BANGLADESH APON CHULA IMPROVED COOKSTOVE PROGRAM I

Document Prepared by Guangzhou Iceberg Environmental Consulting Services Co., Ltd.

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The project involves distribution of portable fuel-efficient Apon Chula improved cookstoves (hereinafter referred to as "ICSs") in Sylhet Division, Mymensingh Division, Dhaka Division and Chittagong Division of People's Republic of Bangladesh.

Through this project, Guangzhou Iceberg Environmental Consulting Services Co., Ltd. (hereinafter referred to as "Iceberg") will distribute approximately 100,000 ICSs free of charge to households in rural area of above Divisions of Bangladesh in two years. The project started distribution on 26/07/2022. As of 25/07/2023, the first phase has been completed. 53,003 ICSs have been distributed in Sylhet Division and Mymensingh Division of Bangladesh. In the second phase, the remaining 46,997 ICSs are planned to be distributed from 26/07/2025 to 25/07/2026. The lifetime of Apon Chula improved cookstove is 7 years according to manufacturer specifications. In the sixth year after ICSs distribution, Iceberg will provide new ICSs to households without cost so that households will have access to them for the full crediting period. The local partners are in charge of the stove production and distribution

The ICSs disseminated through this project replace the three stone stove or conventional stove without grate or chimney in rural area of Bangladesh. The ICSs are produced by local factories. The type of ICS distributed in the project is Apon Chula improved cookstove, and the thermal efficiency is 36.0%, which is higher than the baseline cookstoves.

Before the implementation of the project, local people used conventional stove without grate or chimney as well as firewood for cooking according to the baseline survey. They spent plenty of time to collect firewood every day due to low combustion efficiency of baseline cooking devices. The ICSs burn firewood more efficiently thereby improving thermal transfer to pots, hence saving firewood. The project reduces the GHG emission by less non-renewable firewood combustion as well as slowing the rapidly progressing deforestation in Bangladesh.

The baseline scenario existing prior to the implementation of the project was using conventional stove without grate or chimney as well as firewood for cooking. Due to low income, people would have continued to use them to meet thermal energy needs without project activity.

The average annual GHG emission reduction from the project is expected to be 530,738 tCO_2e, the crediting period is expected to be 10 years. The total GHG emission reduction is 5,307,387 tCO_2e.

Audit Type	Period	Program	VVB Name	Number of years

Validation	26/07/2022 - 25/07/2032	VCS	Earthood Services Limited	10
Total	26/07/2022 - 25/07/2032	-	-	10

1.2 Sectoral Scope and Project Type

The project is categorised under type/category as below:

a) Sectoral scope: 03 - Energy demand

b) Type: II – Energy efficiency improvement projects

The project is not a grouped project.

1.3 Project Eligibility

The project involves replacing traditional cooking solutions with fuel-efficient improved cookstoves which falls into the category of efficiency improvements in thermal applications., According to paragraph 2.1.1 of VCS Standard Version 4.4, efficiency improvements in thermal applications (e.g., cook stoves) are not excluded, therefore it is eligible under the scope of VCS Program.

Applicability condition	Justification of compliance
2.1.1 The scope of the VCS Program includes: 1) The seven Kyoto Protocol greenhouse gases. 2) Ozone-depleting substances (ODS). 3) Project activities supported by a methodology approved under the VCS Program through the methodology development and review process. 4) Project activities supported by a methodology approved under an approved GHG program, unless explicitly excluded (see the Verra website for exclusions).	The project activity is distributing ICS to rural people, which will reduce the CO_2 emissions due to higher thermal efficiency. CO_2 belongs to the seven Kyoto Protocol greenhouse gases, and the project activity is supported by VCS methodology-VMR0006. It means the project falls under the scope 1) and 3) of the VCS Program.

5) Jurisdictional REDD+ programs and nested REDD+ projects as set out in the Jurisdictional and Nested REDD+ (JNR) Requirements.	
2.1.2 The scope of the VCS Program excludes projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal, or destruction.	The CO_2 released in the project due to cooking and boiling water, the activities are not for the purpose of their subsequent reduction, removal, or destruction.
The VCS Program also excludes the following project activities under the circumstances indicated in Table 1 (please refer to the Standard).	By checking Table 1, the project activity is not excluded.

According to paragraph 3.1 Scope of the VCS Program of the VCS Standard (version 4.4):

Applicability condition	Justification of compliance
3.1.1 Projects shall meet all applicable rules and requirements set out under the VCS Program, including this document. Projects shall be guided by the principles set out in Section 2.2.1.	The project meets all applicable rules and requirements set out under the VCS Program.
3.1.2 Projects shall apply methodologies eligible under the VCS Program. Methodologies shall be applied in full, including the full application of any tools or modules referred to by a methodology, noting the exception set out in Section 3.14.1. The list of methodologies and their validity periods is available on the Verra website.	The project applies VCS methodology VMR0006 which is eligible under the VCS Program in the first submission.
3.1.3 Projects shall apply the latest version of the applicable methodology in all cases unless a grace period applies to the project as set out in 3.21 below. Projects shall update to the latest version of the methodology when reassessing the baseline or renewing a crediting period.	The project applies the VCS methodology VMR0006, version 1.1, and the grace period for listed projects to complete validation under the 1.1 version of VMR0006 was end on 28 June 2023. The final validation report was completed for the first submission on 25-June-2023, which was before the end of the

	grace period[1]. Hence, the project meets the requirement.
3.1.4 Projects and the implementation of project activities shall not lead to the violation of any applicable law, regardless of whether or not the law is enforced.	The project complies with all relevant local, regional and national laws, statutes and regulatory frameworks in Bangladesh[2].
3.1.5 Where projects apply methodologies that permit the project proponent its own choice of model (see the VCS Program Definitions for the definition of model), the model shall meet the requirements set out in the VCS Methodology Requirements, and it shall be demonstrated at validation that the model is appropriate to the project circumstances (i.e., use of the model will lead to an appropriate quantification of GHG emission reductions or carbon dioxide removals).	Not applicable. The project proponent only uses the formulas from the applied VCS methodology VMR0006 (version 1.1).
3.1.6 Where projects apply methodologies that permit the project proponent to choose a third-party default factor or standard to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, such default factor or standard shall meet the requirements set out in the VCS Methodology Requirements.	Not applicable. The project proponent only uses default factor supplied by the applied VCS methodology VMR0006 (version 1.1).
3.1.7 Where the rules and requirements under an approved GHG program conflict with the rules and requirements of the VCS Program, the rules and requirements of the VCS Program shall take precedence.	Not applicable. No conflict of rules exists in the project.
3.1.8 Where projects apply methodologies from approved GHG programs, they shall conform with any specified capacity limits (see the VCS Program Definitions for the definition of capacity limit) and any other relevant requirements set out with	Not applicable. There is no capacity limit from the VCS methodology VMR0006 (version 1.1).

[1] https://verra.org/public-consultation-proposed-minor-revisions-to-vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/

[2] http://bdlaws.minlaw.gov.bd/laws-of-bangladesh.html

respect to the application of the methodology and/or tools referenced by the methodology under those programs.	
3.1.9 Where Verra issues new VCS Program rules, the effective dates of these requirements are set out in Appendix 3 Document History and Effective Dates or equivalent for other program documents, and are listed in a companion Summary of Effective Dates document which corresponds with each update.	The project followed the latest VCS Program rules in the first submission. According to the online meeting held on 15/10/2024 with Richa Verma and Neha Rao from VERRA, re-submission should follow latest VCS Program rules in the first submission

The start date of the project was 26-July-2022, Guangzhou Iceberg initiated the project pipeline listing process on 30-April-2022, which was with two years of the start date. Thus, it meets the requirement of the pipeline listing deadline. According to 3.8.1 of the VCS Standard (version 4.4), Non-AFOLU projects shall complete validation within two years of the project start date. The date of the project completed validation was 26-June-2023, which meets the requirement of the deadline.

1.4 Project Design

The project has been designed to include multiple locations, but is not being developed as a grouped project.

Eligibility Criteria

Not applicable because the project activity is not a grouped project.

1.5 Project Proponent

Organization name	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.
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Organization name	Bitgreen Carbon Assets Management Pte Limited

Contact person	VEX Xia
Title	Manager
Address	10 Anson Road, #30-01 International Plaza 079903, Singapore
Telephone	8610942235
Email	info@bitgreen-carbon.com

1.6 Other Entities Involved in the Project

No other entities involved.

1.7 Ownership

The ICSs are distributed to end users (Households) free of charge. The end users are informed in advance that the use of ICS generates carbon finance which in turn is used to cover the cost of ICS production and distribution. The participating households, local partner and Iceberg have signed donation and carbon transfer agreements. The participating households and local partner waive the ownership of the carbon credits generated from the project, and transfer the ownership of the carbon assets generated from this project to Iceberg. Therefore, the project ownership and carbon credits generated from the project belong to Guangzhou Iceberg Environmental Consulting Services Co., Ltd. Iceberg takes responsibility of the entire project and pays the costs of producing and distributing to local partners. So it has the legal right to control and operate the project activity as per the project cooperation agreements signed with its local partners.

1.8 Project Start Date

26/07/2022. According to 3.8 of the VCS Standard (version 4.4), the project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or carbon dioxide removals. As the project ICSs are portable type, they can be used on the day they received it, which generating GHG emission reductions at the same time. Thus, the date of distribution of the first improve cookstove was the start date of the project.

1.9 Project Crediting Period

10 years fixed crediting period from 26/07/2022 to 25/07/2032.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

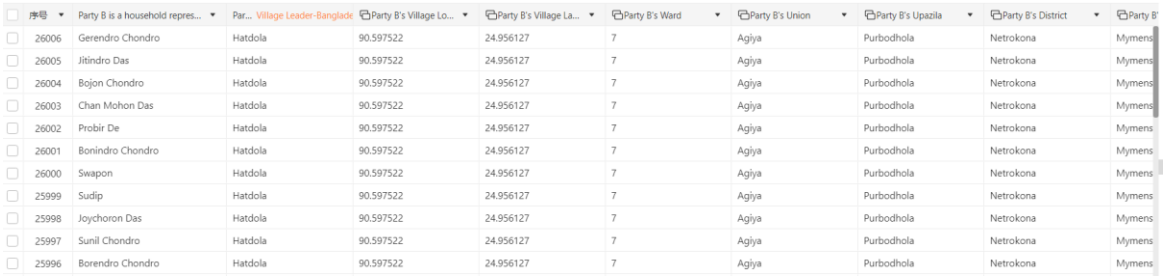
Project Scale	
Project	
Large project	X

Year	Estimated GHG emission reductions or removals (tCO_2e)
Year 2022	38,341
Year 2023	328,566
Year 2024	367,543
Year 2025	376,779
Year 2026	609,968
Year 2027	632,569
Year 2028	677,417
Year 2029	650,071
Year 2030	614,707
Year 2031	649,791
Year 2032	361,635
Total estimated ERs	5,307,387
Total number of crediting years	10
Average annual ERs	530,738

1.11 Description of the Project Activity

Before the implementation of the project, local people in the project location used non-renewable biomass for cooking with conventional stove without grate or chimney. The project will distribute 100,000 fuel-efficient improved cookstoves in 2 years to replace the baseline cookstoves in households. In each year about 50,000 ICSs are planned to be distributed. The local partners are in charge of the cookstove production and distribution. Each ICS distributed in this project has a unique identification ID, and the user's basic information (e.g. name, location, unique identification ID) are recorded. The ICS is also engraved with logo "ICEBERG" and cookstove ID. Hence, the above methods can make sure that it avoids double counting of emission reductions. The dates they received the ICS and number of household members have

been recorded, too. The data has been uploaded to online database, which Iceberg can track the implementation status of the project. For every verification of the project, Iceberg and its local partner will conduct project survey according to the applied methodology. Iceberg has checked the database of VCS, GS and CDM and confirm that no overlap in the project areas with other similar projects during cookstove distribution. Thus, they will get verifiable GHG data generation.



序号	Party B is a household repres...	Par... Village Leader-Banglade	Party B's Village Lo...	Party B's Village La...	Party B's Ward	Party B's Union	Party B's Upazila	Party B's District	Party B'
26006	Gerendro Chondro	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
26005	Jitindro Das	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
26004	Bojon Chondro	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
26003	Chan Mohon Das	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
26002	Probir De	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
26001	Bonindro Chondro	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
26000	Swapon	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
25999	Sudip	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
25998	Joychoron Das	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
25997	Sunil Chondro	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens
25996	Borendro Chondro	Hatdola	90.597522	24.956127	7	Agiya	Purbodhola	Netrokona	Mymens

Figure 1: Screenshot of the ICS distributing online database

In order to avoid double counting, before each distribution, it was confirmed with the village leader whether the village had participated in a similar program before, and if it had, the distribution was not carried out in that village.

Since the project ICSs are portable, there is no specific installation required. The lifetime of Apon Chula improved cookstove is about 7 years according to manufacturer specifications. In the sixth year after ICSs distribution, Iceberg plans to provide a new ICS to Households without cost, so that households will have access to them for the full crediting period.

All ICSs will be produced in local factories and distributed to households free of charge.

The ICS continues to consume non-renewable biomass for cooking, but the ICS consumes less wood fuel to meet thermal needs as it has higher thermal efficiency and it results in a reduction of GHG emissions compared to the baseline scenario.

Technology

The type of ICS distributed in the project is Apon Chula improved cookstove. The chamber of the ICS is better sealed than traditional stoves, which is conducive to higher thermal efficiency. The efficiency of ICS at the start of project activity is sourced from the below technical specification, which is supplied by the ICS manufacturer. The manufacturer used the latest 4.2.3 version of Water Boiling Test[3]. The manufacturer conducted procedures including cold-start high-power phase and hot-start high-power phase. Firstly, the cold-start high-power phase began with the stove at room temperature. Secondly, hot-start high-power phase was conducted after the first phase while stove is still hot. This is in line with the applied methodology, which uses 0.94 as an adjustment factor to account for uncertainty related to project cookstove efficiency test in

[3] https://cleancooking.org/binary-data/DOCUMENT/file/000/000/399-1.pdf

Equation (5). To cross check the efficiency data, Iceberg voluntarily tested the project ICS in a lab in Clean Cooking Alliance's list of Regional Testing and Knowledge Centers. According to independent stove efficiency tests performed by Institute of Fuel Research & Development in Bangladesh on the Apon Chula improved cookstove, the thermal efficiency is 36.0%. The method used to test the thermal efficiency is Water Boiling Test 4.2.3, which is consistent with the requirement of the applied methodology.

Table 1: Technical Specification of Apon Chula Improved Cookstove

No.	Parameter	Value
1	High power thermal efficiency	36.0% (The thermal efficiency was tested by manufacturer following Water Boiling Test, version 4.2.3)
2	Life span	7 years
3	Dimensions	28 CM Height (+/- 0.5 cm) Diameter Higher/Top 30 CM (+/- 0.5 cm) And Lower/Down 35 cm (+/- 0.5 cm)
4	Weight	25 Kg (+/- 1Kg)
5	Material	1.Combustion chamber made by metallic lining 2. Stove body mainly made by cement

Figure 2: Photo of Apon Chula ICS

1.12 Project Location

The project location is in Sylhet Division, Mymensingh Division, Dhaka Division and Chittagong Division of People's Republic of Bangladesh. The distribution of ICS was started from Sylhet Division on 26/07/2022. As of 25/07/2023, the first phase has been completed. 53,003 ICSs have been distributed in Sylhet Division and Mymensingh Division of Bangladesh. In the second phase, the remaining 46,997 ICSs are planned to be distributed from 26/07/2025 to 25/07/2026.

Table 2: Geographical coordinates of the project area

Orientation	Latitude/Longitude
Eastmost	92°38'52" E
Westmost	89°21' 48" E
Southmost	20°46'08" N
Northmost	25°26'1" N

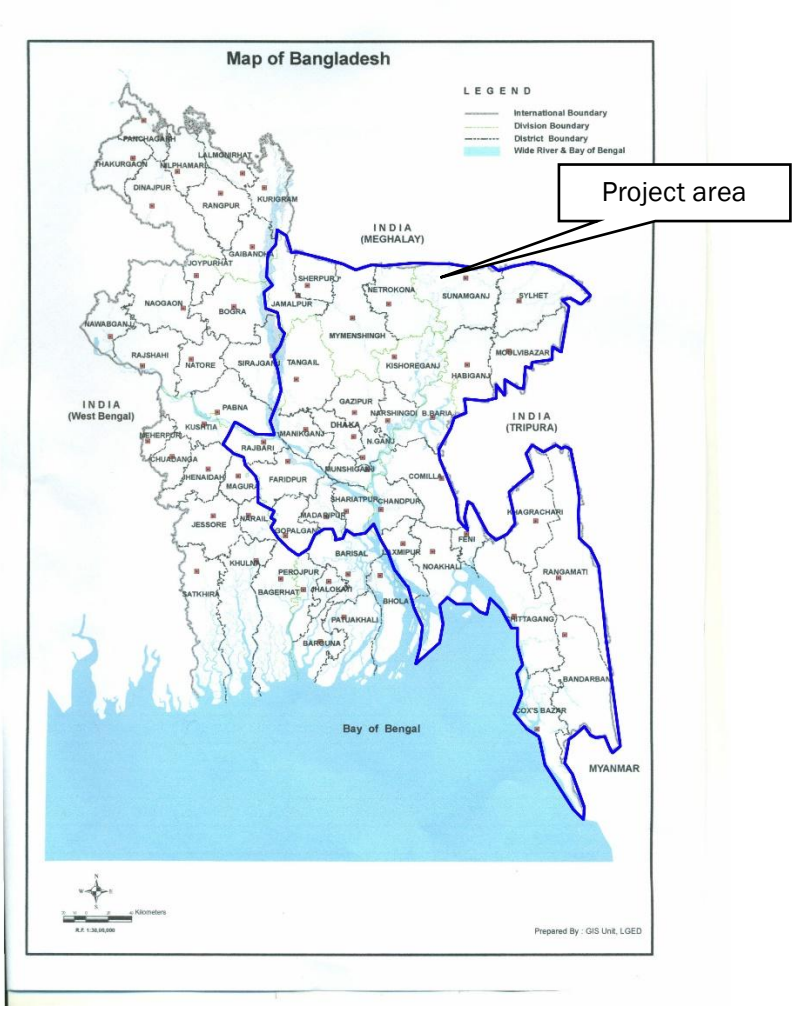


Figure 3: Map of project area[4]

1.13 Conditions Prior to Project Initiation

Before the implementation of the project, local people used conventional stove without grate or chimney as well as firewood for cooking according to the baseline survey. They spent plenty of time to collect firewood every day due to low combustion efficiency of baseline cooking devices. Due to low income, people would have continued to use them to meet thermal energy needs without project activity. The baseline scenario is the same as the conditions existing prior to the project initiation. Please refer to Section 3.4 of the PD for more details.

Figure 4: Photo of baseline survey

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

After searching, there are no laws and regulations about the application of improved cookstoves in Bangladesh households. The project is voluntarily implemented by the Iceberg.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has not been registered, nor is it seeking registration under any other GHG program.

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG program.

[4] https://www.nationsonline.org/oneworld/map/Political-Map-of-Bangladesh.htm

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The project is not included in an emissions trading program or any other mechanism that includes GHG allowance trading.

1.16.2 Other Forms of Environmental Credit

The project has not sought or received another form of GHG-related credit, including renewable energy certificates.

Supply Chain (Scope 3) Emissions

As per the para 3.23.9 of VCS Standard, version 4.4: Where the producer(s) or retailer(s) of the impacted good or service are known but not involved in the project or do not have a website, Iceberg shall notify them of the project and potential risk of Scope 3 emissions double claiming via email. For the project, since our local partners do not have website, Iceberg has notified them about potential risk of Scope 3 emissions double claiming via email. The emails have been attached as Appendix 1.

1.17 Sustainable Development Contributions

Before the implementation of the project, local people in the project location use non-renewable biomass for cooking with conventional stove without grate or chimney. The project distributes fuel-efficient ICS to replace the baseline cookstoves in households. The project enables and enhance households to achieve several sustainable development goals:

Goal 1: No poverty

1.4.1 Proportion of population living in households with access to basic services

Improved cookstove is a basic service necessary to lead a healthy and productive life, including saving time and money for wood fuel at the household level. Iceberg will distribute 100,000 ICSs, and the ICSs are produced in local factories. Hence the implementation of the project results in more job opportunities and higher income for local residents. The project activity will increase the SDG indicator 1.4.1. The number of households receiving project ICS and still in use will be monitored as project-specific indicator. The number will be sourced from the ICS distribution database and usage survey.

Goal 2: Zero hunger

2.1.1 Prevalence of undernourishment.

The project improves food security and nutrition status, particularly for children and women by reducing inadequate cooking, the burden of firewood collection, the time to prepare food, the

need to buy firewood[5]. The project activity will decrease the SDG indicator 2.1.1. The number of households receiving project ICS and still in use will be monitored as project-specific indicator. The number will be sourced from the ICS distribution database and usage survey.

Goal 3: Good health and well-being

3.9.1 Mortality rate attributed to household and ambient air pollution.

Most of non-renewable biomass local people used for cooking is firewood, which generates high PM2.5 and high CO biomass smoke when incompletely burnt. By using ICS, it reduces people's exposure to high PM2.5 and high CO due to higher efficiency of combustion leading to faster cooking and more complete combustion. It also reduces the burn risk, significant to children and toddlers due to enclosure of the fire in the combustion chamber. The project activity will decrease the SDG indicator 3.9.1. The number of households indoor air quality improved since they received the project ICSs will be monitored as project-specific indicator. It will be sourced from the ICS distribution database and monitoring survey.

Goal 4: Quality education

4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex

The project reduces the time spend on firewood collection for children, especially for girls, which increases their time for education. The implementation of project needs plenty of local people to participate in production, distribution or use steps. They get relevant skills and sustainable development and global citizenship education through training by Iceberg. The project activity will increase the SDG indicator 4.3.1. The number of employees provided skill development training will be monitored as project-specific indicator. It will be sourced from training records, including training material, photos and attendance etc.

Goal 5: Gender equality

5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age, and location.

The project reduces women and children's drudgery through time savings in reducing time spent cutting, collecting, and carrying firewood from trees far removed from households and reduce time spent cooking over toxic smoky open fires. These tasks, if being undertaken without relief, are a major cause of gender inequality. The project activity will decrease the SDG indicator 5.4.1. Average time saving on cooking and fuel collection in the project scenario by female per household per day will be monitored as project-specific indicator. It will be sourced from monitoring survey.

Goal 6: Clean water and sanitation

[5] https://www.sciencedirect.com/science/article/pii/S0195925518304189

6.6.1 Change in the extent of water-related ecosystems over time

Deforestation and large agricultural growth were recognized as most important land cover changes occurred which could affect biosphere of the watershed[6]. The project will save 259,077t non-renewable biomass every year. Since there are around 800 rivers in 147,630Km^2 land of Bangladesh which creates the most complex river-system in the world[7], the river ecosystem is in every corner of the country. Hence, the project will result in a significant reduction of deforestation in the river ecosystem, which will increase the spatial extent of forest in the river ecosystem of Bangladesh and contribute to achieve Target 6.6: protect and restore water related ecosystems. The project activity will increase the SDG indicator 6.6.1. Total non-renewable woody biomass fuel saved will be monitored as project-specific indicator. It will be sourced from the ICS distribution database, usage survey, monitoring survey and monitoring report etc.

Goal 7: Affordable and clean energy

7.1.2 Proportion of population with primary reliance on clean fuels and technology.

The ICS distributed to Household is a clean cooking technology. The project increases the proportion of population with primary reliance on clean cooking technology in project area. The project activity will increase the SDG indicator 7.1.2. The number of households receiving project ICS and still in use will be monitored as project-specific indicator. The number will be sourced from the ICS distribution database and usage survey.

Goal 8: Decent work and economic growth

8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

The factories which produce ICS are local enterprises. They hire more workers to produce ICSs for the project. During the project crediting period, Iceberg and its local partners are in charge of maintenance and monitoring plan, which creates working opportunities for local people. The project activity will increase the SDG indicator 8.5.1. The number of employees hired for the project will be monitored as project-specific indicator. It will be sourced from the labour contracts or salary slip etc.

Goal 9: Industry, Innovation, and Infrastructure

9.3.1 Proportion of small-scale industries in total industry value added

[6] http://open-library.cirad.fr/e-learning/rada/res/Land_use_and_land_cover_change_of_Tonle_Sap.pdf

[7] https://tourismboard.portal.gov.bd/sites/default/files/files/tourismboard.portal.gov.bd/page/a3c70b40_263e_4d8c_9c9a_1cc0f551b041/2020-09-30-17-49-581fb3417aa0a4510515e740cabe9f83.pdf

The local factories which produce ICS for project are small-scale industries. They will expand production capacity to satisfy the needs. Thus, the upstream and downstream supply chain benefit from the project. So the project promotes small-scale industries in Bangladesh, which contributes to indicator 9.3.1: Proportion of small-scale industries in total industry value added. The project activity will increase the SDG indicator 9.3.1. The production capacity increased for the project of the producer will be monitored as project-specific indicator. It will be sourced from the production record or related materials.

Goal 13: Climate action

13.2.2 Total greenhouse gas emissions per year

The average annual GHG emission reduction from the project is expected to be 530,738 tCO_2e due to less non-renewable firewood combustion for cooking and heating in the households. The project activity will decrease the SDG indicator 13.2.2. Tonnes of greenhouse gas emissions avoided or removed will be monitored as project-specific indicator. It will be sourced from the ICS distribution database, usage survey, monitoring survey and monitoring report etc.

Goal 15: Life on land

15.1.1 Forest area as a proportion of total land area

The project helps local people consume less firewood as the ICS has higher thermal efficiency and it results in a reduction of GHG emissions compared to the baseline scenario. It also helps reduce deforestation and protect biodiversity and natural habitats in Bangladesh. The project activity will increase the SDG indicator 15.1.1. Total non-renewable woody biomass fuel saved will be monitored as project-specific indicator. It will be sourced from the ICS distribution database, usage survey, monitoring survey and monitoring report etc.

1.18 Additional Information Relevant to the Project

Leakage Management

Not applicable as the project adopts a net gross adjustment factor of 95% to account for leakage.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Further Information

No further information.

2 SAFEGUARDS

2.1 No Net Harm

The project activity reduce the use of non-renewable biomass for combustion. No potential negative environmental or socio-economic impacts have been identified for the project.

2.2 Local Stakeholder Consultation

The process used to identify stakeholders likely impacted by the project is shown below:

1. Initial Scoping and Community Engagement:

Conduct preliminary research to identify target communities and hold initial meetings with local leaders for preliminary feedback.

2. Stakeholder Mapping:

Identify key groups including households, community organizations, local businesses, government agencies, ensuring vulnerable groups are considered.

3. Detailed Stakeholder Analysis:

Perform social and economic impact assessments to evaluate how different groups will be affected.

4. Documentation and Communication:

Document all findings and clearly communicate project objectives and potential impacts using various channels.

Local people, communities and or representatives who are directly or indirectly affected by the project, such as end-users, stove manufacturer, local NGOs and local officials were identified as stakeholders. Iceberg also identified and encouraged anyone who were interested in the project to attend the local stakeholder consultation. Iceberg and its local partner invited local authorities, end-users, stove manufacturer and local non-governmental organisations (NGOs) to participate in the local stakeholder consultation.

Stakeholder Consultation:

Two local stakeholder consultation meetings were held for the project, one was on 28 March, 2022 at Sylhet Zila Parishad Auditorium in Sylhet Division and the other is on 28 December, 2022 at the Conference Hall of Purbadhala union parishad, Netrakona in the Mymensingh Division of Bangladesh. The procedures of the two local stakeholder consultation meetings were almost the same. For introduce the project and collect opinions from all the types of stakeholders identified above, various inviting methods were applied for the stakeholder

consultation meeting. For the convenience of end-users, an invitation in both English and Bengali was sent to them through radio broadcast in villages to make sure everyone can understand. Some local people were invited by phone call. For national government officials, local and international NGOs, women groups, local officers and entrepreneurs, invitation letters were sent to them as formal invitation or by email. The invitation letters for the first meeting were sent on 23 March 2022, and invitation letters for the second meeting were sent on 20 December 2022.

Figure 5: Photos of stakeholder meeting

In the meeting, after welcoming the participants, all authorized people who were present for the meeting introduced themselves respectively. The explanation was also focusing on the benefit of the ICS to enable local people at rural area to have access to save money, energy and to protect environment by reducing wood fuel consumption needed for cooking. They also discussed on potential risks of the project (negative and positive impacts):

Positive impact:

1) Economic impacts

- The project will reduce expenditures of households on firewood for cooking and water boiling.

- The project will contribute to the scale-up of local business and organizations with the potential to create jobs, such as productions, marketing and distribution of related devices.

2) Social impacts

- The project will provide clean cooking solutions to the households to reduce smoke related diseases. Cooking Smoke is a leading cause of major respiratory illnesses such as cough, chest tightness, whizzing and dizziness.

- The project will reduce the time and work load to collect firewood, which is mostly taken by women and girls in Bangladesh.

3) Environmental impacts

- The project will help significantly reduce greenhouse gas emissions from firewood combustion for cooking and water boiling.

- The traditional way of cooking produces a lot of smoke and harmful gases. The project will reduce indoor air pollution and therefore respiratory illness and mortality rates, especially among women and children.

- The project reduces the demand for non-renewable biomass and fossil fuels required for heating, which can protect natural forest eco-systems and benefit biodiversity.

Potential risk:

1) Some People in the village are not enough educated to be aware of health and the environment

2) Rural people used Traditional stoves for a long time so it is hard to change their mindset in short time.

Meeting minutes was used for documenting the outcomes of the local stakeholder consultation. Another method used was evaluation form. After the first meeting, Iceberg and local partner distributed evaluation forms to attenders, and received 8 forms. After the second meeting, Iceberg and local partner distributed evaluation forms to attenders, and received 10 forms. All of them expressed positive opinions about the proposed project, so there is no update to the project design. The LSC participants raised two questions about the project and got the answers immediately:

1. When will we get the project ICS?

Answer: The project ICS will be distributed after the LSC meeting. We plan to distribute 100,000 ICSs for free in 2 years, and they will be distributed in villages. Please wait patiently.

2. How long will the project continue?

Answer: The project operation period is expected to be 10 years.

Free Prior and Informed Consent:

The local communities were informed and fully explained about the project in advance during the stakeholder consultation meeting. The project doesn't impact customary rights holders. There is no ongoing or unresolved conflict.

Iceberg has signed carbon transfer agreements with the end users, cookstove manufacturer and distributor to confirm that Iceberg is authorized to develop the project as the project proponent and has the sole ownership of all the carbon credits generated from the project. The project has not encroached on land, relocated people without consent, and forced physical or economic displacement.

Grievance Redress Procedure and ongoing communication:

The grievance mechanism has been discussed during local stakeholder consultation meeting and the project implementation progress. The following are procedures:

Cultural sensitivity: To ensure that the methods align with local customs, Iceberg and its local partners have contacted respected community members first.

Trained facilitators: The local partners have been trained about active listening, mediation, and culturally appropriate conflict resolution practices.

Investigation process: Iceberg has assigned a responsible person for investigating grievances.

Collaborative resolution: Iceberg and its local partners work with the complainant to explore potential solutions, involving community leaders if appropriate.

The stakeholders or anyone who had not previously been identified but affected by the project can express any complaint.

Stakeholders can complaint to local leaders directly by calling, cell phone message, email and opinion books. Or they can contact Iceberg and its local partners by calling and email too. Their contact information was announced at the meeting, and also printed on the materials distributed at the meeting.

Iceberg: Mr. Ji BAO baoji@icebergchina.com +8613560420840

HWO Energy Ltd.: Dr. Suromoni Singha +8801710995055

Atmosphere Care Of Bangladesh Ltd.: Md Moharram Hossain +8801817491899

They could report problems concerning the project by phone or E-mail. The second way is to use our website (http://www.icebergchina.com/ens/channels/274.html) to submit any comment. And all information about the project can be found in this website.

Iceberg will try to amicably resolve all grievances and provide a written response in a manner that is culturally appropriate. Any grievances that are not resolved by amicable negotiations shall be referred to mediation by a neutral third party. Any grievances that are not resolved through mediation shall be referred either to a) arbitration, to the extent allowed by the laws of the relevant jurisdiction or b) competent courts in the relevant jurisdiction, without prejudice to a party's ability to submit the grievance to a competent supranational adjudicatory body, if any.

Besides the stakeholder consultation meeting, Iceberg and its local partners have continuously visited different areas to collect the opinions from other stakeholders. Opinion books have also been put in the villages where the project has been implemented for continuous feedback and on-going communication.

2.3 Environmental Impact

No negative environmental impacts have been identified from the project and environmental impact assessment is not applicable for the project.

2.4 Public Comments

There are no comments received during the public comment period.

2.5 AFOLU-Specific Safeguards

This section is not applicable as the project is a non-AFOLU project.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Methodology:

VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves, Version: 1.1[8]

TOOL30: Calculation of the fraction of non-renewable biomass, version 04.0[9]

3.2 Applicability of Methodology

The project activity meets each of the applicability conditions:

No.	Applicability criterion	How the project complies
1	Project activities shall be implemented in domestic premises, or in community-based kitchens.	The project activity replaces conventional stove without grate or chimney in individual households only.
2	The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody biomass and can be single pot or multi-pot; in case of project stove replacing fossil fuel baseline stove, it shall exclusively use renewable biomass.	The Apon Chula improved cookstove has a specified high-power thermal efficiency of 36.0% as per the manufacturer's specifications. It uses wood biomass only.

[8] https://verra.org/methodologies/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/

[9] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v1.pdf/history_view

3	Both 'Projects' and 'Large Projects' can use this methodology.	Since the average annual GHG emission reduction from the project is expected to be 530,738 tCO_2e, it is a large project as per Paragraph 3.10.1 of VCS Standard (Version 4.4).
4	Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	According to Global Forest Resources Assessment 2015 Report of Bangladesh by Food and Agriculture Organization of the United Nations[10], the area of forests of Bangladesh in 1990, 2000, 2005, 2010 and 2015 respectively is $1494*10^3$, $1468*10^3$, $1455*10^3$, $1442*10^3$ and $1429*10^3$ hectares, it has decreased 4.4% from 1990 to 2015. Since Bangladesh is a least developed country till now[11], it is highly possible that non-renewable biomass has been used before 1990 across Bangladesh.
5	For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: (a) It is produced using exclusively renewable biomass (more than one type of biomass may be used). (b) The consumption of the fuel should be monitored during the crediting period and (c) Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded.	According to baseline survey, all of the sampled households used firewood for cooking while no biomass residues such as briquettes and wood chips were used. The consumption of the fuel used in the project activity will be monitored. If briquettes utilization in project case the energy consumption for manufacturing of briquettes and transportation of briquette will be monitored to calculate project emissions.
6	The project description shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions	Each ICS distributed in this project has a unique identification ID, and the user's basic information (e.g. name, location, unique identification ID) are recorded.

[10] https://www.fao.org/forest-resources-assessment/past-assessments/fra-2015/country-reports/en/

[11] https://www.un.org/development/desa/dpad/least-developed-country-category/ldcs-at-a-glance.html

	such as unique identifications of product and end-user locations (e.g. programme logo).	The ICS is also labelled with programme logo. Hence, the above methods can make sure that it avoids double counting of emission reductions.
7	The project description shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	The local partners and end users have signed agreements with Iceberg stating clearly that they waive the ownership of the VCUs arising from the project, which belongs to Iceberg and other parties designated by Iceberg.
8	Tool30 may be used by: (a) DNAs to submit region- or country-specific default f_{NRB} values, following the procedures for development, revision, clarification and update of standardized baselines (SB procedures); or (b) project participants to calculate project- or PoA-specific f_{NRB} values.	Iceberg has used tool30 to calculate project-specific f_{NRB} value.

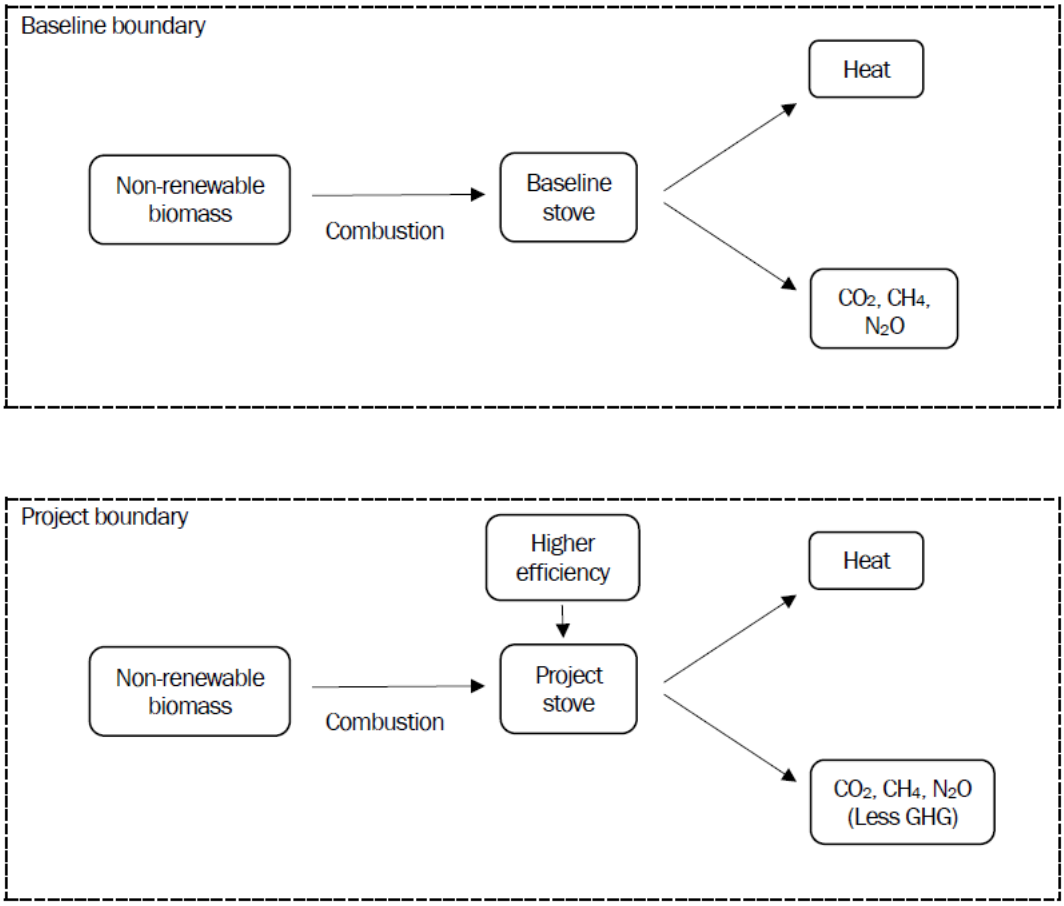
3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Emission from use of non-renewable biomass/Fossil fuel	CO_2	Yes	Major source
		CH_4	Yes	Major source
		N_2O	Yes	Major source
		Other	No	No other source identified
Project	Emission from use of nonrenewable biomass/Fossil fuel	CO_2	Yes	Major source
		CH_4	Yes	Major source
		N_2O	Yes	Major source
		Other	No	No other source identified

The project boundary is shown below:

Figure 6: Project boundary is within Sylhet Division, Mymensingh Division, Dhaka Division and Chittagong Division of Bangladesh

A diagram of the energy flow in baseline boundary and project boundary is shown below：



3.4 Baseline Scenario

Based on publicly available data, 74% traditional stoves were used in Bangladesh[12].91% of households in rural areas of Bangladesh used biomass for cooking[13]. The purpose of the project is replacing the traditional low-efficient cookstoves by improved cookstoves. Thus, the baseline survey targeted rural dwellers who were still using traditional cookstoves. The baseline survey criteria include conducting the baseline survey before the households received ICS, and a random selection method was used to choose the households to be sampled to ensure that the test results reflect the actual fuel savings of the project population. Iceberg has conducted a baseline survey under the cooperation with staff of local partners from 21/07/2022 to 23/07/2022, on 27/10/2022, and from 03/01/2023 to 09/01/2023. The 6 surveyed villages were from 2 different divisions. We started the distribution on different dates in the 2 divisions,

[12] https://documents1.worldbank.org/curated/en/311561624871430872/pdf/Understanding-Market-Based-Solutions-and-Access-to-Finance-Options-for-Clean-Cooking-Technologies-in-Bangladesh.pdf , Page 11, Figure A

[13] https://www.who.int/data/gho/data/indicators/indicator-details/GHO/proportion-of-population-with-primary-reliance-on-fuels-and-technologies-for-cooking-by-fuel-type

and the baseline survey was started in each division before distribution was started in this division. Baseline survey in 2 villages has been finished before distribution began in each division, and Bangladesh is small enough that each division is in a similar situation[14].

Division	Date of baseline survey	Start date of distribution
Sylhet	21/07/2022-27/10/2022	26/07/2022
Mymensingh	03/01/2023-09/01/2023	05/01/2023

Multi-stage sampling method was used for baseline survey. Firstly, they randomly selected 6 villages from the target area. Secondly, 20 households were randomly selected from each village that selected above. Thus total 120 sampled households were randomly selected in 6 villages (Fotehpur bazar side, Patrokhola west line, Bongshidhor, Bamonkhila, Kalakuma, Naterkona) from 3 districts. According to Equation 16 in Page 34 of "Guideline for sampling and surveys for project activities and programmes of activities (Version 04.0)" as well as the baseline survey, the minimum villages should be sampled is calculated as:

Village	Proportion of traditional cookstoves which efficiency applied as 0.1	village variation
fotehpur bazar side	1.00	0
Patrokhola west line	1.00	0
Bongshidhor	1.00	0
Kalakuma	1.00	0
Naterkona	1.00	0
Bamon Khila	1.00	0
p	Overall proportion	1.00
SD^2_B	variance between villages	0.0000
SD^2_W	average within village variation	0.0000
M	Total No. of villages	200
u	No. of households sampled for each village	20
$\bar{N}$	Average No. of households per village	500
1.645	Represents the 90% confidence required	
0.1	Represents the 10% relative precision	
C_{min}	Minimum No. of villages to be sampled	1

The minimum villages should be sampled is calculated as 1. The PP has sampled 6 villages, so 90/10 confidence/precision was achieved.

Baseline situation survey was conducted through questionnaires. The result shows that 100% of surveyed households used conventional stove without grate or chimney before the project implemented, and no three-stone stove has been found.

[14] https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=BD

The applied default value of parameter η_{old}, which means the of efficiency of the baseline stove, is 0.1. Because according to the applied methodology, "the default value of 0.1 shall be used if baseline device is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney". Hence, the value of 0.1 is applied.

All of the households used firewood for cooking. The baseline scenario is the continued use of non-renewable wood fuel (firewood) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity. Because as per the baseline survey 100% of the surveyed population used firewood for fuel.

3.5 Additionality

The methodology uses activity method for the demonstration of additionality.

Step 1: Regulatory Surplus

The project is not mandated by any law, statute or other regulatory framework in the host country, or for UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework.

The project is implemented by Iceberg as well as its local partners and participated by local households voluntarily.

Step 2: Positive List

As per Section 3.2 of the PD, the project meets all the applicability conditions of the methodology which represent the positive list.

The ICSs are distributed at zero cost to local households. The project is not implemented as part of government schemes or supported by multilateral funds. Iceberg undertakes all the expenditures for project implementation and has no other source of revenue other than the sale of GHG credits.

Conclusion: As the project meets the conditions above, it is deemed additional as per the applied methodology.

3.6 Methodology Deviations

The project did not apply any methodology deviations.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The applied methodology does not account for baseline emissions separately, but instead quantifies emission reductions as a function of the reduction in the amount of non-renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves. Please refer to Section 4.4 of the PD.

4.2 Project Emissions

The applied methodology does not account for project emissions separately, but instead quantifies emission reductions as a function of the reduction in the amount of non- renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves. Please refer to Section 4.4 of the PD.

4.3 Leakage

Leakage shall be considered as default 0.95 in accordance with the applied methodology.

4.4 Net GHG Emission Reductions and Removals

The project activity will replace traditional wood-based stove with ICS, therefore net GHG emission reductions are calculated by applying Equations 1 and 2.

$$ER_y = \sum_i \sum_j ER_{y,i,j}$$ Equation (1)

Where:

i	=	Indices for the situation where more than one type/model of improved cook stove is introduced to replace three-stone fire
j	=	Indices for the situation where there is more than one batch of improved cook stove of type i
ER_y	=	Emission reductions during year y in t CO_2e
$ER_{y,i,j}$	=	Emission reductions by improved cook stove of type i and batch j during year y in t CO_2e

$$ER_{y,i,j} = B_{y,saving,i,j} \times f_{NRB,y} \times NCV_{wood\ fuel} \times \left(EF_{wf,CO2} + EF_{wf,non\ CO2}\right) \times N_{y,i,j} \times 0.95$$ Equation (2)

Where:

$B_{y,saving,i,j}$	=	Quantity of woody biomass that is saved in tonnes per improved cook stove of type i and batch j during year y

$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass (f_{NRB}). The value is calculated to be 0.91.
$NCV_{wood\ fuel}$	=	Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)[15]
$EF_{wf,CO2}$	=	CO_2 emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO_2/TJ)[16]
$EF_{wf,non\ CO2}$	=	Non-CO_2 emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO_2/TJ)[17]
$N_{y,i,j}$	=	Number of improved cook stoves of type i and batch j operating during year y
0.95	=	Discount factor to account for leakage

According to "TOOL30: Calculation of the fraction of non-renewable biomass", equation 1 is used to calculate f_{NRB}:

$$f_{NRB} = \frac{NRB}{NRB + RB}$$

Where:

fNRB	=	Fraction of non-renewable biomass in the applicable area in the relevant period (fraction or %)
NRB	=	Quantity of non-renewable biomass consumed in the applicable area in the relevant period (tonnes)
RB	=	Quantity of renewable biomass that is available on a sustainable basis in the applicable area in the relevant period (tonnes)

The quantity of non-renewable biomass consumed in the applicable area (NRB) shall be determined as the difference between the total consumption of woody biomass in the applicable area (H) and the quantity of renewable biomass that can be sustainably harvested in the applicable area (RB):

$$NRB = H - RB$$

Where:

[15] AMS II.G. Version 11

[16] 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Chapter 2 Stationary Combustion

[17] 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Chapter 2 Stationary Combustion

H	=	Total consumption of woody biomass in the applicable area in the relevant period (tonnes)

The total consumption of woody biomass (H) is calculated using the following equation, accounting for all consumption within the applicable area (not only wood fuel but also timber and industrial consumption):

$$H = HW \times N + CE + NE$$

Where:

HW	=	Average consumption of wood fuel per household, including fuelwood and charcoal, in the applicable area in the relevant period (tonnes/household)
CE	=	Commercial woody biomass consumption for energy applications (e.g. commercial, industrial or institutional uses of woody biomass in ovens, boilers etc.) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)
NE	=	Commercial woody biomass consumption for non-energy applications (e.g. construction, furniture) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)
N	=	Number of households consuming wood fuel within the applicable area in the relevant period (number)

The quantity of renewable biomass available in the applicable area (RB) is estimated using the following equation:

$$RB = \sum \left(MAI_{forest,i} \times \left(F_{forest,i} - P_{forest,i} \right) \right) + \sum \left(MAI_{other,i} \times \left(F_{other,i} - P_{other,i} \right) \right)$$

Equation (4)

Where:

$MAI_{forest,i}$	=	Mean Annual Increment of woody biomass growth per hectare in sub-category *i* of forest areas in the relevant period (tonnes/ha/yr)
$MAI_{other,i}$	=	Mean Annual Increment of woody biomass growth per hectare in sub-category *i* of other land areas in the relevant period (tonnes/ha/yr)
$F_{forest,i}$	=	Extent of forest in sub-category *i* in the relevant period (ha)
$F_{other,i}$	=	Extent of other land in sub-category *i* in the relevant period (ha)
$P_{forest,i}$	=	Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within forest areas (in sub-category *i*) in the relevant period (ha)
$P_{other,i}$	=	Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within other land areas (in sub-category *i*) in the relevant period (ha)
i	=	Sub-category *i* of forest areas and other land areas[3]

The f_{NRB} has been calculated as follows:

Description	Unit	Value
Total woody biomass consumption (H)	t/yr	*22,721,466*
Renewable biomass (RB)	t/yr	*2,117,113*
Non-renewable biomass (NRB)	t/yr	*20,604,353*
f_{NRB}	-	0.91

Thus, the value of f_{NRB} is calculated as 0.91. The detailed calculation sheet has been submitted.

According to the paragraph 6(b) of applied TOOL30, the project participants should compare and analyse the calculated values against the values for fNRB reported in relevant scientific literature and justify any differences.

The calculated value 0.91 is higher than that from relevant scientific literature "Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015). The carbon footprint of traditional woodfuels. Nature Climate Change, 5(3), pp. 266–272"[18]. The WISDOM method was used in the literature. While the value of PD is calculated by CDM TOOL30, there may be following reason for the difference:

In the calculation of fNRB of this PD, MAIs were calculated using an age-weighted average based on the forest area of three categories (i.e., primary forest, above 20-year secondary forest, below 20-year secondary forest). And the data sourced from the 2019 Refinement of the

[18] https://www.researchgate.net/publication/271503594_The_Carbon_Footprint_of_Traditional_Woodfuels

2006 IPCC Guidelines[19]. However, MAI values in the relevant literature were derived from a combination of field observations and IPCC values, followed by a different estimation of growth rates as a percentage of standing stock. This approach often yields higher MAIs and may lead to higher estimations of RB and subsequently, lower estimations of NRB and fNRB.

According to the paragraph 13 of applied TOOL30, "If the fNRB value is estimated at the national level, as a cross check, project proponent shall compare the value of estimated NRB with the product of: i) total average above ground biomass tonnage of the area of forest areas deforested in recent past (tonnes/ha), and ii) most recent available observed annual rate of deforestation (ha/yr). If the estimated NRB value is more than 10% above the value calculated as per the product of biomass and deforestation rate, justification shall be provided for the higher value for NRB."

i) The total average above ground biomass tonnage of the area of forest areas deforested in recent past is 62.82 tonnes/ha[20];

ii) The annual rate of deforestation is 0.3 mha and Bangladesh is losing about 3% of the remaining forest areas[21].

a	The total average above ground biomass tonnage of the area of forest areas deforested	62.82	tonnes/ha
b	The total average above ground biomass tonnage of the area of forest areas deforested in recent past is 62.82 tonnes/ha; ii) The annual rate of deforestation	300,000.00	ha
c	a*b	18,846,000	t
d	Difference	8.53%	

According to the calculation above, the NRB is 8.53% higher than the value calculated by i) and ii), which is smaller than 10%. Thus, justification is not needed.

The quantify of woody biomass saved due to implementation of improved cook stoves can be estimated by one of the following options[22] set out in Equations 3 and 4. In the project Equation 4 has been chosen to estimate the quantify of woody biomass saved due to implementation of improved cook stoves:

$$B_{y,savings,i,j} = B_{old} \times \left(1 - \frac{\eta_{old}}{\eta_{new,i,j}}\right) \quad \text{Equation (3)}$$

$$B_{y,savings,i,j} = B_{y=1,new,i,survey} \times \left(\frac{\eta_{new,y,i,j}}{\eta_{old}} - 1\right) \quad \text{Equation (4)}$$

[19] https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf

[20] Global Forest Resources Assessments, Country report 2020, Bangladesh, Page 71

[21] https://www.cabidigitallibrary.org/doi/pdf/10.5555/20173070759 Page 4

[22] The option to determine the $B_{y,savings,i,j}$ shall be decided prior to validation of the project.

Where:

B_{old}	=	Annual quantity of woody biomass that would have been used in the absence of the project activity (in tonnes per device) to generate useful thermal energy equivalent to that provided by the improved cook stove. The value of B_{old} can be sourced from historical data or baseline surveys. Alternatively, a default value of 0.5t/capita/year may be used.
η_{old}	=	Efficiency of baseline cookstove. The value is 0.1 based on baseline survey.
$\eta_{new,y,i,j}$	=	Efficiency of the improved cook stove type i and batch j determined through water boiling test (WBT). Alternatively, efficiency may be determined using Equation 5.
$B_{y=1,new,i,survey}$	=	Annual quantity of woody biomass used by improved cook stoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey. The value is assumed to be 4.7 kg/device/day or equal to 1.72 tonnes/device/year.

$$\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94 \quad \text{Equation (5)}$$

Where:

η_p	=	Efficiency of project stove (fraction) at the start of project activity; the value is 36.0% as per the specifications provided by manufacturer
$(DF_n)^{y-1}$	=	Discount factor to account for efficiency loss of project cookstove per year of operation (fraction). This value may be based on actual monitoring or based on manufacturer's declaration on expected loss in efficiency or through publicly available literature on relevant industry standards. Alternatively default value of 0.99 efficiency loss per year can be considered.
0.94	=	Adjustment factor to account for uncertainty related to project cookstove efficiency test

The Equation 6 in the applied methodology is used when the project households continue to use baseline cookstoves along with improved cookstoves. Since only the firewood used in the ICSs implemented by the project will be taken into account for calculation of emission reductions, the Equation 6 is not applicable in PD for ex-ante estimation.

The Equation 7 and 8 in the applied methodology is used for project stoves replacing fossil fuel with renewable biomass. The project involves replacing low thermal efficient wood fuel combusted cookstoves with high thermal efficient wood fuel combusted cookstoves only.

Relatively rich households who can afford fossil fuel will not be involved in the donation project. Thus Equation 7 and 8 are not applicable.

For ex−ante calculation purpose, the assumption below is applied.

η_p=36.0%;

DF_n=0.99;

Therefore, $\eta_{new,y,i,j}$ is calculated as below:

Age(y)	$\eta_{new,y,1,j}$
1	33.84%
2	33.50%
3	33.17%
4	32.83%
5	32.51%
6	32.18%
7	31.86%

The project will install up to 100,000 ICSs. In the sixth year of the ICSs distribution, Iceberg will provide a new ICS to Households without cost, so that households will have access to them for the full crediting period.

During the crediting period of the project, end-users may no longer use the project ICS for various reasons. Thus, the number of ICS that should be counted as emission reductions from the project is expected to decrease year by year. The annual loss rate of this decrease in $N_{y,i,j}$ is assumed to be 5%.

53,003 ICSs have been distributed to households in the first year since the project started (Phase I). The remaining 46,997 ICSs are planned to be distributed from 26/07/2025 to 25/07/2026, i.e., the fourth year after the start of the project (Phase II).

Therefore, for the ICSs of Phase I,

the $N_{y,i,j}$ in year 1 is 53,003,

the $N_{y,i,j}$ in year 2 is 53,003-53,003*5%=50,353,

the $N_{y,i,j}$ in year 3 is 50,353-53,003*5%=47,703,

the $N_{y,i,j}$ in year 4 is 47,703-53,003*5%=45,053,

the $N_{y,i,j}$ in year 5 is 45,053-53,003*5%=42,402,

the $N_{y,i,j}$ in year 6 is 42,402-53,003*5%=39,752,

Due to in the sixth year of the ICSs distributed, Iceberg will provide a new ICS to Households without cost,

the $N_{y,i,j}$ in year 6 including the redistributed ICSs, which is 53,003. Since it is planned to gradually replace the stoves distributed in the first year with new stoves in the sixth year, it makes the average operating days in the sixth year for the ICS distributed in first year is six months and for the ICS distributed in sixth year is six months too. Thus, two batches of stoves with different thermal efficiencies exist at the same time in the sixth year, which has been taken into account in the calculation of emission reductions below.

Then, the $N_{y,i,j}$ in year 7 is 53,003-53,003*5%=50,353,

the $N_{y,i,j}$ in year 8 is 50,353-53,003*5%=47,703,

the $N_{y,i,j}$ in year 9 is 47,703-53,003*5%=45,053,

the $N_{y,i,j}$ in year 10 is 45,053-53,003*5%=42,402.

Likewise, for the ICSs of Phase II,

the $N_{y,i,j}$ in year 4 is 46,997,

the $N_{y,i,j}$ in year 5 is 46,997-46,997*5%=44,647,

the $N_{y,i,j}$ in year 6 is 44,647-46,997*5%=42,297,

the $N_{y,i,j}$ in year 7 is 42,297-46,997*5%=39,947,

the $N_{y,i,j}$ in year 8 is 39,947-46,997*5%=37,598,

the $N_{y,i,j}$ in year 9 is 37,598-46,997*5%=35,248,

Due to in the sixth year of the ICSs distributed, Iceberg will provide a new ICS to Households or without cost,

the Ny,i,j in year 9 including the redistributed ICSs, which is 46,997. Since it is planned to gradually replace the stoves distributed in the first year with new stoves in the sixth year, two batches of stoves with different thermal efficiencies exist at the same time in the sixth year, which has been taken into account in the calculation of emission reductions below.

Then, the $N_{y,i,j}$ in year 10 is 46,997-46,997*5%=44,647. Therefore, the $N_{y,i,j}$ and $\eta_{new,y,i,j}$ are estimated as below:

		ICSs distributed in year 1		ICSs distributed in year 4	
	Year(y)	$N_{y,i,j}$	$\eta_{new,y,i,j}$	$N_{y,i,j}$	$\eta_{new,y,i,j}$
First-time Distribution	1	53003	33.84%	0	0

2	50353	33.50%	0	0
3	47703	33.17%	0	0
4	45053	32.83%	46997	33.84%
5	42402	32.51%	44647	33.50%
6	39752	32.18%	42297	33.17%
7	0	0.00%	39947	32.83%
8	0	0.00%	37598	32.51%
9	0	0.00%	35248	32.18%
10	0	0.00%	0	0.00%

Second-time Distribution

	ICSs distributed in year 6		ICSs distributed in year 9	
6	53003	33.84%	0	0
7	50353	33.50%	0	0.00%
8	47703	33.17%	0	0.00%
9	45053	32.83%	46997	33.84%
10	42402	32.51%	44647	33.50%

$B_{y=1,new,i,survey}$= 4.7*365/1000=1.72 tonnes/device/year according to ex-ante estimation.

The expected emission reduction is as below:

Year(y)	ERs from ICSs distributed in year 1	ERs from ICSs distributed in year 4	ERs from ICSs distributed in year 6	ERs from ICSs distributed in year 9	Total
26/07/2022-25/07/2023	202,050	0	0	0	202,050
26/07/2023-25/07/2024	378,446	0	0	0	378,446
26/07/2024-25/07/2025	353,417	0	0	0	353,417
26/07/2025-25/07/2026	329,004	179,155	0	0	508,159
26/07/2026-25/07/2027	305,198	335,563	0	0	640,761
26/07/2027-25/07/2028	140,996	313,370	202,050	0	656,415
26/07/2028-25/07/2029	0	291,723	378,446	0	670,169
26/07/2029-25/07/2030	0	270,615	353,417	0	624,032
26/07/2030-25/07/2031	0	125,019	329,004	179,155	633,177
26/07/2031-25/07/2032	0		305,198	335,563	640,761
Total estimated ERs					5,307,387

Total number of crediting years	10
Average annual ERs	530,738

The applied methodology does not account for baseline and project emissions separately, but instead quantifies emission reductions as a function of the reduction in the amount of non-renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves. The ex-ante calculation in the table below.

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
26/07/2022-31/12/2022	N.A.	N.A.	0	38,341
01/01/2023-31/12/2023	N.A.	N.A.	0	328,566
01/01/2024-31/12/2024	N.A.	N.A.	0	367,543
01/01/2025-31/12/2025	N.A.	N.A.	0	376,779
01/01/2026-31/12/2026	N.A.	N.A.	0	609,968
01/01/2027-31/12/2027	N.A.	N.A.	0	632,569
01/01/2028-31/12/2028	N.A.	N.A.	0	677,417
01/01/2029-31/12/2029	N.A.	N.A.	0	650,071
01/01/2030-31/12/2030	N.A.	N.A.	0	614,707
01/01/2031-31/12/2031	N.A.	N.A.	0	649,791
01/01/2032-25/07/2032	N.A.	N.A.	0	361,635
Total	**N.A.**	**N.A.**	**0**	5,307,387

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass
Source of data	Calculated
Value applied	0.91
Justification of choice of data or description of measurement methods and procedures applied	As per the "TOOL30: Calculation of the fraction of non-renewable biomass, version 4.0". Please refer to Bangladesh f_{NRB} calculation sheet.
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	$NCV_{wood\ fuel}$
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted or reduced
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction: Table 1.2 Default net calorific values (NCVs) and lower and upper limits of the 95 percent confidence intervals.
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	$EF_{wf,CO2}$
Data unit	tCO_2 /TJ
Description	CO_2 emission factor for the use of wood fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion: Table 2.5 Default emission factors for stationary combustion in the residential and agriculture/forestry/fishing/fishing farms categories.
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	$EF_{wf,\text{non } CO2}$
Data unit	tCO_2 /TJ
Description	Non-CO_2 emission factor for the use of wood fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	26.23
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	η_p

Data unit	Fraction
Description	Efficiency of project stove at the start of project activity.
Source of data	Manufacturer's specification which was tested by ICS manufacturer following Water Boiling Test, version 4.2.3.
Value applied	36.0%
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined ex-ante The manufacturer conducted procedures including cold-start high-power phase and hot-start high-power phase. Firstly, the cold-start high-power phase began with the stove at room temperature. Secondly, hot-start high-power phase was conducted after the first phase while stove is still hot.
Purpose of Data	Calculation of emission reductions
Comments	-

5.2 Data and Parameters Monitored

Data / Parameter	$N_{y,i,j}$
Data unit	Number
Description	Number of project devices of type i and batch j operating during year y
Source of data	Monitoring
Description of measurement methods and procedures to be applied	Measured directly or based on a representative sample. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence precision according to the latest version of Standard for sampling and surveys for CDM project activities and programme of activities.
Frequency of monitoring/recording	At least once every two years
Value applied	For ex-ante emission reduction calculation, it is assumed that the project will distribute up to 100,000 ICSs and the installation/ distribution of ICSs to be implemented in 2 years with each year comprises of 50,000 ICSs.

Monitoring equipment	Monitoring survey
QA/QC procedures to be applied	Each ICS has a unique serial number on it, which has been recorded in database with the information of received household. Data used in the monitoring plan will be collected in each monitoring period by trained project staff.
Purpose of data	Calculation of emission reductions
Calculation method	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value
Comments	-

Data / Parameter	$\eta_{new,y,i,j}$
Data unit	Fraction
Description	Efficiency of the improved cookstove type i and batch j implemented as part of the project activity
Source of data	Calculation
Description of measurement methods and procedures to be applied	Project stoves produced in the formal sector do not vary in characteristics such as design, material, critical dimensions, etc. beyond a range of acceptable limits hence efficiency shall be measured as per following i. Conduct WBT test on a sample of three improved cookstoves with three tests conducted for each stove. The test can be carried out by project proponents by themselves or stove manufacturers or other third parties. ii. Efficiency to be tested is high-power thermal efficiency. The high-power thermal efficiency is the average of the Cold Start and Hot Start phases. iii. The average of all results for each device type/model and batch shall be taken as the efficiency for each device type and batch. iv. If the standard deviation of the test results indicated above is very small and 90/10 precision requirement is met (in this case, the value of the t-distribution for 90 per cent confidence shall be used instead of Z value), the efficiency determined is acceptable,

	otherwise more sample tests would be required until 90/10 precision is met. v. Efficiency of the improved cookstoves can also be estimated ex-ante using equation 5 above where loss in efficiency per year is calculated, and therefore this parameter does not need to be monitored. The PP adopted option v above.
Frequency of monitoring/recording	Annually
Value applied	The equation 5 is: $\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94$ Efficiency of project stove at the start of project activity; the value is 36%, therefore, efficiency of project stove in each year during the crediting period is:

Age(y)	$\eta_{new,y,1,j}$
1	33.84%
2	33.50%
3	33.17%
4	32.83%
5	32.51%
6	32.18%
7	31.86%

Monitoring equipment	Not applicable
QA/QC procedures to be applied	Not applicable
Purpose of data	Calculation of emission reductions
Calculation method	Equation 5 above: $\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94$
Comments	-

Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	tonnes

Description	Quantity of woody biomass used by project devices in tonnes per device of type i
Source of data	Survey
Description of measurement methods and procedures to be applied	Minimum sample size of each type i and batch j should be in line with the latest version of Standard for sampling and surveys for project activities and programmes of activities or guidelines provided in section 8.4 option (b). Determined in the first year of the introduction of the devices (e.g., during the first year of the crediting period, y=1) through measurement campaigns at representative households.
Frequency of monitoring/recording	Determined in the first year of project implementation
Value applied	For ex-ante emission reduction calculation, Iceberg has conducted two pilot field tests, the result showed that biomass consumption was 4.7kg/device/day by pilot tests, equal to 1.72 tonnes/device/year. The value is used for ex-ante estimation, and the actual value will be determined according to the requirement of applied methodology.
Monitoring equipment	Monitoring survey
QA/QC procedures to be applied	-
Purpose of data	Calculation of emission reductions
Calculation method	-
Comments	-

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline cookstove
Source of data	• Default value: 0.1 or 0.2; or • Surveyed prior to implementation of project activity
Description of measurement methods	(a) A default value of 0.1 shall be used if baseline device is a three-stone fire using firewood (not charcoal), or a conventional

and procedures to be applied

device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney.

(b) A default value of 0.2 shall be used for other types of devices.

(c) If more than one type of baseline device is being replaced in the project region, weighted average values (taking the amount of woody biomass consumed by each device as the weighting factor) shall be used.

(d) If this parameter is surveyed, project promoters may use simplified guidelines stated under Option (b) in Section 8.4 above for arriving at the minimum sample size.

The following is outcome of baseline survey:

Kind of cook stove in baseline scenario	Number of households	Percentage
open fire	0	0%
three-stone fire	0	0%
conventional stove without grate or chimney	120	100%
LPG stove	0	0%
basic charcoal or coal cookstove	0	0%
improved stove with grate or chimney	0	0%
portable improved cookstove	0	0%
others	0	0%
Total	120	100%

Kind of fuel in baseline scenario	Number of households	Percentage
firewood	120	100%
charcoal	0	0%
coal	0	0%
kerosene	0	0%
LPG	0	0%
others	0	0%
Total	120	100%

Conventional stove without grate or chimney belongs to the choice (a). All of them used firewood for fuel in baseline scenario. Hence, the applied value is 0.1 of $\eta_{\_old}$.

The Baseline Survey was conducted in 120 households from 6 villages. Multi-stage sampling method was applied in the baseline survey.

Frequency of monitoring/recording

Fixed for each individual household at the time of project implementation

Value applied	0.1
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of emission reductions
Calculation method	-
Comments	-

Data / Parameter	Life span
Data unit	Years
Description	Project promoters to state the operating lifetime of project device for projects opting Equation 5 for determining project stove efficiency.
Source of data	Manufacturer's specification
Description of measurement methods and procedures to be applied	All ICSs are manufactured to a fixed specification/error tolerance (refer Table 1) and quality inspection of products taken before shipment. Before the ICSs distributed to end-users, the staff check them to ensure there is no damage. One year warranty for the project ICS will be provided to end-users. The usage condition of the project ICS during the crediting period will be monitored by usage survey.
Frequency of monitoring/recording	Once at the time of Project stove installation
Value applied	7
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of emission reductions
Calculation method	-

Comments	-

5.3 Monitoring Plan

The local partners of Iceberg are in charge of the implementation of the monitoring plan and reporting to Iceberg. Iceberg is in charge of designing the monitoring plan and completing the monitoring report. Sampling survey will be applied for monitoring.

（a）Sampling Plan

As per the Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities, Version 09.0:

Sampling design

(1) Objectives and reliability requirements

The objective is determining the value of parameter $N_{y,i,j}$ and $B_{y=1,new,i,survey}$ during the crediting period, and with a 90/10 confidence/precision compliance with the applied methodology.

The following parameters may be determined by sampling:

Parameter	Description	Frequency
$N_{y,i,j}$	Number of project devices of type i and batch j operating during year y	Biennial
$B_{y=1,new,i,survey}$	Quantity of woody biomass used by project devices in tonnes per device of type i and batch j	Determined in the first year of project implementation

(2) Target population

The target population will be the complete set of appliances (ICS) deployed under the project.

(3) Sampling method and size

The sampling requirements of methodology are:

Parameter	Measurement procedures
$N_{y,i,j}$	Measured directly or based on a representative sample. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence/precision levels. Separate samples shall be taken for each batch

$B_{y=1,new,i,survey}$	Determined in the first year of the introduction of the devices (e.g. during the first year of the crediting period, y=1) through measurement campaigns at representative households and/or sample survey. Sampling standard used for determining the sample size to achieve 90/10 confidence/precision levels. Sample surveys to estimate this parameter, that are solely based on questionnaires or interviews (i.e. that do not implement measurement campaigns) may only be used if the following conditions are satisfied: Pre-project devices have been completely decommissioned and only efficient project device(s) are exclusively used in the project households; If multiple devices are used in the project, it is possible from the results of the survey questions to clearly differentiate the quantity of woody biomass being used by each device. In other words, if more than one device, or another device that consumes woody biomass, are in use in project households, then the sample survey needs to distinguish the quantity of biomass used by the project device and the other devices that use biomass. Only the quantity of biomass used by the project device will be accounted in project caused emission reductions.

According to "Standard sampling and surveys for CDM project activities and POAs (Ver9.0)" and "Guideline for sampling and surveys for CDM project and POA (Ver 4.0)", multi-stage sampling will be used. Multi-stage sampling was chosen for reasons below:

According to the Paragraph 17 in Page 6 and Paragraph 22 in Page 7 of "Guideline for sampling and surveys for project activities and programmes of activities (Version 04.0)", as a more complex form of cluster sampling, multi-stage sampling is used when "hierarchical" groupings are evident in a population, such as villages and households within villages, especially when measuring all the elements in the selected clusters may be prohibitively expensive, or not even necessary. Considering the big number of villages involved in the project, multi-stage sampling is the best choice.

The sample size will be decided by the actual distribution quantity of ICSs then. The equations are shown below:

For proportional parameter of interest:

$$c \geq \frac{\frac{SD_B^2}{\overline{p}^2} \times \frac{M}{M-1} + \frac{1}{\overline{u}} \times \frac{SD_w^2}{\overline{p}^2} \times \frac{(\overline{N}-\overline{u})}{(\overline{N}-1)}}{\frac{0.1^2}{1.645^2} + \frac{1}{M-1}\frac{SD_B^2}{\overline{p}^2}}$$

Where:

C	=	Number of groups that should be sampled
M	=	Total number of groups in the population
u	=	Number of units to be sampled within each group
N	=	Average units per group
SD_B^2	=	Unit variance (variance between villages)
SD_W^2	=	Average of the group variances (average within village variation)
p	=	Overall proportion
1.645	=	Represents the 90% confidence required
0.1	=	Represents the 10% relative precision

For mean value parameter of interest:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \left(\frac{M}{M-1}\right) + \left(\frac{1}{u}\right) \times \left(\frac{SD_W}{Overallmean}\right)^2 \left(\frac{\overline{N}-u}{\overline{N}-1}\right)}{\left(\frac{0.1}{1.645}\right)^2 + \frac{1}{M-1}\left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

C	=	Number of groups that should be sampled
M	=	Total number of groups in the population
u	=	Number of units to be sampled within each group
N	=	Average units per group
SD_B^2	=	Unit variance (variance between villages)
SD_W^2	=	Average of the group variances (average within village variation)
1.645	=	Represents the 90% confidence required
0.1	=	Represents the 10% relative precision

(b) Data to be collected

Besides the above parameters, the following data need to be collected as per the applied methodology:

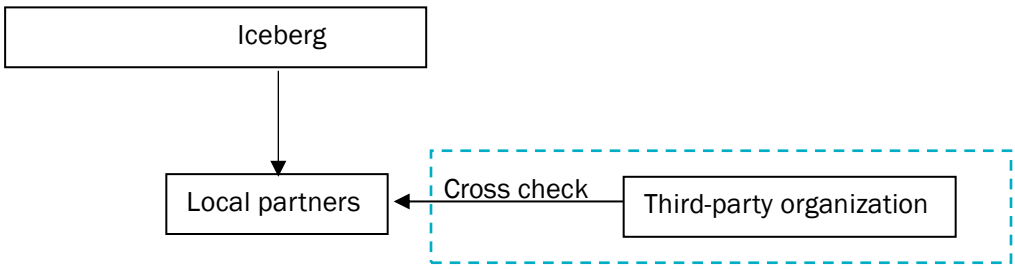
- Date of distribution
- Geographic area of distribution
- Model/type of project technology distributed
- Quantity of project technologies distributed
- Name and telephone number (if available), and address of recipient
- unique identification alpha/numeric ID for each device that is sold/distributed
- Whether the project ICS is still in use
- Whether using other cookstoves besides the project ICS (including baseline cookstove)
- The fuel used for project ICS and other cookstoves, including firewood, biomass residues processed as a fuel (e.g. briquettes, wood chips), LNG etc.
- The way to get the firewood
- The time spend on collecting firewood, etc

The information collected will be stored in the electronic database for 2 years after the end of crediting period.

Organizational structure

Training about monitoring plan will be provided to local partners, including survey method, data record and analysis. The monitoring plan will be carried out by qualified personnel trained for quality assurance and quality control. Iceberg will inspect local partners to confirm that the personnel are qualified and the monitoring plan has been properly implemented. The data collected may be cross checked by Iceberg or a third-party organization.

The organizational structure for monitoring is shown as the bellow:



Their respective roles and responsibilities are as follows:

- Iceberg

Iceberg is the central figure in the monitoring plan of the improved cookstove project. Its responsibilities include:

Monitoring and validation: Designing the monitoring plan to make sure the project function well and solve problems in time.

Data management: Ensuring accurate data collection, storage, and reporting in compliance with the project's monitoring plan.

- Local partners

Local partners act as intermediaries between the project developer and the end users. Their responsibilities include:

End user communication: Informing and notifying end users that they cannot claim emission reductions from the project.

Data collection: Assisting in the collection of data on stove usage and fuel consumption through surveys and field studies.

Implement the monitoring plan: Strict adherence to the monitoring plan to ensure that the project is completed on time and to standard.

- Third-party validation and verification body

Third-party validation and verification body is essential for:

Validation and verification: Conducting independent validation and verification of data, including survey results and fuel consumption test results, to ensure compliance with the applied methodology and fact.

(c) Implementation plan

The main survey methods applied in the sampling plan include hardcopy questionnaires, online questionnaires, face to face interview and telephone interview. The potential of refusals and other means of non-responses will be taken into account for calculation of sample size. Meanwhile, in order to minimize the rates of non-response and answer bias, the questionnaires will be designed by professional team and widely tested before use.

Oversight and accountability of monitoring activities

The following policies are used to conduct oversight and accountability:

- Monitoring Plan:

Iceberg has developed a detailed monitoring plan that clearly defines the roles and responsibilities of each party. Iceberg cooperates closely with the parties and implement the project in accordance with the monitoring plan. Iceberg oversights the local partners follow the monitoring plan strictly, and conduct the surveys at time, the frequency and precision should

meet the requirements of the methodology, and recording data accurately. This helps to ensure transparency and allocation of responsibilities for monitoring activities.

- Data management and record keeping:

Iceberg ensures that all project-related documents and records are kept in a secure and retrievable manner for at least two years after the end of the project crediting period.

- Validation and verification information sharing:

During the validation and verification process, Iceberg provides the VVB with the project description, proof of project ownership, and any necessary supporting information and data to support the statements and data in the project description.

During each monitoring period, Iceberg will provide the applicable monitoring report and any necessary supporting information and to support the statements and data in the monitoring report.

- Stakeholder Engagement and Feedback Mechanisms:

Iceberg has established an ongoing communication mechanism with stakeholders to gather their input and, if necessary, improve project implementation.

Procedures for internal auditing and QA/QC

Internal auditing procedures

- Audit planning: Define the scope and objectives of the audit.
- Process Audit: Ongoing monitoring of the operation of the project processes and close contact with local partners to ensure compliance with requirements.
- Corrective Action Tracking: Identify any non-conformities or suggestions for improvement and track the implementation of corrective actions to ensure that they are effectively addressed.
- Reporting: Document findings and observations in a clear and structured report. Team members prepare the report. Then the project manager reviews and comments on it and the team members make revisions. Finally, the report is given to the General Manager for review and confirmation of correctness before submission.

QA/QC Procedures

As part of the QC/QA system, Iceberg will take steps to ensure that each sampled parameter meets the required confidence/precision, taking into account the possibility of non-response and the removal of outliers from the sampled households.

The sampling plan has the following procedures to ensure high quality data:

Iceberg will ensure that local staff has understood the monitoring plan procedures and could follow them, including provisions for maximizing response rates, documenting out-of-population conditions, rejections, and other sources of nonresponse. Quality control and assurance strategies will be documented. Quality control and assurance strategies include addressing non-sampling errors such as non-response or interviewer bias. Iceberg has trained local staff on how to properly survey households to prevent interviewer bias. If a household refuses to participate, another household will be randomly selected. Iceberg is experienced in similar projects, the questionnaire designed properly, which could minimize investigator bias.

Data identified as outliers will be further examined to correct possible transcription and data entry errors, but if no such administrative errors exist, they will be omitted from the analysis.

Handling non-conformances

Any non-conformances with the validated monitoring plan will be recorded and analysed. If they are in accordance with the applied methodology and other related rules, a change may be conducted in the validated monitoring plan. Otherwise, revision and improvement will be conducted in the monitoring. The related ERs will not be claimed in the monitoring report until the non-conformance has been corrected in the latter case.

APPENDIX

Appendix 1: Emails about the Scope 3 emissions double claiming for VCS 3144 to partners.

Dear Mr Suramoni from HWO Energy Limited,

We assign you to produce and distribute Apon Chula in rural area of Bangaldesh, which is involved in the Verified Carbon Standard project "Bangladesh Apon Chula Improved Cookstove Program I" (VCS ID:3144). VCUs may be issued for the greenhouse gas emission reductions and removals with Apon Chula produced and distributed in the rural area of Bangladesh by HWO Energy Limited from this project. Please do not double claim the corresponding greenhouse gas emission reductions and removals in any other project. Thanks very much!

Regards,

保佶
广州冰川环境咨询服务有限公司　　总经理
手机：13560420840
地址：广州市南沙区丰泽东路106号　邮编：510000

Ji BAO
Guangzhou Iceberg Environmental Consulting Services Co., Ltd.　General Manager
Mobile:+8613560420840
No.106 Fengze East Road, Nansha District, Guangzhou, China　P.C.: 510000

Dear Mr Moharram from Atmosphere Care of Bangladesh Ltd. ,

We assign you to produce and distribute Apon Chula in rural area of Bangaldesh, which is involved in the Verified Carbon Standard project "Bangladesh Apon Chula Improved Cookstove Program I" (VCS ID:3144). VCUs may be issued for the greenhouse gas emission reductions and removals with Apon Chula produced and distributed in the rural area of Bangladesh by Atmosphere Care of Bangladesh Ltd. from this project. Please do not double claim the corresponding greenhouse gas emission reductions and removals in any other project. Thanks very much!

Regards,

保佶
广州冰川环境咨询服务有限公司　　总经理
手机：13560420840
地址：广州市南沙区丰泽东路106号　邮编：510000

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