

Gold Standard for the Global Goals
Key Project Information & Project Design Document
(PDD)



Version 1.1 – August 2017

KEY PROJECT INFORMATION

Title of Project:	Household Biogas plants installed in rural areas of Uttar Pradesh & Maharashtra
Brief description of Project:	<p>The project activity involves bundling 15,702 household biogas plants located in Uttar Pradesh and Maharashtra of varying capacities – 2m³, 3m³ and 4m³. All 15,702 plants in the project are commissioned from 06/02/2017 onwards until 01/07/2018. The biogas plants are combination of deenbandhu model and KVIC model. The purpose of the project is to replace the commonly used inefficient wood fired mud stoves technology, with clean, sustainable and efficient biogas.</p> <p>This project leads to reduction of greenhouse gas emissions by displacing conventionally used non renewable biomass with renewable biogas. In addition, the hygienic conditions in the rural areas will be improved by an appropriate disposal of waste. Further, residue from the bio digesters is used as organic fertilizer and will improve soil conditions in rural areas.</p>
Expected Implementation Date:	07/02/2017
Expected duration of Project:	5 years renewable cycle
Project Developer:	Aadivasi Khadi Avom Krishi Parishchan Sansthan (AKKPS)
Project Representative:	Swiss Carbon Value Ltd.
Project Participants and any communities involved:	Aadivasi Khadi Avom Krishi Parishchan Sansthan (AKKPS) Swiss Carbon Value Ltd.
Version of PDD:	01.1
Date of Version:	01/10/2018
Host Country / Location:	India (Uttar Pradesh and Maharashtra)
Certification Pathway (Project Certification/Impact Statements & Products)	Project Certification
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG: Community Services Activity Requirements
Methodologies applied:	AMS I. E.- Switch from non-renewable biomass for thermal applications by the user, Version 08, EB 97
Product Requirements applied:	GS VER
Regular/Retroactive:	Retroactive
SDG Impacts:	1– Good Health and well being (SDG 3) 2- Affordable and clean Energy (SDG 7) 3-Climate Action (SDG 13)

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Estimated amount of SDG Impact Certified	56,508 tCO ₂ /year

SECTION A. Description of project

A.1. Purpose and general description of project

>> The aim of the project is to replace the commonly used inefficient wood fired mud stoves technology, with clean, sustainable and efficient biogas. The purpose of the project activity is to bundle 2m³, 3m³ and 4m³ plants in Uttar Pradesh & Maharashtra. All 15,702 plants are commissioned in between February 2017 – July 2018 and comprises of total 45,549 m³.

Each household will utilize the dung of its cows to feed the digester for the production of biogas for domestic purposes. This leads to reduction of greenhouse gas emissions by displacing conventionally used non renewable biomass with renewable biogas. In addition, the hygienic conditions in the rural areas will be improved by an appropriate disposal of waste. Further, residue from the bio digesters is used as organic fertilizer and will improve soil conditions in rural areas.

Project activity will contribute towards sustainable development by replacing firewood with biogas generated from the biodigesters.

Baseline Scenario:

Household survey was conducted to assess the baseline fuel and quantity used. As per the Survey, firewood was the main fuel used to suffice domestic needs. It was sourced from nearby forests and open market. Families have to walk 2-5 km to collect this firewood. Usage of inefficient firewood leads to indoor pollution and land use patterns have been showing a decrease in forest land cover and increase in degraded land. Increasing pressure from human and livestock population and indiscriminate and illegal exploitation of forest resources are among factors that have lead to further intensification of the problem. A trend of forests turning into open scrubs has been observed. Degradation of forest lands has exacerbated the already existing problem of desertification. There is a need to maintain adequate forest cover in the state to mitigate climate change effects.

Project Scenario:

Project activity involves bundling of 15,702 plants installed in rural areas of UP & Maharashtra installed between Feb 2017 and July 2018 constructed & maintained by Adivasi Khadi Avom Krishi Parishchan Sansthan(AKKPS). Project activity involves installation of new biogas plant in the households of UP & Maharashtra and produced biogas will be used in the biogas stoves for thermal energy needs. Hence, the project activity is a Greenfield project activity.

Residues from the bio digesters are used as organic fertilizer in the garden area and fields of the local people.

Project activity will result in saving of 847,620 tCO₂ throughout the project activity with an average saving of 56,508 tCO₂/year

The size of the biodigesters varies, depending on the number of people and number of cattle available per household. A detailed breakdown of the plants with the respective installed capacity is given below in Table 1.

Table 1. Breakdown of the plants with the respective installed capacity

Sr. No	Capacity (m ³)	Number of plants	
		Uttar Pradesh	Maharashtra
1	2	361	2212
2	3	350	11763
3	4	1,011	5
Total:		15,702	

A.2. Eligibility of the project under Gold Standard

>> (Describe how the project meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document and the relevant activity requirements document)

The project falls under GG4GG Community Services Activity Requirements:

Eligible Project Types & Scope: The projects leads to climate change mitigation by providing access to resources (biogas) to households. Types of project: The project falls under 'Renewable energy" type- Waste management and handling: Management of animal waste (cattle dung) to deliver biogas.

Project Area, Boundary and Scale: Project Area and Boundary is described under section A.4 below.

Scale: The project falls unde waste handling and disposal with emission reductions 56,508 tCO₂ with installed energy output of 36.27 MW_{thermal} (Below the threshold of 45 MW_{thermal}). Hence, the project falls under small scale projects.

Project Contributes the Sustainable Development

Project implementation in rural areas will improve the socio- economic condition of the rural population and reduce GHG emissions. It is expected that this project will contribute to the improvement of the living standard of the population. A detailed Sustainable Development description of the project activity is given in the Gold Standard project design document.

The advantages of the projects are given in brief below:

Environmental well being

- The project utilizes cow dung & kitchen wastes which in the absence of the project activity would be left to decay and thus leading to substantial methane emissions from anaerobic processes.
- Utilizing biogas as an energy resource contributes to clean environment.
- Transformation of organic wastes into high quality fertilizer.

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- Due to the anaerobic processes, the final sludge of the biodigesters has a very high degree of purity, i.e. it contains no parasites. This reduces the danger of parasitic infestations in people and animals
- During fermentation, part of the nitrogen content is changed into the form of ammonium, more easily absorbed by plants. In the direct spreading of unfermented manure, this process takes place in the soil and requires more time. Thus fermented liquid manure can be applied during the growth period of the plants (top dressing): This direct absorption by plants means that the danger of nitrogen seepage is reduced.
- Improvement of hygienic conditions through reduction of pathogens by utilizing the animal and other organic wastes in the bio digesters.
- Contribute to the global environment improvement by reducing deforestation and improving biodiversity.
- It will lead to improvement in soil condition by providing high quality manure.

Social – Economic well being

- It leads to improve the economic level of the local community by employing local people during construction of the biogas plant.
- The project will reduce the cooking time, thus providing women to take up other activities. It improves the overall health situation by reducing smoke in the kitchen, thus eliminating health hazards from indoor air pollution.

Technology well being:

- Biogas provides a more convenient, dependable energy source that is renewable and that reduces cooking time

The slurry produced from the biogas units is a valuable organic fertiliser that can be applied directly to the fields.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

>>

Implementation of the proposed project doesn't involve any activity that causes alteration of any resource; therefore acquiring any specific legal right to do so is not applicable. However, the entitlement of the emission reductions generated by the project shall be transferred to the project developer from the beneficiary households through a signed covenant.

A.4. Location of project

A.4.1. Host Country

>>

India

A.4.2. Region/State/Province etc.

>>

Uttar Pradesh and Maharashtra

A.4.3. City/Town/Community etc.

>>

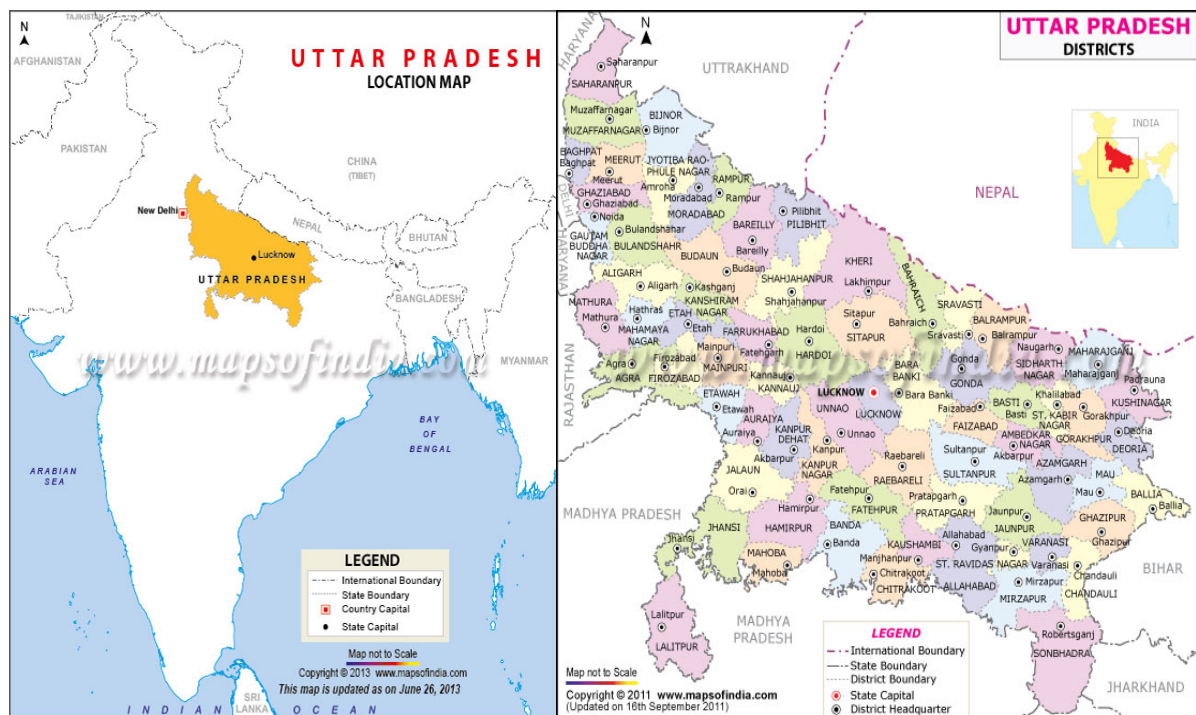
In Uttar Pradesh nine districts (Lakhimpur, Sahjahanpur, Rampur, Bareilly, Sitapur, Faizabad, Sultanpur, Pilibhit, Sonbhadra, Varanasi, Mirzapur, Chandola, Urai, Deoria, Kushinagar, Mathura, Unnav, Raibareilly, Jhansi, Muzzafarnagar and Ballia) were surveyed and in Maharashtra seven districts (Kolhapur, Bhandara, Gondiya, Gharchiroli, Chandrapur, Tiroda and Nagpur).

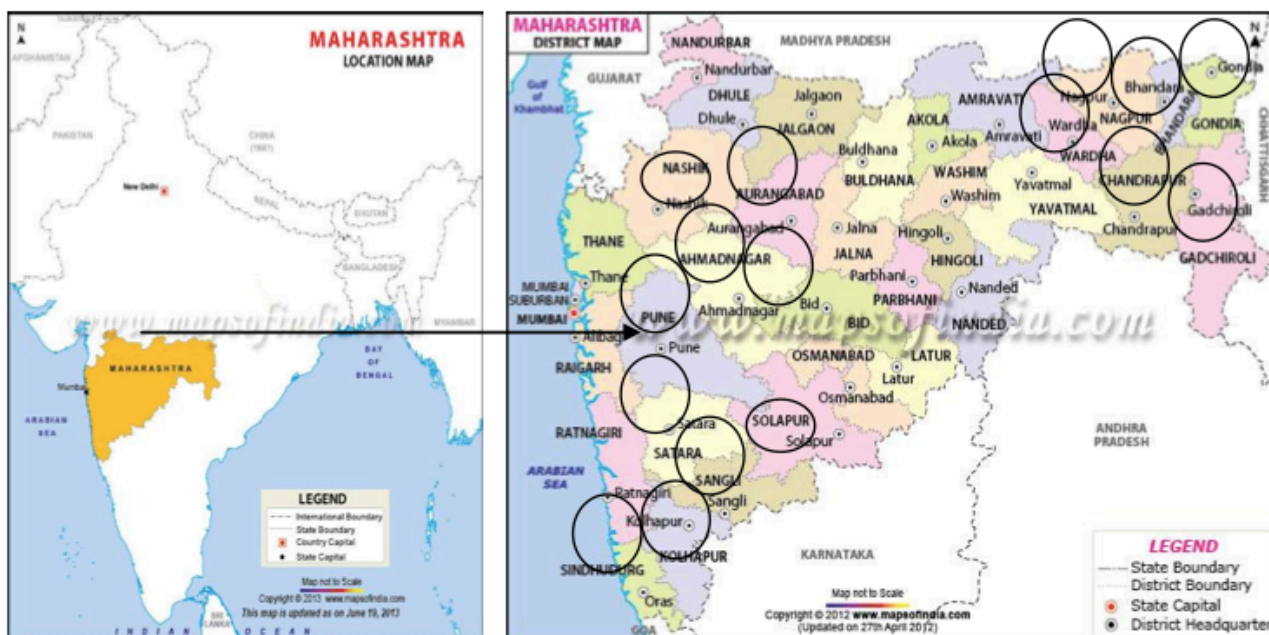
A.4.4. Physical/Geographical location

>> (Include information allowing the unique identification of this project.)

	Coordinates
Latitude(UP & Maharashtra)	27° 40'00" N & 23° 00'00" N
Longitude (UP & Maharashtra)	80° 00'00" E & 72° 00' 00" E

Uttar Pradesh





A.5. Technologies and/or measures

>> (Describe the technologies and measures to be employed and/or implemented by the project, including a list of the facilities, systems and equipment that will be installed and/or modified by the project. Include information essential to understand the purpose of the project and how it will contribute positively to three SDGs.)

As described above project activity involves bundling of household bio-digesters with Deenbandhu model & KVIC model technology installed in rural areas of UP & Maharashtra. There is no technology transfer involved in the project activity. All plants are built by local mesons and the NGOs

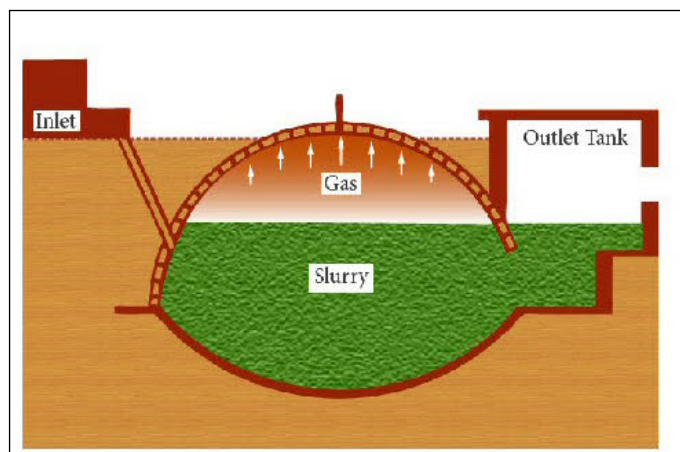
Details of working given below:

Deenbandhu Model:

The major feed cow dung and other organic waste material is mixed with water and fed into the plant through the inlet chamber of the plant. This waste is converted into biogas with the help of a special type of anaerobic bacteria. The digested material, which comes out of the plant, is enriched manure.

The main feature of a Deenbandhu biogas plant is the fixed underground digester chamber, constructed with a layer of bricks and an additional layer of cement mortar forming the roof above. Connected to the underground chamber is an inlet tank (labelled on diagram as "Mixing Tank"), through which manure is fed into the plant. The manure then ferments separating the slurry from the methane gas which rises and collects at the top of the digester tank, and is released through the gas outlet pipe. The slurry passes into the outlet tank where it is ejected from the plant and can be used as fertilizer on the field

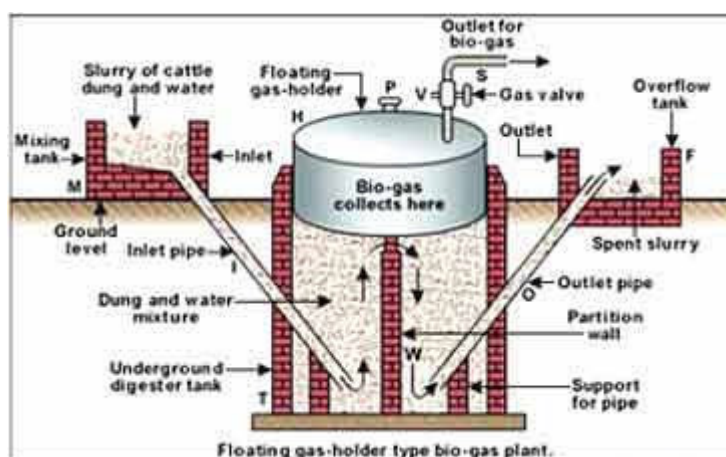
Figure1: Deenbandhu type Biogas plant



KVIC floating model:

KVIC model, consists of a deep well, and a floating drum, usually made of mild steel. The system collects the gas, which is kept at a relatively constant pressure. As more gas is produced, the drum gas holder consequently rises. As the gas is consumed, the drum then falls. The biomass slurry moves through the system, as the inlet is higher than the outlet tank, creating hydrostatic pressure. Only completely digested material can flow up a partition wall, which prevents fresh material from 'short-circuiting' the system, before flowing into the outlet tank.

Figure 2: KVIC type Biogas plant



The project contributes directly in achieving the SDG#3 &7 in addition to SDG#13 as required by Principle- 1 of GS4GG. The project will have following benefits:

- **Environmental Benefits:** Reduction in firewood consumption and emission of greenhouse gases, forest and biodiversity conservation (SDG#13).
- **Economic Benefits:** Employment creation and saving of health cost (SDG#3).
- **Health Benefits:** Sufficiently enhance indoor air quality thereby improving health of

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family members and reducing incidences of smoke and fire related injuries (SDG#3).

- **Social Benefits:** *The project will provide affordable and clean fuel compared to baseline scenario (SDG #7)*

A.6. Scale of the project

>> *(Define whether project is micro scale, small scale or others. Justify the scale referring to relevant activity requirement.)*

The project falls under waste handling and disposal with emission reductions of 56,508 tCO₂ per annum with installed energy output of 36.27 MW_{thermal} (Below the threshold of 45 MW_{thermal}). Hence, the project falls under small scale projects.

A.7. Funding sources of project

>>

No public funding from parties included in Annex I to the UNFCCC, is available to the project. No Official Development Assistance involves in the project activity. The end users invest in procuring biogas technology with special assistance given by AKKPS.

A.8. Assessment that project complies with 'gender sensitive' requirements

>> *(Answer the four mandatory questions included under Step 1 to 3 in "Gold Standard Gender Equality Guidelines and Requirements" available [here](#).)*

Proposed project is developed pursuant to the "gender sensitive" requirements outlined in the "Gold Standard Gender Equality Guidelines and Requirements". As required for the purpose of the PDD as specified in the guidance note to this section, the project participants present the assessment to questions included in step 1 to 3 in the respective guidelines and requirements.

1M) Does the project reflect the key issues and requirements of gender-sensitive design and implementation as outlined in the gender policy? Explain how.

The project respects the key gender issues and requirements of gender-sensitive design and implementation of the project. SDG#5 is one of the impact areas of the project. The project is aimed to avail the clean cooking solutions to the households. Biogas project will result in cutting down the firewood consumption. Therefore, the project will support environmentally sustainable consumption of firewood.

In the overwhelming majority of the households in Uttar Pradesh and Maharashtra, the kitchen chores (including the sourcing of fuel, cooking and cleaning) are handled by women. While getting involved most of the time with the kitchen related activities, women are more exposed to the indoor air pollution and the associated hazard. Situation is more aggravated with a fact that the women are also responsible for taking care of the children and the children who normally need mother's support to perform their activities are bound to accompany their mother in kitchen. This situation has led to enhanced exposure of the women and children to kitchen smoke and associated health consequences. Since the project aims to displace the polluting firewood from the kitchen, the primary beneficiary would be the women and children. Furthermore, the project is

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focused to the socially disadvantaged group of people, which also justifies the dimension of social inclusion in the project design.

On the implementation side, the project has trained and deployed women in the marketing and construction of the biogas plant. Project implementer opines that promotional activities are better addressed with women in the forefront. During the life of the project, the project participant believes to create a conducive environment where women are ably capacitated to discuss the need of a technology, create awareness of the product and process, and in long run, to organize themselves and create business opportunities for themselves. This women prioritized mode of project development and implementation helps address gender equality issues; in the meantime, addressing issues related to environmental sustainability and natural resource management.

2M. Does the project align with existing country policies, strategies and best practices? Explain how.

The project respects all the rights to the women conferred to them by the Republic of India. The constitution embraces the principle of "positive discrimination" to enhance women's participation in all state organs. Article 18 of the constitution highlights the "right to equality", article 38 outlines the "rights of women", article 40 outlines "rights of dalits", article 42 outlines "right to social justice", and article 43 outlines "rights to social security". All these articles embrace the gender equality and social inclusion principles in a way or other. Similarly, the project also respects the spirit of international convention on "women" to which India is a party.

The project shall be implemented in the households of dalits and backward community where the women are the primary beneficiary. Further to it, the project involves women in the forefront of the supply chain that helps fostering their entrepreneurial skills and capacitates them to be part in social dialogue. Doing this, the project fully embraces the spirit of "positive discrimination" held by the constitution.

3M. Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.

The project doesn't trigger key Safeguarding Principles and Requirements adopted by the Gold Standard. Table-1 highlights the project participant's assessment of the key questions on GS Safeguarding Principles & Requirements. The following safeguarding principles and requirements are triggered by the project.

SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES

1. Principle 2 - Gender Equality and Women's Rights

ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES

- Principle 1 - Climate and Energy

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

>>

The relevant project type and category is: Type I. RENEWABLE ENERGY PROJECTS, Category I.E. -

Switch from non-renewable biomass for thermal applications by the user, Version 08, EB 97.

Reference:

<https://cdm.unfccc.int/methodologies/DB/SO8OOGYGWHMXXM287RBNKEYAMN9EUN0>

B.2. Applicability of methodology

>> *(Justify the choice of the selected methodology(ies) by demonstrating that the project meets each applicability condition of the applied methodology(ies))*

Justification for the choice of methodology is given below table:

Criterion	Conditions	Applicability
1	This category comprises activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include, but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass).	Project activity involves installation of biodigesters and biogas thus produced will replace non renewable firewood used to suffice thermal energy needs.
2	Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	Survey was conducted to check since when villagers were using firewood. It is evident from the survey that all villagers have been using firewood as a cooking fuel since 31 December 1989.

Eligible Project Types:

Renewable energy Supply-

Project activity falls into this category as it involves generation of biogas from cow dung and other organic waste. Therefore, replacing non-renewable firewood used in the absence of the project activity to suffice domestic needs. Hence meets the criterion.

Project Types and Eligibility criterion:-

Project activity falls under below project type-

Project Type: Improved distributed heating and cooking devices (e.g. biodigesters, cook-stoves), and distributed micro-scale electricity generation units(e.g. micro-hydro and PV for Households)

Project activity involves installation of household biodigesters and thereby replacing firewood. Biogas thus generated will be used for domestic thermal needs. AKKPS has an agreement with all the plant owners involved in the project activity stating transferring of rights to AKKPS and will share the revenue generated from carbon credits sale. Revenue sharing arrangement was discussed with stakeholders during live stakeholder feedback round. Every stakeholder was aware of the arrangement and ownership of the credits. Hence meeting the GS criterion.

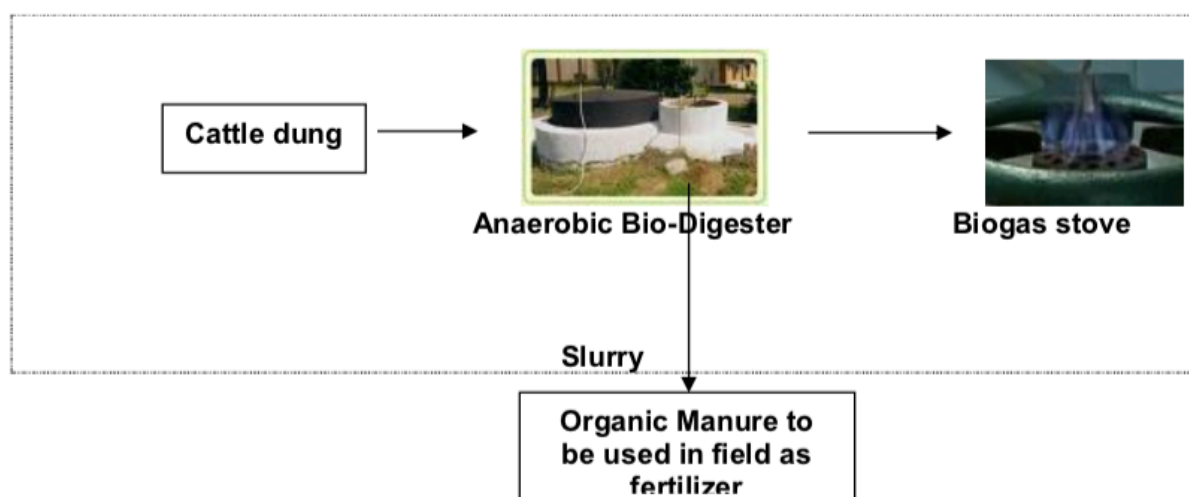
B.3. Project boundary

>> (Present a flow diagram of the project boundary, physically delineating the project, based on the description provided in section A.5 above.)

As per **"AMS I.E-Switch from non-renewable biomass for thermal applications by the user"** methodology the project boundary is:

The project boundary is the physical, geographical site of the use of biomass or the renewable energy.

Therefore, the project boundary encompasses the sum of all the 18,673 physical geographical sites of all individual biogas plants (digester system, pipe leading to the stove and the stove itself) realized by the project activity. However, the baseline emissions from methane avoidance source have been excluded to be conservative.



For the purpose of GHG mitigation/sequestration following table shall be completed (delete if not required)

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Thermal Energy Need	CO ₂	Yes	The major source of emissions in the baseline due to burning of firewood
		CH ₄	No	Excluded for simplification, this is conservative.
		N ₂ O	No	Not applicable for the project activity
	Animal waste handling and storage	CO ₂	No	Not Aailed, as baseline emissions from "feed" are not considered
		CH ₄	No	Not Aailed, as baseline emissions from "feed" are not considered
		N ₂ O	No	Not Aailed, as baseline emissions from "feed" are not considered
Project scenario	Direct emissions from the biodigester	CO ₂	No	Excluded as CO ₂ emissions from biogas incineration are CO ₂ neutral
		CH ₄	No	Excluded for simplification
		N ₂ O	No	Excluded for simplification
Leakage	The use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users	CO ₂	Yes	Source of leakages due to diversion of firewood saved under project activity.

B.4. Establishment and description of baseline scenario

>> (Explain how the baseline scenario is established in accordance with guidelines provided in GS4GG Principles & Requirements and the selected methodology(ies). In case suppressed demand baseline is used then same should be explained and justified.)

As per **"AMS I.E. Switch from non-renewable biomass for thermal applications by the user, Version 08, EB 97"** 'A baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs'.

The proposed project activity involves the installation of anaerobic bio-digesters for the production of biogas which will replace non-renewable biomass, used as a fuel for household cooking purposes. The baseline parameter were identified using a survey of samples in line with the guideline "Sampling and surveys for CDM project activities and programme of activities" version 04. As per baseline survey 100% of the households were using firewood and 3 stone fire as baseline stove.

In Uttar Pradesh nine districts (Lakhimpur, Sahjahanpur, Rampur, Bareilly, Sitapur, Faizabad, Sultanpur, Pilibhit, Sonbhadra, Varanasi, Mirzapur, Chandola, Urai, Deoria, Kushinagar, Mathura, Unnao, Raibareilly, Jhansi, Muzaffarnagar and Ballia) were surveyed and in Maharashtra seven

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districts (Kolhapur, Bhandara, Gondiya, Gharchiroli, Chandrapur, Tiroda and Nagpur). These districts were having all size of plants included in project activity which are 2 m³, 3m³ and 4 m³.

The details of the survey from the study are as follows:

Uttar Pradesh:

S.No	No. of Plants Surveyed	Capacity of Biogas plant(m ³)	Net Saving of firewood (kg/month)	No. of cattle	Whether included in any other CDM project activity
1	37	2	223	2	No
2	92	3	325	3	No
3	110	4	420	3	No

The survey report revealed the woody biomass consumption for respective capacities as below:

Capacity(m ³)	Firewood consumption (kg/month/plant)	No. of Plants	Total firewood consumption (kg/year)
2	223	485	1,297,860
3	325	482	1,879,800
4	420	1,733	8,734,320
		Total	11,911,980

In Maharashtra:

S.No	No. of Plants Surveyed	Capacity of Biogas plant(m ³)	Net Saving of firewood (kg/month)	No. of cattles	Whether included in any other CDM project activity
1	133	2	230	2	No
2	76	3	334	2	No
3	41	4	434	3	No

The survey report revealed the woody biomass consumption for respective capacities as below:

Capacity(m ³)	Firewood consumption (kg/month/plant)	No. of Plants	Total firewood consumption (kg/year)
2	230	3014	8,318,640
3	334	12952	51,911,616
4	434	7	36,456
		Total	60,266,712

B.5. Demonstration of additionality

>> (If the proposed project is not a type of project that is deemed additional, as stated below, then follow guidelines in section 3.5.1 of GS4GG Principles & Requirements to demonstrate additionality.)

The additionality of the project is demonstrated by following the criteria outlined in “Guidelines for demonstrating additionality of small scale project activities” (version 10), Annex 14, EB 83. The paragraph 2(c) of this guideline states: Based on the guidelines, the table below discusses the applicability of the project under discussion as additional.


Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	Guidelines for demonstrating additionality of small scale project activities” (version 10), Annex 14, EB 83. Paragraph 11 (c) defines additionality if “Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds.”
Describe how the proposed project meets the criteria for deemed additionality.	<ul style="list-style-type: none"> ▪ The annual energy saving per unit biogas is 0.005 GWh thermal which is less than 9 MWhth (i.e. less than 5% of the small scale CDM threshold) ▪ Project is considered additional provided that the project is limited to 60 Giga-watt hours of savings per year, which is equivalent to 180 Giga-watt hours thermal per year. Thus, because the project cannot exceed 180 Giga-watt hour thermal energy savings per year, as stated in the eligibility criteria, the project is considered additional.

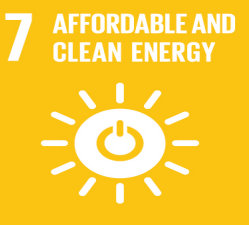

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

>> (Specify the relevant SDG target for each of three SDGs addressed by the project. Refer most recent version of targets [here](#).)

Table below discusses the relevant SDG target for each three SDGs addressed by the project.

SDGs	Targets
 <p>3 GOOD HEALTH AND WELL-BEING</p>	The project will contribute to the SDG goal “By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination”. The project replaces firewood consumption with biogas. Therefore, the indoor air quality at user point will improve and will contribute to the SDG goal.

	<p>The project will contribute towards below SGD goals:</p> <ul style="list-style-type: none"> • By 2030, ensure universal access to affordable, reliable and modern energy services • By 2030, increase substantially the share of renewable energy in the global energy mix
	<p>The project will contribute towards below SGD goals:</p> <ul style="list-style-type: none"> ▪ Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning ▪ Integrate climate change measures into national policies, strategies and planning

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

>> (Explain how the methodological steps in the selected methodology(ies) or proposed approach for calculating baseline and project outcomes are applied. Clearly state which equations will be used in calculating net benefit.)

As per “**AMS I.E- Switch from non-renewable biomass for thermal applications by the user, Version 08, EB 97**”

The emission reductions would be calculated as:

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil_fuel} \quad \text{Equation (1)}$$

Where:

BE_y	=	Baseline emissions during the year y in t CO ₂ e
B_y	=	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	=	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass (fNRB) ¹
$NCV_{biomass}$	=	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne)
$EF_{projected_fossil_fuel}$	=	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 t CO ₂ /TJ ²

¹ Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/methodologies/standard_base/index.html>.

² This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. The value is calculated, based on the global average ratio of cooking fuels (the normalized ratio of kerosene and liquefied petroleum gas (LPG) excluding coal), i.e. 9 per cent for kerosene (71.5 t CO₂/TJ) and 91 per cent for LPG (63.0 t CO₂/TJ).

B_y is determined by using option (a) paragraph 15 of the methodology as follows:

- (a) Calculated as the product of the number of households multiplied by the estimate of average annual consumption of woody biomass per household that is displaced by the project activity (tonnes/household/year);

$$B_y = N_{HH} \times (BC_{BL,HH,y} - BC_{PJ,HH,y}) \quad \text{Equation (2)}$$

Where:

- N_{HH} = Number of households in the project activity, number
- $BC_{BL,HH,y}$ = Average annual consumption of woody biomass per household before the start of the project activity, tonnes/household/year
- $BC_{PJ,HH,y}$ = If it is found that pre-project devices were not completely displaced but continue to be used to some extent, average annual consumption of woody biomass per household in the pre-project devices during the project activity, tonnes/household/year

$BC_{BL,HH,y}$ has been determined as per third party survey for the sample of households explained in section B.4 above.

Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass ($f_{NRB,y}$) is determined as per methodological tool 'Calculation of the fraction of non-renewable biomass' version 01 as follows: The fraction of woody biomass that can be established as non-renewable, is:

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

Where:

f_{NRB} = Fraction of non-renewable biomass (fraction or %)

NRB = Quantity of non-renewable biomass (t/yr)

RB = Quantity of renewable biomass (t/yr)

Estimation of consumption of woody biomass ($H/Bold, total$) is done following paragraph 12 (a) of the tool 'Official Statistics'.

As per Forest Survey of India report 2011, Annual fuelwood consumption in household sector and consumption of wood in House construction, Furniture and Agriculture is given below:

(a) States	(b) Uttar Pradesh	(c) Maharashtra
Annual woodfuel consumption in household sector (Ton/year)	20357000	14035000
Non-domestic wood consumption (ton/year)	147925800	157404330
Total wood consumption (ton/year)	168282800	171439330

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Procedure to estimate RB: Renewable biomass (RB) in the country/region/area is estimated using the equation below:

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

Where: MAI_{forest,i} = Mean Annual Increment of woody biomass growth per hectare in subcategory i of forest areas (t/ha/yr). For this parameter report from Ministry of Environment and Forest, Govt. of India has been referred³

MAI_{other,i} = Mean Annual Increment of woody biomass growth per hectare in subcategory i of other wooded land areas (t/ha/yr). This value is not considered due to non availability of data.

F_{forest,i} = Extent of forest in sub-category i (ha). India state of forest report, 2017 has been referred for this parameter.

F_{other,i} = Extent of other wooded land in sub-category i (ha). This is not used following footnote 4 of the tool.

P_{forest} = Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within forest areas (ha). This parameter is optional and not considered.

P_{other} = Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within other wooded land areas (ha). This parameter is optional and not considered.

i = Sub-category i of forest areas and other wooded land areas

States	(d) Uttar Pradesh	(e) Maharashtra
MAI _{forest,i}	0.5	0.5
F _{forest,i} ⁴	1,658,000	5,206,000
RB	829,000	2,603,000

Accordingly, the fNRB would be:

(f) States	H	(g) RB	(h) NRB (H-RB)	(i) fNRB
Uttar Pradesh	44260000	829,000	167453800	100%
Maharashtra	50246100	2603000	168836330	98%

³ <http://www.moef.nic.in/sites/default/files/Pacific.pdf>

⁴ <http://fsi.nic.in/forest-report-2017>

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Project Emissions (PEy): As per applied methodology AMS-I.E, version 08, project emissions are accounted for below activities:

- a) CO₂ emissions from on-site consumption of fossil fuels due to the project activity
- b) CO₂ emissions from electricity consumption by the project activity
- c) Methane emission from solid waste disposal or waste water
- d) Project emissions related to cultivation of feedstock
- e) Project emissions from transportation

The project activity does not involve any of the above activity and hence, project emissions for the project activity is not applicable.

Leakage

As per AMS-I.E, version 08, "Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on ex-post surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples). The following potential source of leakage shall be considered:

- a) The use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of nonrenewable woody biomass used by the non-project households/users, that is attributable to the project activity, then B_y is adjusted to account for the quantified leakage. Alternatively, B_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

The gross NRB has been multiplied by 0.95 and the resulted value has been taken as net value to calculate the emission reductions. Hence no yearly monitoring surveys are required and the saved time of the project personnel can be used in other aspects related to the project.

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

There is no equipment transferred from outside the boundary to the project boundary. All project equipment are new equipment. Hence, leakage is not considered.

B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

(Include a compilation of information on the data and parameters that are not monitored during the crediting period but are determined before the design certification and remain fixed throughout the crediting period like IPCC defaults and other methodology defaults. Copy this table for each piece of data and parameter.)

Relevant Indicator	SDG	13 (Climate Action)
Data/parameter		$f_{NRB,y}$
Unit		%

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 following requirements of Methodological tool: Calculation of the fraction of non-renewable biomass, version 01						
Value(s) applied	<table border="1"> <tr> <th>(j) State</th><th>fNRB</th></tr> <tr> <td>(k) Uttar Pradesh</td><td>(l) 100%</td></tr> <tr> <td>(m) Maharashtra</td><td>(n) 98%</td></tr> </table>	(j) State	fNRB	(k) Uttar Pradesh	(l) 100%	(m) Maharashtra	(n) 98%
(j) State	fNRB						
(k) Uttar Pradesh	(l) 100%						
(m) Maharashtra	(n) 98%						
Choice of data or Measurement methods and procedures	(o) Methodological tool: Calculation of the fraction of non-renewable biomass, version 01						
Purpose of data	Baseline emissions						
Additional comment							

Relevant SDG Indicator	13 (Climate Action)		
Data/parameter	$N_{H,H}$		
Unit	Number		
Description	Number of households in the project activity in year y		
Source of data	As per PP’s project database		
Value(s) applied			
		Uttar Pradesh	Maharashtra
	2m ³	361	2212
	3m ³	350	11763
	4m ³	1011	5
Choice of data or Measurement methods and procedures	Project database as per the commissioning reports and end user agreements		
Purpose of data	Baseline emissions estimation		

Additional comment	
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Relevant SDG Indicator	13 (Climate Action)		
Data/parameter	BC _{BL,HH,y}		
Unit	Tonnes/household/year		
Description	Average annual consumption of woody biomass per household before the start of the project activity		
Source of data	Baseline survey		
Value(s) applied		Uttar Pradesh	Maharashtra
	2m ³	223	230
	3m ³	325	334
	4m ³	420	434
Choice of data or Measurement methods and procedures	Third party survey was conducted to know the firewood consumption pattern in line with the methodology. Survey was conducted following UNFCCC sampling standard ‘Sampling and surveys for CDM project activities and programmes of activities’ version 07 and guideline ‘Sampling and surveys for CDM project activities and programmes of activities’ version 04. A 90% confidence interval and 10% error margin applied.		
Purpose of data	Baseline emissions estimation		
Additional comment	Not Applicable		

Relevant SDG Indicator	13 (Climate Action)
Data/parameter	EF _{projected_fossilfuel}
Unit	tCO ₂ /TJ
Description	Emission factor for the substitution of non-renewable woody biomass
Source of data	Default value as per AMS-I.E, version 08
Value(s) applied	63.7 tCO ₂ /TJ
Choice of data or Measurement methods and procedures	Default Value obtained from methodology "AMS-IE, Switch from non-renewable biomass for thermal applications by the user", Ver-08
Purpose of data	Baseline emissions estimation

Additional comment	Not Applicable
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Relevant Indicator	SDG 13 (Climate Action)
Data/parameter	NCV _{biomass}
Unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	Default value as per AMS-I.E, version 08
Value(s) applied	0.0156 TJ/tonne
Choice of data or Measurement methods and procedures	IPCC default for wood fuel
Purpose of data	Baseline emissions estimation
Additional comment	Not Applicable

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

>> (Provide a transparent ex ante calculation of baseline and project outcomes (or, where applicable, direct calculation of net benefit) during the crediting period, applying all relevant equations provided in the selected methodology(ies) or as per proposed approach. For data or parameters available before design certification, use values contained in the table in section B.6.3 above. For data/parameters not available before design certification and monitored during the crediting period, use estimates contained in the table in section B.7.1 below)

The amount of firewood saved due to the project activity will be the baseline for calculating the emission reductions. The annual baseline emissions (ER_y) in tCO₂, during each year of the crediting period are expressed as follows:

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil_fuel} \quad \text{Equation (3)}$$

Estimation of B_y (Quantity of woody biomass that is substituted or displaced in tonnes):

Uttar Pradesh

Capacity (m ³)	Firewood consumption (kg/month/plant)	No. of Plants	Total firewood consumption (kg/year)
2	223	361	966036

3	325	350	1365000
4	420	1011	5095440
	Total	1722	7426476

Maharashtra

Capacity(m ³)	Firewood consumption (kg/month/plant)	No. of Plants	Total firewood consumption (kg/year)
2	230	2212	6105120
3	334	11763	47146104
4	434	5	26040
	Total	13980	53277264

Hence, $B_y = 7426.476$ ton/year (Uttar Pradesh) and 53277.264 ton/year (Maharashtra)

Leakage:

In line with the methodology (AMS-I.E, version 08):

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

Accordingly ER_y is estimated as below:

	Maharashtra	Uttar Pradesh
$B_y * 0.95$	(p) 50,613	(q) 7,055
$f_{NRB,y}$	(r) 98%	(s) 100%
NCVbiomass(TJ/tonnes)	0.0156	(t) 0.0156
EFCO _{2i} (tCO ₂ /TJ)	(u) 63.7	(v) 63.7
ER_y (tCO_{2e}/year)	(w) 49,532	(x) 6,976

Total baseline emissions = $(49,532+6,976)$ tCO_{2e} = **56,508** tCO₂

B.6.5. Summary of ex ante estimates of each SDG outcome

Year	Baseline estimate	Project estimate	Net benefit
Year 1	56,508	0	56,508

Year 2	56,508	0	56,508
Year 3	56,508	0	56,508
Year 4	56,508	0	56,508
Year 5	56,508	0	56,508
Total	282,540	0	282,540
Total number of crediting years	5		
Annual average over the crediting period	56,508	0	56,508

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Include specific information on how the data and parameters that need to be monitored in the selected methodology(ies) or proposed approaches or as per mitigation measures from safeguarding principles assessment or as per feedback from stakeholder consultations would actually be collected during monitoring. Copy this table for each piece of data and parameter.)

Relevant Indicator	SDG	13 (Climate Action)
Data / Parameter		$BC_{PJ,HH,y}$
Unit		(y) Tonnes/household/year
Description		Average annual consumption of woody biomass per household in the pre- project devices during the project activity, if it is found that preproject devices were not completely displaced but continue to be used to some extent.
Source of data		Survey
Value(s) applied		(z) To be monitored
Measurement methods and procedures		Monitoring shall consist of estimation of all project devices or a representative sample thereof, at least once every two years (biennial)
Monitoring frequency		(aa) At least once every two years (biennial)
QA/QC procedures		Third party survey to be conducted following standard sampling approach.
Purpose of data		(bb) Baseline Emissions estimations
Additional comment		

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Relevant Indicator	SDG	13 (Climate Action)
Data / Parameter		N _{HH,y}
Unit		Number
Description		Number of households (biogas system) in the project activity in operational per year.
Source of data		Survey
Value(s) applied		To be monitored
Measurement methods and procedures		Monitoring consist of checking of representative sample, to ensure that biodigesters operating
Monitoring frequency		At least once every two years (biennial)
QA/QC procedures		Third party survey to be conducted following standard sampling approach.
Purpose of data		Baseline Emissions estimations
Additional comment		

Relevant Indicator	SDG	1- Good health and well being (SDG 3)
Data / Parameter		(cc) Improvement in health and decrease in illness
Unit		Qualitative
Description		Improvement in health and decrease in illness
Source of data		Sampling survey/annual usage survey/monitoring survey
Value(s) applied		To be monitored
Measurement methods and procedures		Improvement in health and decrease in illness will be assessed through interview with end users due to project implementation. Publicly available results may be referred. In addition, training to the operationa and maintenance technicians and field supervisors to be provided to increase awareness in safe operation and handling emergency situations.
Monitoring frequency		Annual
QA/QC procedures		Sample number shall be determined using UNFCCC sample standard. Publicly available data may referred.
Purpose of data		Sustaiaable development assessment
Additional comment		

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Relevant Indicator	SDG	2- Good health and well being (SDG 3)
Data / Parameter		Quantitative employment and income generation
Unit		Numbers
Description		Number of employment generation and income from the project activity
Source of data		Project Participant/Project proponent
Value(s) applied		To be monitored
Measurement methods and procedures		Monitoring shall provide exact number of employment generated due to the project activity beyond the project and other employment/jobs created due to the project activity (as an effect generated in design, construction, distribution or start-up or decommissioning of the project).
Monitoring frequency		Annual
QA/QC procedures		Job records, payment records etc. shall be used to ensure QC.
Purpose of data		Sustainable development assessment
Additional comment		

Relevant Indicator	SDG	3- Affordable and clean energy (SDG 7)
Data / Parameter		Access to affordable and clean energy services
Unit		Numbers
Description		Number of biogas system operational under the project activity
Source of data		Project Participant/Project proponent
Value(s) applied		To be monitored
Measurement methods and procedures		Sample survey to confirm if project biogas systems are operational. Operational status will confirm that the users are accessed to affordable and clean energy.
Monitoring frequency		Annual
QA/QC procedures		Required sample size shall be determined following UNFCCC sampling standard
Purpose of data		Sustainable development assessment
Additional comment		

B.7.2. Sampling plan

>> (If data and parameters monitored in section B.7.1 above are to be determined by a sampling approach, provide a description of the sampling plan.)

a) Sampling Approach:

- i. **Objectives and reliability requirements:** The objective of the sampling plan is to achieve unbiased and reliable estimates of the proportion or the mean value of the key variables over the crediting period. The methodology applied for the project (AMS.I.E version 08) requires the project proponent achieving 95 percent confidence interval and a 10 percent margin of error when biennial inspection is chosen and when annual inspection is chosen 90 per cent. The table below provides the monitoring parameters that will be monitored annually:

(dd) Parameter	(ee) Type	(ff) Description
(gg) N_{HH}	(hh) Proportional parameter	(ii) Number of households (biogas system) in the project activity in operational per year
(jj) $BC_{PJ,HH,y}$	(kk) Mean value parameter	(ll) Average annual consumption of woody biomass per household in the pre-project devices during the project activity, if it is found that preproject devices were not completely displaced but continue to be used to some extent.

- ii. **Target Population:** The target population for different parameters discussed in the table above are given below:
 - For the proportional parameter; the target population is the bio-digester users listed in the project database.
 - For the mean value parameter; the target population is the total number of operational biogas digester for which the emission reductions will be accounted for the monitoring period in question.
- iii. **Sampling frame:** All the households with biogas digester within the project will be the sampling frame.
- iv. **Sampling Method:** A simple random sampling will be adopted for estimating the sample size for the monitoring surveys. Simple random sampling is suited to populations that are homogenous (EB 75 annex 08).
- v. **Sample Size:** The calculation of the required sample size for each parameter will be calculated at 90/10 confidence/precision as required for the annual monitoring. The sample size is determined using the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. V4.0 (EB86, Annex 4).

The minimum sample size to determine number of biogas system in operation using the procedure outlined in para 12 of appendix 1, EB 86 Annex 4, Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0.

$$n \geq \frac{1.645^2 N \times p(1 - p)}{(N - 1) \times 0.1^2 \times p^2 + 1.645^2 p(1 - p)}$$

Where:

N = Sample size

N = Total number of biogas system of type i installed under the project

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p = expected proportion (0.8). Based on experience from project developer and age of biogas plants, it is expected that 80% plants will be in operation upto the monitoring period.

1.645 = represents the 90% confidence required

0.1 = represents the 10% relative precision ($0.1 \times 0.8 = 0.08 = 8\%$ points either side of p)

b) Data:

i. Field Measurements:

1. Checking of a representative sample of biogas system within the project to ensure that they are still operating (N_{HH}). Samples are first allocated based on share of total population in each state as given in below:

(mm) State	(nn) m^3	(oo) m^3	(pp) m^3	(qq) total	(rr) Share of total	(ss) Sample size
(tt) Uttar Pradesh	(uu) 361	(vv) 350	(ww) 011	(xx) 1722	11%	(yy) 8
(zz) Maharashtra	(aaa) 212	(bbb) 1763	(ccc)	(ddd) 3980	(eee) 9%	(fff) 60
				(ggg) 5,702	(hhh) 00%	(iii) 68

The selection of households are done using online tool 'Statrek random number' (<http://stattrek.com/statistics/random-number-generator.aspx>).

- Determine average annual consumption of woody biomass per household in the pre-project devices during the project activity, if it is found that pre-project devices were not completely displaced but continue to be used to some extent.
- The survey will be conducted annually with the objective to target 10 percent precision and to achieve 90 percent confidence.

ii. Quality Assurance/Quality Control:

A survey questionnaire will be prepared to seek responses of operating status (yes or no) of biogas digesters within the project activity. The survey will be performed by the project developer appointing a third party. During the survey, in order to anticipate any low response rate and answers bias, 10% oversampling will be applied.

iii. Analysis:

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The project developer will collect, compile and analyze the data to derive the number of biogas digesters within the project still operational and average firewood consumption at each biogas digester user (if any). The developer will prepare "monitoring report" based on the survey report.

c) Implementation:

The survey questionnaire will be prepared, pre-tested and field personnel will be trained in conducting the survey to ensure the quality of data collected and the survey will be carried out as per defined frequency covering required data information. The schedule for implementing the sampling effort shall be defined prior to the field activity.

B.7.3. Other elements of monitoring plan

>>

Third party survey will be conducted to monitor all the monitoring parameters required as per the methodology and will also include monitoring of all non neutral sustainable parameters.

AKKPS will provide regular service to the plant owners. In case of malfunctioning of the biogas digester, plant owner will inform AKKPS or any of its representatives. AKKPS will inspect the plant and resolve the problem at earliest.

All the data required for verification and issuance will be kept for two years after the end of the crediting period.

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

>> 06/02/2017 is considered as start date of the project. The date represents first batch of biogas digesters installed within the project activity. PP has submitted initial documents for preliminary review with realization of review fees on 06/02/2018. Therefore, as per clause 3.4.7 under principle and requirement one year prior to first submission date is taken as start date of the project activity. Conservatively, biogas plants commissioned from 06/02/2017 is taken considering 06/02/2017 to be the start date of the project activity.

C.1.2. Expected operational lifetime of project

>>

15 years⁵

C.2. Crediting period of project

⁵ https://www.researchgate.net/publication/282284360_BIOGAS_DIGESTERS_IN_INDIA_A_REVIEW

C.2.1. Start date of crediting period

>> 06/02/2017 first biogas plant commissioning date.

C.2.2. Total length of crediting period

>>

5 years renewable

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

>> (Refer the GS4GG Safeguarding Principles and Requirements document for detailed guidance on carrying out this assessment.)

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
(jjj) SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES			
(kkk) Principle 1 - Human Rights			
a) Recognises the centrality of human rights to sustainable development, poverty alleviation and ensuring fair distribution of development opportunities and benefits; and supports "universal respect for, and observance of, human rights and fundamental freedoms for all".	The project replaces conventional firewood usage with biogas for domestic cooking and heating purpose. Therefore, it provides development opportunity to all section of people proving cleaner fuel, better livelihood and empowering specially rural women. Hence, the project positively recognizes human rights to sustainable development.	No	Not Applicable
(b) Does not recognise or support Projects that contribute to violations of a state's human rights obligations and the core international human rights treaties, and seeks to support the protection and fulfilment of human rights.	India adopted 'The protection of human rights Act' 1993 and the project is bound to follow the rules and regulation of host country. Hence, the project does violate human rights obligations adopted by the host country.	No	Not Applicable

<p>(c) Upholds the principles of accountability and the rule of law, participation and inclusion, and equality and non-discrimination, noting that prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority.</p>	<p>The constitution of India Article 14 states 'the government shall not deny to any person equality before law or the equal protection of the laws'; Article 15 declares that government shall not discriminate against any citizen on the ground of sex; Article 16 guarantees that no citizen shall be discriminated against in matters of public employment on the grounds of sex religion, caste, creed, sex, descent, place of birth, residence. Therefore, the project being in India upholds the principles of accountability and the rule of law, participation and inclusion, and equality and non-discrimination.</p>	<p>No</p>	<p>Not Applicable</p>
<p>The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights</p>	<p>India adopted 'The protection of human rights Act' 1993 and the project is bound to follow the rules and regulation of host country. In addition, India has ratified 'International Convention on the Elimination of All Forms of Racial Discrimination :1969' 'International Covenant on Civil and Political Rights :1976', 'International Covenant on Economic, Social and Cultural Rights :1976' 'Convention on the Elimination of All Forms of Discrimination against Women :1981'. Therefore, the project developer and the project do respect nationally and internationally proclaimed human rights</p>	<p>No</p>	<p>Not Applicable</p>

	and shall not be complicit in violence or human rights abuses of any kind.		
The Project shall not discriminate with regards to participation and inclusion.	India has ratified 'International Convention on the Elimination of All Forms of Racial Discrimination :1969', 'Convention on the Elimination of All Forms of Discrimination against Women :1981' in addition to its national human rights Act' 1993. Therefore, the project will not discriminate with regards to participation and inclusion.	No	Not Applicable
(III) Principle 2 - Gender Equality and Women's Rights			
(i) Promotes gender equality and the empowerment of women.	Ministry of women & child development, govt. of India has taken various measures for gender equality/socio-economic development/empowerment of women ⁶ . Out of these, the project positively contributes towards the national mission for empowerment of women through improvement of health and attaining vision for empowerment of women under national policy for women 2016 (Women participation will be ensured in the efficient use and spreading the use of solar	No	Not Applicable

⁶ <http://pib.nic.in/newsite/PrintRelease.aspx?relid=132945>

	energy, biogas, smokeless chulas and other technological applications to have positive influence on their life styles and a long term impact on meeting sustainable development goals) ⁷ .		
(ii) Does not recognise Projects that contribute to discrimination against women or reinforce gender-based discrimination and/or inequalities.	As explained above the project does not contribute to discrimination against women or reinforce gender-based discrimination and/or inequalities.	No	Not Applicable
(iii) Recognises and seeks to contribute to SDG 5, (Achieve gender equality and empower all women and girls).	Project compliance to SDG 5 is explained in section A.8 above.	No	Not Applicable
(mmm) Mandatory requirements:			
(nnn) 1. The Project shall complete the following gender assessment questions			
Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?	No. The project uses cattle dung as resource to generate biogas. Therefore, it does not put any risk to women's access or control of resources, entitlements and benefits.	No	Not Applicable
Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on	No. The project happens in households where users were using firewood and conventional cooking stoves. The project replaces the conventional cooking practice with clean biogas based system. Hence, the	No	Not Applicable

⁷http://wcd.nic.in/sites/default/files/women%20empowerment%20poliy_Final_17May.pdf

women or social isolation of men)?	project does not affect any marginalized or vulnerable communities.		
Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?	No. The project actually takes care the upliftment of women and men who otherwise spent more time in sourcing firewood which in the project case not needed, This provides more time to the users. Also biogas being clean fuel, leads to low smoke generation resulting health benefits to end users.	No	Not Applicable
Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?	Yes. The project takes care the role of women in cooking. Due to the project women (generally the caretaker of cooking) spend less time in sourcing firewood and can utilize the saved time in other productive works. Also due to clean nature of the fuel, smoke related health issues are reduced due to the project activity.	No	Not Applicable
Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?	No. The project takes care the role of women in cooking. Due to the project women (generally the caretaker of cooking) spend less time in sourcing firewood and can utilize the saved time in other productive works. Also due to clean nature of the fuel, smoke related health issues are reduced due to the project activity.	No	Not Applicable
Would the Project potentially reproduce or further deepen	No. The project does not have any scope which may result to discrimination	No	Not Applicable

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discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?	against women. The project contributes positively to uplift women in its work culture.		
Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?	No. The project helps in protecting NRB. The project does not limit women's ability to use or protecting natural resources.	No	Not Applicable
Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?	No. The project replaces conventional cooking system with clean biogas. Biogas is safe to use and handle. Compared to firewood based cooking system the likelihood of fire hazard is negligible in the project scenario. It also provide someless cooking system. Hence, project does not lead to more hazardous conditions.	No	Not Applicable
(ooo) 2. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women. Specifically, this shall include (not exhaustive):			
Sexual harassment and/or any forms of violence against women - address the multiple risks of gender-based violence, including sexual exploitation or human trafficking	The project happens in individual households. It does not involve any women workforce which may lead to sexual harassment.		Not Applicable

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Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.	No. The project happens in individual households. It does not involve any women workforce which may lead to sexual harassment.	No	Not Applicable
Restriction of women's rights or access to resources (natural or economic).	No. The project actually takes care the upliftment of women and men who otherwise spent more time in sourcing firewood which in the project case not needed, This provides more time to the users. Also biogas being clean fuel, leads to low smoke generation resulting health benefits to end users.	No	Not Applicable
Recognise women's ownership rights regardless of marital status - adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources	Yes. The project does not has any scope which needs to recognise the women's ownership rights. The project replaces conventional firewood based cooking system with clean biogas. This helps women to have access to cleaner cooking technologies.	No	Not Applicable
(ppp) 3. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work, specifically			
Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities	Yes. The project involves construction of biogas digesters at households. Trained labours are used for the same. Local people are engaged for the same. No discrimination either in gender or any other form is followed to engage local people.	No	Not Applicable
Introduce conditions that ensure the participation of women or men in Project	This is not applicable. The project does not have any scope of men and women participation where project	No	Not Applicable

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activities and benefits based on pregnancy, maternity/paternity leave, or marital status	developer has to ensure condition of benefits related to pregnancy, maternity/paternity leave, or marital status .		
Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits	Not applicable. Project happens at individual households where household people operate the biogas system as per their requirements.	No	Not Applicable
4. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks	The project does not has any scope to apply gender strategy as such. Although the project positively contributes towards the national mission for empowerment of women through improvement of health and attaining vision for empowerment of wowed under national policy for women 2016.	No	Not Applicable
(qqq) Principle 3 - Community Health, Safety and Working Conditions			
(a) Requires Projects to anticipate and avoid adverse impacts on the health and safety of affected communities during the Project's life cycle from both routine and non-routine circumstances	The project leads to safe working condition and improvement in health as it will replace firwood as fuel with biogas which is clean and safe.	No	Not Applicable
b) Requires Projects to provide workers with safe and healthy working conditions and to prevent accidents, injuries, and disease.	The project leads to safe working condition and improvement in health as it will replace firwood as fuel with biogas which is clean and safe. Further, periodic maintenance by implementing agency ensure prevention of any unsafe working condition.	No	Not Applicable

(rrr) Principle 4 - Cultural Heritage, Indigenous Peoples, Displacement and Resettlement			
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, or practices)?	The project area covers households which does not have any structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture. Hence, not applicable.	No	Not Applicable
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	The project area covers households which does not require relocation of peoples; hence not applicable.	No	Not Applicable
Does the Project require any change to land tenure arrangements and/or other rights?	No. The project does not require any change to land tenure arrangements and/or other rights?	No	Not Applicable
For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	No. The project does not involve any land use which will have issues related to land tenure or access right.	No	Not Applicable
Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No. The project involves household biogas digesters. Therefore, it does not involve any influence towards indigenous people.	No	Not Applicable
(sss) Principle 5 – Corruption			
<i>The Project shall not involve, be complicit in or inadvertently contribute to or</i>	<i>The project benefits households with clean fuel (biogas). There is no corruption provision in the</i>	No	(ttt) Not Applicable

reinforce corruption or corrupt Projects	project activity.		
(uuu) Principle 6 - Economic Impacts			
Labour Rights: The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions. Where these are contradictory and a breach of one or other cannot be avoided, then guidance shall be sought from Gold Standard	The project does not require labour force for implementation of the project. Trained technicians ⁶ are involved in construction and operation and maintenance of plants. Therefore, no forced labour is involved in the project. No child labour is involved.	No	Not Applicable
(vvv) ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES			
(www) Principle 1 - Climate and Energy			
Emissions: Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No. The project will replace firewood use with biogas. Hence, it will reduce greenhouse gas emissions over the Baseline Scenario.	No	Not Applicable
Energy Supply: Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No. The project uses inhouse cattle dung only.	No	Not Applicable

(xxx) Principle 2 – Water			
Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No. Water in huge quantity is not required for the project which can impact the ground water level or any seasonal flow.	No	Not Applicable
Erosion and/or Water Body Instability: Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2.	No. Water in huge quantity is not required for the project which can impact the ground water level or any seasonal flow.	No	Not Applicable
(yyy) Principle 3 – Environment, ecology and land use			
(zzz) Landscape Modification and Soil			
<i>Does the Project involve the use of land and soil for production of crops or other products?</i>	<i>No. The project does not involve any crop production.</i>	No	Not Applicable
(aaaa) Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No. The project happens at individual households. There is no activity which can affect adversely the natural system to cause earthquake, landslides, erosion, flooding, draught or other extreme climatic conditions.	No	Not Applicable

(bbbb) Genetic Resources			
Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	Not applicable. The project does not involve any crop production or cultivation.	No	Not Applicable
(cccc) Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment?	No. The project does not release any pollutants to the environment.	No	Not Applicable
(dddd) Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	Not applicable. The project does not involve any production process.	No	Not Applicable
(eeee) Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers?	Not applicable. The project does not involve any crop production or cultivation.	No	Not Applicable
(ffff) Harvesting of Forests			
Will the Project involve the harvesting of forests?	Not applicable. The project happens at individual households.	No	Not Applicable
Food: Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	Not applicable	No	Not Applicable
Animal husbandry: Will the Project involve animal husbandry?	No	No	Not Applicable

(gggg) High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	Not Applicable	No	Not Applicable
Endangered Species: Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?	Not Applicable	No	Not Applicable

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

>> *(Describe how stakeholder consultation was conducted in accordance with GS4GG Stakeholder Procedure Requirements and Guidelines.)*

Attached stakeholder consultation report.

E.2. Summary of comments received

>> *(Provide a summary of key comments received during the consultation process.)*

No negative comment received.

E.3. Report on consideration of comments received

>> *(Describe how the comments have been addressed by providing a clarification to the stakeholder or by altering the design of the project or by proposing to monitor any anticipated negative impacts etc.)*

No negative comment received.

Appendix 1. Contact information of project participants

Organization name	Aadivasi Khadi Avom Krishi Parishchan Sansthan (AKKPS)
Registration number with relevant authority	
Street/P.O. Box	Village Bhamodi, Barghat Road
Building	Reyyan Towers
City	Seoni
State/Region	Madhya Pradesh
Postcode	480661
Country	India
Telephone	+91 9424966002
Fax	07692-224998
E-mail	akakps@yahoo.com
Website	
Contact person	Rameshwar Pardhi
Title	Secretary
Salutation	Mr.
Last name	Pardhi
Middle name	
First name	Rameshwar
Department	
Mobile	+91 9424966002
Direct fax	07692-224998
Direct tel.	
Personal e-mail	akakps@yahoo.com

Organization name	Swiss Carbon Value Ltd.
Registration number with relevant authority	
Street/P.O. Box	Technoparkstrasse 1
Building	
City	Zurich
State/Region	Switzerland
Postcode	
Country	Switzerland
Telephone	
Fax	
E-mail	t.bagh@southpole.com

Website	www.southpole.com
Contact person	Tanushree Bagh
Title	Chief Financial Officer
Salutation	Mr.
Last name	Grobbel
Middle name	
First name	Christoph
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	t.bagh@southpole.com

Appendix 2. Summary of post registration design changes

Not Applicable

Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption