



BQS IMPROVED COOKSTOVES FOR BURUNDI'S SCHOOLS



Document Prepared by AERA Group
on behalf of Burundi Quality Stoves S.A.

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

From 25-January 2016 to 31-December-2018, the project activity installed 940 institutional improved cooking stoves (IICS) in 284 schools spread over 16 communes in 4 provinces (Bubanza, Bujumbura, Cibitoke, and Gitega) in Burundi.

They have been supplied with 12,631 tonnes of renewable biomass briquettes over the first monitoring period saving 263,695 tCO₂e.

The IICS come instead of the initially considered ICS designed by the Turkish company SOBAH, which was an indicative choice. The fixed stoves, mostly installed in batches of two or three per school kitchen, have an average thermal efficiency of 44.8% and an average firepower of 32.78 kW_{th}¹.

Compared to the formerly used traditional stoves, the advanced closed design of the institutional improved cookstoves employed in the project allows quicker heating-up, longer cooking and heat retaining with less woodfuel as well as lower combustion fumes:



Figure 1: Picture of baseline situation

v.s.



Figure 2: Picture of project situation

As of 2018/19, the school canteens program benefits 213,240 students, with the following impacts:

- Stimulate schools enrolment in food-insecure areas;

¹ As per CRUEA Water Boiling tests performed on April 14th, 2019.

- Reduce school dropouts;
- Favour children's completion of study cycle

1.2 Sectoral Scope and Project Type

The technology to be implemented by the Project activity falls into Sectoral Scope 1: Energy Industries (renewable sources), as it concerns the provision of briquettes made of renewable biomass waste to schools for cooking activities together with the introduction of improved cooking devices adapted to briquettes consumption. Participating schools (both day schools and boarding schools) are supplied with renewable biomass sources to provide thermal energy and avoid consumption of non-renewable wood fuel.

It falls into Type (I) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts (or an appropriate equivalent). Moreover, the

project falls into Category (C) project activities: thermal energy for the user.

The project is not a grouped project.

Project type	Project category	Output capacity of renewable equipment	Equivalent output capacity of renewable equipment
Type (I): Renewable energy projects	C. Thermal energy for the user	15 MW	45 MWth ²

1.3 Project Proponent

Organization name	Burundi Quality Stoves S.A.
Contact person	M. Pascal Rwemera
Title	Director
Address	Q.Industriel, Av. Nyabisindu, B.P. 5612 Bujumbura, Burundi
Telephone	+257 22259470
Email	info@bqs.bi

² As CDM Project Standard, para. 119 (a), iii

1.4 Other Entities Involved in the Project

Organization name	AERA Group
Role in the Project	Carbon consultant
Contact person	Alexandre Dunod
Title	Head of Certifications
Address	28 Cours Albert 1er, 75008 Paris, France
Telephone	+33 1 42 18 02 02
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1.5 Project Start Date

As per VCS standard V4.2 para 3.7 “The project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals”. Therefore, the project start date is 25-01-2016.

1.6 Project Crediting Period

Start date of the crediting period is 25-January-2016 ending on 24-January-2023 (first crediting period of 7 years).

1.7 Project Location

Host Party: The Republic of Burundi is the host country.

Region/State/Province: All provinces, starting by Bujumbura province.

City/Town/Community etc.: All schools communities' locations, starting by Bujumbura.

Physical/ Geographical location: The project is to take place in schools in Burundi, starting with Bujumbura province. As a reference, Bujumbura city centre's geo-coordinates are 3°22'34" S and 29°21'36" E.

The country-wide geographical area corresponds to the area where renewable biomass is distributed and used in replacement of the former non-renewable woodfuel in IICS.

The list of all participating schools included is provided in Appendix 1.

1.8 Title and Reference of Methodology

The approved baseline and monitoring methodology applied to the project activity is Version 05 of AMS I.E – “Switch from non-renewable biomass for thermal applications by the user”, EB 68.

“Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01)

1.9 Participation under other GHG Programs

The project is registered under the Clean Development Mechanism³ (Project 9791) on 21-September-2020, although its GHG emission reduction will either be claimed under the VCS programme or the CDM programme, never both.

1.10 Other Forms of Credit

n/a, no other forms of credit involved.

1.11 Sustainable Development Contributions

During the monitoring Period, the project has contributed to the following Sustainable Development Goals⁴:

SDG 1.1: Thanks to the distribution of renewable energy (briquettes), in replacement of firewood provided by the students to the schools, around 1,829,707 USD (3,03 USD/year/student), have been saved by the students and their families.

SDG 7.1 : During the monitoring period, 940 IIC have been installed into 284 schools, and 12,631 tonnes of briquettes (renewable energy) have been provided to the schools

SDG 8.5: During the monitoring period, 20 short term jobs and 138 long terms jobs have been generated, with all jobs paid above the minimal monthly wages.

SDG 13: 263,695 tCO₂e have been saved during the current monitoring period as per methodology calculation.

SDG 15.2 : 400 ha of forest equivalent have been saved by the project during this monitoring period. 12,631 tonnes of Briquettes have been distributed while after own calculations, validated by the VVB, 30 tonne of briquettes saves on average 1 ha of forest.

³ <https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1385004301.04/view>

⁴ All the estimated SDGs impacts achieved during the monitoring period, have been assessed and validated by the DOE, the SD contribution report is provided in appendix 1

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	1.1	1.1.1 Proportion of population below the international poverty line	Implemented activities to decrease	During this monitoring period, 1,829,707 USD have been saved by the 201,000 students eating at schools. On average 3.03 USD is saved by year by each student.	In total, 1,829,707 USD have been saved by the 201,000 students eating at schools (on average 3.03 USD/student/year)
2)	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Implemented activities to increase	During this monitoring period, 940 IICS have been installed in 284 schools.	940 IICS have been installed in 284 schools.
3)	8.5	8.5.1 Average hourly earnings of employees, by sex, age, occupation and persons with disabilities	Implemented activities to increase	20 short terms jobs created by 2018 and 138 permanent job created by 2018. With monthly wages above the minimum wages	20 short terms jobs created by 2018 and 138 permanent job created by 2018. With monthly wages above the minimum wages
4)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By distributing improved cooked stoves powered by renewable biomass, the project avoided 263,695 tCO2e during this monitoring period	the project avoided 263,695 tCO2e

5)	15.2	15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	Implemented activities to increase	400 ha of forest saved thanks to the introduction of renewable energy.	400 ha of forest saved thanks to the introduction of renewable energy.
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2 SAFEGUARDS

2.1 No Net Harm

n/a, please see registered CDM-PDD (as per para. 3.19.5 of VCS Project Standard V.4.1).

2.2 Local Stakeholder Consultation

Procedure followed to invite stakeholder comments

The national stakeholder consultation consisted of a public meeting with the identified stakeholders. Local and national policy makers and stakeholders were invited by post mail – see invitation material. Local population was invited through post mail to their representatives, through flyers diffusion and public displays. Additionally, the local stakeholder consultation has been prepared with some demonstration shows including at boarding school of Kamenge and at school of Cibitoke from 16.07.2010 to 21.07.2010 during which the stakeholders have discussed their interest for the project.

Program of the public

Date of meeting: January 13th, 2012, at 9.00 am

Place: Olympafrica (hall of Olympic Stadium), Kanyosha Commune, Bujumbura Mairie Province

Language: Kirundi

Duration: 3 hours and 30 minutes

Meeting procedure:

- Introduction / Mayor of Bujumbura / DNA Permanent Secretary/ Project Developers
- Context and objectives of public consultation
- Project description
- Improved cookstoves
- Renewable biomass
- Presentation of the Clean Development Mechanism
- Environmental and socio-economic impacts
- Modalities of purchase and use
- Status of the project

- Video Spot Projection
- Questions and answers with participants
- Conclusion / Cocktail

Note: During this meeting, BQS SA jointly presented the project for restaurants and its other projects aimed at other Burundian communities (households, schools, polices, etc.).

Key invitees present were:

- Mr. Sef Sabushimike, Presidential advisor, Government of Burundi
- Ms. Bernadette Hakizimana, Director of Environment at the Ministry of Water, Environment, Land Management and Urban Planning (MEEATU), DNA Permanent Secretary
- Mr. Felix Ngengabanyikwa, Director of Forest Department at the Ministry of Water, Environment, Land Management and Urban Planning (MEEATU)
- Mr. Ezeckiel Nibigira, National Deputy, President of party CNDD-FDD's youth league
- Deogratias Suzuguye, Head of Penitentiary Matters, Ministry of Justice
- Serges Irambona, Head of National Police Logistics, Ministry of Public Security
- Mr. Niragira Félix, National Deputy (CNDD-DDD)
- Mr. Evrard Giswaswa, Bujumbura Mayor
- Anatole NIYONKURU, Secretary of Education Ministry

Media:

- Burundi National Radio and Television (RTNB)
- “Le Renouveau” newspaper



Figure 3: Picture of the stakeholders attending public consultation

Participant's questions/concerns	Project proponent's answers
Julien Ntarugera, Manager, Techno Solar Company. Is there a lifetime guarantee on your improved cookstoves? How does warranty work? Have you considered local manufacturers, contributing to job creation, and lowering production cost? Why did you decide to outsource the manufacturing and assembling of improved cookstoves?	Yes, BQS improved cookstoves will have a warranty of five years to the original owner against defects in materials and workmanship for the lifetime of improved cookstove. If a product ever fails due to a manufacturing defect, we will repair the product, without charge, or replace it, at our discretion. This warranty does not cover damage caused by accident, improper care, negligence, normal wear and tear, or the natural breakdown of colors and materials over extended time and use. Damage not covered under warranty will be repaired for a reasonable rate and return shipping will be charged Local artisans and entrepreneurs cannot support a massive manufacturing and ensuring quality and traceability of improved cookstoves at such scale. Few years ago, the Office of the United Nations High Commissioner for Refugees (UNHCR) embarked on an initiative of improved cookstoves in Burundi. The scheme was unsuccessful for many reasons: the custom-built stoves were expensive and not appropriate for refugees cooking habits; dissemination was limited because stoves were made on-site at a slow rate by local artisans and entrepreneurs, and quality control was nonexistent has decided to outsource the manufacturing and assembling of improved cookstoves for quality and quantity reasons. BQS has a partnership with Sabah Enamel & Stove Industry base in Turkey to support the manufacturing and assembling of improved cookstove. The project leads to a

Could the stove's high efficiency prematurely degrade the cooking pots?	technology transfer. The project will provide employment opportunities for local people to improved cookstoves supply chain and distribution channels, renewable biomass supply chain and distribution channels, campaign marketing. No because wood & briquettes have a lower calorific value than woodfuel therefore such renewable fuels will be less harmful to the pots.
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Participant's questions/concerns	Project proponent's answers
Ezeckiel Nibigira, National Deputy, Bujumbura Mairie and Rural Province [Full endorsement of the project, including congratulations to project developers, inputs on economic benefits to households and safeguard of existing forests] However, is it not possible to accelerate the project start? On behalf of a member of the "ADIDI" organization whose activity is nursery production, can you detail tree-planting operations that you intend to undertake during the project?⁵	There are prerequisites to start the CDM project, including public consultation. CDM project needs to be registered by the UNFCCC, namely the CDM Executive Board. One of renewable biomass resources identified for the PoA "Renewable biomass fired improved cookstoves programme for households in Burundi by BQS" is biomass wood wastes collected from existing forests. The exploitation of this resource will be achieved by BQS SA under contract partnership with forests department. We are planning to plant 1,000 hectares per year for the duration of the project, starting from first carbon credits availability. The "Association ADIDI" was identified as a future partner to supply seeds of trees. ⁶
Bernadette Hakizimana, Director of Environment at the Ministry of Water, Environment, Land Management and Urban Planning (MEEATU), DNA Permanent Secretary [Highlights on BQS SA project contribution to empowering women thanks to renewable biomass fired improved cookstoves achieving the following: Reduce the time and cost of procuring fuel,	

⁵ This question regarded the PoA "Renewable biomass fired improved cookstoves programme for households in Burundi by BQS SA" developed by BQS SA where renewable biomass will be produced thanks to sustainable management of existing Forests for households

⁶ For the proposed project the biomass will come from agro-industrial wastes transformed into renewable briquettes.

thereby freeing individuals for other productive activities. Reduce disease and save lives by decreasing exposure to indoor air pollution. Reduce the risk of violence against women a child gathering fuel in conflict areas.	
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Participant's questions/concerns	Project proponent's answers
Venant Barindogo, IFDC [Supporting considerations on wood fuel consumption and the importance of raising awareness. Confirmation that their own experimentation with local manufacturing failed because of poor quality of the scrap metal and bricks used] Isn't the final cost still quite high compared to citizens' buying power?	The stove's cost must be aggregated with the significant monthly savings enabled on the fuel, hence a very profitable overall acquisition. [N.B. this answer was specifically given for the context of the parallel CDM initiative of BQS for households, although it remains valid in the case of communities which operating expenditures will also decrease].
Felix Ngengabanyikwa, Director of Forest Department at the Ministry of Water, Environment, Land Management and Urban Planning (MEEATU) Felix Ngengabanyikwa is suggesting that each improved cookstoves purchaser could plant a new tree at home to mitigate further the climate change effects. Do you accommodate for recycling of discarded improved cookstoves at the end of their use?	BQS has taken note of proposal and will analyze how to integrate this aspect in its programme. Anyway, its commitment to plant 1,000 ha per annum already exceeds this individual suggestion. Most parts of the improved cookstoves can be recycled. BQS will contact existing recycling industries that can collect and process such recyclables.
Jean Marie Masumbuko, Pastor of ECCA Kanyosha (Evangelical Church of Central Africa) How many improved cookstoves do you plan per households? ⁷ If the refractory brick breaks down, do you plan to replace them for free?	Each household might buy as many improved cookstoves as necessary if one ICS replaces one former traditional stove. Spare bricks will be available. Warranty application or replacement for a fee in case of misuse will be assessed on a case-by-case basis.

⁷ This question regarded the PoA "Renewable biomass fired improved cookstoves programme for households in Burundi by BQS SA" developed by BQS where target population is households.

Participant's questions/concerns	Project proponent's answers
Salvator Mpangaje, Neighborhood Leader of Nyakabiga Could you tell me more about the product acquisition agreement between BQS SA and end user?	This agreement contains the terms and conditions that apply between BQS and improved cookstoves end user: A complete abandonment of the use of traditional stove(s) Adoption and sustained use of ICS. Exclusive use of renewable biomass with ICS Record of periodic consumption of renewable biomass Acceptance of periodical audits by monitoring agents. Such monitoring is needed for transparent verification in carbon projects and for improved dissemination with the highest adoption and the substitution of cooking practices.
Zacharie Tuyaga, Pastor of ECCA Ruziba (Evangelical Church of Central Africa) Is it forbidden that craftsman imitate and manufacture the improved cookstove?	No, it is not forbidden and could be included in later additions to the program. They are even encouraged to do the same, there is no restriction as the objective is to substitute as much renewable biomass or briquettes as possible instead of non-renewable woodfuel.
Aaron Ntakarutimana, Local Councilor, Commune of Kamesa-Musaga, Bujumbura Mairie Province Since the project is of national interest, could you not convince the Government to fund free cookstoves for the benefit of the population?	[answers by Ezeckiel Nibigira, National Deputy, Bujumbura Mairie and Rural Province] The current policy aims at raising people's awareness about changing habits to consume less and be more concerned by environment preservation, based on everyone's means. Government support is ensured in many ways, including facilitation of access to renewable biomass and administrative support, but Government cannot afford financial support.
Agnès Hakizimana, Local Councilor, Commune of Murwi, Cibitoke Province If woodfuel is phased out, how will the less fortunate who couldn't acquire the improved cookstove cope? How do you to commercialize your improved cookstoves and renewable biomass? What is BQS SA commercialization strategy?	The objective is to decrease wood fuel consumption as much as possible but totally suppressing is not possible. Anyway, all efforts are made to bring the stove price affordable to all. BQS has taken the challenge up of developing markets for improved cookstoves and renewable biomass in Burundi by: Leveraging mass marketing resources and traditional trade networks. Working with existing local dealer networks that market, sell, and distribute products while pragmatically ramping up depending on penetration

	rates. Teaming up with NGOs and Microfinance Institutions to take advantage of a pre-existing network of relationships.
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Participant's questions/concerns	Project proponent's answers
Innocent Ngomirakiza, Association « Action ceinture verte pour l'environnement (ACVE) » ACVE implements projects to protect the riversides in Bujumbura through afforestation. Our association is 100% behind BQS SA project; We are asking to be associated through afforestation. How can low-income users with no access to banks of microfinance still acquire the stoves? ⁸ Can the stoves accommodate for locally made brick pots?	BQS sees no inconvenient for partnering with ACVE. Thank you for your interest in submitting a partnership proposal to BQS. We will contact you soon. Low-income Burundian households disconnected from retail markets will be able to access the stoves through the local NGOs identified as sales partners; local authorities' network will also be leveraged on. The use of local brick pans is getting very marginal given the availability and affordability of metal pots countrywide.
Oscar Ntirandekura, Neighborhood Leader of Twinyoni, Kamenge Commune Do you plan information and demonstrations on improved cookstoves use in neighborhoods? What woodfuel will be used before the plantations start yielding wood?	The sale outlets will be places of information and demonstrations on stove use. A booklet will also be available for end users. Government has awarded BQS with mature forests to sustainably clean and maintain, duty which wasn't performed for the last 20 years. Hence the immediately available renewable wood source.
Participant's questions/concerns	Project proponent's answers
Shemsa Ciza, Local Councillor, Commune of Kinama, Bujumbura Mairie Province Is it possible to grill meat/fish like on a BBQ? Why improved cookstoves are effective in terms of reduction on health impacts?	Yes indeed, you only need to install an appropriate grate. According to the World Health Organization, exposure to smoke from open fires and traditional cookstoves leads to pneumonia, chronic respiratory disease, and lung cancer, etc. With an ICS, you reduce pollution emissions, and you reduce kitchen concentrations of carbon monoxide. You reduce disease and save lives by decreasing exposure to indoor air pollution. Note that fuelwood needs to be well dried, which BQS will ensure before commercializing it.

⁸ This question regarded the PoA "Renewable biomass fired improved cookstoves programme for households in Burundi by BQS SA" developed by BQS SA where target population is households.

As guaranteed to all participants, all recommendations were highly valued and taken into consideration promptly, including:

- Full information availability (on request to project representatives whose coordinates were handed out during consultation, in flyers, newspapers and posters);
- Best efforts to ensure a rapid ramp-up and provide sufficient improved cookstoves and renewable biomass to match the widely enthusiastic demand;
- Continuous communication with community leaders and authorities to fine-tune the approach and cope with any issue for resolution.

At the end of the meeting, the contact details of BQS have been shared with the participants to ensure on-going communication with the stakeholders.

Following details have been communicated to participants:

- Company Name: Burundi Quality Stoves (BQS)
- Physical address: Quartier Industriel, Avenue Nyabissindu BP 5612, Bujumbura, Burundi
- Contact name: Pascal Rwemera
- Phone number: +257 22259470
- Email address: info@bqs.bi

The participants have been encouraged to use contact information for any questions/complaints/proposition related to the project.

Following the on-going communication guidelines, the stakeholders, are still able to provide comments during the project lifecycle. No comments have been received during this monitoring period.

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2.3 AFOLU-Specific Safeguards

n/a, the project is a non-AFOLU project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Burundi Quality Stoves (BQS) has developed an improved cookstoves project for schools of Burundi. The implemented project activity aims at:

Distributing institutional improved cookstoves (IICS) in schools of Burundi to replace open fire three-stone system (and traditional stoves); and

Switching from non-renewably logged trees to a sustainable energy supply: briquettes made of renewable biomass waste.

Compared to the commonly used three-stone fires or traditional stoves, the advanced closed technology of the fixed IICS installed allows quicker heating-up, longer cooking and heat retaining with less fuel wood as well as lower combustion fumes. It results in saving wood-fuel and associated expenses. Along with the diffusion of such a stove to replace currently inefficient cooking systems, a renewable biomass supply-chain has been set up, by sourcing unutilized biomass residues to produce renewable biomass briquettes in Bujumbura with briquetting machines Jumbo 90 and market it to the participating schools in replacement of their non-renewable woodfuel.

The initially considered IICS designed by the Turkish company SOBAH (indicative choice), has finally not been selected for design and price reasons. The decision has no impact on the already established baseline. On the other hand, less stoves of only one size and of fixed type as well as more schools have been involved in the project activity. The fixed stoves, mostly installed in batches of two or three per school kitchen, have an average thermal efficiency of 44.8% and an average firepower of 32.78 kWth⁹.

While initially envisaged in boarding schools only at project inception and initial PDD registration request, the Government's schools canteen program has been extended to further schools including primary and secondary "non-boarding" schools (day schools), due to the lenders' growing interest in supporting food programmes for children and their families through the educative institutions and local agricultural production at the same time. Both school schemes have been surveyed and feature similar cooking woodfuel consumption baseline/history, with day schools offering breakfast and lunch while boarding schools serve lunch and dinner. However, the non-boarding schools' wood fuel consumption is slightly lower.

Therefore, the more conservative baseline is applied to all types of schools in order to account for ongoing abandonment of the boarding school system, as per 2019 government communication¹⁰, which states that: "the Ministry has migrated from the system of boarding schools to the system of schools with school canteens in the provinces of Bujumbura Rural (5), Bujumbura Mairie (13), Bubanza (4), Ngozi (6), Kirundo (7), Gitega (13) and Muyinga (2). [...] The purpose of this letter is to ask you to support us for the rest of the boarding schools and to extend this school canteen programme to all the provinces of the national territory." The letter documents the ongoing progressive phase out of boarding schools in favour of day schools since 2014.

The installation of 940 stoves in 284 schools over 16 communes in 4 provinces (Bubanza, Bujumbura, Cibitoke, and Gitega) from 25-January-2016 to 31-December-2018, the supply of 12,631 tonnes of renewable biomass briquettes during the monitoring period and the associated awareness and training campaigns in schools has helped reduce their fuel use significantly and turned it virtually 100% renewable. Over this first monitoring period, the project has reduced

⁹ As per CRUEA Water Boiling tests performed on April 14th, 2019.

¹⁰ '2019-08-22 Lettre Ministre WFP internats' letter provided to the DOE

263,695 tCO₂e by the use of non-renewable biomass within the country, thus slowing down deforestation.

The school canteens program benefits 213,240 students as per 2018/19 schools population, with the following triple impacts:

- Stimulate schools enrolment in food-insecure areas;
- Reduce school dropouts;
- Favour children's completion of study cycle

3.2 Deviations

2.1.1 Methodology Deviations

Reasons and explanation of the outcome: monitoring of a discount factor to account for qualitative improvements (gap between total reduction observed and quantitative reduction) For this monitoring period, PP decided to apply ex-post a discount factor of 14% on the emissions reductions, to account for qualitative improvements that could not be assessed quantitatively. Therefore, this new parameter will be monitored during each monitoring period, and will be included in the section 4.2 of the monitoring reports.

Project Description Deviations

Corrections

- 1) Reasons and explanation of the outcome: To improve and correct the project description, the wording has been slightly updated, such as specification of the term "Improved Cook Stove (ICS)" by Institutional Improved Cook Stove (IICS)" (multiple sections). The changes occurred with the beginning of the crediting period.

Impacts:

- i) applicability of the methodology: The corrections do neither relate nor impact the eligibility of the project under the methodology as described in section B.2 of the registered CDM-PDD.
 - ii) additionality: The corrections do neither relate nor impact the additionality as described in section B.5 of the registered PDD.
 - iii) or the appropriateness of the baseline scenario: The corrections do neither relate nor impact the baseline scenario as described in section B.4 of the registered PDD.
- 2) Reasons and explanation of the outcome: update of the average fuel consumption per capita and per day
Historical consumption of woody biomass per person dependant on the kitchen i (tonnes per person) (Mwoody_biomass_hist_pp,i)

The parameter Mwoody_biomass_hist_pp,l, was estimated at 1.28t/p/year (0.053 t/d for 241 days) at the time of the PDD registration.

The value was obtained from average historical wood fuel consumption of the boarding schools over the last three years prior to project start (2009, 2010 and 2011) giving 9.3 wood steres per day per school (0,015 stere/p/d). However, during the PRC, this value was revised to 1.13t/p/y based on more conservative value of 5 kg per student per day. The value was obtained from a study conducted in 2017¹¹ on boarding schools stating that firewood consumption may be conservatively stated as 5kg/student/day in the pre-project scenario instead of the value provided in the registered UNFCCC CDM PDD.

The changes are permanent changes to the registered monitoring plan and occurred with the beginning of the crediting period.

Impacts:

i) applicability of the methodology: The change does neither relate nor impact the eligibility of the project under the methodology as described in section B.2 of the registered CDM-PDD.

ii) additionality: The change does neither relate nor impact the additionality as described in section B.5 of the registered PDD.

iii) or the appropriateness of the baseline scenario: The corrections are more conservative with regard to the value in section B.4 of the registered PDD.

Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

Reasons and explanation of the outcome: Monitoring change (update) of the school years duration and stoves operational status: School year calendar duration is estimated ex-ante at 226 days (three-year average from 2016/17 to 2018/19) instead of 241 days and to be monitored ex-post at actual.

Op_kitchen i,y: the parameter has a value of 1 if kitchen i still operates all of the installed IICS, or a prorated of the IICS found in order of operation out of the total number of IICS initially installed, or a value of 0 if none of the IICS operate.

The operating kitchen status is further discounted by the weighted duration of eventual renewable briquettes shortages (in this case they temporarily have to revert to using firewood instead). In this context, it can be assumed that schools have classes and cook the meals every

¹¹ 2017-06-28 DNCS note to lenders.pdf

single day of the school year calendar (except in case of Force Majeure closure). Student attendance is incentivized by the provision of the meals.

Streamline of the monitoring parameter table to have a biennial monitoring frequency (instead of annual), to make it consistent with the currently required and actual biennial “physical check” performed by the project implementer under current measurement procedure requirements of the PDD. Removal of “statistical average” in “source of data” of the parameter table, which is more conservative.

The changes are permanent changes to the registered monitoring plan and occurred with the beginning of the crediting period.

Impacts:

i) applicability of the methodology: The change does neither relate nor impact the eligibility of the project under the methodology as described in section B.2 of the registered CDM-PDD.

ii) additionality: The change does neither relate nor impact the additionality as described in section B.5 of the registered PDD.

iii) or the appropriateness of the baseline scenario: The corrections to do neither relate nor impact the baseline scenario as described in section B.4 of the registered PDD.

Changes to project design

Reasons and explanation of the outcome: Replacement of ex-ante indicative Turkish-manufactured cook stove by “Institutional Improved Cook Stove (IICS)” (price and design reasons) and focus on installation of new IICS (as opposed to refurbishment of masonry stoves for briquettes consumption) for technical-economic reasons.

Furthermore, update of the school types involved and corresponding baseline woodfuel consumption: While initially envisaged in boarding schools only at project inception and initial CDM-PDD registration request, the Government's schools canteen program has been extended to further schools including primary and secondary “non-boarding” schools (day schools), due to the lenders' growing interest in supporting food programmes for children and their families through the educative institutions and local agricultural production at the same time. Both school schemes have been surveyed and show comparable cooking woodfuel consumption baseline/history, with day schools offering breakfast and lunch when boarding school serve two meals per day too, yet the non-boarding schools consumption amounting to slightly lower.

The changes occurred with the beginning of the crediting period.

Impacts:

- i) applicability of the methodology: The change does neither relate nor impact the eligibility of the project under the methodology as described in section B.2 of the registered CDM-PDD.
- ii) additionality: The change does neither relate nor impact the additionality as described in section B.5 of the registered PDD
- iii) appropriateness of the baseline scenario: The corrections to do neither relate nor impact the baseline scenario as described in section B.4 of the registered PDD.

3.3 Grouped Projects

n/a, the project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

As per registered CDM-PDD, with exception of the following deviating parameters:

Data / Parameter	Pj
Data unit	kWth
Description	Useful thermal output capacity of the IICS
Source of data	Performance test results from the manufacturer
Value applied	32.78
Justification of choice of data or description of measurement methods and procedures applied	Useful thermal output of the IICS has been measured by Water Boiling Test. Tests results have been made available to the DOE.
Purpose of Data	Small-scale threshold, debundling compliance and automatic additionality compliance
Comments	Value from The revised PDD following post registration change is available at: https://cdm.unfccc.int/UserManagement/FileStorage/D4GCTSYMUIFLJKH9OA7B3EZPX2NV5

Data / Parameter	fNRB,y
Data unit	Fraction
Description	Fraction of biomass used in the absence of the CDM project in year y that can be established as non-renewable biomass
Source of data	Table 2 of Information Note EB 67 Annex 22

Value applied	0.77
Justification of choice of data or description of measurement methods and procedures applied	National default value.
Purpose of Data	Calculation of baseline emissions
Comments	The value has been approved by the DNA of Burundi the 6th September 2012 ¹²

Data / Parameter	NCVbiomass
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied	0.015
Justification of choice of data or description of measurement methods and procedures applied	According to methodology AMS-I.E, the Net Calorific Value of the non-renewable woody biomass that is substituted has to be taken as IPCC default for wood fuel.
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	EFprojected_fossilfuel
Data unit	tCO ₂ /TJ
Description	Emission factor for the substitution of non-renewable woody biomass by similar consumers
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied	81.6
Justification of choice of data or description of measurement methods and procedures applied	As indicated by the methodology AMS-I.E, this value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 tCO ₂ /TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 tCO ₂ /TJ for Kerosene and 63.0 tCO ₂ /TJ for Liquefied Petroleum Gas (LPG)).
Purpose of Data	Calculation of baseline emissions

¹² <http://cdm.unfccc.int/DNA/fNRB/index.html>

Comments	-
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Data / Parameter	Leakageadj
Data unit	fraction
Description	Net to gross adjustment factor to account for leakages
Source of data	Methodology AMS-I.E Version 05
Value applied	0.95
Justification of choice of data or description of measurement methods and procedures applied	In case this leakage adjustment factor is applied, it is not required to survey the use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources.
Purpose of Data	Calculation of leakage emissions
Comments	-

Data / Parameter	EFEL,j,y
Data unit	tCO2/MWh
Description	Emission factor for electricity generation for source j in year y
Source of data	"Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01)
Value applied	1.3
Justification of choice of data or description of measurement methods and procedures applied	Option A2: Use a conservative default value of 1.3 tCO2/MWh
Purpose of Data	Calculation of leakage emissions
Comments	-

Data / Parameter	TDLj,y
Data unit	-
Description	Average technical transmission and distribution losses for providing electricity to the briquetting machine
Source of data	"Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01)
Value applied	0.20
Justification of choice of data or description of	Use as default values of 20% for option: (a) project or leakage electricity consumption sources;

measurement methods and procedures applied	
Purpose of Data	Calculation of leakage emissions
Comments	-

Data / Parameter	SECbriq
Data unit	MWh/tonne
Description	Default value for the specific quantity of electricity consumed per tonne of briquettes produced
Source of data	Estimated ex-ante based on historic specific electricity consumption per ton of briquettes produced.
Value applied	0.038
Justification of choice of data or description of measurement methods and procedures applied	The specific electricity consumption is estimated ex-ante based on historic data of electricity consumption per tonne of briquettes produced
Purpose of Data	Calculation of leakage emissions
Comments	Specific consumption provided by the constructor is 35-38 kWh/ Metric tonne of Biomass. In order to be conservative, a value of 38 kWh/tonne is chosen

Data / Parameter	M _{woody_biomass_hist_pp,i}
Data unit	tonnes/ capita at the site i
Description	Historical consumption of woody biomass per person dependent on the kitchen i (tonnes per person)
Source of data	Derived from historical data
Value applied	1.13
Justification of choice of data or description of measurement methods and procedures applied	As permitted by the methodology AMS-I.E, this was derived from historical records of schools s' wood fuel's consumption
Purpose of Data	Calculation of baseline emissions
Comments	Value from the revised PDD following post regist

4.2 Data and Parameters Monitored

Data / Parameter	O _{p_kitchen i,y}
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Data unit	-
Description	Operating status of kitchen i (equipped with IICS) in year y
Source of data	Calculated based monitoring findings (reports of physical checks).
Description of measurement methods and procedures to be applied	A physical check is performed by the VCSproject proponent at least once every two years (biennial) in accordance with the monitoring plan.
Frequency of monitoring/recording	At least biennially Physical onsite checks/surveys took place in - School year 2016/17 (survey date/start of data collection: 13 September 2016) - School year 2017/18 (survey date/start of data collection: 19 February 2018) - School year 2018/19 (survey date/start of data collection: 30 September 2018)
Value monitored	As provided kitchen by kitchen, year by year, in monitoring spreadsheet provided to the VVB
Monitoring equipment	n/a
QA/QC procedures to be applied	-
Purpose of the data	Calculation of baseline emissions
Calculation method	The operational status of each kitchen in the year y is reflected by the parameter ($Op_kitchen_{i,y}$) at a value of 1 if kitchen i still operates all of the improved cookstoves installed, or a prorata of the IICS found in order of operation out of the total number of IICS initially installed, and a value of 0 if none of the IICS is operated.
Comments	The operational status of each kitchen in the year y is reflected by the parameter ($Op_kitchen_{i,y}$) at a value of 1 if kitchen i still operates all of the improved cookstoves installed, or a prorata of the IICS found in order of operation out of the total number of IICS initially installed, and a value of 0 if none of the IICS is operated. Guidance for monitoring are provided to field agents in order to determine the operating status of each kitchen during monitoring session with specific conditions to comply with (appendix 5).

Data / Parameter	$M_{renewable.biomass,y}$
Data unit	tonnes/year

Description	Quantity of renewable biomass consumed by the project activity in year y.			
	School-year 2015-2016	School-year 2016-2017	School-year 2017-2018	School-year 2018-2019
	3,401	3,066	3,714.5	2,449.5
Source of data	BQS delivery notes			
Description of measurement methods and procedures to be applied	Value applied ex ante is calculated based on an average student count per school from 2016/17 (over 284 school) and 226 days of schools (average from 2016/17 to 2018/19). At each distribution site a delivery note is made for each batch of briquettes sold containing the following information: distribution site, school provided and quantity of biomass. The delivery notes are kept and collected for monitoring the quantity of renewable biomass consumed by the project from each production site.			
Frequency of monitoring/recording	Every month			
Value monitored	As provided kitchen by kitchen, year by year, in monitoring spreadsheet provided to the DOE			
Monitoring equipment	At each distribution site a delivery notes is made for each batch of briquettes sold containing the following information: distribution site, production site, school provided and quantity of biomass. The delivery notes are kept and collected for monitoring the quantity of renewable biomass consumed by the project from each production site.			
QA/QC procedures to be applied	The quantity is cross checked with school's receipt			
Purpose of the data	Leakage emissions and Methodology requirements			
Calculation method	n/a			
Comments	The parameter is used for monitoring leakage emissions from electricity consumption. For ex-ante estimation of project emissions the assumption made is: $M_{\text{renewable,biomass},y} = 1/2 \sum M_{\text{substituted,biomass},i,y}$ Quantities in school year 2015-16 only represent briquette deliveries from date of stove installation in the first half of calendar year 2016 to end of school year 2015-16 on 30 June 2016. Similarly, quantities in school year 2018-19 represent briquette deliveries from start of school year in September 2018 to end of December 2018 (cf. to ER calculation sheet for further details).			

Data / Parameter	$N_{\text{pers} / \text{kitchen } i, y}$
Data unit	pers/year
Description	Number of persons dependent on kitchen i in the year y

Source of data	Derived from historical data: Letters from Education ministry				
Description of measurement methods and procedures to be applied	Number of persons dependent on kitchen i is inquired and recorded during each monitoring period				
Frequency of monitoring/recording	At least annually				
Value monitored		School-year 2015-2016	School-year 2016-2017	School-year 2017-2018	School-year 2018-2019
		184,129	185,519	205,817	213,240
Monitoring equipment	Number of persons dependent on kitchen i is inquired and recorded during each monitoring period				
QA/QC procedures to be applied	Data is cross check with relevant literature. Database is periodically checked by the project proponent.				
Purpose of the data	Calculation of baseline emissions				
Calculation method	-				
Comments	For ex-ante calculation a mean value based on the historical number of person for 284 schools in the school year 2016/17 has been used. For ex-post emission calculation, the population (occupancy) of each school is monitored. For ex-post emission calculation, the population (occupancy) of each school is monitored.				

Data / Parameter	$N_{IICS,i,y}$
Data unit	Number
Description	Total number of IICS distributed or replaced by an equivalent appliance in year y
Source of data	Order and delivery records
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	At installation
Value monitored	940
Monitoring equipment	-
QA/QC procedures to be applied	Cross-check with monitored operational figures (monitoring surveys conducted to determine $O_{p_kitchen\ i,y}$).

Purpose of the data	Used to record the number/location of each stove distributed and verify the compliance with small scale limit
Calculation method	-
Comments	Capped in compliance with the small-scale limit with regard to thermal energy power output of the stoves. $\sum N_{IICS}/j,y$ (j indicating IICS distributed * $P_j < 45$ MWth

Data / Parameter	DF
Data unit	%
Description	Discount factor to account for qualitative improvements
Source of data	Calculated by project proponent
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Annually or at each monitoring period
Value monitored	13.8% (rounded conservatively to 14%)
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Used to discount total emissions reduction to account for qualitative improvements following introduction of ICS.
Calculation method	The factor is assessed based on qualitative improvements following distribution of ICS. The factor is the difference between Total assessed reduction (95%) and the quantitative reduction (81,2%), hence a gap of 13.8% (rounded at 14%) Full calculation is available in the Ex-post Emission reduction calculation sheet.
Comments	--

As per ministry letters, the following table shows the school calendars of the relevant school years of this monitoring period:

School calendar Burundi (School days without Sunday and public holiday)				
	2015-16	2016-17	2017-18	2018-19
1. trimester:	21/09 - 24/12	26/09 - 23/12	11/09 - 22/12	09/09 - 24/12
School days	78	74	86	89
2. trimester:	04/01 - 08/04	09/01 - 07/04	02/01 - 30/03	06/01 - 10/04
School days	81	76	75	79
3. trimester	17/04 - 01/07	24/04 - 07/07	09/04 - 13/07	20/04 - 02/07
School days	63	61	80	59
TOTAL - School days	222	211	241	227
https://www.timeanddate.com/date/workdays.html?d1=&m1=&y1=&d2=&m2=&y2=&ti=on&				

Table: School calendar Burundi from 2015/16 to 2018/19

4.3 Monitoring Plan

The monitoring plan defines the procedures to measure and record parameters necessary for the verification of the emission reductions effectively achieved. The monitoring is carried out according to AMS-I.E. The project is managed by BQS who is the project proponent. BQS ensures the overall cook stove distribution, masonry stoves refurbishment and renewable briquettes supply in accordance with Burundi's Laws and technology providers' guidelines.

It will also comply with: EB 65, Annex 5, Clean Development Mechanism Project Standard Version 05.0 whereby it is stated that: The monitoring plan shall include the following:

- The operational and management structure to be put in place to implement the monitoring plan;
- Provisions to ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later;
- Definition of responsibilities and institutional arrangements for data collection and archiving;
- Quality assurance and quality control (QA/QC) procedures;
- Uncertainty levels, methods and the associated accuracy level of measuring instruments to be used for various parameters and variables;
- Specifications of the calibration frequency for the measuring equipments. In cases where neither the selected methodology, nor the Board's guidance specify any requirements for calibration frequency for measuring equipments, project participants shall ensure that the equipments are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.

Sampling Plan

This section is not relevant, as no sampling plan is involved since all participating school sites are exhaustively monitored in the Project. This is a realistic assumption as the number of schools is acceptable for an exhaustive monitoring and because the woodfuel supply refund is centralised at the ministry level so all woodfuel ordered by schools for cooking activities is easily tracked and recorded

Other elements of monitoring plan

Sales Agreement

Before any kitchen is included in the project, a sales agreement between the project proponent and the responsible of woodfuel supply of each kitchen was signed, displaying the following information:

- Name and location of the kitchen
- Number of persons depending on the kitchen
- Agreement that the kitchen cedes all its Carbon Emissions Reductions rights to BQS
- Information regarding the unique identification of all IICS with detail specification (including power output)
- Installation terms and instructions
- Maintenance services

Manual on how to use the IICS is provided.

Number of kitchen i supplied

At the beginning of the project, all kitchens of schools of Burundi are progressively equipped with IICS. Before any inclusion of schools in the project the following procedure is followed and information gathered.

1. Information regarding the number of people depending on the kitchen to be equipped is collected and stored in electronic database
2. The capacity of BQS to supply the new kitchen with renewable briquettes without any shortage is checked
3. Certification of the power output of every cook stove used in the new equipped kitchen i are gathered
4. Signature of the sales agreement with full information required stored in electronic database

As the number of schools may vary across the time of the project, any new kitchen to be included in the project should follow the above procedure. This is documented and reflected in monitoring reports during verification.

Monitoring organization

BQS, is responsible for overall monitoring management. All collected data have been double-checked based on the sales agreements. The project monitoring database includes the selling date of each IICS and each renewable biomass delivery and help calculate the emission reductions attributable to each monitoring period. These records enable to determine the

status of the project activity: the number of IICS distributed, the quantity of renewable biomass distributed, information on baseline and previous monitoring surveys and verification results. Double counting is avoided thanks to the unique identification of each stove included in the project as well as using appropriate record keeping procedures.

Prior to the start of the monitoring period, the organization of the monitoring team have been established. Clear roles and responsibilities been assigned to all staff involved in the project.

The Project Manager coordinates and endorse the overall responsibility for all monitoring of the project, including:

- Develop, approve, execute, and improve the Monitoring/Reporting Procedures;
- Organize in schools seminar to inform and train the monitoring staff to the monitoring procedures;
- Ensure that logistics is available and properly suited to efficiently perform the monitoring;
- Communicate and coordinate the monitoring work of all business units;
- Validate and electronically archive all monitoring data on a monthly basis throughout the crediting period (and conserve it at least for 2 further years);
- Calculate and report the emission reductions; and
- Coordinate the DOE work during the verification audit.

Monitoring Plan

The project proponent has developed and provides a description of the monitoring plan for the present project activity. It identifies the monitoring provisions and data parameters that have to apply/monitor in accordance with the selected methodology.

Parameters to be monitored as per methodology AMS-I.E (Version 05):

N_{IICS,j,y}	Total number of IICS distributed or replaced by an equivalent appliance in year y
Op_{kitchen i,y}	Operating status of kitchen <i>i</i> (equipped with IICS) in year y
M_{renewable.biomass,y}	Quantity of renewable biomass consumed by the project in year y.
N_{pers / kitchen i,y}	Number of person dependant on kitchen <i>i</i> in the year y

Residual consumption of woodfuel is not be monitored for the following reason:

- The orders of woodfuel are centralized at the Ministry level thus once briquette orders are favored, no other fuel could be bought by the kitchens themselves because non-reimbursable thus at their own expenses

- As already experimented, the economics will drive the Finance Ministry to prefer opting for ordering briquettes for fuel consumption of schools
- IICS are designed specifically for briquettes combustion.

However, in case of shortage of briquettes, a procedure is in place in order to exclude all periods of shortage when other type of biomass may be used in emissions reduction calculations.

A database gathering data about IICS¹³ is maintained to consolidate and archive information about:

- Number of IICS per type j distributed per school
- Date and quantity of briquettes delivered
- Sales agreement signed number
- Project stove's serial number.

Every school's kitchen quartermaster (in collaboration with BQS field agents) has been trained to monitor continuously for each kitchen i :

- The operating status of kitchen i
- Mass of renewable biomass consumed by the school based on delivery notes.

In every centralized purchasing site a field agent from BQS sales team has been trained to monitor continuously:

- Quantity of briquettes sold (renewable biomass) based on delivery notes
- Date of delivery
- Production site
- Beneficiary kitchen

A delivery note is emitted each time a kitchen i (school) will order renewable biomass with information regarding quantity of biomass ordered, date of delivery, beneficiary kitchen, production site (origin of briquettes) and location of delivery site.

The following figure shows the monitoring framework described.

¹³ IICS distributed and refurbished masonry stoves

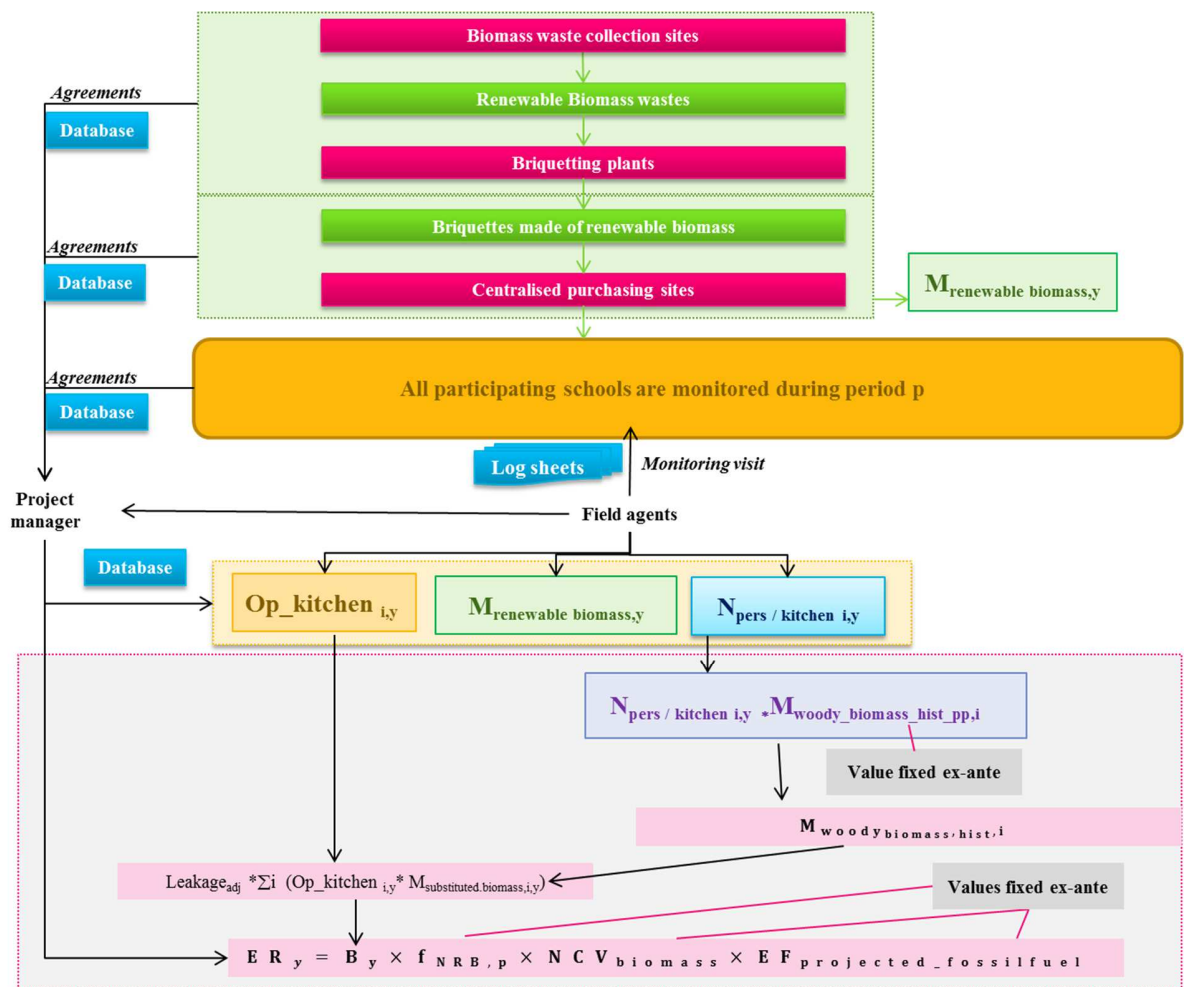


Figure 4: Monitoring flowchart

Data handling

Spreadsheets are set-up for the compilation of all the data recorded. They are used to compute emission reductions effectively achieved by the project activity according to methodologies applied. All data monitored and project documents are regularly archived electronically and printed out on hard copy for archiving until at least two years after the end of the crediting period.

Calculation of emission reductions

Emission reductions calculations are automated through a functional spreadsheet model. This allows for a regular check of emissions reductions achieved and comparison with ex-ante estimations in the PD.

QA/QC procedures

Quality assurance and quality control procedures for recording and archiving data are meant to identify and then correct nonconformities in the project implementation or monitoring requirements. No non-conformities have been observed during this monitoring period, except period of briquettes shortage. Conservatively, during shortages, it is considered that the kitchens were not operational.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline Emissions of the proposed project activity are calculated as:

$$ER_y = B_y * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

Where:

ER_y	Emission reductions during the year y in tCO ₂ e
B_y	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved default country specific fraction of non- renewable woody biomass (f_{NRB}) values available on the CDM website ¹⁴
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ.

Determination of B_y :

B_y is determined as per option (a) approach:

- (a) Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass substituted per appliance (tonnes/year); This can be derived from historical data or estimated using survey methods.

¹⁴ Default values endorsed by designated national authorities and approved by the Board are available at <<http://cdm.unfccc.int/DNA/fNRB/index.html>>

B_y is determined based on the sum of woody biomass substituted by each kitchen¹⁵ in the year y ($M_{\text{substituted biomass},i,y}$) in tonnes/kitchen/ y taking into consideration the operating status of each kitchen as follows:

$$B_y = \text{Leakage}_{\text{adj}} * \sum_i (\text{Op_kitchen}_{i,y} * M_{\text{substituted_biomass},i,y})$$

Where:

B_y Quantity of woody biomass that is substituted or displaced in tonnes in year y

$\text{Op_kitchen}_{i,y}$ Operating status of kitchen i (equipped with IICS / refurbished masonry stove) in year y

$M_{\text{substituted_biomass},i,y}$ Quantity of woody biomass that is substituted by operating kitchen i in year y
(tonnes/kitchen i/y)

$\text{Leakage}_{\text{adj}}$ Net to gross adjustment factor to account for leakages

Operating status of kitchen i in the year y ($\text{Op_kitchen}_{i,y}$)

The operational status¹⁶ of each kitchen in the year y is reflected by the parameter ($\text{Op_kitchen}_{i,y}$) at a value of 1 if kitchen i still operates all of the installed IICS, or a pro rata of the IICS found in operation out of the total number of IICS initially installed, or a value of 0 if none of the IICS operate.

The operating kitchen status is further discounted by the weighted duration of eventual renewable briquettes shortages (in this case they temporarily have to revert to using firewood instead). In this context, it can be assumed that schools have classes and cook the meals every single day of the school year calendar (except in case of Force Majeure closure).¹⁷ Student attendance is incentivized by the provision of the meals.

Quantity of woody biomass that is substituted by kitchen i in the year y ($M_{\text{substituted biomass},i,y}$)

¹⁵ In the project activity, one appliance is defined as one kitchen, i.e. the entire premises whereby cooking activities are performed in the school. One kitchen may be composed of a variable number of stoves, however each school site identified in the project activity operates one kitchen, which overall fuelwood consumption and project briquettes consumption will be monitored.

¹⁶ Guidance for monitoring are provided to field agents in order to determine the operating status of each kitchen during monitoring session; see Appendix 5 of the CDM-PDD..

¹⁷ All schools are open daily except Sundays, public holidays and during vacation time (cf. Ministry note "2018-09-11 NOTE CIRCULAIRE DPE"). Decrees from the Ministry of Education detail the amount of school days per calendar year and reveal an average of 226 school days over the school years from 2016/17 to 2018/19. PP initially counted the ex-ante estimate with 241 school days and revised down the ex-ante ER calculations accordingly.

Wood fuel is by far the main cooking fuel in Burundi's schools. The project activity will substitute all the woodfuel¹⁸ used by these communities by briquettes made of renewable biomass.

The quantity of woody biomass that is substituted by kitchen i in the year y ($M_{\text{substituted_biomass},i,y}$) is calculated as follows:

$$M_{\text{substituted_biomass},i,y} = M_{\text{woody_biomass_hist},i}$$

Where:

$M_{\text{substituted_biomass},i,y}$ Quantity of woody biomass that is substituted by kitchen i in the year y (tonnes/kitchen i/y)

$M_{\text{woody_biomass_hist},i}$ Historical consumption of woody biomass using three stones open fire / traditional stoves / former masonry stoves in the absence of the project activity by kitchen i (tonnes/kitchen i)

Historical consumption of woody biomass using three stones open fire / traditional stoves / former masonry stoves in the absence of the project activity ($M_{\text{woody_biomass_hist},i}$)

The historical consumption of woody biomass using three stones open fire, traditional stoves or old masonry stoves in the absence of the project activity by kitchen i (tonnes/kitchen i) is determined as follows:

$$M_{\text{woody_biomass_hist},i} = M_{\text{woody_biomass_hist_pp},i} * N_{\text{pers}} / \text{kitchen}_{i,y}$$

Where:

$M_{\text{woody_biomass_hist},i}$ Historical consumption of woody biomass by kitchen i (tonnes/kitchen i)

$M_{\text{woody_biomass_hist_pp},i}$ Historical consumption of woody biomass per person dependent on the kitchen i (tonnes per person)

$N_{\text{pers}/\text{kitchen } i,y}$ Number of person dependent on kitchen i in the year y (pers/year)

Historical consumption of woody biomass per person dependent on the kitchen i (tonnes per person) ($M_{\text{woody_biomass_hist_pp},i}$)

¹⁸ Currently, BQS has demonstrated that using briquettes made of renewable biomass wastes together with IICS will save money (see test report provided to the DOE). Actually, schools are managing their woodfuel supply independently and are refunded for woodfuel expenses by Finance Ministry. Due to the fact that the use of briquettes will save money, once the project implemented, schools participating to the project will have to sign a sale agreement for briquettes supply exclusivity and woodfuel expenses other than briquettes will not be refunded thus giving incentive to not use any other woodfuel than briquettes.

Historical data from Education ministry (28-June-2017) provides the following up-to-date figures in kg per day or stere per day based on records across 15 boarding schools around Bujumbura and 12 day schools in three different provinces of the country¹⁹:

The average historical wood fuel consumption of the boarding schools over the last three years prior to project start (2009, 2010 and 2011) is 9.3 wood steres per day per school and the average historical wood fuel consumption of day schools in 2017 is **5 kg per student per day**. A comparison reveals that the latter value is more conservative.

The following ex-ante assumptions are used for converting the boarding school value into kg through dividing the mean historical woodfuel consumption by the historical number of persons perschool:

- The average number of students per school is 653.
- The students are at school during 226 days over 365²⁰.
- A factor of 0.35 is used for converting stere into tonnes of woodfuel (GTZ-HERA, Manual for Programs and Projects to Implement Cooking Energy Interventions, 2012).

While boarding schools serve lunch and dinner, day schools provide for breakfast and lunch.

Calculation for one year:

The historical consumption per person per school per year is obtained by multiplying the daily consumption by 226 days.

Table: School's historical consumption per person of woodfuel in tonne/days/year

	M _{woody_biomass_hist_pp,i}	M _{woody_biomass_hist_pp,i}
	tonnes per capita per day	tonnes per capita per year
SCHOOL		
Conservative baseline consumption retained	0.005	1.13

Number of persons dependent on kitchen i in the year y (pers/year) (N_{pers/kitchen i,y})

¹⁹ Kirundo, Ngozi and Muyinga.

The data available for the 12 day schools are representative of the historical woodfuel consumption per student for the following reasons:

- i. The same traditional food with same cooking practices is observed in all schools' kitchens requiring the same amount of energy.
- ii. Same woodfuel type (non-renewable biomass) is used in all schools' kitchens around Burundi.
- iii. Same climate can be observed around all the country thus not having any differential impacts over the energy consumption for cooking activities around the country.

²⁰ Three-year average. Student holiday calendar for 2016/17 to 2018/19 is provided to the DOE. The finally applicable value will be determined ex-post. See above.

In order to take into consideration, the occupancy rate of each school, the number of person dependent on kitchen i has been monitored ex-post along all the monitoring periods.

Table: Number of persons dependent on kitchen i in the year y (pers./year)

School-year 2015-2016	School-year 2016-2017	School-year 2017-2018	School-year 2018-2019
184,129	185,519	205,817	213,240

Non-renewable woody biomass fraction ($f_{NRB,y}$)

The schools's kitchens are fired with non-renewable wood fuel. The non-renewable biomass fraction ($f_{NRB,y}$) is taken at its national default value of 77%, as approved by the CDM Executive Board at its 67th meeting and lately by the Burundi's DNA the 6 September 2012²¹.

Emission factor for relevant substitution fossil fuel ($EF_{\text{projected_fossilfuel}}$)

According to methodology AMS-I.E v 5, the Emission Factor of the substitution fuel likely to be used by similar consumers has to be taken at 81.6 tCO₂/TJ.

Net calorific value of the substituted non-renewable woody biomass (NCV_{biomass})

According to methodology AMS-I.E, the Net Calorific Value of the non-renewable woody biomass that is substituted has to be taken as IPCC default for wood fuel, 0.015 TJ/tonne.

5.2 Project Emissions

Shifts of pre-project activities

As the renewable biomass used is all from residue/waste, this emission source is not applicable to this project.

Emissions related to the production of the biomass

As the renewable biomass used is all from residue/waste, this emission source is not applicable to this project.

5.3 Leakage

Competing uses for the biomass

According to § III C. of the *General guidance on leakage in biomass project activities* Version 03 (EB 47, Annex 28), in some cases, the biomass used in the project activity could be used for other purposes in the absence of the project. For example, biomass

²¹ <http://cdm.unfccc.int/DNA/fNRB/index.html>

residues from existing forests could have been used as fuel wood or agricultural biomass residues could have been used as fertilizers or for energy generation.

The Project activity's biomass supply involves agro-industrial wastes (sugar cane wastes, sawmills residues...) which are widely available in the region and currently burnt without energy purpose²⁵, therefore this source of leakage can be neglected. The biomass used in the project activity could not be used for other purposes in the absence of the project.

The quantity of biomass wastes needed for the project activity have been compared with the national production of renewable biomass wastes. General guidance on leakage in biomass project activities Version 03 (EB 47, Annex 28) requests in §18:

“The project participant shall evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions.”

As per the public report “Elaboration of a strategy for Energy sector in Burundi” issued by Ministry of Energy and Mines, General Directorate of Energy and Water (Republic of Burundi, Ministry of Energy, Water department, 2011), the annual available amount of renewable biomass, which is not used, is about 1,378,374.43 tonnes (including 1,127,302 tonnes of crop residues, 224,966.2 tonnes of forest litter and 26,106.23 tonnes of timber residues). Based on production capacity of 3 briquetting machines of 500 tonnes per month the quantity of biomass needed is 18,000 tonnes of dry biomass, thus 36,000 tonnes of wet biomass residues assuming 50% moisture of biomass residues. Therefore, the quantity of available biomass residues in the region is at least 25% larger than the quantity of biomass that is utilised including the project activity. This source of leakage can thus be neglected.

Methodology AMS-I.E further indicates that leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on ex post surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples). The following potential source of leakage shall be considered:

(a) The use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass used by the non-project households/users that is attributable to the project activity, then B_y is adjusted to account for the quantified leakage.

- ➔ Alternatively, B_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

If the equipment currently being utilised is transferred from outside the boundary to the project boundary, leakage is to be considered.

- ➔ The improved cook stoves to be disseminated in the project don't include any second-hand equipment but exclusively brand new ones, therefore no currently utilised equipment has been transferred from outside the boundary to the project activity.

Emissions related to the transformation of renewable biomass wastes into briquettes

Furthermore, potential leakage emissions may arise from the electricity consumption from the briquetting machines processing the transformation from renewable biomass into briquettes²².

- ➔ This emissions source is calculated as per the tool '*Tool to calculate baseline, project and/or leakage emissions from electricity consumption*'. A conservative specific electricity consumption per tonnes of briquettes produced is estimated ex-ante.

Leakage emissions from electricity consumption

Leakage emissions from consumption of electricity are calculated as follows:

$$LE_{EC,y} = \sum_j EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$$

Where:

- $LE_{EC,y}$ Leakage emissions from electricity consumption in year y (tCO₂/yr)
- $EC_{PJ,j,y}$ Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)
- $EF_{EL,j,y}$ Emission factor for electricity generation for source j in year y (tCO₂/MWh)
- $TDL_{j,y}$ Average technical transmission and distribution losses for providing electricity to source j in year y
- j Sources of electricity consumption in the project

Determination of the quantity of electricity consumed by the project ($EC_{PJ,j,y}$)

The renewable briquettes production sites are likely to provide briquettes to different projects therefore it is not possible to monitor electricity consumption for the project alone. Thus the quantity of electricity consumed by the project $EC_{PJ,j,y}$ is calculated based on a default value for

²² The briquettes production sites are not included within the boundaries of the project because they will supply different separated projects, different communities and because it is not possible to allocate one production site to one specific school as this will depend on the capacity production per site and the regional demand.

the specific quantity of electricity consumed per ton of briquettes produced SEC_{briq} (MWh/ton) estimated ex-ante multiplied by the quantity of briquettes supplied to the project activity $M_{renewable.biomass,y}$.

Determination of the emission factor for electricity generation ($EF_{EL,j,y}$)

The determination of the emission factor for electricity generation $EF_{EL,j,y}$ depends on scenario A applied to the source of electricity consumption:

Scenario A: Electricity consumption from the grid

In this case, project participants may choose among the following options:

Option A1: Calculate the combined margin emission factor of the applicable electricity system, using the procedures in the latest approved version of the Tool to calculate the emission factor for an electricity system. ($EF_{EL,j/k/l,y} = EF_{grid,CM,y}$).

Option A2: Use the following conservative default values:

- A value of 1.3 tCO₂/MWh if
 - (a) Scenario A applies only to project and/or leakage electricity consumption sources but not to baseline electricity consumption sources; or
 - (b) Scenario A applies to: both baseline and project (and/or leakage) electricity consumption sources; and the electricity consumption of the project and leakage sources is greater than the electricity consumption of the baseline sources.
- A value of 0.4 tCO₂/MWh for electricity grids where hydro power plants constitute less than 50% of total grid generation in 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production, and a value of 0.25 tCO₂/MWh for other electricity grids. These values can be used if
 - (a) Scenario A applies only to baseline electricity consumption sources but not to project or leakage electricity consumption sources; or
 - (b) Scenario A applies to: both baseline and project (and/or leakage) electricity consumption sources; and the electricity consumption of the baseline sources is greater than the electricity consumption of the project and leakage sources.

→ Option A2 is chosen: conservative default value of 1.3 tCO₂/MWh.

Average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$)

In case of scenario A, choose one of the following options:

- *Use recent, accurate and reliable data available within the host country;*
- *Use as default values of 20% for project or leakage electricity consumption sources.*

→ Option chosen: *default values of 20%.*

Leakage emissions from transportation of biomass

Furthermore, potential leakage emissions may arise from the transportation of biomass by vehicles consuming fossil fuels.

→ Transportation of renewable biomass wastes from collection sites to the briquetting plant has been neglected as the briquetting plants are operated close to the residues provision sites²⁸. Moreover, the average distance of transportation of renewable briquettes from briquetting plants to police camps and prisons is shorter than the baseline situation where non-renewable woody biomass was transported over longer distances from isolated rural production site thus can be neglected.

Moreover, taking into consideration that:

- the average distance of collection of renewable biomass for the Project activity is shorter than the mean distance of origin of previously used biomass in the baseline and;
- AMS-I.C methodology mentions that "If biomass residues are transported over a distance of more than 200 kilometres (one way) due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected." For the proposed project, the residues/briquettes will never be transported over a distance more than 200 km (one way) thus can be neglected.

→ Therefore, no additional leakage emissions from transportation need to be accounted for.

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
25 January 2016-31 December 2016	82,025	-	228	81,797
01 January 2017-31 December 2017	87,564	-	169	87,395
01 January 2018-31 December 2018	94,749	-	247	94,503
Total	264,338	-	644	263,695

Comparison of the emissions reductions expected for this monitoring period as per the registered VCS-PD, and the emission reduction achieved as calculated in the present monitoring report are included in the table below.

Period	Estimated emissions reduction in the VCS-PD	Emissions reduction achieved during the monitoring period
25 January 2016-31 December 2016	153,080	81,797
01 January 2017-31 December 2017	163,855	87,395
01 January 2018-31 December 2018	163,855	94,503
TOTAL	480,790	263,695

The emissions reduction achieved are well below the estimated emissions reduction in the VCS-PD. This is due to the fact that some parameters estimated ex-ante are above the values observed during the monitoring period. It was estimated ex-ante that the proportion of operational schools would be 100%, value that was not achieved during this monitoring period. Also, the discount factor was estimated ex-ante at 10% while the monitored value for this monitoring period is 14%, hence lower emissions reduction achieved in comparison with estimated values in the registered VCS-PD.

APPENDIX 1: <SUSTAINABLE DEVELOPMENT CONTRIBUTION VALIDATION REPORT>

SUSTAINABLE DEVELOPMENT CO-BENEFITS VERIFICATION REPORT

-
UNFCCC CDM



Project Title: BQS improved cook stoves for Burundi's schools **UNFCCC project**

ID: 9791

Internal ID: BELL_CDM_2019_BUR BQS_ICS_CDM
VER

Customer: Burundi Quality Stoves S.A.

Date: 03/06/2020

Revision: 00

The verification team conducted a site visit to the project implementation area dated on **25/11/2019** to **27/11/2019** to confirm the information and to resolve any issues identified in the document review for the Sustainable Development (SD) Report submitted.

An on-site assessment was conducted as a part of UNFCCC CDM Verification activity to confirm the information of the Sustainability Indicators' results claimed in the Project Participant's Sustainable Development (SD) Report.

The below table provides a detailed assessment of the extent to the indicators presented in the SD report:

Sustainability Indicator	Assessment of relevance to the project (Yes/Potentially/No)	Justification of the Assessment/DOE team
ENVIRONMENT CO-BENEFIT		
Forest SDG target 15.2	YES	Assessment team checked that according to World Bank data (https://data.worldbank.org/indicator/AG.LND.FRST.ZS?locations=BI) 11% of the land areas are forested in Burundi in 2015. From 2002 to 2019 Burundi lost 314 Ha. of humid primary forest making up 1.2% of its total tree cover loss in the same time period. Total forest cover decreased in Burundi around this time is 1.2%. (SOURCE: globalforestwatch.org) The project activity is basically developing an improved cook stoves project for schools of Burundi. The small scale CDM project activity aims at: Distributing institutional improved cook stoves (ICS) and/or refurbishing former masonry stoves in schools of Burundi to replace currently used old masonry stoves and open fire threestone system (and traditional stoves); and Switching from non-renewable logged trees to a sustainable energy supply: briquettes made of renewable biomass waste. Compared to the commonly used three-stone fires or traditional stoves, the advanced closed technology of the fixed ICS installed allows quicker heating-up, longer cooking and heat retaining with less fuel wood as well as lower combustion fumes. It results in saving wood-fuel and associated expenses. Along with the diffusion of such a stove to replace currently inefficient cooking systems, a renewable biomass supply-chain has been set up, by sourcing unutilized biomass residues to produce renewable biomass briquettes and market it to the participating schools in replacement of their non-renewable wood fuel.

Sustainability Indicator	Assessment of relevance to the project (Yes/Potentially/No)	Justification of the Assessment/DOE team
		The project consists in switching 100% of the fuel consumption of the boarding schools of Burundi from non-renewable biomass consumption for thermal applications into renewable sources, thanks to innovative production of briquettes made of renewable biomass wastes in Bujumbura with briquetting machines Jumbo 90. Assessment team checked that 30 tonnes of renewable biomass briquettes allows reducing deforestation by 1 Ha. which is huge in terms of forest tree cover saving. Therefore assessment team is of the opinion that the project has a positive impact and allow to save already depleting forest cover in the country by providing an alternative measure of fuel to be used in an improved and more efficient cook stove than the open fire three-stone system previously used having efficiency less than 10%.
SOCIAL CO- BENEFIT		
New long/short term jobs SDG target 8.5	YES	Assessment team during the interviews with the PP found that local people are generally unemployed and there lifestyle or living standard is quite low in the country. The project not only employed the locals in and around the vicinity but also improved their living standard. The project not only employed the locals but also provided training during the operation phase of the project activity. The training activity performed is checked by the assessment team and found correct. The parameter is monitored and therefore to confirm the indicator assessment team checked the Job employment letter (to reveal the number of permanent/temporary jobs created): Cf. lists of salary payments (BQS Salaries April 2018.pdf, BQS Salaries December 2017.pdf, BQS Salaries December 2016.pdf). In continuation of the above assessment team checked that project has employed: - Staff with temporary contracts (Short terms jobs): 15 (2016), 15 (2017), 20 (2018).

		- Staff with permanent contracts (Long terms jobs): Security: 23 (2016), 21 (2017), 21 (2018). - Factory: 43 (2016), 45 (2017), 45 (2018).
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Sustainability Indicator	Assessment of relevance to the project (Yes/Potentially/No)	Justification of the Assessment/DOE team
		- Drying: 36 (2016), 30 (2017), 49 (2018). - Refugee camp: 3 (2016), 3 (2017), 3 (2018). - Administration: 14 (2016), 16 (2017), 16 (2018). - Other: 1 (2017), 4 (2018). Assessment team checked the Salary slips and found that the Salary amount provided is more than the national average. Minimum wage is 105 BIF/day in rural zones (4800 BIF/month) and 160 BIF/day (3150 BIF/month) in the cities of Bujumbura and Gitega (http://burundi-eco.com/salaire-minimum-burundi-reference-ne-rejouit-plus-concerne/#.XhWxnPxCdPY, https://votresalaire.bi/salaire/salaire-minimum). The documentation provided shows that all salaries paid are significantly higher than the minimum wage. Assessment team also checked the HR policy for the organization and found that point 5 mentions regarding nondiscrimination in particular on the basis of sexual orientation, among others. The work is provided to both the gender as per the requirement of the organization and their skills irrespective of the sexual orientation. The same is acceptable to the assessment team. Assessment team checked health services (health services provided to its personnel in 2016, 2017 and 2018). The health services photos are checked by the assessment team for the period mentioned and found correct. Free work safety equipment (copies of invoices of purchase of face masks, brooms and cleaning rags is checked and found correct) and Social security (cheque slips social security payments 2016-2018 is checked and found correct) are provided to workers. Moreover, facilitated access to microfinance is provided through the payment of the BQS salaries through the microfinance institution WISE (Women's initiative for self-employment), which allows each

		worker to have systematically a microfinance account and to borrow small credits for investments at times (cf. BQS WISE Microfinance 2016-2018.zip). Assessment team found that from the list of salary payments (mentioning WISE), the cooperation with WISE has been existing since 2016. Therefore assessment team is of the opinion that project has a positive impact for the local and also provided them a sustainable source of employment and improve their lifestyle.
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Sustainability Indicator	Assessment of relevance to the project (Yes/Potentially/No)	Justification of the Assessment/DOE team
Reduction of diseases and disease prevention SDG target 3.9	YES	The parameter is not monitored however since the extent for the indicator is provided high therefore assessment is being done as mentioned below. According to the reference by the WHO (https://www.who.int/news-room/factsheets/detail/household-air-pollution-and-health) 3.8 million deaths: 27% are due to pneumonia, 18% from stroke, 27% from ischaemic heart disease, 20% from chronic obstructive pulmonary disease (COPD), 8% from lung cancer. The project as observed during onsite visit and also among discussion to the household people it is expected that the project activity results in strong health and safety improvements. The project reduces (because of higher efficiency of the stoves) and prevents diseases due to health damaging air pollution (asthma, cancer, etc.).
Reducing health damaging indoor air pollution SDG target 3.9	YES	The parameter is not monitored. Moreover, the stoves are placed outside as observed during the onsite visit. However, enclosed type of the stove and its high efficiency reducing cooking time and air pollution that women are exposed to the project therefore improve overall health situation of the person/women exposed to the situation. The efficiency test is checked (School stoves tests CRUEA.pdf) and assessment team found that stoves implements have overall higher efficiency than the one used before the implementation of the project activity.

Enhanced educational Services SDG target 13.3	YES	The project activity forms a complementary part of the World Food Programme against malnutrition of children. While the WFP provides food to the participating schools, the project participant provides efficient cook stoves and briquettes. It was found during the discussion with the project participant that students are not allowed to attend the classes if they do not bring the wood from the forest. The result is decrease in attendance for the students and hence the child are deprived of education. With the implementation of the project activity school attendance of 98% is achieved. The data is sourced from NOTE DU DIRECTEUR NATIONAL DES CANTINES SCOLAIRES à BQS.pdf and Direction Nationale des Cantines Scholaries 2019: "Enquetes sur la consommation de bois dans les cantines scolaires au Burundi" (p.2). The parameter is monitored.
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Sustainability Indicator	Assessment of relevance to the project (Yes/Potentially/No)	Justification of the Assessment/DOE team
Improvement of working conditions SDG target 8.5	YES	The parameter is monitored with number of short-/long-term jobs - SDG target 8.5 (see above). All new jobs created due to the project activity are formalized in accordance with existing laws and above minimum wage. All jobs created seek to provide better working conditions than alternative jobs in the informal sector or in agriculture. Working conditions of women in school kitchens improve to due to improved cook stoves). All the documentation as described above for jobs concerning for the parameter is applicable for this indicator as well. Hence, assessment team confirms that project activity helps in improving the working conditions.

Poverty alleviation SDG target 1.1	YES	Burundi is one of the poorest countries in the world. Nearly 75% of its people live below the poverty line (https://www.wfpusa.org/articles/10-facts-about-conflicthunger-in-burundi/). During the onsite visit assessment team observed that the project helps decrease expenses for firewood (or respective working time to collect the same), and thus reduces a household's poverty. With the implementation of the project activity, annual savings achieved per student are: 1,829,707 USD / 3 years / 201,000 students = 3.03 USD. The calculation is checked and found correct by the assessment team. Hence, project activity helps reduce poverty rate in the host country.
Increased municipal revenues SDG target 17.1	YES	The parameter is monitored however assessment team found that strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection for the country is important for the GDP of the country to prosper. Assessment team found that 1,520,200 BIF of taxes were paid by project participant to municipality of Bujumbura until 31/12/2018 (Source: BQS paiements municipalité 2016-2018 .zip). The source is found correct and therefore assessment team confirms that implementation of the project activity increased the municipal revenue of the province.
ECONOMIC CO-BENEFIT		
Sustainability Indicator	Assessment of relevance to the project (Yes/Potentially/No)	Justification of the Assessment/DOE team
New industrial / commercial activities SDG target 8.3	YES	The parameter is not monitored. However, with the implementation of the project activity coffee, rice, timber and other agricultural crop/timber producers can earn additional income by providing their biomass waste to the project participant. To confirm the parameter assessment team checked the contracts with the rice and coffee husk producers and found correct. Thus the project helps in new industrial/commercial activities.

Affordability and/or reliability of energy SDG target 7.1	YES	The basic need for any household is Affordable and reliable energy source to meet there day to day demand. Assessment team noted that with the help of World food program from the project activity project participant has been providing renewable biomass briquettes to 284 schools. 284 schools are helped with equipped cook stove (more efficient) and renewable biomass supply with the help of WFP. Thus, assessment team is of the opinion that project activity helps in providing the Affordable and reliable energy source to the schools thereby reducing the need for the people to go out and search for firewood.
OTHER		
Integrate climate change measures into national policies, strategies and planning SDG target 13.2	YES	Assessment team noted that on 14 November 2018, the government launched a National Programme of School Canteens (NPSC) covering 820 schools. As part of the programme, the installation of an ICS is envisaged on mid-term (http://ppbdi.com/index.php/ubum/imibano/11819-meftp-etatdes-lieux-descantines-scolaires-au-burundi). To help government assist in this mission project activity helped in installation of ICS in at-least 284 Schools for the monitoring period 25/01/2016 – 31/12/2018. The target achieved for the relevant SDG is thus acceptable to the assessment team.