CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Annexes

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

Esajadi small hydropower project in Malaysia
Version 1.4
Completed date 06/6/2007

A.2. Description of the small-scale project activity:

The proposed project is to construct three run-of-river type hydro power plants, i.e., Kadamaian small hydro power plant (SHPP), Pangapuyan SHPP and Kaingaran SHPP in the State of Sabah, Malaysia, and to sell generated energy to the local grid. Since the generated electric power is clean energy which accompanies no emission of Greenhouse gases (GHGs), implementing this project will be effective in achieving reduction of GHGs utilizing water as a renewable energy to alternate fossil fuel.
Since the total generated output for these three power plants would be 9 MW, comprise of 2.0 MW from the total generation power of Kadamaian SHPP, 4.5 MW from Pangapuan SHPP and 2.5 MW from Kaingaran SHPP, hence this project would be implemented as a small scale CDM project. The three projects are bundled due to the same type, same category and technology/measure.
On electrical power supply in the State of Sabah, SESB (Sabah Electricity Sdn. Bhd.) is the sole power utility which has transmission network all over Sabah and this project would be connected to SESB's west coast transmission grids.
In the project, total maximum output of 9MW and annual generating power of 60,487MWh will be generated by these three power plants and reduction effect of global GHGs could be achieved up to 39,135tCO_2e (approximately 820,000tCO_2e for 21 years)

The project will be expected to contribute to sustainable development of Malaysia in the way mentioned below;

①Development of sustainable energy

Since the constitution of power source in the State of Sabah, Malaysia is made up mainly by natural gas and diesoline, development of renewable energy is needed in view of stable power supply and diversification of power source.

②Local employment and economy revitalization through construction and maintenance of hydro power plant

With implementation of the project, locals would be employed and procured during construction and operation, thus leads to local revitalization.

③Technical transfer

In the State of Sabah, developing small hydro power plant by private sector is not advancing. One of the main reasons for it is that technical experts in developing hydro power plant are limited. Moreover, there is no other hydro power plant operated and maintained by private sector in Sabah and sufficient know-how of operation and maintenance are not diffused. Through implementing the project, various technical transfers ranging from developing hydro power plant to operation and maintenance could be realized.

A.3. Project participants:

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 as project participant (Yes/No)
Malaysia (host)	Esajadi Power Sdn. Bhd.	No
Japan	Hokkaido Electric Power Co., Inc.	No

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

A.4.1.1. Host Party(ies):

Malaysia

A.4.1.2. Region/State/Province etc.:

The State of Sabah

A.4.1.3. City/Town/Community etc:

Kadamaian SHPP; Kota Belud
Pangapuyan SHPP; Kota Marudu
Kaingaran SHPP; Tambunan

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

a) Kadamaian SHPP
The proposed Kadamaian SHPP development is located 73.8km northeast from Kota Kinabalu in the extreme northeast corner of Kota Belud District of Sabah on Kadamaina river. The intake coordinate N05 ° 38.8', E116 ° 25.3'and power house coordinate N05 ° 39.5', E116 ° 23.8'.

b) Pangapuyan SHPP
The proposed Pangapuyan SHPP development is located 6km to the southeast of Kota Marudu town in Kota Marudu District of Sabah on Pangapuyan river. The intake coordinate N06 ° 24.0', E116 ° 44.7' and power house coordinate N06 ° 26.2', E116 ° 44.7'.

c） Kaingaran SHPP
The proposed Kaingaran SHPP development is situated in the District of Tambunan, State of Sabah. The proposed site is located on Kaingaran river, 10km to the southeast of Tambunan Town. The intake coordinate N06 ° 04.7', E116 ° 37.3' and power house coordinate N06 ° 05.4', E116 ° 37.1'.

Figure-1 Project sites

A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

In line with 'Appendix B of simplified modalities and procedures for small-scale CDM project activities (SSC M&P)', the project is sorted out in the classifications as shown below;

a) Type and category(ies) of the small-scale project activity
Type I: RENEWABLE ENERGY PROJECTS
Category D: Grid connected renewable electricity generation

This is a small scale CDM project to generate electric power of 9 MW in total by bundling run-of-river type hydro power with Kadamain SHPP, Pangapuyan SHPP and Kaingaran SHPP. Since obtained power will be connected to the grid, I.D. shall be applied for the type and category in SSC M&P.

b) Technology of the small-scale project activity
The applied technique is general run-of-river type hydro power generation technique. Table 1 shows the particulars of the generation plan.

Table-1 Generation Plan

Item		Kadamaian	Pangapuyan	Kaingaran
River name	-	Kadamaian River	Pangapuyan River	Kaingaran River
Catchment area	km2	74	84	188
Power generation type	-	Run-of-river, Conduit type	Run-of-river, Conduit type	Run-of-river, Conduit type
Total head	m	62.5	142.0	42.0
Maximum discharge	m3/s	4.3	4.5	8.8
Maximum output	MW	2.0	4.5	2.5
Electricity generation	MWh	14,366	30,353	15,768

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

The credit period is set for 7 years, which the total amount over the aggregate GHG reductions will be 273,945tCO_2 e. In addition, the total amount over 21 years which is added up with 2 renewals will be 821,835tCO_2 e .

Table-2 Estimated amount of emission reductions

Years	Estimation of annual emission reductions in tonnes of CO_2e
Year 1 (1/4/2008～31/3/2009)	39,135
Year 2 (1/4/2009～31/3/2010)	39,135
Year 3 (1/4/2010～31/3/2011)	39,135
Year 4 (1/4/2011～31/3/2012)	39,135
Year 5 (1/4/2012～31/3/2013)	39,135
Year 6 (1/4/2013～31/3/2014)	39,135
Year 7 (1/4/2014～31/3/2015)	39,135
Total estimated reductions (tonnes of CO_2e)	273,945
Total number of crediting years	7 years
Annual average of the estimated reductions over the crediting period (tCO_2e)	39,135

A.4.4. Public funding of the small-scale project activity:

There is no public funding involved for the financing of the project activity.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

The proposal of the small-scale CDM projects that satisfy the following 4 criteria is considered as debundling;

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

Since the project will be the first hydropower CDM project to be implemented in Malaysia by the project participants, it will not implement as a debundled undertaking of a large scale CDM project.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

This project will apply the methodology stated below;

AMS-I.D. "Grid connected renewable electricity generation" (version 11)
ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources" (Version 06)

B.2 Justification of the choice of the project category:

In order to apply I.D. to the project, it is needed to supply electric power generated by photovoltaics, hydro, tidal/wave, wind, geothermal, and renewable biomass to the grid which energy is supplied by fossil fuel or other non-renewable fuels. The project complies with this requirement because hydro power plant will be constructed and obtained power will be connected to the power grid.
Moreover, bundled total capacity of 9MW will be generated through the project, it complies with the requirement which set down that the generation capacity should be less than 15 MW.
In this category, based on the small-scale CDM simplified methodology AMS-I.D., the emission coefficient (tCO_2 e /MWh) is calculated using the Combine Margin (CM) obtained from the Simple Operating Margin (OM) and Build Margin (BM), and the baseline emissions are obtained through multiplying this by the amount of electricity generated in the project.

B.3. Description of the project boundary:

Based on AMS-I.D., because the project boundary is physically and geographically related to the small scale project activity, the project shall include the intake weir, penstock, power plant and discharge channel. Moreover, the project boundary includes until the inter-connection point at the SESB's substation.

B.4. Description of baseline and its development:

The baseline will be calculated based on the small scale CDM simplified methodology AMS-I.D. In this methodology, the baseline is defined as the value obtained through multiplying the electricity generation

(MWh) obtained in generation based on renewable energy by the emission coefficient (tCO_2 e /kWh) and calculation methods can be chosen from these two options mentioned below;.

(a) A combined margin (CM) obtained from OM and BM. The procedures to calculate this value is prescribed in the approved methodology ACM 0002 in which the four procedures to calculate OM are shown, ① Simple OM, ② Simple adjusted OM, ③ Dispatch Data Analysis OM, ④ Average OM. Either procedure can be chosen according to AMS-I.D, however, the applicable condition of ACM0002 should be met to use the ① Simple OM and the ④ Average OM.

OR

(b) The weighted average emissions (tCO_2 e /MWh) of the current generation mix in the most recent years. The data of the year in which project generation occurs must be used.

In the project, the emission coefficient is calculated using the method in (a) above. Moreover, in this approach, ①Simple OM is used to calculate the OM.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

The additionality for the project shall be demonstrated by; a) investment barrier and b) barrier due to prevailing practice.

a) Investment barrier
In Sabah, Sabah Electricity Sdn. Bhd (SESB) and 5 independent power producers (IPPs) are supplying electric power. These two sources are the potential suppliers to develop a new electric power plant in Sabah.

SESB have plans to extend one gas combined cycle thermal power plant, and develop a new coal thermal power plant and a large scale hydro power plant, but no plan of constructing small hydro power plant. The major reasons are as bellow;

- The low return due to the small business scale and the development, transaction and administration costs for financing that are disproportionately high.
- The high business risk due to occasional change of water flow during its long business term.
- SESB requires peaking plant due to the demand of Sabah, however small hydro power plant is the basic load plant.

Therefore, SESB aims to develop thermal power plant, such as gas and coal, and large scale hydro power plant.

The situations are same for IPPs, thus the risky business undertaking small hydro power generation is not prefer in Sabah. Moreover, the thermal power plant such as gas are much more attractive because of the reasons written bellow.

- The natural gas price is subsidies by the Malaysian government.
- The payback period of gas-fired power plant is shorter than hydro power plants due to the higher construction cost per kWh.
- The gas-fired plants are peaking capacity suppliers, which are prefer by utility companies, such as SESB. Therefore the price of electricity sell would be higher.

The cost for planning, surveying, designing and construction of this project are intensive whilst selling price is low. Thus, this project would not be viable without some additional revenue. In general, it is understand that the project IRR should be at least a few percentages higher than the cost of capital. Since this project is planned to be highly finance by the bank, the cost of capital is represented by the interest rate of loan. The interest rate of this project is planned to be 7%[1]. Participants of the project have expressed their deliverance that they would invest for the project if the IRR is at least 2.0 %[2] higher than the interest rate on loans, which would be 9.0%. In case of the project, IRR would be 7.6 – 8.4 %[3] if there are no CERs and it will not satisfy the criterion for investment of project undertakers, thus the project is impossible to be materialized.

As it is shown above, the project return is less attractive as an investment target compared to thermal power such as gas and coal.

b) Barrier due to prevailing practice
For SESB, more than 80 % of total generation capacities are thermal power plants utilizing natural gas or diesoline as fuel. Those hydro power plants being operated in Sabah are Tenom Pangi Hydropower Plant (66MW) and other 6 small hydro power plants with total output of 72MW, which is approximately 15 % of the generation capacity of SESB[4]. The major reason of non-prevalence of small hydro power plant is due the same reasons as investment barrier.

5 IPP businesses being operated in Sabah are thermal power plant utilizing diesoline or natural gas as fuel. The major reason is due to the same as investment barrier.

Malaysian government formulated a preferential treatment system (Small Renewable Energy Power Program: SREP) on May, 2001, which is aims at promoting to develop renewable energy. However, as at December 2006, there are no small hydro power plants started operations yet.

As a conclusion, business of small scale hydro power generation is not prevailing in Sabah, but thermal power generation is common. It is noted that the project is the first venture for private sector to undertake small hydro power generation.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

Project activity emissions, baseline emissions, leakages and GHG emission reductions will be calculated based on AMS-I.D. The methods of calculations for each emissions are as follows;

a) Project activity emissions (PE_y)
Project activity emissions are zero. （$PE_y = 0$）

[1] The interest rate of Esajadi Power small hydro power project

[2] Decision of Kadamaian, Kaingaran, Panagapuyan hydropower project development

[3] The Project IRR had been verified by DOE

[4] www.st.gov.my

b) Baseline emissions (BE_y)

In the project, the baseline emissions are calculated using the following formulae based on AMS-I.D.

$$BE_y = EG_y \times EF_y \quad \cdots\cdots (1)$$

Where,

- BE_y : Annual baseline emissions (tCO_2 e)
- EG_y : Annual electricity generation obtained in line with the project (MWh/y).
- EF_y : Grid emission coefficient in Sabah, Malaysia (tCO_2 e /MWh).

●Calculation of grid emission coefficient

In the project, GHG emissions are calculated using CM based on AMS-I.D.

○Step 1. Confirmation of applied condition of Simple OM

To use Simple OM, applied condition of Simple OM prescribed in the approved methodology ACM0002 must be satisfied. The applied conditions require that electricity generation from low-cost/must-run resources must be less than 50 % of annual total electricity generation of the grid based on average value over the past 5 years or based on long-term normal for hydroelectricity production.

In the project, Simple OM can be used because it is designed to connect energy to the grid owned by SESB and its hydropower energy from low-cost/must-run resources generates less than 50 % of annual total electricity generation.

○ Step 2. Calculation of Simple OM

Simple OM is the emission coefficient (tCO_2 e /MWh) obtained by calculation of weighted average from power source which is not low-cost/must-run resource (thermal power).

$$EF_{OM,Simple,y} = \frac{\sum_{i,j} F_{i,j,y} \bullet COEF_{i,j,y}}{\sum_{i} GEN_{j,y}} \quad \cdots\cdots (2)$$

Where,

- $F_{i,j,y}$ is the amount of fuel (i) (in a mass or volume) consumed by relevant power sources j in year(s) y.
- $GEN_{j,y}$ is the electricity (MWh) delivered to the grid by source j.
- $COEF_{i,j,y}$ is the CO_2 emission coefficient of fuel i (tCO_2/mass or volume unit of the fuel), taking into account the carbon content of fuels used by relevant power sources j and the percent oxidation of the fuel in year(s) y.

$$COEF_i = NCV_i \bullet EF_{CO_2,i} \bullet OXID_i \quad \cdots\cdots (3)$$

Where,

- NCV_i is the net calorific value (energy content) per mass or volume unit of a fuel i,
- $EF_{CO2,i}$ is the CO_2 emission factor per unit of energy of the fuel i.
- $OXID_i$ is the oxidation factor of the fuel.

The simple OM emission factors can be calculated using either of the two following data vantages according to ACM0002 and they cannot be changed during the credit period;

(i) (*ex-ante*) the full generation-weighted average for the most recent 3 years for which data are available at the time of PDD submission, or

(ii) (*ex-post*) the year in which project generation occurs.

In the project, Simple OM emission factors are calculated ex-ante using the former method of (*i*) above mentioned.

○ Step 3. Calculation of BM

Calculate the BM using the following formula;

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} \bullet COEF_{i,m,y}}{\sum_{m} GEN_{m,y}} \cdots\cdots\cdots (4)$$

Where, *F*, *COEF*, *GEN* is the same parameter described in the formula (2) on power station '*m*'.

The data for calculating the BM can be using either of the two following data vantages, and they cannot be changed during the credit period.

(i) (*ex-ante*) based on the most recent information available on plants already built at the time of PDD submission, or

(ii) (*ex-post*) in the first credit period, calculate while renewing data annually from the first year of power generation in the project. Concerning the second credit period, calculate ex-ante using the above method.

In the project, the BM emission factors are calculated ex-ante using the former method of (*i*) above mentioned.

Power station '*m*' that is targeted when calculating the BM is required to use the larger annual generation of the following sample groups based on ACM0002:

(a) the five power plants that have been built most recently, or

(b) the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and have been built most recently.

Total electricity generation in 2004 of SESB grid to which electric power generated by the project will be connected was 1,966,192MWh, and among which the electricity generation of the five power plants that have been built most recently was 1,303,192.82MWh. As a result, the proportion of the electricity generation of the five power plants built most recently in the total electricity generation of the grid occupied 66%. Since this value exceeds 20% of the system generation, BM will be calculated using the data according to the method (a) above mentioned.

○ Step 4: Calculation of CM

CM is calculated using the following formula:

$$EF_y = w_{OM} \times EF_{OM,y} + w_{BM} \times EF_{BM,y} \cdots\cdots\cdots (5)$$

Where, w_{OM} and w_{BM} are weight coefficients and the default value is 50% (w_{OM}=w_{BM}=0.5).

In this project, the CM is calculated using the weight coefficients to be 50%.

c) Leakage (L_y)
Since the project does not entail utilizing power generating equipment from other projects, there is no leakage based on AMS-I.D. (L_y = 0)

d) GHG emission reductions (ER_y)
GHG emission reductions are calculated using the following formula;

$$ER_y = BE_y - PE_y - L_y \quad \cdots\cdots\cdots\cdots \quad (6)$$

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	Annual electricity generation in SESB by power sources (2000－2004)
Data unit:	GWh
Description:	—
Source of data used:	www.st.gov.my/statistics/statSESB.html
Value applied:	See Table-3, Appendix 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	To be used to demonstrate the applied condition of Simple OM that ‘the average rate of electricity generated by low-cost/must-run power sources over the past 5 years is less than 50 % of annual total electricity generation of the grid’. In addition, 5 IPP companies supply electric power to SESB grid other than SESB itself, each of their supplied power is generated by thermal power plant using natural gas or diesel as power sources. Their supply is not taken into account because it shall neither increase proportion rate of hydropower generation in the grid nor affect on the result.
Any comment:	—

Data / Parameter:	GEN_j
Data unit:	MWh
Description:	Electricity generation of SESB (2002－2004)
Source of data used:	Study on Grid Connected Electricity Baselines in Malaysia, April 2006, Pusat Tenaga Malaysia
Value applied:	See Table-4, Appendix 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	To be used for calculation of Simple OM.
Any comment:	—

Data / Parameter:	$F_j \times COEF_j$
Data unit:	tCO_2 e
Description:	Electricity generation of SESB (2002－2004)
Source of data used:	Study on Grid Connected Electricity Baselines in Malaysia, April 2006, Pusat Tenaga Malaysia
Value applied:	See Table-4, Appendix 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	To be used for calculation of Simple OM.
Any comment:	—

Data / Parameter:	GEN_m
Data unit:	MWh
Description:	Electricity generation of 5 power plants built most recently in the SESB grid
Source of data used:	Study on Grid Connected Electricity Baselines in Malaysia, April 2006, Pusat Tenaga Malaysia
Value applied:	See Table-5, Appendix 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	To be used for calculation of Simple BM.
Any comment:	—

Data / Parameter:	$F_m \times COEF_m$
Data unit:	tCO_2 e
Description:	CO_2 emission from of 5 power plants built most recently in the SESB grid.
Source of data used:	Study on Grid Connected Electricity Baselines in Malaysia, April 2006, Pusat Tenaga Malaysia
Value applied:	See Table-5, Appendix 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	To be used for calculation of Simple BM.
Any comment:	—

B.6.3 Ex-ante calculation of emission reductions:

●Project activity emissions (PE_y)

PE_y＝0 (tCO_2 e /year)

● Baseline emissions (BE_y)

○Simple OM

$$EF_{OM,Simple,y} = \frac{\sum_{i,j} F_{i,j,y} \bullet COEF_{i,j,y}}{\sum_{i} GEN_{j,y}}$$

＝2,425,484.92 (tCO_2 e)÷4,364,774 (MWh)

＝0.550 (tCO_2 e /MWh)

○BM

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} \bullet COEF_{i,m,y}}{\sum_{m} GEN_{m,y}}$$

＝969,970 (tCO_2 e)÷1,303,192.84 (MWh)

＝0.774 (tCO_2 e /MWh)

○CM

$EF_y = w_{OM} \times EF_{OM,y} + w_{BM} \times EF_{BM,y}$

＝0.550×0.5+0.744×0.5

＝0.647 (tCO_2 e /MWh)

○Baseline emissions

$BE_y = EG_y \times EF_y$

＝60,487 (MWh/year)×0.647(tCO_2 e /MWh)

＝39,135 tCO_2 e /year

● Leakage (L_y＝0)

L_y＝0 (tCO_2 e /year)

● GHG emission reductions (ER_y)

$ER_y = BE_y - PE_y - L_y$

＝39,135 (tCO_2 e /year)－0 (tCO_2 e /year) －0 (tCO_2 e /year)

＝39,135 (tCO_2 e /year)

B.6.4 Summary of the ex-ante estimation of emission reductions:

Years	Estimation of project activity emissions (tCO_2e)	Estimation of baseline emissions (tCO_2e)	Estimation of leakage (tCO_2e)	Estimation of overall emission reductions (tCO_2e)
Year 1 (1/4/2008～31/3/2009)	0	39,135	0	39,135
Year 2 (1/4/2009～31/3/2010)	0	39,135	0	39,135
Year 3 (1/4/2010～31/3/2011)	0	39,135	0	39,135
Year 4 (1/4/2011～31/3/2012)	0	39,135	0	39,135
Year 5 (1/4/2012～31/3/2013)	0	39,135	0	39,135
Year 6 (1/4/2013～31/3/2014)	0	39,135	0	39,135
Year 7 (1/4/2014～31/3/2015)	0	39,135	0	39,135
Total (tonnes of CO_2e)	0	273,945	0	273,945

B.7 Application of a monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

Data / Parameter:	EG_y
Data unit:	kWh
Description:	Electricity exported to SESB grid
Source of data to be used:	Electricity exported to the grid as recorded in a kWh meter
Value of data	Electricity generation supplied to SESB grid
Description of measurement methods and procedures to be applied:	To measure continuously using kWh meter and record once a month.
QA/QC procedures to be applied:	SESB controls kWh meter according to its own standard.
Any comment:	—

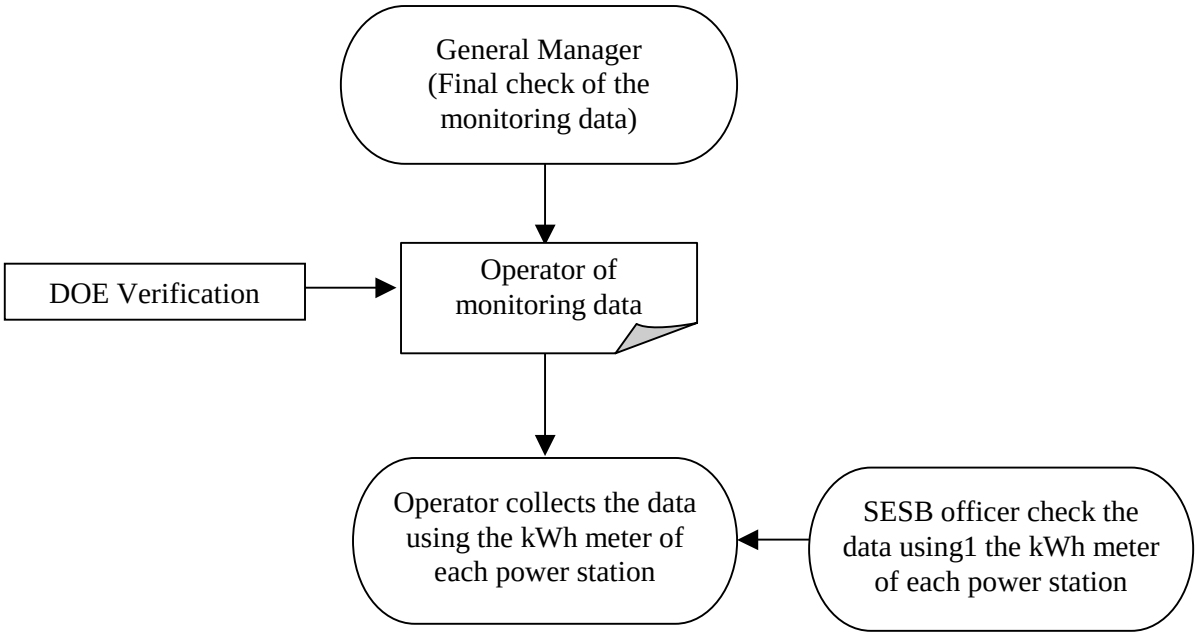
B.7.2 Description of the monitoring plan:

The generated electric energy at each power plant shall be measured by kWh meter, which satisfies the IEC and the BS standard, and would be set at the connecting point of the grid. The kWh meter is

managed by SESB and shall be tested by SESB every 12 months in accordance with prudent utility practices. The project participant can witness and verify the inspection and test.

The energy sold by the project participant is monitored by SESB every month in the presence of both parties. The project operator shall keep the records and use the data to calculate GHG emission reductions. In addition, the project participants shall install alternative kWh meter as a cross-check on the records. DOE should verify the monitoring results. The current plan of setup for monitoring is shown in the Figure-3.

As described above, the quality of the data to be monitored in this project activity will be appropriately controlled and assured.



Figuer-3 Monitoring structure

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

●Date of completing the baseline and monitoring methodology
01/12/2006

● Name of person/entity of determining baseline
Mr. Seiji Toma
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1-2 Ohdori-Higashi, Chuo-ku, Sapporo, Japan 060-8677
TEL:+81-11-251-4623 FAX:+81-11-251-0425
e-mail: h2000009@epmail.hepco.co.jp

CDM – Executive Board

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

01/10/2006

C.1.2. Expected operational lifetime of the project activity:

21 years and 0 months

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

01/4/2008

C.2.1.2. Length of the first crediting period:

7 years and 0 months

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

Not applicable

C.2.2.2. Length:

Not applicable

SECTION D. Environmental impacts

D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

According to the Guideline of Malaysian federal government, EIA is not required in this project. However, the Sabah state government has their own guideline, which requires the EIA report to develop a SHPP. For these three projects, local accredit consultant has been appointed to conduct the EIA. As of today, conditional approve has been given by the Environmental Protection Department (EPD) of Sabah state government. Summary of the EIA is as bellow;

1. Impacts

The assessed environmental impacts of the proposed SHPP are; water quality, soil erosion and hydrology.

2. Recommended mitigation measures and monitoring

During the construction and operation phase, the impacts should be mitigated or kept to a minimum and monitor by the following of programs and plans. These plans and programs include;

a) Water quality; provision of riparian reserves, management of excess earth, provide silt trap, provide an area for storage away from waterways for schedule waste, etc.
b) Disturbance of riverine ecology; measures should be taken not to strip off riverine vegetation and observe the riparian reserve.
c) Air pollution; road sprinkling, avoid employment of poorly maintained machineries, equipment and old transports (to minimise excessive emission of smoke), etc.
d) Noise; working on daytime, Proper planning of the transportation of construction materials so as to minimise the frequency of delivery, control of the speed of vehicles, etc

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

Each project will fallow the mitigation plan and monitoring plan written in the EIA. Therefore, there will be no significant environmental impacts in this project.

SECTION E. Stakeholders' comments

E.1. Brief description how comments by local stakeholders have been invited and compiled:

Malaysian government entrusts State governments to decide on where to collect Stakeholder's comments. In the project, following the instruction of the State government of Sabah, we visited and collect comments directly from those agencies listed below in consideration of all and every effect and influence regarding to the project.

① EPU (Economic Planning Unit, Sabah)
② EPD (Environment Protection Department, Sabah)
③ DID (Department of Irrigation and Drainage)
④ SESB (Sabah Electricity Sdn. Bhd.)
⑤ NGO (Pacos)
⑥ District of Kota Belud
⑦ District of Kota Marudu
⑧ District of Tambunan
⑨ Community leader and the local householder in residential area of Kadamaian SHPP
⑩ Community leader and the local householder in residential area of Pangapuyan SHPP
⑪ Community leader and the local householder in residential area of Kaingaran SHPP

E.2. Summary of the comments received:

Overall, the stakeholders provided very positive comments during the stakeholder consultation. The general comments are written bellow.

- The proposed project would contribute to Global Warming Issue. Therefore, we welcome your project.
- The proposed project would lead to local revitalization. Therefore, we welcome your project.
- Please try to provide local economical contribution, by employing the locals and/or order the construction work to the local company, etc.
- The proposed project would provide electricity to the citizen. Therefore, we welcome your project.

E.3. Report on how due account was taken of any comments received:

The Sabah state government and villagers, etc, are all supportive of the Project and to date there has been no need to modify the project design according to the comments received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Project Participant 1

Organization:	Esajadi Power Sdn. Bhd.
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Represented by:	
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Project Participant 2

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Represented by:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project has no connection with official development assistance for Annex I countries.

Annex 3

BASELINE INFORMATION

Table - 3 Annual total electricity generation of SESB by sources （Unit：GWh）

Year	2000	2001	2002	2003	2004
Hydropower	491	461	437	453	450
Gas	159	258	388	471	466
Diesoline	414	420	427	477	478
Total	1,064	1,139	1,252	1,401	1,394

（Source：Energy Commission HP）

Table - 4 Calculation of Simple OM

Year	Electricity generation （MWh）	CO_2 emissions （tCO_2 e）
2002	1,358,813	554,321.13
2003	1,489,763	796,698.47
2004	1,516,198	1,074,465.32
Total	4,364,774	2,425,484.92

（Source：Study on Grid Connected Electricity Baselines in Malaysia, April 2006, Pusat Tenaga Malaysia）

Table-5 Electricity generation and CO_2 emissions(2004) of 5 power pants that have been built most recently

Name of Plant	Year of the start of operation	Generated output （MW）	Electricity generation （MWh）	CO_2 emissions （tCO_2 e）
Powertron	1998	120	803,004.48	556,427
ARL	1996	50	53,369.82	37,733
Gantisan	1996	40	12,562.60	11,435
Patau-Patau GT3	1995	33	423,627.55	354,700
Melawa	1995	20	10,628.40	9,675
Total	—	263	1,303,192.84	969,970

（Source：Study on Grid Connected Electricity Baselines in Malaysia, April 2006, Pusat Tenaga Malaysia）

Annex 4

MONITORING INFORMATION

No.	Data type	Data source	Data unit	Measured (m) Calculated (c) estimated (e)	Recording frequency	Proportion of data to be monitored	How will data be archived ? (electronic/paper)	For how long data be kept?	Comment
1	Electricity generation of sell to SESB (Kadamaian SHPP)	kWh meter	MWh	m	Measuring continuously and record once a month	100%	Paper	2 years after the final issuance of CER	The bill from SESB is used. The data would be double check by the buck-up metering system.
2	Electricity generation of sell to SESB (Pangapuyan SHPP)	kWh meter	MWh	m	Measuring continuously and record once a month	100%	Paper	2 years after the final issuance of CER	The bill from SESB is used. The data would be double check by the buck-up metering system.
3	Electricity generation of sell to SESB (KaingaranSHPP)	kWh meter	MWh	m	Measuring continuously and record once a month	100%	Paper	2 years after the final issuance of CER	The bill from SESB is used. The data would be double check by the buck-up metering system.