



Validation report form for renewal of crediting period of component project activities

(Version 03.0)

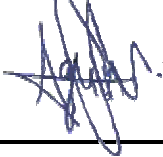
Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	Installation of Solar Home Systems in Bangladesh (UNFCCC Reference Number: PoA 2765) ¹	
Version number of the validation report	01	
Completion date of the validation report	18/08/2021	
Version numbers of PoA-DD to which this report applies	11	
Title and UNFCCC reference number of each CPA for renewal	CPA Ref. no.	Title
	CPA 2765-P2-0009-CP2	Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti
	CPA 2765-P2-0010-CP2	Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti
	CPA 2765-P2-0011-CP2	Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti
	CPA 2765-P2-0012-CP2	Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL
	CPA 2765-P2-0013-CP2	Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL
Sectoral scopes for each CPA	CPA Ref. no.	Sectoral scopes (indicate mandatory and conditional sectoral scopes)
	CPA 2765-P2-0009-CP2	01
	CPA 2765-P2-0010-CP2	
	CPA 2765-P2-0011-CP2	
	CPA 2765-P2-0012-CP2	
	CPA 2765-P2-0013-CP2	

¹ https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/ZSI6WP0ODGRQ8UYKXB3MHTL957JVAE/view

Applied methodologies and standardized baselines for each CPA	CPA Ref. no.	Applied methodologies and standardized baselines	
	CPA 2765-P2-0009-CP2	AMS-I.A. ver. 17- Electricity generation by the user Standardized Baseline: Not Applicable	
	CPA 2765-P2-0010-CP2		
	CPA 2765-P2-0011-CP2		
	CPA 2765-P2-0012-CP2		
	CPA 2765-P2-0013-CP2		
Number and duration of the next crediting period (CP)	CPA Ref. no.	No. of CP	Duration of the CP
	CPA 2765-P2-0009-CP2	2 nd	01/09/2020 to 31/08/2027
	CPA 2765-P2-0010-CP2	2 nd	01/05/2021 to 30/04/2028
	CPA 2765-P2-0011-CP2	2 nd	01/01/2022 to 31/12/2029
	CPA 2765-P2-0012-CP2	2 nd	01/09/2020 to 31/08/2027
	CPA 2765-P2-0013-CP2	2 nd	01/05/2021 to 30/04/2028
Coordinating/managing entity (CME)	Infrastructure Development Company Limited		
Host Parties	Bangladesh		
Estimated amount of annual average greenhouse gas (GHG) emission reductions or GHG removals by sinks in the next crediting period (tCO₂e), per CPA	CPA Ref. no.	Annual emission reductions or removals (tCO₂e)	
	CPA 2765-P2-0009-CP2	41,475 tCO ₂ e	
	CPA 2765-P2-0010-CP2	44,067 tCO ₂ e	
	CPA 2765-P2-0011-CP2	46,659 tCO ₂ e	
	CPA 2765-P2-0012-CP2	51,216 tCO ₂ e	

	CPA 2765-P2-0013-CP2	52,496 tCO ₂ e
Name and UNFCCC reference number of the DOE	LGAJ Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No.: E-0032	
Name, position and signature of the approver of the validation report	Mr. Agustín Calle de Miguel <i>Applus+ Certification CDM Technical Manager</i> Signature: 	

SECTION A. Executive summary

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CPA 09 : Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti

The CPA involves commercial dissemination of about 213,333 units of Solar Home Systems (SHS) with various capacities ranging from 20 Wp to 130 Wp installed in rural areas of Bangladesh which are not connected to grid. The CPA intends to replace use of kerosene lamps for lighting and batteries to run television and other home appliances by generation of electricity by the SHS on site by the end user for their own use. IDCOL as the coordinating and managing entity (CME) for the PoA will work with Partner Organisations (POs), who are mostly Non-Government Organizations and some private sector companies. It will lead to reduction in fuel consumption, improvement in health through smoke reduction and significantly reduce indoor pollution in rural areas of Bangladesh. Thus the CPA will reduce a significant amount of emissions that would have been generated in the baseline scenario.

CPA 10. Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti

The CPA involves commercial dissemination of about 226,667 units of Solar Home Systems (SHS) with various capacities ranging from 20 Wp to 130 Wp installed in rural areas of Bangladesh which are not connected to grid. The CPA intends to replace use of kerosene lamps for lighting and batteries to run television and other home appliances by generation of electricity by the SHS on site by the end user for their own use. IDCOL as the coordinating and managing entity (CME) for the PoA will work with Partner Organisations (POs), who are mostly Non-Government Organizations and some private sector companies. It will lead to reduction in fuel consumption, improvement in health through smoke reduction and significantly reduce indoor pollution in rural areas of Bangladesh. Thus the CPA will reduce a significant amount of emissions that would have been generated in the baseline scenario.

CPA 11. Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti

The CPA involves commercial dissemination of about 240,000 units of Solar Home Systems (SHS) with various capacities ranging from 20 Wp to 130 Wp installed in rural areas of Bangladesh which are not connected to grid. The CPA intends to replace use of kerosene lamps for lighting and batteries to run television and other home appliances by generation of electricity by the SHS on site by the end user for their own use. IDCOL as the coordinating and managing entity (CME) for the PoA will work with Partner Organisations (POs), who are mostly Non-Government Organizations and some private sector companies. It will lead to reduction in fuel consumption, improvement in health through smoke reduction and significantly reduce indoor pollution in rural areas of Bangladesh. Thus the CPA will reduce a significant amount of emissions that would have been generated in the baseline scenario.

CPA 12. Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL

The CPA involves commercial dissemination of about 266,667 units of Solar Home Systems (SHS) with various capacities ranging from 20 Wp to 130 Wp installed in rural areas of Bangladesh which are not connected to grid. The CPA intends to replace use of kerosene lamps for lighting and batteries to run television and other home appliances by generation of electricity by the SHS on site by the end user for their own use. IDCOL as the coordinating and managing entity (CME) for the PoA will work with Partner Organisations (POs), who are mostly Non-Government Organizations and some private sector companies. It will lead to reduction in fuel consumption, improvement in health through smoke reduction and significantly reduce indoor pollution in rural areas of Bangladesh. Thus the CPA will reduce a significant amount of emissions that would have been generated in the baseline scenario.

CPA 13. Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL

The CPA involves commercial dissemination of about 273,333 units of Solar Home Systems (SHS) with various capacities ranging from 20 Wp to 130 Wp installed in rural areas of Bangladesh which are not connected to grid. The CPA intends to replace use of kerosene lamps for lighting and batteries to run television and other home appliances by generation of electricity by the SHS on site by the end user for their own use. IDCOL as the coordinating and managing entity (CME) for the PoA will work with Partner Organisations (POs), who are mostly Non-Government Organizations and some private sector companies. It will lead to reduction in fuel consumption, improvement in health through smoke reduction and significantly reduce indoor pollution in rural areas of Bangladesh. Thus the CPA will reduce a significant amount of emissions that would have been generated in the baseline scenario.

The CME of the PoA is IDCOL (Infrastructure Development Company Limited).

Scope of Validation

The scope of services provided by LGAI Technological Center, S.A. accredited DOE E-0032 (hereinafter referred to as Applus+ Certification or just the DOE) is to perform validation of renewal of crediting period of 5 CPAs in the PoA - Installation of Solar Home Systems in Bangladesh, UNFCCC Reference Number: PoA 2765. The scope of validation is to assess the claims and assumptions made in the CPA DDs against the UNFCCC criteria, including but not limited to , CDM PS for PoA^{/05/}, Version 2.0, CDM VVS for PoA, version 2.0^{/06/}, applied methodology AMS-I.A, version 17^{/12/}, PoA DD and other relevant rules and requirements established for CDM project activities.

Validation process

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM requirements as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol, the CDM rules and modalities as agreed in the Bonn Agreement, the Marrakech Accords and the CDM Executive Board's decisions.

The review of the CPA-DDs and the subsequent follow-up interviews have provided Applus with sufficient evidence to determine the project's fulfillment of all the stated criteria. In our opinion, the project meets all applicable UNFCCC requirements for the CDM.

The validation team has, based on the recommendations in the CDM Validation and Verification Standard version 2.0^{/6/} and employed a risk based approach in the verification, focusing on the identification of significant risks and reliability of project, monitoring plan and generations of CERs. The validation is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

Conclusion

The review of the CPA-DD, supporting documentation and subsequent follow up actions (on site visit and interviews) has provided Applus with sufficient evidence to determine the fulfilment of stated criteria. Applus is of the opinion that the following 5 CPAs in Bangladesh as described in the final CPA-DDs, version 05.0, dated 16/08/2021 meet all relevant requirements of CDM, meet host country criteria and has correctly applied the methodology AMS-I A - Small scale methodology: Electricity generation by the user, version 17.0^{/12/}.

1. CPA 09 – Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti
2. CPA 10 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti

3. CPA 11 - Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti
4. CPA 12 - Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL
5. CPA 13 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL

Therefore, the CPAs are recommended to CDM EB for their CP renewal.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Lead Auditor / Technical Expert	OR	Kumar	Pankaj	True Quality Certifications Private Limited- Outsourced entity	YES	NO	YES	YES

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustín	Applus+ Certification

SECTION C. Means of validation

C.1. Desk/document review

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As a first step, the validation team reviewed the initial CPA-DDs and additional background documents submitted by PP. As a result of these findings, PP has submitted the final CPA-DDs^{1/} addressing the issues.

C.2. On-site inspection

As per the requirement of sec. 8 and para 183 of CDM validation and verification standard for programmes of activities, version 02, assessment team didn't conduct site visit for 2nd renewal of crediting period for the following 5 CPAs,

1. CPA 09 – Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti
2. CPA 10 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti

3. CPA 11 - Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti
4. CPA 12 - Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL
5. CPA 13 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL

To validate the CPA design, eligibility criteria of CPA to be renewed, monitoring & management practices as mentioned in the PoA-DD; assessment team has conducted telephonic interviews with CME/ PO. After telephonic interviews with concerned CME/ PO person; assessment team concluded that the design of CPA is same as envisaged in 1st CPA crediting period. There is no change in the eligibility of CPA design or operation and monitoring practices as mentioned in the registered CPA of 1st crediting period which can alter the applicability or additionality of the project activity/methodology applied i.e. AMS.I.A version 17. Assessment team therefore of the opinion that CPAs are implemented as described in the registered CPA- DD for 1st crediting period and no change is envisaged for the proposed 2nd CPA crediting period.

Duration of on-site inspection: NA				
No.	Activity performed on-site	Site location	Date	Team member
NA	NA	NA	NA	NA

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Tazdik	Mr. Junaed	Manager (RE), IDCOL	12/08/2021	On the Project Implementation, Monitoring team, QA/QC procedure, etc.,	Mr. Pankaj Kumar
2.	Baki	Mr. Abdullah	Manager (ICS), IDCOL			
3.	Rahman	Mashiur	Field Inspector IDCOL			
4.	Kanda	Sandeep	Consultant-WB			
5.	Dutta	Supratik	Consultant			
6.	Rajpoot	Pankaj	Consultant			
7.	Molla	Md. Aminur	SHS User	12/08/2021	Product operation, Installation date,	Mr. Pankaj Kumar
8.	Master	Md. Samsul	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
9.	Hossain	Md. Belal	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
10	Begum	Mos. Zannatul	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
11	Rahman	Md. Muskur	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
12	Islam	Md. Tohidul	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
13	Rani	Ms. Shikha	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
14	Zehan	Mos. Salam	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
15	Khan	Md. Shamim	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
16	Khan	Md. Hanif	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
17	Sikdar	Md. Yusub	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
18	Dhali	Mr. Sudoy	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
19	Khatun	Ms. Shamila	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
20	Hawaldaer	Md. Ruhul	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
21	Hossain	Md. Imran	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar
22	--	Md. Wagid	SHS User	12/08/2021	Product operation	Mr. Pankaj Kumar

C.4. Sampling approach

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As para 27, Standard: Sampling and surveys for CDM project activities and programme of activities, version 9.0^{09/}, the DOE may apply sampling approach, choosing a different confidence/precision than the ones indicated, provided that samples are randomly selected and are representative of the population. Since the CPA is located in a least developed country², applying paragraph 39 (c) of the Standard for “Sampling and surveys for CDM project activities and programmes of activities” version 09.0^{09/}, a sample size of 15 households was chosen (with no discrepant records). A sample size of 14 was required, based on an AQL of 1 % and UQL of 20 %, producer risk 5 % and consumer risk 20 %. Acceptance number (c) thus determined for the sample is 1.

In the view of current situations where travel restrictions have been put in place for international travel around the world due to COVID -19 Pandemic, the DOE has decided to conduct the validation remotely (without on site inspection) for the following 5 CPAs titled,

1. CPA 09 – Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti
2. CPA 10 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti
3. CPA 11 - Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti
4. CPA 12 - Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL
5. CPA 13 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL

in accordance with the provisions of paragraph 41 (a) of CDM- EB 90: Meeting report (Version 1.0)

Considering that Bangladesh is a Least Developed Country, applying paragraph 39 (c) of the Standard for “Sampling and surveys for CDM project activities and programmes of activities” version 09.0^{6/}, a sample size of 15 households was chosen (with no discrepant records). A sample size of 15 was required, based on an AQL of 1 % and UQL of 20 %, producer risk 5 % and consumer risk 20 %. Acceptance number (c) thus determined for the sample is 1. DOE interviewed 15 samples. It was observed that out of the 15 samples, 14 SHS were found to be operational and 1 SHS was non-operational, and this matched with the CME’s records and hence no discrepant records were observed with the published MR^{15/} and ER sheet^{20/} and thus c=1. Thus, CME’s set of records has been accepted in line with the Standard for “Sampling and surveys for CDM project activities and programmes of activities” version 09.0^{6/}, Paragraph 33. Validation team has cross verified these sampling documents during remote audit.

The sampling plan implemented by the CME is in accordance with the PoA-DD^{02/} / CPA-DDs^{01/} as well as the CME has appropriately performed Simple Random Sampling procedure in line with the applied approved monitoring methodology^{12/}. As the registered PoA-DD^{02/} mentions the option for Simple Random Sampling procedure, it is acceptable to the validation team.

The necessary confidence / precision of 95/10 and 90/10 for each of the parameters is met. This has been cross verified by the validation team from the supporting documents submitted.

Random sampling of households by validation team during remote interview establishes the fact that kerosene oil is still used for lighting purpose and diesel consumption for charging batteries for running low power electrical appliances.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings (SECTION D)	No. of CL	No. of CAR	No. of FAR
CPAs to be renewed and corresponding generic CPAs			
Compliance with CPA-DD form		01	
Application and selection of methodologies and standardized baselines			
Validity of original baseline or its update		01	
Demonstration of eligibility of the CPAs		01	

²Bangladesh is considered as a Least Developed Country, and the same has been checked by the DOE in this [LINK](#).

Estimated emission reductions or net anthropogenic removals	01		
Validity of monitoring plan		01	
Crediting period			
CME and project participants			
Post-registration changes			
Others (please specify) FAR raised in line with para 7 (c) of EB 108 meeting report			01
Total	01	04	01

SECTION D. Validation findings

D.1. CPAs to be renewed and corresponding generic CPAs

Title and UNFCCC reference number of the CPA	Version number of the CPA-DD	Host Party	Title and reference number of the corresponding generic CPA	Version number of the PoA-DD on which the RCP is based
Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti (UN Ref. No. – 2765-P2-0009-CP2)	Ver. 05.	Bangladesh	2765-P1-XXXX-CPX	Version 11
Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti (UN Ref. No. – 2765-P2-0010-CP2)	Ver. 05.	Bangladesh	2765-P1-XXXX-CPX	Version 11
Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by IDCOL (UN Ref. No. – 2765-P2-0011-CP2)	Ver. 05.	Bangladesh	2765-P1-XXXX-CPX	Version 11
Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL (UN Ref. No. – 2765-P2-0012-CP2)	Ver. 05.	Bangladesh	2765-P1-XXXX-CPX	Version 11

Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL (UN Ref. No. – 2765-P2-0013-CP2)	Ver. 05.	Bangladesh	2765-P1-XXXX-CPX	Version 11
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D.2. Compliance with CPA-DD form

Means of validation	The Specific case CPA DDs ^{01/} have been prepared using the latest version of CDM-CPA-DD Form, i.e. version 09.0 ^{08/} . It has been checked from the UN website that the form used is the latest form applicable for the CPA and each section has been filled as per the guidelines and the information is materially the same as in the original registered CPA-DDs.
Findings	No findings
Conclusion	The CPA DDs ^{01/} are found to be in compliance with the latest applicable form with all the sections filled in line with the form guidelines.

D.3. Application and selection of methodologies and standardized baselines

Means of validation	The CPA applies AMS I A version 17 - “Electricity generation by the user ³ ”, where project is involved in installation Solar Home Systems (SHS) to reduce use of kerosene oil and diesel to claim emission reduction by reduction in consumption of fossil fuels. The applicability of the methodology AMS IA Version 17 has been assessed as described below:		
	S.N.	Applicability Conditions of AMS-IA, Ver. 17	DOE Assessment
	1.	This category comprises renewable electricity generation units, such as solar photovoltaic, hydro, wind and renewable biomass that supply electricity to individual households/users or groups of households/users.	The SHS units are the renewable energy generation units that supply individual households with a small amount of electricity in areas not connected by grid power.
	2.	The methodology is applicable to project activities that involve new installations (greenfield) or replace existing onsite fossil-fuel-fired generation.	The SHS units are greenfield in nature meant to replace existing fossil fuel usage of kerosene for lighting application and diesel in generator sets for charging batteries as confirmed during telecon with CME representative.
	3.	The applicability of the methodology is limited to individual households and users that do not have a grid connection except when: a) A group of households or users are supplied with electricity through a standalone mini-grid powered by renewable energy generation unit(s) where the	The SHS units are greenfield in nature and the individual household do not have a grid connection confirmed with monitoring data base. For renewable energy lighting

³ <https://cdm.unfccc.int/methodologies/DB/KDHBNSAMLG4HC7WW9GMRJ2KEXZMY9S>

		<p>capacity of the generating units does not exceed 15 MW (i.e. the sum of installed capacities of all renewable energy units connected to the mini-grid is less than 15 MW) e.g. a community-based stand-alone off-the-grid renewable electricity systems; or</p> <p>b) For renewable energy-based lighting applications, the emission reductions per system is less than 5 tonnes of CO₂e a year and it shall be demonstrated that that fossil fuels would have been used in the absence of the project activity by:</p> <ol style="list-style-type: none"> A representative sample survey of target households; or Official statistics from the host country government agencies; <p>c) A group of households or users are connected to a grid prior to the start date of the project activity (or the start date of validation with due justification), however the electricity from the grid is available for the households and users for less than 36 hours in any given calendar month during the crediting period or the grid connected household coverage in the host country is less than 50%.</p>	<p>applications, the emission reductions per SHS system is less than 5 tons of CO₂e/ annum as confirmed through ER sheet.</p>
	4.	<p>The methodology is not applicable to project activities that include units that will be connected to the grid at any time during the crediting period.</p>	<p>IDCOL Inspectors randomly inspect the newly installed SHS to confirm the technical standards and that the SHS has been installed in a rural area to a non-grid connected household. An Inspection Report is produced. The results of the Inspection Report are fed into the IDCOL data base. If the inspection Report indicates that a SHS has been installed in conflict with the program eligibility criteria such as, in an urban area or to a grid connected household, a Discrepancy Report is generated. The SHS then becomes ineligible under the program and is accordingly not eligible to receive any IDCOL financing. A clear system exists for excluding ineligible SHS under</p>

		the program. Validation team checked IDCOL data base and sample survey form and confirm that all SHS installed are not connected to grid at any time.
	5.	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a. The project activity is implemented in an existing reservoir with no change in the volume of reservoir; b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity is greater than 4 W/m ² ; The project activity results in new reservoirs and the power density of the power plant, is greater than 4 W/m ² . Not applicable as this is not a hydro power plant.
	6.	Combined heat and power (cogeneration) systems are not eligible under this category Not applicable as this is not a Combined heat and power (cogeneration) system.
	7.	If the electricity generation unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW. Not applicable as this project don't have non-renewable component.
	8.	Project activities that involve retrofit or replacement of an existing renewable electricity generation unit are included in this category. To qualify as a small-scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW. Not Applicable as this project doesn't involves retrofit or replacement of existing renewable electricity generation.
	9.	In the case of project activities that involve the addition of renewable electricity generation units to an existing renewable electricity generation facility, the total capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units. Not applicable as programme do not involve addition of renewable electricity generation units to an existing renewable electricity generation facility.
	10.	In cases where the project activity utilizes biomass, the applicability conditions of" TOOL16: Project and Not applicable as the project activity doesn't utilizes biomass.

	leakage emissions from biomass" shall apply.	
Findings	No finding was raised in this section	
Conclusion	<p>The CPAs have applied the latest applicable version of the methodology and in-line with the methodology requirement for its project activity. The selected methodology is applicable to the CPA and selected version of the methodology is valid at the time of submission for renewal. For each of the applicability conditions listed in the methodology AMS-IA. Version 17, the steps taken to assess the relevant information contained in the CPA-DDs have been clearly described.</p> <p>The validation team checked the technical specification of SHS and by discussion with the CME/PP during remote audit confirms that the proposed CDM CPAs will only involve distribution of SHS of various capacities in rural regions of Bangladesh which are not connected to grid. As the proposed CDM CPAs fall under the small scale projects category and the project description of CPA-DDs justifies the applicability criteria of the applied methodology AMS-IA version 17 satisfactorily and in line with para 97 - 104 of CDM VVS of PoA, version 02/06/.</p>	

D.4. Validity of original baseline or its update

Means of validation	The baseline scenario as depicted in the PoA-DD version 11 is checked during telecon with CME's representatives and also during the interview with the consultants.
Findings	CAR 02 was raised and successfully closed.
Conclusion	<p>Assessment team referred "Methodological tool (EB 66, Annex 47) "Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period." (Version 03.0.1)" and CDM validation and verification standard for programmes of activities, version 02.0" to check the originality of the baseline. Following are the observations of the assessment team regarding selected baseline for the CPAs in this present 2nd renewable period:</p> <p><u>Step 1.1 (EB 66, Annex 47): Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</u></p> <p>The baseline scenario identified at the validation of the CPA DD was the burning of kerosene for lighting purpose in the households and diesel for generator. Thus this PoA was a voluntary initiative which intends to replace kerosene and diesel usage from renewable source. The CME was not bound to start this initiative (replacement of kerosene for lighting purpose); hence absence of project activity does not lead to any continued baseline practice for CME within their scope whereas the continued operation of the project activity would continue to replace kerosene and other fossil fuels in the project boundary. Hence, the same baseline as identified in the previous crediting period is still valid for the project. Therefore, the assessment of the changes in market characteristics is not required for the renewal of the CPAs' crediting period under CDM.</p> <p>However, DOE also checked the host country requirements and guidelines and confirm that there is no mandatory regulation to replace kerosene in the host country for lighting purposes.</p> <p>The program to provide electricity to users in off-grid, remote and rural areas with SHS. These SHS users currently have no access to grid connected electricity and currently use kerosene for lighting.</p> <p>According to the statistical year book of Bangladesh year book 2018, table 6.14, in total rural population, 12% still use kerosene for lighting which is likely to continue in the absence of the program. It has been confirmed from Statistics year book of Bangladesh from year 2011 to 2018 that there is gradual decrease in dependency on kerosene for lighting purpose over the years. In year 2011, total 45.6% of population dependent on kerosene oil for lighting which came down to 12% as per</p>

Statistical year book of Bangladesh, 2018. Further, statistical year book of Bangladesh published in May 2021 (latest publication) also suggests that in rural areas, still almost 4% of population dependent on kerosene oil. It was observed by reviewing annual statistical year books that there is gradual decrease in dependency on kerosene oil by deployment of SHS over the years which is clear indication that programme is on track to achieve its intended objectives and goals of replacement of kerosene oil for lighting purposes in households of rural areas of Bangladesh.

Furthermore, the CME has considered REB weblink (<http://www.reb.gov.bd/site/page/b36a45d6-6ed2-4477-9cb1-831bd0b13d90/-0>) which confirms kerosene is being used by households in absence of electricity.

Step 1.2 (EB 66, Annex 47) : Assess the impact of circumstances

There are no new circumstances that can impact the original baseline.

The program is to implement solar home systems (SHS) in remote and rural areas that have no access to grid connected power. These SHS users currently have no access to grid connected electricity and currently use kerosene for lighting purpose.

In total rural population, currently kerosene is the source of lighting for off grid population which is likely to continue in the absence of the program. DOE checked latest available data by Govt. of Bangladesh (Statistical Year Book , 2020) which confirms that still around 4% population uses kerosene oil for lighting purposes. The baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment.

Step 1.3 (EB 66, Annex 47): Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

Assessment team confirms that the CPAs were a voluntary initiative which intends to replace kerosene and other fossil fuel for renewable sources. There is no mandatory regulation for CME for this initiative; hence absence of project activity (i.e. the investment) does not lead to any continued baseline practice for CME within their scope. The baseline scenario was the kerosene using by household in off grid areas and the program to provide electricity to users in off-grid, remote and rural areas with SHS. The project activity in green field project and it is unlikely that any baseline equipment or investment involved in project activity. Hence, the same baseline as identified in the previous crediting period is still valid for the CPAs. Therefore, the assessment of the changes in market characteristics is not required for the renewal of the crediting period of CPA DDs under CDM.

Step 1.4 (EB 66, Annex 47): Assessment of the validity of the data and parameters

This step stipulates that "Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CPA."

There is no change in ex ante data and parameters since 1st CPAs' crediting period.

Application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline is valid for the Second CPAs' crediting period.

Step 2.1: Update the current baseline

As evident from the explanation provided above the baseline scenario remains unchanged.

	<p>Updated the baseline emissions based on the latest approved version of the methodology applicable to the project activity for the subsequent crediting period, without reassessing the baseline scenario.</p> <p>Step 2.2: Update the data and parameters The updated Data and/or parameter are followed for estimating the baseline emissions.</p> <p>Hence as per AMS-I.A version 17 (latest Methodology), the baseline of the project is as follows:</p> <p>“The baseline emissions are calculated based on the fuel consumption of the technology in use or that would have been used to generate the equivalent quantity of energy in the absence of the project activity”</p> <p>The above selected baseline is correct and thus applicable to the project activity and in line with approved methodology for the applied renewal of crediting period.</p>
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D.5. Demonstration of eligibility of the CPAs

Means of validation	The eligibility criteria have been developed to meet the references in the PS for PoAs 02.0 Section 7.12.6, taken from the 2 nd CP PoA-DD and the DOE has checked the fulfilment of the same for the renewal of the CPAs.			
Findings	CAR 05 was raised and successfully closed.			
Conclusion	All CPAs to be included or renewed in the present PoA fulfil the following conditions:			
	No	Eligibility criterion – Category	Eligibility criterion – Required condition	Justification of Supporting evidence for inclusion
	1	The proposed CPA should have access to financing channels of the IDCOL Solar Energy Programme. (Each proposed CPA implementer, other than IDCOL itself, should be an approved participant of the IDCOL Solar Energy programme).	The IDCOL Participation Agreement will be used to demonstrate that the CPA implementer is an approved participant of the IDCOL Solar Energy Programme. Articles III and IV of the Participation Agreement make it clear that Pos are eligible to receive IDCOL financing.	The proposed CPAs have access to financing channels of the IDCOL Solar Energy Programme. It has been noted from the participation agreement for IDCOL Solar home systems programme between IDCOL and participating organisation that the participating organisations have access to IDCOL financing.
	2	The CPA should be confined to the self-generation of electricity, by the end user, from SHS technology.	The CPA DD should state that the CPA is confined to the self-generation of electricity by the end user from SHS technology.	The CPAs are confined to the self generation of electricity by the end user from SHS technology conforming with the technology described in the PoA-DD which was confirmed by validation team during interview with households.
	3.	At the time of CPA inclusion, the installation of SHS is not required by	Confirmation by third party that SHS use is not mandated by law in	The CPAs were implemented at a time when there was limited

		law in Bangladesh.	Bangladesh.	institutional support for SHS in Bangladesh where limited institutional support is defined as no existing regulations that directly require SHS implementation: SHS requirement is not mandated by law in Bangladesh. In this context, DOE has checked validation reports of the CPAs for the 1 st crediting period wherein IDCOL has provided written confirmation provided by DNA dated 31/12/2012 that SHS is not required by law and that is still valid. Applus has also confirmed that there is no such requirement mandated by the environmental legislations of Bangladesh as checked from information available in public domain as well as during interaction with PP representative during telephonic interview.
	4.	The proposed CPA must be within the country of Bangladesh which is an LDC	Confirmation that the specific CPA and all households /SHS consumers planned to be included in it are located within the boundaries of Bangladesh.	The proposed CPAs are implemented within the country of Bangladesh which is a LDC. This has been verified through map of Bangladesh as mentioned in the POA-DD.
	5.	The proposed SHS customers in the specific CPA must be households /communities / SMEs and located in rural areas and not have grid connected electricity at the time of SHS installation.	IDCOL Participation Agreement. Section 1.01 (hh) of the Participation Agreement defines the "Subproject Areas" as " <i>Subproject areas means (1) geographical areas outside the grid electrification master plan of REB; (2) areas that do not qualify for grid electrification based on the revenue ratio criteria of REB; (3) remote households not</i>	The SHS customers in the specific CPAs must be households/communities/SMEs and be located in rural areas and do not have grid connected electricity at time of SHS installation. It has been noted from the participation agreement that the project activity is implemented in subproject areas of

			<i>qualified for grid electrification services by PBS; and (4) islands disconnected from the mainland; and isolated pocket areas, etc."</i>	Bangladesh which are clearly defined in the participant agreement as geographical areas outside the grid plan. It has also been confirmed from sample inspection report that there is clear mention whether the SHS is installed within the grid area or not. It has also been noted from the screenshot of database that there is a separate field titled "Discrepancy found" in the database. If the SHS is installed within the grid area, the same is noted under this field.
	6.	The start date of any specific CPA-DD shall be in accordance with EB 47 para 72 requirements and shall be no earlier than 22/06/2007.	Section D.1 of the document shall indicate a CPA start date of no earlier than 22/06/2007.	The start date of CPA-DDs is not earlier than the date of advertisement for global stakeholder consultations: 4 December 2007 (as an early start PoA, the start date of the CPAs under the POA is not before the PoA start date i.e. 22 June 2007. This is in compliance with the CDM-EB 47 guidance and hence found justified.
	7.	The CPA is required to install SHS that meet the minimum standards as approved by the technical standards committee established by the Coordinating Entity. (Approved Solar Equipment)	Copy of the most recent minute from the SHS Committee indicating that it is actively setting standards for the whole SHS programme. IDCOL Participation Agreement requires Pos to purchase SHS from accredited suppliers.	The minimum quality PV panels as approved or defined by the co-coordinating entity shall be installed: The programme has established a technical standards committee which determines technical standards, reviews the credentials of dealers and approves eligible equipment for use in the programme
	8.	Each SSC-CPA and the SHS installed shall be uniquely identified and defined in an unambiguous manner by providing geographic information, and the year of installation covered.	1. The CPA will describe its geographic location and duration for which applicable. 2. Screenshot of IDCOL data	Each SSC-CPA and the systems installed shall be uniquely identified and defined in an unambiguous manner by providing geographic information, and the

			base which confirms that IDCOL is maintaining a unique identification number for each SHS in the SHS programme corresponding to the name of beneficiary, date of installation, location and CPA.	year of installation covered. Applus has verified the screenshots of the database which is submitted by the project participant. The same database was evidenced during site 1 st validation. The database clearly identifies owner of SHS along with unique identification number. Hence Applus considers that it is possible to verify performance of SHS and other related information during future verification
	9.	Planned total installed capacity is within the limits of the small scale limits of 15MW installed capacity (as per Report Annex 20, EB 41, "Indicative Simplified baseline and monitoring methodologies for selected small scale CDM project activity categories") and each of the independent subsystems / measures in the project is planned to be ≤15MW.	Threshold check is not applicable in line with General guidelines for SSC CDM methodologies, version 23, dated 12/09/2019	DOE confirm that CPA will consist of only microscale CDM units, hence in line with para 4.17 of the "general guidelines for SSC CDM methodologies, version 23, 12/09/2019, CME is not required to demonstrate compliance with small scale threshold at the aggregate level of the CPA.
	10.	Conditions to avoid double counting of GHG emission reductions or net anthropogenic GHG removals, such as unique identifications of product and end user locations	<ul style="list-style-type: none"> Prior to seeking an entry of a new SSC-CPA under the proposed PoA, IDCOL will check the UNFCCC and database to confirm that no stand-alone CDM project activity or CPA of another SHS PoA (if registered) has already been registered or entered under another SHS PoA. As it is proposed to uniquely identify each SHS installed under the 	Unique identifications and end user location checked with IDCOL database. Hence, DOE confirms that mechanism in place are adequate to avoid double counting.

			<p>Program, IDCOL will also check the database of already registered CPAs to check any inclusion of SHSs registered as part of any other CPA and exclude any such cases from the said CPA. It will also check to ensure that no SHS is included in 2 CPAs. Each installation entry in the data base will show under which CPA it falls.</p> <ul style="list-style-type: none"> • The DOE requested to enter new CPAs will also verify the above. 	
	11.	Conditions to confirm that CPAs are neither registered as CDM project activities, included in another registered PoAs, nor the project activities that have been deregistered	<p>Prior to seeking an entry of a new SSC-CPA under the proposed PoA, IDCOL will check the UNFCCC and database to confirm that no stand-alone CDM project activity or CPA of another SHS PoA (if registered) has already been registered or entered under another SHS PoA.</p> <p>The DOE requested to enter new CPAs will also verify the above.</p>	IDCOL and UNFCCC database checked and found to be correct.
	12.	Sampling for the determination of parameter values for calculating GHG emission reductions or net anthropogenic GHG removals, conditions related to sampling requirements for the PoA in accordance with the "Standard: Sampling and surveys for CDM project activities and programme of activities"	<p>Sampling of the program activity to be carried out as described in section B of PoA-DD</p>	IDCOL Emission reduction calculation sheet checked and DOE confirms compliance with Standard: Sampling and surveys for CDM project activities and programme of activities

	13.	If the generic CPA is small-scale or microscale, conditions to ensure that CPAs that will be included meet the small-scale or microscale thresholds and remain within those thresholds throughout the crediting period of the CPAs. However, if the generic CPA consists solely of units that qualify as "microscale CDM units" as defined in the "Methodological tool: Demonstration of additionality of microscale project activities", these conditions are not required;	Threshold check is not applicable	Not applicable
	14.	If the generic CPA is small-scale or microscale, conditions for the debundling check based on the "Methodological tool: Assessment of debundling for small-scale project activities". However, if the generic CPA consists solely of units that qualify as "microscale CDM units", these conditions are not required.	De-bundling check is not applicable	Not applicable

D.6. Estimated emission reductions or net anthropogenic removals

Means of validation	The original emission reduction sheets for 1 st CPAs' crediting period remain unchanged and valid for 2 nd CPAs' crediting period as well. As per Para 19 of applied methodology AMS-I.A., Ver. 17, baseline emissions are calculated based on the fuel consumption of the technology. This has been checked by the assessment team as well as the revised CPA-DDs version 05.
Findings	CL 01 was raised during the validation process.

Conclusion	<p>Project emissions: The project being a solar home system will not have any project emissions in accordance with the applied methodology Para 28.</p> <p>Baseline emissions:</p> <p>As the SHS replaces usage of kerosene for lighting and usage of diesel for charging batteries at local diesel generator stations for running a black and white TV, the baseline is:</p> <ul style="list-style-type: none"> • Amount of kerosene that is being consumed in the number of kerosene lamps equivalent to the number of CFL lamps installed per household. • Amount of diesel consumed equivalent to quantity of electricity required to charge the batteries <p>Emission reductions due to replacement of kerosene consumption per lamp are calculated as follows:</p> $BE_y = \sum_j FC_{j,y} \times NCV_j \times EF_{CO_2,j}$ <p>Where,</p> <p>BE_y - Baseline emissions in year y (t CO₂/yr) FC_{j,y} - Projected fuel consumption of fuel type j in year y (mass or volume unit) NCV_j - Net calorific value of fuel type j ((GJ per mass or volume unit) EF_{CO₂,j} - CO₂ emission factor of fuel type j (t CO₂/GJ)</p> <p>Baseline emissions due to replacement of kerosene consumption per lamp are calculated as the product of number of kerosene lamps replaced, amount of kerosene consumption per lamp, net calorific value of kerosene and CO₂ emission factor of kerosene. This method complies with the option 3 of the applied methodology and has been found to be justified.</p> <p>It has been noted that the emission reduction for the higher capacity SHS units is based on the assumption that full output would be available from the solar panel. That is a 50 Wp SHS panel will supply 50 Watt power.</p> <p>Additional distribution losses have been considered for the amount of fuel consumed per lamp, along with 3.5 hours/day and 340 days of operation considering 25 days per year as down time due to maintenance. This is found to be justified in the CPA-DDs accordingly.</p> <p>The amount of fuel (kerosene) required to burn the Kupa lamp is determined on conservatively based on various studies conducted and literature surveyed. Based on this a value of 0.04 litres/hours is used for the estimation of emission reductions, which is found to be consistent with the justification and conservative.</p> <p>With 1,190 hours/year of operation the Kerosene consumption per lamp per year results to be 47.6 litres. Therefore, taking into account the factor for the CO₂ emissions per litre of kerosene usage (2.3619) the baseline emissions per lamp per year results on 112.43 kg CO₂/lamp/yr. This is found acceptable by the assessment team.</p> <p>Total number of kerosene lamps replaced in the baseline is calculated based on number of SHS installed and operational as well as the connected lamps for each SHS.</p> $N_y = \sum SHS_{wp,y} \times N_k$
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where,

- SHS_{wp,y} - No. of SHS of capacity Wp installed and operational in year y
 N_k - No. of kerosene lamps replaced per SHS of installed capacity Wp

The Number of kerosene lamps replaced per SHS of different panel rating (N_k) is conservatively considered based on the survey results of Grameen Shakti.

Emission reductions from avoiding charging of batteries from local shop using diesel set has been calculated from the consumption of electricity for charging the batteries multiplied by CO₂ emission factor. However, considering the very small potential for CO₂ savings out of the replacement of diesel, these baseline emissions will not be included in the project's baseline emission which is conservative and hence found acceptable.

The baseline estimation is therefore calculated as follows:

$$BE_{CO2,y} = N_y \times \sum_j FC_{j,y} \times NCV_j \times EF_{CO2,j}$$

Where,

BE_{CO2,y} - Baseline emissions in year y (t CO₂/yr)

N_y - Total number of kerosene lamps replaced in year y (nos.)

FC_{j,y} - Amount of fuel consumption of fuel type j per lamp in year y (litres)

NCV_j - Net calorific value of fuel type j (TJ/Gg)

EF_{CO2,j} - CO₂ emission factor of fuel type j (t CO₂/GJ)

Leakage:

In line with "General guidelines for SSC CDM methodologies", 23.0, EB104, Annex 5, Section N. Leakage due to transfer of equipment, it is stated in para 26 that:

"For Type I methodologies, the requirement that the replaced energy-generating equipment should be scrapped and that this scrapping should be independently monitored is not needed since under most circumstances the replaced equipment would most likely replace less efficient equipment outside the project boundary."

Hence, the retaining of old kerosene lamps need not be monitored and the leakage emissions are considered to be zero for this project activity.

Leakage is assumed to be zero as the kerosene lamps will be retained for use during emergency. The same has been found acceptable by the assessment team.

Calculation of emission reductions

$$ER_y = (BE_y - PE_y) - LE_y$$

Where,

ER_y - Emission reductions in year y (t CO₂e)

BE_y - Baseline emissions in year y (t CO₂e)

PE_y - Project emissions in year y (t CO₂e)

LE_y - Leakage emissions in year y (t CO₂e)

The resulting estimation of emission reductions, being LE_y and PE_y = 0 are the ones shown in this report.

As an example of the final calculations for baseline emission for a number of SHS units that replace a single kerosene lamp for CPA 09. Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti, the

	<p>following calculation has been done:</p> $BE_{CO_2,Y} = (112.43/1000) * N_y \text{ tCO}_2/\text{Yr}$ $= 0.11243 * 368,906$ $= 41,475 \text{ tCO}_2/\text{Yr}$ <p>This has been found in accordance with the Generic CPA-DD provisions in the PoA-DD for this 2nd Crediting Period as evidenced by its methodological choices in Section I.6.1. and the estimation of the emission reductions in Section I.6.3. of the latter.</p>
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D.7. Validity of monitoring plan

Means of validation	Assessment team checked the monitoring practice of CPAs and also checked the requirement of AMS-I.A version 17 and procedure mentioned in the registered PoA-DD of 2 nd Crediting Period.
Findings	CAR 03 was raised for the section
Conclusion	<p>Following monitoring parameters are included in CPA-DDs and the same is as per the requirement of approved methodology:</p> <p>The following parameters have been determined ex-ante:</p> <ul style="list-style-type: none"> i) Emission factor for kerosene: This has been obtained from the 2006 IPCC guidelines as local values are not publicly available. ii) Annual consumption of kerosene per lamp: It has been noted from the "Assessment of carbon dioxide reduction potential and energy payback period of solar home systems in developing countries: Case of Bangladesh" by Md. Anisuzzaman that in Nepal, Sri Lanka and India that the average kerosene consumption per wick lamp is 0.04 to 0.06 litres per hour. For the PoA a value of 0.04 litre per hour has been applied conservatively. iii) Daily usage of technologies for the generation of lighting: A default value of 3.5 hours per day has been applied for this parameter as directed by the applied methodology. iv) Number of kerosene lamps replaced by a SHS: This has been obtained from the survey report on "Survey Methodology and Implementation Report: Kerosene consumption for solar home systems in Bangladesh: January, 2009" which is found justified. v) Annual operating days of SHS units replacing the kerosene lamps: As per the manufacturer specifications, the SHS is guaranteed to operate all days of year, including rainy days as the SHS retains charge for approximately 3 days without requiring additional charging. However, For conservative purposes, 25 days per year have been deducted to include possible days when a SHS may not be functioning due to system maintenance or any other reasons. Hence, the number of operating days per annum is considered to be 340 days vi) Density of kerosene: Ex ante value of 0.75 kg/litre taken from http://www.answers.com/topic/kerosene (Columbia Encyclopaedia) vii) Net calorific value of kerosene : value of 43.8 TJ/Gj considered from IPCC 2006- Volume 2 Energy , Chapter 1, Table 1.2, page 1.18 <p>Parameters Monitored Ex-Post The following parameters will be monitored:</p> <p>Number of SHS Installed: This will be obtained from the IDCOL database.</p> <p>Number of SHS that are operational (for each rating): It has been noted from solar home system inspection report that records on the condition of all SHS are maintained by the IDCOL. The same information is also maintained in the database which is confirmed during the telecon with CME. A sample will be drawn at 95% confidence level and at 10% precision per CPA from IDCOL data base to monitor and calculate number of operational SHS. The sampling plan will be as per the "General guidelines for sampling and surveys for cdm project activities and</p>

	<p>programme of activities, ver. 04, EB 86.</p> <p>The payment receipt of EMI to POs by individual SHS owner: This will be monitored from the EMIs receipt from the individual households.</p> <p>Confirmation of training or technical support provided: This will be monitored from the certificate on completion of training or receipt on support of technical support to recipient of training or technical support. It was confirmed during the telecon with the PP representative that training is provided to local personnel for the efficient functioning of the SHS units.</p> <p>Based on the above mentioned assessment Applus+ Certification considers that stated monitoring plan is feasible and the project proponent will be able to implement the monitoring plan into practice in order to satisfy the methodological requirements.</p> <p>The ex-ante and monitored parameters are also in line with the Generic CPA-DD as per the registered PoA-DD for the 2nd CP, thus found acceptable by the assessment team.</p>
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D.8. Crediting period

Means of validation	<p>The crediting period is checked as per UNFCCC CDM PoA's view page for all following 5 CPAs:</p> <ol style="list-style-type: none"> 1. CPA 09 – Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti 2. CPA 10 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti 3. CPA 11 - Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti 4. CPA 12 - Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL 5. CPA 13 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL <p>The Crediting period for all these CPA-DDs is as follows: CPA 09: 01/09/2020 to 31/08/2027 CPA 10: 01/05/2021 to 30/04/2028 CPA 11: 01/01/2022 to 31/12/2029 CPA 12: 01/09/2020 to 31/08/2027 CPA 13: 01/05/2021 to 30/04/2028</p>
Findings	CAR 04 was raised and successfully closed.
Conclusion	This is 2 nd renewable crediting period and the duration is 7-year renewable. The next (second) crediting periods of the CPAs commence on the day immediately after the expiration of the first crediting period. This is in accordance with the VVS for PoAs 02.0 Para 391, hence found acceptable by the assessment team.

D.9. CME and project participants

Means of validation	<p>The project participant names were checked from UN homepage https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/ZSI6WP0ODGRQ8UYKXB3MHTL957JVAE/viewCPAs</p>
Findings	No findings raised
Conclusion	Infrastructure Development Company Limited (IDCOL) is the CME and also the CPA implementer for CPA 12 and CPA 13; whereas Grameen Shakti is the CPA implementer for CPA 09, CPA 10 and CPA 11. The same is correct and in line with CPA-DDs registered under 1 st Crediting period as well as MOC obtained from UN home page. The details are true for the 2 nd Crediting period as well.

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D.10. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ⁴	N	NA	NA
Corrections	N	NA	NA
Changes to the start date of the crediting period of component project activity	N	NA	NA
Inclusion of monitoring plan	N	NA	NA
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from applied methodologies, standardized baselines, or other methodological regulatory documents	N	NA	NA
Changes to the project design	N	NA	NA
Changes specific to afforestation and reforestation activities	N	NA	NA
Others (please specify)	N	NA	NA

⁴ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

SECTION E. Internal quality control

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As final step of a validation of the final documentation including the 2nd renewable crediting CPA period validation report and the checklist, have to undergo an internal quality control by the Technical Reviewer(s) to be approved.

Details of the Technical Reviewer(s) are provided within the Validation Report in Section B.2. and Appendix 2 for further references of knowledge and capability to conduct the quality checking.

After the Technical Review process, the final documentation may undergo a final quality checking process called Administrative Review, done by the Applus+ Certification's Project Manager and/or Technical Support.

For final approval, the final set of documents are prepared by the DOE's Technical Manager or its deputy and signed by the authorized signatory of the DOE.

In case any of the persons performing this final internal quality control approval process has acted as a part of the Assessment Team or Technical Review team, the approval can only be given by DOE's authorized personnel who are not part of those teams.

If the final set of documents has been satisfactorily approved, a request of renewal of crediting period is submitted to the UNFCCC CDM EB along with the relevant documents.

SECTION F. Validation opinion

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Applus+ Certification has performed a validation for renewal of crediting period of the following 5 CPAs :

1. CPA 09 – Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti
2. CPA 10 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti
3. CPA 11 - Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti
4. CPA 12 - Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL
5. CPA 13 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL

The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. AMS-I.A version 17, given to provide for consistent project operations, monitoring and reporting.

The review of the component project activity design documentation and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the CPAs meet all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The CPAs will hence be recommended by Applus+ Certification for renewal of crediting period with the UNFCCC.

The project correctly applies the small scale baseline and monitoring methodology AMS-I.A “Electricity generation by the user”, version 17. These CPAs involve installation of various capacity solar home systems for lighting and running of electrical appliances like TV etc. Electricity is generated through solar photovoltaic energy conversion technology and stored in storage cells. The programme of activities is intended for reduction of CO₂ emissions by displacing kerosene lamps and diesel generators through implementation of similar CPAs. As a result, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Adequate training and monitoring procedures have been described.

In summary, it is Applus+ Certification’s opinion that the following 5 CPAs titled

1. CPA 09 – Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti
2. CPA 10 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti
3. CPA 11 - Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti
4. CPA 12 - Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL
5. CPA 13 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL

as described in the CPA-DDs, ver. 05 of 16/08/2021, meet all relevant UNFCCC requirements for a CPA under the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology AMS-I.A, version 17.

The validation has been performed following the requirements of the latest version of the CDM validation and verification standard for programme of activities, version 02 and on the basis of the contractual agreement. The single purpose of this report is its use during the renewal process as part of the CDM/UNFCCC project cycle.

Appendix 1. Abbreviations

Abbreviations	Full texts
CDCF	Community Development Carbon Fund
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CME	Co-ordinating Managing entity
CL	Clarification request
CPA	CDM Programme Activity
CP	Crediting period
IBRD	International Bank for Reconstruction and Development
IDCOL	Infrastructure Development Company Limited
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
ER	External Resource
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IR	Internal Resource
OR	Outside resource
GS	Grammen Shakti
NGO	Non Governmental Organization
PP	Project Participant
REB	Rural Electrification Board
REREDP	Rural Electrification and Renewable Energy Development Project
SHS	Solar Home System
ODA	Official Development Assistance
LDC	Least Developed Country
IPCC	Intergovernmental Panel on Climate Change
PV	Photo Voltaic

Appendix 2. Competence of team members and technical reviewers

- Mr. Pankaj Kumar **Pankaj Kumar** worked as team leader – Bihar for South Asia Climate Proofing and Growth Development(CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India, Pakistan, Nepal, and Afghanistan. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO(Bihar Urban Infrastructure Development Corporation), Govt. of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited DOE), Johannesburg, RSA as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DOE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on climate change & human health, Health Department, GoB and on roster of UNICEF's WASH experts.
- He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing
- Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).
- Mr. Simon Shen **Simon Shen** (Master's Degree in Thermal Energy Engineering, Bachelor's Degree in Environmental Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review.
- He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and review with Applus+, apart from the years of experience working as GHG Auditor and ISO 9001/14001 in TUV SUD for 5 years before he joined Applus+.
- Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager.

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	CME	<ol style="list-style-type: none"> 1. CPA 09 – Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by Grameen Shakti 2. CPA 10 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by Grameen Shakti 3. CPA 11 - Installation of Solar Home Systems in Bangladesh (01/05/2014 to 31/12/2014) by Grameen Shakti 4. CPA 12 - Installation of Solar Home Systems in Bangladesh (01/01/2013 to 31/08/2013) by IDCOL 5. CPA 13 - Installation of Solar Home Systems in Bangladesh (01/09/2013 to 30/04/2014) by IDCOL 	Version 5.0 dated 16/08/2021	CME
2	CME	PoA DD Generic CPA DD	Version 11.0 Dated 29/06/2020	CME
3	CME	Sample baseline survey form		IDCOL
4	UNFCCC	PCP for PoA	Version 2.0	Other
5	UNFCCC	PS for PoA	Version 2.0	Other
6	UNFCCC	VVS for PoA	Version 2.0	Other
7	UNFCCC	CDM Glossary terms	Version 09.1, page 20	Other
8	UNFCCC	CDM-CPA-DD-FORM	Version 9.0	Other
9	UNFCCC	Standard: Sampling and surveys for CDM project activities and programmes of activities	version 9.0	Other
10	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
11	NA	Statistics year book, 2018 Statistics year book, 2020	Govt. of Bangladesh	
12	NA	AMS-I.A version 17	UNFCCC CDM web site	UNFCCC
13	NA	Modalities of Communication	15/03/2019	UNFCCC
14	NA	Tools/ guidelines used in the project activity: <ul style="list-style-type: none"> • Guidance for determining the occurrence of debundling under a PoA, EB 47, Annex 32 • Guidelines on assessment of debundling for SSC project 	UNFCCC CDM web site	UNFCCC

		<p>activities, ver, 04, EB 83, Annex 13</p> <ul style="list-style-type: none"> • Standard for sampling and surveys for CDM project activities and programme of activities, ver. 9.0, EB 108 • Guidelines for sampling and surveys for CDM project activities and programme of activities, ver.4.0 , EB 86 • Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period." (Version 03.0.1). • The general guidelines for SSC CDM methodologies, ver. 23 dated 12/09/2019 • Tool for demonstration of additionality of micro scale project activities, ver. 09 dated 29/11/2018 		
15	NA	Technical specifications for solar home systems (SHS)	07/10/2002 REREDP	
16	NA	ER sheet	13/12/2010	IDCOL
17	NA	Survey report		Grameen Shakti
18	NA	Assessment of carbon dioxide reduction potential and energy payback period of solar home systems in developing countries: Case of Bangladesh" by Md. Anisuzzaman that in Nepal, Sri Lanka and India		
19	NA	Survey Methodology and Implementation Report: Kerosene consumption for solar home systems in Bangladesh	January, 2009	
20	NA	SHS Inspection report		
21	NA	SHS database		IDCOL
22	NA	Participation agreement (IDCOL Solar Home Systems Programme)	15/11/2010	IDCOL
23	NA	Declaration that SHS is not mandated by the law of Bangladesh	02/12/2010	IDCOL

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CLs from this validation

CL ID	01	Section no.	A.1	Date: 14/08/2021
Description of CL				
1. In ER sheet, still AMS-IA, Ver. 14 mentioned which need to be updated.				
CME response				Date: 16/08/2021
Methodology versión has been revised in ER sheet for all CPAs . Submitting herewith revised ER sheets.				
Revised ER sheets for all CPAs (CPA 0009 to CPA 0013)				
DOE assessment				Date: 17/08/2021
CME has now revised versión of applied methodology in ER sheets of all the CPAs. CL closed				

Table 2. CARs from this validation

CAR ID	02	Section No.	B.3	Date : 14/08/2021
Description of CAR				
1. In sec. B.3, assessment of validity of the original/ current baseline is not appropriate as per "Tool for assessment of the validity of the original/ current baseline and update of the baseline at the renewal of the crediting period." Version 03.0.1. No supporting documents or references provided to demonstrate the validity of original/ current baseline				
CME response				Date: 16/08/2021
Revised the text in relevant section of all CPA's (CPA 0009 to CPA 0013), now provided more clarity on assessment of original baseline.				
The baseline scenario has not been re-assessed as per CDM-PS requirements (para 283-286). Documentary evidences as referred at the time of CPA-DDs inclusión supports the selection of original baseline.				
Only the impact of any changes in national and sectoral policies and circumstances have been considered to assess their impact on original baseline. The same has been included in revised CPA-DDs.				
Documentation provided by CME				
Revised CPA DDs (CPA 0009 to CPA 0013)				
DOE assessment				Date: 17/08/2021
CME has made necessary corrections in the sec. B.3 of revised CPA-DDs, ver. 05 dated 16/08/2021. Validation team confirmed the explanation in compliance with CDM- PS, ver. 2.0. CAR closed.				

CAR ID	03	Section No.	B.4.1, B.4.3	Date: 14/08/2021
Description of CAR				
1. In sec. B.4.1, para 8 of AMS-IA, ver. 17 referred for estimation of GHG emission reduction which seems to be incorrect. CME shall refer appropriate paras of applied methodology				
2. In sec. B.4.1, value of emission factor for kerosene consumption provided in the table is not in proper format. Corrective action required				
3. In sec. B.4.3, for leakage emission, CME has not referred latest version of "General guidelines for SSC CDM methodologies.				
CME response				Date: 16/08/2021

1. Intention of stating para 8 of AMS – I.A., in section B.4.1 of the CPA DDs was to state that CPAs meet the eligibility limit of 15 MW for small scale CDM Project activities. Text has been updated to bring in clarity.
2. In sec. B.4.1, value of emission factor for kerosene consumption is now revised, submitting herewith all CPA DDs (CPA 0009 to CPA 0013) for review.
3. Now in section B.4.3 for leakage emission referred latest version of “General guidelines for SSC CDM methodologies. All CPA DDs (CPA 0009 to CPA 0013) are revised accordingly.

Documentation provided by CME

Revised CPA DDs (CPA 0009 to CPA 0013)

DOE assessment**Date:** 17/08/2021

1. CME has updated the sec. B.4.1 of revised CPA DDs, ver. 05 dated 16/08/2021. CAR closed.
2. CME has now revised the value of emission factor of kerosene in the sec. B.4.1 of revised CPA DDs, ver. 05 dated 16/08/2021. CAR closed
3. CME has now referred latest version of “General guidelines for SSC CDM methodologies” in sec. B.4.3 of all the revised CPA-DDs, ver. 05 dated 16/08/2021. CAR closed.

CAR ID	04	Section No.	B.5.1, C.1	Date: 14/08/2021
Description of CAR				
1. CME shall provide evidence of CPA start date.				
CME response				Date: 16/08/2021
Submitting herewith supportive doc. for CPA start date for all CPA DDs (CPA 0009 to CPA 0013)				
Documentation provided by CME				
User agreements between HHs and CPA implementor.				
DOE assessment				Date: 17/08/2021
CME has provided evidence of start date (Copies of user agreements between the households and CPA implementor i.e. Grameen Shakti) for all the CPAs. CAR closed.				

CAR ID	05	Section No.	F	Date: 14/08/2021
Description of CAR				
CME shall provide following document pertaining to eligibility criteria assessment in sec. D.1:				
<ul style="list-style-type: none"> • Signed IDCOL participation agreement for all CPAs • For criteria 6, start date of CPA mentioned as 22/06/2007 which is not consistent with the date mentioned in sec. C.1 • CME shall confirm if “ Standard for demonstration of additionality of GHG emission reductions achieved by a PoA” still applicable? 				
CME response				Date: 16/08/2021
<ul style="list-style-type: none"> • Submitting herewith signed IDCOL participación agreement for review. • Start date of CPA is now revised for all CPAs DDs (CPA 0009 to CPA 0013) in criteria 6 (eligibility criteria assessment) as per start date in section C • CME hereby confirmed that CPA meets all criteria as per latest tool of demostración of additionality, 				
Documentation provided by CME				
DOE assessment				Date: 17/08/2021
<ul style="list-style-type: none"> • CME has provided sample signed IDCOL participation agreement which was found to to be correct and appropriate by validation team. • CME has now corrected the CPA start date in sec. F of all the CPA-DDs, ver. 05 dated 16/08/2021 which are consistent with the start date of CPAs mentioned in sec. C.1. • CME has made necessary corrections in the sec. F of revised CPA-DDs, ver. 05 dated 16/08/2021. 				
CAR closed				

Table 3. FARs from this validation

FAR ID	01	Section No.		Date: 14/08/2021
Description of FAR				
<p>Due to postponement of CMP 16 meeting and scheduled end of 2nd commitment period of Kyoto protocol on 31/12/2020, in accordance with para 7 (c) of EB 108th meeting report, CME shall apply any global warming potential values that may be adopted by the CMP for that period in their monitoring reports for any emission reductions achieved on or after 1 January 2021; and update their project or programme design documents in accordance with any requirements of the CMP guidance for following CPAs as their crediting period starts on or after 01/01/2021:</p> <ol style="list-style-type: none"> 1. CPA 2765-P2-0010-CP2 2. CPA 2765-P2-0011-CP2 3. CPA 2765-P2-0013-CP2 <p><i>This FAR is not applicable for RCP of following two CPAs which are also included in this report as their Crediting period starts before 31/12/2021</i></p> <ol style="list-style-type: none"> 4. CPA 2765-P2-0009-CP2 5. CPA 2765-P2-0012-CP2 				
CME response				Date: 16/08/2021
We will apply any global warming potential values that may be adopted by the CMP for that period in the monitoring reports for any emission reductions achieved on or after 1 January 2021; and will update project or programme design documents in accordance with any requirements of the CMP guidance.				
Documentation provided by CME				
DOE assessment				Date: DD/MM/YYYY

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); • Make editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0). Change form symbol from CDM-CPA-RCP-FORM to CDM-CPA-RCPV-FORM.
01.0	3 August 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Renewal of crediting period Keywords: component project activity, crediting period, validation report		