

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



**NAME /TITLE OF THE PoA: The programme to introduce renewable energy system
into Seoul**



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**CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01**

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NOTE:

- (i) This form is for submission of CPAs that apply a small scale approved methodology using the provision of the proposed small scale CDM PoA.
- (ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)^{1,2} that is specified to the proposed PoA by using the provisions stated in the SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

¹ The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

² At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

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SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

The programme to introduce renewable energy system into Seoul – SSC-CPA (2011, Seoul)

Version 01

Revised date: 2011/03/08

A.2. Description of the small-scale CPA:

This SSC-CPA consists of a group of renewable energy systems under ‘The programme to introduce renewable energy system into Seoul’ (hereafter PoA). SSC-CPA introduces photovoltaic system and solar water heating system to public building in Seoul.

These systems displace fossil fuel based energy use and bring reduction of GHG emission. Photovoltaic system supply electricity and replace existing supply from grid. It brings reduction of GHG emission from grid electricity generation. Solar water heating system supply hot water and replace existing boiler system using liquefied natural gas (LNG) line. It brings reduction of GHG emission by burning LNG. Geothermal heating and cooling system is not included in this SSC-CPA.

Renewable energy system install information is as below:

| No. | Place name | System type | Capacity | Unit |
|-----|-------------------------------------|---------------------|----------|----------------|
| 1 | Jung-gu community centre | Photovoltaic | 60 | kW |
| 2 | Chang-dong sport centre | Solar water heating | 320 | m ² |
| 3 | Dobong-gu waste food disposal plant | Photovoltaic | 30 | kW |
| 4 | Dongdaemun-gu library | Photovoltaic | 10 | kW |
| 5 | Godeok rainwater pump centre | Photovoltaic | 30 | kW |
| 6 | Hagye-2-dong community centre | Photovoltaic | 10 | kW |
| 7 | Sungnae-2-dong community centre | Photovoltaic | 6 | kW |
| 8 | Seodaemun-gu office | Photovoltaic | 30 | kW |
| 9 | Dongjak-gu office | Photovoltaic | 30 | kW |
| 10 | Songpa-gu woman centre | Photovoltaic | 10 | kW |
| 11 | Jamsil rainwater pump centre | Photovoltaic | 23 | kW |
| 12 | Eunpyeong-gu ggumnamu village | Photovoltaic | 10 | kW |

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| | | | | |
|----|--------------------------------------|---------------------|----|----------------|
| 13 | Parangsae child care centre | Solar water heating | 26 | m ² |
| 14 | Eunhye child care centre | Solar water heating | 26 | m ² |
| 15 | Geumbit child care centre | Photovoltaic | 10 | kW |
| 16 | Haja center | Solar water heating | 64 | m ² |
| 17 | Gwangjin youth centre | Photovoltaic | 15 | kW |
| 18 | SR center | Photovoltaic | 30 | kW |
| 19 | Seongdong traffic office | Photovoltaic | 35 | kW |
| 20 | Nanji water treatment centre | Photovoltaic | 22 | kW |
| 21 | Seoul Metropolitan Government office | Photovoltaic | 25 | kW |
| 22 | Hangdang Darim apartment complex | Photovoltaic | 50 | kW |
| 23 | Hangdang Hanjin apartment complex | Photovoltaic | 50 | kW |
| 24 | Mokdong Woosung apartment complex | Photovoltaic | 40 | kW |

Contribution to sustainable development

- Social aspect
 - This program will contribute to revitalization of renewable energy system industry by public purchase.
 - This program will supply renewable energy systems to public buildings such as welfare centre, community centre, sport centre and child care centre. It contributes to enhancement of public welfare and publicizes renewable energy to citizen.
 - This program will be a benchmark practice to reduce energy use of building and vitalize other similar sustainable activities in Korea.
- Environmental aspect
 - Photovoltaic, solar heat and geothermal are natural renewable energy source and usable continuously without any environmental problem.
 - Photovoltaic system and solar heat system do not emit any GHG for operation. Geothermal heating/cooling system use less electricity for operation compared with existing system. It brings reduction of GHG emission from grid electricity use.
- Economic aspect
 - Introducing renewable systems by this program, each public building can save energy cost for operation.

SSC-CPA specific data is as under:

| System type | Number of introducing system | Total capacity |
|-------------|------------------------------|----------------|
|-------------|------------------------------|----------------|

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| | | |
|-----------------------------------|----|--------------------|
| Photovoltaic | 20 | 526 kW |
| Solar water heating | 4 | 436 m ² |
| Geothermal heating/cooling | 0 | |

A.3. Entity/individual responsible for the small-scale CPA:

The entity or individual acting as the SSC-CPA implementer will be provided for each SSC-CPA submitted for inclusion in the PoA.

The Seoul Metropolitan Government representatives will be involved for implementation of the SSC CPAs.

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

The programme to introduce renewable energy system into Seoul – SSC-CPA (2011, Seoul)

A.4.1.1. Host Party:

| 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) |
|--|---|--|
| The Republic of Korea | Seoul Metropolitan Government | |
| | | |

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

>>Geographic reference or other means of identification³, Name/contact details of the entity/individual responsible for the CPA, e.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.

³ E.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.

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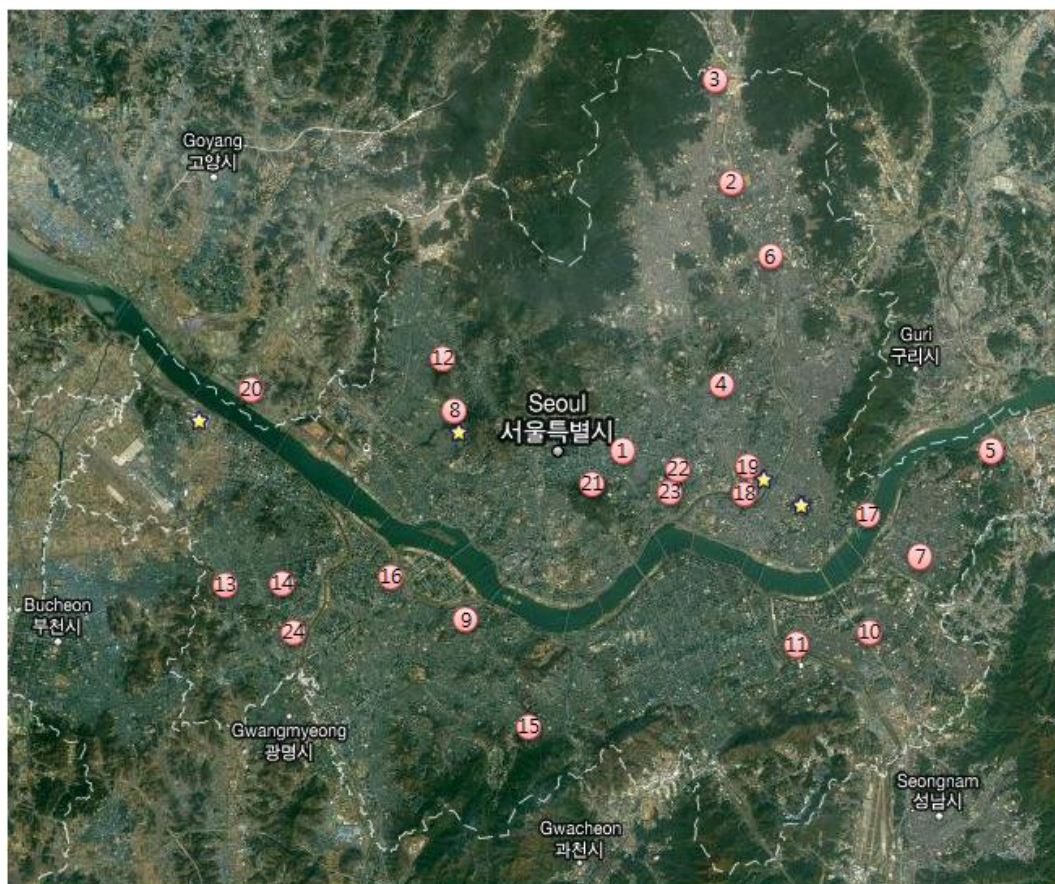
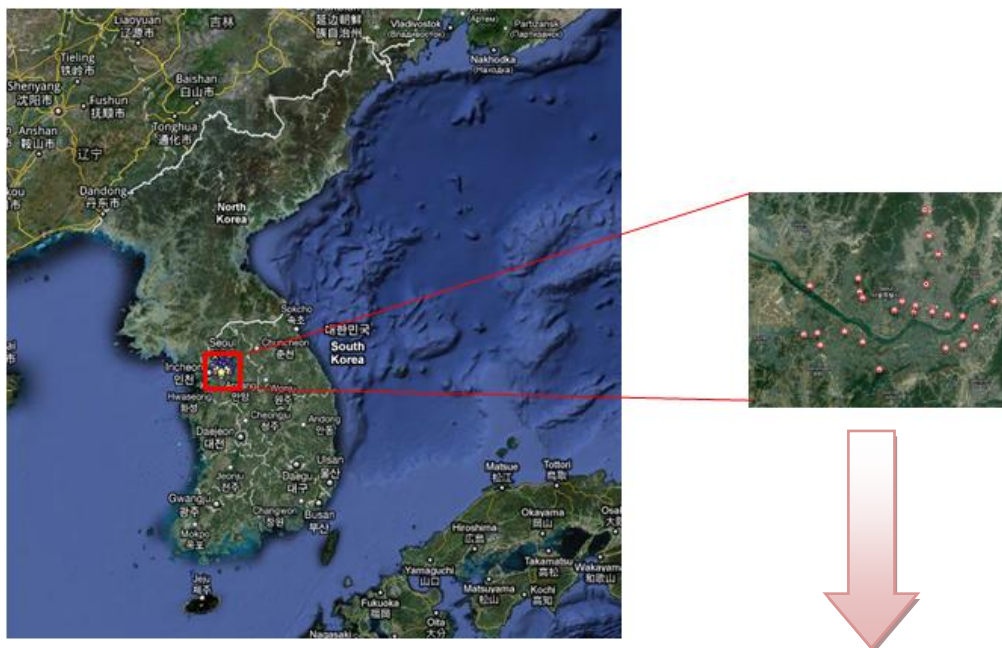


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The red circles are the place which introducing renewable system.

<Geographic Reference of this SSC-CPA>

| No. | Place name | Geographic Reference | |
|-----|--------------------------------------|----------------------|----------------|
| 1 | Jung-gu community centre | 37°34'6.63"N | 127° 0'21.08"E |
| 2 | Chang-dong sport centre | 37°39'28.49"N | 127° 3'0.95"E |
| 3 | Dobong-gu waste food disposal plant | 37°41'27.87"N | 127° 2'38.85"E |
| 4 | Dongdaemun-gu library | 37°35'22.82"N | 127° 2'49.37"E |
| 5 | Godeok rainwater pump centre | 37°34'2.44"N | 127° 9'48.73"E |
| 6 | Hagye-2-dong community centre | 37°37'54.72"N | 127° 4'5.27"E |
| 7 | Sungnae-2-dong community centre | 37°31'56.65"N | 127° 7'46.34"E |
| 8 | Seodaemun-gu office | 37°34'44.82"N | 126°56'12.40"E |
| 9 | Dongjak-gu office | 37°30'44.65"N | 126°56'21.31"E |
| 10 | Songpa-gu woman centre | 37°30'22.46"N | 127° 6'33.55"E |
| 11 | Jamsil rainwater pump centre | 37°30'10.26"N | 127° 4'39.76"E |
| 12 | Eunpyeong-gu ggumnamu village | 37°35'56.21"N | 126°55'39.60"E |
| 13 | Parangsae child care centre | 37°31'19.54"N | 126°50'9.05"E |
| 14 | Eunhye child care centre | 37°31'30.08"N | 126°50'34.24"E |
| 15 | Geumbit child care centre | 37°28'30.29"N | 126°57'55.05"E |
| 16 | Haja center | 37°31'30.44"N | 126°54'11.72"E |
| 17 | Gwangjin youth centre | 37°32'44.74"N | 127° 6'29.15"E |
| 18 | SR center | 37°33'11.49"N | 127° 3'24.97"E |
| 19 | Seongdong traffic office | 37°33'30.33"N | 127° 3'27.86"E |
| 20 | Nanji water treatment centre | 37°35'13.41"N | 126°50'50.14"E |
| 21 | Seoul Metropolitan Government office | 37°33'20.84"N | 126°59'28.42"E |
| 22 | Hangdang Darim apartment complex | 37°33'28.83"N | 127° 1'38.47"E |
| 23 | Hangdang Hanjin apartment complex | 37°33'18.60"N | 127° 1'35.91"E |

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| | | | |
|----|-----------------------------------|---------------|---------------|
| 24 | Mokdong Woosung apartment complex | 37°30'28.20"N | 126°52'0.15"E |
|----|-----------------------------------|---------------|---------------|

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

>>

A.4.2.2. Expected operational lifetime of the small-scale CPA:

>> 10 years

A.4.3. Choice of the crediting period and related information:

Fixed Crediting period

A.4.3.1. Starting date of the crediting period:

The starting date of would be a date of the two:

- (i) the date of inclusion of the SSC-CPA in the registered PoA; or
- (ii) the date of operating the efficient lamp in the SSC-CPA.

A tentative date is expected to be the date of inclusion of this SSC-CPA in the registered PoA

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

>>

NOTE: Please note that the duration of crediting period of any CPA shall be limited to the end date of the PoA regardless of when the CPA was added.

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

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| Years | Estimation of annual emissions reductions in Tones of CO₂e |
|---|--|
| 1 | 539.17 |
| 2 | 539.17 |
| 3 | 539.17 |
| 4 | 539.17 |
| 5 | 539.17 |
| 6 | 539.17 |
| 7 | 539.17 |
| 8 | 539.17 |
| 9 | 539.17 |
| 10 | 539.17 |
| Total estimated reductions (tones of CO₂e) | 5391.7 |
| Total Number of crediting years | 10 |
| Annual average of estimated reductions over the crediting (tCO₂e) | 539.17 |

A.4.5. Public funding of the CPA:

The SSC-CPA will not involve any public funding.

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

Seoul Metropolitan Government (hereafter Seoul) checks the occurrence of de-bundling in each SSC-CPA according to the guidance for determining the occurrence of de-bundling under a PoA (EB 54, Annex13).

1. For the purposes of registration of a Programme of Activities (PoA)⁴ a proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity⁵, which:
 - (a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same sectoral scope, and;

⁴ Only those POAs need to be considered in determining de-bundling that are: (i) in the same geographical area; and (ii) use the same methodology; as the POA to which proposed CPA is being added

⁵ Which may be a (i) registered small-scale CPA of a PoA, (ii) an application to register another small-scale CPA of a PoA or (iii) another registered CDM project activity

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Seoul, the coordinating entity of the proposed PoA, manages no other CDM project activity in the same project category and technology. No other project in this sectoral scope and technology is registered in the Republic of Korea.

- (b) The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.

No other project is within 1km of the boundary of the proposed SSC-CPA, at the closet point.

Also, this SSC-CPA is exempted from performing de-bundling check, because this SSC-CPA is no greater than 1% of the small scale thresholds defined by the methodology applied⁶

⁶ Guidelines on assessment of debundling for SSC project activities

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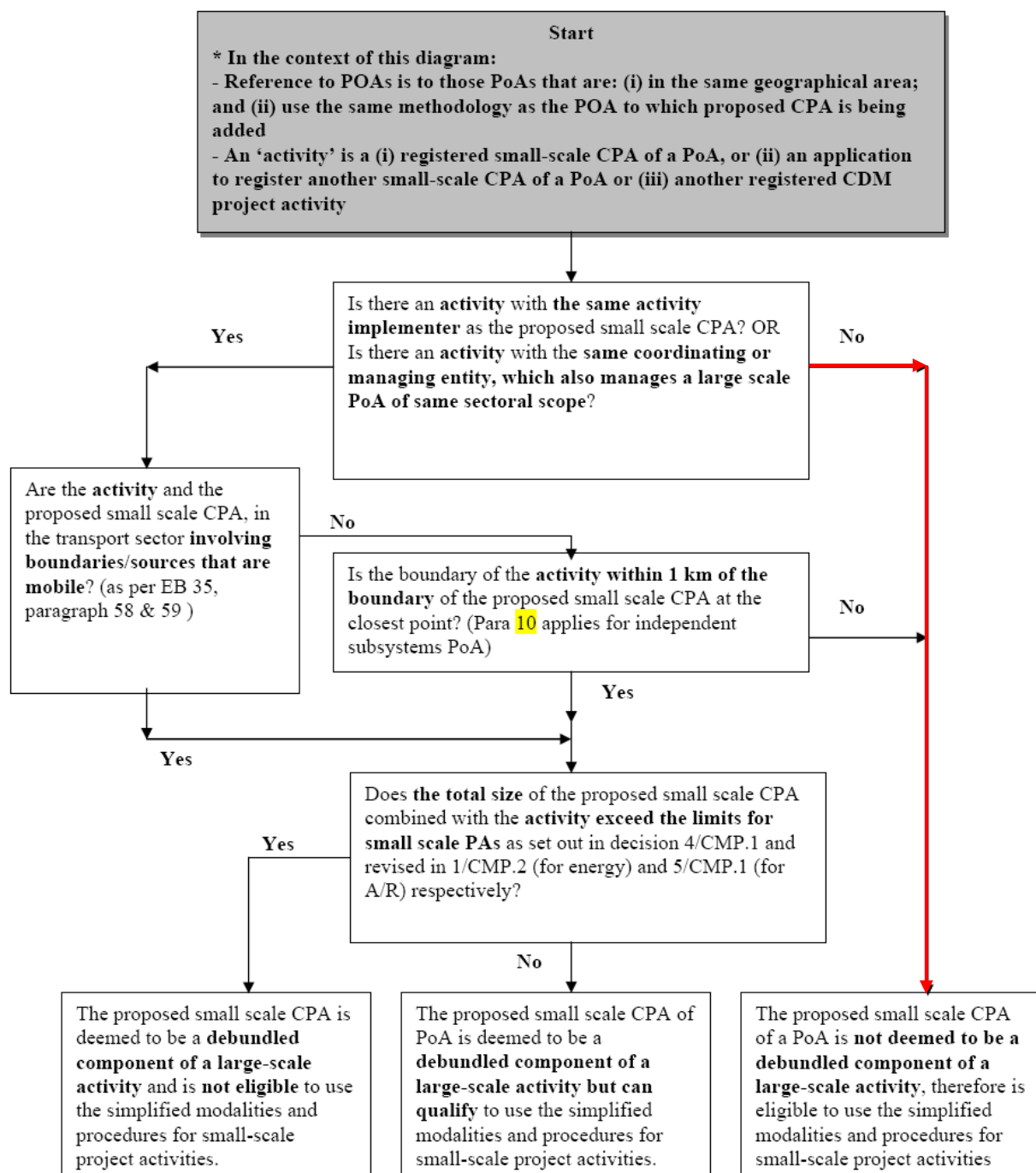


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A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

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This SSC-CPA is not registered as other CDM project activities or part of other PoA.

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

The programme to introduce renewable energy system into Seoul

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA :

Eligibility Criteria:

Check list for each CPA

| A-No | Eligibility criteria | SSC-CPA Self Assessment |
|------|--|---|
| 1 | Is the SSC-CPA performed within the territory of the Republic of Korea? | <input checked="" type="checkbox"/> within Korea <input type="checkbox"/> out of Korea |
| 2 | Are public buildings included in the SSC-CPA belonging to Seoul? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 3 | The SSC-CPA is a single project which is not registered large scale CDM or SSC-CPA in the other PoA or other carbon off-set program? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 4 | Is the SSC-CPA available identified its location from GPS location? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 5 | Confirmation that SSC-CPA is not a de-bundled component of another large-scale CPA or CDM project activity as per the latest guidance given in CDM EB. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 6 | The SSC-CPA is a voluntary project which is not implementing any mandatory policy or regulation of the Government of the Republic of Korea. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 7 | The total generation capacity of systems under SSC-CPA is below 15MW (=45MW thermal) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 8 | Does the SSC-CPA fulfill the key criteria and data for assessing additionality of a SSC-CPA as per section B.3 to prove additionality? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

All Assessment result is “yes”.

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B.3. Assessment and demonstration of additionality of the small-scale CPA , as per eligibility criteria listed in the Registered PoA:

In case of renewable energy project, it can demonstrate additionality by simple check.⁷ This PoA is renewable energy project by introducing renewable energy system to public building, so additionality of SSC-CPA can be demonstrated by below process.

⁷ This method is from EB 54, Annex 15.

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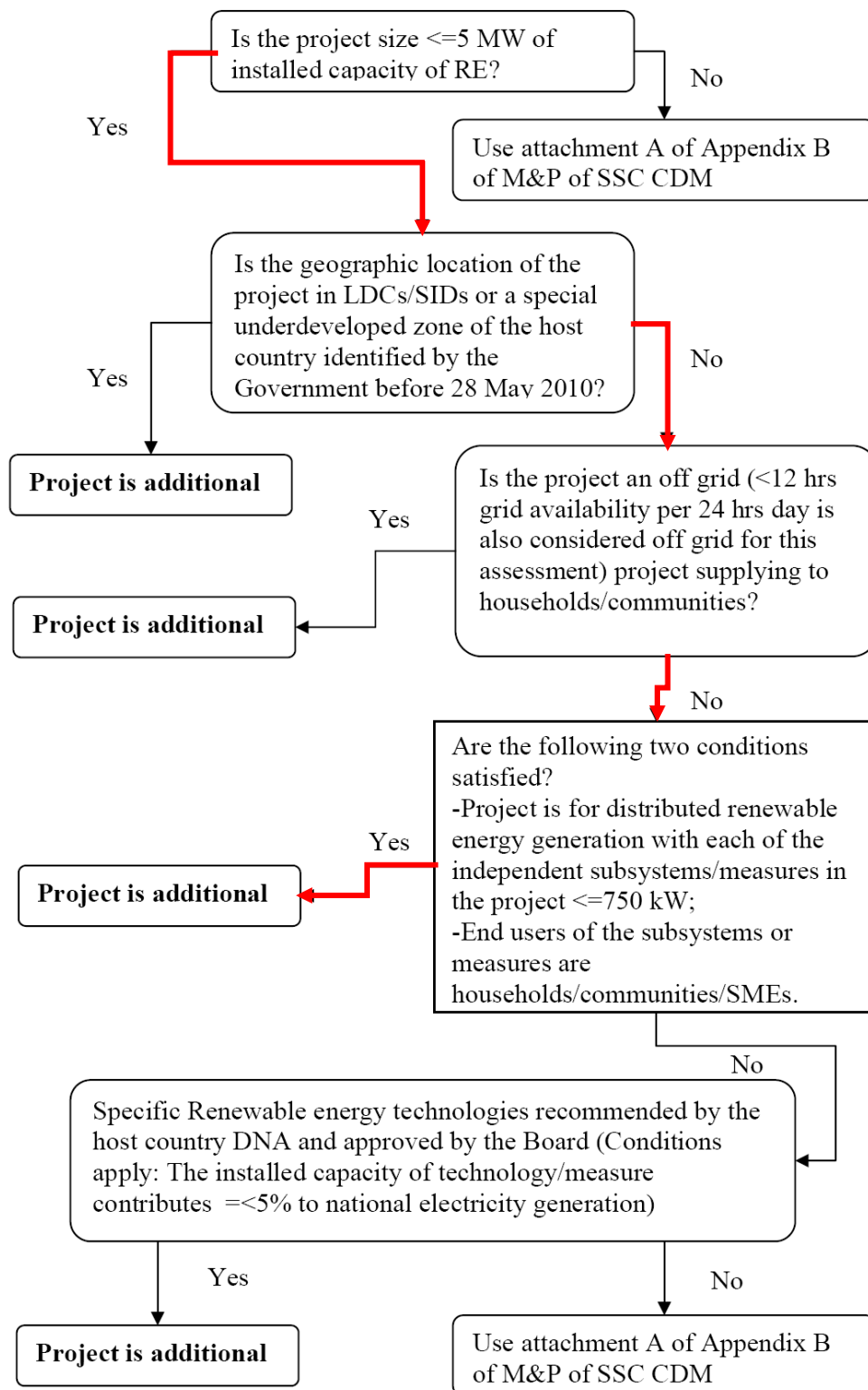


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According to A.2, there is no independent system of which capacity exceed 750 kW and end user of all system is households/communities. Therefore, additionality of this SSC-CPA is demonstrated as redline in above diagram.

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

| | Source | Gas | Included? | Justification |
|------------------|---|------------------|-----------|---------------|
| Baseline | Power Plants servicing the electricity grid | CO ₂ | Yes | |
| | | CH ₄ | No | Minor Source |
| | | N ₂ O | No | Minor Source |
| | LNG line | CO ₂ | Yes | |
| | | CH ₄ | No | Minor Source |
| | | N ₂ O | No | Minor Source |
| Project Activity | Power Plants servicing the electricity grid | CO ₂ | Yes | |
| | | CH ₄ | No | Minor Source |
| | | N ₂ O | No | Minor Source |

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

| | |
|---|--|
| Data / Parameter: | $EG_{solar\ heating,y}$ |
| Data unit: | TJ |
| Description: | The amount of thermal energy produced by the project activity (solar water heating system) during the year y |
| Source of data used: | SSC-CPA database |
| Value applied: | To be filled by SSC-CPA |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | Each system has output meter, it measures the data value. The data will be recorded into the SSC-CPA database. |
| Any comment: | |

| | |
|--------------------------|--|
| Data / Parameter: | $EG_{geo,heating,y}$ |
| Data unit: | TJ |
| Description: | The net quantity of heating energy supplied (displace LNG) by the project activity (geothermal heating and cooling system) during the year y |
| Source of data used: | SSC-CPA database |
| Value applied: | To be filled by SSC-CPA |

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| | |
|---|--|
| Justification of the choice of data or description of measurement methods and procedures actually applied : | Each system has output meter, it measures the data value. The data will be recorded into the SSC-CPA database. |
| Any comment: | Not applicable to this CPA |

| | |
|---|---|
| Data / Parameter: | $EG_{geo,cooling,y}$ |
| Data unit: | MWh |
| Description: | The net quantity of cooling energy supplied (displace grid electricity) by the project activity (geothermal heating and cooling system) during the year y |
| Source of data used: | SSC-CPA database |
| Value applied: | To be filled by SSC-CPA |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | Each system has output meter, it measures the data value. The data will be recorded into the SSC-CPA database. |
| Any comment: | Not applicable to this CPA |

| | |
|---|--|
| Data / Parameter: | $EG_{photovoltaic,y}$ |
| Data unit: | MWh |
| Description: | Quantity of net electricity displaced as a result of the implementation of the CDM project activity (photovoltaic system) in year y (The amount of electricity produced by the project activity during the year y) |
| Source of data used: | SSC-CPA database |
| Value applied: | To be filled by SSC-CPA |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | Each system has electricity generation meter, it measures the data value. The data will be recorded into the SSC-CPA database. |
| Any comment: | |

| | |
|--------------------------|---|
| Data / Parameter: | $PG_{geothermal,y}$ |
| Data unit: | TJ |
| Description: | Quantity of net electricity consumed to operate geothermal heating and cooling system in year y |
| Source of data used: | SSC-CPA database |
| Value applied: | To be filled by SSC-CPA |

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| | |
|---|---|
| Justification of the choice of data or description of measurement methods and procedures actually applied : | Each system has electricity consumption meter, it measures the data value. The data will be recorded into the SSC-CPA database. |
| Any comment: | Not applicable to this CPA |

| | |
|---|--|
| Data / Parameter: | $C_{solar\ heating}$ |
| Data unit: | m ² |
| Description: | Capacity of solar water heating system introduced by project |
| Source of data used: | SSC-CPA database |
| Value applied: | 436 |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | The data from CPA project information. |
| Any comment: | |

| | |
|---|---|
| Data / Parameter: | $C_{geo,heating}$ |
| Data unit: | RT |
| Description: | Heating capacity of geothermal heating and cooling system introduced by project |
| Source of data used: | SSC-CPA database |
| Value applied: | Not applicable to this CPA |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | The data from CPA project information. |
| Any comment: | Not applicable to this CPA |

| | |
|--|---|
| Data / Parameter: | $C_{geo,cooling}$ |
| Data unit: | RT |
| Description: | Cooling capacity of geothermal heating and cooling system introduced by project |
| Source of data used: | SSC-CPA database |
| Value applied: | Not applicable to this CPA |
| Justification of the choice of data or | The data from CPA project information. |

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| | |
|--|----------------------------|
| description of measurement methods and procedures actually applied : | |
| Any comment: | Not applicable to this CPA |

| | |
|---|---|
| Data / Parameter: | $C_{photovoltaic}$ |
| Data unit: | kW |
| Description: | Capacity of photovoltaic system introduced by project |
| Source of data used: | SSC-CPA database |
| Value applied: | 526 |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | The data from CPA project information. |
| Any comment: | |

| | |
|---|--|
| Data / Parameter: | $REC_{heating}$ |
| Data unit: | kW |
| Description: | Rated electricity consumption of geothermal heating and cooling system for heating |
| Source of data used: | SSC-CPA database |
| Value applied: | Not applicable to this CPA |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | The data from CPA project information. |
| Any comment: | Not applicable to this CPA |

| | |
|---|--|
| Data / Parameter: | $REC_{cooling}$ |
| Data unit: | kW |
| Description: | Rated electricity consumption of geothermal heating and cooling system for cooling |
| Source of data used: | SSC-CPA database |
| Value applied: | Not applicable to this CPA |
| Justification of the choice of data or description of measurement methods | The data from CPA project information. |

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| | |
|-----------------------------------|----------------------------|
| and procedures actually applied : | |
| Any comment: | Not applicable to this CPA |

B.5.2. Ex-ante calculation of emission reductions:

1. Baseline Emissions

Solar water heating system

According to AMS I.C methodology, baseline emission of this system which produces thermal energy and replaces fossil fuel is calculated as below:

$$BE_{solar\ heating,y} = EG_{solar\ heating,y} * EF_{NG,CO2}$$

Where:

| | |
|----------------------------|--|
| $BE_{solar\ heating,y}$ | The baseline emissions from thermal energy displaced by the project activity (solar water heating system) during the year y (tCO ₂) |
| $EG_{solar\ heating,PG,y}$ | The net quantity of thermal energy supplied by the project activity (solar water heating system) during the year y (TJ) |
| $EF_{NG, CO2}$ | The CO ₂ emission factor of the LNG; tCO ₂ / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used |

Ex-ante calculation for $EG_{solar\ heating,y}$ is as below:

$$EG_{solar\ heating,y} = SR * C_{solar\ heating} * D * E * JC$$

| | |
|----------------------|--|
| SR | Average solar radiation per day (kcal/m ² /day) |
| $C_{solar\ heating}$ | Capacity of solar water heating system introduced by project (m ²) |
| D | Yearly days, 365 (day) |
| E | Efficiency of solar collector |
| JC | Unit conversion factor from kcal to TJ (TJ/kcal) |

$$\begin{aligned} EG_{solar\ heating,y} &= 3115 \text{ kcal/m}^2/\text{day} * 436 \text{ m}^2 * 365 \text{ day} * 0.44 * 4.1868 * 10^{-9} \\ &= 0.9132 \text{ TJ} \end{aligned}$$

$$\begin{aligned} BE_{solar\ heating,y} &= 0.9132 \text{ TJ} * 56.1 \text{ tCO}_2 / \text{TJ} \\ &= 51.23 \text{ tCO}_2 \end{aligned}$$

Photovoltaic system

According to AMS I.F methodology, baseline emission of this system which produces electricity and replaces grid electricity is calculated as below:

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$$BE_{photovoltaic,y} = EG_{photovoltaic,y} * EF_{grid, CO2}$$

Where:

| | |
|------------------------|---|
| $BE_{photovoltaic,y}$ | Baseline Emissions of project activity (photovoltaic system) in year y (tCO ₂) |
| $EG_{photovoltaic,y}$ | Quantity of net electricity displaced as a result of the implementation of the CDM project activity (photovoltaic system) in year y (MWh) |
| $EF_{grid,CM,y,photo}$ | The CO ₂ emission factor of the national grid electricity for photovoltaic system (tCO ₂ /MWh) |

Ex-ante calculation for $EG_{photovoltaic,y}$ is as below:

$$EG_{photovoltaic,y} = C_{photovoltaic} * H * UC$$

Where:

| | |
|--------------------|--|
| $C_{photovoltaic}$ | Capacity of photovoltaic system introduced by project (kW) |
| H | Yearly operating hours, 8760 (=365*24) (hour) |
| UC | Utilization coefficient of photovoltaic system |

$$\begin{aligned} EG_{photovoltaic,y} &= 526 \text{ kW} * 8760 \text{ h} * 0.155 / 1000 \text{ MW/kW} \\ &= 714.20 \text{ MWh} \end{aligned}$$

$$\begin{aligned} BE_{photovoltaic,y} &= 714.20 \text{ MWh} * 0.6832 \text{ tCO}_2/\text{MWh} \\ &= 487.94 \text{ tCO}_2 \end{aligned}$$

Total baseline emission

$$\begin{aligned} BE_{total,y} &= BE_{solar \text{ heating},y} + BE_{geothermal,y} + BE_{photovoltaic,y} \\ &= 51.23 \text{ tCO}_2 + 0 + 487.94 \text{ tCO}_2 \\ &= 539.17 \text{ tCO}_2 \end{aligned}$$

2. Project Activity Emissions

Solar water heating system

According to AMS I.C methodology, project activity emission of this system is calculated by multiplying the quantity of consumed energy to operate the system by emission factor, but solar water heating system does not consume energy to operate. Therefore, project emission is zero.

Photovoltaic system

According to AMS I.F methodology, project activity emission of this system is zero because this system does not use any energy source for operation.

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Total project activity emission

$$PE_{total,y} = 0$$

4. Emission Reductions

$$ER_y = (BE_{total,y} - PE_{total,y}) - LE_y$$

Where:

ER_y Emission reductions in year y (tCO₂e)

LE_y Leakage emissions in year y (tCO₂e)

$$\begin{aligned} ER_y &= 546.57 \text{ tCO}_2 - 0 \text{ tCO}_2 \\ &= 546.57 \text{ tCO}_2 \end{aligned}$$

B.5.3. Summary of the ex-ante estimation of emission reductions:

| Year | Estimation of project activity emissions (tonnes of CO ₂ e) | Estimation of baseline emissions (tonnes of CO ₂ e) | Estimation of leakage (tonnes of CO ₂ e) | Estimation of overall emission reductions (tonnes of CO ₂ e) |
|---|--|--|---|---|
| 2011 | 0 | 539.17 | 0 | 539.17 |
| 2012 | 0 | 539.17 | 0 | 539.17 |
| 2013 | 0 | 539.17 | 0 | 539.17 |
| 2014 | 0 | 539.17 | 0 | 539.17 |
| 2015 | 0 | 539.17 | 0 | 539.17 |
| 2016 | 0 | 539.17 | 0 | 539.17 |
| 2017 | 0 | 539.17 | 0 | 539.17 |
| 2018 | 0 | 539.17 | 0 | 539.17 |
| 2019 | 0 | 539.17 | 0 | 539.17 |
| 2020 | 0 | 539.17 | 0 | 539.17 |
| Total (tonnes of CO₂ e) | 0 | 5391.7 | 0 | 5391.7 |

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

All introduced system has input/output data meter and monitoring data will be sent to Seoul and Seoul manages the data. The SSC-CPA project database includes the following data-set that can unambiguously determine the emission reductions attributable to each SSC-CPA:

| Data type | List of data |
|--------------------|-----------------|
| System information | A serial number |

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| | |
|-------------------------------|---|
| | system type location introduced date |
| Energy production/consumption | generated energy type and quantity consumed energy type and quantity |

<Description of monitoring method and system of SSC-CPA will be filled>

Collection of the system information data

A serial number, system type, location and introduced date of each introduced system will be collected and recorded. This information will be used for identification of each introduced system. All introduced systems data will be collected when these are installed.

Collection of the energy production/consumption data

This data will be collected and recorded as below:

| Type | Generated energy | Consumed energy |
|----------------------------|--|---------------------------|
| Photovoltaic | Electricity | None |
| Solar water heating | Thermal | None |
| Geothermal heating/cooling | Thermal (heating) Thermal (cooling) | National grid electricity |

All introduced systems have an energy production/consumption meter and it measures the data. This data will be collected and recorded for each monitoring period, and used to calculate emission reductions for that portion of the crediting period. The length of each monitoring period will not exceed one year

Monitoring period

Data will be collected for each monitoring period, and used to calculate emission reductions for that portion of the crediting period. The length of each monitoring period will not exceed one year.

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:

☐ √ Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

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

Not applicable

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

Not applicable

SECTION D. Stakeholders' comments

>>

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

☐ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

Stakeholder consultation is done at the SSC-CPA level

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

<Description for SSC-CPA will be filled>

D.3. Summary of the comments received:

<Description for SSC-CPA will be filled>

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

<Description for SSC-CPA will be filled>

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Annex 1

**CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-
SCALE CPA**

| | |
|------------------|-------------------------------|
| Organization: | Seoul Metropolitan Government |
| Street/P.O.Box: | San 5-85 Yejang-dong Jung-gu |
| Building: | |
| City: | |
| State/Region: | Seoul |
| Postfix/ZIP: | 100-250 |
| Country: | Republic of Korea |
| Telephone: | +82-2-2115-7436 |
| FAX: | +82-2-2115-7799 |
| E-Mail: | hgwon@seoul.go.kr |
| URL: | http://www.seoul.go.kr |
| Represented by: | |
| Title: | Deputy Director |
| Salutation: | Mr |
| Last Name: | Jung |
| Middle Name: | |
| First Name: | Hoe Gwon |
| Department: | Climate change & Air quality |
| Mobile: | |
| Direct FAX: | As above |
| Direct tel: | As above |
| Personal E-Mail: | As above |

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is used for the SSC-CPAs.

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Annex 3

BASELINE INFORMATION

| System type | Number of introducing system | Total capacity |
|-----------------------------------|-------------------------------------|-----------------------|
| Photovoltaic | 20 | 526 kW |
| Solar water heating | 4 | 436 m ² |
| Geothermal heating/cooling | 0 | |

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Annex 4

MONITORING INFORMATION

Standard monitoring form

Period: 20YY/MM

| System information | | | | Production energy | | Consumption energy | | Note |
|--------------------|------|----------|-----------------|--------------------|---------------------|--------------------|----------------------|------|
| Serial number | Type | Location | Introduced date | Type | Production (KWh/TJ) | Type | Consumption (KWh/TJ) | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Total | | | | Electricity | | Electricity | | |
| | | | | Thermal | | LNG | | |
