



**Programme of activities design document form
(Version 09.0)**

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

BASIC INFORMATION

Title of the PoA	National Solar Power Development Programme, India
Version number of the PoA-DD	01.1
Completion date of the PoA-DD	04/09/2019
Coordinating/managing entity	Emergent Ventures India Pvt. Ltd. (EVI)
Host Parties	India
Applied methodologies and standardized baselines	AMS-I.D: Small-scale Methodology: Grid connected renewable electricity generation, Version 18.0 Reference: https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK
Sectoral scopes	Sectoral scope: 01; Energy industries (renewable - / non-renewable sources)

PART I. Programme of activities (PoA)

SECTION A. Description of PoA

A.1. Purpose and general description of PoA

>>

1. **General operating and implementing framework of PoA**

The proposed PoA, called as “*National Solar Power Development Programme, India*” (hereafter referred as NSPDP or PoA) has twin objectives of contributing to India's long-term energy security and to accelerate the implementation of grid-connected solar power projects in the country contributing to its ecological sustainable growth. Generally, solar power can be looked at in two ways: *on-grid* and *off-grid*. NSPDP aims at installation and operation of grid-connected solar power projects based on Solar Photovoltaic (SPV) and/or Concentrated Solar Power (CSP) of upto 15 MW installed capacity. The PoA encompasses all states of India (host country) and hence the host country itself becomes the project boundary for the programme.

2. **Policy/measure or stated goal of the PoA**

Solar based power generation is a key technology option to realize the shift to a decarbonised energy supply and is projected to emerge as an attractive alternative electricity source for the future¹. While the current contribution of solar power to the total India's electricity needs is negligible², in the near future, it is expected that solar power, especially solar photovoltaic will form a vital component of the India's electricity mix. However, owing to the high cost of extracting power from solar resources and negligible share of installed solar capacity in India, NSPDP would need to be supported by additional incentives to have a sustainable growth.

The objective of NSPDP is to develop a platform for overcoming the hurdles to the implementation of a series of solar power projects (*both SPV and CSP*) in India. Since all solar power projects in the country face similar barriers, the PoA approach to such implementation is deemed to be most appropriate. Emergent Ventures India (EVI) Pvt. Ltd. is the Co-ordinating / Managing Entity (CME) for the PoA.

The power generation under the PoA is accomplished through renewable source i.e. Solar and is supplied to the grid system within the host country. This in the business as-usual scenario (absence of PoA) would have been met with the help of conventional fossil fuel³ based power plants (which are the major source of GHG⁴ emissions). Thus, the PoA as a whole reduces GHG emissions by installing solar based power generation systems which utilize the available solar energy (clean fuel) as an alternative source for power generation.

Overall in a way, the PoA will promote the development of renewable energy and facilitate the abatement of GHG emissions through replacement of fossil fuel based electricity. The PoA further contributes to the sustainable development of the host country (India), as stipulated by the *Ministry of Environment and Forest, Government of India*⁵ in the interim approval guidelines for CDM project as follows:

¹ <http://www.renewableenergyworld.com/rea/news/article/2011/02/indias-renewable-future-challenges-and-prospects>

² http://www.mnre.gov.in/annualreport/2009-10EN/Chapter1/chapter1_1.htm

³ http://planningcommission.nic.in/reports/genrep/bkpap2020/13_bg2020.pdf

⁴ <http://www.decisioncraft.com/energy/papers/ecc/ei/lpse.pdf>

⁵ http://envfor.nic.in/divisions/ccd/cdm_iac.html

Social and Economic wellbeing:

- ☐ The CPA(s) under the PoA evacuating power to the connected grid would lead to improvement of electricity availability as the electricity is fed into a deficit grid.
- ☐ The construction and implementation phases of the CPA(s) would generate employment opportunities for local inhabitants on permanent and temporary basis. Thus, by offering job opportunities to both skilled and unskilled manpower the PoA would improve economic conditions of local residents.
- ☐ The CPA would bring in additional investment to the CPA regions which would have not been possible in the absence of CPA. Further the CPA would contribute significantly towards infrastructure development of the region which ultimately leads to rural area development.

Environmental wellbeing:

- ☐ The PoA by replacing electricity generated from fossil fuels would result in reduction of both GHG emissions and air borne pollutants, such as oxides of nitrogen, oxides of sulphur, carbon monoxide and particulates.
- ☐ The PoA further generates real, measurable and long-term GHG emissions reductions.

Technological wellbeing:

- ☐ The PoA improves the supply of electricity with clean, renewable solar power while contributing to the regional/local economic development.
- ☐ The PoA consists of the power generation through eco-friendly resource of energy i.e. solar, which is a safe and proven technology.
- ☐ The successful implementation and operation of the PoA would serve as demonstration for harnessing solar potential and encourage setting up of similar projects in future.

3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity

NSPDP is proposed by EVI to promote renewable energy projects based on solar systems in India. All the key players under the programme i.e., EVI (*managing entity*) and the project participants (*implementing entities*) are voluntarily taking part under this scheme.

A.2. Physical/geographical boundary of PoA

>>

The geographical boundary of the PoA includes all states in India. The CPA(s) that are included under the PoA will be within the defined geographical location of the PoA area and will follow applicable national and/or sectoral policies and regulations. The PoA boundary is depicted in the map⁶ below.

6

<http://www.mapsofindia.com/maps/india/indiastateandunion.htm>



A.3. Technologies/measures

>>

The chosen type under the NSPDP is as follows:

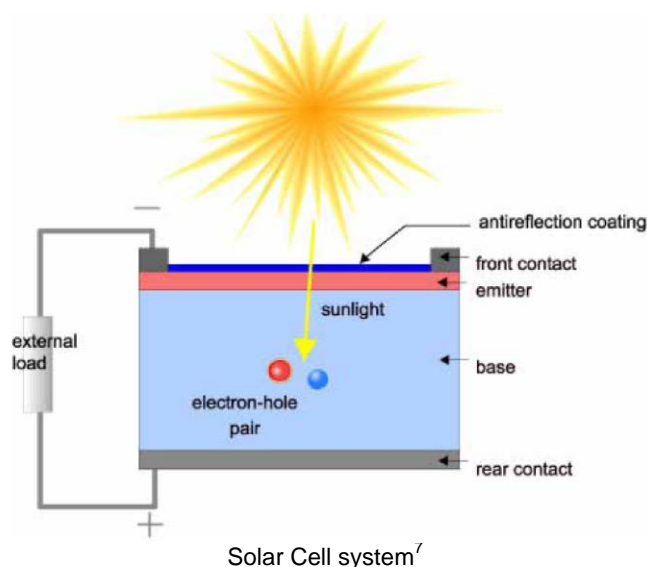
TYPE I: Renewable Energy Projects

Generic description of the technology/measure to be covered under the PoA is presented in the following paragraphs:

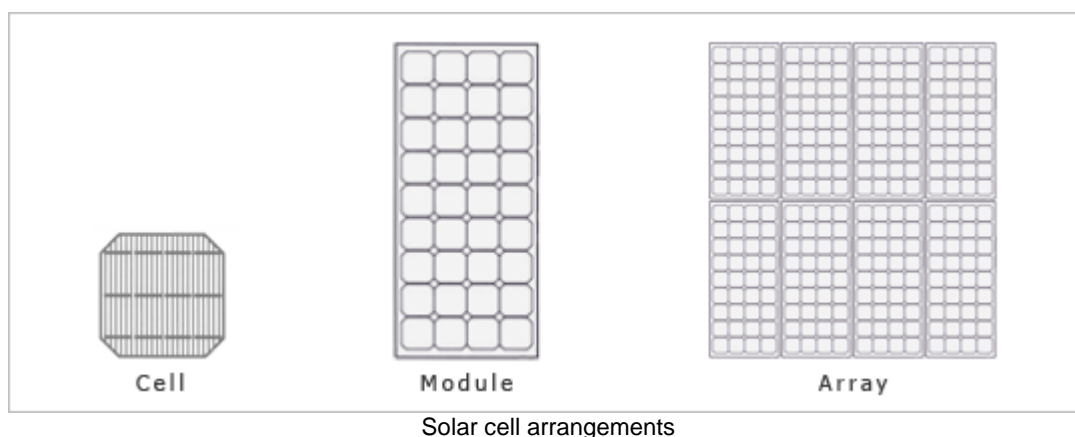
Solar Photovoltaic's (SPV)

Technology / Measure

The solar photovoltaic cells, also known as the solar cells, are used to convert solar energy into electrical energy. The solar cells are the basic elements of a solar module. Essentially, when light strikes the cell, a certain portion of it is absorbed within the semiconductor material. This energy knocks electrons loose, allowing them to flow freely. PV cells have one or more electric fields that act to force electrons freed by light absorption to flow in a certain direction. This flow of electrons constitutes an electric current, which can be drawn from the cell. This current, together with the cell's voltage defines the power that the solar cell can produce. The working structure of the solar cell is illustrated in the figure below.



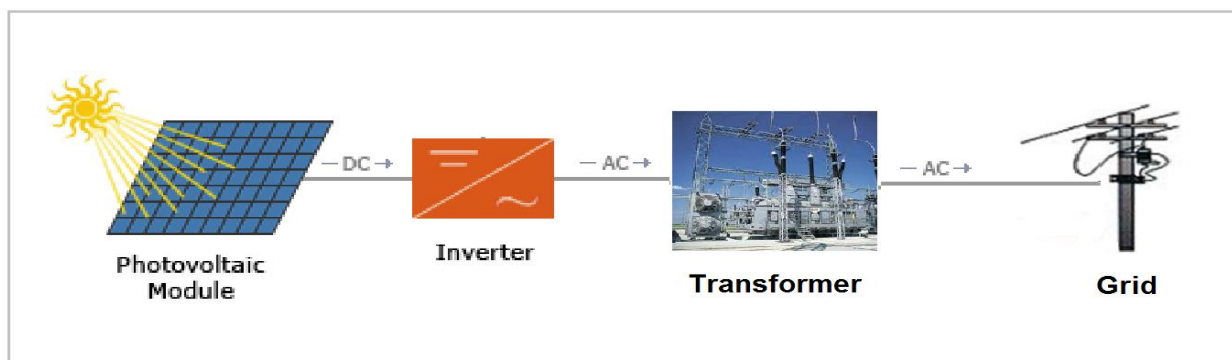
The photovoltaic cell is the basic building block of a photovoltaic system. Individual cells can vary in size from about 1 centimetre (1/2 inch) to about 10 centimetres (4 inches) across. However, one cell only produces 1 or 2 watts, which isn't enough for most applications. To increase power output, cells are electrically connected into a packaged weather-tight module. Modules can be further connected to form an array. The term array refers to the entire generating plant, whether it is made up of one or several thousand modules. The number of modules connected together in an array depends on the amount of power output needed.



The different types of solar panels can be classified based on the type of crystal used in making the solar cell as *mono-crystalline*, *poly-crystalline* and *thin-film* solar cell. The technical details of major equipments, type of solar cell employed and modules of the solar photovoltaic system will be summarized in the respective CDM-CPA-DD.

The objective of NSPDP being the supply of generated electricity to the national grid, the schematic of the same is depicted in the figure below. The model shown contains the following:

- Solar panels which can be mounted either on the roof or in open spaces. Photovoltaic modules produce direct current (DC) electrical power.
- Inverter to convert electricity produced by the system from DC to AC power.
- Transformers to synchronize the power output from the inverter to the grid voltage level.



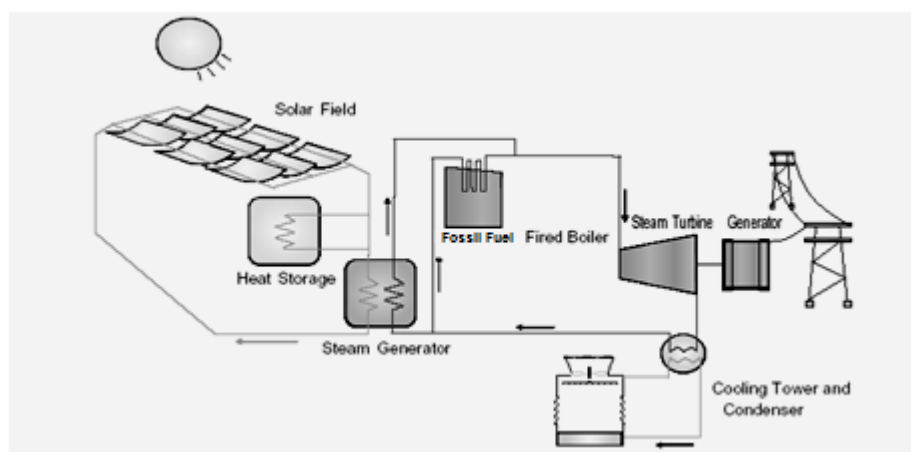
Grid-connected Solar Photovoltaic (SPV) system

Concentrated Solar Power (CSP)

Technology / Measure

Concentrating solar power (CSP) plants, also known as Solar Thermal Power systems produce electric power by converting the sun's energy into high-temperature heat using various mirror configurations. The heat is then channelled through a conventional generator. The plants consist of two parts: one that collects solar energy and converts it to heat, and another that converts heat energy to electricity. The CSP systems use concentrated solar radiation as a high temperature energy source to produce electricity using thermal route. These technologies are appropriate for applications where direct solar radiation is high. The mechanism of conversion of solar to electricity is fundamentally similar to the traditional thermal power plants except use of solar energy as source of heat.

In the basic process of conversion of solar into heat energy, an incident solar irradiance is collected and concentrated by concentrating solar collectors or mirrors, and generated heat is used to heat the thermic-fluids such as heat transfer oils, air or water/steam, depending on the plant design, which act as heat carrier and/or as storage media. The hot thermic fluid is used to generate steam or hot gases, which are then used to operate a heat engine. In these systems, the efficiency of the collector reduces marginally as its operating temperature increases, whereas the efficiency of the heat engine increases with the increase in its operating temperature. The schematic of the grid-connected CSP system is as depicted in the figure below:



Grid-Connected Concentrated Solar Power (CSP) systems⁸

High temperature solar energy collectors are basically of three types:

- ☐ *Parabolic trough system:* The receiver can reach 400°C and produce steam for generating electricity.
- ☐ *Power tower system:* The reflected rays of the sun are always aimed at the receiver, where temperatures well above 1000° C can be reached.
- ☐ *Parabolic dish systems:* Parabolic dish systems can reach about 1000° C at the receiver, and achieve the highest efficiencies for converting solar energy to electricity.

The type of solar energy collector used, their efficiencies and the technical description of the major components of the system will be detailed in the respective CDM-CPA-DD accordingly.

The CPA(s) would use the reliable and proven technology available to ensure that an environmentally safe and sound technology only is being implemented under the proposed PoA.

A.4. Coordinating/managing entity

>>

The CME for NSPDP is Emergent Ventures India Pvt. Ltd. (EVI). The contact details are provided in Appendix 1.

A.5. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (Host Party)	Emergent Ventures India Pvt. Ltd. (EVI) Private Entity	No

The project participants for the CPAs (implementing entities) shall be stated in the respective CDM-CPA-DD

A.6. Public funding of PoA

>>

There is no public funding available for the PoA.

SECTION B. Management system

>>

This management system is proposed for the grid connected solar power projects (both SPV and CSP) to be implemented within the project boundary. This will be implemented by the CPA implementing entities, describes the project management, parameters to be monitored, monitoring practices, QA and QC procedures, data storage and archiving.

The monitoring plan under NSPDP is established at three different levels i.e. project site, CPA and PoA level. The details of the parameters monitored, metering system employed, monitoring responsibilities and other information shall be provided in the respective CDM-CPA-DD. Following will be the key activities under the monitoring plan:

Monitoring Practice

Data parameter(s) as mentioned in section I.7.1 is required to be monitored at each Project Site. The monitoring practice involves taking readings from the energy meters, which measure both the energy export to and import from the grid. The difference of export and import values gives the net power export to the grid. This becomes the basis for the estimation of emission reductions that a CPA would achieve.

Monitoring Structure

The CME of NSPDP will implement a monitoring protocol allowing the DOE to verify all CPAs under the PoA. The parameters included in section I.7.1 shall be monitored by each CPA implementing entity. The CME will provide guidance to all CPA developers on how the monitoring should be conducted and data should be collected with regard to emission reduction calculations. The start and end dates of each monitoring period, together with the CPA monitoring record will be recorded in the PoA monitoring database maintained by the CME.

Procedure for handling uncertainties**a) Data uncertainty:**

For each CPA, all parameters included in I.7.1, will be monitored by the CPA developer and recorded electronically in a CPA monitoring record. The CPA developer will provide the CPA monitoring records to the CME. The CME will document and store all data related to parameters included in section I.7.1 provided by CPA developer in an electronic PoA monitoring record (PoA monitoring database), while primary data will be stored by each CPA developer.

The CME will be responsible for the preparation of the monitoring report and communication with the DOE during verification activities. The monitoring report will compile all required monitoring information, i.e. CPA monitoring records, in order to allow the DOE to verify the emission reductions for each monitoring period of each individual CPA. The monitoring report will unambiguously set out the data on emission reductions generation by each CPA during the monitoring period consistent with the requirements of this CDM-PoA-DD and the corresponding CDM-CPA-DD. Record keeping procedures for the PoA monitoring database undertaken by the CME will ensure that the data attributed to a monitoring period can be clearly attributed to an individual CPA and will furthermore prevent double counting of emission reduction data.

b) Event of failure of meters:

The procedure for handling uncertainty in the metering system varies with each CPA. In general the procedure adopted to handle the failure in meters will be provided in the power purchase agreement signed by each CPA implementing entity. Since the procedure varies with each CPA, the CME finds it appropriate to address the same at the CPA level. The description of the same shall be included in the relevant section of the respective CDM-CPA-DD.

QA/ QC procedure

The meters used for monitoring of required data will be calibrated as mentioned in section I.7.1. Records to this effect will be kept for future verifications.

Data Storage and Archiving

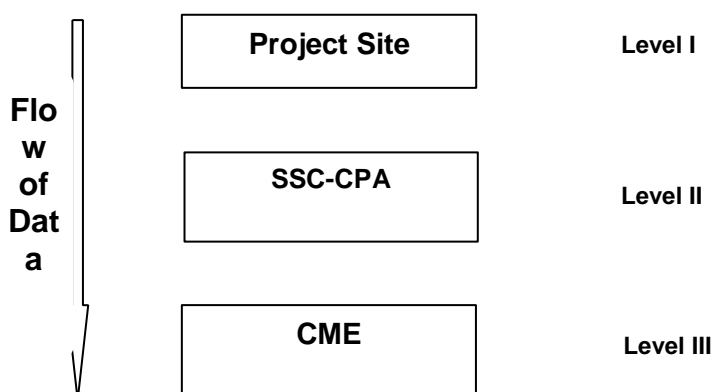
The above documents will be kept at safe storage for verification of emission reductions generated from the CPA(s). All the data monitored under the monitoring plan will be kept for two years after the end of crediting period or till the last issuance of CERs for each CPA whichever occurs later.

Operational and management plan:

The following arrangements have been established by EVI (CME) to ensure an effective, reliable and robust operation and management of the CPA(s) under the PoA:

1. A record keeping system for each CPA under the PoA

The CME has established a profound system in order to maintain robustness of record keeping. The flow of data under the PoA shall occur at 3 different levels. This is as given below:



Typical DATA FLOW Chart under the PoA

As presented in the above flow chart, the data generated at the project site will first flow to the CPA level and is then finally archived at the CME level.

Project Site (Level I): The record keeping at the project site will be executed by using field instruments and software installed and/or manual data recording in the log book. Since the CPA under the NSPDP implements only grid connected solar power projects, hence the net quantity of electricity exported to the grid shall be monitored at each site. The net units displaced which are the difference between the power imported from and exported to the grid shall be measured by the metering system installed at the project site. Appropriate records showing net electricity delivered from each of the project sites (of respective CPAs) will be kept for future verifications. Besides, details and calibration records of meters used for measurement of data will be kept for verification.

CPA (Level II): The captured data at the project sites will be transferred to the database of the respective CPA. At this level the data monitored at the project sites part of the CPA will be compiled.

PoA (Level III): Further the data is transferred from each CPA level to the NSPDP CME, which will archive it and make available to DoE for verification. Other records (meter details and calibration records) as relevant will be compiled by CME for the entire PoA at any given time.

In addition to the above, the CME of NSPDP will develop an electronic monitoring database which contains all the basic information related to CPA(s) subscribing to the PoA. Each CPA will be uniquely identified with-in the PoA monitoring database. The CPA implementing entities must provide the following data to the CME prior to the inclusion in the PoA:

Basic data required for the inclusion of CPA under the PoA	<input type="checkbox"/> Implementing Entity contact details (<i>viz. contact person, address, telephone and email address</i>) <input type="checkbox"/> CPA project capacity details <input type="checkbox"/> Geographical location of the CPA project site (<i>viz. Latitude, longitude and place of the project site</i>) <input type="checkbox"/> Implementation chronology CPA <input type="checkbox"/> Technology employed by the CPA
--	---

The basic data as listed above shall be provided by the CPA implementing entity to the CME prior to the inclusion under the PoA. The CME will be responsible for the management of the PoA monitoring database. All records will be stored at least for a period of two years after the end of the relevant crediting period of each individual CPA. Relevant data capture, verification and storage procedures will be followed in maintaining the data to ensure its accuracy, validity and completeness.

CPA Unique Identification Number

Under the PoA, each CPA shall be assigned a unique code by the CME viz. EVI. The code shall be assigned as per scheme below:

CPA	-	[XXX]
EVI assigned abbreviation for the CPA.		EVI assigned 3-digit numeric to the CPA. E.g. 001, 002, etc.

2. A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA

The PoA monitoring database as described above shall be developed by the CME and will be used to perform a double accounting check. Every new CPA will be compared to the already existing CME database and the list of project activities that are under validation, registered, rejected or withdrawn available in the UNFCCC website. Further the CPA project developers shall provide the land master plan along with clear definition of project site survey numbers and geo co-ordinates details. Moreover, the CPA project developers will be made aware of the double accounting principle and will ensure that the proposed CPA is not registered under the Clean Development Mechanism of the UNFCCC or any voluntary scheme for availing GHG emission reduction benefits. Should such a case occur, then the CME will not proceed with inclusion of the corresponding CPA under the proposed PoA.

Further to ensure that the CPA developer is aware of and have agreed that their activity is being subscribed to the PoA, the CPA project developer shall provide an undertaking to the CME of the PoA with the respective provisions as given below:

- ☐ the CPA is not a part of any other registered or proposed Programme of Activities (PoA)
- ☐ the CPA is not a part of any other registered or proposed CDM Programme Activity (CPA)
- ☐ the CPA is not a part of any other registered or proposed CDM Project Activity
- ☐ there is no other project activity developed by the Implementing Entity within a radius of 1 km of the boundary of the proposed CPA
- ☐ The implementing entity is aware that the CPA will be subscribed to NSPDP (as required by point (4) given below)

3. The CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity

The “TOOL20 – Assessment of debundling for small scale project activities”, version 04 is used to demonstrate that any CPA to be included in the PoA will not be a de-bundled component of a large scale activity.

Paragraph 15 of the guidelines states that, “For the purposes of registration of a Programme of Activities (PoA), a proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity, which satisfies both conditions (a) and (b) below:

- a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same technology/measure, and;
- b) The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.

The CME of the NSPDP does not manage any other large scale PoA of the same technology / measure within the host country.

The CME of the NSPDP shall have the sole authority to include the CPA under the PoA. In order to ensure de-bundling check, implementing entity of CPA before the inclusion under the PoA shall sign the undertaking (as part of the contractual agreement) complying with the requirement as mentioned in condition (b) above.

4. *The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA*

As mentioned in (2) above, the contractual agreement with CPA implementing entity will include an undertaking to the CME before inclusion of CPA to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA.

Monitoring plan:

The following information shall be provided here:

- (i) *Description of the proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse gases achieved by CPAs under the PoA.*
- (ii) *In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA (whether in groups or not, with different or identical verification periods) a transparent system is to be defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA;*

In the proposed PoA, *Option (ii)* is chosen i.e. coordinating / managing entity opts for a verification method that does not use sampling but verifies each CPA.

The monitoring plan is established in order to ensure that all CPAs under the PoA are monitored and verified effectively. The CME will ensure a robust record keeping system which is processed at three levels i.e. project site, CPA and PoA level. As also mentioned, each project site will be identified uniquely by its geographical coordinates and each CPA with a unique identification number. This will ensure that there occurs no double counting and that the status of verification can be checked at any time.

SECTION C. Demonstration of additionality of PoA

>>

1. *The proposed PoA is a voluntary coordinated action*

NSPDP is a voluntary coordinated action. There are no National/International regulations make the implementation of NSPDP mandatory. While there are certain policies / mission that promote the proposed technologies, these do not mandate its implementation.

The Jawaharlal Nehru National Solar Mission⁹ (JNNSM) launched in January 2010 is a major initiative of the Government of India which gives an impetus to tap the huge solar potential in India. However the mission relies on the voluntary participation from project developers and is only to help promote the implementation of solar power technology in India.

2. *If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA*

⁹

<http://mnre.gov.in/pdf/mission-document-JNNSM.pdf>

The CME has proposed to implement NSPDP to promote and accelerate the implementation of solar energy based power generation with support from potential CER revenues. In the absence of the CER revenues, the voluntary coordinated action by the managing entity would not be implemented. The justification of the same is presented by demonstrating the additionality of the PoA as the whole, which is done below.

As per paragraph 9 of “**Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities**”¹⁰, **Annex 3, Version 01.0, EB 65**” guidelines which states “*PoAs that consist of one or more small-scale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of Attachment A of Appendix B of the Simplified modalities and procedures for small-scale CDM project activities*”.

Accordingly the additionality of PoA has been demonstrated as per the “**Attachment A of Appendix B, Version 08, EB 63, Annex 24**”¹¹ of the simplified modalities and procedures for small scale CDM project activities”.

As per para 2 of the guidelines, which states, *the positive list of grid connected renewable electricity generation technologies are automatically defined as additional, without further documentation of barriers, consists of the following grid-connected renewable electricity generation technologies of installed capacity up to 15 MW:*

- a) *Solar technologies (photovoltaic and solar thermal electricity generation)*
- b) *Off-shore wind technologies*
- c) *Marine technologies*

The NSPDP PoA consists of grid-connected renewable energy generation technology i.e. **solar photovoltaic** and **solar thermal technologies**, of installed capacities upto **15 MW**. This is as per the eligibility criteria defined for the inclusion of the SSC-CPA(s) under the programme.

Thus in-line with the **Para 2 option (a)** of above guidelines, the PoA falls under the positive list of grid-connected renewable electricity generation technologies. Therefore is automatically **additional**.

Conclusion:

India's journey to tap solar energy has just started. It will be a long way till grid-connected solar power becomes an activity of significant stature. The NSPDP is indeed a very important step towards this. India's aspiration to attain a large scale grid-interactive solar power capacity from the present 32 MW¹² is a long way to go. However, there is a high technical potency as solar power projects – both PV and CSP do not have a long gestation period, and along with the CDM benefits, can galvanise the private investors to look up for solar power. The successful registration of NSPDP under CDM will instil confidence among the investors and the suppliers as a whole. Furthermore, NSPDP being an activity spread across the host country helps the market to expand tremendously and reflects India's seriousness of solar power objectives inter-alia reduces the GHG emissions ensuring overall sustainable development.

3. If the PoA is implementing a mandatory policy/regulation, this would/is not enforced

As the PoA is not implementing any mandatory policy/regulation, this condition is not applicable.

¹⁰ http://cdm.unfccc.int/Reference/Standards/meth/meth_stan04.pdf

¹¹ https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid05.pdf

¹² http://www.mnre.gov.in/annualreport/2010_11_English/Chapter1/chapter1_1.htm

4. If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation

As per the reasoning given for (3) above, this condition is also not applicable.

SECTION D. Start date and duration of PoA

D.1. Start date of PoA

>>
21/10/2010¹³

D.2. Duration of PoA

>>
28 Years, 00 Months

SECTION E. Environmental impacts

E.1. Level at which environmental impacts analysis is undertaken

- >>
1. Environmental Analysis is done at PoA level ☒
 2. Environmental Analysis is done at CPA level ☐

The CME has selected to demonstrate the Environmental Impact Assessment at the PoA level. As per the *Modalities and Procedures for a Clean Development Mechanism*¹⁴ which requires “project participants to submit an analysis on environmental impacts of the project activity in accordance with procedures as required by the host party”. In line with the above guidelines, the solar power generation projects in the host country do not require Environmental Impact Assessment analysis. The justification for the same is given below.

As per the Ministry of Environment and Forest (MoEF), Govt of India Office Memorandum dated 13/05/2011¹⁵, 30/06/2011¹⁶ and 14/08/2017¹⁷ it had received specific clarification regarding the applicability of EIA Notification, 2006 in respect of Solar Photo Voltaic (PV) and Solar Thermal Power plants. It was further clarified in both the above memorandums respectively that both Solar PV and Solar Thermal power projects are not covered under the ambit of EIA Notification, 2006 and no environment clearance is required for such projects under provisions thereof. Hence the PoA is excluded from carrying out the Environmental Impact Assessment.

E.2. Analysis of environmental impacts

>>
No formal environment impact assessment is required (refer above) for the proposed PoA as per the Ministry of Environment and Forests (MOEF), Govt. of India. The PoA does not pose any negative environmental impacts. It utilizes clean source of energy (solar), technology and seeks full support and encouragement from the communities (the beneficiaries).

¹³ The date of intimation sent to UNFCCC is taken as the start date of the PoA.

¹⁴ <http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=6>

¹⁵ <http://moef.nic.in/downloads/public-information/OM-SolarPV.pdf>

¹⁶ http://mnre.gov.in/file-manager/UserFiles/environmental_clearance_grid_connect_stp_jnnsn.pdf

¹⁷ <https://mnre.gov.in/file-manager/UserFiles/OM-Clarification-reg-EIA-for-Solar-Park.pdf>

E.3. Environmental impact assessment

>>

In line with justification provided above in E.1, Environmental Impact Assessment is not required for CPA under this PoA in accordance with the Host Party Laws/Regulations.

SECTION F. Local stakeholder consultation**F.1. Level at which local stakeholder consultation is undertaken**

>>

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at CPA level ☒

As the PoA is implemented across several geographical locations within India (project boundary), the CME finds it appropriate to conduct the local stakeholder consultation at CPA level. By conducting the local stakeholder consultation at CPA level, it will be possible to address the views and comments of the stakeholders in a better way than at the PoA level.

F.2. Modalities for local stakeholder consultation

>>

Not applicable as it will be given at CPA level.

F.3. Summary of comments received

>>

Not applicable as it will be given at CPA level.

F.4. Consideration of comments received



>>

Not applicable as it will be given at CPA level.

SECTION G. Approval and authorization

>>

Letter of approval from Host Party has been received for this PoA. Emergent Ventures India Pvt. Ltd. (EVI) is authorised as the coordinating and managing entities.

भारत सरकार
 पर्यावरण एवं वन मंत्रालय
 GOVERNMENT OF INDIA
 MINISTRY OF ENVIRONMENT AND FORESTS

No: 42/2012-CCC

3 April 2012.

To,
 Mr. Anil Singhal, Head
 Carbon Advisory
 Emergent Ventures India Pvt. Ltd
 Sector - 49, Sohna Road
 5th Floor, Universal Trade Tower
 Gurgaon- 122001
 Haryana


Sub: Host Country Approval to the Programme of Activities (PoA) - "National Solar Power Development Programme, India" by M/s Emergent Ventures India Pvt. Ltd (EVI) (Coordinating/ Managing entity- CME) - regarding CDM



Sir,

I am directed to state that the Project Design Document of the Programme of Activities (PoA) - "National Solar Power Development Programme, India" by M/s Emergent Ventures India Pvt. Ltd (EVI) (Coordinating/ Managing entity- CME) was considered by the National CDM Authority in its meeting held on 17 January 2012. The Authority confirms that:

- (i) The Government of India has ratified the Kyoto Protocol in August 2002.
- (ii) This is approval of voluntary participation in the proposed CDM Programme of Activities (PoA).
- (iii) The Programme of Activities (PoA) contributes to Sustainable Development in India.

Yours faithfully,


 (Rajiv Kumar)
 Deputy Secretary & C.J. and
 Member Secretary (National CDM Authority)

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT AND FORESTS

No: 42/2012-CCC

3 April 2012.

To,
Mr. Anil Sanghal, Head
Carbon Advisory
Emergent Ventures India Pvt. Ltd
Sector - 49, Soluna Road
5th Floor, Universal Trade Tower
Gurgaon-122001
Haryana

Sub: Host Country Approval to the Programme of Activities (PoA) - "National Solar Power Development Programme, India" by M/s Emergent Ventures India Pvt. Ltd (EVI) (Coordinating/Managing entity: CME) - regarding CDM

Sir,

Kindly refer to Ministry's letter No.: 42/2012-CCC dated 3 April 2012 conveying Host Country Approval to the Programme of Activities (PoA) - "National Solar Power Development Programme, India" by M/s Emergent Ventures India Pvt. Ltd (EVI) (Coordinating/Managing entity: CME)

Please note that the following conditions shall also be complied with:

- (i) The Managing/Coordinating Entity as well as individual proponent of CDM Programme Activity (CPAs) shall not sell the CERs to any agency/ company/ organization, which purchases the CERs using ODA Funds.
- (ii) The Managing/Coordinating Entity as well as individual proponent of CDM Programme Activity (CPAs) shall furnish expeditiously any information, during the lifetime of the project as requested by the National CDM Authority.
- (iii) The Managing/Coordinating Entity as well as individual proponent CDM Programme Activity (CPAs) shall obtain all statutory clearances and other approvals as required from the competent authorities for setting up of the project.
- (iv) The Managing/Coordinating Entity shall inform biennially the National Clean Development Mechanism Authority (NCDMA) of all CDM Programme Activity (CPAs) added into the PoA during the interim that do not require any clearance from competent authorities e.g. distribution of Compact Fluorescent Lamp (CFLs) etc.
- (v) All activities relating to CDM project activity shall comply with the decisions taken by COP/MOP to the UNFCCC and CDM-Executive Board.
- (vi) The Managing/Coordinating Entity of the PoA shall ensure that all CDM Programme Activity (CPAs) are duly registered/incorporated by Indian Authorities prior to their joining the PoA.
- (vii) This approval is not transferable. The authority reserves the right to revoke this Host Country Approval if the conditions stipulated in this approval are not complied with to the satisfaction of the National CDM Authority.

Yours faithfully,
(Rajiv Kumar)
Deputy Secretary (CCDM)
Member Secretary (National CDM Authority)

पर्यावरण प्रान्त, सी.जी.ओ. कोम्प्लेक्स, लोदी रोड, नई दिल्ली - 110 003

PART II. Generic component project activity (CPA)

SECTION H. Description of generic CPA

H.1. Title of generic CPA

>>

CPA - <include the 3 digit identification number>: <Include the capacity of CPA> MW Solar <cite in either PV or CSP> power project, <name of the district>, <name of the state>, India

Version : <version number>

Date : <dd/mm/yyyy>

H.2. Reference number of generic CPA

>>

CPA - <Include the 3 digit numeric assigned by CME to the SSC-CPA>

H.3. Purpose and general description of generic CPA

>>

<Include the title of CPA> is a part of the Programme of Activities (PoA) titled "National Solar Power Development Programme, India".

The implementing entity of the CPA is <Name of the implementing entity>, which proposes to develop <capacity of CPA> MW grid connected solar <include whether PV or CSP> power project in <name of district> District, <name of the state> State in India. The exact geographic reference of the CPA is provided in the relevant section of the CDM-CPA-DD.

The CPA consists of the power generation through eco-friendly resource of energy i.e. solar, which is a safe and proven technology. The technical description is provided in section A.4 of the CDM-CPA-DD. The generated power <include voltage at which the power is generated> from the CPA will be inverted from Direct Current (DC) to Alternating Current (AC) by using an Inverter <include Inverter specifications>, then boosted by transformers <include transformer specifications> and finally delivered to India's National grid via <include feeder voltage> outlet circuits.

The project activity will evacuate an average of <include net electricity generated> MWh of renewable power annually to the India's National grid system in India. The electricity thus generated shall *inter-alia* contributes to an average GHG reductions estimated at <include emission reductions achieved> tCO₂e / annum.

CPA falls under TYPE I: Renewable Energy Projects.

Physical location of CPA:

The physical location of the CPA project site is marked-up in the maps given below: <CPA to include maps specifying the state, district and the village / town of the project site>

The CPA can be identified using the geographic references specified below.

Table 1 Location of the CPA project site (s)

	Parameter	Description
Geographic location of the CPA	Village	<name of the village>
	Town	<name of the town>
	District	<name of the district>
	State	<name of the state>
	Latitude	<project site latitude>
	Longitude	<project site longitude>

H.4. Technologies/measures

>>

The CPA proposes to use the following technology option for generation of power <please check against the technology option below>:

Solar Photovoltaic (SPV) based power generation systems

Concentrated Solar Power (CSP) based power generation systems

Table 2 (a) Salient features of the CPA (photo voltaic based)

Area	Parameter	Unit	Description	Source
Technical Parameters	Installed capacity	MWp	<capacity>	
	Plant load factor	%	<Plant load factor>	
	Technical lifetime	year	<Design data >	
	Area covered	acres	<area covered>	
PV Module	Type of PV module	-	<type of module>	

	Number of Modules	Nos	<no of modules>	
	Maximum Power (P_{max})	Watt p	<maximum power>	
	Mounting Type	-	<mounting type>	
Inverter/ Power Conditioning Unit	Number of units	Nos	<number of units>	
	Rated Capacity	kWp	<rated capacity>	
	Input Voltage	V _{DC}	<input voltage>	
	Output Voltage	V _{AC}	<output voltage>	
	Frequency	Hz	<frequency>	

Table 2 (b) Salient features of the CPA (concentrated solar power based)

Parameter	Unit	Description	Source
Installed Capacity	MWp	<capacity>	
Plant Load Factor	%	<Plant load factor>	
Proposed area	Acres	<area>	
Turbine capacity	kW	<turbine capacity>	
Type of Concentrated solar collector	-	<type of solar collector>	
Type of working fluid	-	<type of working fluid>	
Type of heat transfer fluid	-	<type of heat transfer fluid>	

Table 3 Grid connection details of CPA

Parameter	Unit	Description
Grid Connectivity	-	<NEWNE / Southern > grid
Power Generation Voltage	Volts	<power generation voltage>
Transformer specifications	-	<transformer specification>
Interconnecting voltage	Kv	<interconnecting voltage>
Feeder Voltage	Kv	<feeder voltage>
Nearest Substation Distance	Kms	<distance>

SECTION I. Application of methodologies and standardized baselines

I.1. References to methodologies and standardized baselines

>>

AMS-I.D: Small-scale Methodology: Grid connected renewable electricity generation, Version 18.0; <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion; <https://cdm.unfccc.int/Reference/tools/index.html>

TOOL07: Tool to calculate the emission factor for an electricity system" (Version 07.0)); <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

TOOL11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period; <https://cdm.unfccc.int/Reference/tools/index.html>

TOOL21: Demonstration of additionality of small scale project activities;
<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-21-v12.pdf>

I.2. Applicability of methodologies and standardized baselines

>>

The position of the PoA vis-à-vis their applicability conditions in the AMS-I.D, Version-18 is described in the following table.

Applicability Conditions	Position of the project activity vis-à-vis applicability conditions																								
<p><i>This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal, and renewable biomass:</i></p> <p><i>(a) Supplying electricity to a national or a regional grid.</i></p> <p><i>(b) Supplying electricity to an identified consumer facility via national / regional grid through a contractual agreement such as wheeling.</i></p>	<p>The CPA(s) under the PoA will consist of only solar energy based generation units (i.e. photovoltaic or solar thermal) and the generated power will be exported either directly to the national grid or to an identified consumer via national grid system.</p> <p>Thus, meets the applicability condition.</p>																								
<p><i>Illustration of situations under which the methodology applies as given in the table below:</i></p> <table><tr><th>Project type</th><th>AMS-I.A</th><th>AMS-I.D</th><th>AMS-I.F</th></tr><tr><td>1 Project supplies electricity to a national/regional grid</td><td></td><td>√</td><td></td></tr><tr><td>2 Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)</td><td></td><td></td><td>√</td></tr><tr><td>3 Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)</td><td></td><td>√</td><td></td></tr><tr><td>4 Project supplies electricity to a mini grid¹⁷ system where in the baseline all generators use exclusively fuel oil and/or diesel fuel</td><td></td><td></td><td>√</td></tr><tr><td>5 Project supplies electricity to household users (included in the project boundary) located in off grid areas</td><td>√</td><td></td><td></td></tr></table>	Project type	AMS-I.A	AMS-I.D	AMS-I.F	1 Project supplies electricity to a national/regional grid		√		2 Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			√	3 Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√		4 Project supplies electricity to a mini grid ¹⁷ system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√	5 Project supplies electricity to household users (included in the project boundary) located in off grid areas	√			<p>The power generated by the CPA(s) under the PoA will be supplied to national grid or to an identified consumer via national grid. This confirms to point (1) & (3) of the table.</p> <p>Thus, meets the applicability condition.</p>
Project type	AMS-I.A	AMS-I.D	AMS-I.F																						
1 Project supplies electricity to a national/regional grid		√																							
2 Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			√																						
3 Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√																							
4 Project supplies electricity to a mini grid ¹⁷ system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√																						
5 Project supplies electricity to household users (included in the project boundary) located in off grid areas	√																								
<p><i>This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).</i></p>	<p>All CPA(s) under the PoA shall install new solar power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity i.e. Greenfield power plants.</p> <p>Thus, meets the applicability condition.</p>																								
<p><i>Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</i></p> <ul style="list-style-type: none"><input type="checkbox"/> <i>The project activity is implemented in an existing reservoir with no change in the volume of reservoir;</i><input type="checkbox"/> <i>The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2;</i><input type="checkbox"/> <i>The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m2.</i>	<p>The CPA(s) under the PoA includes power generation by solar resource and not by hydro resource.</p> <p>Thus, the condition is not applicable.</p>																								

<i>If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.</i>	<p>The CPA under the PoA shall not have any co-firing systems.</p> <p>However, in case of combination of renewable and non-renewable components (hybrid systems such as solar-natural gas, solar-diesel or other fossil fuel systems), the renewable component shall be less than 15MW capacity.</p> <p>Thus, meets the applicability condition.</p>
<i>Combined heat and power (co-generation) systems are not eligible under this category.</i>	<p>The CPA(s) under the PoA will involve only power generation system and no co-generation systems (i.e. heat and power) are involved.</p> <p>Thus, meets the applicability condition.</p>
<i>In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units..</i>	<p>All CPA(s) under the PoA shall install new solar power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity i.e. Greenfield power plants.</p> <p>.</p> <p>Thus, the condition is not applicable.</p>
<i>In the case of retrofit or replacement, to qualify as a small scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW</i>	<p>The CPA(s) under the PoA shall not include retrofitting or modification of an existing facility for renewable energy generation.</p> <p>Thus, the condition is not applicable.</p>
<i>In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as "AMS-I.C.: Thermal energy production with or without electricity" shall be explored.</i>	<p>The CPA(s) under the PoA includes only solar power generation projects and not methane recovery, heat generation or cogeneration project activities.</p> <p>Thus, the condition is not applicable.</p>
<i>In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.</i>	<p>The CPA(s) under the PoA includes only solar power generation projects and not biomass project activities.</p> <p>Thus, the condition is not applicable.</p>

I.3. Application of multiple methodologies

>>

Not applicable.

I.4. Project boundary, sources and greenhouse gases (GHGs)

>>

The greenhouse gas reduced by the CPA under the PoA is carbon dioxide. This reduction will take place due to the avoidance of the fossil fuels (i.e., coal, gas and fuel oil) usage for electricity generation purpose, which otherwise would have been used for the purpose of electricity generation by thermal power plants.

As per the methodological choice AMS-I.D, the project boundary for a small-scale solar power project which supplies electricity to a grid encompasses the physical, geographical site of the renewable generation source. Thus the baseline includes the emissions related to the electricity produced by the facilities and power plants to be displaced by the CPA. This involves emissions from displaced fossil fuel use at power plants connected to the national grid (see table below).

Source		GHG	Included ?	Justification/Explanation
Baseline	CO ₂ emissions from electricity generation in thermal power generating units.	CO ₂	Yes	Main emission source.
		CH ₄	No	Minor emission source.
		N ₂ O	No	Minor emission source.
Project activity	Use of <mention whether SPV or CSP> technology for electricity generation using solar energy.	CO ₂	No	Minor emission source.
		CH ₄	No	Minor emission source.
		N ₂ O	No	Minor emission source.

1.5. Establishment and description of baseline scenario

>>

As per paragraph 19 of AMS I.D, Version.18.0 “The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid”.

NSPDP being the generation of electricity using solar power technology and exporting the same to the national grid system, the baseline scenario is the electricity delivered to the grid, generated by the operation of fossil fuel dominated grid-connected power plants.

Assessment of the validity of the original/current baseline based on “TOOL11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” is carried out in following steps:

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

In 2010 Ministry of New and Renewable Energy launched Jawaharlal Nehru National Solar Mission (JNNSM) which aimed at deploying 20,000 MW of grid connected solar power by 2022. In July 2015, Government of India revised the National Solar Mission (NSM)¹⁸ target of grid connected solar power projects from 20,000 MW to 100,000 MW by the year 2021-22. Also aligned with NSM, India included these targets in its first NDC¹⁹ document. Accordingly, Government of India raised its ambition to achieve 175,000 MW of renewable energy by 2022 including from solar power projects. However, NDC mentions that the targets are “Conditional” and achieving these goals would need financial support through various global climate finance mechanisms. It is evident from this that solar power development though is on an accelerated path than ever before but would need continued support and that overall policy framework of India on solar power is governed by NSM and NDC targets. This indicates that original baseline still complies with national and/or sectoral policies.

Step 1.2: Assess the impact of circumstances

¹⁸ https://mnre.gov.in/sites/default/files/uploads/mission_document_JNNSM.pdf

¹⁹ <https://www4.unfccc.int/sites/submissions/indc/Submission%20Pages/submissions.aspx>

On 31st December 2013, with the connection of Southern Region to Central Grid in Synchronous mode India achieved 'ONE NATION'-'ONE GRID'-'ONE FREQUENCY' for India. That is, India has now one national grid covering whole of India and no separate regional grids exist. This will have no impact on baseline emissions as national grid emission factor will be considered for any new CPA inclusion in PoA or at the time of renewal of existing CPAs.

Hence conditions used to determine baseline emissions are still valid. There is no impact of circumstances on original baseline.

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

Not applicable as the projects in the PoA are all green field projects.

Step 1.4: Assessment of the validity of the data and parameters

To determine baseline emissions, the data available at the time of inclusion of the CPA shall be used for estimation of grid emission factor in the CDM-CPA-DD. No data is fixed ex ante in CDM-POA-DD.

Hence, original baseline is still valid at the renewal of crediting period.

I.6. Estimation of emission reductions

I.6.1. Explanation of methodological choices

>>

As stated in section I.5 above, the baseline scenario for the CPAs will be the electricity delivered to the national grid or to a third party through grid system.

As per para 22 of AMS ID, Version 18.0 *“Baseline emissions include only CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:*

$$BE_y = EG_{PJ,y} * EF_{grid,y}$$

Where:

BE_y = Baseline Emissions in year y (t CO₂)

$EG_{PJ,y}$ =Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{grid,y}$ =Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh)”

The Emission Factor can be calculated in a transparent and conservative manner as follows

- a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the Emission Factor for an electricity system'.

OR

- b) The weighted average emissions (in kg CO₂e/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Based on the above description, the CME has chosen to consider option (a) i.e. combined margin emission factor as the emission factor to be used for the calculation of emission reductions. The baseline emission factor (EF_y) as per the tool is calculated as a combined margin (CM), consisting of the combination of Operating Margin (OM) and Build Margin (BM) factors according to the following steps:

1. Identify the relevant electricity power system
2. Choose whether to include off-grid power plants in the project electricity systems (Optional)
3. Select a method to determine the operating margin (OM)
4. Calculate the Operating Margin emission factor according to the selected method
5. Calculate the build margin (BM) emission factor
6. Calculate the combined margin (CM) emissions factor

Step 1: Identify the relevant electricity power system.

The tool²⁰ defines the electric power system as the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity and that can be dispatched without significant transmission constraints. Keeping this into consideration, the Central Electricity Authority (CEA)²¹ in India has defined the whole country as a unified single national grid.

The proposed PoA being implemented across India, the electricity generated by the CPA(s) will displace the electricity from the national grid in India. Thus all the power generation facilities connected to the national grid form the boundary for the purpose of baseline estimation.

Step 2: Choose whether to include off-grid power plants in the project electricity systems (Optional)

CPA implementing entities may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

For the purpose of calculation of operating margin, only grid connected power plants (Option I) have been included.

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor (EF_{OM,y}) is based on one of the following methods:

- (a) Simple OM, or
- (b) Simple adjusted OM, or
- (c) Dispatch data analysis OM, or
- (d) Average OM

²⁰

<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

²¹

http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf

Any of the four methods can be used. However, the simple OM method (option a) can be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

The CME has chosen to apply Simple OM for the CPA(s). The conditions to apply Simple OM will be ascertained at the time of CPA inclusion. In case, conditions for Simple OM are not fulfilled, other methods according to the “TOOL7: Tool to calculate the emission factor for an electricity system” will be considered at the time of CPA inclusion.

For the simple OM, the emissions factor can be calculated using either of the two following data vintages:

- ☐ *Ex ante* option: A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period,
- Or
- ☐ *Ex post* option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. If the data required calculating the emission factor for year y is usually only available later than six months after the end of year y, alternatively the emission factor of the previous year (y-1) may be used. If the data is usually only available 18 months after the end of year y, the emission factor of the year proceeding the previous year (y-2) may be used. The same data vintage (y, y-1 or y-2) should be used throughout all crediting periods.

The CME has chosen to apply ex-ante option for the CPA(s).

Step 4: Calculate the Operating Margin emission factor according to the selected method.

The simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost / must-run power plants / units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y}$$

Where:

- | | |
|------------------------|--|
| $EF_{grid,OMsimple,y}$ | = Simple operating margin CO ₂ emission factor in year y (tCO ₂ / MWh) |
| $FC_{i,y}$ | = Amount of fuel type i consumed in the project electricity system in year y (mass or volume unit) |
| $NCV_{i,y}$ | = Net calorific value (energy content) of fuel type i in year y (GJ/mass or volume unit) |
| $EF_{CO2,i,y}$ | = CO ₂ emission factor of fossil fuel type i in year y (tCO ₂ /GJ) |
| EG_y | = Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh) |
| i | = All fuel types combusted in power sources in the project electricity system in year y |
| y | = either the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation. |

Step 5: Calculate the build margin (BM) emission factor

The build margin (BM) emission factor can be calculated by choosing between one of the following two options:

Option 1

For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2

For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Option 1 as described above is chosen by the managing entity. BM is calculated ex-ante based on the most recent information available at the time of inclusion of CPA and is fixed for the entire crediting period of the respective CPA under the PoA. The build margin emissions factor is the generation-weighted average emission factor (tCO₂/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO ₂ emission factor in year y (tCO ₂ /MWh).
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh).
$EF_{EL,m,y}$	=	CO ₂ emission factor of power unit m in year y (tCO ₂ /MWh)
m	=	Power units included in the build margin.
y	=	Most recent historical year for which power generation data is available.

Step 6: Calculate the combined margin emissions factor

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

- (a) Weighted average CM; or
- (b) Simplified CM.

The option (a) i.e. Weighted Average CM given above is chosen and the combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO ₂ emission factor in year y (tCO ₂ /MWh)
$EF_{grid,OM,y}$	=	Operating margin CO ₂ emission factor in year y (tCO ₂ /MWh)
w_{OM}	=	Weighting of operating margin emissions factor (%)
w_{BM}	=	Weighting of build margin emissions factor (%)

Where: weights w_{OM} and w_{BM} , by default are $w_{OM} = 0.75$ and $w_{BM} = 0.25$, as per "TOOL7: Tool to calculate the emission factor for an electricity system",

The grid emission factor shall be calculated as per the above procedure for all the CPA(s), and

will be fixed ex-ante throughout the respective crediting periods. The data (used in the above procedure) available at the time of inclusion of the CPA shall be used for estimation of grid emission factor in the CDM-CPA-DD.

The emission reductions for a given year is calculated as baseline emission minus the project emission and leakage, as stipulated in the referred methodology AMS –I D:

I.6.2. Data and parameters fixed ex ante

(Copy this table for each piece of data and parameter.)

Data/Parameter	$EF_{grid,OM,y}$
Data unit	tCO ₂ eq/MWh
Description	Operating Margin emission factor of the national grid
Source of data	<Indicate version and date> of Central Electricity Authority (CEA) CO ₂ Baseline Database.
Value(s) applied	<CPA implementer to apply the value as per the grid connectivity>
Choice of data or Measurement methods and procedures	The CPA owners used the latest operating margin emission factor database available on the CEA website and fix the value ex-ante.
Purpose of data	Baseline emission calculation
Additional comment	The Operating Margin emission factor value determined is fixed for the entire crediting period of the CPA.

Data/Parameter	$EF_{grid,BM,y}$
Data unit	tCO ₂ eq/MWh
Description	Build Margin emission factor of the national grid
Source of data	<Indicate version and date> of Central Electricity Authority (CEA) CO ₂ Baseline Database.
Value(s) applied	<CPA implementer to apply the value as per the grid connectivity>
Choice of data or Measurement methods and procedures	The CPA owners used the latest build margin emission factor database available on the CEA website and fix the value ex-ante.
Purpose of data	Baseline emission calculation
Additional comment	The Build Margin emission factor value determined is fixed for the entire crediting period of the CPA.

Data/Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ eq/MWh
Description	Combined Margin emission factor of the national grid
Source of data	Calculated from the Operating and the Build margin emission factor.
Value(s) applied	<CPA implementer to apply the value as per the grid connectivity>
Choice of data or Measurement methods and procedures	The procedure followed to calculate the Combined Margin emission factor is justified as per the latest version of "Tool to calculate emission factor for an electricity system".
Purpose of data	Baseline emission calculation
Additional comment	The Combined Margin emission factor value determined is fixed for the entire crediting period of the CPA.

I.6.3. Modalities for ex ante calculation of emission reductions

>>

The emission reductions for a given year shall be calculated as:

Emission reductions:

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y	=	Emission Reductions in the y^{th} year
BE_y	=	Baseline Emissions in the y^{th} year
PE_y	=	Project Emissions in the y^{th} year
LE_y	=	Leakage in the y^{th} year

Baseline Emissions:

Baseline Emissions shall be calculated by multiplying the net quantity of electricity supplied by the CPA ($EG_{PJ, y}$) with the CO₂ baseline emission factor for the electricity displaced due to the project ($EF_{CO2, grid, y}$) as follows:

$$BE_y = EG_{PJ, y} * EF_{CO2, grid, y}$$

Since CPA(s) under the PoA shall install new solar power plant only at a site where there was no renewable energy power plant operating prior to the implementation of the project activity i.e. Greenfield power plants therefore,

For Greenfield power plants

$$EG_{PJ, y} = EG_{PJ, facility, y}$$

Where:

$EG_{PJ, facility, y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

Project emissions:

The CPA(s) under the PoA implementing grid connected *solar power generation*, which is a renewable source of power, thus will have no project emissions.

However, as part of the *Hybrid* technology, diesel or natural gas or other fossil fuel generator shall be used to meet the back-up or emergency requirements of power house will be installed. Emissions resulting from usage of fossil fuel generator will be accounted as project emissions based on the following equation as provided in the “**Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion**²²” version 3.

CO₂ emissions from fossil fuel combustion in process j are calculated based on the quantity of fuels combusted and the CO₂ emission coefficient of those fuels, as follows:

$$PE_{FC, j, y} = \sum FC_{i, j, y} \times COEF_{i, y}$$

Where:

- $PE_{FC, j, y}$ = Are the CO₂ emissions from fossil fuel combustion in process j during the year y (tCO₂/yr);
- $FC_{i, j, y}$ = Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr);
- $COEF_{i, y}$ = Is the CO₂ emission coefficient of fuel type i in year y (tCO₂/mass or volume unit)
- i = Are the fuel types combusted in process j during the year y

The CO₂ emission coefficient $COEF_{i, y}$ can be calculated using one of the following two Options, depending on the availability of data on the fossil fuel type i , as follows:

Option A: The CO₂ emission coefficient $COEF_{i, y}$ is calculated based on the chemical composition of the fossil fuel type i , using the following approach:

²²

<https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-03-v3.pdf>

If $FC_{i,j,y}$ is measured in a mass unit: $COEF_{i,y} = W_{c,i,y} \times 44/12$
 If $FC_{i,j,y}$ is measured in a volume unit: $COEF_{i,y} = W_{c,i,y} \times \rho_{i,y} \times 44/12$

Where:

$COEF_{i,y}$ = Is the CO₂ emission coefficient of fuel type i (tCO₂/mass or volume unit);
 $W_{c,i,y}$ = Is the weighted average mass fraction of carbon in fuel type i in year y (t C/mass unit of the fuel);
 $\rho_{i,y}$ = Is the weighted average density of fuel type i in year y (mass unit/volume unit of the fuel)
i = Are the fuel types combusted in process j during the year y

Option B: The CO₂ emission coefficient $COEF_{i,y}$ is calculated based on net calorific value and CO₂ emission factor of the fuel type i, as follows:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO_2,i,y}$$

Where:

$COEF_{i,y}$ = CO₂ emission coefficient of fuel type i in year y (tCO₂/mass or volume unit)
 $NCV_{i,y}$ = weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)
 $EF_{CO_2,i,y}$ = weighted average CO₂ emission factor of fuel type i in year y (tCO₂/GJ)
i = fuel types combusted in process j during the year y

Considering the industry practice of keeping the records of NCV of fuel in India, the CME has selected the option B for calculating CO₂ emission coefficient ($COEF_{i,y}$). Hence, the project emissions for the proposed project activity can be calculated as follows:

$$PE_{i,j,y} = FC_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,y}$$

Where,

$FC_{i,j,y}$ = quantity of fossil fuel used during the year
 $NCV_{i,y}$ = weighted average net calorific value of fuel type i in year y
 $EF_{CO_2,i,y}$ = weighted average CO₂ emission factor of fuel type i in year y

Leakage Emissions:

No leakage emissions are considered for the SSC-CPA(s) since no energy generating equipment will be transferred from another activity and no existing equipment will be transferred to another activity.

$$LE_y = 0 \text{ tCO}_2/\text{year}$$

There is no GHG emission within the project boundary. So the above equation is simplified to

$$ER_y = BE_y - PE_y$$

I.7. Monitoring plan

I.7.1. Data and parameters to be monitored

(Copy this table for each piece of data or parameter.)

Data/Parameter	EG _{PJ, facility, y}
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year <i>y</i> .
Source of data	Electricity meter(s)
Value(s) applied	<CPA implementer to apply the value as per the net electricity exported>
Measurement methods and procedures	Data Type: <measured / calculated / estimated> Recording Frequency: <include the recording frequency i.e. hourly / monthly> Calibration Frequency: <include the calibrating frequency> Archiving Policy: <paper and / or electronic> Accuracy Class: <include the accuracy class>
Monitoring frequency	Recording Frequency: <include the recording frequency i.e. hourly / monthly>
QA/QC procedures	<include the explanation on the recording procedure applied by the CPA implementer and also the QA/QC procedure employed to check the net electricity exported to the grid>
Purpose of data	Baseline and emission reduction calculation
Additional comment	The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each CPA.

Data/Parameter	FC _{i, j, y}
Data unit	Mass or volume unit/yr
Description	Quantity of fuel type <i>i</i> combusted in process <i>j</i> during the year <i>y</i>
Source of data	Onsite measurements
Value(s) applied	<CPA implementer to apply the value as per the fossil fuel used>
Measurement methods and procedures	Data Type: <measured / calculated / estimated> Recording Frequency: <include the recording frequency i.e. hourly / monthly> Calibration Frequency: <include the calibrating frequency> Archiving Policy: <paper and / or electronic> Accuracy Class: <include the accuracy class>
Monitoring frequency	Recording Frequency: Continuously
QA/QC procedures	The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. Where the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records
Purpose of data	Project and emission reduction calculation
Additional comment	The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each CPA.

Data/Parameter	NCV _{i, y}
Data unit	GJ/mass or volume unit

Description	Weighted average net calorific value of fuel type i in year y															
Source of data	<p><include source of data></p> <table border="1"> <thead> <tr> <th></th><th>Data source</th><th>Conditions for using the data source</th></tr> </thead> <tbody> <tr> <td>a)</td><td>Values provided by the fuel supplier in invoices</td><td>This is the preferred source if the carbon fraction of the fuel is not provided (Option A)</td></tr> <tr> <td>b)</td><td>Measurements by the project participants</td><td>If (a) is not available</td></tr> <tr> <td>c)</td><td>Regional or national default values</td><td>If (a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)</td></tr> <tr> <td>d)</td><td>IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2(Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (a) is not available</td></tr> </tbody> </table>		Data source	Conditions for using the data source	a)	Values provided by the fuel supplier in invoices	This is the preferred source if the carbon fraction of the fuel is not provided (Option A)	b)	Measurements by the project participants	If (a) is not available	c)	Regional or national default values	If (a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)	d)	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2(Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If (a) is not available
	Data source	Conditions for using the data source														
a)	Values provided by the fuel supplier in invoices	This is the preferred source if the carbon fraction of the fuel is not provided (Option A)														
b)	Measurements by the project participants	If (a) is not available														
c)	Regional or national default values	If (a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)														
d)	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2(Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If (a) is not available														
Value(s) applied	<CPA implementer to apply the value as per the fossil fuel used>															
Measurement methods and procedures	<p>Data Type: <measured / calculated / estimated> Recording Frequency: <include the recording frequency i.e. hourly / monthly> Calibration Frequency: <include the calibrating frequency> Archiving Policy: <paper and / or electronic> Accuracy Class: <include the accuracy class></p> <p>For (a) and (b): Measurements should be undertaken in line with national or international fuel standards</p>															
Monitoring frequency	<p>Recording Frequency:</p> <p>For (a) and (b): The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated. For (c): Review appropriateness of the values annually. For (d): Any future revision of the IPCC Guidelines should be taken into account</p>															
QA/QC procedures	<p>Verify if the values under (a), (b) and (c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in (a), (b) or (c) should have ISO17025 accreditation or justify that they can comply with similar quality standards</p>															
Purpose of data	Project and emission reduction calculation															
Additional comment	The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each CPA.															

Data/Parameter	EF _{CO₂, i, y}
Data unit	tCO ₂ /GJ

Description	Weighted average CO ₂ emission factor of fuel type i in year y															
Source of data	<p><include source of data></p> <table border="1"> <thead> <tr> <th></th><th>Data source</th><th>Conditions for using the data source</th></tr> </thead> <tbody> <tr> <td>a)</td><td>Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr> <tr> <td>b)</td><td>Measurements by the project participants</td><td>If (a) is not available</td></tr> <tr> <td>c)</td><td>Regional or national default values</td><td>If (a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)</td></tr> <tr> <td>d)</td><td>IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2(Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (a) is not available</td></tr> </tbody> </table>		Data source	Conditions for using the data source	a)	Values provided by the fuel supplier in invoices	This is the preferred source	b)	Measurements by the project participants	If (a) is not available	c)	Regional or national default values	If (a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)	d)	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2(Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If (a) is not available
	Data source	Conditions for using the data source														
a)	Values provided by the fuel supplier in invoices	This is the preferred source														
b)	Measurements by the project participants	If (a) is not available														
c)	Regional or national default values	If (a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)														
d)	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2(Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If (a) is not available														
Value(s) applied	<CPA implementer to apply the value as per the fossil fuel used>															
Measurement methods and procedures	<p>Data Type: <measured / calculated / estimated> Recording Frequency: <include the recording frequency i.e. hourly / monthly> Calibration Frequency: <include the calibrating frequency> Archiving Policy: <paper and / or electronic> Accuracy Class: <include the accuracy class></p> <p>For (a) and (b): Measurements should be undertaken in line with national or international fuel standards</p>															
Monitoring frequency	<p>Recording Frequency:</p> <p>For (a) and (b): The CO₂ emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated. For (c): Review appropriateness of the values annually. For (d): Any future revision of the IPCC Guidelines should be taken into account</p>															
QA/QC procedures	<include the explanation on the recording procedure applied by the CPA implementer and also the QA/QC procedure employed >															
Purpose of data	Project and emission reduction calculation															
Additional comment	<p>The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each CPA.</p> <p>Applicable where option B is used. For (a): If the fuel supplier does provide the NCV value and the CO₂ emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO₂ factor should be used. If another source for the CO₂ emission factor is used or no CO₂ emission factor is provided, Options (b), (c) or (d) should be used</p>															

1.7.2. Sampling plan

>>

In the proposed PoA, the CME opts for a verification method that does not use sampling but verifies each CPA.

1.7.3. Other elements of monitoring plan

>>

1. Monitoring Objective

The objective of the monitoring plan is to assure the complete, consistent, clear, and accurate monitoring and calculation of the project emission reductions during the whole crediting period. The CPA owner is responsible for the implementation of the monitoring plan.

2. Metering System

Table 5 shows the metering system installed by the project owner for data management of quantity of electricity supplied to the grid:

Table 4 Metering System

Monitoring Parameter	Metering System	Status (Yes / No)
Net electricity supplied to the grid by the SSC-CPA	Main Meter	Yes / No
	Back-up Meter	Yes / No

3. Monitoring Responsibility

The SSC-CPA implementing entity will appoint personnel responsible for supervising, verifying and recording data for clear and accurate monitoring and calculation of the project emission reductions during the whole crediting period. The assigned responsibilities and the authorized persons to accomplish the same are given in Table 6 below:

Table 5 Monitoring Responsibilities

Responsibility	Authorized / Assigned person
Recording of meter reading	<authorized representative>
Maintaining log sheets	<authorized representative>
Generation of daily and monthly generation report	<authorized representative>
Data archiving and record keeping	<authorized representative>
Training of the personnel involved in the monitoring of data	<authorized representative>
Calibration of meters	<authorized representative>
Communication with PoA CME and DOE	<authorized representative>

4. QA/ QC procedure

<Include explanation on QA / QC procedure adopted by the SSC-CPA owner>

5. Crosschecking

<Include explanation on how the net electricity injected into the grid is cross-checked>

6. Procedure for handling uncertainties

<Include explanation on how the data uncertainties are handled under the SSC-CPA>

7. Data Storage and Archiving

Readings from energy meter will be collected under the supervision of the <authorized person>. The data would be recorded and stored in logs as well as in electronic form. The records are checked periodically by the <authorized person> and discussed thoroughly with the <authorized person>. The data's will be kept at safe storage for verification of emission reductions generated from the CPA. All the data monitored under the monitoring plan will be kept for two years after the end of crediting period or till the last issuance of CERs, whichever occurs later.

8. Training

All employees responsible for operation, maintenance and monitoring related to the estimation of CER will be trained by experts in accordance with the monitoring plan. The training programs include the on-site operation rules, monitoring requirements, safety codes and inspection specifications, etc.

SECTION J. Crediting period type and duration

>>

☐ 10 years fixed

☐ 7 years twice renewable
SECTION K. Eligibility criteria for inclusion of CPAs

>>

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion
1	Geography	The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA;	<p>The geographic boundary set for the PoA is India (host country). The CPA location is verified against this by the CME. The details of CPA location provided by the IE shall be crosschecked with one or more of the following documents by the CME at the time of inclusion to the PoA:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Project Detailed Project Report <input type="checkbox"/> Land documents with clear definition of the project location <input type="checkbox"/> Geo co-ordinates of the project site using GPS device <input type="checkbox"/> EPC / Purchase Order / Letter of Intent with site location details <input type="checkbox"/> Any Statutory Approvals / clearance received for the project having the mention of project location details
2	Double counting	<p>Conditions to avoid double counting of GHG emission reductions or net anthropogenic GHG removals, such as unique identifications of product and end-user locations (e.g. programme logo);</p> <p>Conditions to confirm that CPAs are neither registered as CDM project activities, included in another</p>	<p>The double counting of emission reduction occurs when the CPA part of the present PoA has been registered or has proposed to register under the Clean Development Mechanism of the UNFCCC or any other voluntary scheme for availing GHG emission reduction benefits. Should such a case occur, then the CME will not proceed with inclusion of the corresponding CPA under the proposed PoA. In order to avoid the same, the CME shall assign a Unique Identification Number to the CPA(s) and shall cross verify with the following documents / sources at the time of CPA inclusion to the PoA and submit one of the below to the DOE at the time of validation / verification:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Project location with any of the documents mentioned in point (a) <input type="checkbox"/> Cross-checking of the CPA geo co-ordinates. <input type="checkbox"/> Comparing between the CME database and the list of project activities that have submitted prior consideration for CDM, that are under validation, registered, rejected or withdrawn available in the UNFCCC website <input type="checkbox"/> Undertaking from the CPA project developer.

		registered PoAs, nor the project activities that have been deregistered;	
3	Technology measures	Specification of the technology/measure, such as the level and type of service, as well as performance specification based on, inter alia, testing/certification	<p>The technology / measure allowed under the PoA are either <i>Solar Photovoltaic's</i> or <i>Concentrated Solar Power</i> based generation systems. Export of generated power is allowed either directly to the national grid or to an identified consumer via national grid system.</p> <p>All CPA(s) under the PoA are allowed to install new solar power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity i.e. Greenfield power plants and does not include retrofitting or modification of an existing facility for renewable energy generation. The CPAs under the PoA are not allowed to have any co-firing systems or cogeneration systems. However, in case of combination of renewable and non-renewable components (hybrid systems such as solar-natural gas, solar-diesel or other fossil fuel systems), allowed capacity under the renewable component is less than 15MW.</p> <p>To verify the same, the CME shall check the CPA technology adopted with the aid of one or more of the following documents:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Project Detailed Project Report <input type="checkbox"/> Technology offer along with the specifications provided by the supplier / Tender form <input type="checkbox"/> Purchase Order copies <input type="checkbox"/> Power Purchase Agreement <input type="checkbox"/> Project Commissioning Certificate <input type="checkbox"/> Any other document
4	Start Date	Conditions to check the start date of the CPA through documentary evidence;	<p>The commencement of validation of the PoA, i.e. the date on which the CDM-POA-DD was first published for global stakeholder consultation was on 06/09/2011²³.</p> <p>As per the “Glossary of CDM Terms²⁴, Version 09.1” which states <i>The starting date as</i> “For a CDM project activity (non-A/R) or CPA (non-A/R), the date on which the project participants commit to making expenditures for the construction or modification of the main equipment or facility (e.g. a wind turbine), or for the provision or modification of a service (e.g. distribution of energy-efficient light bulbs, change of transport management system), for the CDM project activity or CPA. Where a contract is signed for such expenditures (e.g. for procurement of a wind turbine), it is the date on which the contract is signed. In other cases, it is the date on which such expenditures are incurred. If the CDM project activity or CPA involves more than one of such contracts or incurred expenditures, it is the first of the respective dates. Activities incurring minor pre-</p>

23

<http://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/TMH1UNP2QEHLZM71NF7IGHQX1EQT/X/view.html>

24

http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf

			<p>project expenses (e.g. feasibility studies, preliminary surveys) are not considered in the determination of the start date.”</p> <p>In light of the above definition, the start date shall be considered to be the date on which the CPA project participant has committed to expenditures related to the implementation or related to the construction of the CPA and should not be before the PoA webhosting date i.e. 06/09/2011.</p> <p>To verify the same, the CME shall check the date of CPA EPC contracting / Purchase Order placement by the IE. Further it is verified that these activities have happened after the commencement of PoA validation.</p>
5	Methodology compliance	<p>Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents;</p> <p>Conditions to ensure the compliance with other requirements of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents</p>	<p>The PoA being only grid connected solar power projects shall be using the approved methodology - AMS.I.D version 18 or such later version as may be in force at the time of CPA inclusion. There shall be no multiple methodologies allowed under the PoA.</p> <p>The CME to verify the same shall take an undertaking from the CPA implementing entity at the time of inclusion to the PoA pertaining to above requirement.</p> <p>To verify the same, the CME shall also check one or more of the following documents:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Project Detailed Project Report <input type="checkbox"/> EPC Contract / Letter of Intent <input type="checkbox"/> Comparing between the CME database and the list of project activities that have submitted prior consideration for CDM, that are under validation, registered, rejected or withdrawn available in the UNFCCC website <input type="checkbox"/> Technology offer along with the specifications provided by the supplier / Tender form <input type="checkbox"/> Purchase Order copies <input type="checkbox"/> Power Purchase Agreement <input type="checkbox"/> Project Commissioning Certificate <input type="checkbox"/> Any other document
6	Additionality	The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality (please refer to the latest approved version of the. Standard for demonstration of additionality of a programme of activities);	The additionality of the PoA as a whole is demonstrated using Attachment A of Appendix B, Version 08, EB 63, Annex 24 . Thus in accordance with the above ruling, at the time of CPA inclusion, the additionality of the SSC-CPA shall be evaluated on the basis that if the proposed CPA(s) meets the eligibility criteria of CDM-PoA-DD, the CPA(s) shall be deemed additional.
7	Stakeholder consultation	The PoA-specific requirements including any conditions related to undertaking local	As per the Ministry of Environment and Forest (MoEF), Govt of India Office Memorandum dated 30/06/2011 ²⁵ , it had received specific clarification regarding the applicability of EIA Notification, 2006 in respect of Solar

		stakeholder consultations and environmental impact analysis;	<p>Photo Voltaic (PV) and Solar Thermal Power plants. Further Office Memorandum dated 14/08/2017²⁶ is issued by Ministry of New and Renewable Energy, National Solar Mission Division. It was clarified in both the above memorandums that both Solar PV and Solar Thermal power projects are not covered under the ambit of EIA Notification, 2006 and no environment clearance is required for such projects under provisions thereof. The explanation of the same is provided in section E of the CDM-PoA-DD.</p> <p>However, the CPA implementing entity shall conduct the local stakeholder consultation meeting as per the CDM requirements at the time of inclusion to the PoA. The CME shall verify all the documents related to stakeholders consultation meeting viz. Meeting notice, advertisement, minutes, photographs, list of attendees etc to confirm the same.</p>
8	Target Group	Target group (e.g. domestic/commercial/industrial, rural/urban, grid connected/off-grid) and distribution mechanisms (e.g. direct installation);	The CME shall allow only grid connected solar power projects under the PoA. In-line with the same the CME shall check the power purchase agreement or approval from concerned statutory body to ensure that the power generated from the CPA(s) is injected only to the grid system within the host country.
9	Sampling	If the generic CPA applies 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>In the proposed PoA, the CME opts for a verification method that does not use sampling but to verify each CPA.</p> <p>A monitoring plan is established such that each CPA under the PoA are monitored and verified effectively.</p> <p>The CME shall assign a Unique Identification Number to each CPA and further the CPA will be identified by its geographical coordinates. This will ensure that there occurs no double counting and that the status of verification can be checked at anytime.</p>
10	Small-scale or micro-scale threshold criteria	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	<p>In the present PoA, since the CPA only below 15MW capacity are eligible, the CME shall use TOOL21 Version 12 to demonstrate the additionality wherein the grid connected solar power projects upto 15 MW are additional as they fall under the <i>positive list of renewable electricity generation technologies</i>. Further as per the General Guidelines to SSC CDM methodologies²⁷ the CME shall verify the eligibility and the output capacity of the CPA. By definition from the methodology, the CPA(s) being eligible for Type I projects shall not have the installed capacity to increase beyond 15 MW and the maximum output or appropriate equivalent capacity to be upto 15MW.</p> <p>However for using the micro scale additionality guidelines, as of now the Indian DNA has not approved which all renewable energy projects can use this guideline to demonstrate additionality.</p>

26

<https://mnre.gov.in/file-manager/UserFiles/OM-Clarification-reg-EIA-for-Solar-Park.pdf>

27

http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf

		<p>additionality of microscale project activities", these conditions are not required;</p>	<p>Hence as for now, the prominence is given to whether the SSC-CPA capacity is within 15MW capacity or above. To ensure the same, the CME shall verify the SSC-CPA capacity allotment letter from any govt body / capacity mentioned in the PPA / any other relevant document to see the individual SSC-CPA capacity is within the 15 MW limit throughout the crediting period.</p>
11	Debundling	<p>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.</p>	<p>As per para 15 of the TOOL20 – Assessment of debundling for small-scale project activities, version 4, the CPAs under the PoA is deemed to be a de-bundled component of a large scale activity if there is already an activity, which satisfies both conditions (a) and (b) below:</p> <ul style="list-style-type: none"> a) <i>Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same technology/measure, and;</i> b) <i>The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.</i> <p>Further as per Figure 2 of TOOL 20, version 4 a proposed CPA of a PoA is deemed to be debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:</p> <ul style="list-style-type: none"> a) <i>With the same project participants;</i> b) <i>In the same project category and technology/measure; and</i> c) <i>Registered within the previous 2 years; and</i> d) <i>Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point</i> <p>However, the total size of such a CPA combined with a registered CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM, then the CPA of a PoA can qualify to use simplified modalities and procedures for small-scale CDM</p> <p>The CME of the PoA to ensure the de-bundling check shall verify that there is no other activity by the same CPA implementing entity and also within a boundary of 1 km radius. The CME shall crosscheck with one or more of the following documents at the time CPA inclusion:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Undertaking from the CPA implementing entity pertaining to above requirement <input type="checkbox"/> CPA land document with the site survey number <input type="checkbox"/> CPA geo co-ordinates.
12	ODA funding	<p>Conditions to provide an affirmation that funding from Annex I parties, if any, do not result in a diversion of official</p>	<p>The CME before the inclusion of the CPA under the PoA shall check the funding pattern adopted by the IE to implement the project activity. Further the CME shall take an undertaking from the IE that there shall be no funding from Annex I parties which is diverted into</p>

		development assistance.	<p>official development assistance.</p> <p>To verify the same, the CME shall check the CPA funding pattern adopted with the aid of one or more of the following documents:</p> <ul style="list-style-type: none"> <input type="checkbox"/> CA certificate <input type="checkbox"/> Loan sanction letter <input type="checkbox"/> Undertaking from the CPA project developer.
13	Compliance	The condition to ensure that the CPA shall meet all the legal requirements (i.e. clearances / NOC's) from the national / local government bodies for the successful implementation of the project activity.	<p>The CME of the PoA shall also ensure that the CPA willing to be part of the PoA is in-line with all the legal requirement i.e. the clearance / NOC achieved from the relevant local / state / national government bodies.</p> <p>This shall be cross verified with one or more of the following documents at the time of CPA inclusion to the PoA:</p> <ul style="list-style-type: none"> <input type="checkbox"/> NOC from the respective Pollution Control Board <input type="checkbox"/> Consent to Establishment <input type="checkbox"/> Consent to Operate <input type="checkbox"/> Environmental Clearance etc

Technical Review of -CPA Inclusion:

As explained above, the CME will assess the CPA(s) against the list of criteria above either by documentary evidence or by proper written justification from the CPA implementing entity at the time CPA inclusion under the PoA. The compliance and justification of SSC-CPA to the same shall also be included in the respective CDM-CPA-DD. The above description and the compliance of CPA(s) to the same shall be proved (along with documentary proof wherever applicable would be submitted to the DOE) of the respective CDM-CPA-DD.

Appendix 1. Contact information of coordinating/managing entity and project participants

Coordinating/managing entity and/or project participants	<input checked="" type="checkbox"/> Coordinating/managing entity <input checked="" type="checkbox"/> Project participant
Organization name	Emergent Ventures India Pvt. Ltd.
Country	India
Address	408, Tower B, Unitech Business Zone, Sector 50, Golf Course Extension Road, Gurugram, Haryana, India
Telephone	+91-124-4319500
Fax	+91-124-4319501
E-mail	contact@emergent-ventures.com
Website	www.emergent-ventures.com
Contact person	Atul Sanghal

Appendix 2. Affirmation regarding public funding

Details of any public funding for any SSC-CPA will be provided at the time of inclusion under the PoA.

Appendix 3. Applicability of methodologies and standardized baselines

Refer section I.2

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

Refer section I.6 for detailed baseline information.

Appendix 5. Further background information on monitoring plan

Monitoring plan is discussed in section I.7.

Appendix 6. Summary report of comments received from local stakeholders

Not applicable.

Appendix 7. Summary of post-registration changes

Not applicable.

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
09.0	31 May 2019	Revision to: <ul style="list-style-type: none"> <input type="checkbox"/> Ensure consistency with version 02.0 of the “CDM project standard for programmes of activities” (CDM-EB93-A07-STAN); <input type="checkbox"/> Make editorial improvements.
8.1	0 28 June 2017	Revision to: <ul style="list-style-type: none"> <input type="checkbox"/> Remove a duplicated instruction; <input type="checkbox"/> Make editorial improvement.
08.0	7 June 2017	Revision to: <ul style="list-style-type: none"> <input type="checkbox"/> Improve consistency with the “CDM project standard for programmes of activities” and with the PDD and CPA-DD forms; <input type="checkbox"/> Make editorial improvement.
7.0	0 25 May 2017	Revision to: <ul style="list-style-type: none"> <input type="checkbox"/> Ensure consistency with the “CDM project standard for programmes of activities” (CDM-EB93-A07-STAN) (version 01.0); <input type="checkbox"/> Incorporate the “Programme design document form for small-scale CDM programmes of activities” (CDM-SSC-PoA-DD-FORM); <input type="checkbox"/> Make editorial improvement.
6.0	0 15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
5.0	0 9 March 2015	Revision to: <ul style="list-style-type: none"> <input type="checkbox"/> Include provisions related to choice of start date of PoA; <input type="checkbox"/> Include provisions related to delayed submission of a monitoring plan; <input type="checkbox"/> Provisions related to local stakeholder consultation; <input type="checkbox"/> Add exception for generic CPA where technology is under positive lists; <input type="checkbox"/> Make editorial improvement.
4.1	0 5 August 2014	Editorial revision to correct the document information table.
4.0	0 25 June 2014	Revision to: <ul style="list-style-type: none"> <input type="checkbox"/> Include the Attachment: Instructions for filling out the project design document form for CDM programme of activities (these instructions supersede the Guideline: Completing the programme design document form for CDM programme of activities (Version 04.0)); <input type="checkbox"/> Include provisions related to standardized baselines; <input type="checkbox"/> Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1; <input type="checkbox"/> Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and Appendix 6;

				<input type="checkbox"/> Change the reference number from F-CDM-PoA-DD to CDM-PoA-DD-FORM;
				<input type="checkbox"/> Make editorial improvement.
3.0	0	3 December 2012	EB 70	Revision to reflect changes to the <i>Guideline: Completing the programme design document form for CDM programmes of activities</i> (EB 70, Annex 6).
2.0	0	13 March 2012	EB 66	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for CDM programmes of activities" (EB 66, annex 12).
1.0	0	27 July 2007	EB 33, Annex 41	Initial publication.
Decision Document Business			Class: Type: Function:	Regulatory Form Registration
Keywords: programme of activities, project design document				