



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

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

Promotion of Small Hydro Power in Solomon Islands

Version: 01

Date: 10/08/2012

A.2. Purpose and general description of the PoA

Policy/Measure or stated goal that the PoA seeks to promote

The 'Programme of Activities (PoA) for 'Promotion of Small Hydro Power in Solomon Islands' later on referred to as 'PoA', envisages to assist development of small-scale hydro power plants across Solomon Islands.

In the Solomon Islands electricity is supplied to less than 20% of the population. Almost all generation is based on imported diesel fuel. Apart from high dependence on external fuel supply, the country also faces challenges in the development of the energy sector, including maintaining reliability, ensuring commercial viability of the power utility Solomon Island Electricity Authority (SIEA), and increasing access to modern energy supply. The objective of the program is to develop alternative energy resources for electricity generation in particular small scale hydropower for the out stations of SIEA in order to improve power supply to provinces through less GHG intensive sources as compared to fossil fuel. Currently, there are no mandatory regulations or policies within the host country to generate electricity using renewable energy resources.

Framework for the implementation of the proposed PoA

Each small-scale CDM Program Activity (referred later on as CPA) under this PoA will comprise one or more such hydro power plants and will have a combined installed capacity of no more than 5MW_e. The PoA is a voluntary action being coordinated and managed by Solomon Islands Electricity Authority (referred later on as the coordinating entity or SIEA), the coordinating entity. SIEA will also work closely with other developers of the hydro energy power plants and other organizations¹ active in the hydropower sector in Solomon Islands to facilitate the development of new hydropower plants and their inclusion in this PoA. At least 5 viable small hydro projects in Solomon Islands have been identified to be a part of this program. These five sites have been selected on basis of consultation with the Ministry of Mines, Energy and Rural Electrification (MMER) and SIEA. The details are as in the table below:

¹Private Developers



Load Center	Capacity kW	Annual GWh	Investment (\$ millions)	Expected Commissioning
Auki	1,160	9.8	4.2	2014
Taro	260	2.1	1.7	2014
Ringi ²				
Variant A	1,210	10.4	4.4	2013
Variant B	4,320	26.3	11.3	2014
Lata	107	0.8	2.2	2014
Honiara	2,740	12.7	7.2	2014

Studies were conducted at the above sites, including broad stakeholder consultation, surveys of power supply infrastructure, assessment of existing hydropower resources through GPS surveys and discharge measurements, demand surveys on both existing and potential new SIEA customers and specific community consultations and individual interviews on relevant subjects, such as pre-payment metering systems, support for data collections (level and rainfall gauging stations), and possible community participations in hydropower development and power system expansion projects.

Solomon Islands Electricity Authority (SIEA) expects the above projects to be developed by private Independent Power Producer (IPP) investors to overcome land ownership issues and shortage of investment funds. However this would require a framework that is able to balance interests of investors, consumers and the electricity buyer SIEA.

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

The proposed PoA is a voluntary action by Solomon Islands Electricity Authority (SIEA).

Proposed PoA contribution to Sustainable Development

Solomon Islands offers challenging conditions for sustainable energy development due to the widely scattered market on islands, separated by substantial areas of sea, and the communities are often small, isolated population centres. The Solomon Islands Electricity Authority (SIEA) is responsible for providing electricity to all the urban and provincial centres. Solomon Islands is almost fully dependent on fossil fuels for electricity generation and transport, with about 90% of electricity generated by diesel engine. There have been small renewable energy projects, mainly solar and hydropower, constructed for rural and remote communities.

A National Energy Policy Framework was developed and endorsed by cabinet in 2007. It sets out the Government's policies for the planning and management of the energy sector over the next 10 years. The Policy encourages the energy sector participants to maximise use of appropriate, proven and cost-effective renewable technologies utilizing indigenous resources to meet energy demands and needs. Current challenges and constraints in the energy sector are related to expanding the coverage of electrification largely through the development of indigenous energy sources (wind, biomass and hydro), and managing a transition from fossil fuel based power generation to renewable power sources. Related to these concerns are those regarding the integration of energy planning into other sectors, and the integration of environmental considerations into energy planning.

²Two designs have been selected for analysis at the Ringi site. Variant A is the smaller one of the two configurations and would supply electricity to only the Kolombangara Island. The second 'Variant B' would be a much larger scheme capable of supplying electricity to the Kolombangara Island plus Noro/Munda region using undersea cable. Further analysis will be done during feasibility stage on choice of 'Variant' to be implemented



The proposed PoA is a renewable energy project and is in line with the above stated sustainable development strategy of the host country.

A.3. CMEs and participants of PoA

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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
Solomon Islands	Solomon Islands Electricity Authority	No

A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants(as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Solomon Islands	Public entity - Solomon Islands Electricity Authority (SIEA)	No

A.5. Physical/ Geographical boundary of the PoA

The geographical boundary for the PoA is Solomon Islands

A.6. Technologies/measures

A typical CPA under this PoA comprises of one or more small hydropower plants with an installed capacity not exceeding 5MW. The hydropower plants are newly constructed by one or more project owners and generate electricity from hydropower. The hydropower generation technologies employed in each CPA may differ from one CPA to the next. The CPA's will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit i.e., in the absence of the project activity, the users would have been supplied electricity from one or more sources listed below:

- Electricity supply from national/regional grid
- Import of electricity from grid and/or captive fossil fuel electricity generation at the user end
- Electricity generation in mini grid system where in the baseline all generators use exclusively fuel oil and/or diesel fuel

Each CPA-DD will provide the detailed specification on the type of hydro technology and measure employed in a particular project or particular component of the CPA, as applicable.

The implementation of the PoA could require technology transfer from an Annex-I country or non-Annex I country.

A.7. Public funding ofPoA



The “Promotion of Small Hydro Power in Solomon Islands’ will not have any diversion of ODA.

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

The proposed PoA is a voluntary coordinated action by SIEA to support the development and implementation of renewable energy projects in Solomon Islands in order to improve power supply to rural provinces through renewable and less GHG intensive sources as compared to fossil fuel.

As per paragraph 73 of the 47th EB meeting report “additionality” is to be demonstrated either at the PoA level or at CPA level”. The CME chooses to demonstrate additionality at the CPA level as per Annex 3 of EB 65. The CPAs under this PoA will consist of micro scale projects.

As per the paragraph 2 (a) of the “Guidelines for demonstrating additionality of Micro-scale project activities” EB 68 (version 4), project activities up to 5 megawatts that employ renewable energy as their primary technology are additional if the geographic location of the project activity is in LDCs/SIDs or in a special underdeveloped zone of the host country identified by the Government before 28 May 2010.

According to the United Nations, Solomon Islands is classified as Small Island Developing State (SIDS) and as Least Developed Country³. Hence under the proposed PoA, renewable energy CPAs having up to 5 MW installed capacity are considered to be additional as per the “Guidelines for demonstrating additionality of Micro-scale project activities” EB 68 (version 4)”

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

The eligibility criteria for inclusion of a CPA in the PoA is being guided by the “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities”, version 01, EB 65, Annex 3.

A CPA to be included in the proposed PoA shall:

- Be a new hydro power plant at a site where there is no other existing renewable energy power project.
 - Be located within the geographical boundary of Solomon Islands
 - Meet the applicability requirements of all the relevant CDM methodologies – AMS-I.F., version 02 EB 61, AMS-I.D., version 17 EB 60 as determined in section B.3
 - Have an installed capacity of ≤ 5 MW
 - Supply the renewable (small hydro) electricity generated to the relevant and clearly identified electricity distribution system - national/regional/mini grid. Details on name and type of grid (national/regional/mini) system shall be provided in each CPA-DD.
- OR
- Be small hydro electricity generation units that supply individual households/users or groups of households/users included in the project boundary of the CPA.
 - In case of project implementer other than SIEA, have a cooperation agreement with SIEA that governs the SSC-CPA’s participation in the PoA. The roles and responsibility of the CME and the CPA implementer shall be as defined in the Operational and Management System for this PoA.
 - Not result in the construction of new reservoirs or in an increase in the capacity of existing reservoirs where the power density of the power plant is less than 4 W/m^2 .
 - Demonstrate additionality as described in section B.1 of the PoA-DD.

³<http://www.un.org/special-rep/ohrls/sid/list.htm>



- Develop a record keeping system for each CPA under the PoA as described in Section C of PoA-DD and Annex 3 of EB 65.
- Has a system/procedure to avoid double accounting as described in Section C of PoA-DD.
- Establish procedures for de-bundling check for the CPAs as described in Section C of PoA-DD.
- Develop provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA.
- Have a start date after the commencement of PoA validation
- Confirm that funding from Annex I parties, if any, do not result in a diversion of official development assistance.
- Confirm that the technology will not be substituted within the project period (Declaration from the CPA implementer)

B.3. Application of methodologies

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Each CPA under this PoA shall use one of the following methodologies

AMS-I.F. ‘Renewable electricity generation for captive use and mini-grid’ (AMS-I.F., version 02, Sectoral scope: 01, EB 61)

OR

AMS-I.D. ‘Grid connected renewable electricity generation’ (AMS-I.D., version 17, Sectoral scope: 01, EB 60)

AMS I.F will be used in case the CPA:

- a) Displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid).
- b) Supplies electricity to a mini grid system where in the baseline all generators use exclusively fuel oil and/or diesel fuel

AMS I.D will be used in case the CPA:

- a) Supplies electricity to a national/regional grid
- b) Supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)

The scenario mentioned for AMS-I.D. are not applicable currently, however it may become reality over the lifetime of PoA.

For CPAs applying the AMS-I.F. ‘Renewable electricity generation for captive use and mini-grid’ (AMS-I.F., version 02, Sectoral scope:01, EB 61).

No	Applicability Criteria as per AMS I.F., version 02	Project Scenario
1	This methodology comprises of renewable energy generation units, such as solar, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s).	A typical CPA will comprise of a hydro power plant(s) that supplies electricity to the users.
2	The project activity will displace electricity from an	The CPA will displace electricity from



	<p>electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit i.e., in the absence of the project activity, the users would have been supplied electricity from one or more sources listed below:</p> <ul style="list-style-type: none"> a) A national or a regional grid (grid hereafter); b) Fossil fuel fired captive power plant; c) A carbon intensive mini-grid. 	<p>an electricity distribution system that is an existing mini grid or would have been supplied by at least one diesel or fossil fuel fired generating unit.</p> <p>In the absence of the CPA, the users would have been supplied electricity from a carbon intensive (fossil fuel based) mini-grid.</p>
3	<p>For the purpose of this methodology, a mini-grid is defined as small-scale power system with a total capacity not exceeding 15 MW (i.e., the sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW) which is not connected to a national or a regional grid.</p>	<p>Under a typical CPA, the respective mini-grid would not be connected to a national or regional grid and the sum of installed capacities of all generators connected to the mini-grid would be equal to or less than 15 MW.</p>
4	<p>Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <ul style="list-style-type: none"> · The project activity is implemented in an existing reservoir with no change in the volume of reservoir; · The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; · The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4W/m². 	<p>Each hydro power plant under this PoA will be a small hydro power plant/unit either with run-of-river or reservoir.</p> <p>The hydro power will be either A run- of- river project Or A hydro power plant on existing reservoir with no change in volume.</p> <p>In case the project activity is implemented in existing reservoir with increase in volume than the power density will be more than 4 W/m².</p> <p>In case CPA is a project activity with new reservoir the power density of the power plant will be more than 4 W/m².</p>
5	<p>For biomass power plants, no other biomass other than renewable biomass is to be used in the project plant.</p>	<p>This PoA will not involve biomass power plant and hence this condition is Not Applicable.</p>
6	<p>This methodology is applicable for project activities that:</p> <ul style="list-style-type: none"> a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); b) involve a capacity addition c) involve a retrofit of (an) existing plant(s); or d) involve a replacement of (an) existing plant(s). 	<p>A typical CPA under this PoA will involve (a) installation of new renewable energy power plant.</p>
7	<p>In the case of project activities that involve the capacity addition of renewable energy generation units</p>	<p>This PoA will not involve capacity addition of renewable energy generation</p>



	at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	units at an existing renewable power generation facility. Hence this condition is Not Applicable
8	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	This PoA will not involve retrofit or replacement unit and hence this condition is Not Applicable.
9	If the unit added has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	CPA's involving addition of both renewable and non-renewable components will consider the eligibility limit of 15 MW for a small-scale CDM project activity only to the renewable component.
10	Combined heat and power (co-generation) systems are not eligible under this category.	Combined heat and power systems are not considered in this PoA and hence, the condition is Not Applicable
11	If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered that ensures that there is no double counting of emission reductions.	CPA's delivering electricity produced to another facility or facilities within the project boundary will enter into a contract between the supplier and consumer(s) of the electricity specifying that only the facility generating the electricity can claim emission reductions from the electricity displaced.
12	In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues only or biomass from dedicated plantations complying with the applicability conditions of AM0042.	This PoA will not involve biomass power plant and hence this condition is Not Applicable.
13	In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities; Decision 4/CMP.1) or following the procedures included in the leakage section of AM0042.	This PoA will not involve biomass power plant and hence this condition is Not Applicable.
14	In case the project activity involves the replacement of equipment, and the leakage from the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment	This applicability condition is no more a requirement for PoA's under Type I methodology as concluded in SSC-WG 34 th meeting ⁴ .

⁴Please refer SSC-WG 34th meeting recommendations to the EB and corresponding EB decision http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf and <http://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/63945>



	should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.	
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For CPAs applying AMS-I.D. ‘Grid connected renewable electricity generation’ (AMS-I.D., version 17, Sectoral scope: 01, EB 61).

Para No	Applicability Criteria as per AMS-I.D., version 17	Project Scenario
1	<p>This category comprises renewable energy generation units, such as solar, hydro, tidal/wave, wind, geothermal and renewable biomass</p> <ul style="list-style-type: none"> a. Supplying electricity to a national or a regional grid; or b. Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling 	A typical CPA will comprise of a hydropower plant supplies electricity to a national or a regional grid and/or supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.
2	This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	A typical CPA will involve installation of new renewable energy power plant.
3	<p>Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <ul style="list-style-type: none"> · The project activity is implemented in an existing reservoir with no change in the volume of reservoir; · The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; · The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4W/m². 	<p>Hydro power CPA’s will be a small hydro power plant/unit either with run-of-river or reservoir.</p> <p>The hydro power will be either a run-of-river project or A hydro power plant on existing reservoir with no change in volume.</p> <p>In case the project activity is implemented in existing reservoir with increase in volume than the power density will be more than 4 W per m².</p> <p>In case the CPA is a project activity with new reservoir the power density of the power plant will be more than 4 W/m².</p>
4	If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility	The CPAs involving addition of both renewable and non-renewable



	limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	components will consider the eligibility limit of 15 MW for a small-scale CDM project activity only to the renewable component.
5	Combined heat and power (co-generation) systems are not eligible under this category.	Project activities applying combine heat and power will not be included in this PoA.
6	In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	This PoA will not involve capacity addition of renewable energy generation units at an existing renewable power generation facility. Hence this condition is Not Applicable
7	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	This PoA will not involve retrofit or replacement unit and hence this condition is Not Applicable.
8	In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues only or biomass from dedicated plantations complying with the applicability conditions of AM0042.	This PoA will not involve biomass power plant and hence this condition is Not Applicable.
9	In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities; Decision 4/CMP.1) or following the procedures included in the leakage section of AM0042.	This PoA will not involve biomass power plant and hence this condition is Not Applicable.
10	In case the project activity involves the replacement of equipment, and the leakage from the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.	This applicability condition is no more a requirement for PoA's under Type I methodology as concluded in SSC-WG 34 th meeting ⁵ .

SECTION C. Management system

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

⁵Please refer SSC-WG 34th meeting recommendations to the EB and corresponding EB decision http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf and <http://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/63945>



The managing entity SIEA will maintain an electronic database of all the CPAs under the PoA which will include the below details:

- Name of the CPA
 - Implementing entity of the CPA
 - Contact Details of the Implementing entity (Address / Contact person /Phone/e-mail/fax)
 - Technology of the CPA
 - Installed capacity of the CPA
 - Location of the hydropower plant(s) covered under the CPA (GPS coordinates)
 - The record of technical specification of each renewable energy plant participating in the PoA
- (ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA

The electronic database described above will also be used to perform a double accounting check. Every new CPA will be compared to the already existing database and the list of project activities that are under validation or registered at the UNFCCC. Further, the project proponents will be made aware of the double accounting issue and will certify that the proposed CPA is not registered or included under the CDM of the UNFCCC. Should such a case occur then the coordinating entity will not proceed with inclusion of the corresponding CPA in the proposed PoA.

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

The De-bundling check for the CPAs will be carried out according to the *Guidelines on Assessment of De-bundling for SSC Project Activities, Version 3, Annex 13*, EB 54, section II: Guidance for Determining the Occurrence of De-bundling under a Programme of Activities (PoA).

According to the guidelines, for the purposes of registration of a Programme of Activities (PoA), a proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity, which satisfies both conditions (a) and (b) below:

- (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.

The electronic database described above shall be used to determine that a CPA is not a de-bundled component of another CDM project activity. Every new renewable energy power plant included as a CPA will be compared to the already existing database and the list of project activities under-validation or registered at the UNFCCC. Further, the project proponents will be made aware of the de-bundling rules and will certify that the proposed CPA is not a de-bundled part of a project. Should such a case occur then the coordinating entity would not proceed with inclusion of the corresponding CPA in the proposed PoA.

- (iv) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;



In order to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA, the project implementer of a CPA shall enter into a contractual arrangement with the SIEA, the coordinating entity including respective provisions that:

- The CPA has not been and will not be registered as a single CDM project activity or as a CPA under another PoA.
- The project implementer is aware that the CPA will be subscribed to the present PoA.
- The project implementer subscribed under the PoA shall not undertake another renewable energy project under CDM within one kilometre of the proposed CPA. The de-bundling check as mentioned in (iii) above will be met as per the requirements.
- The project implementer in consultation with the managing entity of the present PoA will arrive at an agreement on the rights to claim and own emission reductions.
- The project implementer certifies that the CPA is not registered under the Clean Development Mechanism of the UNFCCC.

SECTION D. Duration of PoA

D.1. Start date of PoA

Date of registration of PoA

D.2. Length of the PoA

28 years

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

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| 1. Environmental Analysis is done at PoA level | 1 |
| 2. Environmental Analysis is done at SSC-CPA level | 1 ü |

Local and focussed impacts of each hydropower project (depending on the location, capacity, and type of construction) justify a separate environmental assessment for each CPA. Environmental analysis will therefore be conducted for each hydropower plant included in a CPA according to the host country applicable environmental policies.

E.2. Analysis of the environmental impacts

The environmental impacts analysis will be done at CPA level.

E.3. Environmental impact assessment

The environmental impacts analysis will be done at CPA level.

SECTION F. Local stakeholder comments

F.1. Solicitation of comments from local stakeholders

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| 1. Local stakeholder consultation is done at PoA level | 1 ü |
| 2. Local stakeholder consultation is done at SSC-CPA level | 1 |

The programme level stakeholder meeting was conducted on October 19, 2012 at the conference room, Ministry of Mines, Energy and Rural Electrification (MMERE), Honiara, Solomon Islands. The stakeholders were invited through specific invitation letters which were sent out prior to the consultation meeting. The meeting was attended by participants consisting of representatives from project developer,



managing entity, representatives from Solomon Islands DNA, concerned government ministries and departments, private sector, community representatives, consultants and NGO's.

MMERE delivered the welcome address and opening remarks and informed the participants about the purpose of the meeting. International CDM consultant provided participants with a detailed overview of CDM procedure and of the proposed small hydro PoA and the progress made till date. An overview on the Auki small hydro project, the first CPA under the PoA was also provided to the participants.

F.2. Summary of comments received

The following questions were asked by the participants during the consultation meeting. MMERE and consultants provided responses to all the issues and concerns raised by the stakeholders.

Question 1. What is the procedure to include a new CPA under a registered PoA?

A CPA can be included in a registered PoA at any time during the duration of the PoA. To include an additional CPA in a registered PoA, the coordinating/managing entity (SIEA) will forward specific CPA for inclusion to a DOE, after ensuring that the CPA is eligible. The DOE will include the CPA in PoA once it meets as UNFCCC requirements. DOE will use dedicated interface on the UNFCCC CDM website for this procedure.

Question 2. Can any organisation become a coordinating/managing entity for a PoA?

There does not appear to be any restrictions on who can be a coordinating/managing entity In case of Programme of Activities (PoA) for Promotion Small Hydro Power in Solomon Islands, SIEA has voluntarily decided to be the coordinating/managing entity.

Question 3. Where is the DNA office in Solomon Islands and what are their roles and responsibilities?

DNA in Solomon Islands is under the Climate Change unit, Ministry of Environment, Climate Change, Disaster Management and Meteorology. The DNA is responsible for the development of national rules for the approval of CDM projects. The responsibilities of DNA general include: issuing Letters of Approval; authorizing private and public entities to participate in the CDM; ensuring all stakeholders have a clear point of contact with regard to national policies and procedures relating to the CDM; developing rules and procedures for approval of CDM projects, including national sustainable development criteria or principles; and reporting on national CDM programmes and providing recommendations on changes or additions to be made to CDM procedures.

Question 4. What is the estimated quantity of CERs from the Auki small hydro project?

The CPA-DD for the Auki small hydro project, which is also the first CPA under the proposed PoA estimates based on the currently available data that the annual emission reductions is around 2470 tCO₂e.

Question 5. Are there any policies being developed for promoting renewable energy and rural electrification in Solomon Islands?

Since approximately 2007, there is a National Energy Policy Framework in place, implemented through the Pacific Islands Energy Policy and Strategic Action Planning (PIEPSAP) project. The National Energy Policy Framework has been endorsed by Cabinet of Solomon Islands Government in 2007.

Question 6. What is the procedure for registering a CPA under a PoA?



Programmatic CDM procedures involve registration at two levels:

- § CDM PoA – At the programme level, the PoA is the organizational and financial framework that provides structure to the effort, and is managed by a coordinating entity
- § CPA – At the programme activity level, the CPA is a single measure or a set of measures to reduce greenhouse gases that is applied to many plants / installations of the same type over a period of time

F.3. Report on consideration of comments received

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The stakeholders were very supportive for the proposed CDM project activity and there were no negative comments and no critical issues were raised for implementing the project.

SECTION G. Approval and authorization

Letter(s) of approval from Party(ies) who wish to be involved in the PoA will be provided at the time of submitting the PoA-DD to the validating DOE.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

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The CPA involves the construction of a [capacity] hydropower plant, which is located on [river] river in [commune] commune, [district] district, [province] province of Solomon Islands. The CPA's installed capacity and estimated annual gross power generation is [XXX] MW and [XXX] MWh. The net electricity generated will be supplied to [name of grid/mini-grid]

[CPA description]

The project's contributions to the sustainable development of the local area as well as the host country are as follows:

[Contributions to sustainable development]

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

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This CPA applies the following baseline and monitoring methodology:

[AMS-I.F. ‘Renewable electricity generation for captive use and mini-grid’⁶ (AMS-I.F., version 02, Sectoral scope: 01, EB 61).

OR

AMS-I.D. ‘Grid connected renewable electricity generation’ (AMS-I.D., version 17, Sectoral scope: 01, EB 60)⁷]

Based on applicable methodology, the following tools referred by the selected methodology will be used:

Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion, Version 01⁸.

Tool to calculate the Emission Factor for an electricity system, Version 02.2.1⁹.

B.2. Application of methodology(ies)

For CPA’s following AMS-I.F. ‘Renewable electricity generation for captive use and mini- grid (AMS-I.F., version 02, Sectoral scope: 01, EB 61).

No	Applicability Criteria as per AMS-I.F. Version 02	Project Scenario
1	This methodology comprises renewable energy generation units, such as solar, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s).	
2	The project activity will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit i.e., in the absence of the project activity, the users would have been supplied electricity from one or more sources listed below: d) A national or a regional grid (grid hereafter); e) Fossil fuel fired captive power plant; f) A carbon intensive mini-grid.	
3	For the purpose of this methodology, a mini-grid is defined as small-scale power system with a total capacity not exceeding 15 MW (i.e., the sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW) which is not connected to a national or a regional grid.	
4	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply	

⁶http://cdm.unfccc.int/filestorage/4/1/J/41JF08WD9MSEB5YLHTZ6KVAPUC7XNQ/EB61_repan18_Revision_%20AMS-I.F_ver02.pdf?t=UFN8bThjNXJyfDax87Tr7qsShjwso533hH7T

⁷http://cdm.unfccc.int/filestorage/V/9/L/V9LRSXKP24Q7YT6HZDUBO3C0ING8AJ.1/EB61_repan17_Revision_A MS-I.D_ver17.pdf?t=cUZ8bThjNXFofDAEJ_l8jY_K1KLrn6Qtg1Fa

⁸<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf>

⁹<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf>



	<p>this methodology:</p> <ul style="list-style-type: none"> · The project activity is implemented in an existing reservoir with no change in the volume of reservoir; · The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; · The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4W/m². 	
5	For biomass power plants, no other biomass other than renewable biomass is to be used in the project plant.	
6	<p>This methodology is applicable for project activities that:</p> <ul style="list-style-type: none"> e) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); f) involve a capacity addition g) involve a retrofit of (an) existing plant(s); or h) involve a replacement of (an) existing plant(s). 	
7	In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	
8	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	
9	If the unit added has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	
10	Combined heat and power (co-generation) systems are not eligible under this category.	
11	If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy	



	will have to be entered that ensures that there is no double counting of emission reductions.	
12	In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues only or biomass from dedicated plantations complying with the applicability conditions of AM0042.	
13	In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities; Decision 4/CMP.1) or following the procedures included in the leakage section of AM0042.	
14	In case the project activity involves the replacement of equipment, and the leakage from the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.	

For CPAs following AMS-I.D. ‘Grid connected renewable electricity generation’ (AMS-I.D., version 17, Sectoral scope: 01, EB 61).

No	Applicability Criteria as per AMS-I.D. Ver. 17	Project Scenario
1	This category comprises renewable energy generation units, such as solar, hydro, tidal/wave, wind, geothermal and renewable biomass c. Supplying electricity to a national or a regional grid; or d. Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling	
2	This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	
3	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply	



	<p>this methodology:</p> <ul style="list-style-type: none"> · The project activity is implemented in an existing reservoir with no change in the volume of reservoir; · The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; · The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4W/m². 	
4	If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	
5	Combined heat and power (co-generation) systems are not eligible under this category.	
6	In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	
7	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	
8	In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues only or biomass from dedicated plantations complying with the applicability conditions of AM0042.	
9	In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities; Decision 4/CMP.1) or following the procedures included in the leakage section of AM0042.	
10	In case the project activity involves the replacement of equipment, and the leakage from the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented.	



	The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.	
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B.3. Sources and GHGs

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the distribution grid that the CPA is connected to.

The emissions and the gases in the project boundary source are:

- In case of AMS-I.F. version 02 - from fossil fuel fired power plants connected to the distribution grid that the CPA is connected to;

In case of AMS-I.D. version 17 - from the generation mix of power plants connected to the national or regional grid

The table below illustrates which emissions sources are included and which are excluded from the project boundary for determination of both baseline and project emissions. The table will be updated accordingly in each CPA-DD.

Source		Gas	Included?	Justification / Explanation
Baseline	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
Project activity	For geothermal power plants, fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	To be decided at CPA level	Main emission source
		CH ₄	To be decided at CPA level	Main emission source
		N ₂ O	No	Minor emission source
	CO ₂ emissions from combustion of fossil fuels for electricity generation	CO ₂	To be decided at CPA level	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
	On-site fossil fuel Consumption	CO ₂	To be decided at CPA level	Main emission source



		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
	For hydro power plants, emissions of CH ₄ from the reservoir	CO ₂	No	Minor emission source
		CH ₄	To be decided at CPA level	Main emission source
		N ₂ O	No	Minor emission source

B.4. Description of baseline scenario

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[Describe the identification of baseline scenario and the relevant emission factor]

B.5. Demonstration of eligibility for a generic CPA

>>

The CPA will be able to apply for inclusion in the PoA as it meets the following criteria:

Sr. No	Eligibility Criteria	Justification
1	The CPA should be a new hydro power plant at a site where there is no other existing renewable energy power project.	
2	The CPA should be located within the geographical boundary of Solomon Islands	
3	The CPA should meet the applicability requirements of all the relevant CDM methodologies – AMS-I.F., version 02, EB 61, AMS-I.D., version 17, EB 60 as determined in section B.3	
4	The CPA should have an installed capacity of ≤ 5 MW	
5	<p>The CPA should supply the renewable electricity generated to the relevant and clearly identified electricity distribution system - national/regional/mini grid. Details on name and type of grid (national/regional/mini) system shall be provided in each CPA-DD.</p> <p>OR</p> <p>The CPA should consist renewable electricity generation units that supply individual households/users or groups of households/users included in the project boundary of the CPA.</p>	
6	In case of project implementer other than SIEA, have a cooperation agreement with SIEA that governs the SSC-CPA's participation in the PoA. The roles and responsibility of the CME and the CPA implementer shall be as defined in the	



	Operational and Management System for this PoA.	
7	The CPA should not result in the construction of new reservoirs or in an increase in the capacity of existing reservoirs where the power density of the power plant is less than 4 W/m ² .	
8	The CPA should demonstrate additionality as described in section B.1 of the PoA-DD.	
9	The CPA should develop a record keeping system for each CPA under the PoA as described in Section C of PoA-DD and Annex 3 of EB 65	
10	The CPA should be have a system/procedure to avoid double accounting as described in Section C of PoA-DD.	
11	Establish procedures for De-bundling check for the CPAs as described in Section C of PoA-DD.	
12	Develop provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA.	
13	The CPA should have a start date after the commencement of PoA validation	
14	The CPA should conduct local stakeholder consultation at CPA level.	
15	The CPA implementer should confirm that funding from Annex I parties, if any, do not result in a diversion of official development assistance.	
16	The CPA implementer should confirm that the technology will not be substituted within the project period (Declaration from the CPA implementer)	

[Describe the CPA eligibility as per section B.1 of the PoA-DD and as per the “Guidelines for demonstrating additionality of Micro-scale project activities” EB 68 (version 4)]

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

B.6.1. Explanation of methodological choices

The methodological choice explained below is for a run-of river hydro project using AMS-I.F. ‘Renewable electricity generation for captive use and mini-grid’ (AMS-I.F., version 02, Sectoral scope: 01, EB 61).

The baseline scenario assumed is diesel based electricity generation.

The procedure for calculating baseline emissions is as discussed below:

Baseline Emissions

Baseline scenario: Displacement of electricity from mini-grids comprising of exclusively fuel oil/or diesel fuel based generation.

As per AMS-I.F. version 02, paragraph 13:



‘For a mini-grid system where all generators use exclusively fuel oil and/or diesel fuel, the baseline emissions is the annual electricity generated by the renewable energy unit times an emission factor for a modern diesel generating unit of the relevant capacity operating at optimal load as given in Table I.F.1’.

As the CPAs involves displacement of electricity from mini-grids comprising of exclusively fuel oil/or diesel fuel based generation will adopt the above baseline scenario.

Project emissions (PE_y)

The following project emissions have been considered for this CPA

- a) Emissions from Hydro Power project
- b) CO₂ emissions from on –site consumption of fossil fuel
- c) CO₂ emissions from electricity consumption by the project activity

a) Emissions from Hydro Power project

For hydro power CPAs that result in new reservoirs and/or the increase of existing reservoirs, the power density (PD) of the CPA shall be calculated as per ACM0002, version 12.2.2, as follows:

$$PD = Cap_{PJ} / A_{PJ}$$

Where¹⁰:

PD	Power density of the CPA, in W/m ² .
Cap_{PJ}	Installed capacity of the hydro power plant after the implementation of the CPA (W).
A_{PJ}	Area of the reservoir measured in the surface of the water, after the implementation of the CPA, when the reservoir is full (m ²).

If the PD is greater than 4 W/m² and less than or equal to 10 W/m²:

$$PE_y = EF_{Res} * TEG_y / 1000$$

Where:

PE_y	Emission from reservoir expressed as tCO ₂ e/yr
EF_{Res}	default emission factor for emissions from reservoirs
TEG_y	Total electricity produced by the CPA, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh).

If PD is greater than 10 W/m², then: $PE_y = 0$

The project is a run-of-river project. Hence emissions from reservoir are zero.

b) CO₂ emissions from on-site consumption of fossil fuel

For CPA’s involving on-site consumption of fossil fuels, CO₂ emissions due to the project activity will be calculated using the latest version of the “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion”

As per “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion”(Version 2) CO₂ emissions from fossil fuel combustion in process j are calculated based on the quantity of fuels combusted and the CO₂ emission coefficient of those fuels, as follows:

¹⁰Since the eligibility requirements admit only Greenfield hydropower projects the parameters Cap_{bl} and A_{bl} defined in version 12.2.0 of ACM0002 are set equal to zero.



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

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

The CO₂ emission coefficient $COEF_{i,y}$ will be calculated as per option B below.

Option B: The CO₂ emission coefficient $COEF_{i,y}$ is calculated based on net calorific value and CO₂ emission factor of the fuel type *i*, as follows:

$$COEF_{i,y} = NCV_{i,y} * EF_{CO_2,i,y}$$

Where:

$COEF_{i,y}$	=	Is the CO ₂ emission coefficient of fuel type <i>i</i> (tCO ₂ /mass or volume unit);
$NCV_{i,y}$	=	Is the weighted average net calorific value of the fuel type <i>i</i> in year <i>y</i> (GJ/mass or volume unit)
$EF_{CO_2,i,y}$	=	Is the weighted average CO ₂ emission factor of fuel type <i>i</i> in year <i>y</i> (tCO ₂ /GJ)
<i>i</i>	=	Are the fuel types combusted in process <i>j</i> during the year <i>y</i>

For ex-ante calculation it has been assumed that project emissions due to on-site fossil fuel consumption is assumed to be zero.

c) CO₂ emissions from electricity consumption by the project activity

In case of plant maintenance/shut down, if electricity is imported from the grid relevant project emissions will be calculated as per the “*Tool to calculate baseline, project and/or leakage emissions from electricity consumption*” Version 1.

As per the “*Tool to calculate baseline, project and/or leakage emissions from electricity consumption*”

The tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption:

Scenarios	Applicability
Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only. Either no captive power plant is installed at the site of electricity consumption or, if any onsite captive power plant exists, it is not operating or it can physically not provide electricity to the source of electricity consumption.	Not Applicable as the electricity will be consumed from captive power plant installed at site
Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants are installed at the site of the electricity consumption source and supply the source with electricity. The captive power plant(s) is/are not connected to the electricity grid.	Applicable. In case of exigencies/maintenance/plant shut down the electricity will be consumed from DG Set installed at site
Scenario C: Electricity consumption from the grid and (a)	Not Applicable as the electricity will

<p>fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumption source. The captive power plant(s) can provide electricity to the electricity consumption source. The captive power plant(s) is/are also connected to the electricity grid.</p>	<p>be consumed from captive power plant installed at site which is not connected to grid.</p>
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As per the tool, project emissions from consumption of electricity are calculated based on the quantity of electricity consumed, an emission factor for electricity generation and a factor to account for transmission losses, as follows:

$$PE_{EC,y} = \sum_j EC_{P,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$$

Where;

- PE_{EC,y} = Project emissions from electricity consumption in year y (tCO₂/yr)
- EC_{P,j,y} = Quantity of electricity consumed by the project electricity consumption source *j* in year y (MWh/yr)
- EF_{EL,j,y} = Emission factor for electricity generation for source *j* in year y (tCO₂/MWh)
- TDL_{j,y} = Average technical transmission and distribution losses for providing electricity to source *j* in year y

The emission factor is calculated as per Option B1 of the tool.

$$EF_{EL,j/k/l,y} = \frac{\sum_n \sum_i FC_{n,i,t} \times NCV_{i,t} \times EF_{CO_2,i,t}}{\sum_n EG_{n,t}}$$

Where:

- EF_{EL,j/k/l,y} = Emission factor for electricity generation for source *j, k* or *l* in year *y* (tCO₂/MWh)
- FC_{n,i,t} = Quantity of fossil fuel type *i* fired in the captive power plant *n* in the time period *t* (mass or volume unit)
- NCV_{i,t} = Average net calorific value of fossil fuel type *i* used in the period *t* (GJ / mass or volume unit)
- EF_{CO₂,i,t} = Average CO₂ emission factor of fossil fuel type *i* used in the period *t* (tCO₂ / GJ)
- EG_{n,t} = Quantity of electricity generated in captive power plant *n* in the time period *t* (MWh)
- i* = the fossil fuel types fired in captive power plant *n* in the time period *t*
- j* = Sources of electricity consumption in the project
- k* = Sources of electricity consumption in the baseline
- l* = Leakage sources of electricity consumption
- n* = Fossil fuel fired captive power plants installed at the site of the electricity consumption source *j, k* or *l*
- t* = Time period for which the emission factor for electricity generation is determined

For ex-ante calculation it has been assumed that project emissions due to electricity consumption from on-site DG set is assumed to be zero.

Leakage (Ly)

For CPA's not transferring energy generating equipment from another activity, the leakage is considered as zero.

Emission reductions (ER_y)

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - L_y$$

Where:

ER_y Emission reductions in year y (tCO₂e/yr).

BE_y Baseline emissions in year y (tCO₂e/yr)

PE_y Project emissions in year y (tCO₂/yr).

L_y Leakage emissions in year y (tCO₂/yr).

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

(Copy this table for each data and parameter.)

Data / Parameter	EF _{CO₂,mini-grid}
Unit	tCO ₂ e/MWh
Description	Emission factor of the mini-grid where the hydropower is exporting (or would have exported) its electricity to.
Source of data	As per AMS-I.F., version 2, Table I F.1
Value(s) applied	0.8 (ex-ante)
Choice of data or Measurement methods and procedures	Default values for diesel generator systems as per AMS-I.F., version 1, Table I F.1
Purpose of data	Calculate baseline emissions
Additional comment	

B.6.3. Ex-ante calculations of emission reductions

The total emission reductions of the CPA are calculated on the basis of the equations and parameters presented and explained in AMS-I.F., version 02.

In case of the [Name of project] (CPA), emission reductions are calculated as discussed below -

The CPA involves electricity supply to mini-grid and the baseline scenario is **Displacement of electricity from mini-grids comprising of exclusively fuel oil/or diesel fuel based generation**

As per AMS-I.F., version 02, paragraph 13:

'For a mini-grid system where all generators use exclusively fuel oil and/or diesel fuel, the baseline emissions is the annual electricity generated by the renewable energy unit times an emission factor for a modern diesel generating unit of the relevant capacity operating at optimal load as given in Table I.F.1'.

Baseline emissions (BE_y)



Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

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

Where:

BE_y = Baseline Emissions in year y (tCO₂)

EG_{BL, y} = Quantity of net electricity displaced as a result of the implementation of the CDM project activity in year y (MWh) 11,686 (Year 1)

EF_{CO₂, mini grid} = Emission factor (tCO₂/MWh) 0.8 tCO₂/MWh as suggested in Table 1.F.1 of AMS-I.F., version 02.

$$BE_y = [\text{net electricity supplied}] \times 0.8 = \text{XX,XXX tCO}_2\text{e}$$

Installed Capacity	XX	MW	As per Project Feasibility Study Report
Estimated Gross annual electricity Generation	XXX	MWh	As per Project Feasibility Study Report
Station & Line losses (8%)	XXX	MWh	As per Project Feasibility Study Report
Estimated Net annual electricity Generation (EG _{BL,y})	XXX	MWh	Calculated
Emission Factor for Diesel Generation System	0.8	kgCO ₂ e/kWh	As per AMS-I.F., Table I.F.1
Baseline Emissions	X,XXX	tCO₂e/year	

Project emissions (PE_y)

In case of [Name of project] CPA, the potential sources of project emissions are:

1. Emission from hydro power project.
2. Emissions due to electricity consumption

1. Emissions from Hydro Power project

The CPA is a run - of river project and does not involve any large reservoir development. Hence project emissions due to reservoir are zero.

2. CO₂ emissions from electricity consumption by the project activity

As mentioned in above for ex-ante calculation it has been assumed that project emissions due to electricity consumption from on-site DG set is assumed to be zero.

Hence, PE_y = 0

Leakage (L_y)

[Name of project] CPA is not transferring energy generating equipment from another activity. Hence, the leakage is considered as zero, L_y = 0

**Emission reductions (*ER_y*)**

Emission reductions are calculated as follows:

$$\begin{aligned}
 ER_y &= BE_y - PE_y - L_y \\
 &= \mathbf{X,XXX} - 0 - 0 \text{ (tCO}_2\text{e)} \\
 &= \mathbf{X,XXX} \text{ tCO}_2\text{e}
 \end{aligned}$$

B.7. Application of the monitoring methodology and description of the monitoring plan**B.7.1. Data and parameters to be monitored by each generic CPA**

Data / Parameter	EG _{BL,y}
Unit	MWh/y
Description	Quantity of net electricity displaced in year y
Source of data	Measured by energy meter(s)
Value(s) applied	XX,XXX
Measurement methods and procedures	Continuous monitoring by at least 0.5 class accuracy meter integrated hourly and recorded monthly and yearly. Data archiving would be done both electronically and on paper records. The Data will be stored for at least 2 years after last crediting period
Monitoring frequency	Continuous monitoring
QA/QC procedures	If applicable, measurement results will be cross checked with records for sold/purchased electricity (e.g., invoices/receipts). Measuring equipment will be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years.
Purpose of data	Baseline emissions
Additional comments	-



Data / Parameter	$EC_{PJ,j,y}$
Unit	MWh/yr
Description	Quantity of electricity consumed by the project electricity consumption source j in year y
Source of data	Electric meter readings located at the project site
Value(s) applied	X
Measurement methods and procedures	Continuous monitoring by at least 0.5 class accuracy meter integrated hourly and recorded monthly and yearly. Data archiving would be done both electronically and on paper records.
Monitoring frequency	Continuous monitoring
QA/QC procedures	Measuring equipment will be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years. Data will be stored for at least 2 years after last crediting period.
Purpose of data	Project emissions
Additional comment	-

Data / Parameter	$TDL_{j,y}$
Unit	-
Description	Average technical transmission and distribution losses for providing electricity to source j in year y
Source of data	As per the Tool to calculate baseline, project and/or leakage emissions from electricity consumption this value is zero for Scenario B
Value(s) applied	X
Measurement methods and procedures	Not Applicable
Monitoring frequency	Not Applicable
QA/QC procedures	-
Purpose of data	To calculate relevant project emissions
Additional comment	



Data / Parameter	$FC_{i,j,y}$
Unit	Mass or volume unit/y
Description	Quantity of fossil fuel type <i>i</i> (diesel) fired in the captive power plant (<i>j</i>) in the year <i>y</i>
Source of data	On-site measurements
Value(s) applied	0
Measurement methods and procedures	<p>As small tanks will be used, rulers will be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge will be calibrated at least once a year and have a book of control for recording the measurements.</p> <p>Data archiving would be done both electronically and on paper records The Data will be stored for at least 2 years after last crediting period.</p>
Monitoring frequency	Daily basis
QA/QC procedures	<p>Measuring equipment will be calibrated annually at appropriate intervals according to manufacturer specifications.</p> <p>The consistency of measured fuel consumption quantities will be cross-checked by an annual energy balance that is based on purchased quantities and stock change. The calibrations would be done as per manufacturer's specifications.</p>
Purpose of data	To calculate relevant project emissions
Additional comment	-



Data / Parameter	NCV_i
Unit	GJ/tonne
Description	Average net calorific value of fossil fuel type <i>i</i> (diesel) used in the period <i>t</i>
Source of data	The following data sources to be used <ul style="list-style-type: none"> a) Supplier data b) If <i>a</i>) is not available, measurement by PP c) If <i>a</i>) is not available, regional or national default values will be taken for liquid fuels d) If <i>a</i>) is not available, IPCC default values at the upper limit of the uncertainty at a 95% confidence interval.
Value(s) applied	43.3 (IPCC default value)
Measurement methods and procedures	For (a) and (b) Measurements to be undertaken in line with national or international fuel standards and at each fuel delivery. In case of (c), appropriateness of the values will be reviewed annually. In case of (d), any revisions of the IPCC Guidelines will be taken into account. Data archiving would be done both electronically and on paper records. The Data will be stored for at least 2 years after last crediting period.
Monitoring frequency	For a) and b) - Each fuel delivery For c) – annually For d) – as per revisions of the IPCC Guidelines
QA/QC procedures	Verify if the values under a), b) and c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in a), b) or c) should have ISO17025 accreditation or justify that they can comply with similar quality standards.
Purpose of data	To calculate relevant project emissions
Additional comment	-



Data / Parameter	EF _{CO₂i,y}
Unit	tCO ₂ /GJ
Description	CO ₂ emission factor of fossil fuel type <i>i</i> used in the period <i>t</i>
Source of data	The following data sources to be used <ul style="list-style-type: none"> a) Supplier data b) If a) is not available, measurement by PP c) If a) is not available, regional or national default values will be taken for liquid fuels d) If a) is not available, IPCC default values at the upper limit of the uncertainty at a 95% confidence interval.
Value(s) applied	Diesel - 0.0748 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, table 1.4 (Upper limit of the uncertainty at a 95% confidence interval)
Measurement methods and procedures	For a) and b): The CO ₂ emission factor should be obtained for each fuel delivery, from which weighted average values for the period <i>t</i> should be calculated In case of c), appropriateness of the values will be reviewed annually. In case of d), any revisions of the IPCC Guidelines will be taken into account. Data archiving would be done both electronically and on paper records. The Data will be stored for at least 2 years after last crediting period.
Monitoring frequency	For a) and b) - Each fuel delivery For c) – annually For d) – as per revisions of the IPCC Guidelines
QA/QC procedures	For a) and b): Measurements should be undertaken in line with national or international fuel standards. For a): If the fuel supplier does provide the NCV value and the CO ₂ emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO ₂ factor should be used. If another source for the CO ₂ emission factor is used or no CO ₂ emission factor is provided, options b), c) or d) should be used.
Purpose of data	To calculate relevant project emissions
Additional comment	-

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

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The monitoring plan is described below:

Monitoring Plan Objective and Organisation

The project entity and the project participant, as defined in each CPA, will monitor the net electricity delivered by the respective project. The data will be archived electronically and be stored for 2 years after the end of the crediting period of each CPA. To ensure that the data is reliable and transparent, the project entity will also establish Quality Assurance and Quality Control (QA & QC) measures to effectively control and manage data reading, recording, auditing as well as archiving data and all relevant documents.

*Monitoring Data*

Data to be monitored is the electricity delivered by the project. The electricity delivered will be monitored, as further detailed in each CPA. The entity responsible for monitoring as detailed in the specific CPA-DD will provide SIEA with meter readings for electricity delivered and calibration certificates of the meters.

Project meter will be calibrated as required by the manufacturer's and/or grid operator's instructions. SIEA will subsequently provide the verifying DOE with the data from all CPAs.

Quality Assurance and Quality Control

The installation location of the meters will be detailed in the specific CPA-DD. The project entity will implement QA&QC measures to calibrate and guarantee the accuracy of metering and safety of project operation. The metering devices will be calibrated and inspected properly and periodically, according to manufactures' specifications, to ensure their accuracy.

[XXXXX]

Verification of Monitoring Results

The responsibilities for verification of the projects are defined in each specific CPA-DD. The specific CPA-DD also defines the responsibility for providing the DOE with all required necessary information, before, during and in the event of queries, after the verification.

[XXXXX]

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

Organization	Solomon Islands Electricity Authority
Street/ P.O. Box	P.O. Box 6
Building	
City	Honiara
State/Region	
Postcode	
Country	Solomon Islands
Telephone	+677 39442
Fax	+677 39472
E-mail	martin.sam@siea.com.sb
Website	http://www.siea.com.sb/
Contact person	
Title	Chief Engineer
Salutation	Mr
Last name	Sam
Middle name	
First name	Martin
Department	
Mobile	
Direct fax	
Direct tel.	+677.7495170
Personal e-mail	

Appendix 2: Affirmation regarding public funding

The Project does not receive any public funding and do not have any diversion of ODA.

Appendix 3: Application of methodology(ies)

The applicability of selected methodology for the project has been described in D.2 above.

Appendix 4: Further background information on ex ante calculation of emission reductions**Appendix 5: Further background information on the monitoring plan**

The monitoring plan has been discussed in section D.7.2 above

**History of the document**

Version	Date	Nature of revision(s)
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for CDM programmes of activities" (EB 66, Annex 12).
01	EB33, Annex41 27 July 2007	Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Registration		