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).

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 Jeju Island – CPA No.XXX <Added Year, information of CPA Implementer>

Version : XX.

Revised date : DD/MM/YYYY

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

>>

The CPA No.XXX (hereafter CPA) consists of <Technology (Photovoltaic system or Wind power plant or Small-hydro power plant)> under 'The programme to introduce renewable energy system into JGP' (hereafter PoA).

The registered PoA *(The programme to introduce renewable energy system into Jeju island)* aims to mitigate GHG emission through introduction of renewable energy project (photovoltaic system, wind power plant and small hydro power plant) to Jeju Island. These systems displace national grid electricity and have a significant effect on reducing of GHG emission.

<Extra description of CPA can be filled>

Renewable energy system install information is as below:

No.	Renewable energy type	Project site name	Capacity	Unit

CPA specific data is as under:[3]

System type	Number of introducing system	Total capacity (kW)
Photovoltaic		
Wind power		
Small hydro power		

Contribution to sustainable development

· **Social aspect**

- This program will contribute to revitalization of renewable energy system industry by public purchasing.
- This program will contribute to enhance energy independence of JGP.
- This program will be a good example to enhance energy independence and vitalize other similar sustainable activities in Korea.

[3] Brief specification of applying systems information is described in Annex 3 baseline information.

· **Environmental aspect**
- Photovoltaic system, wind power plant and small hydro power plant are natural renewable energy source and do not emit any GHG for operation. It contributes to reduction of GHG emission from grid electricity use.

· **Economic aspect**
- Building which installed renewable energy system can save energy cost for operation.

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

>>

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

The <information of CPA implementer> representatives will be involved for implementation of the CPA.

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 Jeju Island - CPA No.XXX <Added Year, information of CPA Implementer>

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)

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

>>

<Geographical information (including map) should be filled. e.g. CPA geographic reference.>

[Geographic Reference of this CPA]

No.	Project site name	Address	Geographic Reference	

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

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

>>

DD MM YYYY

<Starting date of this CPA is the date of first order for renewable energy system in this CPA>.

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

>>

<Lifetime of introduced renewable energy system>

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 the CPA would be a date of the two;

(i) the date of inclusion of the CPA in the registered PoA; or

(ii) the date of operating the renewable energy system in the CPA.

The starting date of crediting period shall be either (i) or (ii), **whichever is later**

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

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

>>

10 years

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

>>

Years	Estimation of annual emissions reductions in tones of CO_2e
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total estimated reductions (tones of CO_2e)	
Total Number of crediting years	

Annual average of estimated reductions over the crediting (tCO_2e)	

A.4.5. Public funding of the CPA:

>>

There is no public funding of the CPA

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

>>

According to the guidance for determining the occurrence of de-bundling under a PoA (EB 54, Annex13), the JGP checks the occurrence of de-bundling in each CPA.

Q1. In accordance with the guidance below, is the proposed CPA deemed to be a de-bundled component of a large scale activity?

A proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity, which satisfies both conditions (a) and (b) below:

(a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same technology/measure,

and;

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

No **Yes**

Q2. In accordance with the guidance below, can the proposed CPA be qualified to use simplified modalities and procedures for small-scale CDM?

*If a proposed small-scale CPA of a PoA is deemed to be a debundled component in accordance with **Q1** above, but the total size of such a CPA combined with a registered small-scale CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM as set out in decision 4/CMP.1 and revised in 1/CMP.2 (for energy) and 5/CMP.1 (for A/R) respectively, the CPA of a PoA can qualify to use simplified modalities and procedures for small-scale CDM project activities.*

Yes **No**

*The proposed CPA is **applicable** under this PoA*

*The proposed CPA is **not applicable** under this PoA*

<De-bundling check path should be expressed in above diagram>

Q1 **In accordance with the guidance below, is the proposed CPA deemed to be a de-bundled component of a large scale activity?**

(a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same technology/measure,

<Description should be filled>

and;

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

<Description should be filled>

If a proposed small-scale CPA of a PoA is deemed to be a debundled component in accordance with Q1 above

Q2 the total size of such a CPA combined with a registered small-scale CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM as set out in decision 4/CMP.1 and revised in 1/CMP.2 (for energy) and 5/CMP.1 (for A/R).

<Description should be filled>

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

>>

This 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 Jeju Island

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

>>

Eligibility Criteria*[4]*: *CPA should result **all** assessment as **'yes'** and submits **evidence**.*

[CHECKLIST for each CPA]

No	Eligibility Criteria		Compliance		Mean of Proof/ Evidence document
	Category	Description	Yes	No	
1	Voluntary action	Is CPA a **voluntary coordinated action** without any mandatory policy or regulation of the Korean Government? [5]	☐	☐	<Assessment result will be filled>
2	Boundary and location of CPA	Is the CPA performed within the geographical boundary of the **Jeju Special Self-Governing Province** in the Korea?	☐	☐	<Assessment result will be filled>

[4] Reference: Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (the latest version); UNFCCC

[5] "Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy", Government of Republic of Korea, April 2010

3	Avoid double-counting of CPA	The CPA is a **new project** which is not registered other CDM or CPA in the other PoA or other carbon off-set program. (The CPA is neither registered as an individual CDM project activity nor is it part of another registered PoA.)	☐	☐	<Assessment result will be filled>
4	Avoid double-counting of each project in the CPA	A **unique numbering or identification system** for the renewable energy equipment disseminated is applied.	☐	☐	<Assessment result will be filled>
5	Debundling check	Confirmation that CPA is a single project which is **not a de-bundled component** of another large-scale CDM or PoA as per the latest guidance given in CDM EB.	☐	☐	<Assessment result will be filled>
6	Technological requirements	The applied equipment for CPA gets a Renewable energy system **certification of KEMCO** or passes a **KS standard**.	☐	☐	<Assessment result will be filled>
7	CPA start date	CPA start date shall not be before PoA webhosting date, i.e. **15 April 2011**. In case any installed project facility will be found not in line with CPA start date requirement, those project will not be counted for emission reduction calculation.	☐	☐	<Assessment result will be filled>
8	CPA crediting period	CPA starting date of the crediting period is date of inclusion into registered PoA or any date thereafter (e.g. operating date of project facility) and crediting period not to exceed the PoA end date.	☐	☐	<Assessment result will be filled>
9	Applicability	Confirmation that the CPA is appropriate for methodology **AMS-I.D or AMS-I.F**.	☐	☐	<Assessment result will be filled>
10	additionality	Additionality of each CPA is demonstrated in accordance with section E.5.2 of PoA-DD.	☐	☐	<Assessment result will be filled>
11	Stakeholder consultant	Local stakeholder consultants shall be performed before inclusion of CPA in the PoA *(*Stakeholder consultant will be done at CPA level).*	☐	☐	<Assessment result will be filled>
12	Environmental Impact Analysis	EIA shall be performed as per requirements of the CDM modalities and comply with the related raw. *(* EIA will be done at CPA level)*	☐	☐	<Assessment result will be filled>
13	Project scale threshold	CPA should have an installed capacity lower than 15MW to apply small-scale methodology.	☐	☐	<Assessment result will be filled>
14	Sampling method	This PoA and CPA do not use the sampling method for monitoring.	☐	☐	<Assessment result will be filled>
15	Funding from Annex I parties	Confirmation that official development assistance (ODA) is not being diverted to the implementation of the PoA and CPA.	☐	☐	<Assessment result will be filled>
16	Approval of CPA by CME	CME approved each CPA to be included into its registered PoA (contractual agreement)	☐	☐	<Assessment result will be filled>
17	CER ownership	CPA implementer under the specific CPA contractually cede their right to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to the CME of the PoA (JGP).	☐	☐	<Assessment result will be filled>

[Reference] Eligibility #9: Applicability

The basic structure of the <CPA No.XXX> is installation of <technology> and the generated electricity by project plant/unit is supplied to <the end users or the national grid>. So, CPA implementer determines that it can apply the methodology <AMS-I.D. or AMS-I.F.> for <CPA No.XXX>.
Additionally, CPA implementer do analysis specific CPA scenario to ensure the applicability of methodology. The result of analysis is as below table.

<Choice the appropriate methodology in accordance with CPA>
AMS I.D states:

	PoA Scenario (Section E.2 of PoA-DD)	CPA Scenario	compliance	
			Yes	No
1	The project which supplies electricity to a national grid will apply AMS-I.D. - Photovoltaic system; - Wind power plant; or - Small-hydro power plant	<Assessment result will be filled>	☐	☐
2	The CPA should supplies electricity 1) to a national grid; or 2) to an identified consumer facility via national grid (through a contractual arrangement such as wheeling)	<Assessment result will be filled>	☐	☐
3	The CPA includes the project type per technologies, (A) Photovoltaic System ; (a) Greenfield plant, (b) Capacity addition (B) Wind power plant ; (a) Greenfield plant, (b) Capacity addition, (c) Replacement (C) Small-hydro power plant (a) Greenfield plant	<Assessment result will be filled>	☐	☐
4	In case that the project activity result in new reservoirs, the power density should be greater than $4W/m^2$. In case that the project activity is implemented in an existing reservoir, it can be divided to two (2) types; One is that the volume of reservoir is increased and the other is that the volume of reservoir is not changed. If the volume is increased, the power density of power plant should be greater than $4W/m^2$ and if the volume is not changed, power density is no considered.	<Assessment result will be filled>	☐	☐
5	The new project unit by CPA will introduce only renewable energy. Capacity of renewable components will be up to 15MW to satisfy the small-scale project criteria.	<Assessment result will be filled>	☐	☐
6	Combine heat and power plant will be excluded from this PoA.	<Assessment result will be filled>	☐	☐
7	In the case that CPA involves capacity addition of renewable energy generation units at an existing renewable power generation facility, it will ensure that the capacity of the units added by the CPA is lower than 15MW and be physically distinct from the existing units. That means If CPA involves the capacity addition project, PP should install the monitoring equipment separately with the existing equipments.	<Assessment result will be filled>	☐	☐

8	In the case of CPA involves replacement of existing renewable power generation facility, it will ensure that the capacity of replacement unit is lower than 15MW. (*This PoA do not include Retrofit project)*	<Assessment result will be filled>	☐	☐

AMS I.F states:

	PoA Scenario (Section E.2 of PoA-DD)	CPA Scenario	Compliance	
			Yes	No
1	The project which supplies electricity to end users will apply AMS-I.F. *;Photovoltaic system* The generated electricity through photovoltaic system will displace electricity supplied from a national grid. In other word, in the absence of the CPA, the users supplied electricity from a national grid.	<Assessment result will be filled>	☐	☐
2	Generally, at CPA project site, the users would have been supplied electricity from a national grid. That mean, project site is connected to a national grid. But the project facility and the electricity generated by CPA will not be exported to a national grid. So it can be considered that it does not connect to a national grid. And Total capacity of the introduced renewable energy facility by CPA will be lower than 15MW of course.	<Assessment result will be filled>	☐	☐
3	The electricity generated from CPA displaces grid electricity consumption (e.g. grid import)	<Assessment result will be filled>	☐	☐
4	CPAs that introduce Small-hydro power plant will not apply AMS-I.F. In case that CPA include the project which applies small-hydro power plant, it will supply the generated electricity to the national grid	<Assessment result will be filled>	☐	☐
5	Biomass power plants will not be included in this PoA.	<Assessment result will be filled>	☐	☐
6	The CPA that introduce Photovoltaic system for the purpose of captive-use will involves two (2) type; (a) Greenfield plant type, (b) Capacity addition type.	<Assessment result will be filled>	☐	☐
7	In the case that CPA involves capacity addition of renewable energy unit at an existing renewable energy unit, it will ensure that the capacity of the unit added by the CPA is lower than 15MW and be physically distinct from the existing unit. That means If CPA involves the capacity addition project, PP should install monitoring equipment separately with the existing equipments.	<Assessment result will be filled>	☐	☐
8	In case that the project has a purpose of use the electricity generated by project activity for captive use and should apply the methodology AMS-I.F., Replacement or Retrofit type is excluded.	<Assessment result will be filled>	☐	☐
9	The new project unit by CPA will introduce only renewable energy. Capacity of renewable components will be up to 15MW to satisfy the small-scale project criteria.	<Assessment result will be filled>	☐	☐
10	Combine heat and power plant will be excluded from this PoA.	<Assessment result will be filled>	☐	☐
11	In case that electricity produced by CPAs is delivered to another facility or facilities within the project boundary, CPA	<Assessment result will be filled>	☐	☐

	implementers(JGP or other project owners) will ensure that emission reduction from displacing electricity will be only claimed by CPA implementers through contract between the supplier and consumer(s)			

It should check the specific eligibility criteria as below table to include the CPA. <CPA No.XXX> is to introduce <Technology>, and apply <Methodology> and type is <Project type>.
Therefore Technology-project type combination of <CPA No.XXX> satisfies <Specific eligibility criteria>.

<Highlight the appropriate heading>

[Guidelines to choice the specific eligibility criteria by technology-project type combinations

	Methodology	Greenfield plants	Capacity addition	Replacement
Photovoltaic	AMS-I.F.	A	B	-
	AMS-I.D.	C	D	-
Wind power	AMS-I.D.	E	F	G
Small hydro power	AMS-I.D.	H	-	-

<More description can be filled if it is necessary>

[Specific Eligibility criteria by technology-project type combinations]

Classify	Eligibility Criteria (Description)	Compliance		Mean of Proof/ Evidence document (to be check at CPA inclusion)
		Yes	No	
photovoltaic system (A,B,C,D)	In case of CPA introduce photovoltaic system; it can involve (a) Fixed type or (b) non-fixed type.	☐	☐	<Assessment result will be filled>
A, B	Generated electricity from CPA displaces grid electricity consumption at the end users.	☐	☐	<Assessment result will be filled>
C, D	Generated electricity from CPA is supplied to a national grid.	☐	☐	<Assessment result will be filled>
B, D	The electricity produced by the added power plant(s) or unit(s) could be directly metered and separately metered.	☐	☐	<Assessment result will be filled>
wind power plant (E,F,G)	In case of CPA introduce wind power plant; it can involve (a) gear type or (b) gearless type.	☐	☐	<Assessment result will be filled>
	Generated electricity from CPA is supplied to a national grid.	☐	☐	<Assessment result will be filled>
F	The electricity produced by the added power plant(s) or unit(s) could be directly metered and separately metered.	☐	☐	<Assessment result will be filled>
G	CPA implementer shall monitor the scrapping of replaced equipment. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other.	☐	☐	<Assessment result will be filled>
	The existing facility was operated before the implementation of this CDM project activity.	☐	☐	<Assessment result will be filled>
Small-hydro	In case of CPA introduces small hydro power plant; it	☐	☐	<Assessment result will be filled>

power plant (H)	can involve (a) Run of river type or (b) Storage type or (c) Tunnel type.			
	Generated electricity from CPA is supplied to a national grid.	☐	☐	<Assessment result will be filled>

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

>>

<CPA implementer checks the table below and choice appropriate method for demonstrating the additionality. After choice the appropriate method, apply the method>

[Guidelines to choice the method for demonstrating the additionality]

Technology	Project Type (=Methodology)	Capacity	Result	check
Photovoltaic	AMS-I.D.	≤ 5MW	B (positive list)	☐
		6MW~15MW	B (positive list)	☐
	AMS-I.F.	≤ 5MW	A (Simple Check)	☐
		6MW~15MW	C (Investment barrier)	☐
Wind power	AMS-I.D.	≤ 5MW	A (Simple Check); or C (Investment barrier)	☐ ☐
		6MW~15MW	C (Investment barrier)	☐
Small-hydro power	AMS-I.D.	≤ 5MW	A (Simple Check); or C (Investment barrier)	☐ ☐
		6MW~15MW	C (Investment barrier)	☐

Method A. Application of simple criteria for assessing additionality.

Preferentially, applying method in EB 63, Annex 23, and the CPA should be consistent with below additionality criteria as below.

Precondition to use this tool:

The project activities employ renewable energy technology and installed capacity is ***up to 5 megawatts***

** To determine additionality of project activities, ***any one of the conditions below*** *has to be satisfied.*

(a) The geographic location of the project activity is in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone of the host country identified by the government before 28 May 2010;

(b) The project activity is an off-grid activity supplying energy to households/communities (less than 12 hours grid availability per 24 hrs is also considered 'off-grid' for this assessment);

(c) The project activity is designed for distributed energy generation (not connected to a national or regional grid) with both conditions (i) and (ii) satisfied;

(i) Each of the independent subsystems/measures in the project activity is smaller than or equal to 1500kW electrical installed capacity;

(ii) End users of the subsystems or measures are households/communities/small and medium enterprises (SMEs).

(d) The project activity employs specific renewable energy technologies/measures recommended by the host country designated national authority (DNA) and approved by the Board to be additional in the host country. The following conditions shall apply for DNA recommendations:

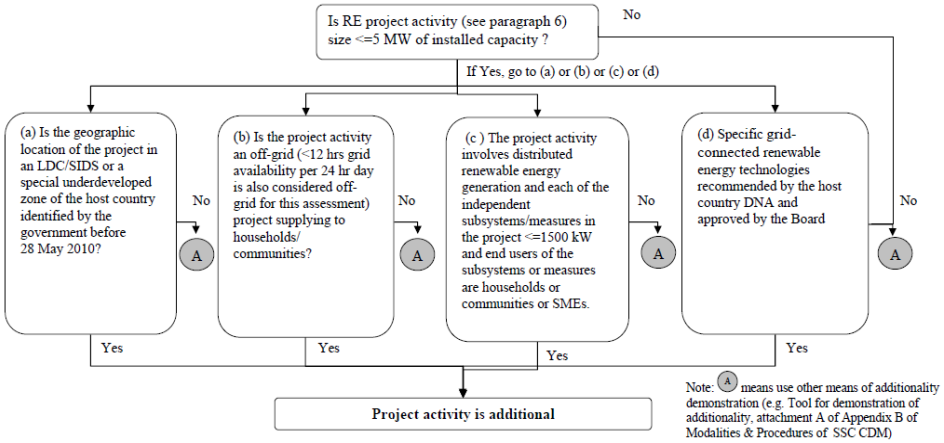
(i) Specific renewable energy technologies/measures. refers to grid connected renewable energy technologies of installed capacity equal to or smaller than 5 MW;

(ii) The ratio of installed capacity of the specific grid connected renewable energy technology in the total installed grid connected power generation capacity in the host country shall be equal to or less than 3 per cent;

(iii) Most recent available data on the percentage of contributions of specific renewable energy technologies shall be provided to demonstrate compliance with the 3 per cent threshold. In no case shall data older than three years from the date of submission be used;

(iv) Technologies/measures recommended by DNAs and approved by the Board to be additional in the host country remain valid for three years from the date of approval. However, additionality of eligible project activities applying the guidelines remains valid for the entire crediting period;

(v) DNA submissions shall include the specific grid connected renewable electricity generation technologies that are being recommended and provide the required data as indicated above (e.g. wind power, biomass power, geothermal power, and hydropower).



[Micro-scale additionality test for RE project activities (Method A)]

[Data for criteria *(Method A)*]

Criteria	Data
(a)	Not applicable *(Korea is not included as LDCs, SIDs and does not have underdevelopment zone)*
(b)-(i)	Evidence document to determine the usage of off-grid; or Daily operation time of energy generation system in the CPA *(less than 12 hours grid availability per 24 hrs is also considered 'off-grid')*
(b)-(ii)	Information of end user *(Households/Communities)*
(c)-(i)	Maximum capacity of a renewable energy system in the CPA
(c)-(i)	Information of End user that is supplied the generated electricity through introduced renewable energy system by the CPA *(Households/Communities/Small and Medium Enterprises (SMEs))*
(d)	Information of introducing technology for contribution to national electricity generation
	Approval by the Board about the specific renewable energy technologies/measures recommended by the host country designated national authority (DNA)

If the CPA satisfies above criteria and PP can submit all the evidence data for criteria, the CPA is additional.

Method B. Positive list for assessing additionality

Grid connected photovoltaic system project with the installed capacity up to 15MW can consider as positive list. So, it can be automatically define as additional, without further documentation of barriers.

[Data for criteria *(Method B)*]

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

Method C. Barrier analysis for assessing additionality.

Applying "Attachment A to Appendix B of the simplified modalities and procedures for SSC CDM project activities", the CPA should be consistent with least one of below additionality criteria. (Refer above E.5.1)

CPA would demonstrate **investment barrier**.

(a) Investment barrier [6]

This CPA applies the simple cost analysis.

- Outflow :
  - Initial investment for introduction of system (purchase & install)
- Inflow :
  - Profit from power sale to grid
  - Quantity of generated electricity (In case of Photovoltaic system project that is captive-use type)[7]

[Cash flow analysts without CER income *(Method C)*] **(unit: KRW, won)**

year	1	2	3	4	5	6	7	8	9	10	Total
Cash inflow											
1.1 Revenue from power											
Outflow											
2.1 Total investment											
2.2 Total O&M cost											
2.3 Construction and education surtax											
2.4 Income tax											
Net Cash flow											

[6] Guidelines on the assessment of investment analysis (EB 61, Annex 13), UNFCCC

[7] In case that the generated electricity is supplied for captive use at the PV project site, it can substitute the electricity bought from nation grid. So, it can save the electricity charge. Therefore, CPA implementer should consider the quantity of generated electricity which used to captive use as profit.

Net Present Value (NPV) = <project value>
CPA without CER is financially infeasible and unattractive than alternative which maintaining current state. Maintaining current state would be a financially more viable alternative to CPA, and this alternative would lead higher emission. Therefore, investment barrier to CPA is demonstrated.
<More description can be filled when above process is used >

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.

>>

[Emission source and gases in the project boundary]

	Source	Gas	Included	Justification
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants	CO_2	Yes	Main Source
		CH_4	No	Minor Source
		N_2O	No	Minor Source
Project activity	For photovoltaic system and wind power plant, No emission of GHG	CO_2	No	Minor Source
		CH_4	No	Minor Source
		N_2O	No	Minor Source
	For hydro power plant, emission of CH_4 from the reservoir.	CO_2	No	Minor Source
		CH_4	Yes	Main Source
		N_2O	No	Minor Source

B.5. Emission reductions:

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

>> < CPA implementer choice the appropriate parameter in accordance with CPA>

For exante calculations:

Data / Parameter:	***(i)*** $C_{facility\_captive}$ ***(ii)*** $C_{facility\_grid}$ ***(iii)*** $C_{facility\_ADD}$ ***(iv)*** $C_{facility\_replacement}$
Data unit:	MW
Description:	(i) Capacity of renewable energy equipment introduced by project activity (Greenfield project that applies methodology AMS-I.F.) (ii) Capacity of renewable energy equipment introduced by project activity (Greenfield project that applies methodology AMS-I.D.) (iii) Capacity of renewable energy equipment that Added under the project (iv) Capacity of renewable energy equipment introduced by project for the purpose of Replacement of existing facilities
Source of data used:	CPA database
Value applied:	To be filled by CPA
Justification of the choice of data or description of measurement methods and	*(i) and (ii) Greenfield project;* Capacity of renewable energy equipment introduced by project activity *(iii) Capacity addition;*

procedures actually applied :	Capacity of renewable energy equipment that Added under the project *(iv) Replacement;* Capacity of renewable energy equipment introduced by project for the purpose of Replacement of existing facilities
Any comment:	This parameter and value will be applied to exante calculation of baseline emissions.

Data / Parameter:	***H***
Data unit:	hr/yr
Description:	Yearly operating hours
Source of data used:	Fixed data
Value applied:	8760
Justification of the choice of data or description of measurement methods and procedures actually applied :	It assumes that Renewable energy equipment installed for CPA will be continually operated. (365d/yr and 24hr/d)
Any comment:	-

Data / Parameter:	$UC_{renewable\ energy}$
Data unit:	%
Description:	Utilization coefficient of renewable energy equipment
Source of data used:	Korea Power Exchange
Value applied:	Photovoltaic system : 0.153 Wind power plant : 0.251 Small-hydro power plant : 0.442
Justification of the choice of data or description of measurement methods and procedures actually applied :	Korea Power Exchange (KPX) surveyed for Utilization coefficient of renewable energy equipment in Korea.
Any comment:	-

For Replacement type project (especially wind power project):

Data / Parameter:	$EG_{historical}$
Data unit:	MWh
Description:	Annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity
Source of data used:	CPA database
Value applied:	To be filled by CPA
Justification of the choice of data or description of measurement methods and procedures actually	It can be check from KPX invoice (or evidence document assessed by authorized person in KPX) and historical monitoring data by electricity meters.

applied :	
Any comment:	-

Data / Parameter:	$\sigma_{historical}$
Data unit:	MWh
Description:	Standard deviation of the annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity
Source of data:	Calculated from data used to establish $EG_{historical}$
Value applied:	To be filled by CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	Parameter to be calculated as the standard deviation of the annual generation data used to calculate $EG_{historical}$ for retrofit or replacement project activities
Any comment:	-

Data / Parameter:	$DATE_{BaselineRetrofit}$
Data unit:	date
Description:	Point in time when the existing equipment would need to be replaced in the absence of the project activity
Source of data used:	CPA database
Value applied:	To be filled by CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	In order to estimate $DATE_{BaselineRetrofit}$, project participants may consider the specification of the existing equipment that may be determined and documented.
Any comment:	

Data / Parameter:	$DATE_{hist}$
Data unit:	date
Description:	Point in time from which the time span of historical data for replacement project activities may start
Source of data used:	CPA database
Value applied:	To be filled by CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	$DATE_{hist}$ is latest point in time between: (i) The commercial commissioning of the plant/unit; (ii) If applicable: the last capacity addition to the plant/unit; or (iii) If applicable: the last retrofit of the plant/unit
Any comment:	In this PoA, CPA implementers will consider the commercial commissioning of the plant/unit as $DATE_{hist}$

For small-hydro power project:

Data / Parameter:	EF_{Res}
Data unit:	$kgCO_2e/MWh$
Description:	Default emission factor for emissions from reservoirs
Source of data used:	Decision by EB23
Value applied:	90
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default emission factor for emissions from reservoirs It is decided by EB 23 meeting.
Any comment:	-

Data / Parameter:	Cap_{BL}
Data unit:	W
Description:	Installed capacity of the hydro power plant before the implementation of the project activity
Source of data used:	The data provided by project participant
Value applied:	To be filled by CPA (applied value is depend on each CPA)
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determine the installed capacity based on recognized standards If CPA is a greenfield project, this value does not exist prior to the implementation of the project activity. (For new hydro power plants, this value is zero)
Any comment:	-

Data / Parameter:	A_{BL}
Data unit:	m^2
Description:	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full
Source of data used:	The data provided by project participant
Value applied:	To be filled by CPA (applied value is depend on each CPA)
Justification of the choice of data or description of measurement methods and procedures actually applied :	Measured from topographical surveys, maps, satellite pictures, etc. If CPA is a green-field project, this value does not exist prior to the implementation of the project activity. (For new reservoirs, this value is zero)
Any comment:	-

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

>>

1. Determination of Grid emission factor

The grid emission factor is calculated according to "Tool to calculate the emission factor for an electricity system (the latest version)". OM (Operating Margin) and BM (Build Margin) are calculated by using the data from existing power plants that provide electricity with the current grid-connected electricity generation, and with this result, the $EF_{grid,CM,y}$ (Combined Margin) can be calculated.

[Major parameter of emission factor]

Parameter	Value	Source
$FC_{i,m,y}$ is the amount of fuel *i* (in a mass or volume unit) consumed by a relevant power source m in year(s) y, which supplies electricity to the grid, not including low-operating cost and must-run power plants.	< Make up the reference value in Annex 3 >	< project value >
Net Calorific Values by Power Plant	< Make up the reference value in Annex 3 >	< project value > (Net Caloric Value = Caloric value net × caloric value conversion factor)
$EG_{m,y}$ (MWh) is the electricity delivered to the grid by source m	< Make up the reference value in Annex 3 >	< project value >
Net Caloric Values Conversion Factor	Solid/Liquid fossil fuel : 0.95 Gaseous fuel : 0.90	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Fuel CO_2 Emission Factor($EF_{CO2,i,y}$)	< Make up the reference value in Annex 3 >	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Operating Margin Emissions Factor ($EF_{grid,OM,y}$) (ton CO_2/MWh)	< project value >	Calculated
Build Margin Emissions Factor ($EF_{grid,BM,y}$) (ton CO_2/MWh)	< project value >	Calculated
Baseline Emissions Factor ($EF_{grid,CM,y}$) (ton CO_2/MWh)	< project value >	Calculated

<More description should be filled >

2. Baseline Emissions

Baseline emissions include only CO_2 emission from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.
The methodology applied to this project activity assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants.

The baseline emissions are to be calculated as follows:

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

Where:

BE_y = Baseline emissions in year y (tCO_2)
$EG_{BL,y}$ = Quantity of net electricity supplied to the grid or end users as a result of the implementation of the CDM project activity in year *y* (MWh)

$EF_{CO2, grid, y}$ = CO_2 emission factor of the grid in year *y* (tCO_2/MWh)

Calculation of $EG_{BL,y}$

The calculation of $EG_{BL,y}$ is different depending on the combinations of project type (Greenfield plants, Capacity additions, and replacements) and technology (photovoltaic, wind power and small hydro power) It can be choose the option to calculate the $EG_{BL,y}$ depend on the project type and technology.

[Guidelines to choice the option of the $EG_{BL,y}$ calculation method]

Project type / Technology	Methodology	Greenfield plants	Capacity addition	Replacement
Photovoltaic	**AMS-I.F.**	**(a)**	**(c)**	**-**
	AMS-I.D.	**(b)**	**(c)**	**-**
Wind power	**AMS-I.D.**	**(b)**	**(c)**	**(d)**
Small hydro power	**AMS-I.D.**	**(b)**	**-**	**-**

< CPA implementer should check the table above to choice appropriate method for calculating the $EG_{PJ,y}$ and apply it >

Option (a) : 'AMS-I.F(Captive use type) – Greenfield plants'

$\boldsymbol{EG_{BL,y}}$ = $\boldsymbol{EG_{BL\_Captive,y}}$

Where:

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

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

In the case that CPA will introduce the photovoltaic system, electricity generated by the project plant/unit will supply to the end user for captive use.

** *In accordance with the methodology AMS-I.F. (ver. 02), $EF_{CO2,y}$ which is a emission factor of a grid calculated as per the procedures provided in AMS-I.D. and it is same with $EF_{CO2,grid,y}$.*

Ex-ante calculation for $\boldsymbol{EG_{BL\_captive,y}}$ is as below:

$EG_{BL\_captive,y} = C_{facility\_captive} * H * UC_{renewable\ energy}$

Where:

$C_{facility\_captive}$ = Capacity of Renewable energy equipment introduced by project activity (MW)

H = Yearly operating hours, 8760 (=365*24) (hr/yr)

$UC_{renewable\ energy}$ = Utilization coefficient of Renewable energy power plant (%)

$\boldsymbol{BE_y}$ <Project value>

Option (b) : 'AMS-I.D(Grid connected type) – Greenfield plants'

$\boldsymbol{EG_{BL,y}}$ = $\boldsymbol{EG_{BL\_grid,y}}$

Where:

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

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

In the case that CPA will introduce the photovoltaic system, wind power plant or small hydro power plant, electricity generated by the project plant/unit will supply to the national grid.

Ex-ante calculation for $\boldsymbol{EG_{BL\_grid,y}}$ is as below:

$EG_{BL\_grid,y} = C_{facility\_grid} * H * UC_{renewable\ energy}$

Where:

$C_{facility\_grid}$ = Capacity of Renewable energy equipment introduced by project activity (MW)

H = Yearly operating hours, 8760 (=365*24) (hr/yr)

$UC_{renewable\ energy}$ = Utilization coefficient of Renewable energy power plant (%)

$\boldsymbol{BE_y}$ <Project value>

Option (c) : 'AMS-I.D(Grid connected type) & AMS-I.F(Captive use type) – Capacity addition'

In the case where the addition of new capacity of photovoltaic system or wind power plant, it does not affect the electricity generated by the existing plant(s) or unit(s), *the following approach can be used provided that the electricity generated (fed into the grid or supplied to end users) by the added power plant(s)/unit(s) addition is separately metered:*

$\boldsymbol{EG_{BL,y}} = \boldsymbol{EG_{BL\_ADD,y}}$

Where:

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

$EG_{BL\_ADD,y}$ = Quantity of net electricity generation supplied to the grid or end users in year y by the project plant/unit that has been added under the project activity (MWh)

In the case where the addition of new capacity of photovoltaic system, electricity generated by the project plant/unit will supply to either the end-user for captive use or the national grid.
In the case where the addition of new capacity of the wind power plant, electricity generated by the project plant/unit will supply to the national grid.

Ex-ante calculation for $\boldsymbol{EG_{BL\_ADD,y}}$ is as below:

$EG_{BL\_ADD,y} = C_{facility\_ADD} * H * UC_{renewable\ energy}$

Where:

$C_{facility\_ADD}$ = Capacity of renewable energy equipment that added under the project (MW)

H = Yearly operating hours, 8760 (=365*24) (hr/yr)

$UC_{renewable\ energy}$ = Utilization coefficient of Renewable energy power plant (%)

$\boldsymbol{BE_y}$ <Project value>

Option (d) : 'AMS-I.D(Grid connected type) – Replacement'

According to the Methodology AMS-I.D., it use historical data to determine the electricity generation by the existing plant in the baseline scenario, assuming that the historical situation observed prior to the implementation of the project activity would continue.

$\boldsymbol{EG_{BL,y}} = \boldsymbol{EG_{BL,retrofit,y}}$

Where:

$\boldsymbol{EG_{BL,retrofit,y} = EG_{PJ,facility,y} - (EG_{historical} + O_{historical})\ ;\ until\ DATE_{BaselineRetrofit}}$

and;

$EG_{BL,retrofit,y} = 0$; *on/after* $DATE_{BaselineRetrofit}$

Where;

$EG_{BL,retrofit,y}$	=	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EG_{PJ,facility,y}$	=	Quantity of net electricity supplied to the grid by the project plant/unit in year y (MWh)
$EG_{historical}$	=	Annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity (MWh)
$O_{historical}$	=	Standard deviation of the annual average historical net electricity generation delivered to the grid supplied to the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity (MWh)
$DATE_{BaselineRetrofit}$	=	Point in time when the existing equipment would need to be replaced in the absence of the project activity (date)

To determine $EG_{historical}$, project participants may choose between the following two historical periods. This allows some flexibility; the use of the longer time period may result in a lower standard deviation and the use of the shorter period may allow a better reflection of the (technical) circumstances observed during the more recent years.

CPA implementer may choose among the following two time spans of historical data to determine $EG_{historical}$:

(a) The three last calendar years prior to the implementation of the project activity; or

(b) The time period from the calendar year following $DATE_{hist}$, up to the last calendar year prior to the implementation of the project, as long as this time span includes at least three calendar years, where $DATE_{hist}$ is latest point in time between:

(i) The commercial commissioning of the plant/unit;

(ii) If applicable: the last capacity addition to the plant/unit; or

(iii) If applicable: the last retrofit of the plant/unit

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

$EG_{PJ,facility,y} = C_{facility\_replacement} * H * UC_{renewable\ energy}$

Where:

$C_{facility\_replacement}$	=	Capacity of Renewable energy equipment introduced by project for the purpose of Replacement of existing facilities (MW)
H	=	Yearly operating hours, 8760 (=365*24) (hr/yr)
$UC_{renewable\ energy}$	=	Utilization coefficient of Renewable energy power plant (%)

BE_y <Project value>

3. Project Activity Emissions

3-1. Photovoltaic system

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

$PE_{PV,y} = 0$

3-2. Wind power plant

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

$PE_{WD,y} = 0$

3-3. Small-hydro power plant

For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoirs, estimated as follows:

(a) If the power density of the single or multiple reservoirs (PD) is greater than 4 W/m^2 and less than or equal to 10 W/m^2:

$$PE_{HP,y} = \frac{EF_{Res} * TEG_y}{1000}$$

Where,

$PE_{HP,y}$ = Project emissions from water reservoirs (tCO_2e/yr)

EF_{Res} = Default emission factor for emissions from reservoirs of hydro power plants in year *y* ($kgCO_2e/MWh$)

TEG_y = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in tear *y* (MWh)

$PE_{HP,y}$ <project value>

(b) If the power density of the project activity (PD) is greater than 10 W/m^2:

$PE_{HP,y} = 0$

The power density of the project activity (PD) is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where,

PD = Power density of project activity (W/m^2)

Cap_{PJ} = Installed capacity of the hydro power plant after implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero.

3-4. Total project emission

$PE_y = PE_{PV,y} + PE_{WD,y} + PE_{HP,y}$

PE_y <Project value>

4. Leakage

No leakage emissions are considered.

- PP will purchase new energy generating equipment for this PoA, so not transferred from another activity.
- The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport).

$LE_y = 0$

5. Emission Reductions

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

Where:

ER_y = Emission reductions in year y (tCO_2e)
BE_y = Total Baseline emissions in year y(tCO_2e)
PE_y = Total Project emissions in year y (tCO_2e)
LE_y = Leakage emissions in year y (tCO_2e)

ER_y <project value>

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

Year	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Total (tonnes of CO_2e)				

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 a monitoring meter for checking the output data, this monitoring data will be sent to JGP and JGP manages the data. The CPA database includes the following data-set that can unambiguously determine the emission reductions attributable to each CPA

[List of data]

Data type	List of data
System information	✓ A serial number ✓ system type ✓ location ✓ introduced date
Energy production	Generated electricity quantity

Management of the monitoring information

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

* *Serial number is created as 'JGP – Type of renewable energy (i.e, PV, WD, HP) – Added order'.*

Installation of monitoring equipment

- All introduced project systems have to be installed monitoring equipment.
  (i) In case of the generated electricity supplied to the end users for captive use, monitoring equipment is inverter (inverters have the measuring device in them) and (ii) In case of the generated electricity supplied to the national grid, monitoring equipment is electricity meter to monitor the quantity of electric transmission.
- In accordance with Article 7 of Electric Utility Act, Any person who intends to operate an electric utility business shall obtain a license by the type of the electric utility from the Minister of Knowledge Economy.
- In accordance with Article 63 of Electric Utility Act, When any person has completed the works for setting up or altering electric installations, electric facility operator shall use these installations only after they have passed an Inspection conducted by the Minister of Knowledge Economy or the Mayor or/Do governor.
- 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*** [8]

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

[requirements per equipment type]

Equipment	*Requirements*	*Evidence*
Inverter	Accuracy ≤ 3%	- specification of the equipment
Electricity meter	Accuracy ≤ 1%	- specification of the equipment

2) Measurement positions and monitoring item

[measurement position and monitoring item]

category	*Monitoring item*	*Data (aggregate)*	*Measurement*

[8] Standards for New & renewable energy facilities, Renewable energy centre of Korea, Jan 2010

Photovoltaic Wind power Hydropower	Daily electricity output (kW)	24 unit (hourly)	- output data of inverter (or related monitoring equipment)
	Operation time (min)	1 unit (daily)	

Measurement of the energy generation

- The amount of electricity transmitted to the grid or supplied to the end user for captive use shall be measured automatically by established meters. The monitoring equipment measures the quantity of energy generation automatically and continually.

• In case of Grid connected project

- The net electricity export/supplied to a grid ($EG_{BL,y}$) is the difference between the measured quantities of the grid electricity export and the import. To monitor the amount of electricity export, (1) quantity of electricity export measured by the electric 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 Korea Power eXchange) will be the main source of data[9].

• In case of Captive use type

- The net electricity generation is the difference between the total quantity of electricity generated by this project and the auxiliary electricity consumption.
  (1) the quantity of generated electricity by the electric meter (or inverter) is used as main source of the data and (2) the auxiliary electricity consumption (of connector bands and inverters) will be very small; however, the auxiliary electricity consumption will be conservatively calculated using recording annually the number of systems operating and estimating the annual hours of systems operating (Equation : The auxiliary electricity consumption = Standby power[10] (of monitoring equipments) * Numbers * Hours).
  The net electricity generation is the quantity of generated electricity from the renewable electric generation facility excluding the quantity of auxiliary electricity consumption.
  (The net electricity generation = The quantity of generated electricity – The quantity of auxiliary electricity consumption)

Archive of the monitoring data

- This data will be collected and recorded as below:

[data to be collected and recorded]

Type	Generated energy	Consumed energy
Photovoltaic	Electricity	None

[9] Electricity import amount is measured by the electric 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.

[10] Standby power is the electric power consumed by electronic appliances while they are switched off or in a standby mode and is based on the letter (or evidence) from manufacturers.

Wind power	Electricity	None
Small hydro	Electricity	None

- All introduced project systems have to be installed monitoring equipment and it measures the data of energy production/consumption. This measured data will be collected and recorded for each monitoring period, and used to calculate emission reductions for that portion of the crediting period.
- At the end of each month, the measured data are transferred to CME (Jeju special self-governing province) and the person in charge of data management in JGP should be archived the data as electronically. The CPA implementer will also keep the copy of generating electronic energy.
- In order to verify the emission reductions of the project, the index of the project materials and monitoring results will be collected. All paper-based information and data shall be stored by CPA implementer and all the materials shall have copies for backup. And all data will be kept until 2 years after the end of the total credit period of the proposed project.
- CME will prepare the monitoring procedures and calibration and measurement manual that will be implemented during the operation of the CPA.
- After the proposed PoA is registered and added CPA begins its operation, the monitoring report will be submitted for the verification. The report will cover the monitoring of generating electronic energy, check report, report on calculation of the emission reductions and records of monitoring instrument repair and calibration, etc.

Quality Assurance & Quality Control

- Each CPA implementer should apply QA&QC procedures for monitoring.
- All introduced monitoring equipment should be certified to national standards.
- Basically, monitoring should be performed by complying with ‘monitoring procedure’ in the Operating Manual Document 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.
- CPA implementer should guarantee the accuracy and safety of monitoring equipment. According to *General guidelines to SSC CDM methodologies*, the monitoring equipment will be calibrated and inspected to ensure their accuracy at least once in 3(three) years.
- If an unusual data without any special change or effect is detected, metering device should be inspected and plural staffs would record data again with cross-check.

Identify organizational structure, responsibilities.

[Monitoring structure and responsibility]

Monitoring Structure	***Responsibility***
Director of Jeju special self-governing province(CME)	*- Duty of whole management* *- Check and approval of monitoring report*
↑	
Monitoring manager of Jeju special self-governing province(CME)	*- General management of monitoring activity* *- Archive and manage the monitoring data* *- Write out the monitoring report*
↑	

Monitoring manager of each CPA project site	*- General management of the monitoring activity at CPA project site* *- Archive the monitoring data and transmit to CME*
↑	
The person in charge of Monitoring at each CPA project site	*- Operate and manage the renewable energy equipment* *- Operate and manage the monitoring equipment* *- Document and inform the finding issue from monitoring activity*

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.

Monitoring parameter for this CPA

<Choice the appropriate parameter in accordance with CPA>

For common parameter

Data / Parameter:	$EF_{CO2,\ grid,\ y}$
Data unit:	tCO_2 / MWh
Description:	CO_2 emission factor of the grid electricity in year *y*
Source of data to be used:	CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and procedures to be applied:	As per the latest version of "Tool to calculate the emission factor for an electricity system"
QA/QC procedures to be applied:	As per the latest version of "Tool to calculate the emission factor for an electricity system"
Any comment:	- Value will be applied under the year corresponding to the CPA is added. - In case of the project that apply the methodology AMS-I.F., $EF_{CO2,y}$ *is same with* $EF_{CO2,grid,y}$.

For captive use type

Data / Parameter:	$EG_{BL\_captive,y}$
Data unit:	MWh
Description:	Quantity of net electricity displaced as a result of the implementation of the CDM project activity in year *y*
Source of data to be used:	CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and	Measurements are undertaken using electricity meter. The net electricity displaced is the gross energy generation by the project

procedures to be applied:	activity power plant minus the auxiliary/station electricity consumption As for the total quantity of electricity generated by this project, Measuring equipment : Electricity meter (the measuring device in inverter) Calibration frequency : 3 year Accuracy of measurement method: Allowable error range ≤ 3.0% Measurement interval : Automatically measured As for the auxiliary electricity consumption (of monitoring equipment), The auxiliary electricity consumption will be calculated according to the below equation. (Equation: The auxiliary electricity consumption = Standby power * Numbers * Hours).
QA/QC procedures to be applied:	The measuring device should be recalibrated at least once in three 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.
Any comment:	Monitoring frequency : Continuous monitoring, hourly measurement and at least monthly recording

Data / Parameter:	$EG_{BL\_Add,y}$
Data unit:	MWh
Description:	Quantity of net electricity generation supplied to the end users in year y by the project plant/unit that has been added under the project activity
Source of data to be used:	CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and procedures to be applied:	Measurements are undertaken using electricity meter. The net electricity displaced is the gross energy generation by the project activity power plant minus the auxiliary/station electricity consumption As for the total quantity of electricity generated by this project, Measuring equipment : Electricity meter (the measuring device in inverter) Calibration frequency : 3 year Accuracy of measurement method: Allowable error range ≤ 3.0% Measurement interval : Automatically measured As for the auxiliary electricity consumption (of monitoring equipment), The auxiliary electricity consumption will be calculated according to the below equation. (Equation: The auxiliary electricity consumption = Standby power * Numbers * Hours).
QA/QC procedures to be applied:	The measuring device should be recalibrated at least once in three 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.
Any comment:	Monitoring frequency : Continuous monitoring, hourly measurement and at

	least monthly recording

For grid-connected type

Data / Parameter:	$EG_{BL\_grid,y}$
Data 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 to be used:	CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and procedures to be applied:	Measurements are undertaken using electricity meters. Measurement results shall be cross checked with records for sold/ purchased electricity (e.g. invoices/receipts). 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. But at the meter for the electricity generation, the consumption electricity is already subtracted and then the net electricity is supplied to the KPX. When the plant doesn't operate and stop generating electricity, the consumption electricity is calculated using electric charge invoice based on the meter for electricity from grid.
QA/QC procedures to be applied:	The measuring device should be recalibrated at least once in three 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.
Any comment:	Monitoring frequency : Continuous monitoring, hourly measurement and at least monthly recording

Data / Parameter:	$EG_{BL\_Add,y}$
Data unit:	MWh
Description:	Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the project activity
Source of data to be used:	CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and procedures to be applied:	Measurements are undertaken using electricity meters. Measurement results shall be cross checked with records for sold/ purchased electricity (e.g. invoices/receipts). 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. But at the meter for the electricity generation, the consumption electricity is already subtracted and then the net electricity is supplied to the KPX. When the plant doesn't operate and stop generating electricity, the consumption electricity is calculated using electric charge invoice based on the meter for electricity from grid.
QA/QC procedures to be applied:	The measuring device should be recalibrated at least once in three 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.
Any comment:	Monitoring frequency : Continuous monitoring, hourly measurement and at least monthly recording

Data / Parameter:	$EG_{PJ,facility,y}$
Data unit:	MWh
Description:	Quantity of net electricity supplied to the grid by the project plant/unit in year y
Source of data to be used:	CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and procedures to be applied:	Measurements are undertaken using electricity meters. Measurement results shall be cross checked with records for sold/ purchased electricity (e.g. invoices/receipts). 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. But at the meter for the electricity generation, the consumption electricity is already subtracted and then the net electricity is supplied to the KPX. When the plant doesn't operate and stop generating electricity, the consumption electricity is calculated using electric charge invoice based on the meter for electricity from grid.
QA/QC procedures to be applied:	The measuring device should be recalibrated at least once in three 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.
Any comment:	Monitoring frequency : Continuous monitoring, hourly measurement and at least monthly recording

For small-hydro power project (additionally monitored):

Data / Parameter:	Cap_{PJ}
Data unit:	W

Description:	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data to be used:	CPA database (Project site)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and procedures to be applied:	Determine the installed capacity based on recognized standards
QA/QC procedures to be applied:	-
Any comment:	Monitoring frequency : Yearly

Data / Parameter:	A_{PJ}
Data unit:	m^2
Description:	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data to be used:	CPA database (Project site)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Description of measurement methods and procedures to be applied:	Measured from topographical surveys, maps, satellite pictures, etc
QA/QC procedures to be applied:	-
Any comment:	Monitoring frequency : Yearly

Data / Parameter:	TEG_y
Data unit:	MWh
Description:	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year *y*
Source of data to be used:	Project activity site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be filled by CPA
Measurement procedures (if any):	Electricity meters
Description of measurement methods and procedures to be applied:	Continuous measurement and at least monthly recording

QA/QC procedures to be applied:	-
Any comment:	Applicable to hydro power project activities with a power density of the project activity (PD) greater than 4 W/m^2 and less than or equal to 10 W/m^2

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:

>>

< Environmental impacts of introduced technology should be filled >

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:

>>

< Environmental impacts of introduced technology should be filled >

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.

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

>>

< Stakeholders consultant of CPA should be filled >

D.3. Summary of the comments received:

>>

< Stakeholders consultant of CPA should be filled >

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

>>

< Stakeholders consultant of CPA should be filled >

Annex 1

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

Organization:	Information about CPA implementer
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is used for this CPA

Annex 3

BASELINE INFORMATION

(1) Project outline of CPA

[Project outline of CPA]

System type	Number of introducing system	Total capacity
Photovoltaic		
Wind power		
Small hydro power		

[Detailed specification about CPA]
- In case of Photovoltaic system

No	Project site	Capacity (kW)	Power of a module (W)	Source of imports

- In case of Wind power plant

Item	Specification
Capacity	
Rated speed	
Rated voltage	
Rated frequency	
Power factor	
Synchronous speed	
Cooling system	
Manufacturer	

- In case of Small hydro power plant

Device	Item	Specification
Turbine	Type	
	Capacity	
	Rated head	
	RPM	
	Efficiency	
	Manufacturer	
Generator	Type	
	Capacity	
	Voltage	
	Poles	
	Power factor	
	Efficiency	
	Manufacturer	

(2) Data used to determination of Grid emission factor

< Each CPA will calculate the emission factor in accordance with the latest version of 'Tool to calculate the Emission Factor for an electricity system' and report the specific information about the calculation >

[Calculation of Operation Margin Emission Facotr]

Year	Plant name	Amount of fossil fuel (FCi,m,y)				Net caloric value (NCVi,y)				Net electricity generated (EGm,y, MWh)	Emission factor for each plant (tonCO_2/MWh)
		Coal (t)	Heavy oil (kl)	Diesel oil (kl)	L.N.G (t)	Coal (kcal/kg)	Heavy oil (kcal/l)	Diesel oil (kcal/l)	L.N.G (kcal/kg)		

<Reference>

[Sample group plants used in the Build Margin calculation and CO2 emission factor of Build Margin]

Year	No.	Plant name	Technology	Type of fossil fuel	Year operation	Net electricity generated ($EG_{m,y}$)	CO_2 emission factor ($EF_{EL,m,y}$)	Results EF for each plant

<Reference>

[Default CO_2 Emission factor for combustion]

Fuel type	Default carbon content (kg/GJ)	Default carbon oxidation factor	Effective CO_2 emission factor (kg/TJ)		
			Default Value	96% confidence interval	
	A	B	C=A*B*44/12*1000	Lower	Upper
Motor Gasoline					
Aviation Gasoline					
Jet Gasoline					
Gas/Diesel oil					
Residual fuel oil					
Anthracite					
Other bituminous coal					
Natural Gas					

<Reference>

Annex 4

MONITORING INFORMATION

(1) Standard monitoring form

Period: YYYY/MM

System information					Energy production (kWh)	Energy Consumption (kWh)	Note
Serial number	technology	Capacity (kWh)	Location	Introduced date			
Total							

(2) Detailed information about monitoring equipment (CPA No.XXX)

No.	Project site	Information of Monitoring equipment

- - - - -