



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

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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):

Grid Connect SSC Solar PV Power Generation Plant Programme
Version: 02
Date: 27/08/2012

version	date	Comments
Version: 01	21/03/2012	Global Stakeholder Consultation
Version: 02	27/08/2012	Revised according to DOE's findings

A.2. Description of the small-scale programme of activities (PoA):

1. General operating and implementing framework of PoA

Grid Connect SSC Solar PV Power Generation Plant Programme (hereafter referred to as “The proposed PoA”) aims to establish a CDM framework to which solar PV power generation projects can be included in the proposed PoA as CPAs, thus supporting the development of new solar power projects in China that supply electricity to the grid and replace equivalent electricity generated by fossil fuel fired power plants connected to the grid.

The coordinating/managing entity (CME) is responsible for managing all CPAs, coordinating all the entities involved in the PoA, CPA inclusion and sales of CERs in the international market. The CME will sign CME contracts with CPA operators, assign consulting company to carry out CDM development and manage the CPA monitoring. The CPA operators are responsible for planning, financing arrangement and the detailed implementation of each CPA, including the operating of the power plant, the calibration of the monitoring equipment, and the monitoring and reporting of data etc.

The coordinating/managing entity for the proposed PoA is Union Power Carbon Asset Management (Beijing) Co., Ltd.

2. Policy/measure or stated goal of the PoA

On July 24th 2011, China's NDRC issued *Circular on the Establishment of Feed-in Tariffs for On-grid Solar PV Power Generation*, which stated that tariff of non-tendering solar PV power generation projects in China must follow the fixed bus-bar tariff according to the social average investment and operational cost. Once determining the time of project approval and commissioning, the feed-in tariff would be fixed and almost unlikely to increase. On the other hand, the technology in connection with the solar PV power generation is still at the initial stage, resulting in low solar to electricity efficiency and unstable electricity production. Meanwhile, the investment of solar PV projects is relatively high compared to other types of power generation through the experience of implemented projects. Also, the investment is very stable and hard to decrease as the technical limits exist in solar PV industry.

As seen from above, it's obvious that the green field solar PV projects in the future will face more severe financial barrier due to fixed tariff, low solar to electricity efficiency and high investment.

The objective of the proposed PoA is to develop a platform for overcoming institutional and financial barriers for the construction of a series of small-scale solar PV projects by searching for financial support.



Since most of the solar PV projects in China face the similar barrier, it is highly desirable to carry out the proposed PoA and get substantial revenues through CDM support. Therefore, the proposed PoA will not only alleviate the financial barrier but also speed up the development of Chinese solar PV industry.

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

The proposed PoA is a voluntary action by Union Power Carbon Asset Management (Beijing) Co., Ltd. The proposed PoA will include entities which agree over the philosophy and carry out voluntary activity with the same targets. That is, CPAs for reducing GHG emission by using renewable solar to generate electricity to the grid in China, which meet the eligibility criteria, will be included in the proposed PoA.

Prior to the implementation of the proposed PoA, equivalent amount of annual power supplied by each CPA will be generated and supplied by the grid which the CPA is connected to. This is the same as the baseline scenario. The expected result for the proposed PoA is a significant reduction of GHG emissions compared to the emissions that would occur in the absence of the proposed PoA. Furthermore, technology development of solar PV industry is expected to be effectively promoted.

a. Local and global environmental benefits

The proposed PoA will contribute GHG emission reduction to local environment, therefore contributing to the mitigation of adverse impacts of climate change, both locally and globally.

The proposed PoA may also displace electricity from the grid, thereby reducing SO_x and particulate matter emissions from the power generation industry in China compared to a business-as-usual scenario.

b. Social-Economic benefits

The proposed PoA will utilize clean solar energy, thus contributing to the establishment of a recycling-oriented and zero-emission society, and to the amelioration of the imbalance of energy supply/demand in the area where the proposed PoA would be implemented.

The proposed PoA will also promote application and diffusion of the innovative/creative solar PV technology in China through the demonstrative practice of the project activity.

In summary, the proposed PoA will not only benefit global GHG emission reduction but also contribute to local environment and sustainable development.

A.3. Coordinating/managing entity and participants of SSC-POA:

The coordinating/managing entity of the proposed PoA is Union Power Carbon Asset Management (Beijing) Co., Ltd. Coordinating/managing entity and project participants of this PoA are listed as follows:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Union Power Carbon Asset Management (Beijing) Co., Ltd.	No
Japan	Carbon Capital Management, Inc.	No



Further contact information of coordinating /managing entity and project participants is provided in Annex 1.

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

A.4.1. Location of the programme of activities:

A.4.1.1. Host Party(ies):

People's Republic of China

A.4.1.2. Physical/ Geographical boundary:

The physical boundary of the proposed PoA is the grids that are controlled by State Grid or the China Southern Power grid contained the 30 provinces in China, as shown in Table 1. The geographical boundary of the proposed PoA is that of the 30 provinces in China listed in Table 1, as shown in Figure 1.

Table-1 Geographical distribution of the grids controlled by State Grid or the Southern Power Grid

	Regional grid	Controlled province	Sub-Total
State Grid	Northeast Power Grid	Liaoning Province, Jilin Province, Heilongjiang Province,	3
	North China Power Grid	Beijing Municipality, Tianjin Municipality, Hebei Province, Shanxi Province, Shandong Province Inner Mongolia Autonomous Region	6
	East China Power Grid	Shanghai Municipality, Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province	5
	Central China Power Grid	Henan Province, Hubei Province, Hunan Province, Jiangxi Province, Sichuan Province, Chongqing Municipality	6
	Northwest Power Grid	Shaanxi Province, Gansu Province, Qinghai Province, Ningxia Hui Autonomous Region, Xinjiang Uygur Autonomous Region	5
China Southern Power Grid	China Southern Power Grid	Guangdong Province, Guangxi Zhuang Autonomous Region, Yunnan Province, Guizhou Province, Hainan Province	5

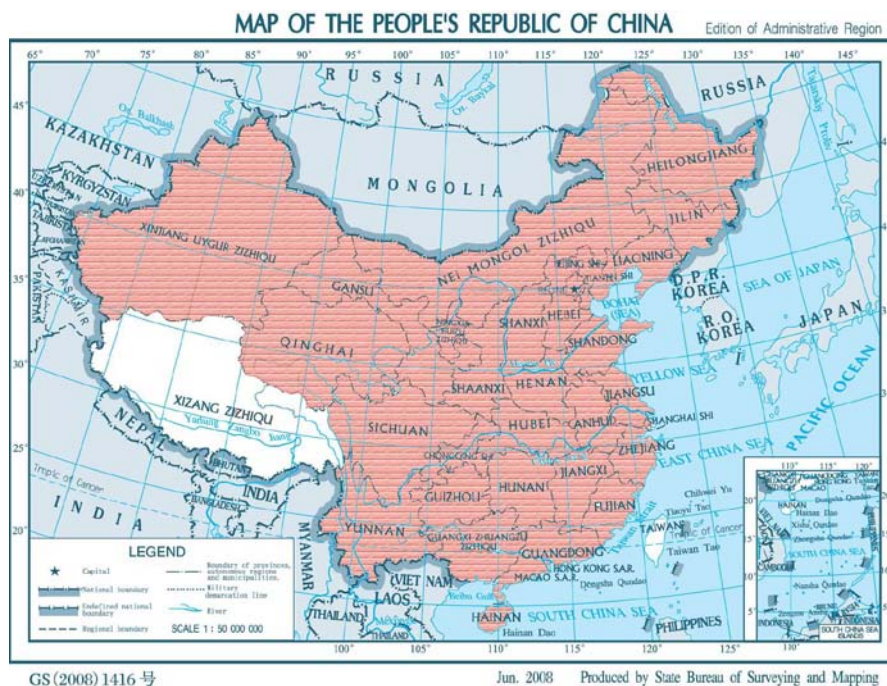


Figure-1 Geographical boundary of the proposed PoA

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

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

The proposed PoA activity consists of CPAs which have the same technical concept. Technologies applied by each CPA will only involve solar photovoltaic power generation, which may include, but are not limited to single crystal silicon, polycrystalline silicon and thin film technologies. The total capacity of the power plant will be no more than 15MW.

The process is the PV array inverts a photovoltaic power to a direct current electricity power, and the power conditioning system inverts a direct current to an alternating current. Then, the alternating current is boosted through boost transformer with a generated voltage supplied to the grid.

Schematic diagram of the technology to be employed by the proposed PoA is illustrated in Figure-2:

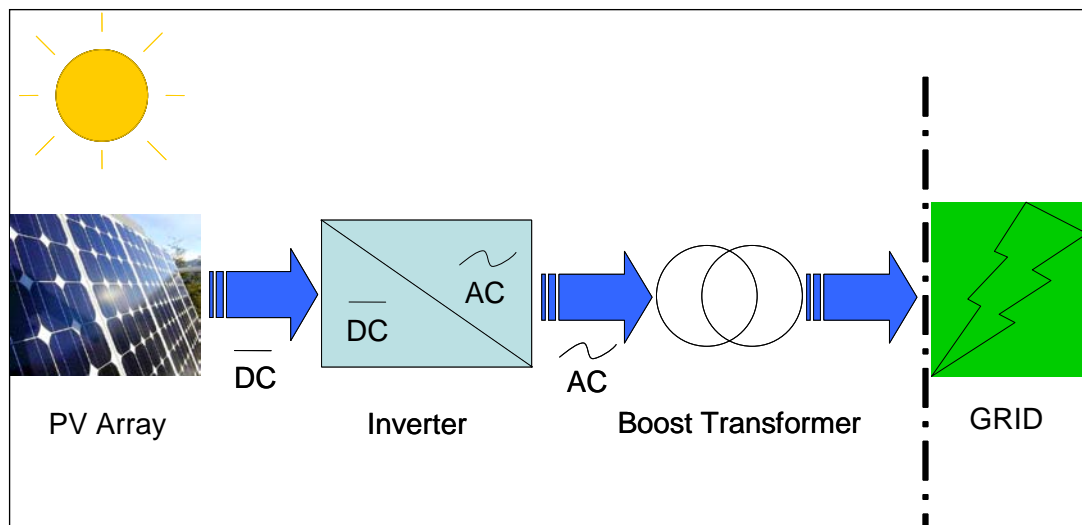


Figure-2 Schematic diagram of the technology to be employed by the proposed PoA

Technology to be employed by each CPA in the proposed PoA includes following equipments:

■ PV array

PV array cells are the core component in solar PV plant, whose function is to collect solar energy and convert it into electricity. At present, the main types of PV array cells are monocrystalline silicon cells, polycrystalline silicon and others.

■ Inverters

Inverter is an electrical device that converts direct current (DC) to alternating current (AC).

■ Boost Transformer

Boost transformer is an electrical device that changes the AC voltage.

A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:

Following eligibility criteria should be applicable for inclusion of the CPA in the proposed PoA:

- 1) The geographic boundary of a CPA lies within the geographic boundary set in the PoA, including 30 provinces in China, and the CPA operator belongs to power generation companies;
- 2) According to the project information database set up by the CME, the CME will confirm that:
 - (i) All solar PV power plant to be newly installed under a CPA is not and will not be part of another CDM project or PoA;
 - (ii) All CPA operators involved in the PoA are aware and agree with the inclusion of a CPA to the proposed PoA.
 - (iii) The proposed CPA isn't registered as a single CDM project and will not be a part of another registered PoA;
 - (iv) The project information including name, geographic coordinates, technology, equipment and end-user of the proposed CPA can be uniquely identified.

To ensure the above information, a written statement should be issued by the CPA operators. Meanwhile, CME will search in UNFCCC website or confirm with relevant organization to check the information of the proposed CPA against the information of other similar CDM project activities to



ensure that no overlap between CPAs occurs, thereby avoiding double accounting of emission reductions.

- 3) Only solar PV power generation technology is involved in the CPA with no solar thermal electricity generation technology included. Such technologies may include, but are not limited to single crystal silicon, polycrystalline silicon and thin film technologies;
- 4) No equipment will be transferred from another project activities, and no technology transfer is involved in the CPA;
- 5) The start date (defined in the Glossary of CDM terms) of the CPA is not prior to the PoA GSC date. The start date of each CPA is determined as the earliest date on which either the implementation or construction or real action of a project activity begins. To determine the project starting date, the documents that will be reviewed includes the Equipment Purchase Contract, the Construction Contract, and the Construction Permit etc;
- 6) An existing Approved CDM Methodology AMS-I.D. (Version 17.0), is applicable to a CPA, the applicability conditions are described below;

As per the methodology	As per the CPA
This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that (a) supplying electricity to a national or a regional grid; or (b) supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	Each CPA under the proposed PoA comprises renewable energy generation units using solar photovoltaic power generation technology and will supply electricity to a national or a regional grid or supply electricity to an identified consumer facility via national/regional grid through a contractual arrangement
This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated 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 plant(s).	Each CPA under the proposed PoA is a green field solar PV power generation project, which supplies electricity generated to the grid.
Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: <ul style="list-style-type: none"> • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • 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 4W/m²; • The project activity results in new reservoirs and the power density of the power plant, as per 	Not applicable



definitions given in the Project Emissions section, is greater than 4 W/m ² .	
If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The generation unit of Each CPA under the proposed PoA is a new solar PV power plant with capacity of no more than 15MW.
Combined heat and power (co-generation) systems are not eligible under this category.	Each CPA under the proposed PoA is a solar PV based power plant only, and no heat will be generated in this system.
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.	Each CPA under the proposed PoA is a green field solar PV power generation project, which doesn't involve the addition of renewable energy generation units at an existing renewable power generation facility.
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.	Each CPA under the proposed PoA is a green field solar PV power generation project, which doesn't involve retrofitting or modifying an existing facility for renewable energy generation.

- 7) A CPA meets following criteria for assessing additionality according to Guidelines on the demonstration of additionality of small-scale project activities (Version 09.0):
 - (i) Solar technologies;
 - (ii) the installed capacity of no more than 15MW;
- 8) The length of the proposed PoA does not exceed 28 years, as well as the CPA crediting period will not exceed the PoA end date;
- 9) Local stakeholder consultations and environmental impact analysis will be carried out at the CPA level, both of which will be conducted by the operator of each CPA prior to the start date of the CPA and can be clearly identified according to the documentary evidence;
- 10) All CPAs will not involve public funding from Annex I Parties;
- 11) All CPA operators involved in the PoA should confirm in a written statement that the proposed CPA complies with the debundling check as per "Guidelines on assessment of de-bundling for SSC project activities". The CME will also verify if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:
 - With the same project participants;
 - In the same project category and technology/measure; and
 - Registered within the previous 2 years; and
 - Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.



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):

The information presented here shall constitute the demonstration of additionality of the PoA as a whole.

(i) The proposed PoA is a voluntary coordinated action;

There are no national, provincial or local requirements providing for solar PV power plants installation. Therefore the proposed PoA is a voluntary action to reduce GHG emissions and organized by the coordinating/managing entity.

(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;

Any CPA under the proposed PoA was additional, and then no investment will be made into the CPAs in the absence of the PoA. Major financial benefits generated by the proposed PoA to the PoA coordinator are CER revenue. Without CER revenue, the PoA coordinator has no obligation to, and cannot manage the PoA and conduct coordination between all participants because it is a private entity. Thus, the voluntary coordinated action would not be implemented in the absence of the PoA, and none of the CPA which would be included in the PoA is likely to be implemented without CDM revenue.

(iii) If the PoA is implementing a mandatory policy/regulation, this would not be /is not enforced;

Not applicable. The proposed PoA is not implementing a mandatory policy/regulation.

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

Not applicable. The proposed PoA is not implementing a mandatory policy/regulation.

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

A.4.4.1. Operational and management plan:

Management and operational scheme of the proposed PoA is shown in Figure-3 below.

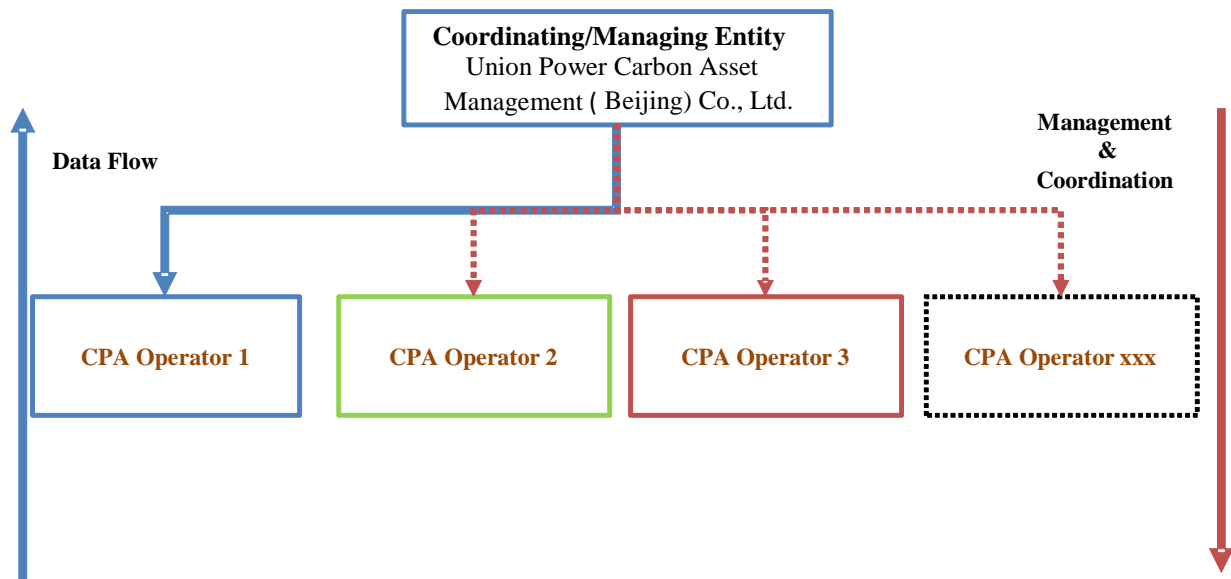


Figure-3 Management and operational scheme of the proposed PoA

The managing/coordinating entity, Union Power Carbon Asset Management (Beijing) Co., Ltd. is in charge of coordinating all project participants of the proposed PoA, collecting necessary data and information from each CPA for the purpose of monitoring, and also communicating with DOE and CDM Executive Board. In addition, a PoA management system, including CPA inclusion, monitoring, data analysis, training and verification management etc., has been established by the CME to ensure an effective, reliable and robust operation and management of each CPA under the PoA.

- (i) A record keeping system for each CPA under the PoA.

Each CPA is operated by a CPA operator under the control of the coordinating entity. The CPA operator reports monitored data to the managing/coordinating entity.

The record keeping system consists of the method of data monitoring, the duty and roles of each participants and the database including all necessary information/data of each CPA. The data is collected by CPA operators through *ex ante* and *ex post* survey of entire activity. The database is renewed to the coordinating entity periodically. All the monitoring parameters related to emission reduction calculation is maintained and analyzed by CME. The CME will verify the reported data through relevant proofs from 3th entity, such as receipts or invoices, as well as conduct field check if necessary.

Related responsibilities and tasks of participants under the record keeping system are described in the Table-2 below.

Table-2 Responsibilities and tasks of the participants to the PoA

Activities	Entity in Charge	Task Description
Inclusion request of CPA	CME will be in charge of check the features of potential CPAs and ensure that the proposed CPA meets all requirements and eligibility criteria before inclusion in the registered PoA.	Receive and approve formal written request for CPA inclusion. Sign the agreement on the participation in the PoA and CER revenue allocation framework. Review competencies of participants.



Writing Stakeholder guideline	CME will be in charge of providing the guideline and supervising the implementation.	Compile PoA guideline with instruction for all involved stakeholders to definition of roles and responsibility of personnel involved.
Inclusion of CPA	CME will take the full charge of the CDM application.	Approve the CPA inclusion and develop the CPA under the PoA as per the CDM and PoA regulations.
Monitoring	CPA operators will be in charge of collecting and reporting the monitoring data and project information according to the requirements.	Collect monitoring parameters and other information including but not limited to schedule and serial number.
Data archiving and analysis	CME will be in charge of archiving and analyzing the monitoring sent by CPA operators.	Maintain data base and analyze the data in a suitable format for calculating emission reduction.
CDM verification	CME will manage all monitoring report of all CPAs and request to verification by a DOE who has not performed validation/inclusion/renewal of crediting period activities for the PoA.	Verification and issuance of all CPAs under the PoA as per the CDM regulations.
CER trading and revenue allocation	CME will be in charge of trading the CERs and allocating the revenue based on the agreement with the related project participants.	Trade CERs and allocate revenue.

All the competencies of participants and the related responsibilities and tasks of participants described in the Table-2 will be reviewed by CME.

(ii) Arrangements for training and capacity development for personnel.

The CME will organize training sessions periodically to stay up to date with CDM regulations. Training for CPA operators will be provided whenever a new CPA is included and should be dominated by a qualified organization or department. A record of training sessions and other capacity development activities for personnel is included.

(iii) Procedure for technical review.

All the technical requirements for inclusion of the CPA in the PoA, as outlined in this PoA-DD, are specified in the PoA management system. The technical review procedure will ensure the proposed CPA meeting the eligibility criteria requirements of the PoA. The CME will review the technology of the proposed CPA compliance with requirements of the PoA management system. The procedures for inclusion of a CPA in the PoA are as follows:



- Competency assessment to affirm the qualification of the CPA operators applying for inclusion of the CPA in the PoA;
 - Due diligence to check if the proposed CPA meets the eligibility criteria requirements of the PoA.
- (iv) 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 CDM project activity or as a CPA of another PoA.

The operator of a CPA shall, in accordance with the eligibility criteria in section A.4.2.2, confirm with a written statement at the time of CPA inclusion that any solar PV power plant under the CPA does not belong to another CPA under this PoA, another registered CDM project activity or another CDM PoA. CME will check the CPA against the eligibility criteria and other information such as the DNA website and UNFCCC website to confirm no double accounting will occur. CME will build the information database which includes the name, geographic coordinates, technology, product and end-user of the proposed CPA and other similar CDM project activities. CME will check the information of the proposed CPA against the information of other similar CDM project activities to confirm no double accounting will occur.

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

At the time of CPA inclusion, the CPA operators should confirm with a written statement that the CPA is not a de-bundled component of another CPA or CDM project activity. In addition, CME will conduct the debundling check as per “Guidelines on assessment of de-bundling for SSC project activities” to verify if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity which meets the following conditions:

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

- (vi) Records and documentation control process for each CPA under the PoA including the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA;

The records and documentation related to CDM for each CPA will be checked and maintained by the CME. As per the eligibility criteria for CPAs in section A.4.2.2, the operator shall also confirm with a written statement that they are aware that the CPA will be subscribed to the PoA.

- (vii) Measures for continuous improvements of the PoA management system.

Continuous improvements of the PoA management system must consider not only latest EB decisions and changing monitoring requirement but also the comments from the whole stakeholders of the PoA.

In the case of a deviation of the process or if a process needs to be updated, any members can request a revision of the procedure, which will be taken into account by the CME, who is responsible that the procedure is efficiently and up to date.

Also the periodic training, as stated in point (ii) above, is a measure of continuous improvements.



The CME will demand progress-updates at least once a month and will define goals of improvement for the near future.

A.4.4.2. Monitoring plan:

- (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.

No statistically sound sampling method/procedure will be used by DOEs. All data required for verification of amount of reduction of anthropogenic emission by sources by CPAs under the PoA is provided the coordinating/managing entity through operators.

- (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;

As for avoiding double accounting:

During the CPA inclusion phase, the operator of a CPA shall, in accordance with the eligibility criteria in section A.4.2.2, confirm with a written statement at the time of CPA inclusion that any solar PV power plant under the CPA does not belong to another CPA under this PoA, another registered CDM project activity or another CDM PoA. CME will check the CPA against the eligibility criteria and other information such as the DNA website and UNFCCC website to confirm no double accounting will occur. CME will build the information database which includes the name, geographic coordinates, technology, product and end-user of the proposed CPA and other similar CDM project activities. CME will check the information of the proposed CPA against the information of other similar CDM project activities to confirm no double accounting will occur.

During the CPA monitoring phase, the CME will maintain the electronic database including unique identification code, location, title, entity name, technical specifications of each CPA, which ensures the unique identification and monitoring information of the CPA. Therefore, that no double accounting occurs will be guaranteed.

As for determining the status of verification:

All CPAs included in the PoA shall together request to DOE for verification purpose and the status of verification can be determined anytime for each CPA under the proposed PoA. The request for verification shall be at least three months after the previous one. According to the 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 (version 04.1), all the CPAs under the proposed PoA will be monitored as per the related methodologies, procedures and guidelines.

All relevant parameters included in the monitoring plan shall be monitored and recorded for each included CPAs independently. Monitoring reports will be prepared separately for each of the CPAs for the purpose of verification and request for issuance of CERs. To guarantee the uncomplicated access to the CPA data, the coordinating entity will maintain a database for all included CPAs.



A.4.5. Public funding of the programme of activities (PoA):

No public funding from Parties included in Annex I countries is involved.

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

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

Starting date of the proposed PoA is the same as the starting date of the first CPA included in the proposed CPA, which is not determined yet at the time of the publication of the CDM-SSC-PoA-DD for global stakeholder consultation. The starting date of the first CPA is 01/04/2012 when the Equipment purchase agreement signed. Starting date of the crediting period is 01/01/2013.

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

The length of the proposed PoA is 28 years and 0 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 | <input type="checkbox"/> |
| 2. Environmental Analysis is done at CPA level | <input checked="" type="checkbox"/> |

Due to the difference of geographical and ecological environment, local environmental impact of each solar PV power generation project (depending on the location, capacity and construction etc.) justifies a separate environmental assessment for each CPA. Therefore, environmental analysis will be conducted for each solar PV power generation project at CPA level according to the applicable environmental policies.

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

Not applicable. Environmental Analysis is done at CPA level before CPA-DD publication.

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 the national law/regulations, an Environmental Impact Assessment (EIA) should be carried out and approved by the environmental agency in charge of environmental protection before a CPA would start. The EIA should be carried out for the following Environmental impact:

- Expected Environmental impacts during construction, on such as atmosphere, noise, waste water and solid waste;
- Expected Environmental impacts during operation, on such as atmosphere, noise, waste water and solid waste.



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 CPA level ☒

In order to collect essential project specific information and local stakeholder comments, stakeholder consultation will be conducted at CPA level to ensure that all the affected parties have the best opportunity to attend.

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

Not applicable. Local stakeholder consultation is done at CPA level.

D.3. Summary of the comments received:

Not applicable. Local stakeholder consultation is done at CPA level.

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

Not applicable. Local stakeholder consultation is done at CPA level.

SECTION E. Application of a baseline and monitoring methodology

This section shall demonstrate the application of the baseline and monitoring methodology to a typical small-scale CPA. The information defines the PoA specific elements that shall be included in preparing the PoA specific form used to define and include a CPA in this PoA (PoA specific CDM-SSC-CPA-DD).

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

- (a) Approved Consolidated Methodology AMS-I.D. (Version 17.0), "Grid-connected renewable electricity generation", which has been approved for use in a PoA by the Board;
<http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X>
- (b) The tool to calculate the emission factor for an electricity system (Version 02.2.1);
<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf>.
- (c) EB 68 annex 27 "Guidelines on the demonstration of additionality of small-scale project activities" (version 09).
http://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf

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

AMS-I.D. defines the applicability of this methodology. The following Table-3 explains the reason why the methodology applies to each CPA:

Table-3 Comparison of extraction components of each CPA with applicability of AMS-I.D.



As per the methodology	As per the CPA
This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that (a) supplying electricity to a national or a regional grid; or (b) supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	Each CPA under the proposed PoA comprises renewable energy generation units using solar photovoltaic power generation technology and will supply electricity to a national or a regional grid or supply electricity to an identified consumer facility via national/regional grid through a contractual arrangement
This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated 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 plant(s).	Each CPA under the proposed PoA is a green field solar PV power generation project, which supplies electricity generated to the grid.
Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: <ul style="list-style-type: none"> • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • 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 4W/m²; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m². 	Not applicable
If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The generation unit of Each CPA under the proposed PoA is a new solar PV power plant with capacity of no more than 15MW.
Combined heat and power (co-generation) systems are not eligible under this category.	Each CPA under the proposed PoA is a solar PV based power plant only, and no heat will be generated in this system.
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	Each CPA under the proposed PoA is a green field solar PV power generation project, which doesn't involve the addition of renewable energy generation units at an existing renewable power



should be lower than 15 MW and should be physically distinct from the existing units.	generation facility.
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.	Each CPA under the proposed PoA is a green field solar PV power generation project, which doesn't involve retrofitting or modifying an existing facility for renewable energy generation.

It can be concluded from the above analysis that the proposed project complies with both the baseline and the monitoring methodologies of AMS-I.D.

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

Based on approved methodology AMS-I.D., the project boundary for a CPA is determined as follows:

Table-4 Overview on emissions sources included in or excluded from the typical CPA boundary

	Source	Gas	Included?	Justification/Explanation
Baseline	CO ₂ emissions from electricity generation of the grid that are displaced due to the project.	CO ₂	Yes	Main emission sources.
		CH ₄	No	Minor emission source.
		N ₂ O	No	Minor emission source.
Project activity	CO ₂ emissions of the project	CO ₂	No	Minor emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source

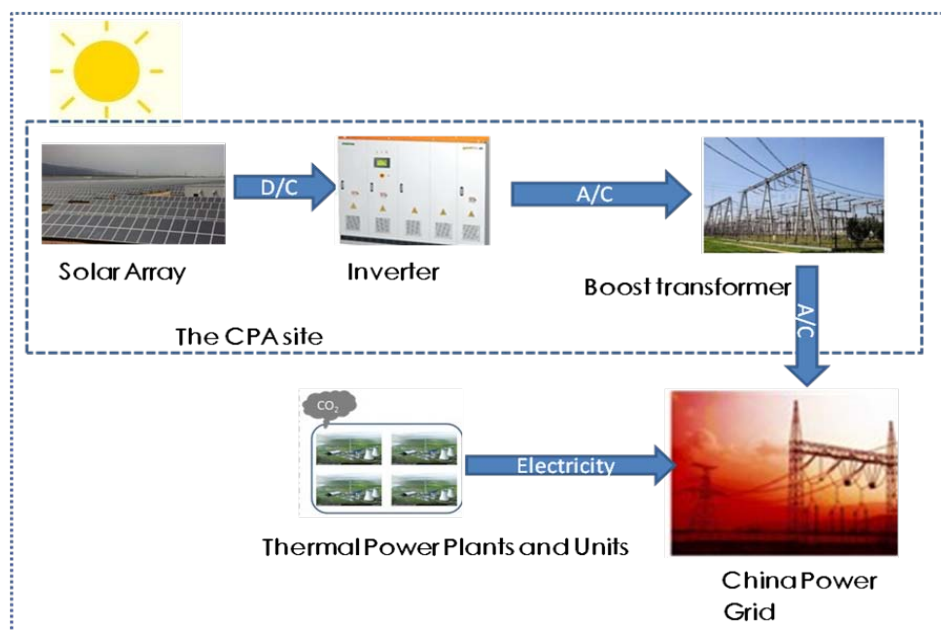


Figure-4 The project boundary of the CPA

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



According to the methodology AMS-I.D., if the project is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by each CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in *Tool to calculate the emission factor for an electricity system*.

Each CPA under the proposed PoA is the installation of a new grid-connected renewable solar power plant that connects with and delivers electricity to the grid. According to *Tool to calculate the emission factor for an electricity system*, the delineation of grid boundaries of each CPA is the grid which the CPA is connected to. According to the methodology AMS-I.D., the baseline scenario of each CPA is “the provision of an equivalent amount of annual power output by the grid which the project is connected to”.

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:

The additionality for a typical SSC-CPA under the proposed PoA has been demonstrated as per “**Guidelines on the demonstration of additionality of small-scale project activities**”, version 09, EB 68 annex 27.

As per Guidelines on the demonstration of additionality of small-scale project activities, the positive list of grid-connected renewable electricity generation technologies that are automatically defined as additional, without further documentation of barriers, consists of the following grid-connected and off-grid renewable electricity generation technologies of installed capacity up to 15 MW:

- (a) Solar technologies (photovoltaic and solar thermal electricity generation);
- (b) Off-shore wind technologies;
- (c) Marine technologies (wave, tidal);
- (d) Building-integrated wind turbines or household rooftop wind turbines of a size up to 100kW.

Since the proposed PoA is solar photovoltaic grid connected renewable electricity generation technologies of installed capacity up to 15MW and it satisfies second paragraph, (a) condition of Guidelines on the demonstration of additionality of small-scale project activities, each CPA under the proposed PoA is additional.

E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:

Based on additionality assessment undertaken in E.5.1 above, a CPA to be included in the proposed PoA has to satisfy the following criteria to be considered additional.

Key criteria and data for assessing additionality of a SSC-CPA are as follows:

Criteria related to Technology to be employed by the SSC-CPA.

Only solar PV power generation technology is involved in the CPA with no solar thermal electricity generation technology included. The eligibility criterion has been selected in accordance with analysis done in Section A.4.2 above. The evidence of applied technology will be checked while adding a CPA to



the proposed PoA as per relevant contracts, technology agreement or other similar document.

Criteria related to Installed capacity to be employed by the SSC-CPA

The installed capacity of the CPA involved in the CPA has to be no more than 15MW. The eligibility criterion has been selected in accordance with analysis done in Section A.4.2 above. The evidence of installed capacity will be checked while adding a CPA to the proposed PoA as per relevant supporting document.

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

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

The equations determined by the approved methodology AMS-I.D. are applied for calculating emission reduction of a CPA.

The formulae from “*Tool to calculate the emission factor for an electricity system*” are applied for calculating emissions factor.

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

1) Project Emissions

Each CPA under the proposed PoA is new installation of solar PV power project and no project emissions should be considered as per the methodology AMS-I.D. Therefore, $PE_y = 0 \text{ tCO}_2\text{e}$.

2) Baseline Emissions

As per the methodology AMS-I.D., baseline emissions include only CO_2 emissions from electricity generation in the grid that the proposed CPA is connected to. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{BL,y} \times EF_{CO_2,grid,y} \quad (1)$$

Where:

BE_y	Baseline Emissions in year y (tCO_2);
$EG_{BL,y}$	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh);
$EF_{CO_2,grid,y}$	CO_2 emission factor of the grid in year y ($\text{t CO}_2/\text{MWh}$)

$$EG_{BL,y} = EG_{facility,y} \quad (2)$$

Where:

$EG_{facility,y}$	Quantity of electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh);
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Calculation of the CO_2 emission factor for the electricity of the China Power Grid ($EF_{grid,CM,y}$)



The emission factor is determined by the tool “Tool to calculate emission factor for an electricity system (Version 02.2.1)”.

Step 1: Identify the relevant electricity systems

For determining the electricity emission factors, identify the relevant project electricity system.

The host country (China) has published a delineation of the project electricity system and connected electricity systems, these delineations should be used. The electricity system identification will be carried out at the CPA level and showed in the CDM-CPA-DD. The spatial extent of the each CPA power grid comprises all the power plants connected physically to the CPA.

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

Project participants may choose either of the following two options to calculate the operating margin and the 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 factor or for both the build margin and the operating margin emission factor but not only for the build margin emission factor.

If Option II is chosen, off-grid power plants should be classified as per the guidance in Annex 2 in different classes of off-grid power plants. Each off-grid power plant class should be considered as one power plant j , k , m or n in the following steps, as applicable.

For the proposed PoA, **Option I** is chosen: Only grid power plants are included in the calculation.

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

The calculation of the operating margin emission factor ($EF_{\text{grid,OM},y}$) is based on one of the following methods, which are described under Step 4:

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

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

The dispatch data analysis (Option c) cannot be used if off-grid power plants are included in the project



electricity system as per Step 2 above.

As per *Tool to Calculate the Emission Factor for an Electricity System* (version 02.2.1), referring to *2011 Baseline Emission Factors for Regional Power Grids in China*, the method (a) simple OM is employed for calculation of the operating margin emission factor ($EF_{grid,OM,y}$) of the proposed PoA. As per the tool, the method (a) simple OM only can be used when 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. Among the total electricity generation of the State Power Grid (Northeast China Power Grid, North China Power Grid, East China Power Grid, Central China Power Grid and Northwest Power Grid) and Southern Power Grid, which the CPAs under the proposed PoA are connected to, the amount of low-cost/must-run resources all account for less than 50%. Thus, the method (a) simple OM can be used to calculate the baseline emission factor of operating margin ($EF_{grid,OM,y}$) of the PoA.

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

- Ex ante option: If the ex ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use 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. For off-grid power plants, use a single calendar year within the five most recent calendar years prior to the time of submission of the CDM-PDD for validation.
- Ex post option: If the ex post option is chosen, the emission factor is determined for 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 preceding 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.

For the dispatch data analysis OM, use the year in which the project activity displaces grid electricity and update the emission factor annually during monitoring.

The data vintage chosen should be documented in the CDM-PDD and should not be changed during the crediting period. Power plants registered as CDM project activities should be included in the sample group that is used to calculate the operating margin if the criteria for including the power source in the sample group apply.

Step 4: Calculate the operating margin emission factor according to the selected method

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

The simple OM may be calculated by one of the following two options:



Option A: Based on the net electricity generation and a CO₂ emission factor of each power unit; 3 or

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Option B can only be used if:

- (a) The necessary data for Option A is not available; and
- (b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and
- (c) Off-grid power plants are not included in the calculation (i.e. if Option I has been chosen in Step 2).

However, due to the necessary data, including the fuel consumption and net electricity generation of each power plant, is not available in China, and the other two requirements (b and c) are also satisfied, Option B will be adopted for each CPA.

As per Option B, 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:

Data on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system can be identified; thus, Option B is employed to calculate OM.

$$EF_{grid,OM, simple,y} = \frac{\sum_i FC_{i,y} \cdot NCV_{i,y} \times EF_{CO2,i,y}}{EG_y} \quad (3)$$

$EF_{grid,OM, simple,y}$ is Simple operating margin CO₂ emission factor in year y (tCO₂/MWh)

$FC_{i,y}$ is the amount of fossil fuel type i (in a mass or volume unit) consumed by project electricity system in year(s) y,

$NCV_{i,y}$ is Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)

$EF_{CO2,i,y}$ is CO₂ emission factor of fossil fuel type i in year y (tCO₂/GJ)

EG_y is Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh)

\sum is All fossil fuel types combusted in power sources in the project electricity system in year y

y is the relevant year as per the data vintage chosen in Step 3

For this approach (simple OM) to calculate the operating margin, the subscript m refers to the power plants/units delivering electricity to the grid, not including low-cost/must-run power plants/units, and including electricity imports to the grid. Electricity imports should be treated as one power plant m.

Step 5. Calculate the Build Margin(BM) emission factor

According to *Tool to Calculate the Emission Factor for an Electricity System* (version 02.2.1), project participants shall choose between one of the following two options to calculate the build margin emission



factor ($EF_{grid,BM,y}$).

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 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 Proposed Project 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 emission 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 is adopted by the Proposed PoA.

Capacity additions from retrofits of power plants should not be included in the calculation of the build margin emission factor.

The sample group of power units m used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

- Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5-units}$) and determine their annual electricity generation ($AE_{SET-5-units}$, in MWh);
- Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AE_{total} , in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AE_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AE_{SET-\geq 20\%}$, in MWh);
- From $SET_{5-units}$ and $SET_{\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin. Ignore steps (d), (e) and (f).

Otherwise:



- (d) Exclude from SET_{sample} the power units which started to supply electricity to the grid more than 10 years ago. Include in that set the power units registered as CDM project activity, starting with power units that started to supply electricity to the grid most recently, until the electricity generation of the new set comprises 20% of the annual electricity generation of the project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) to the extent is possible. Determine for the resulting set ($SET_{sample-CDM}$) the annual electricity generation ($AE_{SET-sample-CDM}$, in MWh) ;

If the annual electricity generation of that set is comprises at least 20% of the annual electricity generation of the project electricity system (i.e. $AE_{SET-sample-CDM} \geq 0.2 \times AE_{total}$), then use the sample group $SET_{sample-CDM}$ to calculate the build margin. Ignore steps (e) and (f).

Otherwise:

- (e) Include in the sample group $SET_{sample-CDM}$ the power units that started to supply electricity to the grid more than 10 years ago until the electricity generation of the new set comprises 20% of the annual electricity generation of the project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation);
- (f) The sample group of power units m used to calculate the build margin is the resulting set ($SET_{sample-CDM \rightarrow 10 \text{ yrs}}$).

It is suggested the set of power units that comprises the larger annual generation should be used.

Considering data availability, CDM EB accepts the following deviation in application of methodology¹:

- 1) Use of capacity additions during the last several years for estimating the build margin emission factor for grid electricity.
- 2) Use of weights estimated using installed capacity in place of annual electricity generation.

And it is suggested to use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy.

Therefore for the Proposed Project: First, calculate the share of different power generation technology in recent capacity additions. Second, calculate the weight for capacity additions of each power generation technology. And finally calculate the emission factor using the efficiency level of the best technology commercially available in China.

The build margin emissions factor is the generation-weighted average emission factor (tCO₂/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid, BM, y} = \frac{\sum_m EG_{m, y} \times EF_{EL, m, y}}{\sum_m EG_{m, y}} \quad (4)$$

Where:

¹ http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_QEJWJEF3CFBP1OZAK6V5YXPQKK7WYJ.



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

Due to data availability in China, the CO₂ emission factor of each power unit m ($EF_{EL,m,y}$) should be determined as per the guidance of options A2 to calculate the simple OM, using for y the most recent historical year for which power generation data is available, and using for m the power units included in the build margin.

As the data of installed capacity cannot be separated into coal fired, oil fired and gas fired currently, the build margin emission factor is calculated by the following steps and formulae:

Step a. Calculate the power generation emissions of solid fuel, liquid fuel and gas fuel and each share in the total emissions based on *Energy Balance Table* of the most recent year.

$$\lambda_{Coal,y} = \frac{\sum_{i \in COAL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}} \quad (5)$$

$$\lambda_{Oil,y} = \frac{\sum_{i \in OIL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}} \quad (6)$$

$$\lambda_{Gas,y} = \frac{\sum_{i \in GAS,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}} \quad (7)$$

Where:

$F_{i,j,y}$ is the amount of fuel i (in a mass or volume unit) consumed by province j in year(s) y ;

$NCV_{i,y}$ is the net calorific value (energy content) of fuel i in year y (GJ/mass or volume unit);

$EF_{CO2,i,j,y}$ is the emission factor of fuel i in year y (tCO₂e/GJ);

COAL, OIL and GAS are footnote group for solid fuels, liquid fuels and gas fuels.

Step b. Calculate the emission factor for thermal power of the grid based on the result of Step a and the efficiency level of the best technology commercially available in China.

$$EF_{Thermal,y} = \lambda_{Coal,y} \times EF_{Coal,Adv,y} + \lambda_{Oil,y} \times EF_{Oil,Adv,y} + \lambda_{Gas,y} \times EF_{Gas,Adv,y} \quad (8)$$

$$EF_{Coal,Adv,y} = FC_{adv,coal} \times NCV_{coal,y} \times EF_{CO2,coal,y} \quad (8-a)$$

$$EF_{oil,Adv,y} = FC_{adv,oil} \times NCV_{oil,y} \times EF_{CO2,oil,y} \quad (8-b)$$

$$EF_{gas,Adv,y} = FC_{adv,gas} \times NCV_{gas,y} \times EF_{CO2,gas,y} \quad (8-c)$$

Where $EF_{Coal,Adv,y}$, $EF_{Oil,Adv,y}$ and $EF_{Gas,Adv,y}$ are emission factor proxies of efficiency level of the best



coal fired, oil fired and gas fired power generation technology commercially available in China.

Step c. Calculate the build margin emission factor of the grid based on the result of Step b and the share of thermal power of recent 20% capacity additions.

$$EF_{grid,BM,y} = \frac{CAP_{Thermal,y}}{CAP_{Total,y}} \times EF_{Thermal,y} \quad (9)$$

Where:

$CAP_{Total,y}$ is total capacity additions that are close to and exceed 20% of existing capacity;

$CAP_{Thermal,y}$ is capacity additions of thermal power.

Step6. 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 weighted average CM method (option A) should be used as the preferred option.

The simplified CM method (option b) can only be used if:

- The project activity is located in a Least Developed Country (LDC) or in a country with less than 10 registered projects at the starting date of validation; and
- The data requirements for the application of step 5 above cannot be met.

(a) Weighted average CM

The combined margin emission factor is calculated as follows:

$$EF_{grid,CM,y} = w_{OM} \cdot EF_{grid,OM,y} + w_{BM} \cdot EF_{grid,BM,y} \quad (10)$$

Where:

$EF_{grid,BM,y}$ Build margin CO₂ emission factor in year y (tCO₂/MWh)

$EF_{grid,OM,y}$ Operating margin CO₂ emission factor in year y (tCO₂/MWh)

w_{OM} Weighting of operating margin emissions factor (%)

w_{BM} Weighting of build margin emissions factor (%)

According to the “Tool to calculate the emission factor for an electricity system”, the default weights for solar power generation projects are as follows: $w_{OM} = 0.75$ and $w_{BM} = 0.25$.

3) Leakage

According to the methodology AMS-I.D., the leakage is not considered.



4) Estimation of emission reductions:

The emission reduction ER_y by the CPA during a given year y is the difference between the baseline emissions (BE_y), project emissions (PE_y) and leakage (LE_y), as follows:

$$ER_y = BE_y - PE_y - LE_y \quad (11)$$

Where:

ER_y Emissions reductions of the project activity during the year y (tCO₂e);
 BE_y Baseline emissions during the year y (tCO₂e);
 PE_y Project emissions during the year y (tCO₂e);
 LE_y Project leakage during the year y (tCO₂e).

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

Data / Parameter:	$EG_{i,y}$
Data unit:	MWh
Description:	Net electricity supplied to the grid by power plant i in year y
Source of data used:	China Electric Power Yearbook
Value applied:	Depends on the grid concerned.
Justification of the choice of data or description of measurement methods and procedures actually applied :	China Official Data of <i>National Bureau of Statistics of China and National Development and Reform Commission</i>
Any comment:	-

Data / Parameter:	$EF_{OM,y}$
Data unit:	tCO ₂ e/MWh
Description:	Operating margin emission factor of the Power Grid concerned by each CPA
Source of data used:	“ <i>Baseline Emission Factors for Regional Power Grids in China</i> ” issued by China’s DNA
Value applied:	Depends on the grid concerned by each CPA.
Justification of the choice of data or description of measurement methods and procedures actually applied :	China Official Data of <i>National Bureau of Statistics of China and National Development and Reform Commission</i>
Any comment:	-

Data / Parameter:	$EF_{BM,y}$
Data unit:	tCO ₂ e/MWh
Description:	Build margin emission factor of the Power Grid concerned by each CPA
Source of data used:	“ <i>Baseline Emission Factors for Regional Power Grids in China</i> ” issued by China’s DNA
Value applied:	Depends on the grid concerned by each CPA.
Justification of the choice of data or	China Official Data of <i>National Bureau of Statistics of China and National Development and Reform Commission</i>



description of measurement methods and procedures actually applied :	
Any comment:	-

Data / Parameter:	$EF_{CO_2,grid,y}$
Data unit:	tCO ₂ /MWh
Description:	CO ₂ emission factor of the grid in year y
Source of data used:	The calculation was conducted based on data calculated by China DNA
Value applied:	Depends on the grid concerned.
Justification of the choice of data or description of measurement methods and procedures actually applied :	China Official Data of <i>National Bureau of Statistics of China and National Development and Reform Commission</i>
Any comment:	The calculation was conducted based on data calculated by the Office of National Coordination Committee on Climate Change.

Data / Parameter:	$EF_{CO_2,i,y}$
Data unit:	kgC/GJ / tCO ₂ /mass
Description:	CO ₂ emission factor of fossil fuel type <i>i</i> in year y
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories” Volume2 Energy, CHAPTER 1, P1.21, Table 1-3 and P1.23, Table 1-4.
Value applied:	Please refer to each CPA DD.
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC’s official data
Any comment:	-

Data / Parameter:	$FC_{i,y}$
Data unit:	mass or volume unit
Description:	Amount of fossil fuel type <i>i</i> consumed in the project electricity system in year y
Source of data used:	China Energy Statistical Yearbook
Value applied:	Depends on the grid concerned.
Justification of the choice of data or description of measurement methods and procedures actually applied :	China Official Data of <i>National Bureau of Statistics of China and National Development and Reform Commission</i>
Any comment:	-

Data / Parameter:	$NCV_{i,y}$
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Data unit:	kJ/kg
Description:	Net calorific value (energy content) of fossil fuel type i in year y
Source of data used:	China Energy Statistical Yearbook
Value applied:	Please refer to each CPA DD.
Justification of the choice of data or description of measurement methods and procedures actually applied :	China Official Data of <i>National Bureau of Statistics of China</i> and <i>National Development and Reform Commission</i>
Any comment:	-

Data / Parameter:	$OXID_y$
Data unit:	%
Description:	Oxidation rate of the fuel type i
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	Please refer to each CPA DD.
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC default value
Any comment:	-

Data / Parameter:	$CAP_{i,y}$
Data unit:	MW
Description:	Total capacity of fossil fuel type i power plant in year y
Source of data used:	China Electric Power Yearbook
Value applied:	Please refer to each CPA DD.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official Statistical Data
Any comment:	-

Data / Parameter:	$\eta_{i,Adv}$
Data unit:	%
Description:	The power efficiency of the best technology i commercially available in the power plant
Source of data used:	China DNA
Value applied:	Please refer to each CPA DD.
Justification of the choice of data or description of measurement methods	According to alternatives of EB, the application of the most efficient technology meets with the conservative principle.



and procedures actually applied :	
Any comment:	-

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

E.7.1. Data and parameters to be monitored by each SSC-CPA:

Data / Parameter:	$EG_{facility,y}$
Data unit:	MWh
Description:	Net quantity of electricity delivered to the grid by each CPA in year y
Source of data to be used:	The data used are obtained from the FSR et al of the Proposed CPA. Actual data will be obtained through on-site measurement.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Depends on each CPA
Description of measurement methods and procedures to be applied:	Continuously monitored and monthly recorded. The meters are calibrated at least once a year and checked for accuracy by a qualified third party in accordance with national or industry standards. The measurement precision of the meters employed by the each CPA will be at least 0.5s.
QA/QC procedures to be applied:	The meter(s) is periodically checked and maintained, and receipt(s) is used for crosscheck.
Any comment:	-

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

Monitoring System Organization Structure

The CPA operator will monitor the electricity delivered to the grid. The monitoring data and operation condition of each CPA shall be reported to the CME monthly. The data will be archived and stored for 2 years after the end of the crediting period of each CPA.

The CPA operator will designate a CDM manager to be in charge of monitoring the data and information related to the calculation of emission reductions, with a monitoring team and a QA/QC team formed under the CDM manager. The operation and management structure is shown in Figure-5.

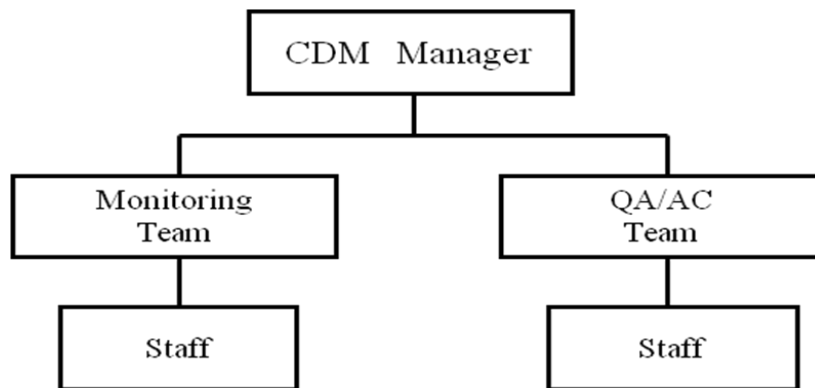


Figure-5 The monitoring system of a CPA

Monitoring data

Data to be monitored is the net quantity of electricity delivered to the grid by each CPA in year y . In different CPA, the monitoring points and way may be different according to the real condition of the plant. All CPA under the proposed PoA shall provide a monitoring point chart to demonstrate where the meters installed and how to monitor quantity of electricity delivered to the grid, i.e. $EG_{facility,y}$.

Installation and Maintenance of Meter(s)

The meter(s) of each CPA will be installed in line with *Technical Administrative Code of Electric Energy Metering* (DL/T 448-2000). The measurement precision of the meter(s) employed by each CPA will be at least 0.5s.

The meter(s) of each CPA will be calibrated once per year.

Data Management System

- Particular staff in Figure-5 will be appointed by the CPA operator to take the overall responsibility for monitoring emission reductions and keeping all the data collected as part of monitoring archived electronically.
- Electronic data and documents will be regularly copied and archived, and kept at least for two years after the end of the last crediting period or two years after the last issuance of CERs, whichever is later.
- Written data and documents will be copied and archived, and kept for at least two years after the end of the last crediting period or two years after the last issuance of CERs, whichever is later.

Quality Assurance and Quality Control Procedure

Particular QC staff will be appointed by the CPA operator to take the overall responsibility of calibrating monitoring equipments, managing and processing the monitored data according to QA/QC procedure provided in Section E.7.1. If something unusual, the Project Manager should be immediately reported.

CDM training

All staff involved in the CPA will receive relevant training and ensure that only trained staffs are involved in the operation of the monitoring system.

Emergency



When erroneous measurement is detected involved in implementation of the monitoring plan, the erroneous measurement should be reported to the CDM Manager and CME instantly. The CDM Manager takes the responsibility to handle the erroneous measurement as follows:

The project owner and the grid company shall jointly prepare a reasonable and conservative estimate of the correct reading based on the plant consumption rate, and provide sufficient evidence that this estimation is reasonable and conservative when DOE undertakes verification.

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)

The application of the baseline study and monitoring methodology of the PoA was completed on 27/08/2012.

The name of the responsible person(s)/entity (ies):

Name/origination	Project participant: Yes/No
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Annex 1

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

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



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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding from Parties included in Annex I countries is involved.



Annex 3

BASELINE INFORMATION

Baseline information will be listed in CDM-SSC-CPA-DD.



Annex 4

MONITORING INFORMATION

No other additional information.

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