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

CONTENTS

Annexes

NOTE:

(i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.

(ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

SECTION A. General description of small-scale programme of activities (PoA)

A.1 Title of the small-scale programme of activities (PoA):

Sustainable Small Hydropower Programme of Activities (PoA) in Indonesia

Version 1
Date: December 14, 2009

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

1. General operating and implementing framework of PoA

The "Sustainable Small Hydropower Programme of Activities (PoA) in Indonesia", later on referred to as "The Sustainable Indonesian Hydro PoA or the SSC-PoA", will support the development of new small-scale grid connected hydropower plants across the Republic of Indonesia. The SSC-PoA supports hydropower plants delivering energy to the main grids but also to small isolated grids in the context of rural electrification. Each small-scale CDM Program Activity (referred later on as SSC-CPA) under this SSC-PoA will comprise one or more such hydropower plants and have a combined installed capacity of no more than 15 MW - the threshold for small-scale CDM projects. The Sustainable Indonesian Hydro PoA is a voluntary action being coordinated and managed by PT. Hydro Program International (referred later on as PT. HPI or the coordinating entity), the coordinating entity. PT. HPI will work closely with the developers of the hydropower plants and other organizations active in the hydropower sector in Indonesia[1] to facilitate the development of new power plants and their inclusion in this SSC-PoA.

2. Policy/measure or stated goal of the PoA

This SSC-PoA is motivated by the paradoxical situation of the hydropower industry in Indonesia. In spite of abundant hydropower resources, hydropower contributes only a small share to Indonesia's power generation. According to the Hydro Power Potential Study[2] conducted by PLN in 1982, the total potential capacity of hydropower resources in Indonesia is 75,000 MW. Yet, in 2008 the country had installed a total of 3,504 MW hydropower capacity, which represents a mere 4.7% of the technical potential and only 7.2% of the total Indonesian electricity generation capacity[3]. In response, the Indonesian government through the Ministry of Energy and Mineral Resources obliges the State-Owned Electricity Company (referred to as PT. PLN) to buy electricity generated from renewable energy sources with an installed capacity lower than 10 MW[4], but this incentive has not been sufficient to kick-start the hydropower industry in Indonesia. As a result, the development of new hydropower plants remains slow and lags besides its huge potential sources. As a vivid illustration of these constraints, the contribution of

[1] Such partners include the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and the Foundation of Indonesian Institute for Energy Economics (referred as IIEE).

[2] National Generation Development Plan year 2009-2018 (Rencana Usaha Penyediaan Tenaga Listrik PT. PLN (Persero) tahun 2009 s.d. 2018), p. 82.

[3] http://www.pln.co.id/laporantahunan2008/index.htm, p.72-73, retrieved on November 5, 2009.

[4] Ministerial Regulation of Ministry of Energy and Mineral Resources No. 05 year 2009 about The Guidance of Electricity Purchase Price by PT. PLN for Cooperative or Other Public/Private Entities (http://www.djlpe.esdm.go.id/modules/_website/files/37/File/permen-esdm-05-2009.pdf, retrieved on October 23, 2009), p. 3

hydropower towards the Indonesian energy mix has been falling steadily; from 13% in 1998[5] to 7.2% in 2008[6].

The objective of the Sustainable Indonesian Hydro PoA is to develop a platform for supporting the development of sustainable small hydropower projects in Indonesia. To reach this goal PT.HPI will provide the following services:

- raise awareness among local stakeholders of climate change and hydropower. To ensure maximum stakeholder involvement, SSC-CPAs will be developed according to the Gold Standard requirements and will include significant public education and consultation components.
- raise awareness among Indonesian hydropower developers of opportunities for generating CDM revenues. To this end the coordinating entity, in collaboration with the Deutsche Gesellschaft für Technische Zusammenarbeit (referred as GTZ) and the Foundation of Indonesian Institute for Energy Economics (referred as IIEE), will conduct capacity building sessions across the country that explain the CDM and support entrepreneurs in integrating CDM into their hydropower projects in order to improve the financial viability of such projects.
- provide standardized and streamlined access to CDM services for the hydropower projects in Indonesia, including the smallest ones that otherwise would not be able to generate into CDM revenues. To this end PT. HPI will coordinate the inclusion of the CPA in the PoA; conduct the registration of the SSC-CPA as a Gold Standard activity (if applicable); provide monitoring and verification services to all SSC-CPAs; and support the effective commercialization of CERs. Over time additional services will be added to support the effective development of the hydropower sector across Indonesia.

In this way the Sustainable Indonesia Hydro PoA will promote the development of renewable energy and facilitate the abatement of greenhouse gas emissions through replacement of fossil fuel based electricity.

The Sustainable Indonesian Hydro PoA contributes to the sustainable development of Indonesia, as determined by the sustainable development criteria of Indonesia[7].

Environmental sustainability

- The SSC-PoA encourages hydropower utilization to generate electricity, which otherwise would have been generated through power plants using most likely fossil fuels, thereby reducing associated emissions of local pollutant and greenhouse gases.
- As a hydropower project activity, each SSC-CPA uses a renewable energy source and does not produce any solid waste, which in turn reduces the problem of solid waste disposal encountered by most other power sources.
- Being a renewable energy source, hydropower used to generate electricity contributes to resource conservation.
- The eligibility criterion of SSC-CPAs having a capacity of less then 15 MW assures least impact to the environment. Providing carbon finance for such small-hydro power facilities will enhance their profitability towards alternative not sustainable electricity production alternatives.
  In summary, the SSC-PoA causes no negative impact on the surrounding environment; in the end it contributes to environmental well being within the Indonesian regions.

[5] http://www.pln.co.id/investor/files/PLN's%20Annual%20Report%202002.pdf, p. 39, retrieved on October 23, 2009

[6] http://www.pln.co.id/laporantahunan2008/index.htm, p. 72, retrieved on October 23, 2009.

[7] Indonesian DNA website, http://dna-cdm.menlh.go.id/en/susdev/, retrieved on October 10th, 2008

Economic sustainability

- The SSC-PoA increases employment opportunities in the area where the SSC-CPA is located, which will increase local communities' income.
- By generating additional electricity, the SSC-PoA enhances the local investment and business environment, and thereby improves the local economy.
- The SSC-PoA diversifies the sources of electricity generation, important for meeting growing energy demands and the transition away from diesel and coal-supplied electricity generation.
- By only allowing small-hydros, the SSC-PoA helps market players with few capital resources to realise their renewable energy projects which otherwise wouldn't have been able to invest due to too low profitability of such project.
- The decentralised electricity production through the SSC-PoA will help to enhance the grid stability and therefore decrease the regular electricity interruptions.

Social sustainability

- The SSC-PoA supports the development of hydropower resources in remote parts of the country will otherwise not be served by electricity grids, thereby providing access to power for populations that are socially disadvantaged.
- During civil works, the SSC-CPA is expected to generate considerable employment opportunities for the local population.
- Moreover, the SSC-PoA will generate demand for various kinds of mechanical work, which would generate employment on regular and permanent basis.

Technology sustainability

- The SSC-PoA supports technology and know-how transfer from other regions or even other countries through trainings and practical works.
- The SSC-PoA generates demand for local products when spare parts are needed.

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

The Sustainable Indonesian Hydro PoA is a voluntary action being coordinated and managed by PT.HPI. There are no mandatory laws or regulations in place in Indonesia that require hydropower plants to seek CDM services. Likewise, no mandatory laws or regulations exist requiring the coordinating/managing entity or any other party to develop an SSC-PoA for hydropower plants in Indonesia.

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

1. PT. HPI[8] will be the Coordinating/Managing Entity[9] for the project activities under the Programme of Activities (PoA) and communicate with the CDM Executive Board.
2. Project participants being registered in relation to the proposed SSC-PoA are:

Name of Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants	Kindly indicate if the Party involved wishes to be considered

[8] Also referred to "coordinating entity".

[9] The Coordinating/Managing Entity shall be a project participant authorized by all participating host country DNAs involved and identified in the modalities of communication as the entity which communicates with the Executive Board, including on matters relating to the distribution of CERs.

	(as applicable)	as project participant (Yes/No)
Indonesia (host)	PT. Hydro Program International (PT. HPI)	No
Switzerland	South Pole Carbon Asset Management Ltd.	No

Project participants may or may not be involved in the SSC-CPAs included in this SSC-PoA.

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

A.4.1. Location of the programme of activities:

A.4.1.1. Host Party(ies):

Republic of Indonesia

A.4.1.2. Physical/ Geographical boundary:

The Sustainable Indonesian Hydro PoA will be developed within the territory of the Republic of Indonesia.

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

A typical SSC-CPA under this PoA comprises one or more small hydropower plants with an installed capacity not exceeding 15MW. The hydropower plants are newly constructed by one or more third-party project owners and generate electricity from hydropower. As outlined in Section A.4.2.2, a CPA participating in this PoA must not comprise an addition, retrofit or replacement activity in an existing hydro power plant.

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

The technologies employed in each CPA may differ from one SSC-CPA to the next, and may comprise *inter alia* barrages, diversion tunnels, fore bays, spillways, pressure pipes, powerhouses, and booster stations. SSC-CPAs will transmit the generated electricity to a grid.

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

An SSC-CPA to be included in the proposed SSC-PoA shall:

i. be a hydropower plant generating electricity.
ii. comply with all eligibility requirements defined in AMS I.D. v15.
iii. not be a capacity addition/retrofit/replacement activity at an existing hydropower plant.
iv. export the renewable electricity generated to the relevant and clearly identified grid within the geographical boundary of Indonesia.
v. have a cooperation agreement with PT. HPI that governs the SSC-CPA's participation in the Sustainable Indonesian Hydro PoA.
vi. 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.

vii. consist of one or more hydropower projects. The proposed projects can only be bundled in one SSC-CPA if they share some equipment (e.g. sub-station, connection line, power house) and are undertaken by the same project implementer, or if each constituent of the SSC-CPA is below 150 kW (1% of the type 1 small-scale threshold).

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

(i) The proposed PoA is a voluntary coordinated action

The proposed SSC-PoA is a voluntary and coordinated action, which will develop capacity in the hydropower sector; coordinate small hydropower plants in Indonesia to adopt more sustainable practices and seek for carbon finance services; and promote the consultation of local stakeholders. In doing so, the SSC-PoA will encourage renewable energy electricity generation in the country. There are no mandatory laws or regulations in Indonesia stipulating to have recourse to CDM to develop hydropower facilities.

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

In the absence of the proposed SSC-PoA, the voluntary coordinated actions outlined above will not be implemented. The only income to be generated by hydropower projects would be the electricity sales. Meanwhile the continuation of the baseline situation would require no investments on the part of the project owner and would not face any barriers. As a result, in the absence of the capacity development and streamlined CDM services proposed under the proposed SSC-PoA, incentives would remain at an insufficient level to undertake the investments into setting up new plants and the total number of CDM Indonesian hydropower projects is hence expected to remain far below potential[10].

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 PPs choose to demonstrate the additionality at SSC-CPA level by showing that the SSC-CPAs cannot be implemented in the absence of this PoA because of financial as can be seen in section E.5.2 of this SSC-PoA-DD. In view of the heterogeneity across hydropower projects in Indonesia the additionality at SSC-CPA level is more appropriate than demonstrating the additionality at PoA level. Indeed, the demonstration of financial barriers will guarantee that every SSC-CPA included at any point in time in the PoA would not have occurred in the absence of receiving the benefits from generating carbon credits.

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

Not applicable, the proposed SSC-PoA itself is a stated goal without any mandatory policy/regulation in Indonesia.

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

Not applicable

[10] At the start of validation of the proposed SSC-PoA, there is no Indonesian hydropower project that had been registered by the CDM Executive Board.

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

A.4.4.1. Operational and management plan:

The proposed SSC-PoA involves a range of operational activities in order to implement and manage each SSC-CPA by the coordinating entity PT. HPI and SSC-CPA owner (or the project implementer) within the Sustainable Indonesian Hydro PoA.

Entity	Management Responsibilities and Arrangements
PT. HPI (the coordinating entity)	• Maintain existing relationship with the project implementers (e.g. conduct training for data monitoring). • Periodically collect monitoring data. • Prepare monitoring reports for emission reduction verification.
Project implementer	• Implement hydropower plant project activity (construction, daily operation, and maintenance of hydropower plant). • Prepare monitoring data.

In addition to the above management tasks, PT. HPI will implement the following operational elements to ensure proper management and oversight of the proposed SSC-PoA.

(i) A record keeping system for each SSC-CPA under the PoA
In order to unambiguously identify hydropower plant participating in the SSC-PoA a serial numbering system will be implemented that uniquely identify each hydropower plant through numbers for the SSC-CPA and the hydropower facility. This serial numbering system will be used to record baseline and monitoring data on a continuous basis using an Excel database. In this way, the SSC-PoA coordinating entity will be able to track the emission reduction of each hydropower plant over the full duration of the crediting period.

In summary, PT. HPI will record and document SSC-CPA detail information as follows:

- Name of the SSC-CPA and its installed capacity
- The name, address, and project owner details of each participating SSC-CPA
- The geographical coordinates of each SSC-CPA (GPS coordinates of the power house)
- The record of technical specification of each hydropower plant participating in the SSC-PoA

PT. HPI will be responsible for the management of records and data associated with each SSC-CPA. The Excel database will be updated manually using the data supplied by the participating hydropower plants. It will form the basis for the verification of SSC-CPAs and be available for inspection by the DOE at any point in time.

(ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new SSC-CPA that has been already registered either as a CDM project activity or as a CPA of another PoA,

The database described above will be used to perform a double accounting check. Every new SSC-CPA will be compared to the already existing database and the list of project activities that are under validation or registered at the UNFCCC. Moreover as shown below, the project implementers will be made aware of

the double accounting principle and will certify that the proposed SSC-CPA is registered under the Clean Development Mechanism of the UNFCCC or any voluntary scheme. Should such a case occur then the coordinating entity will not proceed with inclusion of the corresponding SSC-CPA in the proposed SSC-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.

As per *Guidelines on Assessment of De-bundling for SSC Project Activities* issued on the EB's 47th meeting, hydropower projects with a size greater than 150 kW will perform the de-bundling check. The database described above will be used to perform the de-bundling check. Every new hydropower plant above the 150 kW included as an SSC- CPA will be compared to the already existing database and the list of project activities under-validation or registered at the UNFCCC. Moreover as shown below, the project implementers will be made aware of the de-bundling rules and will certify that the proposed SSC-CPA is not a de-bundled part of a bigger hydropower project. Should such a case occur then the coordinating entity would not proceed with inclusion of the corresponding SSC-CPA in the proposed SSC-PoA.

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

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

- The SSC-CPA has not been and will not be registered as a single CDM project activity nor as a CPA under another PoA.
- The project implementer is aware that the SSC-CPA will be subscribed to the present PoA.
- The project implementer (has not) is not (and will not) undertaking another hydropower project within one kilometre of the proposed CPA[11].
- The project implementer cedes its rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC or any voluntary scheme to the managing entity of the present SSC-PoA.
- The project implementer certifies that the SSC-CPA is not registered under the Clean Development Mechanism of the UNFCCC or any voluntary scheme.

A.4.4.2. Monitoring plan:

One of the great benefits of the PoA modalities is to reduce the transaction costs of CDM through sampling procedures for verification. Such sampling procedures are particularly important for this SSC-PoA since it plans to include a large number of very small hydro projects. The coordinating entity will therefore implement a sampling procedure to be used by the DOE during verification. However the coordinating entity wants to keep the option to verify individually some SSC-CPAs. The coordinating entity will submitSSC- CPAs for verification by the DOE pursuant to the sequence described below:

1- The coordinating entity will continuously update a list of all SSC-CPAs indicating whether they wish to be sampled or verified individually

[11] Only for hydro plants with capacity above the 150kW threshold

2- The coordinating entity collects the monitoring information for all SSC-CPAs that will be verified and prepares one monitoring report.
3- The DOE performs a desk review of all SSC-CPAs (sampled and individually verified).
4- The DOE determines the SSC-CPAs that belong to the samples
5- The DOE performs the on-site assessments of the SSC-CPAs belonging to the samples and of all individually verified SSC-CPAs.
6- The DOE computes total verified emission reductions by the SSC-PoA

1- Maintenance of a list of verification procedures to be applied to each SSC-CPA

The coordinating entity will develop and continuously update a list of SSC-CPAs that indicates whether an SSC-CPA would like to be individually verified or make use of the sampling modality for verification described below.

2- Collection of monitored parameters and elaboration of the monitoring plan

The monitoring report will compile all required monitoring information for all SSC-CPAs (sampled and individually verified) that will be verified by the DOE. This report will unambiguously set out the data relating to the emission reductions generated by each specific SSC-CPA during the monitoring period consistent with the requirements of this SSC-PoA-DD and the corresponding SSC-CPA-DD.

The monitoring plan for parameters included in section E.7.1 will be implemented for each SSC-CPA with assistance from the coordinating entity as follows:

- SSC-CPA owner will implement each SSC-CPA individually and monitor and record all parameters included in section E.7.1.
- The coordinating entity will provide guidance to SSC-CPA owner on how monitoring should be conducted and data should be collected in regards to emission reductions calculation.
- The SSC-CPA owners will provide data on monitored parameters included in section E.7.1 to the coordinating entity.
- The coordinating entity will document and store all parameters included in section E.7.1 provided by SSC-CPA owners in an electronic database, while primary data will be stored by SSC-CPA owner
- The coordinating entity review relevant monitoring documents, prepare the monitoring report, and provide the latter to the DOE.

3- Desk review

The DOE performs a desk review of the monitoring information of all SSC-CPAs (sampled and individually verified) as per procedures determined by the CDM Validation and Verification Manual.

At the end of the desk review the coordinating entity shall provide an updated monitoring report elaborated in light of the DOE findings. The DOE approves the final monitoring report provided by the coordinating entity and certifies that (i) the list and type of data collected and provided within the monitoring report is consistent with the monitoring plan of each SSC-CPA (ii) ERs are estimated as described in this SSC-PoA-DD and the respective SSC-CPA-DD and are not miscalculated.

4-Determination of samples

The sampling method is a risk-based approach by which projects with a similar risk profile are included in a sampling category. For each sampling category a sample will be determined as described further below. The selection of the sampling category is based on the criteria described the table below:

Table 1: Parameters for determining sampling categories

Item	Justification
GHG sources	The GHG sources for all SSC-CPAs are considered similar since all are hydropower. *- Project Activity / Project Emission* no project emissions have to be considered in this SSC-PoA *-Baseline Emissions* The way to determine the baseline scenario for the SSC-CPAs will be the same for each CPA.
GHG sinks	The GHG sinks are considered similar since all the SSC-CPAs are hydropower projects.
GHG reservoirs	N/A
GHG types	Same as "GHG sources"
Organizations, facilities, sites	Monitoring plan can differ from projects that signed a PPA with PT.PLN to projects delivering power without PPA or without PPA signed with PT.PLN. This shall be taken into account while setting up the sampling groups
GHG projects	Same as "GHG sources"
GHG processes	The GHG processes for all SSC-CPAs are similar since all the grouped projects are hydropower projects, which generate electricity by utilizing zero-emission renewable hydropower resources.

By considering the analysis above the sampling categories selected for the verification of this SSC-PoA are:

Sampling category	Definition
Category I	Hydropower project with PPA with PT.PLN
Category II	Hydropower plants without PPA or without a PPA with PT.PLN

For each sampling category the randomly selected samples will be defined as per the Sampling Guidance (Clause A.2.4.6.4, ISO 14064-3:2006). The number of SSC-CPAs included in a sample for each sampling category shall be at least the square root of the number of SSC-CPAs in the respective sampling category, rounded up to the upper whole number (for example, 10 CPAs for a sampling category comprising 99 CPAs, 11 CPAs for a group of 101).

In order to ensure transparency and representativeness of the sample chosen, the SSC-CPAs to be included in a sample will be chosen randomly at each verification by the DOE itself. Since the number of SSC-CPAs included in the proposed SSC-PoA will evolve during the monitoring period, the sampling process is to be carried out for each verification.

All SSC-CPAs included in a sampling group will be subject to on-site verification pursuant to the guidelines established in this SSC-PoA-DD (see below).

5-Onsite assessments

The DOE performs onsite assessments as per procedures determined by the CDM Validation and Verification Manual of the SSC-CPAs to be verified individually and of the randomly selected sample SSC-CPAs.

6-Computation of total emission reductions by the SSC-PoA

The total verified emissions reductions by the SSC-PoA will be the sum of the emissions reductions verified by the sampled and individually verified SSC-CPAs. Verified emission reductions generated by the latter type of SSC-CPAs will be aggregated in the monitoring report.

For the sampled SSC-CPAs, the DOE shall follow the following procedures for computing verified emission reductions for each sampling category. These procedures identify the potential types of errors and procedures for how to handle them. The DOE shall report several types of errors identified during the spot checks conducted at CPA level. For each type of error the DOE shall apply the following procedure.

Error type 1-The error is quantifiable:
The error will be conservatively approximated and discounted from the verified ERs.

Error type 2-The error is not quantifiable (other errors)
As a conservative approach the verified ERs from the SSC-CPA will be set to 0. The total missing ERs will be counted as an error and treated as follows.

Introducing errors in the final amount of verified ERs
For each sampling group the DOE will determine the absolute uncertainty between the monitored and verified ERs. This absolute error will be discounted for all SSC-CPAs from the same sampling category.

Finally :

$$error_l = \frac{\sum_k ER_{monitored,l,k}}{\sum_k ER_{verified,l,k}}$$

and

$$ER = \sum_{k,l} ER_{monitored,k,l} \cdot (1 - error_l) + \sum_j ER_j$$

Where :

ER	Total verified emission reductions to be reported in the verification report (tCO_2e)
$ER_{monitored,l}$	Emission reductions of projects in sampling category l as per monitoring report after desk review (tCO_2e)
$error_l$	Error reported by the DOE during onsite assessment of projects of sampling category l in %
$ER_{monitored,l,k}$	Emission reduction of project k from sampling category l as per monitoring report after desk review (tCO_2e)
$ER_{verified,l,k}$	Verified emission reduction of project k from sampling category l (tCO_2e)
l	Sampling category; l = I or II
ER_j	Verified emission reductions of individual verified project j (tCO_2e)

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

The "Sustainable Small Hydropower Programme of Activities (PoA) in Indonesia" does not receive any public funding.

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

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

22nd June 2007[12]

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

28 years

SECTION C. Environmental Analysis

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at CPA level ☑

Local and focalized impacts of each hydropower project (depending on the location, capacity, and construction or not of dam among others) justify a separate environmental assessment for each SSC-CPA. Environmental analysis will therefore be conducted for each hydropower plant included in a SSC-CPA according to the applicable environmental policies.

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

The environmental impacts analysis will be done at CPA level

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

Environmental impact assessments will be conducted for each SSC-CPA according to the applicable laws and regulations.
For info, at the date of registration of the proposed SSC-PoA, the rules governing Environmental Impact Assessments were laid out in the Ministry of Environment Decree No. 11 issued in 2006. The decree specifies that hydropower projects must conduct an Environmental Impact Assessment if they meet any of the following criteria:

1. Dam height ≥ 15 m
2. Flooded area ≥ 200 m^2
3. Installed capacity ≥ 50 MW

The Decree also specifies that hydropower projects that do not exceed any of the above limits, the project owner shall develop and submit an Environmental Management and Monitoring Plan (EMMP). In addition, local and focalized impacts of each hydropower project (depending on the location and capacity) justify a separate environmental assessment.

[12] As per EB47 paragraph72

As per eligibility criteria (ii) of this SSC-PoA a typical SSC-CPA will not require an environmental impact assessment and only needs to develop an Environmental Management and Monitoring Plan (EMMP), as required under Indonesian law.

SECTION D. Stakeholders' comments

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

1. Local stakeholder consultation is done at PoA level ☑
2. Local stakeholder consultation is done at CPA level ☑

Local and focalized impacts of each hydro project (depending on the location, capacity, and construction or not of dam among others) justify an LSC at CPA level.

In order to provide a forum for stakeholders at the national level and those that cannot attend every LSC for an SSC-CPA to express their opinion on the SSC-PoA, the PPs have organized a PoA LSC to present and discuss the aims and the goals of this initiative. The PoA LSC[13] was conducted on February 18, 2009 in Jakarta and was attended by representatives from the DNA, local policy makers, local authorities, local communities, as well as national and international NGOs.

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

A stakeholder consultation was held by the coordinating/managing entity, PT. HPI, in Hotel Ibis Jakarta on February 18, 2009. Public stakeholders were invited through written letters, E-mails and Mailing lists of several associations sent out to local offices and organisation, such as DNA representative, local policy makers and representative of local authorities, local community representatives, and national and international NGOs.

About 50 people attended the event, and the representatives of South Pole Carbon Asset Management Ltd., Alin Pratidina and Renat Heuberger, gave an explanation of CDM in general, followed by a presentation from Paul Butarbutar, director of PT. HPI regarding the PoA and its social and environmental issues related to small hydropower plant development. Further explanation of PoA progress and current CDM PoA processes was given, followed by an open discussion session as summarised below.

D.3. Summary of the comments received:

Q: Mr. Ridzaluddin, local representative
Q1: For a CPA that plans to be included in the PoA, what will be the consequences if it is commissioned before the PoA is registered?

A1: Mr. Paul Butarbutar → The project can be registered as CPA only after the PoA itself is registered. The CPA that would like to be included in the registered PoA must not have an earlier project start date

[13] The PoA LSC report is available upon request.

than the date when the PoA is registered. Therefore, we could not include CPA that has been commissioned before the PoA is registered.[14]

Q: Mr. Gunardi, DNA representative

1. *Did the PoA Stakeholder Consultation conducted in Jakarta already represent local affected people where mini hydro power plants built?*

A1: Mr. Renat Heuberger →There is still a debate regarding the way to carry out Stakeholder Consultations for PoAs (PoA SC), since the UNFCCC lets project participants decide by themselves. Therefore, we chose to conduct the PoA SC in Jakarta by inviting top-level stakeholders such as project owners, related NGOs, and Government. However, we will also conduct CPA SC at chosen CPA location.

2. *What are differences between the Gold Standard process and the normal CDM process?*

A2: Mr. Renat Heuberger → Basically, GS and CDM process will be run in parallel. However, the GS puts higher attention to sustainable development criteria such as Environment, Social, Technology and Economy, as written in the Sustainable Development Assessment Matrix. The SC must be conducted in line with specific rules, as referred to the Gold Standard version 2.
A2. Mr. Paul Butarbutar → By applying the GS, we want to bring up environmental integrity for the PoA and the CPAs, and give more benefits to local communities.

3. *What are the requirements to be a PoA Coordinator?*

A3. Mr. Renat Heuberger → Any Indonesian private or public entity could be PoA coordinator. For the Sustainable Small Hydropower PoA, PT. Hydro Power International has exclusively and voluntarily decided to be the PoA coordinator managing the PoA registration process from the beginning to the end without any other business.

4. *Is there any minimum CPA size (in term of CERs generated or installed capacity) and number to be included in the PoA?*

A4: Mr. Renat Heuberger → Actually, there is no limit of size and number of CPAs to be included in the PoA. However as this is a first trial, we will develop PoA for on-grid micro or mini hydro with certain eligibility criteria defined in the PoA, without forgetting off-grid CPAs in the future.

5. *Is there any validator who is willing to validate and verify the PoA, especially due to the liability clause issue?*

A5: Mr. Renat Heuberger → So far, we encounter problems to contract a Designated Operational Entity (DOE) due to the liability issue or other unclear guidance problems. However, in order to have the PoA online soon, South Pole Carbon Asset Management Ltd. becomes sole guarantor taking up all liabilities connected to the PoA registration. In the meantime, we also push EB that this issue must be clarified soon if the EB wants PoA flying in the future.

6. *How will the validation process be conducted due to geographical spread of CPAs across the host country?*

[14] This statement has been formulated in February 2009, so before EB47 in which the eligibility of CPAs with a project start date after 22 June 2007 has been allowed. This statement is therefore outdated and the PoA-DD has been modified to take into account this new guidance.

A6: Mr. Renat Heuberger → The validation process will be easier as soon as the PoA is registered. However, regulations regarding validation sampling for all CPAs must also be clarified soon. As the first PoA in Asia, we believe that we can help EB to further shape rules and regulations regarding the PoA thanks to our PoA process and inputs.

7. Can individually owned power plants be included in the PoA? What are the requirements?

A7: Mr. Paul Butarbutar → CPAs included can be owned either by single individuals or entities. For this reason, we are currently developing a new simplified CER agreement that allows individuals, cooperatives or small companies to join the PoA.

Q: Mr. Ambieya Pitoyo, local NGO
1. How will the validation process be conducted for non-pilot CPAs?

A1: Mr. Renat Heuberger → The validation process will be much easier for additional CPAs after the PoA is registered.

2. Could you explain the PoA and CPA scheme in more details?

A2: Mr. Paul Butarbutar → There will be two different Project Design Documents (PDD), the PoADD and CPADDs. Each CPA will have its own CPADD, describing additionality and baseline for each project and referring to the PoADD.

Q&A Session II

Q: Mr. Suwarna, local NGO
1. Could you explain in more details what will be the role of PoA coordinator and what would be the minimum CPA size required?

A1: Mr. Paul Butarbutar → PT.HPI will coordinate and manage the PoA registration and the CERs transfer rights from the Project Owners, to be able to sell them to South Pole. PT. HPI will be one of the project participants in the PoADD and will communicate with the EB and South Pole.

Q: Mr. Gunawan, local representative
1. If there are off-grid micro hydro projects in the remote area with installed capacity between 10-200 kW, and they promote good social and economy impact to local stakeholders, how does PoA accommodate these projects because they really need fund from CERs?

A1: Mr. Paul Butarbutar → We are still focusing on on-grid PoA because the baseline is easier to define and calculate unlike the off-grid PoA. However, in the future, we will develop the off-grid PoA because our cooperation with GTZ includes also off-grid PoA development. In the mean time, we would like to see lesson learnt from on-grid PoA registration process, which still faces hurdles and challenges.

Q: Mr. Dicky Hendarto (DNPI)
1. In case there are lots CPAs coming online after the PoA registered, how will the validation process take place? Are there any specific period or CPAs number for starting the validation process especially after the PoA registered?

A1: Mr. Paul Butarbutar → Random validation will be applied for CPAs joined after the PoA registered. There is no particular number or period for starting the validation process for these additional CPAs. For these CPAs validation, we will apply sound statistical sampling method to ensure CPAs accountability.

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

All comments were considered and there was no need to amend the SSC-PoA-PDD in order to take those comments in to account. Further, see summary of comments and answers above.

SECTION E. Application of a baseline and monitoring methodology

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

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

AMS-I.D.: Grid connected renewable electricity generation --- Version 15

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

The applicability criteria of AMS I.D. v15 are the following:	Methodology AMS I.D. v15 is applicable to an SSC-CPA under the proposed SSC-PoA because:
The category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	An SSC-CPA will consist of a renewable energy generation unit (hydro) that supplies electricity and displaces electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit (thermal power plants in the local regional grid).
Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: • 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/m^2; • The project activity results in new reservoirs and the power density of the power	As per eligibility requirements, an SSC-CPA that comprises a reservoir will have a power density greater than 4W/m^2.
If the unit added has both renewable and non-renewable components (e.g.. a wind/diesel unit), the eligibility limit of 15MW for a small-scale	Each SSC-CPA has only renewable components.

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 15MW.	
Combined heat and power (co-generation) systems are not eligible under this category.	Not applicable, the proposed SSC-PoA does not include combined heat and power systems.
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	Capacity additions are not eligible under the proposed SSC-PoA.
Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small-scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	An SSC-CPA will not retrofit or modify an existing facility for renewable energy generation.

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

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

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in the table below.

Table 2: Emissions sources included in or excluded from the project boundary

	Source	Gas	Included?	Justification/Explanation
Baseline	CO_2 emission 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_2O	No	Minor emission source.
Project activity	Emissions of CH_4 from the reservoir.	CO_2	No	Minor emission source.
		CH_4	No	Minor emission source.
		N_2O	No	Minor emission source.

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

As per AMS I.D. v15, the baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor.

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>

E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:

According to Attachment A to Appendix B to the simplified Modalities & Procedures for small-scale CDM project activities, at least one barrier listed shall be identified due to which the project would not have occurred any way.

For a technology that is as well established as hydropower, financial barriers are the main barriers faced by project owners. Additionality of such projects can be therefore assessed through a financial analysis. As the project generates financial benefits other than CDM-related income, investment comparison analysis or benchmark analysis will be used to demonstrate additionality.

As only newly built grid-connected hydropower plants are eligible for participation in the proposed SSC-PoA, "non-action from the project proponent(s)" is a credible and realistic alternative to the project scenario. The financial viability of the development and operation of each SSC-CPA will be compared with a scenario where the CPA owner does not undertake the project ("non-action") and deploys the financial resources that would have been used to finance the construction of the project for alternative investments. To this end the project IRR (without CDM revenues) will be compared with a benchmark rate for investment returns available to a local investor in Indonesia. This benchmark represents the minimum project IRR that is required for the project to be financially viable relative to the "non-action" scenario.

Hydropower projects in Indonesia have a long investment horizon and tend to be structured as independent companies or entities that are subject to pay taxes under Indonesian law. Therefore a post-tax project IRR shall be used to determine the financial viability of a CPA.

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

For this group, the financial analysis involving the calculation of the project internal rate of return (project IRR) has been selected to demonstrate the additionality of each SSC-CPA. Moreover in order to insure the environmental integrity of each CPA the prior consideration of the CDM will be assessed individually as per *Guidance on the demonstration and assessment of prior consideration of the CDM (version 2).*

Project IRR calculation
Project IRR calculations will be based on a list of economic parameters provided by the PPs that were available at the investment decision. This list of parameters includes:

	Unit	Comment
Technical lifetime	Year	As per *"Tool to determine the remaining lifetime of equipment"* (version 1)
Investment decision date	DD/MM/YY	
Construction start date	Year	

Date project starts operating	Year	
Annual electricity generation	MWh/year	As per *Guidelines for the reporting and validation of plant load factors* (version 1). Value is given at delivery point.
FINANCIALPARAMETERS		
	Unit	**Comment**
Electricity tariff	IDR/kWh	As per legislation at date of investment or as per PPA if signed at date of investment. The tariff will be indexed to inflation only if specified in the PPA or relevant policy.
Increase in electricity tariff	% per year	
Inflation	% per year	If not otherwise specified as per inflation rate during the month when the investment decision was made
Corporate tax	% p.a.	According to tax regulation
(Other taxes)	% p.a.	
Depreciation	%	Using linear depreciation (1/lifespan) if not otherwise specified in the financial documentation of the SSC-CPA
Exchange Rate	Foreign currency/IDR	If some costs/revenues are provided in foreign currency the exchange rate as per date of investment decision shall be used to convert them into IDR.
COSTS AND EQUIPMENT		
	Unit	**Comment**
Total investments	IDR	If the construction is expected to last several years, a yearly breakdown of investments can be provided.
(Other revenues)	IDR	
Operation & Maintenance cost	IDR/year	If no specified otherwise, O&M will be indexed using the consumer price index.
(Other operating expenditure)	IDR/year	
Insurance	% of Capex p.a.	

If the deprecation rate is chosen as 1/lifespan and the assessment period as the technical lifespan of the plant, the fair value of any project activity assets at the end of the assessment will be considered as null[15].

In Indonesia, foreign currencies, such as the US$, are sometimes in parallel with IDR in financial plans prepared by hydropower project developers. In order to conduct the financial analysis in one common currency and avoid a currency bias, all items denominated in foreign currencies will be converted in IDR using the average exchange rate during the twelve months preceding the date of the investment decision.

The main economic parameters shall be extracted from documents provided to banks, equity financers or government. Dates at which these documents were compiled will also be reported in the SSC-CPA-DD. If there is a substantial gap (> 1 year) between the date of the investment decision and the date at which the

[15] As per paragraph 4 of Guidance on the Assessment of Investment Analysis (Version 02).

data for the financial analysis has been compiled, the respective item will be adjusted according to Indonesian construction of electricity equipments or Indonesian consumer price indices[16].

A standardized excel worksheet has been developed into which data received from the PPs will be entered in a transparent manner, and which will in turn compute the project IRR from the post-tax free cash flow. The same template will be used for all SSC-CPAs to be included in the proposed SSC-PoA. A template of the mentioned excel sheet is provided to the DOE. The table will be used for all SSC-CPAs to be included in the proposed SSC-PoA. Any changes to this table will be described and explained in the respective SSC-CPA-DD.

Benchmark calculation

Hydropower projects in Indonesia are financed using a combination of loan and equity financing, so the appropriate benchmark rate of return is determined as the Weighted Average Cost of Capital (WACC)[17]. It is defined as the average return expected across the different types of capital that finance a given project. For the purpose of this SSC-PoA the WACC will be determined by using the following rules:

- The WACC will be based on standard benchmark parameters that are commonly used in the Indonesian market. The choice of these market parameters will depend on the specific characteristics of the project type, but they will not be linked to the subjective profitability expectation or risk profile of a particular project developer.
- All financial information used for the benchmark determination will be sourced from independently verifiable public sources and chosen as per the date of investment decision. In cases where some data is not available at the date of investment decision this data will be adjusted using appropriate and publicly available inflators.
- The WACC will be derived from market equity returns and government bond rates that are adjusted by a suitable risk premium to reflect private investment in the electricity generation sector in Indonesia.

The WACC will be calculated as follows:[18]

WACC= CE * %Equity + CD * %Debt * (1- %Tax)

The cost of equity is determined using the capital asset pricing model[19] (CAPM):

$$CE = RFR + \beta \cdot (MR + RP - RFR)$$

$$\beta = \frac{Co\,\mathrm{var}(r_{portfolio}, r_m)}{Var(r_m)}$$

Where:

[16] http://www.bps.go.id

[17] as per paragraph 11 of the Guidance on the Assessment of Investment Analysis (version 2)

[18] Velez-Pareja, Ignacio and Tham, Joseph, "A Note on the Weighted Average Cost of Capital WACC" (August 7, 2005). Available at SSRN: http://ssrn.com/abstract=254587.

[19] Black, Fischer., Michael C. Jensen, and Myron Scholes (1972). The Capital Asset Pricing Model: Some Empirical Tests, pp. 79-121 in M. Jensen ed., Studies in the Theory of Capital Markets. New York: Praeger Publishers.

Table 3: Parameters for IRR calculation

Parameters	Description	Source and explanation
RFR (Risk free rate)	Indonesian government bond rate with a subscription period that corresponds to the technical lifetime of the SSC-CPA.	Source: Central Debt Management Directorate or Bank of Indonesia or any other official source. The bond rate with a subscription length closest to the life expectancy of the hydro plant available at the investment decision date shall be chosen
ß	Average beta for energy sector in Indonesia or emerging market (Beta is the correlation between an energy stock index performance and average stock market performance)	At the date we register the SSC-PoA, there is no index for electricity generation or energy sector as a whole in Indonesia. Until the date such an index is available, the PPs will refer to the Beta value for "electricity generation" for emerging markets as determined by Professor Damodaran (Stern University)[20]. If data is available a 5 year average shall be preferred.
r_m	Rate of return of the market (Jakarta Stock Exchange)	Calculated as $r_m(d) = \frac{quote_m(d) - quote_m(d-1)}{quote_m(d-1)}$
$r_{portfolio}$	Rate of return of the portfolio representing an energy sector stock index in Indonesia	Calculated as $r_{portfolio}(d) = \frac{quote_{portfolio}(d) - quote_{portfolio}(d-1)}{quote_{portfolio}(d-1)}$
MR (Market Return)	5 years averaged[21] yearly rate of return of the Jakarta Composite Index	JSX (Jakarta Stock Exchange)
RP (Risk Premium)	Small company risk premium	Small-company risk premium; average of premiums for "microcap" (10th decile) sector, from "Stocks, Bonds, Bills and Inflation," Valuation edition, 2001 Yearbook, Ibbotsons Analysis. Copy available upon request.
CD (Cost of debt)	Interest Rate Loans by commercial banks for investment	Indonesian central bank. The interest rate will be chosen in Rupiah for project below the 10MW threshold and $US or Rupiah above according to the loan.
%Debt (Debt ratio)	Average industry debt ratio	Based on a common practice in the power industry,http://www.worldbank.org/html/dec/Publications/Workpapers/WPS1800series/wps1868/wps1868.pdf - Government Support to Private Infrastructure Projects in Emerging Markets, page 6, last paragraph B.
%Equity	Average industry equity ratio	Calculated as 1- %Debt ratio
%Tax (Tax rate)	Tax rate applicable to the hydro project	Tax Regulation
CE (Cost of equity)	Five years average expected return on equity in Indonesia	Calculated as per CAPM
Investment decision date	Date	As per guidance 6 of Guidance on the Assessment of Investment Analysis (Version 02). It will be usually considered as the date in which the main payment being made or financial closure, whichever is the earliest.

If over the course of the lifetime of the SSC-PoA, a parameter or its source become unavailable or are replaced by a more relevant or updated parameter and/or source (example: a new tax regulation is

[20] http://pages.stern.nyu.edu/~adamodar/
[21] Market return and beta values shall be preferentially averaged over the same period.

published), then this parameter and/or sources will be revised accordingly after prior agreement from the DOE.

Sensitivity analysis
As specified in the excel spreadsheet provided to the DOE, a sensitivity analysis will be also conducted using assumptions that are conservative from the point of view of analysing additionality, i.e. the "best-case" conditions for the project IRR were assumed by altering the following parameters by +/- 10%: (1) project revenues (which are dependent on the electricity tariff or the quantity of electricity revenues); (2) total investment, and (3) O&M expenditure.

The full results of each sensitivity analysis will be reported in the respective SSC-CPA-DD using the following format:

Table 4: Framework for reporting results of sensitivity analysis

	IRR	Variation that hits the benchmark	Likelihood of hitting the benchmark
Investment -10%			
O&M -10%			
Revenues +10%			

If the IRR exceeds the benchmark in one or more of the three scenarios considered for the sensitivity analysis, the PPs shall provide evidences that this is unlikely to happen. If no sufficient proof is provided, the CPA will be considered as non-additional.

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

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

As per AMS I.D. version 15, the following equation is used to calculate baseline emissions from electricity generation for a typical SSC-CPA:

$$BE_y = EG_{BL,y} * EF_{CO2} \quad \textbf{(1)}$$

Where:

$BE_{,y}$ Baseline Emissions in year *y*; t CO_2

$EG_{BL,y}$ Energy baseline in year *y*; kWh

EF_{CO2} CO_2 Emission Factor in year y; t CO_2e/kWh

EF_{CO2} will be calculated as per provisions described below:

If sufficient data is available, the PPs will privilege the use of the Combined Margin (CM) emission factor determined using the *'Tool to calculate the Emission Factor for an electricity system'* However, due to the specific topography of Indonesia that involves thousands of islands and numerous discrete grids, it may not be possible to calculate the CM emission factor for every SSC-CPA because of a lack of data. In such cases the PPs will refer to one of the following alternatives:

Alternative 1: for a system where all generators use exclusively fuel oil and/or diesel fuel, the baseline emissions is the annual kWh generated by the renewable unit times an emission factor for a modern diesel generating unit of the relevant capacity operating at optimal load as given in Table I.D.1 of AMS I.D. v15.

Alternative 2: The Emission Factor can be calculated in a transparent and conservative manner as the weighted average emissions (in kg CO_2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Alternative 3: In case the project activity involves the construction of a newly renewable energy generation units delivering its electricity to an isolated[22] mini-grid where the capacity of the generating units does not exceed 15 MW, the energy baseline is the fuel consumption of the technology in use or that would have been used in the absence of the project activity to generate the equivalent quantity of energy

$$BE_y = EG_{BL,y} * EF_{CO2} / (1-l) \quad (2)$$

Where:

l Average technical distribution losses that would have been observed in diesel powered mini-grids installed by public programmes or distribution companies in isolated areas, expressed as a fraction

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

Data / Parameter:	L
Data unit:	Fraction
Description:	Average technical distribution losses that would have been observed in diesel powered mini-grids installed by public programmes or distribution companies in isolated areas, expressed as a fraction
Source of data to be used:	AMS I.A. version 13
Value applied	20%
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value for AMS I.A. version 13
Any comment:	Applicable only if alternative 3 is chosen to determine the emission factor

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

Data / Parameter:	EF_{CO2}
Data unit:	tCO_2e/MWh

[22] Not connected to the regional or national grids and not exporting and/or importing power from the national/regional grids.

Description:	Emission factor of the grid where the hydropower is exporting (or would have exported) its electricity to.
Source of data to be used:	Calculated as per "*Tool to calculate the Emission Factor for an electricity system" or as per alternatives 1,2 or 3 described above.*
Value applied	To be specified in each SSC-CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	Determined ex-ante for all SSC-CPAs

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

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

Based on AMS I.D. v15, the following data and parameter will be monitored during the project crediting period:

Data / Parameter:	$E_{BL,y}$
Data unit:	MWh
Description:	Electricity energy baseline in year *y*; (=Quantity of net electricity generation supplied by the project plant/unit to the grid in year y)
Source of data to be used:	Measured by electricity meter(s)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be specified in each SSC-CPA
Description of measurement methods and procedures to be applied:	The net electricity production will be measured continuously. The net electricity will be calculated by subtracting the electricity exported with the electricity imported by the SSC-CPA. A high level of accuracy of the measurements will be achieved due to the use of high-precision equipment calibrated and tested according to recognized standards, as stated in E.7.2.
QA/QC procedures to be applied:	The device will be recalibrated periodically according to the instructions as per standard industry norms and requirements
Any comment:	

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

1. Monitoring Plan Objective and Organization

The purpose of the monitoring plan is to measure the net electricity delivered to the local electricity grid by the SSC-CPA. The net electricity will be calculated by subtracting the electricity exported with the electricity imported by the SSC-CPA.

Details of the SSC-CPA monitoring plan will be described for each SSC-CPA but shall comprise the

procedures outlined in this section.

2. Monitoring Data and archiving

Data to be monitored is the net electricity delivered to the local grid by the SSC-CPA.

CPA with PPA
In Indonesia, procedures for meter reading are normally specified in the PPA. The detailed monitoring procedures will therefore be established for each SSC-CPA on the basis of the PPA. As a general guidance, at PoA level the PPs can only state that the monitoring data will be derived from periodic electricity meter records kept by the project owners and/or the grid company, which will be crosschecked with actual invoices sent by project owners to the grid company. The operator of the hydro plant will be responsible for collecting the monitoring data and will provide the coordinating entity with meter readings for electricity delivered and if applicable calibration certificates.

CPA without PPA
For SSC-CPA without a PPA (usually it is the case in small isolated grids), the details of the monitoring plant will be described in the SSC-CPA-DD.

The data will be archived electronically and be stored for 2 years after the end of the crediting period of each SSC-CPA by the coordinating entity.

3. Calculation approaches
Calculation of ex-post emission reductions is carried out for each SSC-CPA as per following equation:

$$ER_{[CPA],y} = \left(EE_{[CPA],y} - EI_{[CPA],y}\right) * EF_{[CPA],CO_2}$$

Where:

$ER_{[CPA],y}$	Emission Reductions from [CPA] in year y; t CO_2
$EE_{[CPA],y}$	Electricity exported by [CPA] in year y; kWh
$EI_{[CPA],y}$	Electricity imported by [CPA] in year y; kWh
$EF_{[CPA],CO2}$	CO_2 Emission Factor of the grid where the [CPA] is connected; t CO_2e/kWh

4. Quality Assurance and Quality Control

The installation location of the meters is detailed in each SSC-CPA. The project entity will implement QA&QC measures to calibrate and guarantee the accuracy of metering and safety of the project operation. The metering devices will be calibrated and inspected properly and periodically as per standard industry norms and requirements. The grid company and the project owners are responsible for operation and maintenance of their respective electricity meters.

The meter(s) reading will be readily accessible for the Designated Operational Entity (DOE) carrying out the verification of monitoring data.

E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

The baseline and monitoring sections have been prepared by South Pole Carbon Asset Management Ltd. (www.southpolecarbon.com) the 15 December 2009. South Pole Carbon Asset Management Ltd. is assisting PT. Hydro Program International in project development and implementation.

Company name: South Pole Carbon Asset Management Ltd.
Contact person: Ms. Alin Pratidina
E-mail: a.pratidina@southpolecarbon.com

Company name: South Pole Carbon Asset Management Ltd.
Contact person: Mr. Francois Beaurain
E-mail: f.beaurain@southpolecarbon.com

Company name: South Pole Carbon Asset Management Ltd.
Contact person: Mr. Guido Schmidt-Traub
E-mail: g.schmidt-traub@southpolecarbon.com

Company name: South Pole Carbon Asset Management Ltd.
Contact person: Mr. Patrick Horka
E-mail: p.horka@southpolecarbon.com

Annex 1

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

Organization:	PT. Hydro Program International
Street/P.O.Box:	Jl. M. H. Thamrin No. 1
Building:	50/F, Menara BCA, Grand Indonesia
City:	Jakarta
State/Region:	DKI Jakarta
Postfix/ZIP:	10310
Country:	Indonesia
Telephone:	+62 21 23 58 45 65
FAX:	+62 21 23 58 44 01
E-Mail:	
URL:	
Represented by:	
Title:	President Director
Salutation:	Mr.
Last Name:	Butarbutar
Middle Name:	
First Name:	Paul
Department:	
Mobile:	+62 811 99 303 99
Direct FAX:	
Direct tel:	
Personal E-Mail:	p_maruli@yahoo.com

Organization:	South Pole Carbon Asset Management Ltd
Street/P.O.Box:	Technoparkstrasse 1
Building:	
City:	Zurich
State/Region:	
Postfix/ZIP:	CH_8005
Country:	Switzerland
Telephone:	+ 41 44 633 78 70
FAX:	
E-Mail:	
URL:	www.southpolecarbon.com
Represented by:	
Title:	Managing Partner
Salutation:	Mr.
Last Name:	Heuberger
Middle Name:	
First Name:	Renat
Mobile:	+ 41 79 549 39 51
Direct FAX:	
Direct tel:	registration@southpolecarbon.com

Personal E-Mail:	registration@southpolecarbon.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The PoA does not receive any public funding.

Annex 3

BASELINE INFORMATION

Described in Section E.

Annex 4

MONITORING INFORMATION

Described in Section E.7.2.

- - - - -