Project design document form
(Version 11.0)

BASIC INFORMATION	
Title of the project activity	BQS improved cookstoves for Burundi's schools
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the PDD	2.0
Completion date of the PDD	21/09/2020
Project participants	Burundi Quality Stoves S.A. Shell Trading International Limited
Host Party	Burundi
Applied methodologies and standardized baselines	AMS-I.E – "Switch from non-renewable biomass for thermal applications by the user" – Version 05.0
Sectoral scopes	1. Energy industries (renewable/ non-renewable sources)
Estimated amount of annual average GHG emission reductions	182,061 tCO2 eq

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

Burundi Quality Stoves (BQS) is developing an improved cookstoves project for schools of Burundi. The proposed small scale CDM project activity aims at:

1. Distributing institutional improved cookstoves (IICS) in schools of Burundi to replace currently used old masonry stoves and open fire three-stone system (and traditional stoves); and
2. Switching from non-renewably logged trees to a sustainable energy supply: briquettes made of renewable biomass waste.

Compared to the currently used three-stone fires or traditional stoves, the advanced technology of IICS 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 will be 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 woodfuel. Non renewable biomass fuel consumed in schools will be switched to briquettes made of renewable biomass waste. BQS will ensure a competitive and attractive price for using briquettes together with improved cook stoves in order to give incentives to the state's communities to switch from the previous costly non-renewable woodfuel to the innovative briquettes made of renewable biomass wastes.[1] BQS will ensure through a sale agreement and robust supply strategy that no shortage of briquettes will appear, while unlikely/exceptional shortages imply residual baseline woodfuel supply by the families.

The project will allow the implementation of up to 1,372 IICS[2] . The distribution of IICS, supplied with renewable biomass briquettes, and the associated instructions will help halving these communities' fuel use[3] and turning it renewable. Thus, the project will reduce greenhouse gas emissions by reducing the use of non-renewable biomass within the country, thus slowing down deforestation.

The expected annual amount of greenhouse gas reductions thanks to the project activity averages 182,061 tCO_2 eq and the total amount of greenhouse gas emissions reductions for the chosen crediting period is 1,274,426 tCO_2 eq. The type of GHG reduced is CO_2 emissions from substitution of fossil fuel consumption by similar consumers, equivalent to the non-renewable woody biomass saved by the project activity.

Baseline scenario

According to the World Bank, 172,000 ha (7% of land area) are forested in Burundi in 2010. In total, between 1990 and 2010, this country lost 40.5% of its forest cover or around 117,000 ha (World.DataBank, 2010). In the current situation, wood products represent over 97% of the energy balance of the sub-region of the Great Lakes (Burundi, i.e Democratic Republic of the Congo and Rwanda) (Republic of Burundi. Ministry of Energy and Mines, 2011, January). The imbalance between the supply and demand for woodfuel is increasing at an alarming rate. According to IFDC, woodfuel demand is more than three times local supply capacity (IFDC, 2010).

[1] Thanks to IICS/re-established cook stoves, BQS expect to replace 1 stere of wood by 18kg of briquettes based on experiences done in schools (the report of test has been provided to DOE). Actually, one stere of wood is sold at about 15,000 to 20,000 FBU whereas BQS plans to sell 1 kg of briquettes at 378 FBU (indicative price); satisfying the same thermal energy need, will thus cost about two times less than in baseline situation. Calculation are further detailed in excel sheet provided to DOE.

[2] One stove serves more than 197 students.

[3] Experiments to estimate the approximate renewable briquettes consumption per cookstove have been conducted and recorded, evidencing savings up to 90% in quantity and 50% time. Communities will save fuel and time.

The baseline scenario is the scenario existing prior to the implementation of the project activity. It is the continuation of the current situation i.e. the use of non-renewable wood fuel in traditional inefficient cookstoves (three stones and old masonry cook stoves) by the schools of Burundi. Currently the common practice for cooking consists essentially of using traditional open fire (3-stone) system, traditional stoves and old masonry stoves fired by wood fuel which are still dominant in most schools. These stoves are notoriously wasteful, with an efficiency level of 10-15% (EAC, 2008).

Other drawbacks of traditional biomass stoves include the diffusion of heat during windy conditions, the difficulty of controlling the fire, users' exposure to heat and smoke as well as fire hazards. In spite of this, traditional stoves are extensively used by schools, partly because of lack of awareness of the existence and advantages of improved biomass energy technologies and partly due to lack of access to these technologies. Besides, non-renewable woodfuel consumption, despite its ever increasing scarcity, damage to the environment and price, remains by far the main energy source purchased by school's communities by lack of alternatives.

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. As assessed and revised in detail in section B.6.1, 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 communication[4], 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.

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) will be 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 SSC-CDM project falls into Category (C) project activities: thermal energy for the user. The demonstration that the project is eligible as a small scale activity is done in section B.2.

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 MW_{th}[5]

[4] '2019-08-22 Lettre Ministre WFP internats' letter provided to the DOE

[5] Clean Development Mechanism Project Standard (Version 05.0), Section 8.2. project activity eligibility, §81. (a) & 82. (c)

Contribution to sustainable development

In addition to greenhouse gas emissions reductions, the project participants are confident that the proposed project activity will have the following significant impacts on Republic of Burundi's sustainable development.

The project helps decrease expenses for firewood (or respective working time to collect the same), and thus reduces a household's poverty. According to the statistical service in Burundi more than 60% of the population live below the national poverty threshold at around 1 USD/day[6] (SDG target 1.1).

The project reduces and prevents diseases due to reduced health damaging air pollution (asthma, cancer, etc.). The institutional improved cookstoves employed in the project allow for less combustion fumes (since project stoves are enclosed[7] and more efficient requiring less cooking time, which reduces air pollution in the open-air kitchen (PM and black carbon, VOCs, CO, NOx, PAHS, etc.). Furthermore, the institutional improved cookstoves of the project activity installs enclosed stoves, i.e. reduce accidents due to open fires (due to wind) significantly. The working conditions of the women in the school kitchens improve significantly (SDG target 3.9).

Instead of student's parents spending hours on looking for firewood in the forest, project participant organizes centralized supply of free biomass briquettes to all schools. (SDG target 7.1/SDG target 7.B).

Coffee, rice, timber and other agricultural crop/timber producers can earn additional income by selling their biomass waste to the project participant. (SDG target 8.3)

The CDM project creates new long-term and short job opportunities including income generation. More than 100 permanent jobs with decent work conditions should be created in briquette drying & production (collection of raw material, drying, mixing of biomass residues, briquette production), in administration & management and in security services. More than 15 temporary jobs with decent work conditions in briquette production should be created. Further jobs will be created through use of third-party services (transport of briquettes, lawyers, etc.) (SDG target 8.5)

Educational services are enhanced since parents (and sometimes their children) do not have to collect firewood for the school kitchens anymore. Therefore, educational services become more affordable/accessible and school attendance incentivized (in particular in deforested areas) since students who do not bring firewood to the school are not allowed to attend. The project activity forms a complementary part of the World Food Programme against malnutrition of children. While the WFP provides food to the participating school, the project participant provides efficient cook stoves and briquettes. (SDG target 13.3)

Apart from using more efficient cook stoves, the use of renewable biomass briquettes from agricultural waste instead of non-renewable biomass reduces deforestation significantly. (SDG target 15.2)

Reducing biomass consumption for cooking purposes reduces pressure on forests. Therefore, the activity protects species diversity as the habitat of these species is conserved. (SDG target 15.5)

Due to taxes payed by project participant, domestic resource mobilisation is strengthened (SDG target 17.1).

[6] https://tinyurl.com/v83jxk5, p.31

[7] cf. pictures in section A.3, and footnote 220 of the WFP evaluation report: https://reliefweb.int/sites/reliefweb.int/files/resources/WFP-0000108441.pdf

The activity promotes the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries. In particular, at least three machines of briquettes making (Jumbo) are introduced from India. Highly efficient improved cookstoves designed in the United States are introduced by the International Life Fund in Uganda and transferred to Burundi. Workers will be trained to use the briquette making machines by technology provider (Jumbo) and the technology provider (International Life Fund Uganda) will train the project participant in cook stove construction (SDG target 17.7 and SDG target 17.9)

Therefore, the project is in compliance with the national criteria for sustainable development.

A.2. Location of project activity

Host country: The Republic of Burundi is the host country[8].
Region/State/Province: All provinces, starting by Bujumbura province.
City/Town/Community: 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 (cf -3.3761, 29.3600). The country-wide geographical area corresponds to the area where renewable biomass will be distributed and used in replacement of the former non-renewable woodfuel in IICS (Figure 1).

Figure 1: *Area of implementation of the project activity.*

The targeted schools are scattered throughout the country. The indicative list of schools to participate is given in Table below. More schools may be added along the project life, whenever a new school is created, it may join the project. Any inclusion of new schools will be documented and reflected in the monitoring reports, together with its up-to-date specific baseline unless ex-ante determined baseline is more conservative.

[8] Burundi has ratified the Kyoto Protocol on October 18th 2001 (UNFCCC, 2012). According to the UNFCCC secretariat, the Burundi DNA Focal Point to the UNFCCC is the Ministry of Water, Environment, Land Management and Urban Planning, in Bujumbura (UNFCCC-DNA, 2012) at time of project registration. The project participant is aware of the current DNA of Burundi, which is as shown on the UNFCCC webpage (https://cdm.unfccc.int/DNA/view.html?CID=36).

Table 1: *List of all participating schools*

	PROVINCE	COMMUNE	SCHOOL
1	CIBITOKE	BUGANDA	RUHEMBE I
2			RUHEMBE II
3			BIHAHE I
4			BIHAHE II
5			BUGANDA I
6			BUGANDA II
7			MURAMBI
8			NDAVA TRANS
9			KAGONGO
10			GATERI
11			RUHAGARIKA
12			CUNYU
13			MBUBI
14		RUGOMBO	EP RUGEREGERE
15			RUKANA I
16			RUSORORO
17			MIKASHU
18			RUVUMERA
19			RUSIGA
20			BUSERUKO
21			KIRAMIRA
22			RUKANA II
23			RUVYAGIRA
24			MUSENYI
25			MPARAMBO
26			CUZWE
27			BUHINYUZA
28		BUKINANYANA	BITARE
29			KABERE
30			MASANGO
31			NYAMYEHA
32			NYARUHISHI
33			SEHE
34			GIKENENE
35			BUMBA II
36			BUMBA III

	PROVINCE	COMMUNE	SCHOOL
157	GITEGA	BURAZA	BUBAJI
158			BUGEGA
159			BUHINYUZA I
160			BUHINYUZA II
161			BUTEMBA
162			BURIZA
163			GASHUBI
164			GITARAMUKA I
165			GITARAMUKA II
166			KIGOTI
167			MAZA
168			MIGEZI
169			MUKA
170			NDAGO
171			NDAVA II
172			NYAKABUYE I
173			NYAKABUYE II
174			NYARUNAZI
175			RABIRO I
176			RABIRO II
177			RUBIRA
178			RUFUNZWE
179			RWEZA
180		MAKEBUKO	BUGA
181			BUGUMBASHA
182			BUHUNJA
183			GASASA
184			GASENYI
185			JANJA
186			KAROBA
187			KIGATI
188			MARAMVYA
189			MARAMVYA
190			MUHORORO
191			MUMURI
192			MURENDA

37			BUGARAMA
38			NYAMIRAMBO
39			NDORA
40			KIBATI
41			GIHANGO
42			MUNYINYA
43			BUTARA
44			NYAVYAMO
45			BUKINANYANA
46			GAHABURA
47			RUZIBA
48			MPARO
49			SHIMWE
50	BUJUMBURA	KABEZI	CUMBA
51			GITANGA
52			GASERU
53			GAKUNGWE
54			MICHAELLA
55			GATONGO
56			KIMINA
57			MASAMA I
58			MASAMA II
59			MIGERA
60			NYAMUZI I
61			NYAMUZI II
62			NYAMUZI III
63			RUGEMBE
64			ITYAZO
65			MUTUMBA I
66			MUTUMBA II
67			MUTUMBA III
68			NYAMUGARI
69		KANYOSHA	KIROMBWE I
70			KIROMBWE II
71			KIROMBWE III
72			KIROMBWE IV
73			KIYENZI I
74			KIYENZI II
75			NYAMABOKO I
76			NYAMABOKO II
193			MWARO-MAVUVU
194			MWARO-NGUNDU
195			MWUMBA
196			NYAMAGANDIKA
197			RUTANGANIKA
198			RUTOVU
199			Ste MARIE ASSUMPTA de MUMURI
200			SIMBA
201		NYARUSANGE	BIKINGI
202			BUKORO
203			GITARAMUKA
204			JURWE
205			KIGARA
206			MASARE
207			MUYANGE
208			MUZIMA
209			NKONDO
210			NYAMAZI
211			NYARUBENGA
212			NYARUSANGE
213			NYARUTANGA
214			TYE
215		BUGENDANA	KAREMBA
216			KIVOGERO
217			KIZIGURO
218			MWURIRE
219			NKANDA I
220			NKANDA II
221			NTUNDA
222			JENDA
223			RUSHANGA
224			RWINGIRI
225			WINTEKO I
226			WINTEKO II
227			BITARE
228			BUGENDANA I
229			BUGENDANA II
230			BUHORO
231			BUSANGANA
232			CARIRE

77			RARO I	233			CISHWA I
78			RARO II	234			CISHWA II
79			COGA I	235			CUNYWE
80			COGA II	236			GATERAMA
81			BIGWA I	237			KAREHE
82			BIGWA II	238			KIRIMBI I
83			GITONGO	239			KIRIMBI II
84			SORÓREZO	240			KIVUVU I
85			BUHOMBA	241			KIVUVU II
86			MARAMVYA III	242			MIGINA
87		**MUTIMBUZI**	BUGOMA	243			MUGERA I
88			RUKARAMU I	244			MUGERA II
89			RUKARAMU II	245			MUGERA III
90			VUGIZO	246			MUGITEGA
91			MUGERERO	247			MUKORO
92			NYESHANGA	248			MUNYINYA
93			KAGWEMA	249			MUTOYI I
94			MUYANGE	250			MUTOYI II
95			NDAVA BUSONGO	251			MUVUNAMBOGO
96			BURAMATA	252			NYAKERU I
97			MPANDA - VILLAGE 5	253			NYAKERU II
98		**GIHANGA**	KIZINA	254			NYAMAGANA
99			RUMOTOMOTO	255			RUTONGANIKWA I
100			RUGUNGA	256			RUTONGANAIKWA II
101			MUDUBUGU	257			CUZU
102			EP Mahoro	258			KABUYE
103			GIHUNGWE I ET II	259			KARAGO
104	**BUBANZA**		BWIZA BWA NINGA	260			KINYONZO
105			KIRENGANE	261			KIRANZIRA
106			NYAGATOBE	262			MUGANO
107			TEBERO	263			MURAMA I
108			EP BUHANZA	264			MURAMA II
109			EP RUCE I, II et SHANGO	265		**RYANSORO**	MUYUGA
110			EP BUGANYA	266			NDAVA
111		**RUGAZI**	EP KIBUYE I	267			NTUNDA
112			EP KIBUYE II	268			NYAKARAMBO I
113			EP GASENYI	269			NYAKARAMBO II
114			RUGAZI II	270			RWEZA
115			RUGAZI I	271			RWOGA
116			RUZENGA	272			RYANSORO

117			RUBIZA
118			MANEGE
119			KIBENGA
120			MBUYE I
121			NYUNZWE
122			MABUYE II
123			BUMBA
124			RUZIBIRA
125			BUGANDA
126			RUSEKABUYE I
127			RUSEKABUYE II
128			MUGERI
129			KIVYUKA I
130			KIVYUKA II
131			ECOFO MIVYIRU I
132			ECOFO MIVYIRU II
133			ECOFO MUYEBE I
134		**MUSIGATI**	ECOFO MUYEBE II
135			ECOFO MUYEBE III
136			ECOFO KAYANGE
137			EP MPISHI
138			ECOFO BUKINGA
139			EP MUNANIRA
140			ECOFO NGONYI
141			EP MUKUNGU I
142			EP MUKUNGU II
143			KANAZI
144			GAHISE
145			TITI
146			BUTANUKA
147			BUTEMBE
148			MASHA
149			GATAGURA
150			RUBIRA
151		**MPANDA**	MURENGEZA II
152			RUZIBA
153			GAHWAZI
154			MAHWA
155			NYOMVYI
156			NYENDAGO
273			GATABATABA
274			GITONGO I
275			GITONGO II
276			GITONGO III
277			GITOGO IV
278		**MUTAHO**	MASANGO
279			MURIRIMBO
280			NYANGUNGU I
281			NYANGUNGU II
282			RWISABI I
283			RWISABI II
284			RWISABI III

The project proponents have identified several renewable biomass resources[9] throughout the country. The renewable biomass is from crop residues (like bagasse and coffee husks), forest litter (like pine needles) and timber residues (like sawmill residue).

BQS currently operates three briquetting plants across the country, two in the vicinity of Bujumbura (West) and one in Bubanza (North-West). Further machines are planned to be installed in other parts of the countries such as Cankuzo (East), so as to adequately gather and process the surrounding biomass resources and supply the relevant schools with minimal transportation.

A.3. Technologies/measures

In the baseline scenario (identical to the scenario existing prior to the implementation of the project activity), the prevailing technology in operation is the basic three stones cookstoves or traditional stoves broadly used in most Central African's schools fuelled by non-renewable woodfuel as it is shown on the picture below. In several schools, old masonry stoves are operated for cooking activities fuelled by non-renewable wood fuel.

Figure 2: *Traditional cookstoves used in schools in baseline scenario*

Three stone cooking fires, traditional stoves and masonry stoves are the cheapest methods of cooking. However, such practise also comes with several issues:

- Fuel is wasted, as heat is allowed to escape into the open air;
- The inhalation of smoke causes health problems;
- The use of an open fire creates a risk of burns and scalds.

Under the current scenario, cookstoves are fuelled by non-renewable biomass, i.e. batch deliveries of wood fuel extracted from forest areas.

Technology to be implemented under the project activity

The list of the facilities, systems and equipment that will be installed and/or modified by the project activity includes:

- The distribution at an affordable price of up to 1,372[10] IICS to schools identified as participating customers to the proposed project;

[9] Renewable resource should be understood as per the definition provided in CDM-EB 23, Annex 18

[10] According to project proponent knowledge and expectations, about 940 IICSs should be distributed (one for more than 197 people). However, it is indicative information as the exact number of Institutional cookstoves to be distributed is not known at the time of project validation.

- The setting up of a renewable briquettes supply chain from biomass residues.

1. The Institutional Improved Cookstoves

The stove model to be disseminated is an institutional improved cook stove (IICS) with a robust design (Figure below) currently only available in medium (>50 cm diameter)size. Compared to the currently used traditional stoves, the advanced 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 3: *Improved Institutional cookstoves with briquettes*

The specifications of the Institutional Improved cookstoves designed in the United States of American and introduced in Burundi by the International Life Fund in Uganda are provided to the DOE. More information related to the Procedure to determine the useful power of IICS is provided in Appendix 4.

Table 2: *Institutional improved cookstoves specifications*

	Large IICS
Diameter	>50 cm
Weight	N/A (fixed)
Cooking power output	32.78 kW_{th}
Efficiency	44.8%
Adoption	Traditional cooking styles and posture
Lifetime	>7 years
Age at the time of implementation	new

Supply chain of briquettes made of renewable biomass wastes

The project consists in switching fuel consumption of the schools of Burundi from non-renewable biomass consumption for thermal applications into renewable sources. This will be possible thanks to the innovative introduction of briquettes made of renewable biomass wastes.

Figure 4: *Briquettes made of renewable biomass wastes*

BQS currently operates three briquetting plants across the country, two in the vicinity of Bujumbura (West) and one in Bubanza (North-West). Further machines are planned to be installed in other parts of the countries such as Cankuzo (East). Briquetting machines are of make Jumbo 90[11]. The current supply[12] is centralised at the ministry level where specific budget is allocated for fuel consumption of these communities.

How the technologies and know-how to be used are transferred to the host country

The technology and know-how being applied by the SSC-CDM project is environmentally safe and sound since it will positively curb deforestation currently endangering natural forests by promoting sane and sustainable practices in the targeted areas of Burundi. It is made possible by highly efficient stoves and pioneer briquetting machines technology transfer to the Host party under the benefits of the Clean Development Mechanism.

Besides distribution, after-sale services will comprise a suitable instructions for schools appropriation of the IICS, follow-up and maintenance program for users in order to ensure that the renewable biomass fired IICS are properly and durably used.

As indicative information the project is expected to require 99,723 tonnes of briquettes per year resulting in the power consumption of 3,789 MWh per year emitting 5,912tonnes of carbon dioxide. For detail calculation, please refer to section B.6.3.

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Burundi (host Party)	Burundi Quality Stoves S.A.	No
United Kingdom of Great Britain and Northern Ireland	Shell Trading International Limited	No

The project activity will be developed by Burundi Quality Stoves S.A., hereafter referred to as BQS. BQS is a Bujumbura-based private entity aimed at undertaking the CDM project. In addition to the proposed project, BQS is involved in a Programme of Activities aiming at distributing IICS to households of Burundi, including the supply of renewable biomass from sustainable forests management and briquettes production.

[11] The details description and technical specification of briquetting machines are put in appendix 4 as they are not included within the project boundaries because each production site will supply independently the closest schools and not any production site will be dedicated specifically to one school. Therefore, emissions due to electricity consumption from the briquetting machines will be accounted as leakage emissions.

[12] The supply chain is further described in section B.7.3

A.5. Public funding of project activity

The project activity does not involve any public funding according to the OECD definitions for Official Development Assistance (ODA[13]).

A.6. History of project activity

This project is neither registered as an individual CDM project activity nor included in another registered CDM PoA as a CPA nor a project activity that has been deregistered or excluded from a registered CDM PoA. There is no registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired, which exists in the same geographical location as the proposed CDM project activity.

A.7. Debundling

According to the Clean Development Mechanism Project Standard (Version 5.0, §87-88): "*Project participants shall demonstrate that the proposed small-scale CDM project activity is not a debundled component of a large-scale project activity. Project participants shall follow the applicable provisions in the "Guidelines on assessment of debundling for SSC project activities"*.

As per the *"Guidelines on assessment of debundling for SSC project activities"* [EB 54, Annex 13 (Version 03), §7]: *"If each of the independent subsystems/measures (e.g., biogas digester, residential solar energy systems, kerosene or incandescent lighting replacements) included in one or more CDM project activities is no greater than 1% of the small-scale thresholds defined by the applied methodology and the subsystems/measures are indicated in the PDDs to be each implemented at or in multiple locations (e.g., installed at or in multiple homes) then these CDM project activities are exempted from performing a de-bundling check, i.e., considered as being not a de-bundled component of a large scale activity".*

As described in section A.1 the project activity 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). Type (I) methodology small-scale threshold is 45 MW_{th}, of which 1% is 450 kW_{th}. Each IICS included in this proposed Project activity will not result in output capacity larger than 450 kW_{th} [14], as indicated in Table 2. Besides, the IICS will be each implemented in multiple locations (multiple schools sites) across the country. Therefore, the proposed Project activity is exempted from performing a de-bundling check, i.e., considered as being not a de-bundled component of a large scale activity.

SECTION B. Application of methodologies and standardized baselines

B.1. Reference to methodologies and standardized baselines

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.

The application of AMS-I.E methodology includes references to the following guidelines and tools:
- General guidelines for SSC CDM methodologies (Version 20.0, EB 76)
- Guidelines on the demonstration of additionality of small-scale project activities (Version 09.0, EB68)

[13] Confirmed by the different interviews during the on-site visit with the local authorities.
[14] IICS that will be distributed have been tested with an output capacity of 32.78 kW_{th} such as indicated in table 2.

- General guidance on leakage in biomass project activities (Attachment C to Appendix B of 4/CMP.1 Annex II – Version 03.0, EB47 Annex 28)
- Clean development mechanism project cycle procedure (Version 05.0, EB 65)
- Tool to calculate baseline, project and/or leakage emissions from electricity consumption (Version 01, EB39 Annex 7)
- Guidelines on assessment of debundling for SSC project activities (Version 03.0, EB 54 Annex 13)

B.2. Applicability of methodologies and standardized baselines

1. AMS-I.E category comprises activities to displace the use of non-renewable biomass by introducing renewable energy technologies, which is precisely the purpose of the project activity (the supply of renewable biomass-briquettes to IICS in schools); therefore category I.E is deemed adequate.

2. It is also proven that non-renewable biomass has been used since 31 December 1989:

Table 3: *Anteriority of non-renewable biomass consumption*

Indicator	Evidence
Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area	In total, between 1990 and 2010, Burundi lost 40.5% of its forest cover or around 117,000 ha (World.DataBank, 2010).

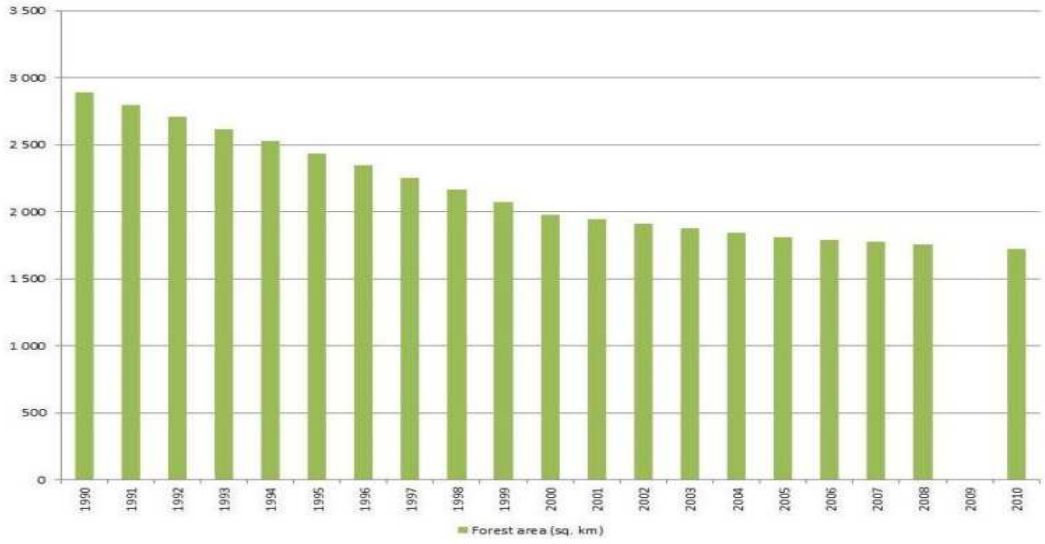

Figure 5: *Change in forest cover in Burundi between 1990 and 2010*

Moreover, it qualifies as a small-scale project activity as it will remain under the limits of small-scale project activity types during every year of the crediting period. Indeed, the appropriate capacity limit for Type I projects is 45 MW_{th}, whereas each IICS thermal output is given at 32.78 kW_{th} according to certified tests[15], hence a total effective output of 1,372 appliances x 32.78 kW_{th} are allowed under the project size limit. However, the whole need of the project should be covered by 940 IICS.[16] This corresponds conservatively to a thermal output capacity of 30,814 kW_{th}, which is below 45 MW_{th}. The useful power of all IICS distributed under the project activity will be kept under 45 MW_{th}.

[15] see test results from manufacturer specification provided to the DOE.

[16] According to project proponent experience and expectations, 940 IICS should be distributed (each IICS suiting around 197 people). However, it is indicative information as the exact number of Institutional cookstoves distributed as well as evolution of student number per school/kitchen is not known at the time of project validation.

B.3. Project boundary, sources and greenhouse gases (GHGs)

As per the methodology AMS-I.E, the project boundary is the physical, geographical site of the use of biomass. Therefore, it encompasses all the school's communities of Burundi targeted by the project activity, who will consume the renewable biomass, enabled by the implementation of the improved cookstoves. Only the communities using the IICS introduced by the project with the renewable biomass supplied by the project are included in the project boundaries, therefore neither communities using project's stove without project's renewable biomass nor communities using project's renewable biomass without project's cookstoves will be part of it.

The briquetting machines are not included within the project's boundaries and will rather be accounted as leakage emissions due to the fact that each production site will supply independently the closest schools but not only because other communities such as police camps, prisons and restaurants may be supplied as well by the same production sites. Moreover, not any production site will be dedicated specifically to one school.

The main emission sources and type of GHGs in the project boundary are CO_2 emissions from substitution of fossil fuel consumption by similar consumers, equivalent to the non-renewable woody biomass saved by the project activity, as listed in the table below:

Table 4: *Gases included in the boundary related to the project activity*

	Source	GHG	Included?	Justification / Explanation
Baseline	CO_2 emissions from consumption of non-renewable woody biomass in low-efficiency three-stone fires and traditional cook stoves	CO_2	YES	Main emission source.
		CH_4	NO	Minor emission source (neglected for simplification).
		N_2O		
Project activity	CO_2 emissions from consumption of non-renewable woody biomass in improved cook stoves distributed by the project activity	CO_2	NO	No emission source due to the fact that the previous woodfuel is switched to renewable biomass.
		CH_4	NO	Minor emission source (neglected for simplification).
		N_2O		
	CO_2 emissions from shift of pre-project activity	CO_2	NO	The renewable biomass used is all from residue/waste, this emission source is not applicable to this project.
		CH_4		
		N_2O		
	CO_2 emissions from biomass generation/ cultivation	CO_2	NO	The renewable biomass used is all from residue/waste, this emission source is not applicable to this project.
		CH_4		
		N_2O		
Leakage	CO_2 emissions from electricity consumption for briquettes production	CO_2	YES	Main emission source.
		CH_4	NO	Minor emission source (neglected for simplification).
		N_2O		
	CO_2 emissions from transportation of biomass	CO_2	NO	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; for the proposed project, the residues will never be transported over a distance more than 200 km thus can be neglected.

				Moreover, the average distance of transportation of renewable briquettes from briquetting plants to schools is shorter than the baseline situation where non-renewable woody biomass was transported over a longer distance from isolated rural production site thus can be neglected.
		CH_4	NO	Minor emission source (neglected for simplification).
		N_2O		
	CO_2 emissions from competing use of biomass	CO_2	NO	The Project activity's biomass supply involves agro-industrial wastes which are widely available in the region and currently burnt without energy purpose, 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.
		CH_4		
		N_2O		

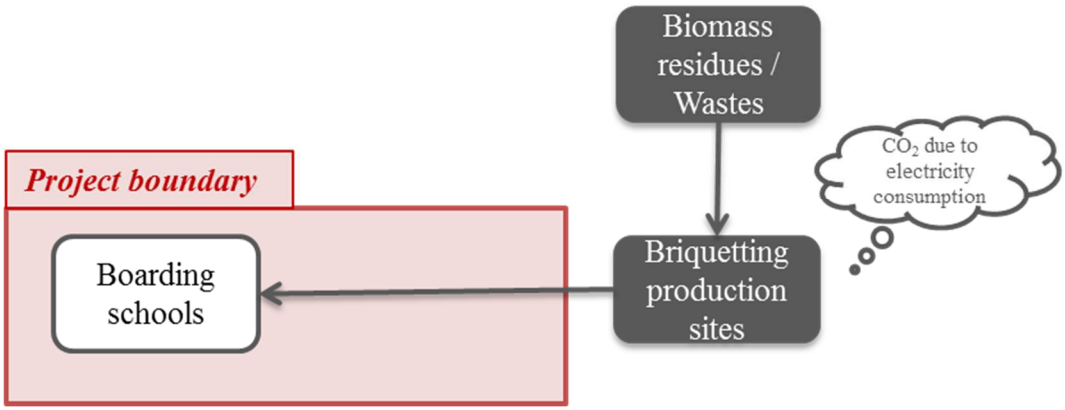

Figure 6: *Project boundary*

B.4. Establishment and description of baseline scenario

Baseline scenario description

The baseline scenario is the same as the scenario existing prior to the implementation of the project activity, although according to methodology AMS-I.E:
It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs.

Letter of information from Education Ministry (Education Ministry, September 2012) and one site interviews with a representative of the Education ministry have highlighted a strong prevailing practice of cooking with traditional low efficiency open stoves supplied with non-renewable woodfuel in the vast majority of schools of Burundi, resulting in severe deforestation and higher emissions than the proposed CDM project activity. The historical baseline description for technologies and measures has been provided in section A.3.

B.5. Demonstration of additionality

Additionality

As per Annex 27 EB68 "Guidelines on the demonstration of additionality of small-scale project activities" Version 09.0 §2:
"Documentation of barriers is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of:[…]

(c) Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds; […].

The proposed project comply with the requirements criteria under option (c) of the positive list. The proposed project is solely composed of isolated units (Improved Cookstoves) where the users of the technology are schools where the size of each unit is no larger than 5% of the small-scale CDM-thresholds. Under these conditions, each appliance shall result in less than 2.25 MWh_{th} capacity.

Therefore, the conditions are sufficient for **the proposed project to be automatically additional**.

Prior Consideration of the CDM

According to the Clean development mechanism project cycle procedure (Version 05.0, EB 65), for project activities with a start date from 2 August 2008 the project participant must inform a Host Party designated national authority (DNA) and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status within six months of the project activity start date.

As shown in Table below, the project activity fulfils the requirement of prior consideration of the CDM as both UNFCCC and the DNA of Burundi have been informed of the intention of BQS to undertake the proposed project activity under the CDM framework. The notification has been done within six months of the project starting date as per UNFCCC requirement.

Table 5: *Project timeline and early consideration and continuation of actions to secure CDM.*

Project milestones	Date	Comments/ Evidence
Notification to host country DNA	28th February 2011	No objection letter from the DNA
Local Stakeholders Consultation	13th January 2012	Press article from local newspaper
Notification to the UNFCCC secretariat	5th March 2012	UNFCCC confirmation of receipt
ERPA signing with carbon credit buyer	4th April 2012	ERPA
Pilot container purchase (starting date)	25th June 2012	IICS Order / Letter of Credit
Start of CDM validation	23 th October 2012	GSC upload by the DOE

B.6. Estimation of emission reductions
B.6.1. Explanation of methodological choices

The procedures in the approved project category to calculate project emissions, baseline emissions, leakage emissions and emission reductions are applied to the proposed project activity as follows.

Baseline emissions

Baseline Emissions of the proposed project activity will be calculated as:

$$ER_y = B_y * f_{NRB,y} * NCV_{biomass} * EF_{projected\_fossilfuel} \quad (1)$$

Where:

ER_y	Emission reductions during the year *y* in tCO_2e
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[17]
$NCV_{biomass}$	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 By:

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.

B_y will be determined based on the sum of woody biomass substituted by each kitchen[18] in the year *y* ($M_{substituted\ biomass,i,y}$) in tonnes/kitchen/y taking into consideration the operating status of each kitchen as follows:

$$B_y = Leakage_{adj} * \Sigma i(Op\_kitchen_{i,y} * M_{substituted\_biomass,i,y}) \quad (2)$$

Where:

B_y	Quantity of woody biomass that is substituted or displaced in tonnes in year *y*
$Op\_kitchen_{,i,y}$	Operating status of kitchen *i* (equipped with IICS / refurbished masonry stove) in year *y*
$M_{substituted\_biomass,i,y}$	Quantity of woody biomass that is substituted by operating kitchen *i* in year *y* (tonnes/kitchen *i*/y)
$Leakage_{adj}$	Net to gross adjustment factor to account for leakages

Operating status of kitchen *i* in the year *y* ($Op\_kitchen_{,i,y}$)

The operational status[19] 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 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

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

[18] 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.

[19] Guidance for monitoring are provided to field agents in order to determine the operating status of each kitchen during monitoring session; see Appendix 5.

school year calendar (except in case of Force Majeure closure).[20] Student attendance is incentivized by the provision of the meals.

In ex-ante calculations (baseline scenario), it is assumed that all targeted schools' kitchen will properly operate with constant supply of renewable briquettes.

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

Wood fuel is by far the main cooking fuel in Burundi's schools. The project activity will substitute all the woodfuel[21] 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* ($M_{substituted\_biomass,i,y}$) is calculated as follows:

$$M_{substituted\_biomass,i,y} = M_{woody\_biomass\_hist,i} \quad \textbf{(3)}$$

Where:

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

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:

$$M_{woody\_biomass\_hist,i} = M_{woody\_biomass\_hist\_pp,i} * N_{pers/kitcheni,y} \quad \textbf{(4)}$$

Where:

$M_{woody\_biomass\_hist,i}$	Historical consumption of woody biomass by kitchen *i* (tonnes/kitchen *i)*
$M_{woody\_biomass\_hist\_pp,i}$	Historical consumption of woody biomass per person dependant on the kitchen *i* (tonnes per person)
$N_{pers/kitchen\ i,y}$	Number of person dependent on kitchen *i* in the year *y* (pers/year)

Historical consumption of woody biomass per person dependant on the kitchen *i* (tonnes per person) ($M_{woody\_biomass\_hist\_pp,i}$)

[20] 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 ex-ante with 241 school days and revised down the ex-ante ER calculations accordingly.

[21] 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 (28/06/2017) 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 country[22]:

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 per school:

- The average number of students per school is 653.
- The students are at school during 226 days over 365[23].
- 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 will be obtained by multiplying the daily consumption by 226 days.

Table 6: *School's historical consumption per person of woodfuel in tonne/days/year*

	$M_{woody\_biomass\_hist,\_pp,i}$	$M_{woody\_biomass\_hist,\_pp,i}$
SCHOOL	*tonnes per capita per day*	*tonnes per capita per year*
Conservative baseline consumption retained	**0.005**	**1.13**

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

In order to take into consideration the occupancy rate of each school, the number of person dependant on kitchen *i* will be monitored ex-post along all monitoring period. For ex-ante determination of person dependant on kitchen *i*, average historical number of person present in each school (653) in 2016/17 will be used.

Determination of 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 2012[24].

[22] 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.

[23] 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.
[24] http://cdm.unfccc.int/DNA/fNRB/index.html

Determination of Emission factor for relevant substitution fossil fuel ($EF_{projected\_fossilfuel}$)

According to methodology AMS-I.E, the Emission Factor of the substitution fuel likely to be used by similar consumers has to be taken at 81.6 tCO_2/TJ.

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).

Determination of 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.

According to § III.4 of the General guidance on leakage in biomass project activities Version 03 (EB 47, Annex 28) three types of emission sources are potentially significant (>10% of emission reductions) and attributable to the project activities:

A. **Shifts of pre-project activities**. Decreases of carbon stocks, for example as a result of deforestation, outside the land area where the biomass is grown, due to shifts of preproject activities.
B. **Emissions** related to the production of the biomass.
C. **Competing uses for the biomass**. The biomass may in the absence of the project activity be used elsewhere, for the same or a different purpose.

Project emissions

A. <u>Shifts of pre-project activities</u>

According to § 6 A. of the *General guidance on leakage in biomass project activities* Version 03 (EB 47, Annex 28) "*Shifts of pre-project activities are relevant where in the absence of the project activity the land areas would be used for other purposes (i.e. agriculture). For example: where cropland is converted to forest to produce wood for energy purposes, the pre-project activity (crop production) might be shifted to other land areas. In the worst case, this shift of the pre-project activity could result in deforestation on other land areas.*"

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

B. <u>Emissions related to the production of the biomass</u>

According to § III B. of the *General guidance on leakage in biomass project activities* Version 03 (EB 47, Annex 28), potentially significant emission sources from the production of renewable biomass can be:

(a) Emissions from application of fertilizer; and
(b) Project emissions from clearance of lands.

"These emissions sources should respectively be included in a simplified manner, not involving any significant transaction costs. All other emission sources are likely to be smaller than 10% (each) - including transportation of raw materials and biomass, fossil fuel consumption for the cultivation of plantations - and can therefore be neglected in the context of SSC project activities."

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

Leakage emissions

C. 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 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 purpose[25], 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 will be 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.

[25] Apart from the cogeneration project of SOSUMO where already residues is declared as too many. Indeed, SOSUMO has too much residues and has to burn a great part of it. That's why BQS is signing a partnership with SOSUMO at the sugar cane plant location in order to process the surplus into briquettes.

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 will be 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 briquettes[26].

➔ 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:

$$LE_{EC,y} = \sum_{j} EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y}) \quad \textbf{(5)}$$

Where:

$LE_{EC,y}$	Leakage emissions from electricity consumption in year *y* (tCO_2/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* (tCO_2/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 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 $M_{renewable.biomass,,y}$.

Ex-ante Determination of the Quantity of renewable biomass consumed by the project activity in year y ($M_{renewable.biomass,y}$)

For ex-ante estimation of leakage emissions the assumption made is:

$$M_{renewable.biomass,y} = ½ * \sum M_{substituted.biomass,i,y}$$

[26] 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.

Value applied ex ante is based on conservative biomass savings estimate derived from preliminary experience[27].

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 tCO_2/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 tCO_2/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 tCO_2/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 tCO_2/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.

[27] Experiments to estimate the approximate renewable briquettes consumption per cookstove have been conducted in two schools of the communes of Kamenge and Cibitoke and recorded, evidencing savings up to 90%. A conversion factor of 0.5 is a conservative assumption. Report has been provided to the DOE.

➔ Transportation of renewable biomass wastes from collection sites to the briquetting plant will be neglected as the briquetting plants will be operated close to the residues provision sites[28]. 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.

Emission reductions

The final emission reductions are obtained from the baseline emissions minus the project emissions and leakage.

B.6.2. Data and parameters fixed ex ante

Data/Parameter	**P_j**
Data unit	kW_{th}
Description	Useful thermal output capacity of the IICS
Source of data	Performance test results from the manufacturer
Value(s) applied	*32.78*
Choice of data or Measurement methods and procedures	Useful thermal output of the IICS has been measured by Water Boiling Test. Tests results have been made available to the DOE. See Appendix 4 containing procedure for calculation.
Purpose of data	Small-scale threshold, debundling compliance and automatic additionality compliance
Additional comment	-

[28] It has been confirmed during on site visit by the DOE that Bujumbura briquetting machines are installed at immediate proximity of the coffee factory residues disposal; the same will be applied in Bubanza and Cankuzo.

Data/Parameter	$f_{NRB,y}$
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(s) applied	0.77
Choice of data or Measurement methods and procedures	National default value.
Purpose of data	Calculation of baseline emissions
Additional comment	The value has been approved by the DNA of Burundi the 6th September 2012[29]

Data/Parameter	$NCV_{biomass}$
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(s) applied	0.015
Choice of data or Measurement methods and procedures	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
Additional comment	-

Data/Parameter	$EF_{projected\_fossilfuel}$
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(s) applied	81.6
Choice of data or Measurement methods and procedures	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
Additional comment	-

[29] http://cdm.unfccc.int/DNA/fNRB/index.html

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(s) applied	1.13
Choice of data or Measurement methods and procedures	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
Additional comment	-

Data/Parameter	$\mathbf{Leakage_{adj}}$
Data unit	fraction
Description	Net to gross adjustment factor to account for leakages
Source of data	Methodology AMS-I.E Version 05
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	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
Additional comment	-

Data/Parameter	$\mathbf{EF_{EL,j,y}}$
Data unit	tCO_2/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(s) applied	1.3
Choice of data or Measurement methods and procedures	Option A2: *Use a conservative default value of 1.3 tCO_2/MWh*
Purpose of data	Calculation of leakage emissions
Additional comment	-

Data/Parameter	$\mathbf{TDL_{j,y}}$
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(s) applied	0.20
Choice of data or Measurement methods and procedures	Use as default values of 20% for option: (a) project or leakage electricity consumption sources;
Purpose of data	Calculation of leakage emissions
Additional comment	-

Data/Parameter	SEC_{briq}
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(s) applied	0.038
Choice of data or Measurement methods and procedures	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
Additional comment	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

B.6.3. Ex-ante calculation of emission reductions

Parameter	Value	Data unit	Description of parameter	Source/reference/justifications
$N_{pers / kitchen\ i,y}$	653	Pers/year	Number of person dependent on kitchen *i* in the year *y (pers/year)*	Derived from historical data
$M_{woody\_biomass\_hist\_pp,,i}$	1.13	tonnes/ capita at the school	Historical consumption of woody per person dependent on kitchen *i* (tonnes per person)	Derived from historical data
$M_{woody\_biomass\_hist,i}$	739	tonnes/ kitchen *i*	Historical consumption of woody biomass by kitchen *i* in year *y* (tonnes/ kitchen i/y)	$M_{woody\_biomass\_hist,i} = N_{pers / kitchen\ i,y} * M_{woody\_biomass\_hist\_pp,,i}$
$M_{substituted.biomass,i,y}$	739	(tonnes/kitchen *i*/y)	Quantity of woody biomass that is substituted by kitchen *i* in the year (tonnes/kitchen *i*/y)	$M_{substituted.biomass,i,y} = M_{woody\_biomass\_hist,i}$
$Op\_kitchen_{,i,y}$	1	-	Operating status of kitchen *i* (equipped with IICS/refurbished masonry stove) in year *y*	*In ex-ante calculations, it is assumed that all targeted schools' kitchen will properly operate with the provided improved cookstoves and renewable briquettes.*
$Leakage_{adj}$	0.95	-	Net to gross adjustment factor to account for leakages	*Default Value*
B_y	199,445	tonnes/y	Quantity of woody biomass that is substituted or displaced in tonnes	$B_y = Leakage_{adj} * \sum_i (Op\_kitchen_{,i,y} * M_{substituted.biomass,i,y})$
$f_{NRB,y}$	77	%	Fraction of biomass used in the absence of the CDM project in year y that can be established as non-renewable biomass	*Default Value*
$NCV_{biomass}$	0.015	TJ/ton	Net calorific value of the non-renewable woody biomass that is substituted	*Default Value*
$EF_{projected\_fossilfuel}$	81.6	tCO_2/TJ	Emission factor for the substitution of non-renewable woody biomass by similar consumers	*Default Value*
SEC_{briq}	0.038	MWh/Metric tonne	Default value for the specific quantity of electricity consumed per ton of briquettes produced	*Default Value provided by technology provider*
$M_{renewable.biomass,y}$	99,723	tonnes/y	Quantity of renewable biomass consumed by the project activity in year *y*.	The parameter will be used for monitoring project emissions from electricity consumption.

				For ex-ante estimation of project emissions the assumption made is: $M_{renewable.biomass,y}$ = $1/2\sum M_{substituted.biomass,i,y}$
$EC_{PJ,j,y}$	3,789	MWh/y	Quantity of electricity consumed by the project electricity consumption source *j* in year *y*	$EC_{PJ,j,y}=SEC_{briq,y} * M_{renewable.biomass,y}$
$EF_{EL,j,y}$	1.30	tCO_2/MWh	Emission factor for electricity generation for source *j* in year *y* (tCO_2/MWh)	*Default Value*
$TDL_{j,y}$	0.20	-	Average technical transmission and distribution losses for providing electricity to source j in year y	*Default Value*
$LE_{EC,y}$	5,912	tCO_2/yr	Leakage emissions from electricity consumption in year *y*	*Calculated*
BE_y	187,973	tCO_2e	Baseline emissions	*Calculated*
LE_y	5,912	tCO_2e	Leakage emissions	*Calculated*
PE_y	0	tCO_2e	Project emissions	*Calculated*
ER_y	182,061	tCO_2e	Emission reductions	$ER_y= BE_y- PE_y- LE_y$

B.6.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage (tCO_2e)	Emission reductions (tCO_2e)
25/01/2016 to 31/12/2016	175,631	-	5,523	170,089
01/01/2017 to 31/12/2017	187,973	-	5,912	182,061
01/01/2018 to 31/12/2018	187,973	-	5,912	182,061
01/01/2019 to 31/12/2019	187,973	-	5,912	182,061
01/01/2020 to 31/12/2020	187,973	-	5,912	182,061
01/01/2021 to 31/12/2021	187,973	-	5,912	182,061
01/01/2022 to 31/12/2022	187,973	-	5,912	182,061
01/01/2023 to 24/01/2023	12, 360	-	389	11,971
Total	1,315,811	-	41,384	1,274,426
Total number of crediting years	7			
Annual average over the crediting period	187,973	-	5,912	182,061

B.7. 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 will be 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:

a) The operational and management structure to be put in place to implement the monitoring plan;

b) 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;

c) Definition of responsibilities and institutional arrangements for data collection and archiving;

d) Quality assurance and quality control (QA/QC) procedures;

e) Uncertainty levels, methods and the associated accuracy level of measuring instruments to be used for various parameters and variables;

f) 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.

B.7.1. Data and parameters to be monitored

Data/Parameter	**Op_kitchen $_{i,y}$**
Data unit	-
Description	Operating status of kitchen i (equipped with IICS) in year *y*
Source of data	Estimates based on surveys then monitored. Calculated based on monitoring findings.
Value(s) applied	1
Measurement methods and procedures	A physical check will be performed by the CDM project proponent at least once every two years (biennial) in accordance with the monitoring plan.
Monitoring frequency	At least biennially
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	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. In ex-ante calculations, it is assumed that all targeted schools' kitchen will properly operate with the provided improved cookstoves and renewable briquettes. 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*.
Source of data	BQS delivery notes
Value(s) applied	99,723
Measurement methods and procedures	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.
Monitoring frequency	Every month
QA/QC procedures	The quantity will be cross checked with school's receipt
Purpose of data	Leakage emissions and Methodology requirements
Additional comment	The parameter will be used for monitoring leakage emissions from electricity consumption. For ex-ante estimation of project emissions the assumption made is: $M_{renewable.biomass,y} = 1/2 \sum M_{substituted.biomass,i,y}$

Data/Parameter	$N_{pers\ /\ kitchen\ i,y}$
Data unit	pers/year
Description	Number of person dependant on kitchen *i* in the year *y*
Source of data	Derived from historical data: - Letters from Education ministry
Value(s) applied	653
Measurement methods and procedures	Number of persons dependant on kitchen *i* will be inquired and recorded during each monitoring period
Monitoring frequency	At least annually
QA/QC procedures	Data will be cross check with relevant literature. Database will be periodically checked by the project proponent.
Purpose of data	Calculation of baseline emissions
Additional comment	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 will be monitored.

Data/Parameter	$N_{IICS/,j,y}$
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
Value(s) applied	940 (ex-ante estimate)
Choice of data or Measurement methods and procedures	-
Purpose of data	Used to record the number/location of each stove distributed and verify the compliance with small scale limit
Additional comment	Capped in compliance with the small-scale limit with regard to thermal energy power output of the stoves as detailed in B.2. $\sum N_{IICS/,j,y}$ (j indicating IICS distributed * $P_j < 45\ MW_{th}$

B.7.2. Sampling plan

This section is not relevant, as no sampling plan is involved since all participating school sites will be 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 will be centralised at the ministry level so all woodfuel ordered by schools for cooking activities will be easily tracked and recorded.

B.7.3. Other elements of monitoring plan

Sales Agreement

Before any kitchen i is included in the project, a sales agreement between the project proponent and the responsible of woodfuel supply of each kitchen will be signed. The sale agreement will display 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 will be provided.

Number of kitchen i supplied

At the beginning of the project, all kitchens of schools of Burundi will be progressively equipped with IICS. Before any inclusion of schools in the project the following procedure will be 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 will be checked & accounted
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 will be documented and reflected in monitoring reports during verification.

Monitoring organization

BQS, is responsible for overall monitoring management. All collected data will be double-checked based on the sales agreements. The project monitoring database shall include the selling date of each IICS and each renewable biomass delivery and will help calculate the emission reductions attributable to each monitoring period. These records will enable determine the status of the CDM 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 will be 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 crediting period, the organization of the monitoring team will be established. Clear roles and responsibilities will be assigned to all staff involved in the CDM project.

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

- Develop, approve, execute, and improve the CDM 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):

$\mathbf{N_{IICS/,j,y}}$	Total number of IICS distributed or replaced by an equivalent appliance in year *y*
$Op\_kitchen_{i,y}$	Operating status of kitchen *i* (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* in the year *y*

Residual consumption of woodfuel will 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 will be designed specifically for briquettes combustion.

However, in case of shortage of briquettes, a procedure is described in appendix 5 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 IICS[30] will be 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) will be 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 will be trained to monitor continuously:

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

[30] IICS distributed and refurbished masonry stoves

A delivery note will be 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.

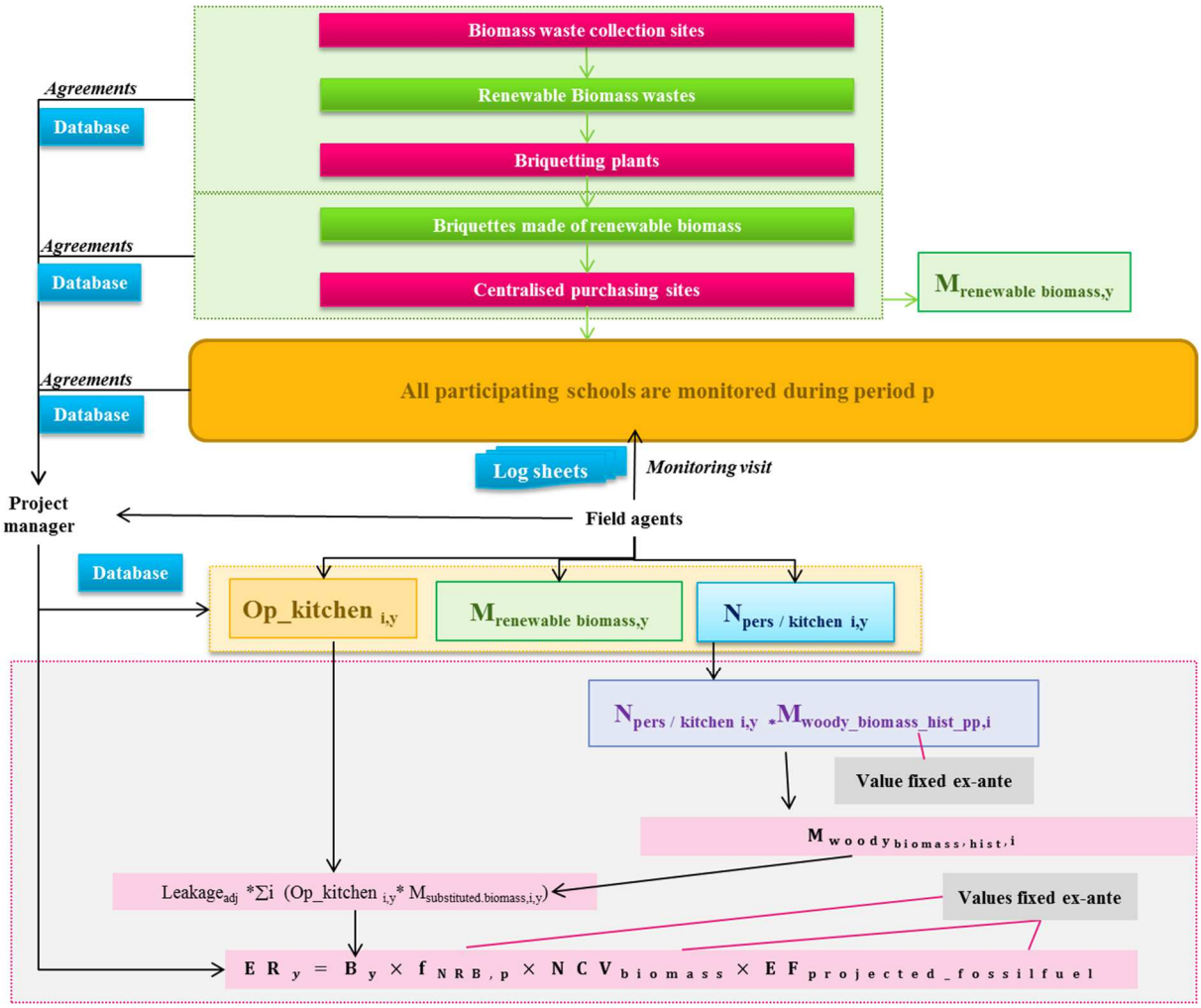

Figure 7: *Monitoring flowchart*

Data handling

Spreadsheets will be set-up for the compilation of all the data recorded. They will also be used to compute emission reductions effectively achieved by the project activity according to methodologies applied. All data monitored and project documents will be 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 will be automated through a functional spreadsheet model. This will allow for a regular check of emissions reductions achieved and comparison with ex-ante estimations in the PDD.

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.

Monitoring of renewable biomass production and supply chain

According to AMS I.E:
"14. Monitoring should confirm the displacement or substitution of the non-renewable woody biomass at each location. In the case of appliances switching to renewable biomass the quantity of renewable biomass used shall be monitored."

The Quantity of renewable biomass delivered $M_{renewable.biomass,y}$ to each kitchen i will be monitored. Field agents will collect all delivery notes as proof of Quantity of renewable biomass delivered. Basically, the logistics strategy is to get a contact person in each kitchen i (schools) in charge of ordering fuel for cooking (which is already the case in the current situation).

The closest briquettes' production site will be in charge of delivering directly to the kitchen i the ordered quantity of briquettes. At each delivery, a delivery note will be signed by the representative of the kitchen supplied acknowledging the quantity of briquettes delivered, the date, location and name of kitchen supplied. Every month, all delivery notes will be collected by BQS and sent to each school for payments.

The project proponent implementer has identified renewable biomass resources inside the country from agricultural wastes origin for feeding briquetting machines. A large quantity of agricultural wastes has been secured with contracts[31] in order to supply without any shortage all kitchens included in the project. Indeed, before including any new kitchen in the project, the supply capacity of the project proponent will be checked. In case of shortage, a procedure is applied in order to not count any emissions reductions during period of shortage (Appendix 5).

Renewable biomass will be transformed into briquettes and then distributed by the project proponent implementer or authorised distributors. The amount of renewable biomass will be monitored from renewable biomass collection to end user delivery in order to determine quantity of biomass delivered per kitchen.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

25/06/2012.
The start date has been determined as the date of order of the pilot container (first committing project expenditure), in accordance with the *Glossary of CDM terms*.

C.2. Expected operational lifetime of project activity

The expected operational lifetime of the project activity is about 21 years. In the meantime, improved cook stoves will be systematically renewed at the end of their operational lifetime, as agreed with participating communities in the improved stove purchase contracts.

C.3. Crediting period of project activity

C.3.1. Type of crediting period

The project activity will use a renewable crediting period. This is the first renewable crediting period.

C.3.2. Start date of crediting period

25/01/2016

C.3.3. Duration of crediting period

7 years and 00 months.

[31] Different contracts for biomass waste availability for the project have been provided to the DOE including pine needles, bagasse from sugar factory and coffee parchment.

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

D.2. No Environmental Impacts Analysis is required by the host Party for this type of project activity[32]. Environmental impact assessment

However, to demonstrate the safety and positive impacts of the technology used by the project, a voluntary Environmental Impact Assessment has been performed and the report has been provided to the DOE.

Besides, the project activity implemented will directly benefit to the population by reducing respiratory disease due to toxic fumes and curbing the rate of deforestation throughout Burundi.

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

A. Procedure followed to invite stakeholder comments

The national stakeholder consultation consisted of a public meeting with the identified stakeholders[33]. Local and national policy makers and stakeholders were invited by post mail – see invitation material[34]. 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.[35]

B. Program of the public meeting

Date: January 13th, 2012 at 9.00 am
Place: Olympafrica (hall of Olympic Stadium), Kanyosha Commune, Bujumbura Mairie Province
Language: Kirundi
Duration: 3 hour and 30 minutes
Meeting procedure:

- Introduction / Mayor of Bujumbura / DNA Permanent Secretary/ Project Developers
- Context and objectives of public consultation
- Project description
    - o Improved cookstoves
    - o 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

[32] It has been confirmed during one site visits's interviews with local authorities.
[33] Press article from local newspaper covering the Local Stakeholder Consultation has been provided to the DOE
[34] Invitation template has been provided to the DOE
[35] Reports of demonstration shows have been made available to the DOE

Note: During this meeting, BQS jointly presented the project for schools and its CDM projects aimed at Burundian communities (households, police camp and prisons, restaurants, etc.).
The list of participants (163 registered participants) attending the public consultation is provided to the DOE[36].

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 8: *Picture of the stakeholders attending public consultation*

[36] Copy of attendance sheets have been provided to the DOE.

E.2. Summary of comments received

Participant's questions/concerns	Project proponent's answers
Julien Ntarugera, Manager, Techno Solar Company. 1. Is there a lifetime guarantee on your improved cookstoves? How does warranty works? **2.** 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? 3. Could the stove's high efficiency prematurely degrade the cooking pots?	Yes, BQS's 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. BQS has decided to outsource the manufacturing and assembling of improved cookstoves for quality and quantity reasons. At the moment, 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 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.

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]**	
1. However, is it really not possible to accelerate the project start?	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. We do our best to start the mass distribution before the end of 2012.
2. 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?[37]	One of renewable biomass ressources 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 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. [38]
Bernadette Hakizimana, Director of Environment at the Ministry of Water, Environment, Land Management and Urban Planning (MEEATU), DNA Permanent Secretary [Highlights on BQS project contribution to empowering women thanks to renewable biomass fired improved cookstoves achieving the following : □ Reduce the time and cost of procuring fuel, 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 children gathering fuel in conflict areas.	-
Venant Barindogo, IFDC [Supporting considerations on woodfuel consumption and the importance of raising awareness. Confirmation that their own experimentation with local manufacturing did not succeed 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 has to 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].*

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

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

Felix Ngengabanyikwa, Director of Forest Department at the Ministry of Water, Environment, Land Management and Urban Planning (MEEATU) 1. Felix Ngengabanyikwa is suggesting that each improved cookstoves purchaser could plant a new tree at home to mitigate further the climate change effects. 2. 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) 1. How many improved cookstoves do you plan per household? [39] 2. If the refractory brick breaks down, do you plan to replace them for free?	Each household might buy as many improved cookstoves as necessary as long as 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.
Salvator Mpangaje, Neighborhood Leader of Nyakabiga Could you tell me more about the product acquisition agreement between BQS and end user?	This agreement contains the terms and conditions that apply between BQS and improved cookstoves end user: i. A complete abandonment of the use of traditional stove(s) ii. Adoption and sustained use of ICS iii. Exclusive use of renewable biomass with ICS iv. Record of periodic consumption of renewable biomass v. 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 craftsmen 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 Councillor, 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 in order 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.

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

Agnès Hakizimana, Local Councillor, Commune of Murwi, Cibitoke Province 1. If woodfuel is phased out, how will the less fortunate who couldn't acquire the improved cookstove cope? 2. How do you to commercialize your improved cookstoves and renewable biomass? What is BQS 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.
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 project; We are asking to be associated through afforestation.** 1. How can low-income users with no access to banks of microfinance still acquire the stoves? [40] 2. 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 **1.** Do you plan information and demonstrations on improved cookstoves use in neighborhoods? **2.** 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.
Omer Manirakiza, Neighborhood Leader of Cibitoke, Bujumbura Mairie [congratulations from what was observed on the running demonstration of improved cooking stove outside the auditorium, in that it seems to save great deal of time] Can you confirm that the pilot commune is the commune of Kanyosha?	Yes it is confirmed, the programme for households will start from Kanyosha.

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

Shemsa Ciza, Local Councillor, Commune of Kinama, Bujumbura Mairie Province 1. Is it possible to grill meat/fish like on a BBQ? **2.** 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 welldried, which BQS will ensure before commercializing it.

E.3. Consideration of comments received

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.

SECTION F. Approval and authorization

The letter of approval from the Republic of Burundi has been obtained on 19/07/2013. The letter of approval from the United Kingdom of Great Britain and Northern Ireland has been obtained on 29/10/2013.

Appendix 1. Contact information of project participants

Organization name	BURUNDI QUALITY STOVES S.A.
Country	Burundi
Address	Quartier Industriel, avenue Nyabissindu, B.P. 56 12, Bujumbura
Telephone	+257 22259470
Fax	-
E-mail	info@bqs.bi
Website	-
Contact person	Mr. Pascal Rwemera

Organization name	SHELL TRADING INTERNATIONAL LIMITED
Country	United Kingdom of Great Britain and Northern Ireland
Address	Shell Centre, SE1 7NA London
Telephone	+44 2075463635
Fax	-
E-mail	b.mcgrath@shell.com
Website	www.shell.com
Contact person	Ms. William McGrath

Appendix 2. Affirmation regarding public funding

This section is not relevant, as no public funds are involved in the Project.

Appendix 3. Applicability of methodologies and standardized baselines

No additional information is provided here as all applicability conditions of selected methodology have already been described inside the PDD.

Appendix 4. Further background information on ex ante calculation of emission reductions

The Renewable Briquettes Facilities

The project technology employs direct compaction (binder-less) equipment – *Jumbo-90 Briquetting Machine*, most popular in India. Jumbo-90 is a flagship model of briquetting industry with high production, low conversion cost and easy operation. These binders-less briquetting machines are based on very high compaction characteristics of combustible cellulosic agro waste such as bagasse saw dust, groundnut shells, etc. into cylindrical briquettes under high pressure & process heat.

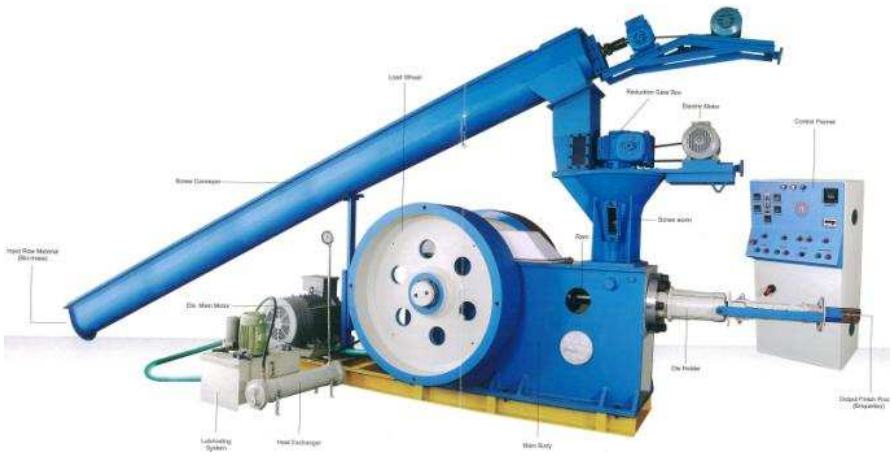

Figure 9 : *Jumbo-90 briquetting machine overview*

The features of Jumbo-90 are:

- Acceptability up to 20 mm size of raw material. (No need of powdery from) ;
- High density of finished product with 90 mm diameter ;
- Low electric consumption due to direct feeding without hammer mill ;
- No loss of production & Air pollution due to direct feeding system ;
- Expected lifetime of 25 years.

Table 7: ***Electricity consumption specifications***

	Supplied Elec.Motor (HP)[41]	**Required Load (HP)**
Main elec. Motor	75	60
Feeding Kuppy gear	7.5	5
Screw Conveyor	3	2
Lubrication	3	2
Total HP	**88.5**	**69**
Total equivalent kW	**66kW**	**35 - 38 kWh/Metric Tonne of biomass[42]**

[41] 1 Horse Power (HP) is equal to 0.7456 kW
[42] Information given by the technology provider

PROCEDURE TO DETERMINE THE USEFUL THERMAL OUTPUT OF IICS

As per the Clean Development Mechanism Project Standard (Version 05.0) to determine the performance of equipment used in the proposed small-scale CDM project activity, project participants shall use:

(a) The appropriate value specified in the selected methodology;
(b) The national standard for the performance of the equipment type (project participants shall identify the standard used) if the value specified in subparagraph (a) is not available;
(c) An international standard for the performance of the equipment type, such as International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) standards (project participants shall identify the standard used) if the value specified in subparagraph (b) is not available;
(d) The manufacturer's specifications, provided that they are tested and certified by national or international certifiers, if the value specified in subparagraph (c) is not available;
(e) Performance data from test results conducted by an independent entity for equipment installed under the project activity if the value specified in subparagraph (d) is not available.

Not any value are specified in methodology (option (a) not possible), no any national standard for the performance of equipment type is identified (option bis not available) therefore option (c) is used: an international standard is used for determining equipment performance. Water Boiling Test protocol[43] has been used and test results provided to the DOE.

- ***Useful thermal output***

The Berkeley's WBT (Water Boiling Test) protocol was used for testing performance. The useful thermal output of a cook stove can be determined as the mean effective thermal power, i.e. the quotient of effective energy delivered for the cooking process divided by heating time. In other words, this corresponds to the average rate of energy released from fuel combustion that is transferred to the pot over the duration of a certified water boiling test. The procedure will be used to determine thermal output of refurbished masonry stoves.

Useful thermal output of IICS was computed as follows:

$$\frac{C_p * m_{w,i} * (T_f - T_i) + H_v * (m_{w,i} - m_{w,f})}{t_c}$$

Where:

c_p	*Heat capacity of water (4.186 J/g°C)*
$m_{w,i}$	*Mass of water prior to test*
T_f	*Water temperature after test*
T_i	*Water temperature prior to test*
H_v	*Enthalpy of vaporization of water (2,260 J/g)*
$m_{w,f}$	*Mass of water after test*
t_c	*Test duration*

[43] http://www.pciaonline.org/node/1048

Appendix 5. Further background information on monitoring plan

Guidance provided to field agents regarding the monitoring of the operational status of Kitchen i

During monitoring session field agents should visit every kitchen included in the project in order to check their operational status. To determine their operational status, the following procedure should be followed:

1. **Cookstove identification.** Ask to the responsible of the kitchen in order to identify all the cookstoves used daily for preparing the meals. Note the serial number of every IICS In case a baseline stove is present in the kitchen, take a picture or draw the stove and take description notes.

2. **Visual check.** Assess visually if they have been used recently. Is there any ash? Does the cookstove seems to have been used recently? Is it still warm?

3. **Fuel used check**. Ask the person in charge of fuel provision what kind of fuel is used in every cookstoves. Ask the responsible to show you the fuel stock of the boarding/day school. Check visually that only briquettes are stored. In case any other type of fuel than briquettes is present onsite, take notes and describe.

4. **Check shortage status**. Does the kitchen experience a shortage of briquettes during the monitoring period? If yes identify what type of fuels has been used and identify precisely the periods of shortages.

5. **Check delivery notes**. Ask all delivery notes received and compare to delivery timeline provided by project proponent. Identify inconsistencies and possible shortage period.

Concluding on operational status of the kitchen:

The kitchen is declared as non-operational in all following cases:

1. A baseline stove has been discovered and is used onsite.
2. Other fuel than briquettes are used or suspected to be used in stoves (based on interviews and fuel stock check: any other fuel found onsite).
3. None of the IICS operate or a pro rata of the IICS found in operation out of the total number of IICS initially installed.

In the case where a period of shortage is identified, emissions reductions during the period are excluded from calculation. For example, if a period of 20 days has been identified during which there was a shortage of briquettes over the all year (365 days), the emissions reductions achieved thanks to the school will be prorated at 345 days over 365 days.

The kitchen is declared operational in all other cases.

Appendix 6. Summary report of comments received from local stakeholders

Not applicable.

Appendix 7. Summary of post-registration changes

Corrections

	Reason(s)	Impact
Corrections to the project information, such as • Correction of the fuel consumption switching goal • Revision of the text in the section on Sustainable Development (A.1). • Update of location of the project activity (A.2) (number of schools) and related revision of number of IICS involved (multiple sections). • Update of location and number of briquetting machines (A.2 & A.3, B.6.1). • Newly filled sections A.6. History of the PA and section D (environmental impacts) • Replacement of the term "Gas" by "GHG" in Table 4 (B.3) • Revision of requirements of sale agreements (A.1, A.3, B.7.3) • Update of section F to take account of letters of approval obtained in the year 2013). • Removal of Table of Contents (Section F). • Update of Appendix 1	• To provide updated project information due toRemoval of '100%' due to the unavoidable, occasional briquettes 'out-of-stock' situations • CDM Sustainable Development Report developed for this project and available at the UNFCCC CDM project web site. • list of finally considered schools and number of IICS installed (with revised thermal output per stove). . • actual project implementation and investment plans. • instructions of the latest PDD-form version (V.11) used. • instructions of the latest PDD-form version (V.11) used. • revision of sales agreement template between PP and users. • instructions of the latest PDD-form version (V.11) used. • instructions of the latest PDD-form version (V.11) used. • new contact information of PP.	All parameter values of the registered monitoring plan remain unchanged. The design of the project activity remains unchanged.

All corrections are in line with AMS I.E (V.5), the actual situation as well as para. 232 of the PA Standard V.2.

Change to the start date of the crediting period:

- Correction of start date of crediting period (postponement from 01/06/2014 to 25/01/2016): proposed change to the start date of the crediting period of a registered CDM project activity below two years, as **approved by UNFCCC secretariat on 28/05/2020**.

Section(s) of PDD revised	Reason(s)	Impact
C.3	Following project implementation delays, the start date of the crediting period has been postponed from previously expected 01/06/2014 to 25/01/2016, in compliance with §278 "Changes to the start date of the crediting period" of the CDM Project Standard.	The change has been notified to the secretariat on 28/05/2020 and affects the start of the first monitoring period.

Permanent changes to the project design:

- Update of indicative cook stove specifications and changes/corrections in related sections:

Section(s) of PDD revised	Reason(s)	Impact
A.1, A.2, A.3, B.2, B.3, B.6.2, B.7	Replacement of ex-ante indicative Turkish-manufactured cook stove by "Institutional Improved Cook Stove (IICS)" and focus on installation of new IICS (as opposed to refurbishment of masonry stoves for briquettes consumption).	Technical specifications of actual project devices clarified and simplified, with no impact on eligibility (improved cook stoves). There are no further impacts, neither in terms of applicability of the applied methodologies (cf. section B.2), nor in terms of compliance of monitoring plan with the applied methodology, nor in accuracy and completeness in the monitoring nor in terms of additionality. Scale remains unchanged.

- Update of school types and baseline woodfuel consumption and changes/corrections in related sections:

Section(s) of PDD revised	Reason(s)	Impact
A.1, A.2, A.3, B.2, B.3, B.6.2, B.6.3, B.7	While initially envisaged in boarding schools only at project inception and initial PDD registration request, the Government's school 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. As assessed and revised in details in section B.6.1, both school schemes have been surveyed and shown to feature comparable cooking woodfuel consumption baseline/history. While day schools offer breakfast and lunch, boarding schools serve lunch and dinner.	The updated 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 communication[44] 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." – illustrating the ongoing, progressive phase out of boarding schools since 2014 towards day schools. There are no further impacts, neither in terms of applicability of the applied methodologies (cf. section B.2), nor in terms of compliance of monitoring plan with the applied methodology, nor in accuracy and completeness in the monitoring nor in terms of additionality. Scale remains unchanged.

All changes are in line with AMS I.E (V.5), the actual situation as well as para. 240 & 241 of the PA Standard V.2.

[44] '2019-08-22 Lettre Ministre WFP internats' letter provided to the DOE

Permanent changes to the registered monitoring plan:

- Monitoring change (update) of the school years duration and stoves operational status and changes/corrections in related sections:

Section(s) of PDD revised	Reason(s)	Impact
B.6.1, B.7.1, B.7.2	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 from now on. 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).45 In case of briquette shortage schools temporarily have to revert to using firewood. Student attendance is incentivized by the provision of the meals. $O_{p\_kitchen\ i,y}$: update of parameter table and related sections to take account of the prorate of the IICS found in order of operation out of the total number of IICS initially installed. The current PDD does not consider such a situation appropriately. Streamline of parameter table in section 7.1 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. This is in coherence with section 4.8 of the "General guidelines for SSC CDM methodologies Version 23.0"	There is no material impact on the applicability of the applied methodologies or the other applied methodological regulatory documents, compliance of monitoring plan with the applied methodology, additionality or the accuracy and completeness of the monitoring; Scale remains unchanged. On the contrary, monitoring becomes more complete and accurate due to the monitoring of school days as well as the more accurate and conservative monitoring of $Op\_kitchen_{i,y}$ **(notably** due to the the inclusion of prorate of the IICS found in order of operation)**.**

All changes are in line with AMS I.E (V.5), the actual situation as well as para. 238 & 239 of the PA Standard V.2.

[45] 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 last 3-years period monitored. PP initially counted ex-ante with 241 school days and revised down the ex-ante ER calculations accordingly.

Document information

Version	*Date*	*Description*
11.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
10.1	28 June 2017	Revision to make editorial improvement.
10.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for project activities" and with the PoA-DD and CPA-DD forms; • Make editorial improvement.
09.0	24 May 2017	Revision to: • Ensure consistency with the "CDM project standard for project activities" (CDM-EB93-A04-STAN) (version 01.0); • Incorporate the "Project design document form for small-scale CDM project activities" (CDM-SSC-PDD-FORM); • Make editorial improvement.
08.0	22 July 2016	EB 90, Annex 1 Revision to include provisions related to automatically additional project activities.
07.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
05.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from F-CDM-PDD to CDM-PDD-FORM; • Make editorial improvement.

Version	*Date*	*Description*
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.
04.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for CDM project activities" (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

Decision Document Business	Class: Type: Function:	Regulatory Form Registration

Keywords: project activities, project design document