



**CLEAN DEVELOPMENT MECHANISM  
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
(CDM-SSC-PoA-DD) Version 01**

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- Annex 3: Baseline information
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**NOTE:**

- (i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.
- (ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).



**SECTION A. General description of small-scale programme of activities (PoA).**

**A.1 Title of the small-scale programme of activities (PoA):**

**National Solar Power Development Programme, India**

Version : 1.2

Date : 14/05/2012

**A.2. Description of the small-scale programme of activities (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.

The technical description for the technologies covered in the PoA, is given in section A.4.2 of the SSC-PoA-DD in detail.

**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 future<sup>1</sup>. While the current contribution of solar power to the total India's electricity needs is negligible<sup>2</sup>, 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 fuel<sup>3</sup> based power plants (which are the major source of GHG<sup>4</sup> emissions). Thus the PoA as a whole reduces GHG emissions by installing solar based power

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

<sup>2</sup> [http://www.mnre.gov.in/annualreport/2009-10EN/Chapter1/chapter1\\_1.htm](http://www.mnre.gov.in/annualreport/2009-10EN/Chapter1/chapter1_1.htm)

<sup>3</sup> [http://planningcommission.nic.in/reports/genrep/bkpap2020/13\\_bg2020.pdf](http://planningcommission.nic.in/reports/genrep/bkpap2020/13_bg2020.pdf)

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



generation systems which utilize the available solar energy (clean fuel) as an alternative source for power generation (the first SSC-CPA under the PoA to generate 7259 MWh of net electricity which corresponds to an emission reduction of 6887 tCO<sub>2</sub> for the first year).

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*<sup>5</sup> in the interim approval guidelines for CDM project as follows:

**Social and Economic wellbeing:**

- The SSC-CPA(s) under the PoA evacuating power to the nearest regional grid would lead to improvement of electricity availability as the electricity is fed into a deficit grid.
- The construction and implementation phases of the SSC-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 SSC-CPA would bring in additional investment to the SSC-CPA regions which would have not been possible in the absence of SSC-CPA. Further the SSC-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.3. Coordinating/managing entity and participants of SSC-POA:**

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**1. Coordinating or managing entity of the PoA as the entity which communicates with the Board**

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

**2. Project participants being registered in relation to the PoA.**

<sup>5</sup> [http://envfor.nic.in/divisions/ccd/cdm\\_iac.html](http://envfor.nic.in/divisions/ccd/cdm_iac.html)



| Name of Party involved<br>((host) indicates a host Party) | Private and/or public entity(ies)<br>project participants<br>(as applicable) | Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|-----------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| India (host)                                              | Emergent Ventures India Pvt. Ltd.<br>(EVI) Private Entity                    | No                                                                                            |

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

**A.4. Technical description of the small-scale programme of activities:**

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**A.4.1. Location of the programme of activities:**

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**A.4.1.1. Host Party(ies):**

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India

**A.4.1.2. Physical/ Geographical boundary:**

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The geographical boundary of the PoA includes all states in India. The SSC-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 map<sup>6</sup> below.



<sup>6</sup> <http://www.mapsofindia.com/maps/india/indiastateandunion.htm>



**A.4.2. Description of a typical small-scale CDM programme activity (CPA):**

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EVI will coordinate NSPDP as the CME, and will support the SSC-CPA implementer(s) for including the SSC-CPAs in the PoA.

The SSC-CPA(s) under the PoA will be either SPV or CSP based power generation systems, with an installed capacity upto 15MW, connected to the grid. The detailed eligibility criteria for the inclusion of SSC-CPA(s) under NSPDP are given in section A.4.2.2.

**A.4.2.1. Technology or measures to be employed by the SSC-CPA:**

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The chosen type under the NSPDP is as follows:

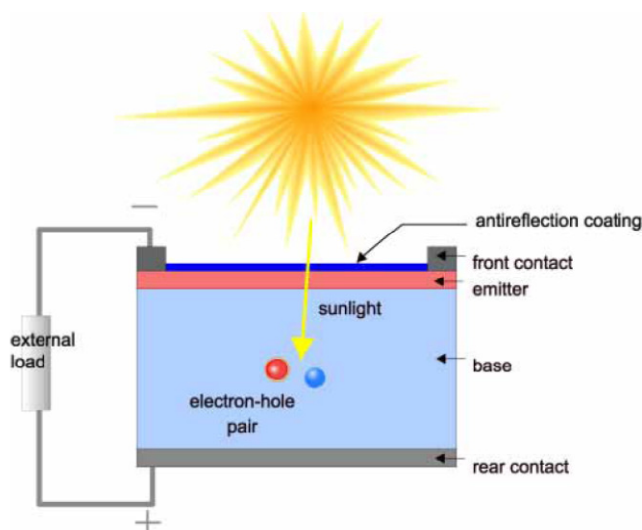
TYPE I : Renewable Energy Projects

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

**Solar Photovoltaic's (SPV)**

Technology / Measure

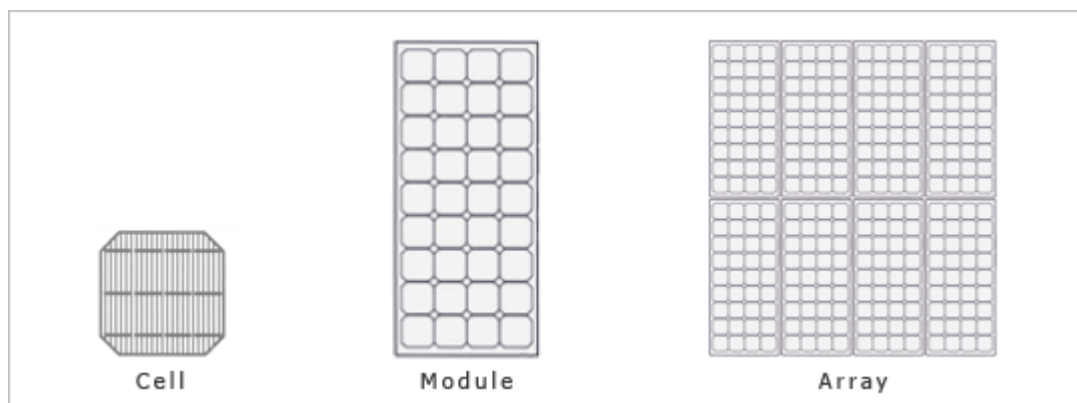
The solar photovoltaic cells, also known as the solar cells, are used to convert solar energy into electrical energy. The solar cells are the basic elements of a solar module. Essentially, when light strikes the cell, a certain portion of it is absorbed within the semiconductor material. This energy 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.





Solar Cell system<sup>7</sup>

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.



Solar cell arrangements<sup>8</sup>

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*<sup>9</sup> 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 SSC-CPA-DD(s).

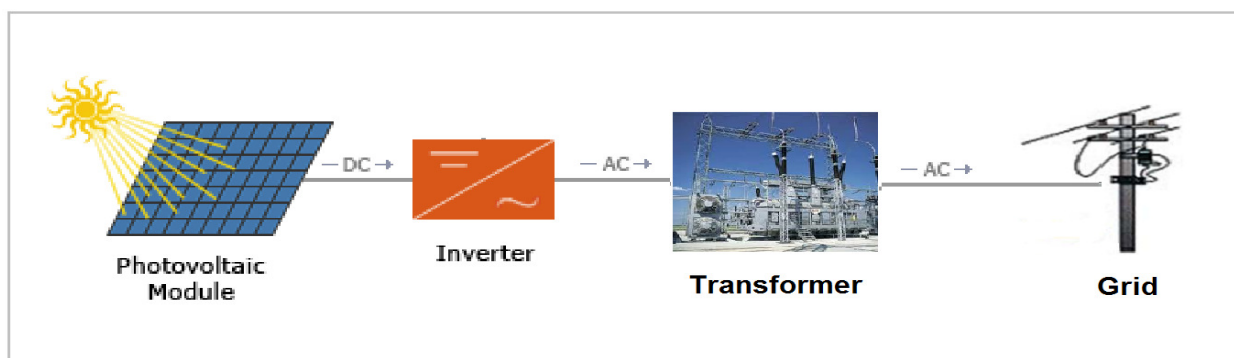
The objective of NSPDP being the supply of generated electricity to the national/regional grid, the schematic of the same is depicted in the figure below. The model shown contains the following:

- 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.

<sup>7</sup> <http://jc-solarhomes.com/PV/DIY%20photo-voltaics.htm>

<sup>8</sup> [http://www.synergysenvirom.com/resources/solar\\_photovoltaic\\_energy.asp](http://www.synergysenvirom.com/resources/solar_photovoltaic_energy.asp)

<sup>9</sup> <http://protekan.com/SolarPVTechology.aspx>



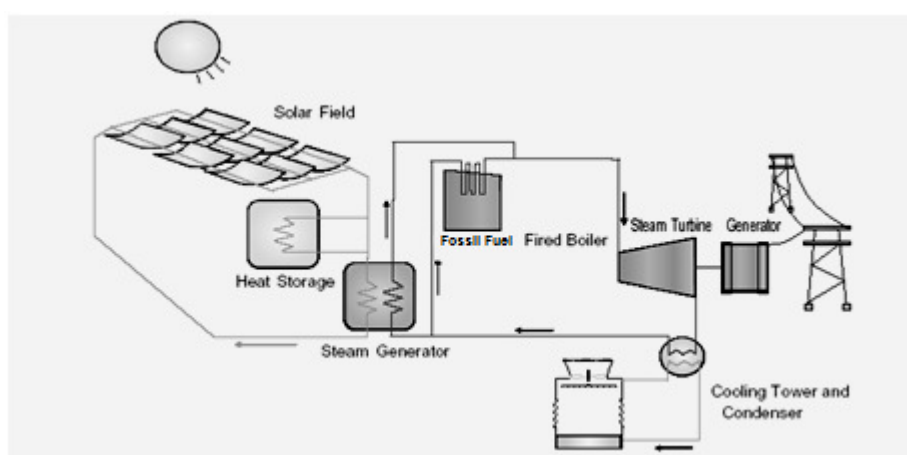
Grid-connected Solar Photovoltaic (SPV) system

### 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) systems<sup>10</sup>

<sup>10</sup> [http://www.cognizance.org.in/main/pages/technovision/Dr\\_Garud\\_Teri.pdf](http://www.cognizance.org.in/main/pages/technovision/Dr_Garud_Teri.pdf)



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 SSC-CPA-DD accordingly.

*The SSC-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.*

|                                                                                           |
|-------------------------------------------------------------------------------------------|
| <b>A.4.2.2. Eligibility criteria for inclusion of a <u>SSC-CPA</u> in the <u>PoA</u>:</b> |
|-------------------------------------------------------------------------------------------|

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EVI, as the PoA CME, has developed the following eligibility conditions for the inclusion of any SSC-CPA(s) under the PoA. The eligibility criterion's defined below is in-line with the requirements of "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities"<sup>11</sup>, Annex 3, Version 01.0, EB 65". Further to this, the SSC-CPA(s) must also comply with the applicability criteria of AMS. 1. D methodology as defined in section E.2 of the PoA-DD.

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<sup>11</sup> [http://cdm.unfccc.int/Reference/Standards/meth/meth\\_stan04.pdf](http://cdm.unfccc.int/Reference/Standards/meth/meth_stan04.pdf)





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| Sl. No | Eligibility Criteria developed by the CME                                                                                                                      | Evaluation procedure adopted by CME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a.     | 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 SSC-CPA location is verified against this by the CME. The details of SSC-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"><li>• Project Detailed Project Report</li><li>• Land documents with clear definition of the project location</li><li>• Geo co-ordinates of the project site using GPS device</li><li>• EPC / Purchase Order / Letter of Intent with site location details</li><li>• Any Statutory Approvals / clearance received for the project having the mention of project location details</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| b.     | Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo);              | <p>The double counting of emission reduction occurs when the SSC-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 SSC-CPA under the proposed PoA. In order to avoid the same, the CME shall assign a Unique Identification Number to the SSC-CPA(s) and shall cross verify with the following documents / sources at the time of SSC-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"><li>• Project location with any of the documents mentioned in point (a)</li><li>• Cross-checking of the SSC-CPA geo co-ordinates.</li><li>• 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</li><li>• Undertaking from the SSC-CPA project developer.</li></ul> |
| c.     | The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications; | <p>The technology / measure allowed under the PoA are either <i>Solar Photovoltaic's</i> or <i>Concentrated Solar Power</i> based generation systems. To verify the same, the CME shall check the SSC-CPA technology adopted with the aid of one or more of the following documents:</p> <ul style="list-style-type: none"><li>• Project Detailed Project Report</li><li>• Technology offer along with the specifications provided by the supplier / Tender form</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

This template shall not be altered. It shall be completed without modifying/adding headings or logo, format or font.



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|----|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                                                    | <ul style="list-style-type: none"> <li>• Purchase Order copies</li> <li>• Power Purchase Agreement</li> <li>• Project Commissioning Certificate</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| d. | 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 POA-DD was first published for global stakeholder consultation was on 06/09/2011<sup>12</sup>.</p> <p>As per the “<b>Glossary of CDM Terms<sup>13</sup>, Version 05</b>” which states “<i>The starting date of a CDM programme activity is the earliest date at which either the implementation or construction or real action of a programme activity begins. The starting date of the CPA cannot be prior to the commencement of validation of the programme of activities, i.e. the date on which the CDM-POA-DD is first published for global stakeholder consultation</i>”.</p> <p>In light of the above definition, the start date shall be considered to be the date on which the SSC-CPA project participant has committed to expenditures related to the implementation or related to the construction of the SSC-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 SSC-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> |
| e. | Conditions that ensure compliance with applicability and other requirements of single or multiple methodology/ies applied by CPAs; | <p>The PoA being only grid connected solar power projects shall be using the approved methodology - AMS.1.D version 17 or such later version as may be in force at the time of SSC-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 SSC-CPA implementing entity at the time of inclusion to the PoA.</p> <p>Further the justification to how the chosen methodology is applicable to the SSC-CPA is given in detail in section E.2 of the SSC-PoA-DD.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| f. | The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of                                      | The additionality of the PoA as a whole is demonstrated using <b>Attachment A of Appendix B, Version 08, EB 63, Annex 24</b> . Thus in accordance with the above ruling, at the time of SSC-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

<sup>12</sup> <http://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/TMH1UNP2QEHLVMZ71NF7IGHQX1EQTX/view.html>

<sup>13</sup> [http://cdm.unfccc.int/Reference/Guidclarif/glos\\_CDM.pdf](http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf)



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|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | additionality (please refer to the latest approved version of the. Standard for demonstration of additionality of a programme of activities);                           | CPA inclusion, the additionality of the SSC-CPA shall be evaluated on the basis that if the proposed SSC-CPA(s) meets the eligibility criteria in section E.5.2 of PoA-DD, the SSC-CPA(s) shall be deemed additional.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| g. | The PoA-specific requirements stipulated by the CMEs including any conditions related to undertaking local stakeholder consultations and environmental impact analysis; | <p>As per the Ministry of Environment and Forest (MoEF), Govt of India Office Memorandum dated 13/05/2011<sup>14</sup> and 30/06/2011<sup>15</sup>, 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. The explanation of the same is provided in section C of the PoA-DD.</p> <p>However, the SSC-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> |
| h. | 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 <b>power purchase agreement</b> or <b>approval from concerned statutory body</b> to ensure that the power generated from the SSC-CPA(s) is injected only to the grid system within the host country.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| i. | The conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys;        | <p>In the proposed PoA, the CME opts for a verification method that does not use sampling but to verify each SSC-CPA.</p> <p>A monitoring plan is established such that each SSC-CPA under the PoA are monitored and verified effectively.</p> <p>The CME shall assign a Unique Identification Number to each SSC-CPA and further the SSC-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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| j. | The conditions that ensure that CPA in aggregate meets the small-scale or micro-scale threshold criteria (please refer to the latest approved version                   | In the present PoA, since the SSC-CPA only below 15MW capacity are eligible, the CME shall use <b>Attachment A of Appendix B guidelines</b> 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</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

<sup>14</sup> <http://moef.nic.in/downloads/public-information/OM-SolarPV.pdf>

<sup>15</sup> [http://mnre.gov.in/file-manager/UserFiles/environmental\\_clearance\\_grid\\_connect\\_stp\\_jnnsn.pdf](http://mnre.gov.in/file-manager/UserFiles/environmental_clearance_grid_connect_stp_jnnsn.pdf)



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|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p>of the Guidelines for demonstrating additionality of micro scale project activities and the latest approved version of the General Guidelines to SSC CDM methodologies) and remain within those thresholds throughout the crediting period of the CPA;</p> | <p><i>renewable electricity generation technologies</i>. Further as per the <b>General Guidelines to SSC CDM methodologies</b><sup>16</sup> the CME shall verify the eligibility and the output capacity of the SSC-CPA. By definition from the methodology, the SSC-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> <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>                                                                                                                                           |
| k. | <p>The requirements for the debundling check, in case CPAs belong to small scale (SSC) or micro scale project categories (please refer to the latest approved version of the Guidelines on assessment of debundling for SSC project activities);</p>          | <p>As per para 8 of the de-bundling guidelines, the SSC-CPA's 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> <p style="padding-left: 40px;">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></p> <p style="padding-left: 40px;">b) <i>The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.</i></p> <p>Further as per para 9 of the de-bundling guidelines, a proposed SSC-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> <p style="padding-left: 40px;">a) <i>With the same project participants;</i></p> <p style="padding-left: 40px;">b) <i>In the same project category and technology/measure; and</i></p> <p style="padding-left: 40px;">c) <i>Registered within the previous 2 years; and</i></p> |

<sup>16</sup> [http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC\\_guid06.pdf](http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf)



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|    |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                                                                                                                             | <p><i>d) Whose project boundary is within 1 km of the project boundary of the proposed small- scale activity at the closest point</i></p> <p>However, the total size of such a CPA combined with a registered SSC-CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM, then the SSC-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 SSC-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 SSC-CPA inclusion:</p> <ul style="list-style-type: none"> <li>• Undertaking from the SSC-CPA implementing entity pertaining to above requirement</li> <li>• SSC-CPA land document with the site survey number</li> <li>• SSC-CPA geo co-ordinates.</li> </ul> |
| 1. | Conditions to provide an affirmation that funding from Annex I parties, if any, do not result in a diversion of official development assistance.                                                            | <p>The CME before the inclusion of the SSC-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 official development assistance.</p> <p>To verify the same, the CME shall check the SSC-CPA funding pattern adopted with the aid of one or more of the following documents:</p> <ul style="list-style-type: none"> <li>• CA certificate</li> <li>• Loan sanction letter</li> <li>• Undertaking from the SSC-CPA project developer.</li> </ul>                                                                                                                                                                                                                                                                                                                                   |
| m. | 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 SSC-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 govt bodies.</p> <p>This shall be cross verified with one or more of the following documents at the time of SSC-CPA inclusion to the PoA:</p> <ul style="list-style-type: none"> <li>• NOC from the respective Pollution Control Board</li> <li>• Consent to Establishment</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

This template shall not be altered. It shall be completed without modifying/adding headings or logo, format or font.



SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
(CDM SSC-PoA-DD) - Version 1.0



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|  |  |                                                                                                            |
|--|--|------------------------------------------------------------------------------------------------------------|
|  |  | <ul style="list-style-type: none"><li>• Consent to Operate</li><li>• Environmental Clearance etc</li></ul> |
|--|--|------------------------------------------------------------------------------------------------------------|



Technical Review of SSC-CPA Inclusion:

As explained above, the CME will assess the SSC-CPA(s) against the list of criteria above either by documentary evidence or by proper written justification from the SSC-CPA implementing entity at the time SSC-CPA inclusion under the PoA. The compliance and justification of SSC-CPA to the same shall also be included in the respective SSC-CPA-DD. The above description and the compliance of SSC-CPA(s) to the same shall be proved in section B.2 (along with documentary proof wherever applicable would be submitted to the DOE) of the respective SSC-CPA-DD's.

**A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):**

>>

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

As stated in section A.2, 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 Mission<sup>17</sup> (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***

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**”<sup>18</sup>, **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**”<sup>19</sup> 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:*

---

<sup>17</sup> <http://mnre.gov.in/pdf/mission-document-JNNSM.pdf>

<sup>18</sup> [http://cdm.unfccc.int/Reference/Standards/meth/meth\\_stan04.pdf](http://cdm.unfccc.int/Reference/Standards/meth/meth_stan04.pdf)

<sup>19</sup> [https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC\\_guid05.pdf](https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid05.pdf)



- 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 given in section A.4.2.2 of the PoA-DD i.e 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 MW<sup>20</sup> 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.

***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.

**A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):**

**A.4.4.1. Operational and management plan:**

>>

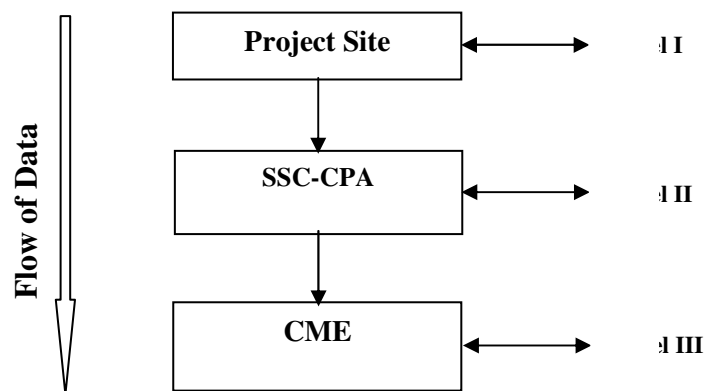
The general operational and management framework of the PoA is detailed in the section E.7 of the SSC-PoA-DD. In addition to that, the following arrangements have been established by EVI (CME) to ensure an effective, reliable and robust operation and management of the SSC-CPA(s) under the PoA:

***1. A record keeping system for each SSC-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:

<sup>20</sup> [http://www.mnre.gov.in/annualreport/2010\\_11\\_English/Chapter1/chapter1\\_1.htm](http://www.mnre.gov.in/annualreport/2010_11_English/Chapter1/chapter1_1.htm)





**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 SSC-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 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 SSC-CPAs) will be kept for future verifications. Besides, details and calibration records of meters used for measurement of data will be kept for verification.

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

**PoA (Level III):** Further the data is transferred from each SSC-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 SSC-CPA(s) subscribing to the PoA. Each SSC-CPA will be uniquely identified with-in the PoA monitoring database. The SSC-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 SSC-CPA under the PoA | <ul style="list-style-type: none"> <li>Implementing Entity contact details (<i>viz. contact person, address, telephone and email address</i>)</li> <li>SSC-CPA project capacity details</li> <li>Geographical location of the SSC-CPA project site (<i>viz. Latitude, longitude and place of the project site</i>)</li> <li>Implementation chronology SSC-CPA</li> <li>Technology employed by the SSC-CPA</li> </ul> |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The basic data as listed above shall be provided by the SSC-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 SSC-CPA. Relevant data capture, verification and storage procedures will be followed in maintaining the data to ensure its accuracy, validity and completeness.

## SSC-CPA Unique Identification Number

Under the PoA, each SSC-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 SSC-CPA. | EVI assigned 3-digit numeric to the SSC-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 SSC-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 SSC-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 SSC-CPA project developers will be made aware of the double accounting principle and will ensure that the proposed SSC-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 SSC-CPA under the proposed PoA.

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

- the SSC-CPA is not a part of any other registered or proposed Programme of Activities (PoA)
- the SSC-CPA is not a part of any other registered or proposed CDM Programme Activity (CPA)
- the SSC-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 SSC-CPA
- The implementing entity is aware that the SSC-CPA will be subscribed to NSPDP (as required by point (4) given below)

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

The “*Guidelines on assessment of de-bundling for SSC project activities*”, version 03 (EB54, Annex 13) is used to demonstrate that any SSC-CPA to be included in the PoA will not a de-bundled component of a large scale activity.

Paragraph 8 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:*

- c) 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;*
- d) 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 SSC-CPA under the PoA. In order to ensure de-bundling check, implementing entity of SSC-CPA before the inclusion under the PoA shall sign the undertaking (as part of the contractual agreement) complying to 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 SSC-CPA implementing entity will include an undertaking to the CME before inclusion of SSC-CPA to ensure that those operating the SSC-CPA are aware of and have agreed that their activity is being subscribed to the PoA.

|                                  |
|----------------------------------|
| <b>A.4.4.2. Monitoring plan:</b> |
|----------------------------------|

>>

*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 SSC-CPA.

The monitoring plan is established in order to ensure that all SSC-CPAs under the PoA are monitored and verified effectively. As mentioned in section A.4.4.1 of this document, the CME will ensure a robust record keeping system which is processed at three levels i.e. project site, SSC-CPA and PoA level. As also mentioned, each project site will be identified uniquely by its geographical coordinates and each SSC-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 anytime.

|                                                                    |
|--------------------------------------------------------------------|
| <b>A.4.5. Public funding of the programme of activities (PoA):</b> |
|--------------------------------------------------------------------|

>>

There is no public funding available for the PoA.



**SECTION B. Duration of the programme of activities (PoA)**

**B.1. Starting date of the programme of activities (PoA):**

>>  
21/10/2010<sup>21</sup>

**B.2. Length of the programme of activities (PoA):**

>>  
28 Years, 00 Months

**SECTION C. Environmental Analysis**

>>

**C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:**

1. Environmental Analysis is done at PoA level
2. Environmental Analysis is done at SSC-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*<sup>22</sup> 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 13/05/2011<sup>23</sup> and 30/06/2011<sup>24</sup>, 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.

**C.2. Documentation on the analysis of the environmental impacts, including transboundary 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

<sup>21</sup> The date of intimation sent to UNFCCC is taken as the start date of the PoA.

<sup>22</sup> <http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=6>

<sup>23</sup> <http://moef.nic.in/downloads/public-information/OM-SolarPV.pdf>

<sup>24</sup> [http://mnre.gov.in/file-manager/UserFiles/environmental\\_clearance\\_grid\\_connect\\_stp\\_jnnsmpdf](http://mnre.gov.in/file-manager/UserFiles/environmental_clearance_grid_connect_stp_jnnsmpdf)



environmental impacts. It utilizes clean source of energy (solar), technology and seeks full support and encouragement from the communities (the beneficiaries).

**C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA):**

>>

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

**SECTION D. Stakeholders' comments**

>>

**D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:**

1. Local stakeholder consultation is done at PoA level
2. Local stakeholder consultation is done at SSC-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 SSC-CPA level. By conducting the local stakeholder consultation at SSC-CPA level, it will be possible to address the views and comments of the stakeholders in a better way than at the PoA level.

**D.2. Brief description how comments by local stakeholders have been invited and compiled:**

>>

*Not applicable* as it will be given at SSC-CPA level.

**D.3. Summary of the comments received:**

>>

*Not applicable* as it will be given at SSC-CPA level.

**D.4. Report on how due account was taken of any comments received:**

>>

*Not applicable* as it will be given at SSC-CPA level.

**SECTION E. Application of a baseline and monitoring methodology**

**E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:**

>>

The proposed Programme of Activities (PoA) uses the following approved SSC methodology:

TYPE I : RENEWABLE ENERGY PROJECTS  
Category : AMS-I.D. Version 17, EB 61  
Title : Grid connected renewable electricity generation  
Reference : <http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X>

**E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:**

>>



The position of the PoA vis-à-vis their applicability conditions in the AMS-I.D, Version-17 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 SSC-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 or regional grid or to an identified consumer via national or regional grid system.</p> <p><b>Thus, meets the applicability condition.</b></p> |              |        |        |        |   |                                                          |  |   |  |   |                                                                                                                                                                                    |  |  |   |   |                                                                                                                                                 |  |   |  |   |                                                                                                                                                   |  |  |   |   |                                                                                                              |   |  |  |                                                                                                                                                                                                                                                                          |
| <p><i>Illustration of situations under which the methodology applies as given in the table below:</i></p> <table><tr><th></th><th>Project type</th><th>AMS-LA</th><th>AMS-LD</th><th>AMS-LF</th></tr><tr><td>1</td><td>Project supplies electricity to a national/regional grid</td><td></td><td>√</td><td></td></tr><tr><td>2</td><td>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</td><td>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</td><td>Project supplies electricity to a mini grid<sup>17</sup> 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</td><td>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-LA | AMS-LD | AMS-LF | 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 <sup>17</sup> 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 SSC-CPA(s) under the PoA will be supplied to national/regional grid or to an identified consumer via national/regional grid. This confirms to point (1) &amp; (3) of the table.</p> <p><b>Thus, meets the applicability condition.</b></p> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Project type                                                                                                                                                                                                                                                                                                                                         | AMS-LA       | AMS-LD | AMS-LF |        |   |                                                          |  |   |  |   |                                                                                                                                                                                    |  |  |   |   |                                                                                                                                                 |  |   |  |   |                                                                                                                                                   |  |  |   |   |                                                                                                              |   |  |  |                                                                                                                                                                                                                                                                          |
| 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 <sup>17</sup> 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 new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of an existing plants</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>All SSC-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><b>Thus, meets the applicability condition.</b></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> <p>✓ <i>The project activity is implemented in an existing reservoir with no change in the volume of reservoir;</i></p> <p>✓ <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></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>The SSC-CPA(s) under the PoA includes power generation by solar resource and not by hydro resource.</p> <p><b>Thus, the condition is not applicable.</b></p>                                                                                                                                                                                      |              |        |        |        |   |                                                          |  |   |  |   |                                                                                                                                                                                    |  |  |   |   |                                                                                                                                                 |  |   |  |   |                                                                                                                                                   |  |  |   |   |                                                                                                              |   |  |  |                                                                                                                                                                                                                                                                          |



|                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ✓ <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/m<sup>2</sup>.</i>                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                 |
| <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 SSC-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><b>Thus, meets the applicability condition.</b></p> |
| <i>Combined heat and power (co-generation) systems are not eligible under this category.</i>                                                                                                                                                                                                                                                                                | <p>The SSC-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><b>Thus, meets the applicability condition.</b></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>If the SSC-CPA(s) under the PoA involves the addition of solar power generating units to the existing solar power generation facility, the added capacity of units to the SSC-CPA shall be lower than 15 MW and will be physically distinct<sup>25</sup> from the existing units.</p> <p><b>Thus, meets the applicability condition.</b></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 SSC-CPA(s) under the PoA shall not include retrofitting or modification of an existing facility for renewable energy generation.</p> <p><b>Thus, the condition is not applicable.</b></p>                                                                                                                                                                |
| <i>In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues only or biomass from dedicated plantations complying with the applicability conditions of AM0042.</i>                                                                                                          | <p>The SSC-CPA(s) under the PoA includes only solar power generation projects and not biomass project activities.</p> <p><b>Thus, the condition is not applicable.</b></p>                                                                                                                                                                                      |
| <i>In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities; decision 4/CMP.1) or following the procedures</i> | <p>The SSC-CPA(s) under the PoA includes only solar power generation projects and not biomass project activities.</p> <p><b>Thus, the condition is not applicable.</b></p>                                                                                                                                                                                      |

<sup>25</sup> Physically distinct units are those that are capable of generating electricity without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered “physically distinct”.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <i>included in the leakage section of AM0042</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                       |
| <i>In case the project activity involves the replacement of equipment, and the leakage from the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.</i> | <p>The SSC-CPA(s) under the PoA shall not include replacement of equipments.</p> <p><b>Thus, the condition is not applicable.</b></p> |

### E.3. Description of the sources and gases included in the SSC-CPA boundary

>>

The following table shows the gases included in the project activity:

| Source           |                                                                                          | Gas              | Included? | Justification / Explanation                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|------------------------------------------------------------------------------------------|------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Baseline         | CO <sub>2</sub> emissions from electricity generation in thermal power generating units. | CO <sub>2</sub>  | Yes       | The GHG reduced by the SSC-CPA(s) under the PoA is carbon dioxide. This reduction will take place due to the avoidance of the fossil fuel (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. Hence the CO2 emission is considered as the <b>main emission source</b> . |
|                  |                                                                                          | CH <sub>4</sub>  | No        | Minor emission source.                                                                                                                                                                                                                                                                                                                                                                               |
|                  |                                                                                          | N <sub>2</sub> O | No        | Minor emission source.                                                                                                                                                                                                                                                                                                                                                                               |
| Project activity | Use of SPV or CSP technology for electricity generation using solar energy.              | CO <sub>2</sub>  | No        | <p>The SSC-CPA(s) under the PoA generate electrical power using <i>solar photovoltaics</i> or <i>concentrated solar power technology</i> which is a renewable source of energy. Generation of power through solar is a clean technology<sup>26,27</sup> as no fossil fuel is fired or no GHG gases are emitted during the process.</p> <p>In case of hybrid systems where-in</p>                     |

<sup>26</sup> [http://www.mckinsey.com/locations/india/mckinseyonindia/pdf/environmental\\_energy\\_sustainability\\_media.pdf](http://www.mckinsey.com/locations/india/mckinseyonindia/pdf/environmental_energy_sustainability_media.pdf)

<sup>27</sup> <http://bangalore.tie.org/initiative/8/special-interest-group-clean-tech>





|  |  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--|--|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |                  | non renewable component (diesel generator, natural gas or other fossil fuel system) is involved, it accounts for CO <sub>2</sub> emissions. The same shall be monitored and accounted as project emissions. However, since the quantity of fossil fuel that will be consumed is unpredictable before actual operation of the project, and also to simplify the ex-ante calculations of emission reductions, the project emissions are excluded and hence the <b>CO<sub>2</sub> emission is considered nil.</b> |
|  |  | CH <sub>4</sub>  | No<br>The SSC-CPA(s) under the PoA generate electrical power using solar energy which is a renewable source of energy. Generation of power through solar is a clean technology, as no fossil fuel is fired or no GHG gases are emitted during the process. Hence there is <b>no CH<sub>4</sub> emission.</b>                                                                                                                                                                                                   |
|  |  | N <sub>2</sub> O | No<br>The SSC-CPA(s) under the PoA generate electrical power using solar energy which is a renewable source of energy. Generation of power through solar is a clean technology, as no fossil fuel is fired or no GHG gases are emitted during the process. Hence there is <b>no N<sub>2</sub>O emission.</b>                                                                                                                                                                                                   |

**E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:**

>>

As per paragraph 10 of AMS I.D, Version.17 *“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/regional grid system, the baseline scenario is the electricity delivered to the grid, generated by the operation of fossil fuel dominated grid-connected power plants.

**E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>**

**E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:**

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As per **EB 47, paragraph 73** which state *“the additionality is to be demonstrated either at PoA level or at CPA level”*<sup>28</sup>. In-line with the same, the CME of NSPDP has chosen to demonstrate additionality at PoA level. The details of additionality assessment used for the same is provided in section A.4.3 of the PoA-DD.

The description of arguments presented therein is also prevalent to the SSC-CPA project area under the PoA. Hence, the SSC-CPA which shall be included under the PoA need not re-write the arguments presented therein to support CPA additionality, except present an analysis to support the compliance of SSC-CPA to the key additionality criteria's.

In addition, the EB further clarifies under **“Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities, EB 60, Version 01, Annex 26, paragraph 04”**<sup>29</sup> which states *“full additionality requirement is not required in the context of component project activities (CPA), rather the confirmation of additionality for CPAs should be conducted by means of the eligibility criteria”*.

Thus in accordance with the above rulings, the assessment of additionality of each SSC-CPA to this PoA shall be evaluated on the basis that if the proposed SSC-CPA(s) meets the key eligibility criteria and data stipulated in section E.5.2 below, the SSC-CPA(s) shall be deemed additional.

|                                                                               |
|-------------------------------------------------------------------------------|
| <b>E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:</b> |
|-------------------------------------------------------------------------------|

>>

As stated in section E.5.1 above, the SSC-CPA(s) shall be deemed additional if it complies with the key criteria's stated below. Further the CME of NSPDP to assess the same prior to the inclusion of SSC-CPA under the PoA.

| Sl. No | Key Criteria for assessing SSC-CPA additionality                                                                                                            |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | The SSC-CPA shall involve implementation and operation of a new power generation plant through either solar photovoltaic (SPV) or solar thermal technology. |
| 2      | The electricity generated from the SSC-CPA project activity should be supplied to the national / regional grid system within India.                         |
| 3      | The installed capacity of SSC-CPA shall not exceed 15 MW.                                                                                                   |

The compliance of SSC-CPA(s) to the above key criteria's shall make it automatically **additional**, since they fall under the positive list of grid-connected renewable electricity generation technologies.

**E.6. Estimation of Emission reductions of a CPA:**

|                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|

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As stated in section E.4 above, the baseline scenario for the SSC-CPAs will be the electricity delivered to the national/regional grid or to a third party through grid system.

As per paragraph 11 of AMS I.D, Version.17 the baseline emissions are the product of electrical energy baseline  $EG_{BL, y}$  expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

<sup>28</sup> <http://cdm.unfccc.int/EB/047/eb47rep.pdf>

<sup>29</sup> [http://cdm.unfccc.int/Reference/Guidclarif/PoA/poa\\_guid06.pdf](http://cdm.unfccc.int/Reference/Guidclarif/PoA/poa_guid06.pdf)



$$BE_y = EG_{BL,y} * EF_{CO_2, grid, y}$$

Where:

- BE<sub>y</sub> = Baseline Emissions in year y (t CO<sub>2</sub>)  
 EG<sub>BL, y</sub> = Quantity of net electricity supplied to the grid as a result of the implementation of CDM project activity in year y (MWh)  
 EF<sub>CO<sub>2</sub>, grid, y</sub> = CO<sub>2</sub> emission factor of the grid in year y (t CO<sub>2</sub>/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 CO<sub>2</sub>e/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<sub>y</sub>) 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 emissions factor

**Step 1: Identify the relevant electricity power system.**

The tool<sup>30</sup> 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)<sup>31</sup>, Government of India has divided the Indian Power Sector into two regional grids (see table below).

| NEWNE Grid |         |         |               | Southern Grid |
|------------|---------|---------|---------------|---------------|
| Northern   | Eastern | Western | North-Eastern |               |

<sup>30</sup> <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.0.pdf>

<sup>31</sup> [http://cea.nic.in/reports/planning/cdm\\_co2/user\\_guide\\_ver6.pdf](http://cea.nic.in/reports/planning/cdm_co2/user_guide_ver6.pdf)



|                                                                                                                                                                                                                                                    |                                                                                                                                                                      |                                                                                                                                                                                                                    |                                                                                                                                                                                          |                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Chandigarh</li> <li>• Delhi</li> <li>• Haryana</li> <li>• Himachal Pradesh</li> <li>• Jammu and Kashmir</li> <li>• Punjab</li> <li>• Rajasthan</li> <li>• Uttar Pradesh</li> <li>• Uttarakhand</li> </ul> | <ul style="list-style-type: none"> <li>• Bihar</li> <li>• Jharkhand</li> <li>• Orissa</li> <li>• West Bengal</li> <li>• Sikkim</li> <li>• Andaman-Nicobar</li> </ul> | <ul style="list-style-type: none"> <li>• Chhattisgarh</li> <li>• Gujarat</li> <li>• Daman &amp; Diu</li> <li>• Dadar &amp; Nagar Haveli</li> <li>• Madhya Pradesh</li> <li>• Maharashtra</li> <li>• Goa</li> </ul> | <ul style="list-style-type: none"> <li>• Arunachal Pradesh</li> <li>• Assam</li> <li>• Manipur</li> <li>• Meghalaya</li> <li>• Mizoram</li> <li>• Nagaland</li> <li>• Tripura</li> </ul> | <ul style="list-style-type: none"> <li>• Andhra Pradesh</li> <li>• Karnataka</li> <li>• Kerala</li> <li>• Tamil Nadu</li> <li>• Pondicherry</li> <li>• Lakshadweep</li> </ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The proposed PoA being implemented across India, the electricity generated by the SSC-CPA(s) will displace the electricity either from the NEWNE regional grid or Southern regional grid based on the location of the SSC-CPA. Thus all the power generation facilities connected to these grids 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)**  
SSC-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.*

*Option I corresponds to the procedure contained in earlier versions of this tool. Option II allows the inclusion of off-grid power generation in the grid emission factor. Option II aims to reflect that in some countries off-grid power generation is significant and can partially be displaced by CDM project activities, e.g. if off-grid power plants are operated due to an unreliable and unstable electricity grid. Option II requires collecting data on off-grid power generation as per Annex 2 and can only be used if the conditions outlined therein are met. Option II may be chosen only for the operating margin emission*

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:

- Simple OM, or
- Simple adjusted OM, or
- Dispatch data analysis OM, or
- Average OM

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.

Contribution of the *must run power plants*<sup>32</sup> of five most recent years for NEWNE and Southern regional

<sup>32</sup> [http://cea.nic.in/reports/planning/cdm\\_co2/user\\_guide\\_ver6.pdf](http://cea.nic.in/reports/planning/cdm_co2/user_guide_ver6.pdf)



grids are given below:

| Years         | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | Average       |
|---------------|---------|---------|---------|---------|---------|---------------|
| NEWNE Grid    | 18.0%   | 18.5%   | 19.0%   | 17.4%   | 15.9%   | <b>17.76%</b> |
| Southern Grid | 27.0%   | 28.3%   | 27.1%   | 22.8 %  | 20.6%   | <b>25.16%</b> |

The above table clearly shows that the percentage of total grid generation by low-cost/must-run plants (on the basis of average of five most recent years) for both NEWNE and Southern regional grids is much less than 50% of the total generation. Thus, the selection of Simple OM method for calculating the emission factor is justified.

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 SSC-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:

$$EF_{grid,OMsimple,y} = \frac{\sum_{i,m} FC_{i,m,y} * NCV_{i,y} * EF_{CO2,i,y}}{\sum_m EG_{m,y}}$$

Where:

|                           |   |                                                                                                                                    |
|---------------------------|---|------------------------------------------------------------------------------------------------------------------------------------|
| $EF_{grid, OM simple, y}$ | = | Simple operating margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> / MWh)                                         |
| $FC_{i, m, y}$            | = | Amount of fossil fuel type i consumed by power plant/unit m in year y (mass or volume unit)                                        |
| $NCV_{i, y}$              | = | Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)                                    |
| $EF_{CO2, i, y}$          | = | CO <sub>2</sub> emission factor of fossil fuel type i in year y (tCO <sub>2</sub> /GJ)                                             |
| $EG_{m, y}$               | = | Net electricity generated and delivered to the grid by power plant/ unit m in year y (MWh)                                         |
| m                         | = | All power plants/units serving the grid in year except low cost must run power plants/units                                        |
| i                         | = | All fossil fuel types combusted in power plant/unit m 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 SSC-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 (tCO<sub>2</sub>/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

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

Where:

|                  |   |                                                                                                  |
|------------------|---|--------------------------------------------------------------------------------------------------|
| $EF_{grid,BM,y}$ | = | Build margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /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 <sub>2</sub> emission factor of power unit m in year y (tCO <sub>2</sub> /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 <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /MWh)     |
| $EF_{grid, OM, y}$ | = | Operating margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /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  $w_{BM} = 0.25$

The grid emission factor shall be calculated as per the above procedure for all the SSC-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 SSC-CPA shall be used for estimation of grid emission factor in the SSC-CPA DD.

**E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:**

>>

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:

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             |

Project emissions:

The SSC-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 CO<sub>2</sub> emissions from fossil fuel combustion**”<sup>33</sup> EB 41, Annex 11, version 2.

CO<sub>2</sub> emissions from fossil fuel combustion in process  $j$  are calculated based on the quantity of fuels combusted and the CO<sub>2</sub> emission coefficient of those fuels, as follows:

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

Where:

<sup>33</sup> <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf>



- $PE_{FC,j,y}$  = Are the CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/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 CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub>/mass or volume unit)
- i = Are the fuel types combusted in process j during the year y

The CO<sub>2</sub> 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 CO<sub>2</sub> emission coefficient  $COEF_{i,y}$  is calculated based on the chemical composition of the fossil fuel type i, using the following approach:

- 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 CO<sub>2</sub> emission coefficient of fuel type i (tCO<sub>2</sub>/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 CO<sub>2</sub> emission coefficient  $COEF_{i,y}$  is calculated based on net calorific value and CO<sub>2</sub> emission factor of the fuel type i, as follows:

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

Where:

- $COEF_{i,y}$  = CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub>/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 CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)
- i = fuel types combusted in process j during the year y

The CME has selected the option B for calculating CO<sub>2</sub> 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 CO<sub>2</sub> 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

$$ER_y = BE_y - PE_y$$

**Baseline Emissions ( $BE_y$ )**

Baseline Emissions shall be calculated by multiplying the net quantity of electricity supplied by the SSC-CPA ( $EG_{BL,y}$ ) with the CO<sub>2</sub> baseline emission factor for the electricity displaced due to the project ( $EF_{CO_2, grid,y}$ ) as follows:

$$BE_y = EG_{BL,y} * EF_{CO_2, grid,y}$$

**E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:**

*(Copy this table for each data and parameter)*

|                                                                                                                    |                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>                                                                                           | $EF_{grid,OM,y}$                                                                                                                                                                                                      |
| <b>Data unit:</b>                                                                                                  | tCO <sub>2</sub> eq/MWh                                                                                                                                                                                               |
| <b>Description:</b>                                                                                                | Operating Margin emission factor                                                                                                                                                                                      |
| <b>Source of data used:</b>                                                                                        | The latest version of Central Electricity Authority (CEA) CO <sub>2</sub> Baseline Database will be used for calculation.                                                                                             |
| <b>Value applied:</b>                                                                                              | SSC-CPA to apply the value for the relevant grid                                                                                                                                                                      |
| <b>Justification of the choice of data or description of measurement methods and procedures actually applied :</b> | As per the “ <i>Tool to calculate emission factor for an electricity system</i> ”, the SSC-CPA shall use the latest operating margin emission factor database available from CEA at the time of its inclusion in PoA. |
| <b>Any comment:</b>                                                                                                | This shall be fixed ex-ante for the entire crediting period of SSC-CPA                                                                                                                                                |

|                                                                                                                    |                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>                                                                                           | $EF_{grid,BM,y}$                                                                                                                                                                                                      |
| <b>Data unit:</b>                                                                                                  | tCO <sub>2</sub> eq/MWh                                                                                                                                                                                               |
| <b>Description:</b>                                                                                                | Build Margin emission factor                                                                                                                                                                                          |
| <b>Source of data used:</b>                                                                                        | The latest version of Central Electricity Authority (CEA) CO <sub>2</sub> Baseline Database will be used for calculation.                                                                                             |
| <b>Value applied:</b>                                                                                              | SSC-CPA to apply the value for the relevant grid                                                                                                                                                                      |
| <b>Justification of the choice of data or description of measurement methods and procedures actually applied :</b> | As per the “ <i>Tool to calculate emission factor for an electricity system</i> ”, the SSC-CPA shall use the latest operating margin emission factor database available from CEA at the time of its inclusion in PoA. |
| <b>Any comment:</b>                                                                                                | This shall be fixed ex-ante for the entire crediting period of SSC-CPA                                                                                                                                                |

|                          |                         |
|--------------------------|-------------------------|
| <b>Data / Parameter:</b> | $EF_{grid,CM,y}$        |
| <b>Data unit:</b>        | tCO <sub>2</sub> eq/MWh |



|                                                                                                             |                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Description:                                                                                                | Combined Margin emission factor                                                                                                 |
| Source of data used:                                                                                        | Calculated from the Operating and the Build margin emission factor                                                              |
| Value applied:                                                                                              | SSC-CPA to apply the value for the relevant grid                                                                                |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | The Combined margin has been calculated as the weightage of the Operating margin and the Build margin as shown in section E.6.1 |
| Any comment:                                                                                                | This shall be fixed ex-ante for the entire crediting period of SSC-CPA                                                          |

|                                                                                                             |                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>                                                                                    | <b>EF<sub>CO<sub>2</sub>i,y</sub></b>                                                                                                                                                                                                                                                                   |
| Data unit:                                                                                                  | t CO <sub>2</sub> /TJ                                                                                                                                                                                                                                                                                   |
| Description:                                                                                                | Weighted average CO <sub>2</sub> emission factor of the fuel type <i>i</i> in year <i>y</i> .                                                                                                                                                                                                           |
| Source of data used:                                                                                        | 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 (In case of any revision in the IPCC guidelines, the revised value shall be taken into account) |
| Value applied:                                                                                              | SSC-CPA to apply the value for the relevant fuel type                                                                                                                                                                                                                                                   |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | IPCC values have been used for the relevant fossil fuel type because no country specific data is available.                                                                                                                                                                                             |
| Any comment:                                                                                                | The value has been fixed ex-ante for the entire crediting period of SSC-CPA                                                                                                                                                                                                                             |

|                                                                                                             |                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>                                                                                    | <b>NCV<sub>i,y</sub></b>                                                                                                                                                                                                                                                                                |
| Data unit:                                                                                                  | TJ/Gg                                                                                                                                                                                                                                                                                                   |
| Description:                                                                                                | Weighted Average net Calorific Value of fuel type <i>i</i> in year <i>y</i>                                                                                                                                                                                                                             |
| Source of data used:                                                                                        | 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 (In case of any revision in the IPCC guidelines, the revised value shall be taken into account) |
| Value applied:                                                                                              | SSC-CPA to apply the value for the relevant fuel type                                                                                                                                                                                                                                                   |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | IPCC value has been used for the fuel type since no country specific oxidation factor is available. In case of any revision in the IPCC guidelines, the revised value shall be taken into account.                                                                                                      |
| Any comment:                                                                                                | The Monitored Data to be kept for a minimum of two years after the end of the crediting period of the SSC-CPA.                                                                                                                                                                                          |

|                          |                                                                              |
|--------------------------|------------------------------------------------------------------------------|
| <b>Data / Parameter:</b> | <b>ρ<sub>i,y</sub></b>                                                       |
| Data unit:               | kg/m <sup>3</sup>                                                            |
| Description:             | Weighted average density of fuel type <i>i</i> in year <i>y</i>              |
| Source of data used:     | IPCC 2006 default value (In case of any revision in the IPCC guidelines, the |



|                                                                                                             |                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                             | revised value shall be taken into account).                                                                                                                                                        |
| Value applied:                                                                                              | SSC-CPA to apply the value for the relevant fuel type                                                                                                                                              |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | IPCC value has been used for the fuel type since no country specific oxidation factor is available. In case of any revision in the IPCC guidelines, the revised value shall be taken into account. |
| Any comment:                                                                                                | The Monitored Data to be kept for a minimum of two years after the end of the crediting period of the SSC-CPA.                                                                                     |

**E.7. Application of the monitoring methodology and description of the monitoring plan:**

| <b>E.7.1. Data and parameters to be monitored by each SSC-CPA:</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>(Copy this table for each data and parameter)</i>               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Data / Parameter:</b>                                           | <b>EG<sub>BL, y</sub></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Data unit:                                                         | MWh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description:                                                       | Net quantity of electricity export to the grid during the year y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Source of data to be used:                                         | Energy meter reading recorded for each project site part of SSC-CPA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Value of data                                                      | To be specified in each SSC-CPA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Description of measurement methods and procedures to be applied:   | <p><u>Data Type:</u> measured &amp; calculated</p> <p><u>Measurement Frequency:</u> Continuously using energy meters installed for project sites</p> <p><u>Recording Frequency:</u> Periodically (most likely monthly, however it might differ for different sites)</p> <p><u>Responsibility:</u> The authorized representative of the implementing entity shall be responsible for monitoring this parameter</p> <p><u>Archiving Policy:</u> Either paper / electronic method shall be employed for maintaining the depository containing historical records of the parameter</p> <p>For a SSC-CPA the value of this parameter will be the sum of values gathered for all the Project Sites part of the SSC-CPA.</p> |
| QA/QC procedures to be applied:                                    | <p>Sale records of the power sale to the grid or to a third party through grid shall be used to cross check the energy generated data and thus ensure consistency.</p> <p>The energy meters at the SSC-CPA project site(s) shall be calibrated at least once in three years.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Any comment:                                                       | The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each SSC-CPA.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                            |                                                                                |
|----------------------------|--------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>   | <b>FC<sub>i, j, y</sub></b>                                                    |
| Data unit:                 | Mass or volume unit per year                                                   |
| Description:               | Quantity of fossil fuel type i combusted in the project activity during year y |
| Source of data to be used: | On-site measurements                                                           |
| Value of data              | 0 (assumed value for ex-ante calculation of emission reductions)               |
| Description of             | <u>Data Type:</u> measured                                                     |



|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| measurement methods and procedures to be applied: | <p><u>Measurement Procedure:</u> The total number of operating hours of fossil fuel generator set and the corresponding quantity of fossil fuel consumed for the purpose will be recorded.</p> <p><u>Responsibility:</u> The authorized representative of the implementing entity shall be responsible for monitoring this parameter</p> <p><u>Recording Frequency:</u> As and when consumed</p> <p><u>Archiving Policy:</u> Either paper / electronic method shall be employed for maintaining the depository containing historical records of the parameter</p> |
| QA/QC procedures to be applied:                   | The data recorded can be cross checked against the fuel purchase receipts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Any comment:                                      | The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each SSC-CPA.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>                                         | <b>EF<sub>CO<sub>2</sub>i,y</sub></b>                                                                                                                                                                                                                                                                                                                                                                                                             |
| Data unit:                                                       | t CO <sub>2</sub> /TJ                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description:                                                     | Weighted average CO <sub>2</sub> emission factor of the fuel type <i>i</i> in year <i>y</i> .                                                                                                                                                                                                                                                                                                                                                     |
| Source of data to be used:                                       | 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 (In case of any revision in the IPCC guidelines, the revised value shall be taken into account)                                                                                                                                           |
| Value of data                                                    | SSC-CPA to apply the value for the relevant fuel type                                                                                                                                                                                                                                                                                                                                                                                             |
| Description of measurement methods and procedures to be applied: | <p><u>Data Type:</u> measured</p> <p><u>Measurement Procedure:</u> Based on the fuel type, IPCC default value shall be considered.</p> <p><u>Responsibility:</u> The authorized representative of the implementing entity shall be responsible for monitoring this parameter</p> <p><u>Archiving Policy:</u> Either paper / electronic method shall be employed for maintaining the depository containing historical records of the parameter</p> |
| QA/QC procedures to be applied:                                  | Any further revision of the IPCC guidelines shall be taken into account.                                                                                                                                                                                                                                                                                                                                                                          |
| Any comment:                                                     | The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each SSC-CPA.                                                                                                                                                                                                                                                                                                                                   |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>                                         | <b>NCV<sub>i,y</sub></b>                                                                                                                                                                                                                                                                                                                                                |
| Data unit:                                                       | TJ/Gg                                                                                                                                                                                                                                                                                                                                                                   |
| Description:                                                     | Weighted Average net Calorific Value of fuel type <i>i</i> in year <i>y</i>                                                                                                                                                                                                                                                                                             |
| Source of data to be used:                                       | 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 (In case of any revision in the IPCC guidelines, the revised value shall be taken into account)                                                                 |
| Value of data                                                    | SSC-CPA to apply the value for the relevant fuel type                                                                                                                                                                                                                                                                                                                   |
| Description of measurement methods and procedures to be applied: | <p><u>Data Type:</u> measured</p> <p><u>Measurement Procedure:</u> Based on the fuel type, IPCC default value shall be considered.</p> <p><u>Responsibility:</u> The authorized representative of the implementing entity shall be responsible for monitoring this parameter</p> <p><u>Archiving Policy:</u> Either paper / electronic method shall be employed for</p> |



|                                 |                                                                                                                 |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                                 | maintaining the depository containing historical records of the parameter                                       |
| QA/QC procedures to be applied: | Any further revision of the IPCC guidelines shall be taken into account.                                        |
| Any comment:                    | The Monitored Data to be kept for a minimum of two years after the end of the crediting period of each SSC-CPA. |

### **E.7.2. Description of the monitoring plan for a SSC-CPA:**

>>

This monitoring plan for a SSC-CPA(s) is developed in accordance with the modalities and procedures for small-scale CDM project activities and is proposed for the grid connected solar power projects (both SPV and CSP) to be implemented within the project boundary. The monitoring plan here, which will be implemented by the 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, SSC-CPA and PoA level. The description of the data flow between these three levels and their compilation is given in section A.4.4.1. The details of the parameters monitored, metering system employed, monitoring responsibilities and other information shall be provided in the respective SSC-CPA-DD. Following will be the key activities under the monitoring plan:

#### **Monitoring Practice**

Data parameter(s) as mentioned in section E.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 SSC-CPA would achieve.

#### **Monitoring Structure**

The CME of NSPDP will implement a monitoring protocol allowing the DOE to verify all SSC-CPA's under the PoA. The parameters included in section E.7.1 shall be monitored by each SSC-CPA implementing entity. The CME will provide guidance to all SSC-CPA developer on how the monitoring should be conducted and data should be collected with regards 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 E.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 E.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 PoA-DD and the corresponding 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 SSC-CPA. In general the procedure adopted to handle the failure in meters will be provided in the power purchase agreement signed by each SSC-CPA implementing entity. Since the procedure varies with each SSC-CPA, the CME finds it appropriate to address the same at the SSC-CPA level. The description of the same shall be included in section B.6.1 of the respective SSC-CPA-DD.

**QA/ QC procedure**

The meters used for monitoring of required data will be calibrated as mentioned in section E.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 SSC-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 SSC-CPA whichever occurs later.

|                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|

>>

Date of completing the final draft of the baseline: 23/09/2011

**Name of the entity determining the baseline:**

Atul Sanghal  
Head – Carbon Advisory

Emergent Ventures India Pvt. Ltd.  
5<sup>th</sup> Floor, Universal Trade Tower,  
Sohna Road, Sector – 49,  
Gurgaon-122001, India

*Emergent Ventures India Pvt. Ltd. is the Coordinating / Managing Entity for the proposed Programme of Activities as listed in Annex 1.*



**Annex 1**

**CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and  
PARTICIPANTS IN THE PROGRAMME of ACTIVITIES**

|                  |                                                                            |
|------------------|----------------------------------------------------------------------------|
| Organization:    | Emergent Ventures India Pvt. Ltd.                                          |
| Street/P.O.Box:  | Sector – 49, Sohna Road                                                    |
| Building:        | 5 <sup>th</sup> Floor, Universal Trade Tower                               |
| City:            | Gurgaon                                                                    |
| State/Region:    | Haryana                                                                    |
| Postfix/ZIP:     | 122001                                                                     |
| Country:         | India                                                                      |
| Telephone:       | +91 - 124 – 43 53 100                                                      |
| FAX:             | +91 - 124 – 41 02 980                                                      |
| E-Mail:          |                                                                            |
| URL:             | <a href="http://emergent-ventures.com/">http://emergent-ventures.com/</a>  |
| Represented by:  |                                                                            |
| Title:           | Head                                                                       |
| Salutation:      | Mr.                                                                        |
| Last Name:       | Sanghal                                                                    |
| Middle Name:     |                                                                            |
| First Name:      | Atul                                                                       |
| Department:      | Carbon Advisory                                                            |
| Mobile:          |                                                                            |
| Direct FAX:      | +91 - 124 – 41 02 980                                                      |
| Direct tel:      | +91 - 124 – 43 53 100                                                      |
| Personal E-Mail: | <a href="mailto:atul@emergent-ventures.com">atul@emergent-ventures.com</a> |



Annex 2

**INFORMATION REGARDING PUBLIC FUNDING**

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





**Annex 3**

**BASELINE INFORMATION**

Refer section E.6. for detailed Baseline Information



**Annex 4**

**MONITORING INFORMATION**

Monitoring Information is discussed in section E.7.

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