14064-3:2019

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other

information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms, based on final revised MR, that:

1. the project activity was found completely implemented as per the description given in the registered VCS-PD; and
2. the actual operation conforms to the description in the registered VCS-PD.

In our opinion, the GHG emissions reductions reported for the project activity for the period mentioned above are correct in the final version of the Monitoring Report. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology and the monitoring plan contained in the VCS-PD.

Therefore, ESPL can certify that the emission reductions from the VCS project "Viñales biomass power plant" as follows:

Verification period: ***from*** *01-Jan-2017 to 31-Dec-2020*

Verified GHG emission reductions and removals in the above verification period, broken down by calendar year:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01-Jan-2017 to 31-Dec-2017	209,604	6,611	0	202,993
01-Jan-2018 to 31-Dec-2018	213,375	9,015	0	204,360
01-Jan-2019 to 31-Dec-2019	198,214	7,539	0	190,675
01-Jan-2020 to 31-Dec-2020	232,806	7,512	0	225,294
TOTAL	**853,999**	**30,677**	**0**	**823,322**

The comparison between the estimated ERs ex-ante and the actual achieved ERs are as follows:

Year	*Ex-ante emissions reductions/removals (A)*	*Achieved emissions reductions /removals (B)*	*Percent difference* *(B)-(A)/(A) x 100*	*Justification for the difference*
2017	*258,093*	*202,993*	*-21.6%*	The achieved ERs are lower than the estimated ones especially due the consumption of less biomass and generation of less energy when comparing to the values estimated .
2018	*258,093*	*204,360*	*-21.1%*	
2019	*258,093*	*190,675*	*-26.4%*	
2020	*258,093*	*225,294*	*-13.0%*	
Total	***1,032,372***	***823,322***	***-20.5%***	

Approved by

Dr. Kaviraj Singh

Managing Director

Earthood Services Privated Limited

Date: 30-04-2024

Place: Gurugram, Haryana

APPENDIX I: REFERENCES

No.	Title	References
1.	Methodology ACM0002 – Consolidated methodology for electricity and heat generation from biomass	version 12.1.1
2.	Tools 1. TOOL07: Tool to calculate the emission factor for an electricity factor for an electricity system; 2. TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion; 3. TOOL09: Tool to determine the baseline efficiency of thermal or electric energy generation systems 4. TOOL01: Tool for the demonstration and assessment of additionality. 5. TOOL05: Tool to calculate baseline, project and/or leakage emissions from electricity consumption 6. TOOL12: Tool for project and leakage emissions from transportation of freight.	Version 03.0.0 Version 02 Version 01 Version 7.0.0 Version 01 Version 1.1
3.	Registered VCS-PD	Version 02 10/05/2013
4.	Monitoring report – draft / revised	version 1 – 03/08/2022 Version 02 – 03/10/2022 Version 03 – 01/12/2022 Version 4 – 11/12/2023
5.	Monitoring report - final	Version 5 – 25/04/2024
6.	ER Spreadsheet – draft / revised	version 1
7.	ER Spreadsheet – final (ER calc 2020-19-18-17 post audit round3.1.2 TR round 1.2)	round3.1.2 TR round 1.2
8.	Environmental License 1. Environmental License of Viñales Power plant RCA 80/2009	25/03/2009
9.	Ownership of PA RCA 80/2009 where it is stated the project ownership.	25/03/2009
10.	Electricity generation and consumption	2017-2020

	1. Monthly Plant Balance – 0X Balance_Planta_Viñales_month YYYY	
11.	Number of stoppages 1. Monthly operational control - Operación PBV mensual - YYYY	2017-2020
12.	Heat Generation 1. Monthly heat generation spreadsheets extracted from internal system - Resumen operaciones YYYY 2. Correction of heat to process calculations – spreadsheet Heat to process correction v1.2	2017-2020
13.	Biomass consumption in the power boiler 1. 31_Recepción biomasa B_Carbono_month_YY 2. Wood density – Report Centro de Transferencia Tecnólogica Pino Radiata 3. Conversion factor from 3.2 STm³ =1 Solid m³. Information provided by PP 4. Biomass adjustment weighbridge – regarding calibration delay 5. Calculation of remanufacturing quantities 6. Procedure – Biomass collection (PT-PBV-BIO-11 from 06/2014) 7. Work Instruction – Biomass moisture (IT-PBV-BIO-01 from 01/06/20147)	2017-2020 November 2003
14.	Biomass from third parties 1. Thirdparty biomass – origin, distance and quantity of biomass brought to power plant 2. Truck yield certificates (km/L) -Information provided by service providers - CERTIFICADO DE RENDIMIENTO DE CAMIONES	2017 - 2020
15.	Net calorific value (NCV_{BR}) 1. Reports issued every semester by Universidad de Concepción – Biomass Analysis	2017-2020
16.	Fossil fuel consumption in the power boiler 1. Fossil fuel consumption due to power plant stoppages - Resumen operaciones YYYY 2. Fossil fuel consumption due to biomass internal transportation – Consumo annual YYYY 3. Evidence LPG consumption. The quantity consumed is estimated based on historical consumption and reported annually to the National Energy Balance. The estimated consumption is equal to Diesel Consumption in the Power Boiler, divided by 625. This proportion could be duly observed at National Energy Balance (BNE) from 2018 to 2021 (referring to years from 2017 to 2020).	2017-2020
17.	Energy Balance of Viñales Power Plant	2017-2020

	1. RPG APT1 YYYY	
18.	Technical Specifications of metering equipment 1. Accreditation of calibration providers a. Carta Ineco b. Cientec acreditación c. GSE60series_u_en_37149 d. Memmert-Rep 2016 e. Molinstec Acreditación f. Sartorius-Rep 2016 2. Accuracies a. Endress hauser 33F page 109 b. Endress Hauser 83F Page 15 c. Endress Hausser Cerebar S PMP75 Page 30 d. Endress Hausser PMD75 Page 27 e. Endress Hausser TH53 Page 8 f. ION 7550 Page 3 g. ION 8600 PowerLogic_Specifications_Rev_1_3 h. Memmert UFE600 page 2 i. Range Sartorius MA150 j. Rosemount 644 Page 98 k. Rosemount 2051C 2051T Page 43 l. Sartorius MA150 page 23 m. Sartorius TE150 3. Calibration frequency a. Plant Weighbridge calibration frequency b. Endress+Hauser frequency recommendation c. Memmert d. Rosemount 644 e. Sartorious f. Schneider ION 4. Calibration certificates a. BRpj,n,y b. ELpj,aux,y c. ELpj,gross.y d. ELpj,imp,y e. FCi,j,y f. HCbl,y g. Moisture content h. Equipos 2020 - Spreadsheet with all equipment calibration	2017-2020
19.	Biomass transport 1. Internal control of biomass transportation per type, weight and date - Despacho CFI Viñales YYYY	2017 - 2020
20.	Grid Emission Factor Calculation 1. Emission Factor SIC YYYY BM and OM 2. Evidences a. Fuel consumption b. Monthly generation	2017-Version 3 2018-Version 4 2019-Version 4 2020-Version 1

	c. Potencia Suficiencia YYYY	
21.	QAQC of all parameters 1. Excel Spreadsheet QAQC with quality assurance and quality control of all parameters in accordance with registered monitoring plan	2017 - 2020
22.	SDGs evidences 1. SDG 8 a. Informe Final Programa Energízate con el Medio Ambiente UTALCA 2018 b. RV_ Verificacion Viñales with employees number and minimum wage	2017 - 2020
23.	Applicable Legislation 1. Law 20.763 – Informs the values of minimum monthly wage in Chile 2. Law N°19.300 regarding general basis of Environment. 3.	18/07/2014
24.	Geographical location of Power Plant 1. The geographical location of power plant has been plotted in Google Maps, which could be evidenced through following link.	https://www.google.com.br/maps/place/35%C2%B022'15.6%22S+72%C2%B024'43.2%22W/@-35.3709956,-72.4141887,554m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0xf9899720991814b5!8m2!3d-35.371!4d-72.412
25.	On site Evidences - Pictures of boiler - Pictures of generators - Pictures of unifiliar diagram - Pictures of metering equipment - Pictures of biomass types	09-10/08/2022
26.	Grievance mechanism 1. https://www.arauco.cl/chile/contactanos/ 2. RE PROGRAMA ENERGIZATE CON EL MEDIO AMBIENTE - PLANTA BIOENERGIA VIÑALES_archivos 3. Informe Final Programa Energízate con el Medio Ambiente UTALCA 2018 4. REPORTE SUSTENTABILIDAD 2021 ARAUCO	-
27.	Technical characteristics of power boiler 1. Design data of the boiler for training 17 to 20.pdf	2017-2020

28.	Validation and Verification Standard for CDM Project Activities	Version 3.0
29.	IPCC publications	https://www.ipcc-nggip.iges.or.jp/public/2006gl/
30.	VCS 1. VCS Standard V.4.5 2. VCS Program Guide V.4.4 3. VCS-V4-Summary-of-Effective-Dates	https://verra.org/

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APPENDIX II: ABBREVIATIONS

Abbreviations	Full texts
BE	Baseline Emission
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CNE	National Council of Energy
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CL	Clarification Request
DOE	Designated Operational Entity
ER	Emission Reduction
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse gas(es)
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PBA	Environmental Basic Project
PE	Project Emission
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
SPC	Special Purpose Company
UNFCCC	United Nations Framework Convention on Climate Change
UT	Transaction Unit (National Electric System Operator)
VCS	Verified Carbon Standard
VCS-PD	VCS – Project Description
VCU	Verified Carbon Unit
XLS	Emission Reduction Calculation Spread Sheet
WPP	Wind Power Plant
WPT	Wind Power Turbine

APPENDIX III: FINDINGS

CL from this verification

CL ID	01	Section no.	3.1	Date: 11/08/2022
Description of CL				
The MR form have not been completed in accordance with requirements for completing the MR as follows: Section 1.1: - missing table mentioned highlighted in yellow ok - net harm and stakeholders ongoing communication not mentioned in appendix B unlike mentioned Section 1.4: information regarding host parties and project participants not part of this project activity (Viñales-VCS). Section 1.6: although mentioned that details of deviation (change in start date of CP) are being explained in section 2.2.2, no explanation is being observed. Section 4.3: - values of Efgrid are not provided (highlighted in yellow)				
Project participant response				**Date:** 03/11/2022
Section 1.1: The table is not included in the present MR. The PP considered not necessary to included net harm and stake holder ongoing communication at the appendix B. Section 1.4: The PP added the corresponding table with project participant. Section 1.6: Details of this deviation are explained in section 3.1.2 of the present Monitoring Report Section 4.3: values of Efgrid for 2017-18-19 and 2020 were provided and evidence of their calculation as well.				
Documents provided by Project Participant				
Refer to file CLID 01 to get evidence associated the calculation of the grid emission factors for years 2020, 2019,2018 and 2017. The corresponding corrections were done to the Monitoring report, which is also provided.				
DOE assessment				**Date:** 25/01/2023

Section 1.1: the corrections were duly carried out in the MR. Incorrect references have been erased

Section 1.4: Information has been duly provided in the MR. Celulosa Arauco y Constitución S.A is the Project proponent. Maderas S.A is the project owner (which is controlled by Celulosa Arauco y Constitución).

Section 1.6: Summary of the deviation has been mentioned in this section whereas details of this deviation were included in section 3.1.2 of the MR. This change was already carried out during the 1st verification and no action was needed during this verification. No further changes have been observed.

Section 4.3: the values have been completed as required by instruction for completing the MR. They are in accordance with calculations provided.

CL is closed

CL ID	02	**Section no.**	3.3.4	**Date:** 11/08/2022
Description of CL				
SDGs section 1.11 1. Evidences regarding the chosen SDGs 8.5 (employment and earnings above minimum wage) have not been provided to the verification team. 2. the provided figures for SDGs 13 and 7.2 related to this monitoring period (column 5 of table 1) and related to accumulated since projects start date (column 6) are not correctly determined. 3. No evidences of contributions over the project lifetime related to parameter 7.2 have been provided (number of households receiving renewable energy)				
Project participant response				**Date:** 03/11/2022
The PP updated the figures for SDGs 13 and 7.2 according to this monitoring period 01-01-2017 to 31-12-2020. The PP provides evidence of contributions over the project lifetime relates to the following parameters: - Number of households receiving renewable energy (SDG 7.2) - Employment and earnings above minimum wage (SDG8.5)				
Documents provided by Project Participant				
The PP provides evidence to support issue describe in point 1 and 3. Also an email was sent with evidence to the lead auditor of the DOE.				
DOE assessment				**Date:** 25/01/2022

1. The evidences provided for Employment and earnings above minimum wage (SDG8.5) (email Verification Viñales) shows information for number of employees and minimum wage from 2017 to 2021. Nevertheless, the information provided in the MR refers to year 2022, which is not part of this monitoring period. Moreover, the table was completed accordingly: current project contributions refers to net increase/decrease during this monitoring period, whereas contribution over the project lifetime refers to accumulated values since the beginning of CP. **Issue remains open**
2. The Contributions over the project lifetime of each parameter does not take into account the values achieved during this monitoring period plus the previous monitoring periods. **Issue remains open**
3. It is not clear in the evidences provided, where it is stated the values presented of the parameter Number of households receiving renewable energy (SDG 7.2) during this monitoring period and over the project lifetime. **Issue remains open**

CL remains open

Project participant response	**Date:** 30/03/2023

1.- The project activity has increased the total number of jobs to 99 (*) collaborators during its lifetime.(*) average number of collaborators in the reporting period.

2.

- In previous monitoring periods the project avoided GHG emissions of 572,874 tCO2.

The project avoided anthropogenic emissions of greenhouse gases (GHG) of 622,800 tCO2 during the reporting period (01 Jan 2017 to 31 Dec 2020).

Over the project lifetime it has avoided anthropogenic emissions of greenhouse gases emissions (GHG) of 1,195,674 tCO2e.

- Over the project lifetime it has contributed to the production of electricity to 209,647.2 households.

During its previous monitoring periods contributed to the production of electricity from biomass to 62,321.6 households' consumption per annum.

In the reporting monitoring period, the project has contributed to the production of electricity from biomass equivalent to 147,325.6 households' consumption per annum.

- Over the lifetime of the project activity provided wages above local minimum wage to all employees.

3 information corrected in the MR

Documents provided by Project Participant
MR version 4

DOE assessment	**Date:** 18/09/2023

1. Information related the number of jobs in each year has now been included as per evidences provided. The values are correct. **Issue is closed**
2. Information related to the contributions over the project live time have been duly included in the MR. **Issue closed**
3. Information has been better explained in the MR. section 1.4. **Issue is closed**

CL is closed

CL ID	03	**Section no.**	3.3.8	**Date:** 11/08/2022
Description of CL				

The cross-check measures of the following parameters have not been discussed in the MR:

1. HC_{BL}: it is wrongly stated that there are no historical efficiency indexes from previous monitoring periods
2. $EL_{PJ,gross,y}$: cross-check results have not been discussed
3. $EL_{PJ,imp,y}$: cross-check results have not been discussed
4. $EL_{PJ,aux,y}$: cross-check results have not been discussed in section QA/QC procedures nor the calculation methods from pneumatic transportation (section calculation method)
5. NCV_{BR}: cross-check with values from other projects have not been mentioned unlike stated in the MR.

Project participant response	**Date:** 03/11/2022

1. HC_{BL}: it is informed the historical efficiency indexes from the present monitoring period. MR is updated with the historical efficiency indexes.
2. $EL_{Pjgross,y:}$ cross-check results were informed as required
3. $EL_{PJ,aux,y}$: cross-check results were informed in the monitoring report as required. Also the calculation method is described in calculation method section of this parameter.
4. $EL_{PJ.imp.y:}$ CROSS-CHECK results were informed in the monitoring report as required
5. NCV: cross-check from other CDM projects is presented in this case. Also, the results are according to average value defined by IPCC.

Documents provided by Project Participant

QA/QC procedures were included in the current monitoring report under the parameters: Elpj,gross, EL pj, imp,y Elpj,aux,y. Also QA/QC historical efficiency index from previous period is iinformed under the parameter HCBL,Y together with NCV QA/QC.

DOE assessment	**Date:** 27/01/2023

1. HC_{BL}: The QA/QC values have been provided and it is clear that the heat generation per biomass consumption is within the values specified by manufacturer/27/.
2. $EL_{PJgross,y}$: the project implementers have been presented QA/QC values for this parameter which evidence the accuracy of the measurements. Comparison between sales invoices and calculated values and between generation and fuel consumption have been carried out, which is in accordance with requirements of the monitoring plan.
3. $EL_{PJ,aux,y}$: the project implementers have been presented QA/QC values for this parameter which evidence the accuracy of the measurements. Comparison between sales invoices and calculated values and between generation and fuel consumption have been carried out, which is in accordance with requirements of the monitoring plan.
4. $EL_{PJ.imp.y}$: CROSS-CHECK results were informed in the monitoring report as required
5. NCV: cross-check from other CDM projects are now duly presented in the MR. The values are coherent and also within the limits of IPCC.

CL is closed

CAR from this verification

CAR ID	01	**Section no.**	3.1	**Date:** 11/08/2022
Description of CAR				
The following inconsistencies were found in the grid emission factor calculation applied. - 2017: o The name of project activity is not correct in the spreadsheet o Values of EFom and EFbm are not correct - All years: The BM calculation did not exclude the CDM plants unlike required by applied TOOL07. - The values of w_{bm} and w_{om} in the EF calculations spreadsheet are not in accordance with applicable TOOL07 for the 1st crediting period. - The EF_{BM} for 2020 has not been taken into account in the ER calculations, unlike presented in the EF calculations spreadsheet.				
Project participant response				**Date:** 03/11/2022
The PP made the corresponding correction and updated the GRID emission actor.				
Documents provided by Project Participant				
CAR ID01 with evidence is provided.				
DOE assessment				**Date:** 27/01/2023
1. The name of the project activity and the values of EFom and EFbm have been corrected in the 2017 EF calculation spreadsheet 2. The BM calculations duly excluded the CDM plants as per requirements of TOOL07/ACM0002 3. The values of w_{bm} and w_{om} are now correct.				

4. The values presented in the ER calculations for EF_{BM} for 2020 is not in accordance with calculation provided "Viñales - Emission Factor SIC 2020 v1". **Issue remains open**
5. EF calculation of 2018 to 2020: tab " Gen SIC data YYYY", column AA/W. The formula for the calculation of total net power is not considering the correct plant efficiency (e.g. EF2018: tab " Gen SIC data 2018", CELL AA397 onwards, EF2019: tab " Gen SIC data 2019", CELL AA15 onwards and EF2020: tab " Gen SIC data 2020", CELL W202 onwards.) **issue is open**

CAR remains open

Project participant response	**Date:** 30/03/2023
The value presented in the ER calculations for EFBM for 2020/2019/2018 updated as per calculation.	
Documents provided by Project Participant	
Viñales – Emission factor SIC 2018v4 round 2 Viñales – Emission factor SIC 2019v4 round 2 Viñales – Emission factor SIC 2020v1 round 2	
DOE assessment	**Date:** 18/09/2023

4. Values presented in the ER calculations for EFbm for 2020 are now in accordance with EFbm calculations spreadsheed "Viñales - Emission Factor SIC 2020 v1round 2".
5. Information has been duly corrected in the EFgrid calculations. The formula is now correct in all EF calculations spreadsheets.

CAR is closed

CAR ID	02	**Section no.**	3.3.8	**Date:** 11/08/2022
Description of CAR				

The following inconsistencies were found in the data transfer form evidence to ER calculations spreadsheet

1. Moisture content: the following inconsistencies were found in the moisture content data
    a. 2017
        i. Average moisture content of biomass mix from internal industrial operations is not in accordance with evidence provided
        ii. External industrial operations: value of March /2017 is not accurate
2. Biomass Consumption: the following inconsistencies were found in the biomass consumption data
    a. 2019: Wet biomass mix from internal industrial operations from **Jan, Feb and Dec/2019** are not in accordance with evidence provided.
3. Results of Net Calorific Value of biomass residues reported in the ER calculations spreadsheet are not in accordance with evidence provided (e.g. 2017 1st semester, three results have been reported in Analysis Report for internal biomass: 4,429, 4,500 and 4480 kcal/kg resulting in an average equal to 4,470 kcal/kg, which does not match with data reported in ER calculations spreadsheet)

Project participant response	**Date:** 03/11/2022

1. Moisture content: evidence is provided, and monitoring report updated accordingly for year 2017. Refer to "Resume 2017 REUA.xls"

2. Biomass consumption: evidence is provided, and correction of values performed. Refer to file CAR ID02 under 2019/resumen.xls

3. NCV value correction done in the ER calculation spreadsheet.

Documents provided by Project Participant

Evidence to support our responses is provide din file CAR ID 02:

1. NCV_year is provided as evidence to support NCV value informed.
2. Biomass_2017 and 2019 is provided as evidence to support values informed.
3. Similar is done for moisture content.

DOE assessment	**Date:** 27/01/2023

1. Moisture content: the values of moisture content of internal biomass for 2017 is now in accordance with evidences provided, and value of external biomass moisture content for March 2017 has also been corrected.
2. Biomass consumption: Wet biomass mix from internal industrial operations from Jan, Feb and Dec/2019 have been corrected and are now in accordance with evidences provided.
3. Net calorific value: the following issues **remain not corrected**:
    a. 2017:
        i. 1st semester external sources: value applied is Gross Calorific Value
        ii. 2nd semester internal and external sources: value applied is Gross Calorific Value
    b. 2018: 1st and 2nd semester internal and external sources: value applied is Gross Calorific Value
    c. 2019: 1st and 2nd semester internal and external sources: value applied is Gross Calorific Value
    d. 2020: 1st and 2nd semester internal and external sources: value applied is Gross Calorific Value

CAR remains open

Project participant response	**Date:** 03/11/2022

The PP applied net calorific value obtained from third-party laboratory.

2017 first semester: 4429; 4500; 4480 (kcal/Kg) (interna)
2017 first semester: 4306;4172;4190 (Kcal/kg) (externa)
2017 second semester:4387; 4545; 4372(Kcal/kg) (interna)
2017 second semester:4450; 4385; 4469(Kcal/kg) (externa)

2018 first semester:4315; 4310;4302(kcal/Kg)(interna)
2018 first semester:4449, 4403, 4466 (kcal/Kg)(externa)
2018 second semester: 4431;4264 (kcal/Kg)(interna)
2018 second semester:4377;4228: (kcal/Kg)(externa)

2019 first semester:(kcal/Kg) 3998; 4468;4306(internal)
2019 first semester: 4378;4304;4402(kcal/Kg)(externa)
2019 second semester: 4370;4693 (kcal/kg)(internal)
2019 second semester:4377;4228 Kcal/Kg (external)

2020 first semester: 18294;18840;18218 (J/g) (internal)
2020 first semester: 18697;17802;18902 (J/g) (external)
2020 second semester:19495;18317 (internal)
2020 second semester:18598; 18359 (external)

Documents provided by Project Participant

NCV reports 2017-18-19-20
ER calculation spreadsheets.xls

DOE assessment	**Date:** 27/01/2023
3. Information has now been correctly determined in the ER calculations spreadsheet based on correct net calorific values achieved during the monitoring period and reported in the NCV analysis. **CAR is closed**	

CAR ID	03	**Section no.**	3.3.8	**Date:** 11/08/2022
Description of CAR				
The following inconsistencies have been found in the ER calculations tab emissions: 1. The Project emissions from freight have not been calculated unlike required by registered PDD. 2. line 183), the amount of LPG is not correctly determined (unity conversion) 3. According to the PDD, pg 58 item 2, The heat generation in each heat generator should not exceed the total capacity of the heat generator. Nevertheless, this approach is not clear in the calculations (equation 16 of applied methodology) 4. According to the applied methodology pg 28, the parameter Py is used for addressing the uncertainty associated with allocation of biomass into B4 category. Nevertheless, this approach is not being applied in the ER calculations.				
Project participant response				**Date:** 03/11/2022

1.- The PP provide the evidence of the calculation of emissions due to transporting biomass residues to the plant.

2.- The correction was done to expressing in ton by diving by /1000.

3. The heat generation in each heat generator should not exceed the total capacity of the heat generator. According to equation 16:

$$\sum_{n}(BR_{B4,n,h,y} * NCV_{BR,n,y} * \eta_{BL,HG,BR,h}) \leq LOC_{y} * CAP_{HG,h} * LFC_{HFG,h}$$

Where:

$LFC_{HFG,h}$ = 90%

$CAP_{HG,h}$ = (135.1 MW/90%)*3.6 =540 GJ/hr

LOCy is monitored every year.

		2020	2019	2018	2017
LOCy	Hrs	8,388	8,760	8,760	8,760
CAPHG,h	GJ/hr	540	540	540	540
LFC HG,h	%	90%	90%	90%	90%
Heat generating capacity	GJ	4,079,345	4,260,514	4,260,514	4,260,514
Total heat generated	GJ	4,208,902	4,361,920	4,797,477	3,683,539

The total heat generated in power boiler for years 2020,2019 and 2018 surpass the heat generating capacity of the boiler. Therefore, when restriction is not met the heat capacity is used.

4.-Evidence is provided associate to parameter Py in file CAR ID04.

Documents provided by Project Participant	
Evidence is provided File CAR ID04.	
DOE assessment	**Date:** 27/01/2023

1. The project emissions from freight have been demonstrated in the ER calculations. However, the following issues were found
    a. Tab emissions:
        i. The values form line 234 and 235 are not traceable nor evidence from these values have been provided. Moreover, it is not clear the reason for adjustment and nor which adjustment has been applied. **Issue remains open**
        ii. the values from lines 236 and 237 are not traceable – the values are not correct. **Issue remains open**
2. The calculation in line 188 has now been corrected. The unit conversion has been duly carried out for LPG in the ER calculations.
3. It has been observed that the heat generator exceeded the total capacity of baseline heat generator, however, this total capacity is not being used in the BE calculations due to aerobic decay of biomass residues (BE_{BR}). Moreover, the applied value for the parameter $CAP_{HG,h}$ is not in accordance with MR section **Issue remains open**
4. Although the Px values have been provided, the adjustment of parameter BR_{B4} as per equation 5, pg 28 of applied methodology could not be found in the ER calculations**. Issue remains open**

CAR remains open

Project participant response	**Date:** 30/03/2023

Project emissions from freight transportation:

i. The values form line 238 and 239 are traceable and evidence of these values is provided "Third-party biomass"/2020/2018/2017spreadsheet.xls

A conservative adjustment was made to the amount of biomass because weighbridges that measure it were **past their calibration date. The** amount of biomass is used for the calculation of fossil fuel consumption due to biomass transportation to the power plant. Therefore, a higher amount of third-party biomass leads to more fossil fuel consumption due to transportation and hence higher project emissions. Consequently, the amount of **third-party biomass was added 5%,** which was the maximum error detected during calibration.

ii. The values from lines 236 and 237 are traceable and evidence of these values was provided originally in excel sheet "Third-party biomass"/spreadsheet 2020/2019/2018/17spreadsheet.

The PP makes the following correction to the informed response above:

The total heat generated in power boiler for years 2020,2019 and 2017 result to be below the heat generating capacity of the boiler. Only for 2018 the heat generated surpass the total capacity of the HG.

		2020	2019	2018	2017
LOCy	hrs	8,388	8,496	8,520	8,544
CAPHG,h	GJ/hr	540	540	540	540
LFC HG,h	%	90%	90%	90%	90%
Heat generating capacity	GJ	4,079,345	4,132,115	4,143,787	4,155,460
Total heat generated	GJ	3,923,570	4,096,741	4,452,314	3,451,443

For 2018 the total heat surpassed the heat generation capacity, as a result, the PP uses the capacity of the generator as restriction limit. The following changes were registered:

Biomass attributable to project activity (for electricity generation) decrease to 594,432 GJ/year from 902,958 GK/year. As a result, the Mix of biomass from external industrial operations, electricity generation decrease 38,727 BDt/year from 58,827 BDt/year.

Total emissions $BE_{BR,B1/B3,y}$ decrease to 14,942 tCO2/year from 22,697 tCO2/year, being a conservative adjustment from avoidance emissions approach.

Documents provided by Project Participant	
Thirdparty biomass.xls ER calculation 2020-19-18-17.xls	
DOE assessment	**Date:** 18/09/2023

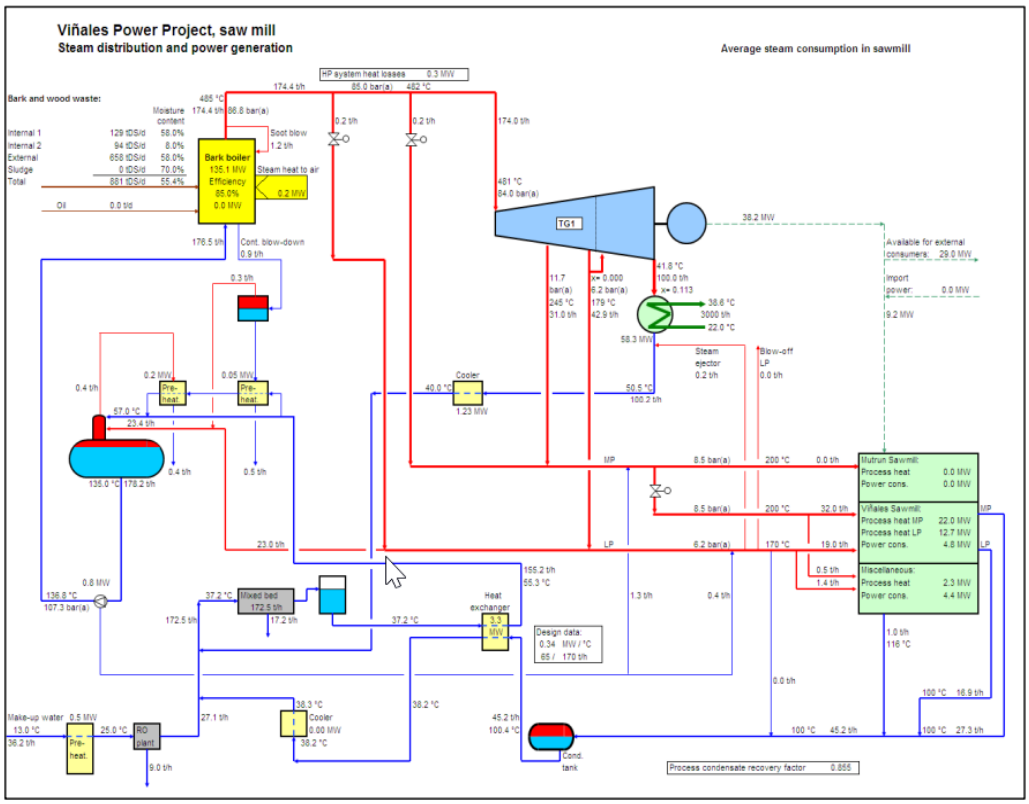
1. The project emissions from freight have been corrected as follows
    a. Tab emissions:
        i. The values form line 238 and 239 are now traceable in the spreadsheet "Thirdparty biomass" where biomass from external sources were adjusted due to calibration delays and then the parameter Df has been re-calculated. **Issue is closed**
        ii. The values form line 240 and 241 are now traceable in the spreadsheet "Thirdparty biomass" where biomass from external sources were adjusted due to calibration delays and then the parameter (∑ Df,m * FRf,m) has been re-calculated. **Issue is closed**
2. .
3. Although it has been observed that for 2018, the heat generator exceeded the total capacity of baseline heat generator and although applied value for the parameter $CAP_{HG,h}$ has been corrected in accordance with PD section 4.1, the verification team observed that the total heat to process, which is the heat that would be required in the baseline scenario also took into account the high pressure heat (see ER calculations spreadsheet, tab emissions, row 129, which also adds row 120). Therefore the calculation remains inconsistent.**Issue remains open.**
4. The adjustment of parameter BR_{B4} as per equation 5, pg 28 of applied methodology has been described in the ER calculations**. Issue is closed**

CAR remains open due to issue #3 above

Project participant response	**Date:** 25/04/2024

3. The previous calculation had an error where the high pressure stream was mistakenly included as part of the process heat, alongside the medium and low pressure streams. To rectify this, the energy provided by the steam currents at medium and low pressure has been taken into consideration. You can refer to the cogeneration plant diagram for more information.

The Viñales project with power generation capacity (cogeneration)



Documents provided by Project Participant	
Heat to process correction v1.2 ER calc 2020-19-18-17 post audit round3.1.2 TR round 1.2	
DOE assessment	**Date:** 26/04/2024

3. During this review process, a calculation error has been observed in the ER calculations spreadsheet: in the tab "emissions", the row 129, calculates the amount of heat to process. Nevertheless, the high pressure steam (row 120) should not be accounted in the heat to process as this heat is used for generating electricity in the project scenario. This high pressure heat is the heat amount generated due to the implementation of the project activity. Therefore, the project participants have excluded the high pressure heat from the calculations of row 129. As a consequence, more heat is attributed to the project activity, and consequently, more biomass is allocated (consumed) due to the project activity. It will result in an increase in Baseline emissions due to aerobic decay or uncontrolled burning of biomass residues ($BE_{BR,B1/B3,y}$). Although the amount of baseline emissions is increasing, the verification team agrees that the calculations were previously wrong and are now correctly adjusted. The verification team has also compared the calculations with previous monitoring periods and confirmed that the calculation is consistent and therefore, accurate. It is also important to point out that the estimated ERs in the PD remains above the achieved ERs, which confirms the inconsistency in the calculations.

CAR is closed

CAR ID	04	**Section no.**	3.3.8	**Date:** 11/08/2022
Description of CAR				
The following calibration delays have not been accounted during the monitoring period:] 1. Weighbridge S/N 152069 from a. 01/01/2017 to 14/02/2017 b. 19/01/2018 to 30/01/2018 c. 04/07/2019 to 29/07/2019 d. 30/01/2020 to 26/02/2020 e. 27/08/2020 to 30/08/2020 2. Laboratory scale TE1502S S/N 27402265 and MA 150C 600 S/N 27008246 a. 11/10/2020 to 12/10/2020				
Project participant response				**Date:** 03/11/2022

Increasing biomass amounts increases methane emissions from controlled biomass burning in the power boiler, thereby increasing project emissions.

The corresponding adjustment were performed to biomass weighted by weighbridges. Results can be found in table below.

Emissions from biomass transportation to the Power Plant			2020	2019	2018	2017	
Total mass of freight transported in freight transportation activity f	$FR_{f,m}$	(wet tons/yr)	415,266	438,844	461,708	376,776	
			420,234	440,881	464,164	379,209	adjustement
Return trip road distance between the origin and destination of freight transportation activity f.(b)	$D_{f,m}$		59.1	58.8	179.6	63.0	
	$D_{f,m}$		59.8	59.4	187.3	64.9	adjustment
Weight average calculation (c)	$\sum D_{f,m} * FR_{f,m}$		15,959,923	14,248,851	21,607,368		
Weight average calculation (c)	$\sum D_{f,m} * FR_{f,m}$	t-km	16,432,352	14,392,607	22,532,592	14,409,469	adjustment
Default CO2 emission factor for freight transportation activity f.	$EF_{CO2,f}$	(g CO2/t-km)	129	129	129	129	
	$PE_{TR,y}$	**(tCO_2eq)**	2,059	1,838	2,787	1,812	
Total emissions	$PE_{TR,y}$	**(tCO_2eq)**	**2,120**	**1,857**	**2,907**	**1,859**	adjustment

Adjustments were made based on the scales' maximum detected error (+/- 2 g) and the error propagation formula for a quotient. To be conservative, moisture values must be lower than measured. The wet sample size is approximately 4 kg and

moisture values are approximately 50 %, i.e. final moisture weight is approximately 2 kg. So to achieve lower/higher moisture values, original values were decreased/increased by a factor equal to [(0,2/2000)+(0,2/4000)]*100=0,015

1.3. BASELINE EMISSIONS							
Note: Table below contains results truncated an ronded down from rows 109 and 144, total baseline emissions.			Total	Total	Total	Total	
Baseline emissions due to minimum grid electricity displacement.	$EL_{BL,GR,y} * EF_{EG,GR}$	(tCO_2)	134,484	140,061	145,077	157,943	
Baseline emissions due to aerobic decay or uncontrolled burning of biomass residues.	$BE_{BR,y}$	(tCO_2)	10,488	21,267	31,373	8,397	
		(tCO_2)	10,371	21,267	31,373	8,397	adjustment
TOTAL BASELINE EMISSIONS		**(tCO_2eq)**	144,973	161,328	176,449	166,340	
			144,855	161,328	176,449	166,340	

Documents provided by Project Participant

Evidence is provided in CAR ID 04

DOE assessment | **Date:** 30/03/2023

1. The delay correction factor has been applied to the project emission due to controlled biomass burning (PE_{BR}) and due to biomass transportation (PE_{TR}). Nevertheless, the adjustment was not carried out for the biomass amount applied to this PE_{BR}. Moreover, biomass is also applied for the calculation of BE_{BR}(biomass due to aerobic decay). Conservative factor due to delay in calibration (decrease in biomass quantity) has not been applied for the BE calculation. **Issue remains open**.
2. Conservative factor due to delay in laboratory scale has been duly applied conservatively for biomasses used in the calculation of PE_{TR}. The application of this factor is duly traceable in the ER calculations spreadsheet. Issue is closed.

CAR remains open

Project participant response | **Date:** 03/11/2022

Conservative factor due to delay in calibration (decrease in biomass quantity) has been applied for the BE calculation with a conservative result of lower baseline emissions due to aerobic decay or uncontrolled burning of biomass residues.

		2020	2019	2018	2017
$BE_{BR,y}$	(tCO_2)	3,316	14,602	14,942	3,197
		3,151	13,872	5,765	3,038

Documents provided by Project Participant

ER calc 2020-19-18-17xls spreadsheet emissions/row 178

DOE assessment | **Date:** 18/09/2023

Correction factor has been duly applied in the ER calculations spreadsheet. The information is traceable in tab emissions, line 173.

CAR is closed

APPENDIX IV: COMPETENCE STATEMENT

Competence Statement			
Name	Marcelo Sebben		
Country	Brazil		
Education	M.Sc. (Sustainable Energy System) B. Eng. (Chemical Engineering)		
Experience	+12.5 Years		
Field	Chemical process industry, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	ACM0001, ACM0002, ACM0006, AM0065, AMS ID, AMS-I.E, AMS-I.C, AM0026, AMS-I.A, AMS-I.F, AMS-III.H, AMS-III.I.		
Local expert	Brazil, Chile, Honduras, Colombia		
Financial Expert	Yes		
Technical Reviewer	Yes		
TA Expert	1.1, 1.2, 4.1, 5.1, 9.1, 13.1		
Reviewed by	Shreya Garg	**Date**	01/03/2018
Approved by	Anshika Gupta	**Date**	01/03/2018

Competence Statement			
Name	Kaviraj Singh		
Country	India		
Education	Ph.D. (Environmental Engineering), IIT Delhi Masters (Energy & Environmental), DAVV Indore		
Experience	15 Years +		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-II.D., ACM0006, AMS-I.A., AMS-I.C., AMS-II.B., AMS-III.H, ACM0002, ACM0001, AM0080, ACM0018, AM0056		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1, TA 13.2)		
Reviewed by	Shreya Garg	**Date**	12/02/2020
Approved by	Anshika Gupta	**Date**	12/02/2020

APPENDIX V: ASSESSMENT OF MONITORED PARAMETERS

1. Biomass residues categories and quantities used in the project activity	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter refers to the biomass categories consumed in the project activity. It is measured continuously during the monitoring period. The following biomasses apply: - Sawdust and bark produced from on-site industrial operations which in absence of PA would be used in heat and power generation on site (B4) and in the PA are used in heat and power generation. - Sawdust and bark produced from on-site industrial operations which in absence of PA would be dumped or burned in open air (B1/B3) and in the PA are used in heat and power generation. - Sawdust and bark produced off-site from third parties industrial operations which in absence of PA would be dumped or burned in open air (B1/B3) and in the PA are used in heat and power generation. - Bark, branches from harvest or pruning produced off-site from forest operations which in absence of PA would be dumped or burned in open air (B1/B3) and in the PA are used in heat and power generation (not consumed during this monitoring period).
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.

standards, or as per the manufacturer's specification?	
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.
Calibration frequency / interval	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.
Is the calibration of measuring equipment carried out by an accredited person or institution?	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.
Is(are) the calibration(s) valid for the entire reporting period?	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Each biomass category has its corresponding monitoring equipment. Refer to the parameters below.
How were the values in the monitoring report verified?	Refer to each biomass description in the parameters below
If applicable, has the reported data been crosschecked with other available data?	The information was cross checked against the information observed during on-site visit, interviews performed, data system analysis (SAP system) and information used in the previous monitoring periods/33/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct and conservative data has been transferred to the monitoring report
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

2. **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.**	
Criteria/Requirements	**Assessment Observation**

Measuring / Reading / Recording frequency	This parameter refers to the quantity of available biomass from the consumed biomass types in the geographic region of the project activity. Considering that no new biomasses are consumed in the project activity, the analysis of quantity of biomass used in the defined region is not needed as already has been carried out at validation phase and, according to the monitoring plan, only need to be monitored in case of new biomasses types are included.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes. Only at the beginning of crediting period or in case any other biomass type is included in the PA.
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A

How were the values in the monitoring report verified?	The information has been checked at the on-site inspection, interviews carried out with project participants and previous monitoring reports.
If applicable, has the reported data been crosschecked with other available data?	The information has been checked at the on-site inspection, interviews carried out with project participants and previous monitoring reports
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes.
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

3. $BR_{PJ,n,y}$ - Quantity of biomass residues of category n used in the project activity in year y (tonnes on dry-basis)	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the amount of biomass residue consumed in the project activity: it corresponds to the following biomass types: - Sawdust and bark produced from on-site industrial operations which in absence of PA would be used in heat and power generation on site (B4) and in the PA are used in heat and power generation. - Sawdust and bark produced from on-site industrial operations which in absence of PA would be dumped or burned in open air (B1/B3) and in the PA are used in heat and power generation. - Sawdust and bark produced off-site from third parties industrial operations which in absence of PA would be dumped or burned in open air (B1/B3) and in the PA are used in heat and power generation. - Bark, branches from harvest or pruning produced off-site from forest operations which in absence of PA would be dumped or burned in open air (B1/B3) and in the PA are used in heat and power generation (not consumed during this monitoring period).

	For each category above, the biomasses are measured as follows: - Sawdust and bark produced from on-site industrial operations transported to the project activity through pneumatic duct (sunder dust) – $BR_{PJ,1,y}$. - Sawdust and bark produced from on-site industrial operations transported to the project activity through trucks and measured at weighbridge – $BR_{PJ,2,y}$. - Sawdust and bark produced from off-site industrial operations transported to the project activity through trucks and measured at weighbridge – $BR_{PJ,3,y}$. - Bark, branches from harvest or pruning produced off-site from forest operations and transported to the project activity through trucks and measured at weighbridge – $BR_{PJ,4,y}$. (not consumed during this monitoring period)
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes. For parameter transported through pneumatic ducts, its quantity is calculated as per PDD pg 113. For parameters transported by trucks, it is measured every truck entrance (valid for on-site and off-site biomass)
Monitoring equipment	<u>Sawdust and bark transported by pneumatic duct:</u> no equipment is applied. Quantity is estimated as per PDD pg 113 calculated by internal provider. The information is direcly provided in SAP. The value is transformed from m^3ST to ton by project participants, by applying wood density/13-2/ and conversion from m^3St (estero m^3) to solid m^3/13.3/ <u>Sawdust and bark procuded on-site and off-site transported by trucks:</u> Type: Weighbridge 1 GSE 460 Accuracy class: Class III (+/- 30kg) Serial number: 152069
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national	Yes. Refer to the equipment description above

standards, or as per the manufacturer's specification?	
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
Calibration frequency / interval	Every 6 months (biannual) for weighbridge
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes.
Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes
Is(are) the calibration(s) valid for the entire reporting period?	Refer to Appendix VI below
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	yes
How were the values in the monitoring report verified?	For the biomass transported by pneumatic ducts, the calculation has been checked/13-5/ and for the quantities measured at weighbridges, the measuring procedure has been followed during the site visit: information is completed at every entrance and transferred to a electronic spreadsheet. This data is then aggregated and stored at company's server. The information has been checked directly at company's server.
If applicable, has the reported data been crosschecked with other available data?	The cross-check of data was based on the boiler efficiencies obtained from energy and mass balance and compared to the provider's information.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

4. $BR_{B4,n,y}$: Quantity of biomass residues of category k used in the project activity in year y for which the baseline scenario is B4 (tonnes on dry-basis)	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the amount of biomass residues to which baseline scenario's fate is B4 (used for generating heat/power) and which is consumed in the project activity. The actual amount of biomass that would be consumed in the baseline scenario is calculated based on the amount of steam (heat) consumed by the sawmill process, which, in the baseline scenario would be consumed anyways. Therefore, the amount of biomass B4 consumed is calculated based on the amount of heat to process and the amount of biomass needed for generating this heat.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Although all biomass is duly measured/calculated as determined in the parameter BR_{PJ} above, the amount of biomass with fate B4 is calculated based on the amount of biomass needed for generating the heat required by the process. Therefore, no measuring equipment is applied.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A

Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	The values were compared to the ones obtained in the calculation spreadsheet.
If applicable, has the reported data been crosschecked with other available data?	The cross-check of data was based on the boiler efficiencies obtained from energy and mass balance and compared to the provider's information.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applied.

5. $BR_{B1/B3,n,y}$: Quantity of biomass residues of category n used in the project activity in year y for which the baseline scenario is B1 or B3 (tonnes on dry-basis)	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the amount of biomass residues to which baseline scenario's fate is B1/B3 (dumped or burned in open air) which is consumed in the project activity. The actual amount of biomass that is consumed in the PA but would be dumped or burned in open air is calculated based on the amount of biomass consumed in the PA which exceeds the amount needed for generating steam (heat) for the sawmill process, which, in the baseline scenario would be consumed anyways. Therefore, the amount of biomass B1/B3 consumed is calculated based on the total amount of biomass consumed by the project activity minus the amount of biomass needed for generating heat to process (fate B4).

Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Although all biomass is duly measured/calculated as determined in the parameter BR_{PJ} above, the amount of biomass with fate B1/B3 is calculated based on the total amount of biomass consumed by the project activity minus the amount of biomass needed for generating heat to process (fate B4). Therefore, no measuring equipment is applied.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	The values were compared to the ones obtained in the calculation spreadsheet.
If applicable, has the reported data been crosschecked with other available data?	The cross-check of data was based on the boiler efficiencies obtained from energy and mass balance and compared to the provider's information.

Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applied.

6. $BR_{B5/B8,n,y}$: Quantity of biomass residues of category n used in the project activity in year y for which the baseline scenario is B5, B6, B7 or B8 (tonnes on dry-basis)	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the amount of biomass residues to which baseline scenario's fate is B5, B6, B7 or B8 (consumed in other sites for power/heat generation, generation of biofuels, used for non energy purposes or fate not clearly identified). These biomasses fate are not foreseen in the project description and have not been observed during this monitoring period.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	N/A
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A

Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	N/A
If applicable, has the reported data been crosschecked with other available data?	N/A
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	N/A
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

7. $EF_{FF,y,f}$: CO2 emission factor for fossil fuel type f in year y.	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the CO2 emission factor of the fossil fuel consumed in the PA. As no information from fuel supplier was provided, IPCC default value at the upper limit of the uncertainty at a 95% confidence was used for determining this parameter. The fuels consumed in the project activity are diesel and LPG.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A

Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Values were compared to the IPCC data.
If applicable, has the reported data been crosschecked with other available data?	Not applied as default values were used in the calculation.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

8. $EF_{CH4,BR}$: CH_4 Emission factor for the combustion of biomass residues in the project plant	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter is determined by the applied methodology, therefore, no monitoring is carried out.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	yes

Monitoring equipment	No equipment is applied as this parameter is determined by applied methodology
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applied.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applied
Calibration frequency / interval	Not applied
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applied
Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applied
Is(are) the calibration(s) valid for the entire reporting period?	Not applied
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applied
How were the values in the monitoring report verified?	Values from methodology were checked and compared to the ones reported in the ER calculations and MR.
If applicable, has the reported data been crosschecked with other available data?	Not applicable
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

9. $EF_{CO2,LE}$: CO_2 Emission factor of the most carbon intensive fossil fuel used in the country	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	Parameter is to be determined in case leakage is to be accounted. As observed in the registered PDD, no leakage is to be accounted for the mentioned biomasses. Moreover, no new biomass type is being consumed in the project activity. Therefore, this parameter is not applicable.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes. Only in case leakage is applicable
Monitoring equipment	Not applied
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applied.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applied
Calibration frequency / interval	Not applied
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applied
Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applied
Is(are) the calibration(s) valid for the entire reporting period?	Not applied
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applied
How were the values in the monitoring report verified?	Value refer to the emission factor of Gas Coke and lignite Coke. Nevertheless, it is not applicable in the current monitoring period.

If applicable, has the reported data been crosschecked with other available data?	Not applicable
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Not applicable
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

10. $HC_{BL,y}$: Baseline process heat generation in year y (GJ).	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter refers to the amount of heat to process produced by the project activity. Considering that biomass would be consumed in the baseline scenario for heat generation, this parameter is measured to determine the quantity of biomass that would have been consumed in the baseline scenario and discount it from baseline emissions.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes. Parameter is measured continuoulsly
Monitoring equipment	<u>Power Boiler High pressure line</u> TAG: 663-PT-0155 Type: pressure gauge transmitter ENDRESS + HAUSER Accuracy class: ±0.075% Serial number: D500C90109C TAG 663-FT-0156 Type: flow transmitter ENDRESS + HAUSER Accuracy class: ±0.075% Serial number: D501F50109D TAG 663-TT-0157

	Type: temperature transmitter ENDRESS + HAUSER Accuracy class: ±0.05% Serial number: 0266161 TAG: 665-PT-9040-A/B Type: pressure gauge transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number: 0032601(A)-0032602(B) TAG 665-FT-9030 Type: flow transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number: 0033712 TAG 665-TT-9043-A-B Type: temperature transmitter ROSEMOUNT Accuracy class: ±0.03% Serial number: 0271902(A)-0219846(B) <u>Power Boiler Medium pressure line</u> TAG: 665-PT-9001-A-B Type: pressure gauge transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number: 0032561(A)- 0032562(B) TAG: 665-FT-9025 Type: flow transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number: 0033711

	TAG 665-FT-9051 Type: flow transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number: 0033713 TAG 665-TT-9026 Type: temperature transmitter ROSEMOUNT Accuracy class: ±0.03% Serial number: 0271897 **Power Boiler Low pressure line** TAG: 665-PT-9002-A-B-C Type: pressure gauge transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number: 0032598(A)-0036244(B)- 0032600(C) TAG: 665-FT-9019 (steam) Type: flow transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number 0033709 TAG 665-FT-9023 (deaerator steam) Type: flow transmitter ROSEMOUNT Accuracy class: ±0.05% Serial number: 0033710 TAG 665-TT-9024

	Type: temperature transmitter ROSEMOUNT Accuracy class: ±0.03% Serial number: 0271896 **Power Boiler feed water line** TAG: 663-PT-0106 Type: pressure gauge transmitter ENDRESS + HAUSER Accuracy class: ±0.075% Serial number: D500BE0109C TAG: 663-TT-0111 Type: temperature transmitter ROSEMOUNT Accuracy class: ±0.03% Serial number 0265913
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. Check each equipment above and evidences in appendix I.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
Calibration frequency / interval	Temperature transmitters: 2 years Pressure transmitters: 18 months Flow transmitters: 18 months For calibration details, refer to calibration table below this section.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	For calibration details, refer to calibration table below this section.

Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes.
Is(are) the calibration(s) valid for the entire reporting period?	Yes
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
How were the values in the monitoring report verified?	Values extracted from DCS system have been checked agains data provided at the ER calculations spreadsheet.
If applicable, has the reported data been crosschecked with other available data?	Values have been cross-checked against biomass boiler energy balance
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. QA/QC procedures have been duly applied for obtaining the data.
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applied

11. $EL_{PJ,gross,y}$: Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year.	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter is measured continuously by one electricity meter and corresponds to the total electricity generated by the turbogenerator. The data is recorded in the Company system and aggregated by DCS.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	yes
Monitoring equipment	TAG N°: 8600-10 Type: Electricity meter Schneider Electric ION 8600 Accuracy class: 0.2% Serial number: LT-1012A701-01

Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. Refer to the equipment description above
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
Calibration frequency / interval	7 years For further details regarding each equipment refer to Appendix 5 below
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes.
Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes
Is(are) the calibration(s) valid for the entire reporting period?	Refer to table below this section
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	yes
How were the values in the monitoring report verified?	Data applied in the ER calculations was checked against data aggregated from DCS system.
If applicable, has the reported data been crosschecked with other available data?	Data was cross-checked with electricity sales report and generation index (quantity of electricity generated over fuel fired - MWh/tDS). And this amount was compared to the values from previous periods.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

12. $EL_{PJ,imp,y}$: Project electricity imports from the grid in year y (MWh)	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter is measured continuously by two electricity meter and corresponds to the total electricity imported by the PA from the grid. The data is recorded in the Company system and aggregated by DCS.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	yes
Monitoring equipment	TAG N°: 52-B1 (import power measurement) Type: Electricity meter Schneider Electric ION 8600 Accuracy class: 0.2% Serial number: PT-1012A934-01 TAG N°: 52-B1 (sawmill consumption) Type: Electricity meter Schneider Electric ION 8600 Accuracy class: 0.2% Serial number: PT-1010A242-01
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. Refer to the equipment description above
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
Calibration frequency / interval	7 years For further details regarding each equipment refer to Appendix 5 below
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in	Yes.

accordance with the local/national standards, or as per the manufacturer's specifications?	
Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes
Is(are) the calibration(s) valid for the entire reporting period?	Refer to table below this section
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	yes
How were the values in the monitoring report verified?	Data applied in the ER calculations was checked against data aggregated from DCS system.
If applicable, has the reported data been crosschecked with other available data?	Data was cross-checked with purchase reports.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

13. $EL_{PJ,aux,y}$: Total auxiliary electricity consumption required for the operation of the power plants at the project site in year y.(MWh)	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter is measured continuously by six electricity meters and corresponds to the electricity consumption by the following equipment: - Management of biomass residues; - Power boiler; - Administration building. - Pneumatic transportation from sawmill and remanufacturer plants to the project activity (this value is calculated as per PDD pg 94) The measured data is recorded in the Company system and aggregated by DCS and the pneumatic consumption is directly calculated in the ER calculations spreadsheet.

Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	yes
Monitoring equipment	Viñales_1_6_Manejo_Desechos_Comb TAG: 669-EI-1603/1604 (1-6) Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A261-02 Accuracy: +/- 0.2% Viñales_1_7_CP_Caldera_Poder TAG: 669-EI-1703/1704 (1-7) Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A263-02 Accuracy class: +/- 0.2% Viñales_1_8_CP_Caldera_Poder TAG: 669-EI_1803/1804 (1-8) Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A264-02 Accuracy class: +/- 0.2% Viñales_1_9_CP_Caldera_Poder TAG: 669-EI-1903/1904 (1-9) Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A262-02 Accuracy: +/- 0.2% Viñales_1_11_Barra_1B_Ed_Administración TAG: 669-EI-1703/1804 (1-11)

	Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A265-02 Accuracy: +/- 0.2%
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. Refer to the equipment description above
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
Calibration frequency / interval	7 years. For details regarding each equipment refer to the equipment description above
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes.
Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes
Is(are) the calibration(s) valid for the entire reporting period?	yes
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	yes
How were the values in the monitoring report verified?	Data applied in the ER calculations was checked against data aggregated from DCS system.
If applicable, has the reported data been crosschecked with other available data?	Data was cross-checked with energy balance from plant compared to the electricity invoices/21/.
Does the data management ensure correct transfer of data and reporting of emission	Correct and conservative data has been transferred to the emission reduction calculations

reductions and are necessary QA/QC processes in place?	
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	The electricity consumed by the biomass crusher is not being measured during this monitoring period and therefore a temporary deviation is being requested. Refer to the validation report on PRC for further details.

14. $NCV_{BR,n,y}$: Net calorific value of biomass residues of category n in year y (GJ/tonne of dry-basis).	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the net calorific value of each biomass consumed in the PA. It is measured by external laboratory based on international standards every 6 months, as per monitoring plan.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement[/34/]. Thus, equipment verification was not conducted by the verification team.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement. Thus, equipment verification was not conducted by the verification team.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement. Thus, equipment verification was not conducted by the verification team.
Calibration frequency / interval	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement. Thus, equipment verification was not conducted by the verification team.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement. Thus, equipment verification was not conducted by the verification team.

accordance with the local/national standards, or as per the manufacturer's specifications?	
Is the calibration of measuring equipment carried out by an accredited person or institution?	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement. Thus, equipment verification was not conducted by the verification team.
Is(are) the calibration(s) valid for the entire reporting period?	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement. Thus, equipment verification was not conducted by the verification team.
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	The monitoring equipment is controlled by the external laboratory with is duly accredited for this measurement. Thus, equipment verification was not conducted by the verification team.
How were the values in the monitoring report verified?	The values were verified in the analysis report and compared to the ones applied in the ER calculations.
If applicable, has the reported data been crosschecked with other available data?	As per monitoring plan, the measured data is to be cross-checked against data from previous monitoring period or IPCC. The reported data was cross-checked with data from previous monitoring period and the range from IPCC data. The values were similar to previous monitoring periods/33/. And to the data not available in previous MP, the obtained data was within IPCC range.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

15. **Moisture content of each biomass residue type k**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter corresponds to the moisture content of all biomasses consumed in the PA. As the biomasses are accounted in dry basis (unit BDt - bone dry tonne), the moisture content is used for this transformation (wet to dry basis).

	The moisture content of each biomass residue generated externally internally are measured in internal laboratory by sampling. Samples are taken with 95% confidence level as it could be observed in the analyisis procedure/13-7/.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Electronic moisture analyzer Sartorius MA150C Accuracy class: Class I/+/-0.001 gr. Serial number: 27008246 Laboratory Oven MEMMERT UFE 600 Accuracy class: +/- 0.5% Serial number: G611.0831 Laboratory Digital scale Sartorius TE1502S Accuracy class: 0.01gr Serial number: 27402265
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. For internal equipment refer to above for each equipment
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
Calibration frequency / interval	12 months calibration frequency for oven and for scales For calibration dates refer table below for details.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes

Is the calibration of measuring equipment carried out by an accredited person or institution?	yes
Is(are) the calibration(s) valid for the entire reporting period?	For calibration dates refer table below for details
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
How were the values in the monitoring report verified?	Results from laboratory analysis were compared to the ones used in the ER calculations. The results were directly checked at the monitoirng spreadsheets completed by laboratory analists.
If applicable, has the reported data been crosschecked with other available data?	No cross-check is required by the monitoring plan as measurements are conducted frequently and any inconsistency is mitigated by the application of weighted average in the results.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

16. $P_{,y}$: Quantity of main product of the productin process produced in year y from plants operated at teh project site	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter refers to the amount of products produced by plants operated at the project site. According to the applied methodology, This parameter is used to address the uncertainty of the allocation of biomass under fate B4 (used in the baseline scenario). This parameter is monitored continuously by the production plant (sawmill and remanufacturing plant)
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Not applicable as the parameter directly provided by sawmill/remanufacturing.
Monitoring equipment	Not applicable as the parameter directly provided by sawmill/remanufacturing.

Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable as the parameter directly provided by sawmill/remanufacturing.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable as the parameter directly provided by sawmill/remanufacturing.
Calibration frequency / interval	Not applicable as the parameter directly provided by sawmill/remanufacturing.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable as the parameter directly provided by sawmill/remanufacturing.
Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable as the parameter directly provided by sawmill/remanufacturing.
Is(are) the calibration(s) valid for the entire reporting period?	Not applicable as the parameter directly provided by sawmill/remanufacturing.
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable as the parameter directly provided by sawmill/remanufacturing.
How were the values in the monitoring report verified?	The values have been directly obtained from SAP system.
If applicable, has the reported data been crosschecked with other available data?	The value has been compared to the one registered as fixed parameter to the maximum design potential.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Not applicable for this parameter
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

17. **LOC_y: Length of the operational campaign in year y (hour)**

Criteria/Requirements	Assessment Observation
Measuring / Reading / Recording frequency	The parameter is obtained in the DCS by discounting from the whole campaign the plant stoppage (one per year) and other significant incidents. Values were available in the DCS system. The measurement of the parameter is in accordance with procedure required by the applied methodology
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Not applicable. The parameter is based on the DCS time measurement.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Values were checked against information provided in the DCS system and stoppage reports/26/

If applicable, has the reported data been crosschecked with other available data?	No cross-check is required by the monitoring plan.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

18. **$FC_{i,j,y}$: Quantity of fuel type i combusted in process j during the year y.**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to all fossil fuel consumed due to the project activity. Two fuel types are applicable: - Diesel oil: consumed in the biomass boiler (startup, operational constraints) and for internal transportation - Propane (LPG): consumed in the biomass boiler (start up) <u>Biomass boiler</u> 1. Diesel consumed is measured continuously and aggregated by system DCS. All fuel consumption will be accounted and applied in the project emissions 2. LPG consumption is not measured. Nevertheless, the project participants estimate its consumption based on the diesel consumption as follows: LPG = diesel/625. This approach is based on historical information from plant and is duly accepted for the National Energy Balance by the National Commission of Energy (CNE) <u>Internal Biomass transportation</u> Diesel is consumed in the project activity for on-site transportation of biomass to power boiler.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes

Monitoring equipment	<u>Diesel monitored in the biomass boiler.</u> *663-FT-0508* *Type: Fossil fuel flow transmitter. Endress+Hausser 83F40-AABSAAACBAAK* *Accuracy class: +/- 0.1%* *Serial number: D606EA16000* *663-FT-0522* *Type: Fossil fuel flow transmitter. Endress+Hausser 83F25-AABSAAACBAAK* *Accuracy class: +/- 0.5%* *Serial number: D606E916000*
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Valid for entire range
Calibration frequency / interval	5 years. For the calibration dates, refer to table below
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	yes
Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes
Is(are) the calibration(s) valid for the entire reporting period?	Check details in table below this section
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes

How were the values in the monitoring report verified?	Diesel consumed in boilers the data was verified in the DCS system. The LPG consumption was based on diesel consumption and therefore, the calculations were checked. Diese consumed from biomass transportation has been obtained from service providers
If applicable, has the reported data been crosschecked with other available data?	For boilers, the consumption was cross-checked with energy and mass balances. From biomass providers, the data was cross-checked within the years in order to check consistency. It could be observed that the consumption index (Lts/hour) is consistent, and therefore, the informed quantities are coherent.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to MR. All QA/QC procedures are in place.
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

19. **$NCV_{i,y}$: Weight average net calorific value of fuel type i in year y.**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the NCV of the fossil fuel consumed in the PA. As no information from fuel supplier was provided, IPCC default value at the upper limit of the uncertainty at a 95% confidence was used for determining this parameter. Furthermore, it is calculated as per “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the	N/A

monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Values were compared to the IPCC data.
If applicable, has the reported data been crosschecked with other available data?	Not applied as default values were used in the calculation.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

20. **$EF_{CO2,i,}$: weighted average CO2 emission factor of fossil fuel type i used in year y.**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the CO2 emission factor of the diesel and LPG consumed in the project activity. IPCC default value at the higher limit of the uncertainty

	at a 95% confidence was used for determining this parameter. Parameter applied in the calculation of project emissions due to fossil fuel consumption.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Values were compared to the IPCC data.
If applicable, has the reported data been crosschecked with other available data?	Not applied as default values were used in the calculation.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes

In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

21. *Df,m* : *Return-trip road distance between origin and destination of freight transportatin activity f in monitoirng period m*	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the average round trip distance of all truck trips that bring Biomass from external sources. The measurement is made through determination of route by satellite map (e.g Google Maps/38/) and the number of trips provided by contractors and checked in the company system (source and type of biomass)
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Not applied. The route distances are measured by software and the trips number is provided by company system.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applied
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applied
Calibration frequency / interval	Not applied
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applied
Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applied

Is(are) the calibration(s) valid for the entire reporting period?	Not applied
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applied
How were the values in the monitoring report verified?	The calculation of parameter was presented to the verification team as well as all sources. The calculation is accurate.
If applicable, has the reported data been crosschecked with other available data?	The distances used in the calculations were compared to the map distances/38/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

22. $FR_{f,m}$: *Total mass of freight transported in freight transportation activity f in monitoring period m*	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the amount of biomass brought from external sources and consumed in the PA. This parameter is used to determine the project emission from freight. The measurements are carried out every truck entrance and registered by the plant operator.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above

Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above
Calibration frequency / interval	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above
Is the calibration of measuring equipment carried out by an accredited person or institution?	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above
Is(are) the calibration(s) valid for the entire reporting period?	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	The equipment applied is the same weighbridge used for measuring the parameter BR_{pj}. Refer to this parameter above
How were the values in the monitoring report verified?	The set of raw data was checked against data provided from company's system.
If applicable, has the reported data been crosschecked with other available data?	The cross-check of data was based on the energy and mass balance of the power boiler.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	Not applicable

23. $FC_{i,m,y}$, $FC_{i,k,y}$: Amount of fossil fuel type i consumed by power plant/unit m and k in year y	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	Parameter corresponds to the amount of fossil fuel consumed by all plants connected to the Chilean grid.

	This information was provided by grid operators (CNE) statistics. Parameter is monitored annually.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	CNE database was checked
If applicable, has the reported data been crosschecked with other available data?	Not applied
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct data has been reported for EFgrid calculations.

In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

24. $NCV_{i,y}$: Net Calorific Value (energy content) of fossil fuel type I in year y.	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	Data from national energy balance was used for this parameter. The values are updated annually. The latest available were used in the calculations. This parameter is used for calculation of grid Emission Factor.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A

How were the values in the monitoring report verified?	The values were checked on the CNE's/11-9/
If applicable, has the reported data been crosschecked with other available data?	Not applicable as official data has been used
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct data has been reported
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

25. $EF_{CO2,I,y}$, $EF_{CO2,m,I,y}$: CO2 emission factor of fossil fuel type i used in power unit m in year y.	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the CO2 emission factor of the fossil fuel consumed in power plants of the grid. IPCC default value at the lower limit of the uncertainty at a 95% confidence was used for determining this parameter. This parameter is used for EF_{grid} calculation.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in	N/A

accordance with the local/national standards, or as per the manufacturer's specifications?	
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Values were compared to the IPCC data.
If applicable, has the reported data been crosschecked with other available data?	Not applied as default values were used in the calculation.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

26. **$EG_{m,y}$, $EG_{k,y}$: Net electricity generated by power plant/ unit m and k in year y.**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	Parameter corresponds to the amount of electricity generated by all plants connected to the Chilean grid. This information was provided by grid operators (CEN – Coordinador Electrico Nacional) statistics. Parameter is monitored annually and is used for EF_{BM} calculation.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national	N/A

standards, or as per the manufacturer's specification?	
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	CEN database was checked
If applicable, has the reported data been crosschecked with other available data?	Not applied
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct data has been reported for EF_{BM} calculations.
In case project participants have temporarily not monitored the parameter, has temporary deviations being applied	N/A

APPENDIX VI: CALIBRATION ASSESSMENT

Parameter	Meter type and S/N	Calibration frequency /18-3/	Accuracy class /18-2/	Calibration dates	Delays
$BR_{PJ,n,y}$, $FR_{f,m}$, $BR_{B1/B3}$, BR_{B4}	Type: Weighbridge 1 GSE 460 Serial number: 152069	6 months	Class III (+/- 30kg)	22.04.2016 15.02.2017 19.07.2017 21.01.2018 31.07.2018 04.01.2019 28.01.2019 22.07.2019 24.02.2020 24.08.2020	Yes 01/01/2017 to 14/02/2017 19/01/2018 to 30/01/2018 04/07/2019 to 29/07/2019 30/01/2020 to 26/02/2020 27/08/2020 to 30/08/2020
$HC_{BL,y}$	TAG: 663-PT-0155 Type: pressure gauge transmitter ENDRESS + HAUSER Serial number: D500C90109C	18 months	±0.075%	10.11.2016 08.11.2017 15.11.2018 12.11.2019 04.12.2020	No
	TAG 663-FT-0156 Type: flow transmitter ENDRESS + HAUSER Serial number: D501F50109D	18 months	±0.075%	10.11.2016 08.11.2017 13.11.2018 18.11.2019 30.11.2020	No
	TAG 663-TT-0157	2 years	±0.05%	10.11.2016 11.11.2017 14.11.2018	No

	Type: temperature transmitter ENDRESS + HAUSER Serial number: 0266161			15.11.2019 03.12.2020	
	TAG: 665-PT-9040-A/B Type: pressure gauge transmitter ROSEMOUNT Serial number: 0032601(A)-0032602(B)	18 months	±0.05%	08.11.2016 11.11.2017 15.11.2018 14.11.2019 03.12.2020	No
	TAG 665-FT-9030 Type: flow transmitter ROSEMOUNT Serial number: 0033712	18 months	±0.05%	08.11.2016 10.11.2017 15.11.2018 15.11.2019 01.12.2020	No
	TAG 665-TT-9043-A-B Type: temperature transmitter ROSEMOUNT Serial number: 0271902(A)-0219846(B)	2 years	±0.03%	08.11.2016 10.11.2017 14.11.2018 15.11.2019 04.12 and 01.12.2020 (A and B)	No
	TAG: 665-PT-9001-A-B Type: pressure gauge transmitter ROSEMOUNT Serial number: 0032561(A)-0032562(B)	18 months	±0.05%	08.11.2016 10.11.2017 14.11.2018 14.11.2019 01.12 and 30.11.2020 (A and B)	No
	TAG: 665-FT-9025 Type: flow transmitter ROSEMOUNT Serial number: 0033711	18 months	±0.05%	12.11.2016 10.11.2017 15.11.2018 15.11.2019 02.12.2020	No
	TAG 665-FT-9051	18 months	±0.05%	11.11.2016	No

	Type: flow transmitter ROSEMOUNT Serial number: 0033713			10.11.2017 14.11.2018 15.11.2019 01.12.2020	
	TAG 665-TT-9026 Type: temperature transmitter ROSEMOUNT Serial number: 0271897	2 years	±0.03%	08.11.2016 10.11.2017 15.11.2018 15.11.2019 04.12.2020	No
	TAG: 665-PT-9002-A-B-C Type: pressure gauge transmitter ROSEMOUNT Serial number: 0032598(A)-0036244(B)-0032600(C)	18 months	±0.05%	14 and 19.11.2015 (A and B) 19.11.2016 10.11.2017 15.11.2018 14.11.2019 05.12.2020	No
	TAG: 665-FT-9019 (steam) Type: flow transmitter ROSEMOUNT Serial number 0033709	18 months	±0.05%	12.11.2016 10.11.2017 14.11.2018 15.11.2019 30.11.2020	No
	TAG 665-FT-9023 (deaerator steam) Type: flow transmitter ROSEMOUNT Serial number: 0033710	18 months	±0.05%	11.11.2016 10.11.2017 16.11.2018 18.11.2019 02.12.2020	No
	TAG 665-TT-9024 Type: temperature transmitter ROSEMOUNT Serial number: 0271896	2 years	±0.03%	08.11.2016 11.11.2017 15.11.2018 15.11.2019 04.12.2020	No
	TAG: 663-PT-0106	18 months	±0.075%	10.11.2016	No

	Type: pressure gauge transmitter ENDRESS + HAUSER Serial number: D500BE0109C			09.11.2017 16.11.2018 12.11.2019 03.12.2020	
	TAG: 663-TT-0111 Type: temperature transmitter ROSEMOUNT Serial number 0265913	2 years	±0.03%	09.11.2016 11.11.2017 15.11.2018 15.11.2019 04.11.2020	No
$EL_{pj,gross}$	TAG N°: 8600-10 Type: Electricity meter Schneider Electric ION 8600 Serial number: LT-1012A701-01	7 years	0.2%	24.12.2010 17.11.2017	No
$EL_{pj,imp}$	TAG N°: 52-B1 (import power measurement) Type: Electricity meter Schneider Electric ION 8600 Serial number: PT-1012A934-01	7 years	0.2%	06.06.2011 17.11.2017	No
	TAG N°: 52-B1 (sawmill consumption) Type: Electricity meter Schneider Electric ION 8600 Serial number: PT-1010A242-01	7 years	0.2%	06.06.2011 17.11.2017	No
$EL_{pj,aux}$	Viñales_1_6_Manejo_Desechos_Comb TAG: 669-EI-1603/1604 (1-6) Brand: Schneider Electric	7 years	+/- 0.2%	12.10.2010 17.11.2017	No

	Model: Ion 7550 Serial number: LI-1010A261-02				
	Viñales_1_7_CP_Caldera_Poder TAG: 669-EI-1703/1704 (1-7) Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A263-02	7 years	+/- 0.2%	12.10.2010 17.11.2017	No
	Viñales_1_8_CP_Caldera_Poder TAG: 669-EI_1803/1804 (1-8) Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A264-02	7 years	+/- 0.2%	12.10.2010 17.11.2017	No
	Viñales_1_9_CP_Caldera_Poder TAG: 669-EI-1903/1904 (1-9) Brand: Schneider Electric Model: Ion 7550 Serial number: LI-1010A262-02	7 years	+/- 0.2%	14.10.2010 17.11.2017	No
	Viñales_1_11_Barra_1B_Ed_Administración TAG: 669-EI-1703/1804 (1-11) Brand: Schneider Electric	7 years	+/- 0.2%	12.10.2010 17.11.2017	No

	Model: Ion 7550 Serial number: LI-1010A265-02				
Moisture content	Electronic moisture analyzer Sartorius MA150C Serial number: 27008246	12 months	Class I /+/- 0.001 gr	26.10.2016 18.10.2017 11.10.2018 11.10.2019 13.10.2020	Yes 11/10/2020 to 12/10/2020
	Laboratory Oven MEMMERT UFE 600 Serial number: G611.0831	12 months	+/- 0.5%	26.10.2016 18.10.2017 11.10.2018 11.10.2019 13.10.2020	Although delays were observed, it refers to a oven and therefore no influence the value of parameter
	Laboratory Digital scale Sartorius TE1502S Serial number: 27402265	12 months	Accuracy class: 0.01gr	26.10.2016 18.10.2017 19.10.2018 11.10.2019 13.10.2020	Yes 11/10/2020 to 12/10/2020
$FC_{i,y}$	*663-FT-0508* *Type: Fossil fuel flow transmitter. Endress+Hausser 83F40-AABSAAACBAAK* *Serial number: D606EA16000*	5 years	*+/- 0.1%*	02.11.2011 12.11.2015 10.11.2016	No
	663-FT-0522 *Type: Fossil fuel flow transmitter.*	5 years	*+/- 0.5%*	02.08.2011 12.11.2015 10.11.2016	No

	Endress+Hausser 83F25-AABSAAACBAAK *Serial number: D606E916000*				