PROJECT REVIEW REPORT

This project review report includes findings raised during Verra's review of the project specified below. The VVB must address the findings before the project request can be considered for approval by Verra. The project review report will be made publicly available on the Verra Registry. Confidential information may be provided in separate attachments.

Project ID	1186
Project Name	Viñales biomass power plant
Review Type	Verification Approval
Program(s)	VCS Program
Verification Period	01/01/2017 – 31/12/2020
Project Proponent	Celulosa Arauco y Constitución S.A.
Methodology	ACM0006: Consolidated methodology for electricity and heat generation from biomass. V12.1.1.
VVB	Earthood Services Private Limited
Assessment Criteria	VCS Standard, 4.5
Date of First Issue	04/04/2024
Review Conclusion	Approved
Date of Final Issue	04/09/2024

FINDINGS

#	Finding Description	VVB Response	Status
1	Inconsistency in the monitored parameters in the Monitoring Report and Excel Sheet		
	Issue 1. In the first monitored parameter in section 4.2, there are no values for the biomass residues categories and quantities used in the project activity for residues category 2. 2. The amount of biomass consumed i.e., $BR_{PJ,1,y}$, $BR_{PJ,2,y}$, $BR_{PJ,3,y}$ and $BR_{PJ,4,y}$ indicated in monitored parameters are inconsistent with values shown in the ERR sheet. for example, tab 2020, rows B33:B39. Additionally, the sum in row B40 is not correctly added, as some rows are left out. 3. In row 243 of the Emissions tab, it is unclear how the data is calculated as it lacks the formula. 4. LPG is reported in lt/yr (2020 Data tab, row 82), while its density is Kg/m3 (Emissions tab, row 95). In calculating emissions associated with LPG use, there is no conversion from KG/m^3 to kg/tonne or conversion from lt/yr to lt/m^3. 5. Determination of $PE_{TR,y}$ is not clear in ERR sheet as the formulas are not traceable. Action Required 1. VVB must ensure that all monitored data is reported per the registered monitoring plan and parameters and that the values are indicated. 2. VVB shall ensure that all monitored data is reported correctly in the monitoring report and is consistent with values indicated in the ERR sheet. 3. The VVB shall ensure that there is clarity of calculated values and the values are traceable for third party auditing.	**Round 1** VVB Response 1. Information duly included by the PP in the section 4.2 in category 2 of the first parameter. As a result, the monitoring report has been updated to reflect the new emission reduction calculations. The values are reported in Dry tonnes (Bdt) and they can be found in the ER calculations spreadsheet, tab “Emissions”, lines 156, 166, 168 and 169 respectively. The values presented in tabs “YYYY data” are in wet tonnes and therefore not suitable for being reported in the Monitoring report section 4.2. 2. It is important to point out that the values presented in the tab YYYY Data, lines 33 to 40 correspond to values actually measured in the weightmeters, i.e, in wet tonnes. In order to convert them to BDt (dry tonnes), the moisture content has been discounted. The values are reported in Dry tonnes (Bdt) and they can be found in the ER calculations spreadsheet, tab “Emissions”, lines 156, 166, 168 and 169 respectively. Regarding the addition of all rows in cell 40 (now 44 and 45 of tab YYYY data), only totals for each biomass type is being measured. For example: in tab 2020 data, line 44 adds line 33 ($BR_{PJ,1}$+$BR_{PJ,2}$), line 40 ($BR_{PJ,3}$) and line 43 ($BR_{PJ,4}$). Line 45 refers to the adjusted up (due to delays in calibration), used for project emission due to transport, which adds line 35 ($BR_{PJ,1}$+$BR_{PJ,2}$), line 40 ($BR_{PJ,3}$) and line 43 ($BR_{PJ,4}$). 3. The details of the calculation are presented in the Excel spreadsheet tabs named YYYY wet tons. The formula is now duly presented in the tab emission, row 240 (former 243). The calculations are considered accurate. 4. An error has been identified in reporting LPG density unit in the cell D95 of tab “emissions”. The correct unit of	Closed

	4. The VVB must ensure that all values are reported either in mass or volume, correct conversion is done and only one single unit of measurement is applied. 5. The VVB shall ensure that all calculated values are traceable, and the formulas are transparently applied. For single inputted values, the data sources must be provided. <u>Program Rule(s)</u> VCS Monitoring Report Template, v4.2; Section 4.2. VCS Standard, v4.5; Section 2.2.1.	measurement is kg/lt, not kg/m3. The unit has been corrected and no change in the calculations are needed. The verification team agrees that the density is actually reported in Kg/lt, considering it refers to liquid Petroleum gas in liquid phase. The cell calculations in ERR remain unchanged. 5. The details of the calculation are presented in the Excel spreadsheet tabs named YYYY wet tons and then transferred to the tab “Emissions”, row 240 (former 243) where the formula is duly presented. The calculations are considered accurate by the verification team. The source of data has been duly checked during the audit process. 6. During this review process, a calculation error has been observed in the ER calculations spreadsheet: in the tab “emissions”, the row 129, that calculates the amount of heat to process. 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 are increasing, the verification team agrees that the calculations were previously wrong and are now correctly adjusted, in accordance with applied methodology and PD. The verification team has also compared the calculations with previous monitoring periods and confirmed that the calculations are consistent and therefore, coherency has been reached. A finding has been raised. For details, refer to CAR 03, item 3, in the verification report for details.	

		Verra Response 1. The PP has clarified that data on biomass consumption are reported on a wet basis in the ER sheet and then converted to a dry basis. The issue is closed. 2. The PP has clarified how the data is presented. With this clarification, a third-party audit of the calculation is now possible. The issue is closed. 3. The ERR sheet is now updated, and formulas have been added to enable auditing. The issue is closed. 4. The LPG measurement unit has been corrected to kg/lt. The issue is closed. 5. The ERR sheet is now corrected, and the data applied is linked for traceability. The issue is closed. 6. The justification provided for revising the ERR sheet formula is accepted. However, upon review, it is established that the total heat generated by the project (i.e., heat for electricity and process) in row 142 should be equal to the sum of row 129 + 120. Instead, the cross-checks do not provide the same value. The issue is open. **Round 2** VVB Response First of all, it is important to highlight that both values refer to different parameters: one is total heat to process at heat demand side (sum of row 129 + 120) and the other refers to total heat generated by biomass (row 142). As observed during the audit process and by checking the monitored parameters, the energy obtained from the steam (sum of row 129 + 120) has been determined by the enthalpy difference (T,P) of the high, medium, and low steam currents. From the operating pressure and set point temperature, the enthalpy of each steam line has been determined. As it could be observed	

		through interviews to the PP and confirmed in the on-site inspection by checking the steam diagram, this energy corresponds the amount contributed to the system, but there is still some energy remaining in the water entering the boiler, which will be converted into steam again. This feed water heat is being duly discounted in the rows 123 and 127 as required by applied methodology Step 1.1. The information could be duly checked directly at company's system and therefore, could be validated during the verification process. The total energy (row 142) is calculated based on the biomass quantity and its calorific value, which are consistently monitored and also duly checked for consistency by the verification team. Moreover, they are multiplied by heat generator efficiency, which is based on fixed data. Therefore, it is expected a difference between the measurements of high, medium and low-pressure steam generation and total steam accounted from biomass combustion. In other words, biomass energy (row 142) represents the overall primary energy, while steam energy (sum of row 129 + 120) is a significant component of this total energy. As mentioned earlier, any energy not utilized by the system is returned in the boiler feed water. (see calculations from rows 124 and 128 from ERR sheet) Therefore, it is clear to the verification team that it is expected that the total heat generated by high, medium and low pressure differs from the total energy estimated from biomass combustion. And that is why, minimum value from both measurements have been chosen to determine "Baseline emissions due to aerobic decay or uncontrolled burning of biomass residues" and as duly evidenced in row 152.	

		The calculations are considered accurate and in accordance with applied methodology by the verification team. No changes in neither FVR nor in the ER calculations or MR were needed due to this clarification.	
		Verra Response The VVB has clarified how the energy balance and the total energy is determined and the reason why it differed from the estimated total energy. The explanation provided is accepted. The issue is closed.	
		Round 3	
		VVB Response (Pending)	
		Verra Response (Pending)	

2	Omissions in the Verification Report		
	Issue 1. In section 2.1 of the verification report, the VVB has not mentioned the documents and version numbers of the documents reviewed. 2. The Uruguayan grid is mentioned on page 91 of the Verification report. Action Required 1. VVB shall update the verification report and provide the correct documents and their corresponding version number of the final documents reviewed. 2. The VVB shall confirm the rationale for referencing the Uruguay grid system. Program Rule(s) VCS Standard, v4.5; Section 2.2.1.	**Round 1** VVB Response 1. In order to be effective and avoid cross-referencing errors, the verification team only includes the list of documents reviewed as well as their version in Appendix I of the report. Information has been duly referenced in the section 2.1 as required by reviewer. 2. The typographic mistake has been corrected. The relevant grid has been mentioned in this section. Verra Response 1. The reference to documents reviewed has been provided. The issue is closed. 2. The VVB has updated the VR and mentioned the correct national grid system to which the project is connected. The issue is closed. **Round 2** VVB Response (Pending)	Closed

		Verra Response (Pending)	
		Round 3	
		VVB Response (Pending)	
		Verra Response (Pending)	