GS ID (s)	GS6598
Title of Project	Water for Climate Rwanda Project
Name of VVB	Carbon Check (India) Private Limited
Date and version of the report	31/01/2022, version 02.0
Assessment Team	Team Leader: Vikash Kumar Singh Local Assessor: Rogers Muganga Technical Reviewer: Amit Anand Approver: Amit Anand

The PP (CO2logic) has appointed Carbon Check (India) Private Ltd. (CCIPL, VVB), to perform the validation of the Post Registration Changes to the project "Water for Climate Rwanda Project" (GS ID GS6598 hereafter "Project"):

Details of Proposed Design Change

The PDD of GS6598 mentions that the f_{NRB} can be updated at any time during the crediting period. The project participants with this Design Change Memo request to update the f_{NRB} value from 89.68% to 98.00%. The new value has been calculated by a third party based on CDM Methodological Tool: Calculation of the fraction of non-renewable biomass (v3.0).

f_{NRB}- The value of this ex-ante parameter has been changed to following:

Previous Value	Revised Value
0.8968	0.98

VVB Assessment:

PP has contracted an Independent party "C4Ecosolutions" for a study and calculation of f_{NRB} as per CDM Methodological Tool: "Calculation of fraction of non- renewable biomass" (v03.0). Validation team confirms that it has checked f_{NRB} calculation report/spread sheet /04/ prepared by C4Ecosolutions.

As per the applied methodological, In the case of ex ante calculation of $f_{NRB,}$ the parameter f_{NRB} shall be estimated using the most recent historical year for which data is available. Review of f_{NRB} report /04/ prepared by C4Ecolution revealed that all the data used for the calculation is latest available data at the time of validation.

Review of f_{NRB} calculation report/spread sheet /04/ prepared by C4Ecosolutions reveals that the estimation of woody biomass consumption was derived from the UN Statistics Division wood Consumption and population statistics, in combination with the national average per capita woody biomass consumption. Charcoal consumption converted to the equivalent wood biomass by the use of IPCC default factor and the wood volume converted to metric tonnes using the FAO default conversion factor.

The domestic woody biomass consumption was estimated by multiplying the reported per capita consumption of fuelwood and charcoal by the 2018 population, disaggregated by urban and rural household areas and validated based on UN Statistics Division data. Per capita fuelwood demand is greater than that of charcoal across all households, with rural households consuming fuelwood at a greater rate than urban. The non-domestic woody biomass consumption estimates provided by the UN Statistics Division have been conservatively applied, disregarding the additional deforestation likely occurring because of shifting agriculture and from informal or illegal harvesting. This includes consumption by manufacturing, construction, non-fuel industries and transformation in charcoal plants.

Although applying the domestic consumption based on population data and per capita statistics is compliant with the methodological requirements, the results from this are approach are greater than the consumption reported by the UN Statistics Division. To be conservative, the mean between these two estimates have therefore been applied by the third-party report /04/, which is deemed acceptable to the VVB. The validated total woody biomass consumption for Rwanda is conservatively estimated as 15,860,168 t/yr.

In Rwanda only one ecological zone has been found i.e. tropical mountain system and the same was verified by referring the FAO data through web-research. VVB has noted that in the report /04/ geospatial data products for Rwanda were analysed in R22–26 to estimate Rwanda's renewable biomass. The woody cover from all areas defined as "forest" (>10%) cover "other wooded land" (5-10% cover) as well as "other land" (<5% cover), according to the FAO definitions for 2000 and 2018 was estimated using Hansen/UMD/Google/USGS/NASA spatial data, which is derived from Hansen et al.

As no woody cover was excluded from the analysis based on a threshold of minimum cover, disaggregation into the FAO forest categories would have been superfluous. The woody cover was disaggregated according to the FAO global ecological zones and the total woody cover extent was calculated for each ecological zone, within the protected areas and within areas that are either accessible or geographically remote. The woody cover is estimated as a percentage for the whole country within 30 x 30 m resolution grid cells. The woody cover extent for each cell is therefore calculated as the woody cover percentage multiplied its area (0.9 ha).

The default age-weighted mean annual increment (MAI) estimates of each ecological zone, as reported by the IPCC, was used for the study /044, checked and confirmed by the VVB. The proportion of forest stand ages above and below 20 years old were estimated for each ecological zone by extrapolating the observed forest gain extents between 2000 and 2012 to a 20-year period. Where primary forest growth rates are available, they were applied based on the primary forest extent data published by Turubanova et al. The resulting MAI estimate for Rwanda is 1.89 t/ha/year for the tropical mountain system.

Table below provides the validated total, protected and remote forest cover extent, mean annual increment and renewable biomass by ecological zone for the Republic of Rwanda.

Ecological Zone	Total forest cover (ha)	Protected cover (ha)	Remote cover (ha)	MAI (t/ha/yr)	Renewable biomass (t/yr)
Tropical mountain system	552,401	119,924	230,074	230,074	382,778

The difference between woody biomass consumption and renewable biomass is considered to be non-renewable. Non-renewable biomass utilisation in Rwanda is, therefore, validated as 15,477,389 t/yr. The fraction of non-renewable biomass is the quotient of the non-renewable and the total biomass. The fraction of non-renewable biomass for Rwanda is, therefore, validated as 0.98.

From the review of this report/spread sheet /04/ and interviews with the PP and C4 EcoSolutions (Pty) Ltd, validation team's confirms the following:

- The report has been prepared by an independent party (i.e., C4 EcoSolutions (Pty) Ltd.), who is experienced in conducting such study.
- The detailed methodology (including the calculation) of conducting the study has been provided in the report /spread sheet /04/.
- The study has been done in accordance with the CDM Methodological Tool: "Calculation of fraction of non- renewable biomass" (v03.0) including the equitation used and the data source as required by the tool.
- All the reference and data source used for the calculation/study has been listed and assessed by the VVB.

In the opinion of validation team, the calculation of f_{NRB} is correct and in line with the CDM Methodological tool: Calculation of the fraction of non-renewable biomass (v03.0) and thus acceptable to the validation team.

In accordance with the §288 of CDM VVS for PoA (version 03.0), validation team confirms the following:

- The proposed revision ensures that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revision.

The proposed revision complies with all requirements the updated version of the methodology including the standards, methodological tools and guidelines applied in accordance with the updated methodology.

Describe the Impacts of Design Change on the following

a. Additionality

VVB based on review of the revised PDD /01/, confirms that the Design Change does not have any impact on the additionality of the project. The project continues to be considered as deemed additional, since implemented in the LDC country Rwanda.

b. Applicability of methodology and other methodological regulatory documents with which the project activity has been certified

Methodology applicability requirement	Impact of proposed Design Change
This methodology is applicable to programs or activities introducing technologies and/or practices that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of households and non- domestic premises. The methodology is for project technologies/practices that introduce 'zero emission technology' for safe water, instead of boiling water as a purification technique.	No impact, the DC does not alter the project activity in any way.
The project activity is implemented by a project proponent and can include additional project participants. The individual households and institutions do not act as project participants.	No impact, the DC does not alter the governance of the project.
The project boundary needs to be clearly identified, and the technologies counted in the project are not included in another voluntary market or CDM project activity (i.e. no double counting takes place). In some cases there maybe another similar activity within the same target area. Project proponents must therefore have a survey mechanism in place together with appropriate mitigation measures so as to prevent any possibility of double counting.	No impact, the DC does not alter the project boundary.
Technologies each have a continuous useful energy output of less than 150kW per unit (defines as total energy delivered usefully from start to end of operation of a unit divided by time of operation). For technologies or practices that do not deliver thermal energy in the project scenario but only displace thermal energy supplied in the baseline scenario, the 150kW threshold applies to the displaced baseline technology.	No impact, the DC does not affect the project technology nor the useful energy output in the baseline scenario.

The use of baseline technology as backup or auxiliary technology in parallel with the improved technology introduced by the project activity is permitted as long as a mechanism is put into place to encourage the removal of the old technology (e.g. discounted price for the improved technology) and the definitive discontinuity of its use. The project documentation must provide a clear description of the approach chosen and the monitoring plan must allow for a good understanding of the extent to which the baseline technology is still in use after the introduction of the improved technology. For example, whether the existing baseline technology is not surrendered at the time of the introduction of the improved technology, or whether a new baseline technology is acquired and put to use by targeted end users during the project crediting period. The success of the mechanism put into place must therefore be monitored and the approach must be adjusted if proven unsuccessful. If an old technology remains in use in parallel with the improved technology, the corresponding emissions must be accounted for as part of the project emissions.	No impact, the DC does not alter the existing monitoring activities.
The project proponent must clearly communicate to all project participants the entity that is claiming ownership rights of and selling the emission reductions resulting from the project activity. For technology producers and the retailers of the improved technology or the renewable fuel in the project situation, this must be communicated by contract or clear written assertions in the transaction paperwork. If the claimants are not the project technology end-users, the end-users should be informed and notified that they cannot claim for emission reductions from the project. For example, leaflets distributed with the products alerting the end-users to the waiving of their carbon rights in exchange for pricing or the improved technology, which discounts its true cost (waivers forms signed by end- users are another example).	No impact, the DC does not alter the transfer of carbon credits ownership in any way.
Project activities making use of a new biomass feedstock in the project situation (e.g. shift from non-renewable to green charcoal, plant oil or renewable biomass briquettes) must comply with relevant Gold standard specific requirements for biomass related project activities, as defined in the latest version of the Gold standard rules14.	No impact, the DC does not involve the use of new biomass feedstock.
The water in its improved form should be available within 1 km walking/pedaling distance from the households.	No impact, the DC will not alter the distance of 1km between the households (end users) and improved water source.
Special attention is required as to the level of GHG emissions arising from production, transport, installation and delivery of the clean water supply or treatment options.	No impact, the DC will not increase the GHG emissions arising from production, transport, installation and delivery of the clean water supply or treatment options.

Only end users that boil water or are currently using unsafe water are eligible for crediting. Suppressed demand can be applied in instances where inadequate safe water is available or where treatment is not practiced.	No impact, the DC will not alter the end user population.

Also, the revised value of fNRB has been calculated in accordance with NRB Assessment Option (a) Quantitative NRB Assessment as listed in the Annex 1 of the methodology.

VVB based on review of the revised PDD /01/, confirms that the Design Change does not have any impact on the applicability of the methodology. Since the project continues to use the same version of the applied methodology TPDDTEC and complies with all applicability criteria.

c. Compliance with the monitoring plan and the applied methodology

VVB based on review of the revised PDD /01/, confirms that the Design Change is in compliance with the monitoring plan. The f_{NRB} is determined ex-ante (see section B.6.3 of the PDD "Data and parameters fixed ex-ante for monitoring contribution to each of the three SDGs") though as described in the PDD the project proponent may at any time choose to re-examine the f_{NRB} during the crediting period.

d. Level of accuracy and completeness in the monitoring of the project activity compared with the requirements contained in the registered monitoring plan

VVB based on review of the revised PDD /01/, confirms that the Design Change does not have any impact on the level of accuracy and completeness in the monitoring of the project activity compared with the requirements contained in the registered monitoring plan.

e. Project Scale (note suppressed demand rules for large scale)

VVB based on review of the revised PDD /01/, confirms that the Design Change does not have any impact on the project scale. Since the project had been already registered as large-scale project and continues as large-scale project.

f. Stakeholder feedback on design change

VVB based on review of the revised PDD /01/, confirms that the Design Change is not expected to have any impact on the stakeholder's feedback.

g. Sustainable Development Assessment

The PD has undergone changes in the ER calculation sheet as also in the ex-ante estimation of SDG 13 Outcome based on the design change. The Annual average Baseline estimate has been revised from 70,581 tCO2e to 76,607 tCO2e while the Annual average Project estimate has been revised from 11,101 tCO2e to 12,049 tCO2e leading to the revision in Net benefit estimation from 59,480 tCO2e to 64,558 tCO2e.

VVB based on review of revised ER spread sheet /02/ and PDD /01/, confirms that the changes are deemed appropriate and does not have an impact on the Sustainable Development Assessment.

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h. Safeguarding Assessment

VVB based on review of the revised PDD /01/, confirms that the Design Change does not have an impact on the Safeguarding Assessment. Since the design of the project itself does not change, the result of the Safeguarding Assessment of the project are expected to be the same.

i. Legislation

VVB based on review of the revised PDD /01/, confirms that the Design Change does not have any impact on the legislation. The project was and will continue to be in compliance with Rwandan legislation.

The validated ER estimation /02/ due to this design changes is as below:

Emission Reductions before Design Change (as per PDD)	59,480 VERs/year
Emission Reductions after design Change (as per revised PDD)	64,558 VERs/year

Documentation Referred:

No.	Author	Title	References to the document	Provider
/01/	PP	Revised PDD	PDD, version 5.4	CME
/02/	PP	ER calculation, version 3.1	3.1	PP
/03/	PP	Design change Memo	Ver 1.1	PP
/04/	C4Ecosolutions	fNRB calculation spreadsheet and report from C4 Ecosolutions for Rwanda	Rwanda_fNRB Report_24 May 2021 Rwanda_fNRB Calculation Sheet_24 May 2021	PP
/05/	FAO	FAO report/map (FAO. Global ecological zones for FAO forest reporting	--	others
/B01/	UNFCCC	1. CDM VVS for PoAs (Version 03.0). 2. CDM PS for PoAs (Version 03.0) 3. CDM PCP for PoAs (Version 03.0)	http://cdm.unfccc.int/	Others
/B02/	UNFCCC	*Methodological tool: Calculation of the fraction of non-renewable biomass (Version 03.0).*	http://cdm.unfccc.int/	Others
/B03/	IPCC	2006 IPCC Guidelines for National Greenhouse Gas Inventories	https://www.ipcc.ch	Others

Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Noppen	Herman	CO2 Logic	08/09/201	Proposed changes in the PDD	Vikash Kumar Singh Priya Suman
2.	Costenoble	Victor	CO2 Logic	08/09/201	Proposed changes in the PDD	Vikash Kumar Singh Priya Suman
3.	Wet	Ruan de	C4 Ecosolutions	08/09/201	1. Discussion of ecological zone in Rwanda. 2. Calculation process of fNRB including the data and assumption used for the calculation of MAI and RB. 3. Discussion on the methodological equation of tool 30, version 03.0 4. Discussion on the use of GIS image and extrapolation done for the secondary forest cover 5. Discussion of data of population, wood consumption (domestic, other purposes). 6. Discussion of IPCC values used for the growth rate	Vikash Kumar Singh Priya Suman

Revision History

Rev Date	Rev. No.	Brief Details of Changes
10/09/2021	1.0	New document
31/01/2022	2.0	Updated as per revised documents submitted by the PD