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:

Small Hydropower Project in the State of Sabah, Malaysia
Version 1
Date: March 5, 2008

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

a) Outline of the host country

The host country of Malaysia has achieved steady economic growth except for Asian economic crisis in 1997 and it has showed strong growth mainly through electronic industry, especially in recent years. Though rising oil prices put a dent in economic growth rate slightly in the year 2005, it even showed healthy growth of 5 - 6 %.

On another front, in the State of Sabah where the proposed project site is located, has once developed through timber industry with its vast area of tropical rainforest. Now, its industrial strength are agriculture, forestry and fishery which is centered on palm oil industry based on oil palm trees and mining industry centered on petroleum oil in recent years.

On electric power supply in the State of Sabah, SESB (Sabah Electricity Sdn. Bhd.) bears responsibility which has transmission network in the West Coast region centered on the State capital of Kota Kinabalu and the project is designed to connect electric power to the grid.

b) Outline of the project

The project, which aims to construct a run-of-river type power plant, entails building an intake weir at 2 sites (Kimanis Kanan and Kimanis Kiri) on Kimanis River in the northwest parts of Sabah, Malaysia, and connects to the local grid to sell the generated electric power. Since the generated electric power is clean energy which accompanies no emission of global warming gas, implementing this project will be effective in achieving reduction of emission of global warming gas by utilising grid as a renewable energy to alternate fossil fuel.

In the project, total maximum output of 4 MW and annual generating power of 24,000MWh can be obtained by bundling these 2 sites mentioned above, and reduction effect of global warming gas can be achieved up to 15,528tCO_2 (approximately 326,000tCO_2 in 21 years).

In addition, implementation of the project will be carried on utilizing SREP (Small Renewable Energy Power Program) formulated in Malaysia in the aim of promoting usage of renewable energy.

c) Objective of the project

Objective of the project is to achieve sustainable reduction of environment load and to supply electric power to surrounding areas by utilizing technique of run-of-river type hydro power generation which is a renewable energy with little impact to environment.

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

1. Development of sustainable energy
   'Best Mix Strategy through 5 kinds of energy for power source' was formulated in 1999 in which promotion of using renewable energy to supplement petroleum oil, natural gas, coal and hydro power (in large scale) is decided. This strategy quotes biomass, biogas, municipal refuse, solar light and small scale hydro power as renewable energy sources to be given priority. Moreover, Malaysian government set a goal of 350 MW as a target value to introduce SREP in 'The 9th Malaysia Plan'.
   The project meets the strategy because it is a project aiming at developing renewable energy.

2. Employment creation and local revitalization through construction and maintenance of hydro power plant
   With implementation of the project, employment creation will be attained in the time of construction and operation, thus the project will lead to local revitalization.

3. Spillover to other sites of hydro power generation in Sabah
   As mentioned in the clause 1) above, run-of-river type plant for hydro power generation is listed as one of renewable energy to be developed, implementation of the project will provide a spark for developing potential areas for introducing small scale hydro power plant.

e) Technical transfer

1. Techniques regarding to development, operation and maintenance of run-of-river type plant for hydro power plant
   In the State of Sabah, developing small scale hydro power plant by private sector is not prevailing. One of the main reasons for it is that number of technical experts capable of developing hydro power plant is limited. Moreover, there is no other hydro power plant operated and maintained by private sector and sufficient know-how of operation and maintenance are not well diffused yet. It is deemed that through implementing the project, various technical transfers ranging from developing hydro power plant to operation and maintenance is expectable.

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)	SPC (special purpose company)	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:

Papar

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

The project site is located at the upper stream area of Kimanis originated from Crocker Range National Park covering Crocker Range which divides middle part of Sabah, Borneo Island, Malaysia. It takes about 2 hours by road from Kota Kinabalu, capital of Sabah. Kimanis River flows in the direction of Northwest from Crocker Range and pour into South China Sea at around Papar area.

This project is to construct run-of-river type hydropower plant in at Kimanis Kanan River and Kimanis Kiri River, both are tributaries of Kimanis River. At Kimanis Kanan River, construction of an intake weir is designed at the point 213 meters in altitude utilizing an effective head of 124 meters in order to generate maximum output of 2.5 MW. At Kimanis Kiri River, construction of an intake weir at the point 85 meters in altitude utilizing an effective head of 63 meters in order to generate maximum output of 1.5 MW.

Map of Project site is shown in Figure 1.

Figure 1 Project Site

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 4 MW in total by bundling run-of-river type hydro power with 2.5 MW capacity at Kimanis Kanan site and 1.5 MW at Kimanis Kiri site. 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 Power Generation Plan Particulars

Item				Kimanis Kanan site	Kimanis Kiri site
River name			—	Kimanis Kanan River	Kimanis Kiri River
Catchment area			km^2	34	36
Generating plan	Power generation type		—	Run-of-river, conduit type	Run-of-river, conduit type
	Intake elevation		m	213	85
	Outlet elevation		m	76	15
	Total head		m	137	70
	Effective head		m	124	63
	Maximum discharge		m^3/s	2.5	3.0
	Maximum output		MW	2.5	1.5
	Electricity generation		MWh	15,400	8,600
	Maintenance flow		m^3/s	0.1	0.1
Equipment outline	Intake weir	Type	—	Concrete gravity type	Concrete gravity type
		Height	m	4.0	4.0
		Dam crest length	m	35.0	35.0
	Channel	Headrace	m	L=4,600, D=1.40	L=3,200, D=1.60
		Penstock	m	L=600, D=1.20	L=500, D=1.40
	Turbine type		—	Francis Turbine	Francis Turbine

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

The project estimates 15,528 tCO_2 of annual GHG reduction, and the credit period is set for 7 years, which the total amount over the aggregate GHG reduction will be 108,696tCO_2, In addition, the total amount over 21 years which is added up with 2 renewals will be 326,088tCO_2.

Table 2 GHG Reduction

Year	Estimated Annual GHG Reduction(tCO_2)
1st year	15,528
2nd year	15,528
3rd year	15,528
4th year	15,528
5th year	15,528
6th year	15,528
7th year	15,528
Total GHG reduction (tCO_2)	108,696
The credit period	7 years
Annual average GHG reduction in the credit period (tCO_2)	15,528

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

There is no public funding involved for the financing of the project activity. As such it will not result in a diversion of official assistance.

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;

- Participation of same project participants participate in the project.
- Same project category and same technology is applied
- Registration within the past two years
- The nearest project boundary lies within the proposed small scale project boundary no more than 1 km away

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;

I.D. Grid connected renewable electricity generation

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 4MW 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/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 generation 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 tailrace since these facilities are linked Project (see the Figure-2). Moreover, the transmission line shall be extended to SESB's administrative boundary (connection point).

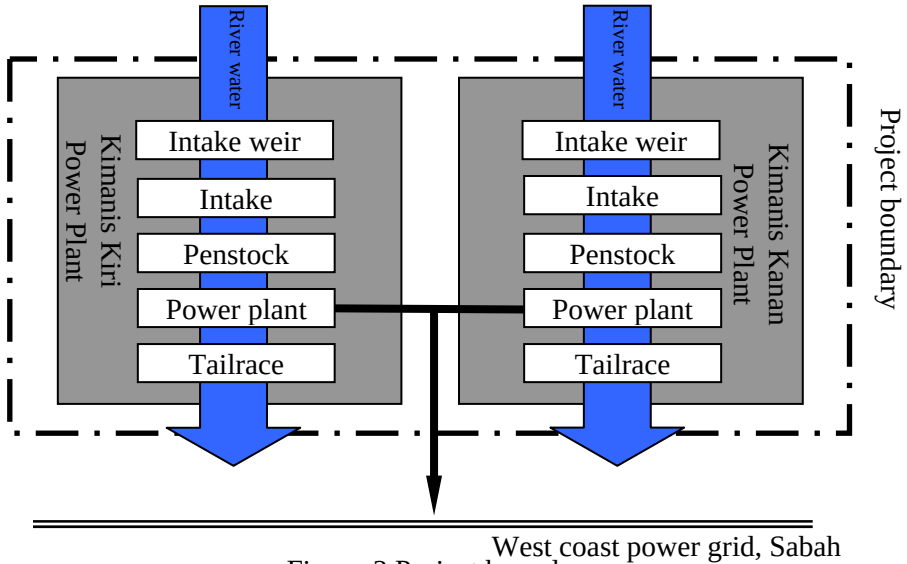

Figure-2 Project boundary

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/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/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, ②Simple 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:

In case of small scale CDM undertakings, it is considered to be eligible if the project faces any of each barrier such as;

① Investment barrier
② Technological barrier
③ Barrier due to prevailing practice
④ Other barriers

Additionality for the project shall be demonstrated by ① and ③.

a) Investment barrier

Generally, the project scale of run-of-river type hydropower plant is small and generates low profit. Moreover, since business risk might be high due to occasional change of generating power during its long business term, it is not widely prevailing as general IPP project. On the contrary, IPP business utilizing thermal power is prevailing in each country with participation of investors because thermal power generates more than tens of MW and its business profit is much larger than hydro power.
In the State of Sabah, 5 IPP operate power plants are all thermal plant using diesel or natural gas as fuel. In recent years, construction of a gas combined cycle thermal power station is being planned. Therefore, it can be said that thermal power plant is the prevailing IPP projects in Sabah.

The result of local survey and hearing in Sabah shows that 10 – 12 % of IRR is needed to secure a loan from local banks to operate small scale hydropower generation in Malaysia. Since IRR value is calculated as 8.4 % (Power selling rate 0.19RM/kWh) without CER for 21 years of the term of project, thus it is difficult to secure a loan from local banks. However, if CER revenue is combined, it shall be 10.4 % (CER=10 EUR/tCO_2, power selling rate 0.19RM/kWh) and it shows that the project is sufficient undertaking to secure a loan from local banks.
Therefore, it is deemed natural that general IPP business operators should be interested in developing thermal power generation than this project.

b) Barrier due to prevailing practice
Actually in Sabah, there is only 6 run-of-river type hydropower plants which is being operated by SESB and no such plant is operated by any other private sector. Moreover, Small Renewable Energy Power Program (SREP) was formulated on May, 2005 which is aiming at promoting to develop renewable energy, it has not taken root even at the present time on October, 2006.
As a conclusion, run-of-river type hydropower plant is still not general and common in Sabah.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

Project Emissions, baseline emissions, leakages and GHG emission reductions will be calculated based on AMS-I.D. Followings are the methods of calculations;

a) Project emissions (PEy)
Project emissions are zero.（PEy = 0）

b) Baseline emissions (BEy)
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)
- EG_y : Annual electricity generation obtained in line with the project (MWh/y).
- EF_y : Grid emission coefficient in Sabah, Malaysia (tCO_2/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 normals 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/MWh) obtained by calculation of weighted average from power source which is not low-cost/must-run resource (thermal power).

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

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.

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

Where,

- $NCVi$ 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) ($ex\text{-}ante$) the full generation-weighted average for the most recent 3 years for which data are available at the time of PDD submission, or

(ii) ($ex\text{-}post$) 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;

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

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

The data used for calculating the BM can be calculated 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:

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

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%.

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

<u>d) GHG emission reductions (ERy)</u>
GHG emission reductions are calculated using the following formula;

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

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:	PTM HP
Value applied:	See Figure-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 generation 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:	PTM HP
Value applied:	See Figure-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
Description:	Electricity generation of SESB (2002－2004)
Source of data used:	PTM HP
Value applied:	See Figure-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:	PTM HP
Value applied:	See Figure-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
Description:	CO_2 emission from of 5 power plants built most recently in the SESB grid.
Source of data used:	PTM HP
Value applied:	See Figure-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 emissions (PEy)

PEy＝0 (tCO_2/year)

●Baseline emissions (BEy)

○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)÷4,364,774 (MWh)

＝0.550 (tCO_2/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)÷1,303,192.84 (MWh)

＝0.774 (tCO_2/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/MWh)

○Baseline emissions

$$BE_y = EG_y \times EF_y$$

＝24,000(MWh/year)×0.647(tCO_2/MWh)

＝15,528tCO_2/year

●Leakage (Ly＝0）

Ly＝0 (tCO_2/year)

●GHG emission reductions (ERy)

$$ER_y = BE_y - PE_y - L_y$$

＝15,528(tCO_2/year)－0(tCO_2/year) －0(tCO_2/year)

＝15,528(tCO_2/year)

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

Year	Project emissions (tCO_2)	Baseline emissions (tCO_2)	Leakage (tCO_2)	Emission reductions (tCO_2)
1st year	0	15,528	0	15,528
2nd year	0	15,528	0	15,528
3rd year	0	15,528	0	15,528
4th year	0	15,528	0	15,528
5th year	0	15,528	0	15,528
6th year	0	15,528	0	15,528
7th year	0	15,528	0	15,528
Total	0	108,696	0	108,696

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

B.7.1 Data and parameters monitored:

Data / Parameter:	EGy
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:

Participants from Malaysia and Japan will establish a SPC (Special Purpose Company) and it will conduct monitoring. Operation and maintenance of monitoring shall be conducted in line with items prescribed in a manual which will be set up separately and in the framework of the setup shown in the Figure-3. In addition, measured data will be checked by the General Manager and verified by DOE.

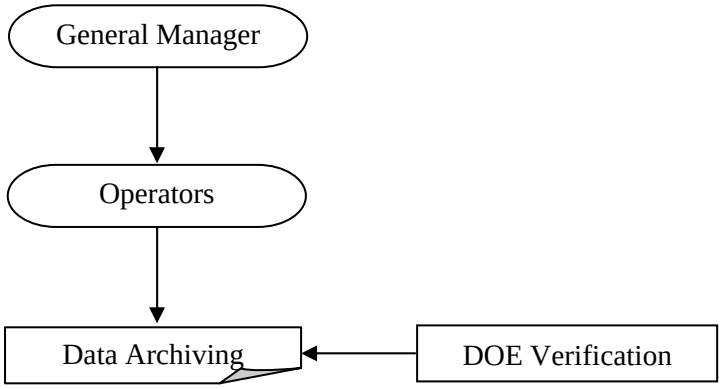

Figure-3 Monitoring Setup

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 final draft of this baseline section
March 5, 2007

CDM – Executive Board

● Name of person/entity of determining baseline

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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:

May 1, 2008 (date of starting construction)

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

21 years

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:

October 1, 2009 (date of the starting operation)

C.2.1.2. Length of the first crediting period:

7 years

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:

The project is designed to construct small scale hydropower plant in upper river basin of Kimanis River (Kimanis Kanan site and Kimanis Kiri site). The development object area is located outside of the restricted zone of Crocker Range Park (Crocker Range National Park).
The results of local survey and hearing toward relevant authorities and agents are as followed;

- The project is the subject to EIA. (EPD：Environmental Protection Department, Sabah)
- In case of small scale run-of-river type plant, the EIA shall be done in the extent of water quality analysis and examination of documents. (Local consultant)
- DID shall issue the licence to the application for usage of water upon receiving submission of EIA. (DID)
- Fish way is not necessary to be set (MONRE, SESB, and local consultant).

In addition, the actual situation on main subjects which are deemed to generate impact on environment at each phase of progress (phase of development and construction, phase of operation, maintenance and management) is mentioned below referring to those subjects at a certain project in the conducted environmental investigation as EIA. Further details of countermeasures will be studied in the official process for EIA.

① The phase of development and construction

○ Impact on water quality

It is assumed that impact will be generated by examination works such as boring, and construction work of intake weir.
In Malaysia, water quality control is set down in 'Environmental Quality (Sewage and Industrial Effluents) Regulations 1979'.
To fulfil its criteria, countermeasures such as setting sedimentation ponds, turbid water treatment facilities and so on are to be designed in the project.

○ Impact of noise

Loud noise from heavy equipments is deemed to be generated.
In Malaysia, noise control is set down in 'Guidelines for the Citing and Zoning of Industries, Environmental Requirements, Seventh Edition, November 2000' that noise should not exceed more than 65dB within the buffering zone of 500 m in radius.
To fulfil its criteria, countermeasures such as setting working time, using low-noise equipments and so on are to be designed in the project.

○ Impact on air

Littering of traffic dust in accordance with construction works is deemed to be generated.
In Malaysia, air quality control is set down in 'Environmental Quality （Clean Air）Regulations 1978'.
To fulfil its criteria, countermeasures such as sprinkling water as may be necessary and so on are to be designed in the project.

○ Impact on plants and animals

According to the result of hearing survey to the residents living in surrounding area of the project, It is deemed that there is no habitat of endangered species listed in Red Data Book published by IUCN (International Union for Conservation of Nature and Natural Resources) and no ecologically valuable flora exists in the development object area.

○ Impact on landscape

To minimize the area of land modification and felling of trees arising from construction works, it is designed to implement appropriate afforestation to achieve harmonization with surrounding natural landscape.

In addition, the development object area is not designated as a part of national park.

② The phase of operation, maintenance and management

○ Impact on river flow rate

Since water reducing parts in the river will appear due to intake of water, maintenance flow will be taken.

Official maintenance flow will be defined upon discussion with DID, however, we draw maintenance flow at the intake point as $0.1m^3/s$ all year round.

○ Impact of noise

Since no resident is living in the surroundings of the proposed power plant, impact of noise is deemed to be little on living environment of the residents in the surroundings.

○ Impact on fish

As the result of hearing survey to relevant authorities and agents on the possibility of interception against fish that run to upstream, it is deemed that there is no fish that run to upstream and there is no past record of setting fish way in Sabah according to some comments. Therefore, it is deemed that no fish way is necessary to set.

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:

As aforementioned, since the project is designed to take appropriate measures for protecting environment in the phase of development, construction, operation and maintenance, no significant environmental impact is deemed to be generated.

SECTION E. Stakeholders' comments

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

We visited those government authorities and agents listed below and collected comments on development as CDM project.

① MONRE (Ministry of Natural Resources and Environment)
② DOE (Department of Environment in Sabah, Ministry of Natural Resources and Environment)

③ MEWC (Ministry of Energy, Water and Communications)
④ EC (Energy Committee)
⑤ PTM (Malaysia Energy Committee)
⑥ MIDA (Malaysian Industrial Development Authority)
⑦ SESB (Sabah Electric Sdn. Bhd.)
⑧ EPU (Economic Planning Unit, Sabah)
⑨ DID (Department of Irrigation and Drainage)
⑩ EPD (Environment Protection Department, Sabah)
⑪ Papar {Municipality）

E.2. Summary of the comments received:

The government authorities and agents have made no specific remark or comment on development as CDM project, rather, they made positive comments such as they 'welcome' or 'support' the project.

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

No specific report.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Project Participant 1

Organization:	Hokkaido Electric Power Co., Inc.
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Telephone:	+81-11-251-1111
FAX:	-
E-Mail:	-
URL:	http://www.hepco.co.jp
Represented by:	
Title:	Manager
Salutation:	Mr.
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Middle Name:	-
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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

Figure - 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）

Figure - 4 Calculation of Simple OM

Year	Electricity generation （MWh）	CO_2 emissions （tCO_2）
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：PTM HP）

Figure-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）
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：PTM HP）

Annex 4

MONITORING INFORMATION

Monitoring of electricity generation shall be conducted in the way that both side shall confirm and verify the data of voltmeters which are set at the both end of generating (project side) and transmission (SESB side) once a month, and this data would be used for electric power selling to SESB. Monitoring items are shown in the Figure-6 below;

Figure-6 Monitoring items

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 (Kimanis Kanan as generating end)*	*Voltmeter*	*MWh*	*m*	*Measuring continuously and record once a month*	*100%*	*Both*	*2 years after the final issuance of CER*	
2	*Electricity generation (Kimanis Kiri as generating end)*	*Voltmeter*	*MWh*	*m*	*Measuring continuously and record once a month*	*100%*	*Both*	*2 years after the final issuance of CER*	
3	*Electricity generation (Kimanis Kanan as generating end)*	*Voltmeter*	*MWh*	*m*	*Measuring continuously and record once a month*	*100%*	*Both*	*2 years after the final issuance of CER*	
4	*Electricity generation (Kimanis Kiri as generating end)*	*Voltmeter*	*MWh*	*m*	*Measuring continuously and record once a month*	*100%*	*Both*	*2 years after the final issuance of CER*	