

**PROGRAMME DESIGN DOCUMENT FORM FOR  
SMALL-SCALE CDM PROGRAMMES OF ACTIVITIES (F-CDM-SSC-PoA-DD)  
Version 02.0**

**PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)**

**PART I. Programme of activities (PoA)**

**SECTION A. General description of PoA**

**A.1. Title of the PoA**

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Shinsung Solar Energy Grid Connected Photovoltaic Power Generation PoA

Version: 2

Date: 29 October 2012

**A.2. Purpose and general description of the PoA**

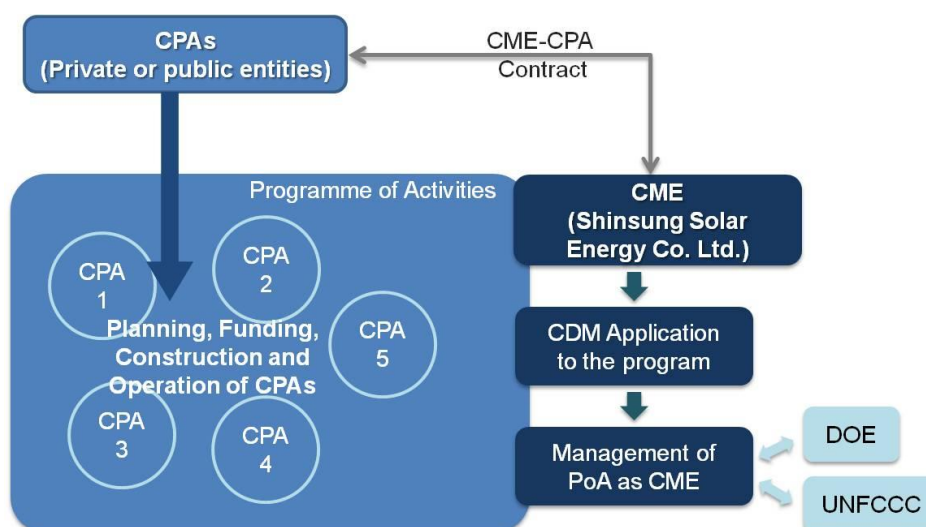
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**(a) Policy/measure or stated goal that the PoA seeks to promote;**

The goal of the PoA is to encourage photovoltaic (PV) power generation activities in the Republic of Korea and produce the renewable energy-based electricity that will be provided to the national grid. CPAs under the PoA will implement the installation of a new power plant at a site where there was no PV power plant operating prior to the implementation of the project activity (Greenfield plant). Only Greenfield power generation project is included under this PoA.

**(b) Framework for the implementation of the proposed PoA;**

CME of the proposed programme of activities is Shinsung Solar Energy Co., Ltd., which will establish and manage the whole system to operate the PoA. Any private or public entities in Korea including CME can participate in one or more Component Project Activities (CPAs) under this PoA provided that their PV power generation activities satisfies the eligibility criteria included in B.2. Roles and responsibilities of the participating CPA(s) and the CME will be specified in a separate contract document.



**[Figure A.1] Technical project structure of the proposed programme of activities**

**(c) Confirmation that the PoA is a voluntary action by the coordinating/managing entity**

The proposed PoA is a voluntary and coordinated action. First of all, there is no mandatory policy/regulation in Korea that requires any public agencies or private companies to implement the PV power generation activities. Second, construction and operation of PV power plants does not violate any domestic regulation if such projects could obtain the necessary approval such as permission of power generation activity etc.

In Korea, there is a national policy named ‘RPS (Renewable Portfolio Standard)’, which requires power generators to mandatorily provide to the grid a certain percentage of their electricity generation with renewable energy. The legal statement about this policy is initially included in the revised version of ‘Act on the promotion of the development, use and diffusion of new and renewable energy’ published on 17th of September, 2010<sup>1</sup>. Based on this legal basis, ‘Management and operation guidelines on RPS’ have been first legislated on 27th of December 2011, so it is regarded as E- policy<sup>2</sup>.

Additionally, in the past, these small scale PV power generation activities have not generally been attractive for CDM application due to the fact that CER profit is considerably small when it is compared to the construction and operation cost of PV power plants. Therefore, this PoA will encourage the developers to promote their SSC PV power generation projects as CDM with the support of the established CDM management system under this PoA.

**(d) Contribution to Sustainable Development**

The proposed project will contribute to sustainable development such as accumulation of advanced technological experiences and maintenance know-how and creation of job opportunities of the country as follows.

- Social/ Technological aspect:
  - The proposed project can diversify sources of electric generation and help improve the solar power generation technology.
  - The proposed project will contribute to decrease of the dependency on foreign oil for the domestic energy supply.
- Environmental and National aspect:
  - The project contributes to national renewable energy promotion policy and the global effort of GHG emission reduction.
  - The plant will contribute to improvement of air quality by reducing domestic fossil fuel consumption for the power generation.
  - The proposed project will create job opportunities directly and indirectly through construction and operation of the plant.

**A.3. CMEs and participants of PoA**

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(a) CME of the proposed PoA : Shinsung Solar Energy Co., Ltd. (Private entity)

(b) Project participant of the proposed PoA : Shinsung ENG Co., Ltd. (Private entity)

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<sup>1</sup> In Article 12-5 (Name: Mandatory supply of renewable energy) of the Act is the legal basis of RPS. Clause 1 of that article says ‘If it is considered to be necessary for the vitalization of renewable energy industry and promotion of renewable energy usage and diffusion promote, Minister of Knowledge Economy can require the entities, which ... [ellipsis] ....., to mandatorily provide to the grid a certain percentage of their electricity generation with renewable energy’

<sup>2</sup> E- Policy is that which give comparative advantage to less emission intensive technologies or fuels. The impacts of these policies can be excluded in establishing a baseline scenario **if they have been implemented since the adoption of the Marrakesh Accords (11/11/2001)**. EB 22, Annex 3

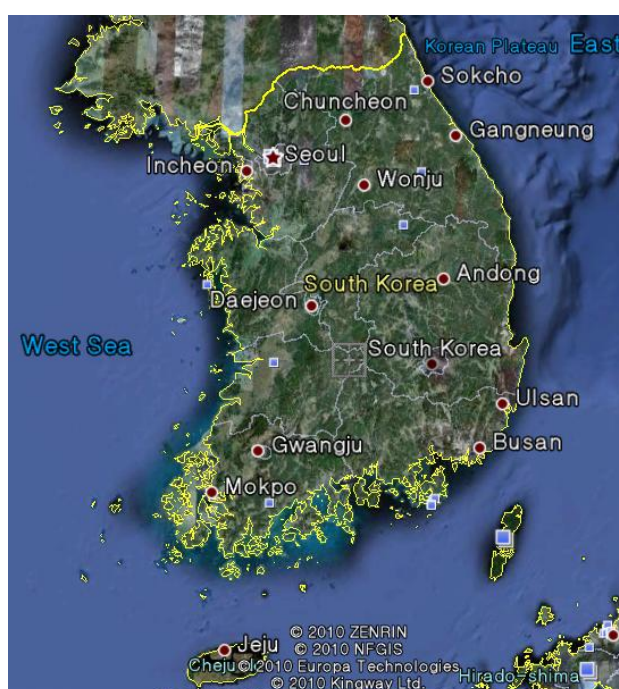
#### A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of Korea	Shinsung Solar Energy Co., Ltd. (CME, Private entity) Shinsung ENG Co., Ltd. (Private entity)	No

#### A.5. Physical/ Geographical boundary of the PoA

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Geographical boundary of the proposed programme of activities is the national boundaries of Republic of Korea.



[Figure A.2] Geographical boundary of this PoA

#### A.6. Technologies/measures

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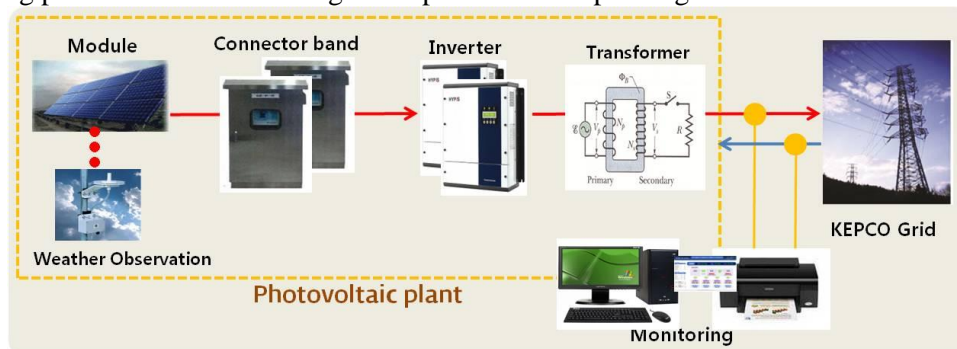
A typical CPA will have the following features:

<b>Technology</b>	Photovoltaic-based electricity generation technology
<b>Generation capacity</b>	Each CPA with the total installed capacity of up to 15MW
<b>Applicability</b>	Only greenfield project are applicable
<b>Usage of the produced electricity</b>	All the electricity generated from the CPA will be provided to the national grid

As above feature of typical CPA, The typical CPA, that will be included in the PoA, satisfies the conditions to be included in the positive list of ‘Guidelines on the demonstrations of additionality of small-scale project activities, version 09.0 (EB68, Annex27)’. Therefore, the baseline scenario is, as suggested by the methodology, 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.

The typical CPA will generate electricity using energy from the sunlight so that there is no severe adverse impact to environment. The power plant will mainly be consisted of arrays of solar module, inverter, electricity meter (it was installed for monitoring), transformer etc. Basically, the electricity, once generated, will be exported to the national grid and the net amount of electricity export will be monitored.

The following picture describes on the general process of the power generation.



[Figure A.3] On-grid photovoltaic power generation process

Any photovoltaic power generation technologies are applicable under the PoA as long as it could demonstrate in the CPA-DD that all the conditions included in the eligibility criteria and applicability of methodology AMS-I.D. Therefore, the applicable technology is not limited to the ones described above. However, each CPA-DD will have the technological specification and property of its power plant.

## A.7. Public funding of PoA

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This PoA ensures that public funding for a CPA(s) from Annex I Parties, if any, is not to result in the diversion of official development assistance (ODA) and is to be separate from and not counted towards the financial obligations of Annex I Parties.

## SECTION B. Demonstration of additionality and development of eligibility criteria

### B.1. Demonstration of additionality for PoA

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According to ‘Guidelines on the demonstration of additionality of small-scale project activities, version 09.0 (EB68, Annex27)<sup>3</sup>’, the positive list of technologies and project activity types can be defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15MW).

The positive list comprises of;

(a) *The following grid-connected and off-grid renewable electricity generation technologies*

(i) **Solar technologies (photovoltaic and solar thermal electricity generation);**

(ii) Off-shore wind technologies;

(iii) Marine technologies (wave, tidal);

(iv) Building-integrated wind turbines or household rooftop wind turbines of a size up to 100kW;

(b), (c), (d).... [ellipsis]

The above list includes solar technology, especially the photovoltaic electricity generation that are grid-connected with the installed capacity up to 15 MW, which corresponds to the typical CPA of this PoA. No project that cannot be included in the positive list will participate in the PoA.

<sup>3</sup> Title changed from Attachment A of Appendix B to ‘Guidelines on the demonstration of additionality of small-scale project activities’

[Table B.1] Data for demonstration

Criteria	Data
Positive list	Information of introducing technology for contribution to national electricity generation
	Capacity of a renewable energy system in the CPA (Specification)

## B.2. Eligibility criteria for inclusion of a CPA in the PoA

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As required by ‘Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities, version 01.0 (EB 65, Annex 3)’, the PoA 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.

Therefore, to meet the eligibility criteria<sup>4</sup> will be crucial for any CPA to be additional. In each CPA-DD, the demonstration why the CPA satisfies the criteria will be specified.

Here only a description of criteria for enrolling the CPA shall be described, the criteria for demonstrating additionality of CPA shall be described at each CPA-DD

[Table B.2] Eligibility criteria for each CPA

	Criteria	Description
1	Geographical boundary	The CPA shall be performed within the territory of Republic of Korea.
2	Avoid double counting of CPA	The CPA shall be a new project which is not registered large scale CDM or CPA in the other PoA or other carbon off-set program
3	Specifications of technology	The applied equipment for CPA gets a Renewable energy system certification of KEMCO. ** KEMCO promotes renewable energy, so made the certification about renewable energy technology ‘Renewable Energy System Certification of KEMCO’.
4	CPA start date	The start date of proposed CPA should not be before the first published date for global stakeholder consultation about Programme of activities (PoA), i.e. 20th March of 2012 <sup>5</sup> . In the above context, ‘CPA start date’ means the earliest date at which either the implementation or construction or real action of CPA
5	CPA type	The CPA comprises Photovoltaic power generation units supplying electricity to a national grid.
6	CPA scale threshold	Every each CPA has the total installed capacity of no more than 15MW and will remain within 15MW throughout its crediting period.
7	Methodology Applicability	The CPA satisfies the applicability conditions of AMS-I.D methodology.
8	Additionality	The CPA satisfies the conditions to be included in the positive list of grid-connected renewable electricity generation technologies that are automatically defined as additional in accordance with Attachment A of Appendix B <sup>6</sup> .

<sup>4</sup> Refer to [Table B.2] Eligibility criteria for each CPA

<sup>5</sup> That date can be found on the page of the UNFCCC web-site through which the project was published. (<http://cdm.unfccc.int>)

<sup>6</sup> This document, together with the ‘General Guidance’ and all other approved SSC methodologies, was part of a single document entitled: Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM project activities until version 07.

9	Stakeholder consultant	Local stakeholder consultations shall be done and due account also shall be taken of any comments received at CPA level.
10	Environmental Impact Assessment	Environmental Impact Assessment or Preliminary Environmental Review shall be done at CPA level according to the related domestic regulation.
11	ODA diversion	CPA shall not be funded by an Annex I party. The funding by an Annex I party could lead to a diversion of ODA, so, such diversion does not take place.
12	De-bundling check	Confirmation that CPA is a single project which is not a de-bundled component of another large-scale CPA or CDM project activity as per the latest guidance given in CDM EB at CPA level.

### B.3. Application of methodologies

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All the CPAs under this PoA are a small-scale CDM project activity (i.e. Installed capacity of each CPA is up to 15 MW) and according to the Appendix B of “*the simplified modalities and procedures for small-scale CDM project activities*” of UNFCCC, type and category of the project can be confirmed as follows;

<b>Type</b>	I – Renewable Energy Projects
<b>Category</b>	I.D. – Grid connected renewable electricity generation (Version 17)
<b>Applicability</b>	<ul style="list-style-type: none"> <li>- Renewable electricity generation project activity</li> <li>- Grid connected type</li> <li>- The installed capacity up to 15MW</li> </ul> <p>♣ <i>Specific applicability criteria of methodology should be demonstrated at each CPA-DD.</i></p>

[Table B.3] Applicability of methodology AMS-I.D.

	Applicability condition of the AMS-I.D. ver. 17	Note
1	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (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.	
2	Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2.	
3	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 plant(s).	
4	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: ‘ ... [ellipsis]...’	
5	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.	
6	Combined heat and power (co-generation) systems are not eligible under this category.	
7	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.	

8	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 15MW.	
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## SECTION C. Management system

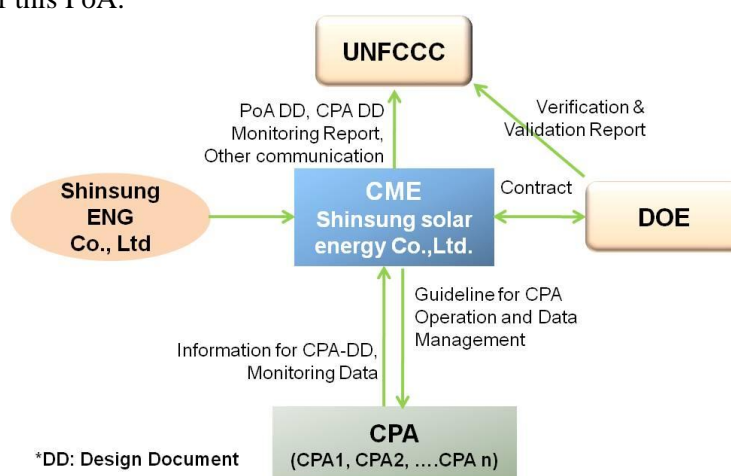
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Grid-connected PV power generation activities with installed capacity up to 15 MW are applicable under the PoA. As stated above section A, these small scale PV power generation activities have not generally been attractive, so this PoA will be able to encourage the developers to promote their SSC PV power generation projects as CDM with the support of the established CDM management system as below.

After the registration, additional CPAs will be included in the PoA based on the contract between the participant(s) of each CPA implementer and CME (CME-CPA Contract). Under the contract, Shinsung Solar Energy Co., Ltd. (CME) is expected to be responsible for the CDM-related management of the PoA including the preparation/revision of the PoA-DD, management of monitoring data submitted from CPAs, establishment/update of the guideline for the monitoring activity of CPAs, and etc.

As for each CPA, it is expected to implement the construction/operation of power plants, direct data monitoring/reporting, calibration of monitoring equipment, etc. However, the specific roles and responsibilities of CME and CPA implementer(s) may vary by each CPA. Therefore, CME will have separate contractual relationship with each CPA and reflect the special circumstance of each CPA.

Any public agency or private companies in Korea that promotes the PV power generation activities and satisfies the eligibility criteria could participate in the PoA. The following pictures describes on the operation structure of this PoA.



[Figure C.1] General operation structure of this PoA

### The roles of CME and CPA implementer

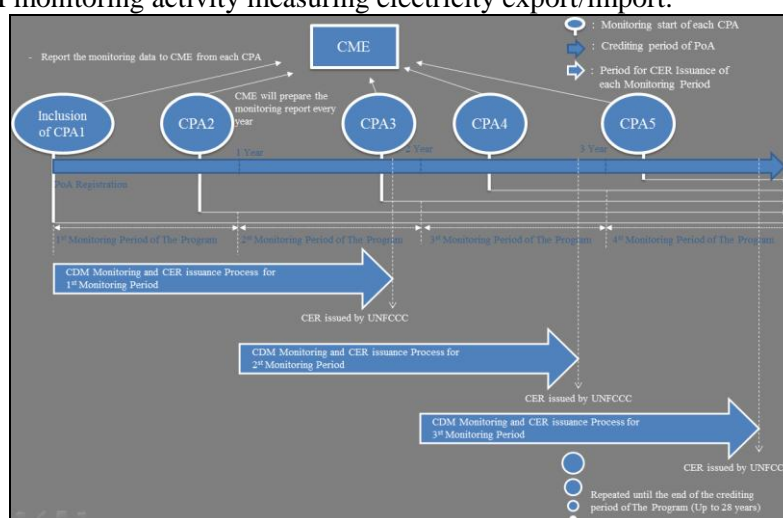
- ✓ **CME**
  - Duty of whole management of PoA and CPAs.
  - Manage PoA registration process: validation and verification
  - Inclusion of new CPAs : Analyse the eligibility of CPA
  - Support the Stakeholder consultant
  - Make and Revise a Project Description Document (PoA-DD, CPA-DD)
  - Make the monitoring report
  - Communicate with CDM EB, DOE
  - CER allocation with CPA implementer according to agreement
  - Ensure monitoring plan

- Archive and Manage the monitoring data
- Verification and Storage of monitoring data
- Train the CPA implementer about the monitoring procedure

※ CME had developed The "PoA CDM Operational Manual - Shinsung solar energy the grid connected solar PV PoA CDM operation instruction" and will provide it to the CPA implementer to manage 'Shinsung solar energy grid connected photovoltaic power generation PoA' effectively. This document consists of nine items, i.e., definition of this PoA, Role and responsibilities of the CME and CPA implementers, CPA inclusion and management, training and monitoring, and eligibility criteria for inclusion of a CPA in the PoA, etc.

#### ✓ CPA implementer

- Duty of whole management about monitoring
- Support the Stakeholder consultant
- Construction and operation of their PV power plant
- Installation of monitoring equipment
- Report monitoring data and QA/QC activity to CME
- Support the making of a CPA-DD and monitoring report
- Operation and Management of PV power plant
- Operation and Management of Monitoring equipment including QA/QC activities
- Direct CDM monitoring activity measuring electricity export/import.



[Figure C.2] PoA operation scheme

#### (1) A record keeping system for each CPA under the PoA,

Separate monitoring manual for this PoA<sup>7</sup> will be provided to CME and each CPA implementer. They will follow the manual in their monitoring activity. The manual specifies the following subjects and it is submitted to the validation DOE for its investigation.

- A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;
- Records of arrangements for training and capacity development for personnel;
- Procedures for technical review of inclusion of CPAs;
- A procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA);
- Records and documentation control process for each CPA under the PoA;
- Measures for continuous improvements of the PoA management system.

<sup>7</sup> PoA CDM Operational Manual - Shinsung solar energy the grid connected solar PV PoA CDM operation instruction

Coordinating/managing entity (Shinsung Solar Energy Co., Ltd.)

Shinsung Solar Energy Co., Ltd. establishes and updates the monitoring guideline and supervises the monitoring process of the PoA as a whole. It will designate a separate take force for CDM data management. The personnel in charge will be qualified to manage the monitoring and QA/QC records.

It collects and verifies the data from the CPAs whether all variables are valid or not, and makes a monitoring report. Electronic records will be kept during the entire crediting period of each CPA (10 years) and two years after the crediting period. Records submitted will be electronically archived by CME. It ensures reliability of data storage system and secure alternative storing unit for accidental situation.

CPA implementer

Each CPA implementer should establish its monitoring system and process based on the guideline provided by CME. Installation and the periodic calibration of the monitoring equipment will be implemented by each CPA. In addition, appropriate QA/QC measures will be applied to ensure the credibility of the monitoring data.

If any accident that could affect the monitoring activity or reliability of the monitoring data happens, CPA implementer should immediately report it to CME and apply appropriate solution.

Each CPA identified with the geographical location of its power plant will maintain the following data.

[Table C.1] Data managed by each CPA

Article	Details
Power generation capacity and status	Number of modules, total power generation capacity
Monitoring equipment	Producer, model name, serial number, location and initial/periodic calibration certificate
Monitoring data	Export electricity, import electricity and/or fossil fuel consumption

(2) Plan to avoid double accounting of emission reductions achieved by each CPA

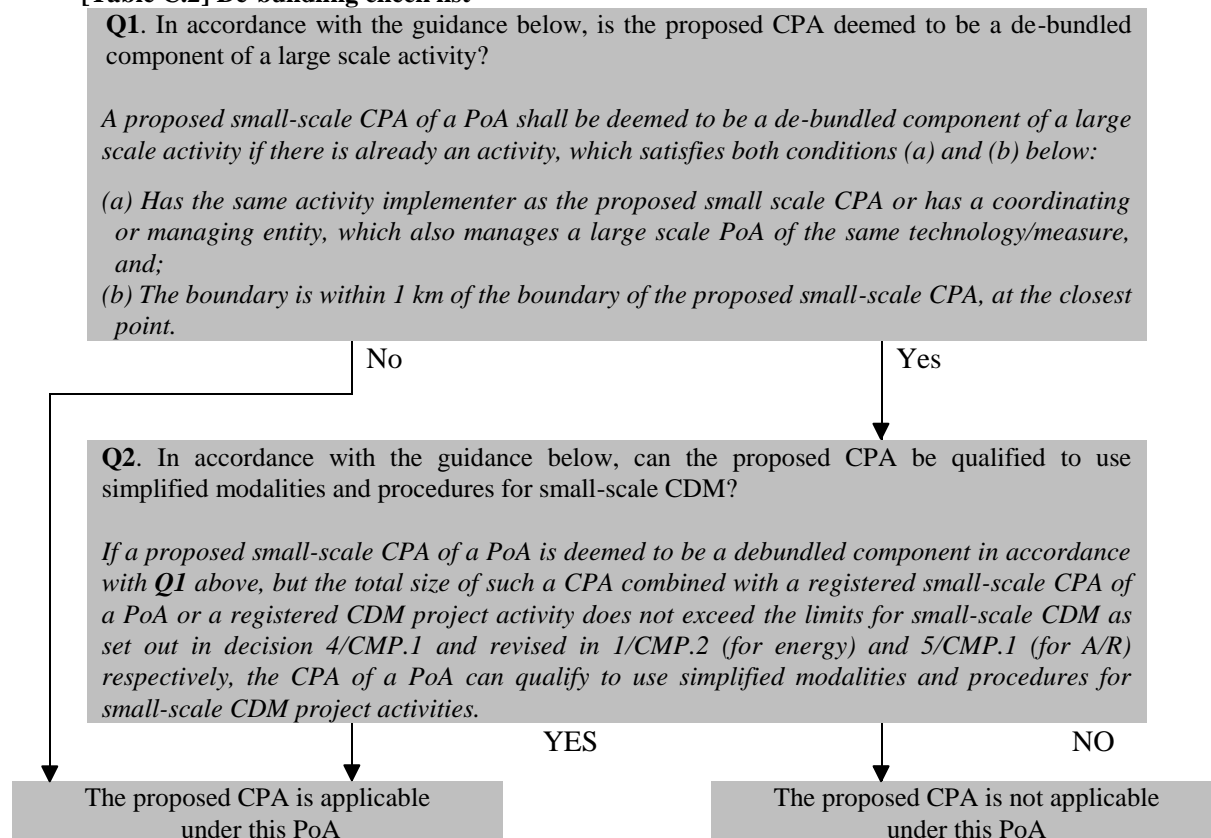
Double counting could occur if the CPA is already registered as an individual CDM project activity or is part of another registered PoA. To prevent such instances, CME will check whether there is any double-counting case using UNFCCC website or other statistical documents with the confirmation from each CPA that the CPA is neither registered as an individual CDM project activity nor is part of another registered PoA.

In the periodic monitoring report, CME will report the result of its investigation on the CPAs about this issue specifying the location, capacity, developer information, etc. of each CPA.

(3) The confirm that the proposed small-scale CPA is not a de-bundled component

Debundling is defined as the fragmentation of a large project activity into smaller parts. A small-scale project activity that is part of a large project activity is not eligible to use the simplified modalities and procedures for small-scale CDM project activities. CME will investigate whether there is any such case in accordance with ‘Guidelines on assessment of de-bundling for SSC project activities (Annex 13, EB 54)’ or its update

To make sure de-bundling check, CME checks accurate location of CPA using GPS information and the installed capacity of each site.

**[Table C.2] De-bundling check list****(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 every CPA implementer will make a written contract with CME on the terms and responsibilities prior to their CDM promotion. That means all the CPA will be aware and will have agreed that their activity is subscribed to the proposed PoA before its participation into the PoA. In addition, CME will maintain the database of CME-CPA contract documents.

**(5) Monitoring Plan of the CPA under the PoA;****a. Sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions**

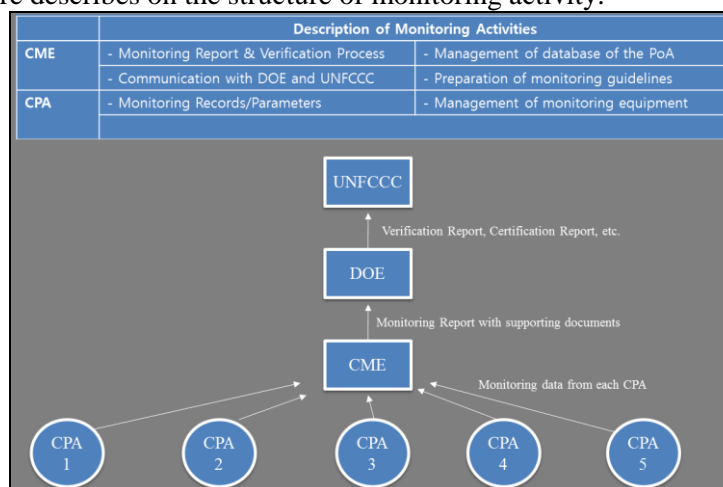
Not applicable for the proposed PoA.

The PoA does not use sampling but will verify each CPA. In addition, any sampling method or procedure is not utilized to implement the monitoring activity of the CPAs under the PoA.

**b. 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;**

Basically, all the monitoring data of each CPA will be directly measured by monitoring equipment (i.e. no monitoring parameter is monitored based on the sampling method). Periodically, each CPA will report its monitoring data to CME. In verification stage of the PoA, the collected data of all the CPAs under the PoA will be submitted to DOE for its investigation.

The following picture describes on the structure of monitoring activity.



[Figure C.3] Monitoring structure of the program

The monitoring parameters described in Appendix 5 below will be monitored and recorded as a database by each CPA independently. According to the monitoring plan specified in each CPA-DD, CPA collects the monitoring data and manages the monitoring equipment. In case of the parameters that are fixed throughout the crediting period (e.g. GWP of methane under CDM regulation, grid emission factor etc.), CME will be responsible for monitoring/updating them.

Monitoring equipment such as electricity meter will be certified to national or IEC standards and managed by each CPA implementer in accordance with the related local regulation.

And all the monitoring equipment should be calibrated or replaced with new one in accordance with the related CDM standard, '*clean development mechanism project standard (EB65, Annex5)*'.

It states that project participants shall ensure that the equipments are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.

The related regulation about the calibration frequency in Republic of Korea is '*measure act*' and '*the rules on the operation of the electric utility market*'.

At the 'measure act', it regulates that electricity meter should be calibrated every 7 years. And according to 'the rules on the operation of the electric utility market', it depended on the capacity of the electricity generation facility as below.

[Table C.3] Major QA/QC Checklist

Capacity	Over 1MW	Under 1MW
Calibration frequency	Every 3 year 6 month $\pm$ 6 month	Exemption

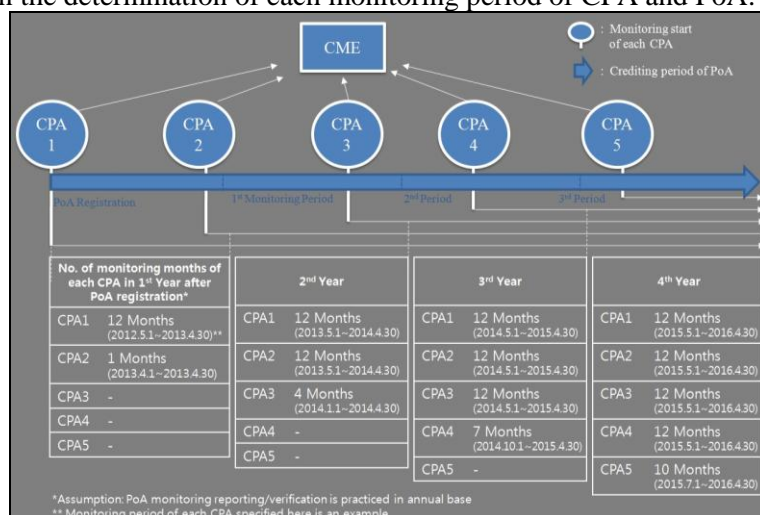
Therefore, as a conservative way, CME and CPA implementer applies 'the rules on the operation of the electric utility market' and regardless of the capacity of electricity generation facility, the CPAs under this PoA will calibrate the electricity meter every 3~4 years.

In case that the PP can't control the calibration of monitoring equipment, For example, there is any electricity imported from the grid for the project activity, the meter used for its monitoring is installed, owned and operated by KEPCO (Korea Power Corporation) and its calibration cannot be in control of the project participant under current domestic regulation. In that case, the calibration or replacement of that particular meter will be implemented in accordance with the related national regulation.

(Actually, KEPCO also applies same regulation stated above. That mean, the meter controlled by KEPCO also calibrated every 3~4 years.)

Each CPA provides CME with its monitoring data and CME manages the database of all CPAs. Based on the monitoring records, CME will prepare monitoring report and it is responsible for DOE verification and communication with UNFCCC and new CPA inclusion.

After CDM registration of the PoA, preparing monitoring report and its verification will be done periodically. As a general guidance, the first monitoring period of a newly included CPA is the period from the start of that CPA crediting period (i.e. the inclusion is officially completed) to the end of each monitoring period of the PoA as a whole. However, latest CDM guide/regulation approved by CDM EB will be considered in the determination of each monitoring period of CPA and PoA.



[Figure C.4] Monitoring period of PoA and CPA

Basically, CME will report the monitoring data of all the CPAs to the verifying DOE. Whether DOE adopts or not sampling-based approach in their verification implementation<sup>8</sup> may be in accordance with the latest CDM regulation at the time of verification.

The list of CPAs and their verification status will be updated to ensure that no double accounting occurs and that the monitoring period of each CPA and the PoA is consecutive. For the specific information regarding monitoring measures and parameters, refer to Appendix 5 below.

## SECTION D. Duration of PoA

### D.1. Start date of PoA

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15<sup>th</sup> of February, 2012

(it is the contract date between Shinsung ENG co.,ltd. and Ecoeye co.,ltd. for consultancy service of this PoA activity.)

### D.2. Length of the PoA

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28 years

<sup>8</sup> such as the number of on-site/field checks

**SECTION E. Environmental impacts****E.1. Level at which environmental analysis is undertaken**

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**Environmental Analysis is done at SSC-CPA level**

The PoA consists of construction and operation of photovoltaic power generation in Korea. As the site-specific environmental conditions at individual CPAs could affect an Environmental Analysis, it will be carried out at the CPA level and reported in each CPA-DD.

**E.2. Analysis of the environmental impacts**

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The analysis of environmental impacts, including transboundary impacts, will be conducted at CPA level.

**SECTION F. Local stakeholder comments****F.1. Solicitation of comments from local stakeholders**

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**Local stakeholder consultation is done at SSC-CPA level**

Considering the site-specific conditions of an individual CPA and all potential local stakeholders, local stakeholder consultation will be carried out at the CPA level prior to its inclusion in this PoA.

**F.2. Summary of comments received**

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Comments from local stakeholders will be conducted at CPA level.

**F.3. Report on consideration of comments received**

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Comments from local stakeholders will be conducted at CPA level.

**SECTION G. Approval and authorization**

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Approval date : August 24, 2012.

Host country : The Republic of Korea

No. 2012 - 25

**Approval of CDM Project****Shinsung Solar Energy Co., Ltd. CEO Mr. Lee Wan-Geun**

404-1, Baekhyeon-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

**Shinsung ENG Co., Ltd. CEO Mr. Lee Soon-Ku**

404-1, Baekhyeon-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

In respect of "Shinsung Solar Energy Grid Connected Photovoltaic Power Generation PoA", in which the above-mentioned entity participates, the Government of the Republic of Korea hereby confirms the followings in accordance with the approval decision of the CDM review committee;

- i) The Government of Republic of Korea has ratified the Kyoto Protocol in November 2002.
- ii) This is approval of voluntary participation in the proposed CDM project activity.
- iii) This project contributes to Sustainable Development in Korea.

August 24, 2012

Ministry of Knowledge Economy

Hong, Suk woo

THE REPUBLIC OF KOREA

**PART II. Generic component project activity (CPA)****SECTION A. General description of a generic CPA****A.1. Purpose and general description of generic CPAs**

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<The description here is the general guideline for the ease of CPA-DD preparation for CPA implementers. Therefore, there may be some discrepancies between this template and the actual CPA-DDs of the additional CPAs (i.e. CPA implementer may also revise the contents written in black color considering their specific circumstance).>

As a component project activity (CPA) under Shinsung Solar Energy Photovoltaic Power Generation PoA, this project is to construct photovoltaic (PV) power generation facilities and provide the produced electricity to the national grid. The CPA includes the installation of a new power plant at a site where there was no PV power plant operating prior to the implementation of the project activity (Greenfield plant). <Specify here the specific location where the plant is constructed (e.g. on the roof, on the ground etc.)>

The developer of the CPA is <Name of the project developer>, which will establish and manage the whole CPA power plant. The plant is consisted of the total installed capacity of <Total installed capacity>. It will generate about <Amount of power generation> of electric power and contribute to reducing greenhouse gases by replacing the grid electricity with renewable electricity. In the average during the crediting period, the CPA is expected to reduce about <Amount of ex-ante emission reductions>.

**SECTION B. Application of a baseline and monitoring methodology****B.1. Reference of the approved baseline and monitoring methodology(ies) selected**

&gt;&gt;

The emission reductions to be achieved as a result of each CPA under the proposed PoA are calculated according to the approved methodology AMS-I.D. “Grid connected renewable electricity generation”.

The typical CPA includes the installation of a new renewable energy power plant at a site where there was no PV power plant operating prior to the implementation of the project activity (Greenfield plant). In the calculation of emission reductions of a CPA, the following methodological tools will be referred as suggested by the methodology;

**[Table B.1] Referred methodology and tools**

Reference		Version
Methodology	AMS-I.D. ‘Grid connected renewable electricity generation’	17
Tool	Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion	02
	Tool to calculate the emission factor for an electricity system	02.2.1
	Guidelines on Assessment of de-bundling for SSC project activities	03

<There may be revisions of the tools above and the CPAs added in the future may refer to the latest version of these tools.>

## B.2. Application of methodology(ies)

>>

To eligible for small-scale type I project activities, the introduced project type should be renewable energy and the maximum output capacity of the renewable energy project is required not to be over 15MW.

The typical CPAs under the PoA will be photovoltaic system, renewable energy resource, and PP makes the eligibility criteria that project activities that have an installed capacity up to 15MW only can be included in the PoA.

If a kind of renewable energy project of type I supply electricity into a national/regional grid, this project belongs to I.D categories, specially.

The following list is to demonstrate the applicability condition of the AMS-I.D.

[Table B.2] Methodological applicability check of typical CPA

	Applicability condition of the AMS-I.D. ver. 17	General description of PoA
1	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (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.	The CPA comprises PV power generation units supplying electricity to a national or to an identified consumer facility via national /regional grid through a contractual arrangement.
2	Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2.	The electricity generated by the CPA under the registered PoA will be supplied to a national grid or an identified consumer facility via national grid.
3	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 plant(s).	Greenfield project will be only included to the CPA under the registered PoA.
4	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology ... [ellipsis].	The type of included CPA under the registered PoA will be photovoltaic system project, not a hydro power project. Therefore, this content needs not to consider.
5	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 CPA will not have non-renewable components and co-fires fossil fuel, but just renewable component.
6	Combined heat and power (co-generation) systems are not eligible under this category	Co-generation will not be involved as a CPA
7	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	Greenfield project will be only included to the CPA under the registered PoA.

	units.	
8	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 15MW.	Greenfield project will be only included to the CPA under the registered PoA.

<To check whether or not the specific CPA has the applicability of methodology AMS-I.D, it will be checked above criteria and makes the specific description in its CPA-DD.>

### B.3. Sources and GHGs

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The extent of CPA boundary as per the AMS-I.D. is the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

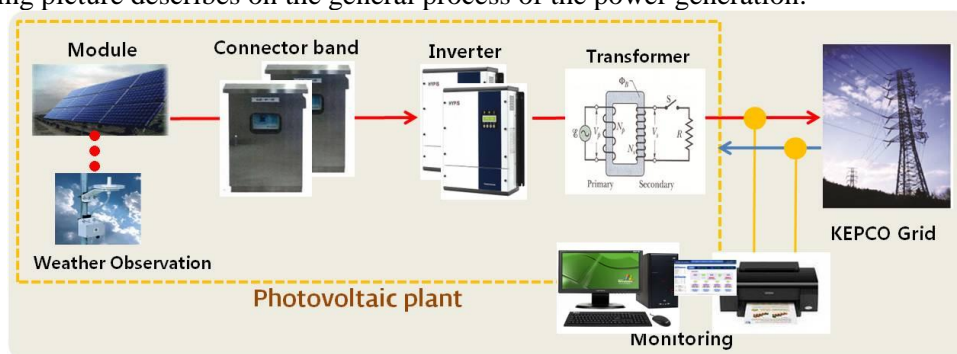
The gases and sources relevant to the CPA are listed below based on the AMS-I.D.

[Table B.3] Emissions sources within CPA Boundary that are considered

	Source	Gas	Included?	Justification
Baseline	CO <sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO <sub>2</sub>	Yes	Main emission source
		CH <sub>4</sub>	No	Minor emission source
		N <sub>2</sub> O	No	Minor emission source
Project	For photovoltaic system, No emission of GHGs	CO <sub>2</sub>	No	Minor emission source
		CH <sub>4</sub>	No	Minor emission source
		N <sub>2</sub> O	No	Minor emission source

The typical CPA will generate electricity using energy from the sunlight so that there is no severe adverse impact to environment. The power plant will mainly be consisted of arrays of solar module, inverter, electricity meter (it was installed for monitoring), transformer etc. Basically, the electricity, once generated, will be exported to the national grid and the net amount of electricity export will be monitored.

The following picture describes on the general process of the power generation.



[Figure B.1] On-grid photovoltaic power generation process

### B.4. Description of baseline scenario

>>

The typical CPA satisfies the conditions to be included in the positive list of ‘Guidelines on the demonstrations of additionality of small-scale project activities, version 09.0 (EB68, Annex27)’.

That means, the typical CPA will satisfy the criteria as below;

- Grid-connected renewable electricity generation technologies (i.e, photovoltaic system)
- Installed capacity up to 15MW

And, CME (Shinsung solar energy) set the criteria that the typical CPA can be included in this PoA only when the project activity is Greenfield type.

Therefore, as suggested by the methodology AMS-I.D., 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.

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.

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

Where:

$BE_y$  = Baseline Emissions in year y (tCO<sub>2</sub>)

$EG_{BL,y}$  = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO2,grid,y}$  = CO<sub>2</sub> emission factor of the grid in year y (tCO<sub>2</sub>/MWh)

In accordance with the methodology, project and leakage emission of this project corresponds to zero and baseline emissions corresponds to power generated by the project activity and delivered to the grid, multiplied by the baseline emission factor. There are two options for the baseline emission factor 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 tCO<sub>2</sub>/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

The PoA choose (a) approach, each CPA will calculate the emission factor in accordance with the latest version of ‘Tool to calculate the Emission Factor for an electricity system’. Calculations will be based on data from an official source (where available) and made publicly available.

## B.5. Demonstration of eligibility for a generic CPA

>>

**Eligibility Criteria<sup>9</sup>:** The general objective of the eligibility criteria is to provide for a quick check whether a new CPA meets all criteria of the CDM and the registered PoA. CPA should result all assessment as ‘yes’ and submits evidence.

[Table B.4] Demonstration of eligibility for a generic CPA

	Eligibility criteria		Satisfy?		Demonstration of Eligibility
	Criteria	Description	Y	N	
1	Geographical boundary	The CPA shall be performed within the territory of Republic of Korea.	<input type="checkbox"/>	<input type="checkbox"/>	Geographical coordinates (longitude and latitude)
2	Avoid double counting of CPA	The CPA shall be a new project which is not registered large scale CDM or CPA in the other PoA or other carbon off-set program	<input type="checkbox"/>	<input type="checkbox"/>	1. Declaration letter received by CPA implementer; and 2. unique Identification (serial number)
3	Specifications of technology	The applied equipment for CPA gets a Renewable energy system certification of KEMCO. ** KEMCO promotes renewable energy, so made the certification about renewable energy technology ‘Renewable Energy System Certification of KEMCO’.	<input type="checkbox"/>	<input type="checkbox"/>	Certification by KEMCO

<sup>9</sup> Refer to ‘Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities, version 01, UNFCCC (EB65, Annex3)



4	CPA start date	The start date of proposed CPA should not be before the first published date for global stakeholder consultation about Programme of activities (PoA), i.e. 20th March of 2012 <sup>10</sup> . In the above context, ‘CPA start date’ means the earliest date at which either the implementation or construction or real action of CPA	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">The contract for project activity</a>
5	CPA type	The CPA comprises Photovoltaic power generation units supplying electricity to a national grid.	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Information about end users of electricity generated by this CPA (e.g. Electric utility business License)</a>
6	CPA scale threshold	Every each CPA has the total installed capacity of no more than 15MW and will remain within 15MW throughout its crediting period.	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Evidence that can check the installed capacity</a>
7	Methodology Applicability	The CPA satisfies the applicability conditions of AMS-I.D methodology.	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Check section B.2. of generic CPA-DD</a>
8	Additionality	The CPA satisfies the conditions to be included in the positive list of grid-connected renewable electricity generation technologies that are automatically defined as additional in accordance with Attachment A of Appendix B <sup>11</sup> .	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Grid-connected solar power technology is automatically defined as additional without further documentation of barriers</a>
9	Stakeholder consultant	Local stakeholder consultations shall be done and due account also shall be taken of any comments received at CPA level.	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Result report of stakeholder consultants</a>
10	Environmental Impact Assessment	Environmental Impact Assessment or Preliminary Environmental Review shall be done at CPA level according to the related domestic regulation.	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Result report of Environmental Impact Analysis (EIA)</a>
11	ODA diversion	CPA shall not be funded by an Annex I party. The funding by an Annex I party could lead to a diversion of ODA, so, such diversion does not take place.	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Statement of CME and CPA implementer</a>
12	Debundling check	Confirmation that CPA is a single project which is not a de-bundled component of another large-scale CPA or CDM project activity as per the latest guidance given in CDM EB at CPA level.	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Check ‘[table C.2] in section C of PoA-DD, part I’. (i.e. guidance on assessment of debundling for SSC project activities)</a>

## B.6. Estimation of emission reductions of a generic CPA

### B.6.1. Explanation of methodological choices

>>

#### 1. Baseline Emission

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.

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

Where:

$BE_y$  = Baseline Emissions in year y (tCO<sub>2</sub>)

$EG_{BL,y}$  = 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<sub>2</sub> emission factor of the grid in year y (tCO<sub>2</sub>/MWh)

<sup>10</sup> That date can be found on the page of the UNFCCC web-site through which the project was published. (<http://cdm.unfccc.int>)

<sup>11</sup> This document, together with the ‘General Guidance’ and all other approved SSC methodologies, was part of a single document entitled: Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM project activities until version 07.

The emission factor of the CPA will be calculated in accordance with the latest version of ‘Tool to calculate the Emission Factor for an electricity system’ and each CPA specifies the calculation in its CPA-DD.

## 2. Project emissions

In accordance with the methodology,  $PE_y = 0$ .

However, CO<sub>2</sub> emissions from on-site consumption of fossil fuels due to the project activity, if any, will be calculated using the latest version of the ‘Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion’ and considered in ex-post ER calculation of the CPA.

## 3. Leakage

If the energy generating equipment is transferred from another activity for the CPA, leakage is to be considered. ( $LE_y = 0$ )

## 4. Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

$ER_y$  = Emission reductions in year  $y$  (tCO<sub>2</sub>/y)

$BE_y$  = Baseline Emissions in year  $y$  (tCO<sub>2</sub>/y)

$PE_y$  = Project emissions in year  $y$  (tCO<sub>2</sub>/y)

$LE_y$  = Leakage emissions in year  $y$  (tCO<sub>2</sub>/y)

### B.6.2. Data and parameters that are to be reported ex-ante

Data / Parameter	EF <sub>CO<sub>2</sub>,grid,y</sub>
Unit	tCO <sub>2</sub> /MWh
Description	CO <sub>2</sub> emission factor of the grid in year $y$
Source of data	Calculated
Value(s) applied	To be specified in CPA-DD
Choice of data or Measurement methods and procedures	Calculated in accordance with the latest version of ‘Tool to calculate the Emission Factor for an electricity system’
Purpose of data	Used to calculate emission reduction of CPA - Calculation of baseline emissions
Additional comment	Each CPA implementer can choose option in the tool considering the specific circumstance of its activity.

### B.6.3. Ex-ante calculations of emission reductions

>>

#### 1. Baseline Emission

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.

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

Where;

$EG_{BL,y}$  = 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<sub>2</sub> emission factor of the grid in year  $y$  (tCO<sub>2</sub>/MWh)

\* *Value applied for Ex-ante calculation*

$EG_{BL,y}$  = Quantity of electricity generated will be calculated by stimulation program (i.e. Solar pro) of shinsung solar energy co.,ltd..

$EF_{CO2,grid,y}$  = The emission factor of the CPA will be calculated in accordance with the latest version of ‘Tool to calculate the Emission Factor for an electricity system’.

## 2. Project emissions

In accordance with the methodology,  $PE_y = 0$ .

However, CO<sub>2</sub> emissions from on-site consumption of fossil fuels due to the project activity, if any, will be calculated using the latest version of the ‘Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion’ and considered in ex-post ER calculation of the CPA.

## 3. Leakage

If the energy generating equipment is transferred from another activity for the CPA, leakage is to be considered. ( $LE_y = 0$ )

## 4. Emission reductions

$$ER_y = BE_y - PE_y - LE_y$$

Where:

$ER_y$  = Emission reductions in year y (tCO<sub>2</sub>/y)

$BE_y$  = Baseline emissions in year y (tCO<sub>2</sub>/y)

$PE_y$  = Project emissions in year y (tCO<sub>2</sub>/y)

$LE_y$  = Leakage emissions in year y (tCO<sub>2</sub>/y)

## B.7. Application of the monitoring methodology and description of the monitoring plan

### B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter	$EG_y$
Unit	MWh
Description	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y
Source of data	Measured
Value(s) applied	To be specified in CPA-DD
Measurement methods and procedures	<p>The net electricity generation supplied to the grid is the difference between the total quantity of electricity generated by this project and the auxiliary electricity consumption.</p> <ol style="list-style-type: none"> <li>Amount of electricity export (<i>Collect the data Both A and B</i>) <ol style="list-style-type: none"> <li>Measurements are undertaken using electricity meters.</li> <li>Measured value shall be <u>cross checked</u> with records for sold/ purchased electricity (e.g. invoices/receipts from power plant KPX).</li> </ol> </li> <li>Amount of electricity import (<i>Choose the data source either A or B</i>) <ol style="list-style-type: none"> <li>Measurements are undertaken using electricity meter; or</li> <li>Calculate the amount using the specification from monitoring equipment manufacturer (check the standby power consumption of inverter from this document).</li> </ol> </li> </ol>
Monitoring frequency	Continuous monitoring, hourly measurement and at least monthly recording

<b>QA/QC procedures</b>	The measuring device should be recalibrated at least once in 3~4 years in accordance with the instructions (schedules, procedures) for QA of the technology provider and/or grid operator. There will be strict compliance to maintenance schedule recommended by the technology provider and/or the grid operator.
<b>Purpose of data</b>	Used to calculate emission reduction of CPA - Calculation of baseline emissions
<b>Additional comments</b>	It can refer to ‘Appendix 5. Further background information on the monitoring plan’ about detailed.

### B.7.2. Description of the monitoring plan for a generic CPA

>>

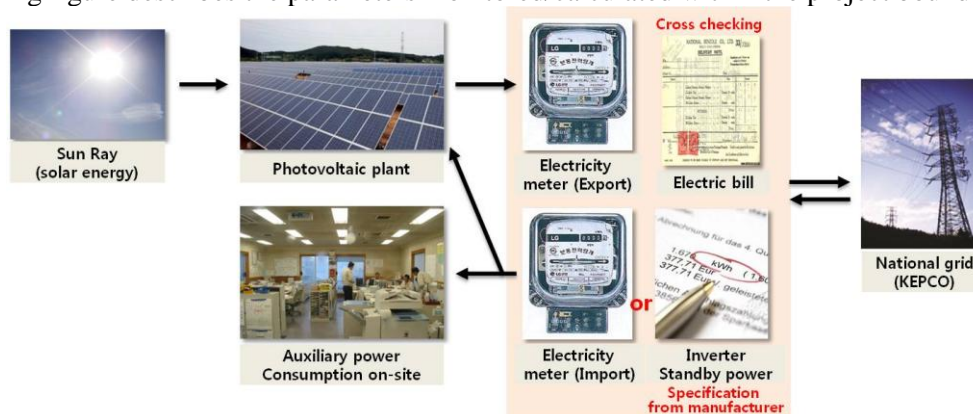
All introduced photovoltaic system should have a monitoring meter for checking the output data, this monitoring data will be sent to CME (shinsung solar energy) and CME manage the archived data. The CPA database includes the following data-set that can unambiguously determine the emission reductions attributable to each CPA.

[Table B.5] List of data

Type	List
Project Information	- A serial number - Location - Introduced date
Energy Production/Consumption	- Quantity of generated electricity - Quantity of consumed electricity on-site(Auxiliary power)

The monitoring parameters described above will be monitored and recorded as a database by each CPA independently. In case of the parameters that are fixed throughout the crediting period, CME will be responsible for monitoring/updating them.

The following figure describes the parameters monitored/calculated within the project boundary.



[Figure B.2] Diagram of monitoring activity

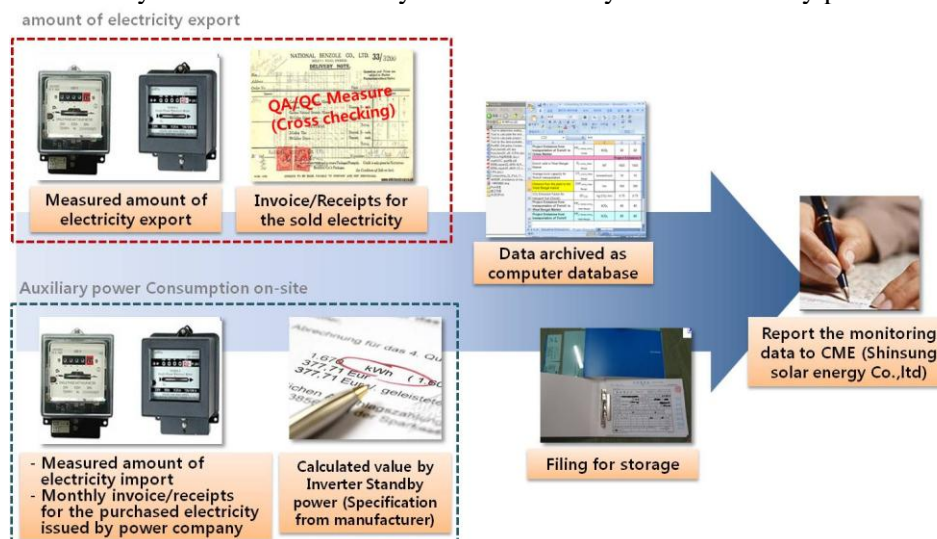
### Archive of the monitoring data

The net electricity generation supplied to the grid ( $EG_{BL,y}$ ) is the difference between the total quantity of electricity generated by this project and the auxiliary electricity consumption (Quantity of imported electricity).

To monitor the amount of electricity export, 1) quantity of electricity export measured by the electricity meter is used as a main source of the data, and 2) invoice/receipts for the sold electricity is used as a measure for cross check.

As for the amount of electricity import from the grid to the project power plant, the amount measured at the grid interface/connection used for billing purposes (e.g. Monthly invoice/receipts for the purchased electricity published by the power company) will be the main source of data<sup>12</sup>.

If the monthly invoice/receipts issued by power company is not applicable, the quantity of auxiliary power consumption on-site can be calculated by inverter standby power consumption from specification of manufacturer. CPA implementers choose the method to check auxiliary power consumption either by measurement directly or calculation by inverter standby power.



[Figure B.3] Documentation and report of monitored parameters

### Installation of monitoring equipment

Monitoring equipment should be installed is electricity meter to monitor the quantity of electric transmission.

Installed monitoring equipment should comply with the standards at ‘Guideline for the support on the new and renewable energy equipments’ as below.

#### [Reference] Requirements of monitoring equipment

In the case of this projects that install the mandatory monitoring equipment, the project participant has to follow regulations as below.

##### 1) Requirements of equipment

Equipment	Requirements	Evidence
Inverter	Accuracy $\leq 3\%$	- specification of the equipment
Electricity meter	Accuracy $\leq 1\%$	- specification of the equipment

Source: Standards for New & renewable energy facilities, Renewable energy centre of Korea

### Quality Assurance & Quality Control

Each CPA implementer should apply QA&QC procedures for monitoring.

First of all, to assure quality of monitoring data, Monitoring equipment such as electricity meter should be certified to national or IEC standards and managed in accordance with the related CDM and local regulation.

<sup>12</sup> Electricity import amount is measured by the electricity meter that is, in most cases, legally installed, operated and owned by Power Company. Therefore, the monthly invoice issued by power company is the only reliable source that is directly monitored by measuring equipment while more specific data (hour or daily base data) is often not available for the CPA implementer (because providing such information is not the responsibility of the power company). This is why CPA implementer will use the invoice/receipts for monitoring electricity import amount as a main data source.

Monitoring should be performed by complying with ‘monitoring procedure’ in the PoA CDM operational manual and the person in charge of monitoring should be educated about it. Before the formal operation of the proposed project, the person in charge of project will organize the relevant people to participate the training. The period of the training will last 1 working day at least.

The following items will be investigated periodically to ensure the credibility of the monitoring data collected. As the PoA continues to operate and update ‘monitoring procedure’, which will be prepared by CME, the CPA will follow those update version of guideline in the implementation of QA/QC process.

[Table B.6] Major QA/QC Checklist

No	Check Item
1	Failure, malfunction, or any other technical problem in the operation of electricity meters for import and/or export electricity
2	Observance of Calibration frequency and the authenticity of the practiced calibration
3	Monitoring data loss or damage
4	In case of export electricity amount, crosscheck the measured data on-site with the invoice, published by power company for the sold electricity
5	Collection status of invoices for export and import electricity and clarity of their documentation

All the monitoring equipment should be calibrated or replaced with new one in accordance with the related CDM standard, ‘*clean development mechanism project standard (EB65, Annex5)*’.

It states that project participants shall ensure that the equipments are calibrated either in accordance with the local/national standards, or as per the manufacturer’s specifications. If local/national standards or the manufacturer’s specifications are not available, international standards may be used.

The related regulation about the calibration frequency in Republic of Korea is ‘*measure act*’ and ‘*the rules on the operation of the electric utility market*’.

At the ‘measure act’, it regulates that electricity meter should be calibrated every 7 years. And according to ‘the rules on the operation of the electric utility market’, it depended on the capacity of the electricity generation facility as below.

[Table B.7] Major QA/QC Checklist

Capacity	Over 1MW	Under 1MW
Calibration frequency	Every 3 year 6 month $\pm$ 6 month	Exemption

Therefore, as a conservative way, CME and CPA implementer applies ‘the rules on the operation of the electric utility market’ and regardless of the capacity of electricity generation facility, the CPAs under this PoA will calibrate the electricity meter every 3~4 years.

In case that the PP can’t control the calibration of monitoring equipment, For example, there is any electricity imported from the grid for the project activity, the meter used for its monitoring is installed, owned and operated by KEPCO (Korea Power Corporation) and its calibration cannot be in control of the project participant under current domestic regulation. In that case, the calibration or replacement of that particular meter will be implemented in accordance with the related national regulation.

(Actually, KEPCO also applies same regulation stated above. That mean, the meter controlled by KEPCO also calibrated every 3~4 years.)

### Monitoring period

Measured data will be collected for each monitoring period and used to calculate emission reductions for that portion of the crediting period. Generally, monitoring period can be decided by project participant.

**Appendix 1: Contact information on entity/individual responsible for the PoA**

<b>Organization</b>	Shinsung Solar Energy Co., Ltd.
<b>Street/P.O. Box</b>	404-1, Baekhyeon-dong
<b>Building</b>	
<b>City</b>	Bundang-gu, Seongnam-si
<b>State/Region</b>	Gyeonggi-do
<b>Postcode</b>	463-420
<b>Country</b>	Republic of Korea
<b>Telephone</b>	+82-31-7889-454
<b>Fax</b>	+82-31-7889-290
<b>E-mail</b>	ksson@shinsung.co.kr
<b>Website</b>	<a href="http://www.shinsung.co.kr">http://www.shinsung.co.kr</a>
<b>Contact person</b>	Mr. Sun Keuk-sang
<b>Title</b>	Manager
<b>Salutation</b>	
<b>Last name</b>	Sun
<b>Middle name</b>	
<b>First name</b>	Keuk-sang
<b>Department</b>	
<b>Mobile</b>	
<b>Direct fax</b>	+82-31-7889-290
<b>Direct tel.</b>	+82-31-7889-454
<b>Personal e-mail</b>	ksson@shinsung.co.kr



<b>Organization</b>	Shinsung ENG Co., Ltd.
<b>Street/P.O. Box</b>	404-1, Baekhyeon-dong
<b>Building</b>	
<b>City</b>	Seongnam-si
<b>State/Region</b>	Gyeonggi-do
<b>Postcode</b>	463-420
<b>Country</b>	Republic of Korea
<b>Telephone</b>	+82-31-7889-102
<b>Fax</b>	+82-31-7889-420
<b>E-mail</b>	asw@shinsung.co.kr
<b>Website</b>	<a href="http://www.shinsung.co.kr">http://www.shinsung.co.kr</a>
<b>Contact person</b>	Mr. Ahn Sang-won
<b>Title</b>	Manager
<b>Salutation</b>	
<b>Last name</b>	Ahn
<b>Middle name</b>	
<b>First name</b>	Sang-won
<b>Department</b>	
<b>Mobile</b>	
<b>Direct fax</b>	+82-31-7889-420
<b>Direct tel.</b>	+82-31-7889-102
<b>Personal e-mail</b>	asw@shinsung.co.kr

## **Appendix 2: Affirmation regarding public funding**

This PoA ensures that public funding for a CPA(s) from Annex I Parties, if any, is not to result in the diversion of official development assistance (ODA) and is to be separate from and not counted towards the financial obligations of Annex I Parties.

## **Appendix 3: Application of methodology(ies)**

Refer to section B.2 Application of methodology (ies)

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

*Ex-ante calculation for  $BE_y$  is as below:*

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

Where:

$EG_{BL}$  = 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<sub>2</sub> emission factor of the grid in year y (tCO<sub>2</sub>/MWh)

Parameter	Value	Unit	Description	Data source	Justification of the choice of data for ex-ante calculation
$EG_{BL}$	To be filled by CPA	MWh	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y	Result value of stimulation program	Shinsung solar energy has their photovoltaic system stimulation program, so ex-ante quantity of net electricity can be calculated/ measured by using this program.
$EF_{CO_2, grid, y}$		tCO <sub>2</sub> /MWh	CO <sub>2</sub> emission factor of the grid in year y	Calculation	CME or CPA implementer should calculate the emission factor in accordance with 'Tool to calculate the emission factor for an electricity system.



## Appendix 5: Further background information on the monitoring plan

No.	Data	Data Collection Source	Initial data collection	Reporting and calibration frequency <sup>13</sup>	Note
<i>EG<sub>y</sub> (Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y)</i>					
1.1	Amount of electricity export (Collect the data Both A and B)	A. Electricity meter	Monitoring frequency: Continuously How: Record the reads from the meter	Reporting frequency: At least monthly Calibration frequency: Every 3~4 years	
1.2		B. Invoice/receipts for the sold electricity	Monitoring frequency: In accordance with the frequency that the power purchaser issues their invoice How: Collect the invoice/statement from the power purchaser	Reporting frequency: Monthly Calibration frequency: -	This data is used as QA/QC purpose
2	Amount of electricity import (Choose the data source either A or B)	A. Electricity meter	Monitoring frequency: Continuously How: Record the reads from the meter	Reporting frequency: At least monthly Calibration frequency: Every 3~4 years	
		B. Calculation	Data: Specification from monitoring equipment manufacturer (check the power consumption from this document) How: Calculation (Equation = Power consumption * 8760hr/yr)	Reporting frequency: Specification should be submitted at the point of installation the monitoring equipment. Calibration frequency: -	

<sup>13</sup> Here, 'reporting' means 'archiving the collected data as computer database in CPA level'.



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**History of the document**

<b>Version</b>	<b>Date</b>	<b>Nature of revision(s)</b>
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities" (EB 66, Annex 13).
01	EB33, Annex43 27 July 2007	Initial adoption.
<b>Decision Class:</b> Regulatory <b>Document Type:</b> Form <b>Business Function:</b> Registration		