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# Validation Report

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Client: Mitsubishi UFJ Securities Co., Ltd.


Power Prospect 9.9MW Rice Husk Power Plant  
(the “Project” or “project activity”)

Project No.: JQA-C0066  
(1812000077)

06 November 2008



JAPAN QUALITY ASSURANCE ORGANIZATION

Date of issue: 06 November 2008	Project No.: JQA-C0066
Approved by:  Tsutomu Matsuno	Client: Mitsubishi UFJ Securities Co., Ltd.
<p><b>Summary:</b></p> <p>This is the Validation Report for the project activity "Power Prospect 9.9MW Rice Husk Power Plant (the "Project" or "project activity")", proposed by Power Prospect Company Limited and Mitsubishi UFJ Securities Co., Ltd.</p> <p>This project activity aims at reducing GHGs emissions by setting up a biomass-based power generation plant, utilizing rice husk as biomass waste of the rice milling process. The approved baseline and monitoring methodology, AMS-I.D./Version 12 "Grid connected renewable electricity generation" is applied.</p> <p>Japan Quality Assurance Organization (JQA) as a DOE conducted the validation on the basis of UNFCCC, Kyoto Protocol and relevant decisions of COP/MOP and CDM-EB.</p> <p>After the implementation of the project activity, the average amount of emission reductions of 33,788 t-CO<sub>2</sub>e/year is to be achieved.</p> <p>JQA confirmed that the project activity meets all relevant criteria. JQA determines the project activity to be valid as a CDM project activity.</p>	

Report No : JQA-C0066-VaR (Ver. 03)	Report Title : Power Prospect 9.9MW Rice Husk Power Plant (the "Project" or "project activity")
Assessed by : Team Leader: Toshimizu Okada, Assessor (TLUO) Member: Itaru Watanabe, Lead Assessor	Verified by : Leader: Dr. Ikuo Tamori Dr. Hiroshi Kuribayashi (External) Dr. Takahisa Yokoyama (External)

## Abbreviations

AMS	Approved Methodology for Small-scale CDM Project Activities
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction
CL	Clarification Request
CM	Combined Margin
COP	Conference of the Parties
COP/MOP	Conference of the Parties serving as the Meeting of the Parties
DNA	Designated National Authority
EGAT	Electricity Generating Authority of Thailand
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement and Construction
GHG	Greenhouse Gas
GWP	Global Warming Potential
IEE	Initial Environmental Evaluation
ISO	International Organization for Standardization
JQA	Japan Quality Assurance Organization
LoA	Letter of Approval
MUS	Mitsubishi UFJ Securities Co., Ltd.
NGO	Non-governmental Organization
NLRM	Nakorn Luang Rice Mill
ODA	Official Development Assistance
OM	Operating Margin
ONEP	Office of Natural Resources and Environmental Policy and Planning
PCD	Pollution Control Department
PDD	Project Design Document
PDP	Power Development Plan
PEA	Provincial Electricity Authority
PP	Project Participant
PPA	Power Purchase Agreement
PPCL	Power Prospect Company Limited
QA/QC	Quality Assurance and Quality Control
SD	Sustainable Development
SSCDM	Small-scale CDM Project Activity
TAO	Tambon Administration Organization
TGO	Thailand Greenhouse Gas Management (Public) Organization
THB	Thai Baht
TLUO	Team Leader under Observation
UNFCCC	United Nations Framework Convention on Climate Change
VSPP	Very Small Power Producer

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Appendix A: SSCDM Validation Checklist

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# 1 INTRODUCTION

## 1.1 Objective

The objective of the validation is to review whether the project activity is in conformance with the requirements defined by the UNFCCC, the Kyoto Protocol, CDM Modalities and Procedures and related decisions by COP/MOP and CDM-EB. The most important thing to be confirmed is to achieve GHGs emissions reductions against the baseline in along with the sustainable development policy of Thailand.

## 1.2 Scope

The scope of this validation process is set as follows:

- a) Documentary
  - UNFCCC
  - Kyoto Protocol
  - Decisions of COP/MOP and CDM-EB
  - AMS-I.D./Version 12
  - Attachment C of Appendix B of the Simplified M&P for Small-scale CDM project activities
  - Guidance on the Assessment of Investment Analysis (Version 02)
  - Guidance on the Demonstration and Assessment of Prior Consideration of the CDM
  - PDD Version Number 01: AMS-I.D./Version 11, AMS-III.E./Version 12
  - PDD Version Number 02: AMS-I.D./Version 12
- b) Physical

The physical, geographical site of the biomass-based power generation plant of Power Prospect Company Limited
- c) Organizational
  - Power Prospect Company Limited
  - Mitsubishi UFJ Securities Co., Ltd.
- d) Temporal
  - The first crediting period of the project activity is set at 7 years (renewable).

## 1.3 GHG Project Description

- a) Project Participants : Power Prospect Company Limited  
Mitsubishi UFJ Securities Co., Ltd.
- b) Non-Annex 1 Party : Thailand
- c) Annex 1 Party : Japan
- d) Project Site : Tha Ruea district, Ayutthaya province, Thailand
- e) Location : Biomass-based power generation plant (100°42' East and 14°32' North)
- f) Starting date of the project activity : 31 Mar 2007
- g) Expected operation lifetime of the project activity : 20 years
- h) Starting date of the first crediting period : 01 January 2009 or immediately after project registration, whichever is the latest.

- i) Length of the first crediting period : 7 years
- j) Technology : an advanced biomass-fired generation system  
with gross capacity of 9.9MW (8.9MW net)
- k) The total estimate of anticipated reductions in tons of CO<sub>2</sub> : 33,788 t-CO<sub>2</sub>e/year

## 1.4 Validation Team

The validation team was assigned on 24 May 2007 based on the JQA CDM Quality Manual (Version 5, 6 December 2006).

Team Leader	Toshimizu Okada	JQA Certified CDM Assessor (TLUO)
Member	Itaru Watanabe	JQA Certified CDM Lead Assessor

The sectoral scope (1: Energy industries (renewable - / non-renewable sources)) relating to the project is covered by the validation team in accordance with the JQA CDM Quality Manual. Certificates of the validation team members are attached. (Appendix B)

The role and responsibility of the team leader is mainly to prepare the validation plan including the Desk Review, the Site-visit and related documentation and to manage the validation activities of the team. And the leader is responsible for stating the validation opinion and conclusion in the validation report.

The role and responsibility of the member is to implement the Desk Review and the Site-visit including the investigation and collection of background information and interviews with the project participants and related stakeholders, and also to indicate potential CARs and/or CLs through the validation activities.

Itaru Watanabe, who is a member of the validation team, is a chemical engineer and qualified as a lead assessor of CDM. He worked as a lead assessor for environmental management systems (ISO 14001) in JQA and has been engaged in validation of CDM projects. He validated the Nubarashen LFG project in Yerevan, Armenia (Ref. No. 69) as a team leader, through which the sectoral scopes of (1) and (13) were accredited to JQA. He has participated in several validations of the registered CDM projects of LFG recovery and power generation, factory energy-efficiency improvement and HFC23 decomposition.

Toshimizu Okada is a team leader of the validation team under observation of Itaru Watanabe. He has Master Degree of Forest Resources. He has experiences as assessor of ISO 14001 in JQA and as CDM assessor for small-scale renewable energy with biomass utilization and factory energy-efficiency improvement projects through CDM validation.

## 2 VALIDATION PROCESS

The validation process of JQA consists of the following phases:

- 1) Desk Review of the PDD
- 2) Background Investigations including interviews with governmental officials and stakeholders at the Site-visit
- 3) Resolution of clarification requests (CLs) and corrective action requests (CARs)
- 4) Preparation of the Validation Report
- 5) Deliberation by Certification Committee

The PDD is made directly publicly available on the UNFCCC and JQA websites. If JQA receives any public comments, every comment is informed to the project participants and the CDM secretariat for uploading it on the UNFCCC and JQA websites.

In the validation, the SSCDM Validation Checklist (Appendix A) is utilized as a tool of the validation. The checklist serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet; and
- It ensures a transparent validation process by inducing the validator to document how a particular requirement has been validated and which conclusions have been reached;

Problems or findings identified in the process are indicated under the titles “CAR” (Corrective Action Request) and “CL” (Clarification Request) in the checklist.

CAR requires the project participants to take some corrective actions or others without fail, while CL indicates that it is desirable that the project participants take some corrective actions or others though not mandatory. The validation process does not provide the project participants with any consulting service, but if they take justifiable and appropriate corrective action for CAR and CL items included in the report, such action will clearly contribute to substantial improvement of PDD.

Criteria for judging problems as CAR or CL are as follows:

The criteria for CL and CAR are as follows:

<CAR (Corrective Action Request)>

- a) Non-compliance with laws and regulations of the host country; or
- b) Non-conformance with requirements defined by the UNFCCC, Kyoto Protocol, Decision 4/CMP.1 and other relevant decisions of COP/MOP, and EB decisions; or
- c) Items, which would affect CER calculation significantly

<CL (Clarification Request)>

- a) Insufficient description from the view of accuracy, reliability, completeness and /or consistency; or
- b) Vague expressions

Finally, all the CAR and CL are resolved through the project participant's correspondences to those. Comments on the correspondences are provided in italics in the checklist.

## 2.1 Schedule

- 24 May 2007: Start of the first Desk Review based on the PDD
- 06 June 2007: Start of Global Stakeholder Process on the UNFCCC and JQA websites
- 22 June 2007: Desk Review Report
- 02 - 05 July 2007: Site-visit in Thailand
- 05 July 2007: End of Global Stakeholder Process

Due to the change of application of the methodologies, the new PDD was made publicly available from 02 November to 01 December 2007.

The second Desk Review Report dated on 10 December 2007 was prepared:

- 02 November 2007: Start of the second Desk Review based on the new PDD and Global Stakeholder Process on the UNFCCC and JQA websites
- 01 December 2007: End of Global Stakeholder Process
- 10 December 2007: Desk Review Report

- 06 June 2008: Validation Report (Ver. 01) to the CDM Certification Committee of JQA
- 13 June 2008: CDM Certification Committee of JQA
- 16 June 2008: Validation Report (Ver. 02)
- 29 August 2008: Receipt of the revised PDD
- 06 November 2008: Validation Report (Ver. 03)

## **2.2 Desk Review of Documents**

The Desk Review is conducted using by the SSCDM Validation Checklist (Appendix A), which is prepared for a small-scale CDM project activity.

The main purposes of the Desk Review are as follows:

- Confirm the completeness of the PDD in accordance with the “Guidelines for Completing the SSC-PDD (CDM-SSC-PDD), Version 05” including “Glossary of CDM Terms (Version 04, 02/Aug/2008)”
- Review the PDD in order to judge the conformity of the project activity against the requirements
- Collect information regarding the project activity from an independent source for verification, if necessary
- Identify the issues at the Site-visit

And also, it focuses on:

- Justification and appropriateness of the baseline and monitoring methodologies for the proposed project
- Transparency and conservativeness of the assumptions for the baseline
- Technological, political, socio-demographic and environmental and legal aspects and trends relevant to the proposed project
- Additionality of the proposed project
- Appropriateness of the calculation of GHG emission reductions
- Responsibility and authority for monitoring, measurement and recording activities in the monitoring plan including quality control and quality assurance

## **2.3 Background Investigations**

The background investigations include the visit to the project site and the interviews mainly with the key persons in the host country including local project participants and governmental officials.

In this process, the followings are investigated:

- SD policy in the host country including Environmental Impact Assessment
- CDM approval and authorization procedures by DNA
- Technologies related to the project activity in the host country

## **2.4 Resolution of Clarifications and Corrective Action Requests**

The project participants are requested to respond how to resolve each CAR and/or CL pointed out in the Desk Review Report.

Though resolving them, the project participants revise the PDD and submit it to JQA.

## **2.5 Internal Quality Control**

The manager of Global Environmental Assessment Division organizes the validation team after considering the expertise of the project, the assessor qualification suitable for the technical and regional aspects of the project, and the



knowledge of environmental laws and regulations in the host country. Through the validation process, the validation team establishes the draft validation report including draft conclusion. The team leader of the validation team submits the documents including the outline of the validation result and the conclusion of the team to the Certification Committee of JQA, as a function to ensure that the validation is appropriately carried out. The Certification Committee, upon receipt of the draft validation report from the team, deliberates appropriateness of the validation and its procedures. After the Management Representative confirms the results of the deliberation, the Chair of the Certification Committee reports the results to the Senior Executive. Finally the Senior Executive decides the validity of the project activity as DOE.

### **3. VALIDATION FINDINGS**

Following the first Desk Review and the concern shown by the validation team at the Site-visit regarding the applicability condition of the paragraph 1 of AMS-III.E. to the PDD (Version Number 01, 31 May 2007), the new PDD that AMS-I.D./Version 12 is applied to was submitted for validation and the second Desk Review started on 02 November 2007.

The SSCDM Validation Checklist on 10 December 2007 was prepared based on the second Desk Review. There was no CAR pointed out. However, there were several issues pointed out specifically to the project. Those CLs items in Table 2 of the SSCDM Validation Checklist are listed below.

**CL1: Emission Factor (B.6.1.)**

Regarding the methodological choice for Simple OM, it is explained in the PDD that EGAT's low-cost/must-run resources have constituted less than 50% of the total grid generation in the past 5 years.

The summary of "average of the five most recent years" for the chosen option1) should also be provided in B.6.3.

**CL2: Emission Factor (B.6.3.)**

IPCC default is used for imported coal in Table 5. The use of the factor should be explained.

**CL3: Monitoring Item (B.7.1.)**

Monitoring item should be added in accordance with the paragraph 14 & 15 of AMS-I.D.

**CL4: Planned operational and management structure for monitoring (B.7.2.)**

"DOE verification" to the data archiving in Figure 3, B.7.2., should be deleted, because the role is outside the scope of the project activity.

**CL5: Starting Date (C.1.1.)**

The starting date should be set in accordance with the CDM Glossary of Terms.

All the CLs are resolved as described in the following sections.

Before conducting the second Desk Review, the validation team visited EGAT, PEA and PCD in Bangkok on 02 and 05 July 2007. The team visited the project site of Power Prospect Company Limited on 04 July 2007, where the leveling operation of ground for construction was observed. Team also visited Nakorn Luang Rice Mill

(NLRM) that is located near the project site and a main supplier of new rice husk to the project activity. The team also visited another rice husk mill located about 20km away in the Sara Buri province.

Key findings obtained through the Site-visit are described below.

- 1) According to PEA, the power purchase capacity for VSPP was extended from 1MW up to 10MW by a new regulation since January 2007. Following the extension, the company has applied for VSPP and received an PPA acceptance letter from PEA on 17 April 2007.
- 2) There are three official sources for the grid data in Thailand. Mitsubishi UFJ Securities Co., Ltd. provided detailed data of EGAT PDP 2002-2004 Energy Generation and Fuel Requirement/EGAT Actual Energy Generation and Fuel Requirement 1988-2002. The validation team also surveyed the data in annual reports of DEDE and on the websites of EPPO, after the Site-visit. Having conducted the assessment of those data and discussed with the PPs, the validation team concludes that EGAT's data provided by the project participants is appropriate for calculation of Operating Margin in accordance with the procedure required by ACM0002 as the chosen option (a) of the paragraph 9 of AMS-I.D. The team was also informed by the PP of their correspondence with the official of DNA(ONEP) that the data of EGAT PDP 2002-2004 can be regarded as the latest publicly available data.
- 3) The validation team visited NLRM as a main supplier of new rice husk to the project activity. NLRM is to receive sufficient steam for parboiling process and to reduce current level of consumption of diesel oil for drying process. The validation team also visited a rice husk mill in the Sara Buri province as possible supplier of new rice husk. While the mill consumes part of rice husk for electricity generation for their own use and also supplies some to chicken farms, a gradual shift to grid electricity from current utilization of rice husk for electricity generation is expected as its facilities get old.
- 4) Manuals and details of monitoring plan, including operational and management structure, and the competency requirements/internal training, are to be established by the project participants before the implementation of the project activity.
- 5) Stakeholders comments were invited in June, 2005, during Initial Environmental Evaluation. The IEE report completed in August, 2005 has been submitted to the Tambon Administration Organization (TAO) of Salaloy sub-district. The validation team interviewed the local government official with an interpreter about the report and confirmed that no significant environment impacts are expected. He expects that the project would contribute to well-being of the local community significantly and he is very keen to the success of the project. He confirmed that the TAO would be responsible to take appropriate measures, if any concerns regarding the project from people in the community were provided to the TAO.
- 6) The specification of the advanced biomass-fired generation system was provided at the Site-visit. The emission standards of air quality for biomass power generation was obtained and confirmed through the interview with PCD.

The project participants have responded to the CLs pointed out. They have been resolved in the revised PDD. Comments are provided in italics in Table 2, SSCDM Validation Checklist (Appendix A).

### 3.1 Participation Requirements

The project participants are Power Prospect Company Limited (Thailand) and Mitsubishi UFJ Securities Co., Ltd. (Japan).

Thailand has ratified the KP on 28 August 2002 and Japan has ratified it on 04 June 2002.

Letter of Approvals of voluntary participation from the DNAs of both Parties, including confirmation by the host Party that the project activity assists it in achieving sustainable development were obtained through the project participants and confirmed by the validation team.

The DNA of Thailand (Thailand Greenhouse Gas Management (Public) Organization) has issued a Letter of Approval on 10 March 2008, authorizing Power Prospect Company Limited as a project participant. The DNA of Japan has issued a Letter of Approval on 22 January 2008, authorizing Mitsubishi UFJ Securities Co., Ltd.

### 3.2 Project Design

The CDM project activity sets up a new biomass-based power generation plant in the Ayutthaya province of Thailand. The project introduces specific measures to address high ash content of rice husk and its aversive characteristic.

The electricity power of 70.2 GWh/y (net) is to be supplied to Provincial Electricity Authority (PEA) under PPA. The project plans to consume the rice husk as fuel for power generation. Project participants surveyed the demand/supply situation of rice husk as waste product of the rice husk milling process around the project site and its availability for the company.

The project participants decided the project design as follows:

- A water tube multi-fuelled boiler
- Gross capacity of 9.9MW (8.9MW net) power generator

The capacity of the power generator is less than the threshold of 15MW. There is no existing renewable power generation facility.

The starting date of the crediting period is 01 January 2009 or immediately after project registration, whichever is the latest.

The average amount of emission reductions to be achieved by the project activity will be 33,788 t-CO<sub>2</sub>e/year.

### 3.3 Baseline

The electricity generated by the renewable energy unit of the project activity is to be supplied to the national grid of Thailand, meeting applicability conditions of AMS-I.D.

The project participants chooses the option (a) of the paragraph 9 for AMS-I.D. for estimation of baseline emission factor as a combined margin (CM) consisting of the combination of operating margin (OM) and build margin (BM) of the Thailand national grid.

The emission factor for baseline emissions is calculated as 0.481 tCO<sub>2</sub>e/MWh.

## 3.4 Additionality

### 3.4.1. Barriers

The PDD discusses three barriers of “Investment barrier”, “Technological barrier” and “Barrier due to prevailing practice” out of four barriers defined in the Attachment A to Appendix B.

#### Investment barrier

A benchmark analysis has been used to demonstrate the investment barriers faced by the project activity. The PPs selected the project IRR as the financial indicator and compared it against an appropriate benchmark. The PPs has identified two independent and publicly available indicative rates associated with power generation in Thailand. One was sourced from a study of “*Biomass-based Power Generation and Cogeneration within Small Rural Industries of Thailand*” furnished by the National Energy Policy Office of Thailand (23%), whereas the other was sourced from “*IPP Bidding*” published in November, 2007 by Ayudhya Securities Public Company Limited, an independent financial firm in Thailand (15%). Having verified these two independent indicative rates, the validation team confirmed that the selection of 15% benchmark level for an Independent Power Producer (IPP) was realistic and conservative at the time of the decision making.

The original IRR calculation, which was presented and discussed at the PPCL’s steering committee meeting held on 10 June 2005, was submitted to JQA for validation. Taking into consideration that the original IRR calculation was not calculated in accordance with the recently available guidance of “*Guidance on the Assessment of Investment Analysis*”, the PPs were requested by the validation team to recalculate the IRR. The new calculation for the project IRR and all supporting documents were submitted to JQA. The validation team has checked the new IRR calculation and validated all input values used in the analysis. These values included:

- a. Capital cost – The value of capital cost has been updated from 663.7 million THB, which was sourced from the inputs of local consultants and contractors for which supporting documents could not be found, to 719.7 million THB, which was sourced from the official tender documents received by PPCL. The validation team has verified all the tender documents received by PPCL and confirmed that the selected document was conservative and appropriate. It is noted that this capital cost is a lump sum including the plant and equipment cost, substation and grid connection cost, land cost, development cost as well as contingency cost.
- b. O&M expenditure – This was based on PPCL’s detailed estimation, which is approximately 4.3% of total capital cost. The breakdown of the expenditure was provided and it was deemed as realistic.
- c. Electricity tariff rate – This was calculated according to the methods specified in EGAT’s SPP firm contract and prevailing gas prices in 2005. The validation team has validated the calculation and confirmed that all the input values were appropriate.

- d. Rice husk price and steam selling price – The rice husk price was sourced from “*Study on CDM case studies in Thailand*” published by ONEP. The unit steam price was sourced from the website of PTT Public Company Limited. The sources of the publicly available information were validated and confirmed.
- e. Income tax rate – It was confirmed that the Board of Investment of Thailand offers the corporate income tax privilege rates to IPPs. The validation team deemed that it was conservative to apply the tax privilege rates in the IRR calculation.
- f. Period of assessment – The PPs has clarified that the expected operational lifetime of the project is at least 20 years. The reason of putting “at least 21 years” in the original PDD is that this was coincident with the proposed crediting period. Taking into account of the guidance given in “*Guidance on the Assessment of Investment Analysis*”, the PPs has corrected the operational lifetime and also the period of investment assessment to 20 years. The validation team considered that the change was appropriate.

In addition to verify the validity of all input values, the validation team has also checked its applicability. It was confirmed that all input values were valid and applicable at the time of the investment decision taken by the PPs.

The new IRR calculation demonstrated that the resultant project IRR was determined as 12.6% in the absence of the CER revenues. This was lower than the 15% benchmark and therefore considered as financially unattractive. The PPs has further carried out the sensitivity analysis to assess the robustness of the financial model. Critical parameters, such as capital cost, annual O&M cost, plant utilization factor, electricity tariff rate, biomass fuel cost and steam revenue, were analyzed. The results of the sensitivity analysis as shown in Table 4 of the PDD indicated that the IRRs of all assessed parameters with variations covering a range of +10% or - 10% were not exceeded the 15% benchmark. The validation team confirmed the IRR calculation and sensitivity analysis, and also concluded that the project is financially unattractive.

### Technological barrier

The key technological barrier faced by the project is attributed to the unique characteristics of rice husk. The PDD clearly discussed the technological aspects, such as high ash content and abrasive ashes, that need to be overcome. For utilization of rice husk, an extra burnout section at the end of the grate and a continuous rapping system are required to be installed.

Due to the low return of investment and difficulties to utilize rice husk for electricity generation, the project activity is additional.

### 3.4.2. Evidence of Prior Consideration of the CDM

In consideration of the definition specified in the “Glossary of CDM terms”, the PPs has changed the starting date of the project activity from the start of

construction activity on 1 June 2007 to the execution date of the equipment purchase agreement dated 31 March 2007 in the revised PDD.

The early consideration of implementing the project as a CDM project was viewed from the email correspondence between PPCL and MUS dated 8 June 2005 and also the minutes of PPCL's steering committee meeting recorded on 10 June 2005. It was demonstrated in the meeting minutes that the project participant discussed about the CDM Consultation Selection Process due to the low project's return and expected that the carbon credit would help to increase its low return to a financial viability level. It was confirmed that the date for the prior consideration of the CDM is 10 June 2005. It is noted that the serious consideration of the CDM was also double-checked against the CDM consultation agreement that was signed on 30 May 2006.

The evidence indicating the PPs' continuing efforts on securing the CDM status for the project was also validated. The agreement between MUS and JQA for validation services was entered into force on 24 May 2007.

In accordance with the recently available guidance of "*Guidance on the Demonstration and Assessment of Prior Consideration of the CDM*", the detailed project timeline was added in Table 5 of Section B.5 and all the documentation evidences were provided to and verified by the validation team.

### 3.5 Monitoring Plan

Following monitoring items are provided in the Section B.7.1.

- $EG_y$  : Net quantity of electricity generated and delivered to the grid
- $Q_y$  : Quantity of waste combusted
- $FC_{i,y}$  : Quantity of fossil fuel type  $i$  combusted in the project plant

" $Q_y$ " is to be monitored by measuring equipment and weighing scales. The actual sale records will be available for the check of consistency of the quantity of rice husk and rice mill suppliers. The monitoring item " $FC_{i,j}$ " for the quantity of fossil fuel was provided as shown in B.7.1. in accordance with the paragraph 14 of AMS-I.D.

The parameter for "specific biomass consumption" was added in B.6.2. in accordance with the paragraph 15 of AMS-I.D.

The planned operational and management structure for monitoring is clearly explained, as shown in Figure-4. Appointment of consultants and/or technical support team will ensure the overall project performance including the system analysis, equipment calibration and overall maintenance on a regular basis.

All parameters required by AMS-I.D. are listed and appropriately described in the section B.6.2. and B.7.1.

### 3.6 Calculation of GHG Emissions and Reductions Including Emission Factors

There is no leakage resulting from transfer of existing equipment, because the boiler and power generator is newly installed and not transferred from another activity.

The leakage resulting from competing use of rice husk is discussed. The amount of rice husk waste generated in the Ayutthaya and Sara Buri provinces of the Central Plain region was estimated based on the survey of major and second rice

production. The amount was estimated based on the ratio of 0.23 tonne for 1 tonne of rice.

The surplus ratio estimated for available biomass in the region is calculated as 78.3% in accordance with Attachment C to Appendix B. As the ratio is higher than 25%, the leakage is neglected.

There are three official sources for the grid data in Thailand. Mitsubishi UFJ Securities Co., Ltd. provided detailed data of EGAT PDP 2002-2004 Energy Generation and Fuel Requirement/EGAT Actual Energy Generation and Fuel Requirement 1988-2002. The validation team also surveyed the data in annual reports of DEDE and on the websites of EPPO, after the Site-visit.

The validation team concludes that EGAT's data provided is appropriate for calculation of Operating Margin in accordance with the procedure required by ACM0002 as the chosen option (a) of the paragraph 9 of AMS-I.D. The team was also informed by the PP of their correspondence with the official of DNA(ONEP) that the data of EGAT PDP 2002-2004 can be regarded as the latest publicly available data.

The data of the five most recent years are provided in Table 4, indicating that the average is about 7% of the total grid generation. As the EGAT's low-cost/must-run resources have constituted less than 50%, the choice of Simple OM method for this project activity is justified. The explanation about IPCC default for imported coal was provided.

Operating Margin emission factor ex-ante was calculated to be 0.595 tCO<sub>2</sub>/MWh.

Based on the recent power plant capacity additions that comprise 20% of the system generation and that have been built most recently, the Build Margin emission factor ex-ante was calculated to be 0.367 tCO<sub>2</sub>/MWh.

The Combined Margin emission factor of the national grid is confirmed to be 0.481 tCO<sub>2</sub>/MWh. Accordingly, the average amount of emission reductions is calculated to be 33,788 t-CO<sub>2</sub>e/year.

### **3.7 Environmental Impacts**

In Thailand, EIA is not required for the project activity with 9.9MW power generation capacity (gross). The project participants has submitted the IEE report to the local government.

The validation team interviewed the official of Tambon Administration Organization (TAO) of Salaloy Sub-district with an interpreter about the IEE report at the Site-visit.

The validation team confirmed that no significant environment impacts is expected.

The IEE report was submitted to DNA as required.

### **3.8 Comments by Local Stakeholders**

#### **3.8.1 Local Stakeholders Consultation by Project Participants**

The local stakeholders consultation meeting with TAO, Heads of Tambon and local villagers was held on 17 June 2005, during Initial Environmental Evaluation. In addition to those participants, stakeholder comments were sought from potential stakeholders in several ways, including a questionnaire survey. Concerns by local stakeholders were duly answered and there was no negative comments raised, during the meeting.

#### **3.8.2 Interview with Government Officials**

It was confirmed that the IEE report was completed by the Power Prospect Company in August, 2005, undertaking local stakeholder consultation, and has been submitted to the Tambon Administration Organization (TAO) of Salaloy sub-district.

The official of TAO expects that the project would contribute to well-being of the local community significantly and is very keen to the success of the project. He confirmed that the TAO would be responsible for taking appropriate measures, if any concerns regarding the project from people in the community were provided to the TAO.

## **4 GLOBAL STAKEHOLDER PROCESS**

### **1) Description of how and when the PDD was made publicly available:**

The comments by Parties, stakeholders and NGOs were invited from 06/Jun/2007 to 05/Jul/2007, and from 02/Nov/2007 to 01/Dec/2007 on the UNFCCC and JQA websites.

### **2) Description of how comments were received and made publicly available:**

During the first and second Global Stakeholder Process, there was no comment received.

### **3) Explanation of how due account has been taken of comments received:**

Not applicable

### **4) Compilation of all comments received:**

Not applicable

## **5 VALIDATION OPINION**

1. JQA started the validation of "Power Prospect 9.9MW Rice Husk Power Plant (the "Project" or "project activity")" by conducting Desk Review of the PDD (Version Number 01).

Due to the change of application of the methodologies, the new PDD was made publicly available from 02 November to 01 December 2007 for Global Stakeholder Process.

After the second Desk Review, all of the CLs pointed out have been resolved in the revised PDD (Version Number 02, 22/Feb/2008) through the correspondences with the PPs. The comments by the validation team are provided in italics in the checklist.

2. The electricity generated by the renewable energy unit of the project activity is to be supplied to the national grid of Thailand, meeting applicability conditions of AMS-I.D.

Baseline is appropriately established.

3. The additionality of the project is assessed and demonstrated in accordance with "Attachment A to Appendix B", discussing "Investment barrier", "Technological barrier" and "Barrier due to Prevailing practice". The project IRR is calculated in accordance with "Guidance on the Assessment of Investment Analysis". The IRR calculated in the absence of the CDM project is lower than the benchmark. The validation team considers that the project is an unattractive investment in Thailand.

The PDD also clearly discusses the technological aspect that needs to be overcome, such as high ash content and abrasive ashes.



The early consideration of the CDM, the starting date of the project activity and other key events are shown in the detailed project timeline (Table 5) in accordance with “Guidance on the Demonstration and Assessment of Prior Consideration of the CDM”.

Due to the low return of investment and difficulties to utilize rice husk for electricity generation, the project activity is additional.

4. In the calculation of the emission reductions, all data and parameters are used in transparent and conservative manners, including project emissions and leakage. All parameters required by AMS-I.D. are listed and appropriately described in the section B.6.2. and B.7.1.  
All potential leakage is sufficiently considered. Survey of quantity of rice husk shows that the surplus of the available biomass waste in the region of the project activity is high enough to neglect the leakage.
5. The Combined Margin emission factor ex-ante of the national grid of Thailand is calculated as 0.481 tCO<sub>2</sub>/MWh.
6. The validation team interviewed the local government official with an interpreter about the IEE report and confirmed that no significant environment impacts is expected.

## **6 CONCLUSION**

JQA confirmed that the project activity meets all relevant criteria. JQA determines the project activity to be valid as a CDM project activity.

## 7 REFERENCES

### Category 1 Documents:

- 1 PDD (Version Number 01, 31 May 2007)
- 2 PDD (Version Number 02, 29 August 2008)
- 3 Letter of Approval of Thailand issued on 10 March 2008
- 4 Letter of Approval of Japan issued on 22 January 2008

### Category 2 Documents:

- 5 Initial Environmental Evaluation Report (August, 2005)
- 6 EGAT's Presentation Paper (May 2007)
- 7 EGAT's Material for "Renewable Energy Policy: Recent Policies on SPP/VSP (Power Purchase from SPPs, Power Purchase from VSPPs)"
- 8 EGAT's Material for "Adder"
- 9 PEA's announcement (purchase/adder)
- 10 Regulations for the Purchase of Power from Very Small Power Producers (for the Generation using Renewable Energy)/PEA
- 11 Distribution Utilities' Regulations for Synchronization of Generators with Net Output under 10MW to the Distribution Utility System/PEA
- 12 PEA/MEA standard contract/Model, Power Purchase Agreement for the Purchase of Power from a Very Small Power Producer (for the Generation using Renewable Energy)
- 13 Summary of Notifications on Industrial Effluent Standards/PCD
- 14 Air Quality Standard/PCD
- 15 Preliminary Plant Arrangement Layout
- 16 Equipment Specification "Scope of Work and Technical Specifications/Steam Generation System (3.2.2) and Power Generation System (3.2.3)"
- 17 EGAT PDP 2002-2004 Energy Generation and Fuel Requirement/EGAT Actual Energy Generation and Fuel Requirement 1988-2002
- 18 EPPO's data for SPP-collective (Renewable & Natural Gas)
- 19 Grid CEF Calculations for Operating Margin
- 20 Generation and Fuel Consumption Data for Recently Built Plants, sourced from DEDE and EPPO (updated on 13 August 2007)
- 21 Breakdown of Plant & Equipments and Breakdown of O&M Costs  
Quotations from Contractors - Tender document from the EPC Contractor (11 August 2005) for 9.9 MW Biomass Power Plant Tender/Revision #1 to proposal TH/6477/05 of June 14, 2005
- 22 Cash flow summary/Power Prospect, Rice Husk Power Plant Project
- 23 Biomass-based Power Generation and Cogeneration within Small Rural Industries of Thailand, Black & Veatch Corporation
- 24 IPP Bindings, Ayudhya Securities Public Company Limited (19/Nov/2007, Ref No. Energy-0710, [www.ays.co.th](http://www.ays.co.th))
- 25 Agricultural Statistic of Thailand Crop 2003/2004
- 26 Rice Husk and Steam Barter Agreement (NLRM and Power Prospect Company Limited, 2005)
- 27 Application Letter for PPA with PEA (16/Feb/2007) and PPA Acceptance Letter from PEA (17/Apr/2007)
- 28 Company Profile – Power Prospect Company Limited
- 29 Purchase Contract Agreement for Equipment between Power Prospect Company

- and VYNCKE Energietechnik N.V. (31/Mar/2007)
- 30 Agreement for Consulting Services between Mitsubishi UFJ Securities Co., Ltd. and Power Prospect Co., Ltd. (30/May/2006)
    - Email Correspondence between Power Prospect Co., Ltd. and MUS for CDM Consultant (08/Jun/2005)
    - Proposal for CDM Advisory presented to Power Prospect Co., Ltd./MUS, Clean Energy Finance Committee (28/Oct/2005)
  - 31 Timeline of the Project Activity (Table 5 of PDD)/Mitsubishi UFJ Securities Co., Ltd.
  - 32 IRR Calculation Spreadsheets with Sensitivity Analysis
  - 33 Minutes of Steering Committee Meeting of Power Prospect Co., Ltd. (10/Jun/2008)
  - 34 Report of the Local Stakeholder Consultation Meeting (English, 17/Jun/2005)
  - 35 Electricity Tariff Rate Calculation
    - EGAT's Tariff Rate for SPP Firm Contract
    - Retail Price of Natural Gas for Thai Power Sector (EN)
    - Email re Natural Gas Price from EPPO
  - 36 Study on CDM case studies in Thailand/ONEP (October/2005)
  - 37 BOI Income Tax Privilege Rate website:  
<http://www.mlsasiapacific.com/thailand-boi-promotional.php>
  - 38 Steam Unit Price website (PPT Public Company Limited):  
[http://pttinternet.pttplc.com/csc\\_gas/csc\\_ind/utilization/co-generation\\_gas-engine.asp](http://pttinternet.pttplc.com/csc_gas/csc_ind/utilization/co-generation_gas-engine.asp)

## **8 LIST OF INTERVIEWED PERSONS**

- 1 Ms. Kyoko Tochikawa, CDM/JI Consultant, Mitsubishi UFJ Securities Co., Ltd.
- 2 Ms. Coty Tsui, CDM/JI Consultant, Mitsubishi UFJ Securities Co., Ltd.
- 3 Mr. Pongsack Liangsiri, M.D./Power Prospect Company Limited
- 4 Mr. Chaifying Sriprasert, Director, Power Prospect Company Limited
- 5 Mr. Sanga Sriprasert, Director, Power Prospect Company Limited
- 6 Mr. Suthep Chimklai, Director, System planning Division, EGAT
- 7 Mr. Prutichai Chonglertvanichkul, Assistant Governor – Planning, EGAT
- 8 Mr. Payomsarit Sripattanagnon, Chief of DG Section, PEA
- 9 Mr. Jumpol Chaibabin, Engineer of DG Section, PEA
- 10 Miss. Ratchaporn Phadungwit, Engineer of DG Section, PEA
- 11 Dr. Chayawee, Wangchavoenrung, Mechanical Engineer, PCD
- 12 Miss Pinida Leelapanang, Environmental Scientist, PCD
- 13 Ms. Piyovadee Limvoranusorn, Environmental Officer, PCD
- 14 Mr. Pramern Pcmcha-Am, Head of Tambon Administration
- 15 Miss Jitrat Srisukho, Environmental Scientist for COT
- 16 Ms. Katunchulee Ekchawa, COT
- 17 Miss. Suvadee Ochapanth, Secretary of Power Prospect Company Limited

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# SSCDM VALIDATION CHECKLIST

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Client: Mitsubishi UFJ Securities Co., Ltd.

Power Prospect 9.9MW Rice Husk Power Plant  
(the “Project” or “project activity”)

Project No.: JQA-C0066  
(1812000077)

06 November 2008



**Japan Quality Assurance Organization**

**Table 1 Comprehensive Checklist for SSCDM Project Activities**

Requirements	Reference	Conclusion	Evidence
<b>1. The purpose of the CDM</b>	Kyoto Protocol Article 12.2		
➤ The project activity shall assist the host country in achieving sustainable development		OK	Approval letter of Thailand dated on 10 March 2008
➤ The project activity shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.		OK	Approval letter of Japan dated on 22 January 2008
<b>2. Emission reductions resulting from the project activity shall be certified by DOE on the basis of:</b>	Kyoto Protocol Article 12.5		
➤ Voluntary participation approved by each Party involved (and Authorization of a private and/or public entity )	(a)	OK  OK	Approval letter of Thailand dated on 10 March 2008 Approval letter of Japan dated on 22 January 2008
➤ Real, measurable and long-term benefits related to the mitigation of climate change	(b)	OK	
➤ Reductions in emissions that are additional to any that would occur in absence of the project activity	(c)	OK	
<b>3. SSCDM Modalities and Procedures (Decision 4/CMP. 1)</b>			
➤ Type of project activity	Decision 4 /CMP.1 Decision 1 /CMP.2 /Paragraph 28	OK	AMS-I.D./Version 12 is applied to the PDD (Version Number 02).
➤ A written approval constitutes the authorization by a DNA of specific entity(ies)' participation as project proponents in the specific project activity.	Glossary of CDM terms (30/Nov/2007)	OK	Approval letter of Thailand dated on 10 March 2008 (Authorization: Power Prospect Company Limited)

		OK	Approval letter of Japan dated on 22 January 2008 (Authorization: Mitsubishi UFJ Securities Co., Ltd.)
➤ Participation requirements	Decision 4 /CMP.1 22(a)	OK	DNA (Thailand): Thailand Greenhouse Gas Management (Public) Organization  DNA (Japan): The Liaison Committee for the Utilization of the Kyoto Mechanisms  KP ratification Thailand: 28 August 2002 Japan: 04 June 2002
➤ Comments by local stakeholders	22 (b)	OK	PDD
➤ Analysis of the environmental impacts of the project activity	22 (c)	OK	PDD
➤ Additionality	22 (d)	OK	PDD
➤ Use of AMS or bundled project activity	22 (e)	OK  OK	AMS-I.D./Version 12 is applied to the PDD (Version Number 02).  The project activity is not bundled.
➤ Other requirements	37 (f)	OK	

➤ Global stakeholder process	23 (b)	OK	<p>PDD for 1<sup>st</sup> GSP</p> <p>Start date: 06/Jun/2007</p> <p>Close date: 05/July/2007</p> <p>No comment was received.</p> <p>The new PDD for 2<sup>nd</sup> GSP</p> <p>Start date: 02/Nov/ 2007</p> <p>Close date: 01/Dec/2007</p> <p>No comment was received.</p>
<b>4. Modalities of communication</b>	Glossary of CDM terms (30/Nov/2007)		
4.1 The modalities of communication between project participants and the Executive Board are indicated at the time of registration by submitting a statement signed by all project participants.		OK	<p>The modalities of communication dated on 16 May 2008</p> <ul style="list-style-type: none"> <li>- Power Prospect Company Limited</li> <li>- Mitsubishi UFJ Securities Co., Ltd.</li> </ul>



**Table 2 PDD Requirements and Resolution of Corrective Action Requests/Clarification Requests**

Section	Requirements	Mo V	Comments	Draft Conc.	Final Conc.
Section A	General description of the project activity				
A.1	Title of the project activity				
	Title of the project activity	DR	Power Prospect 9.9MW Rice Husk Power Plant (the “Project” or “project activity”)	OK	OK
	Version number and date of the doc.	DR	<i>Document Version Number 02 (29/08/2008)</i>	OK -	OK
A.2	Description of the project activity				
	The purpose of the project activity	DR		OK	OK

	What type of technology is being employed What exact measures are undertaken	DR/ SV	The boiler technology is a water tube multi-fuelled boiler, which is capable of being fuelled with waste biomass, such as rice husk, and common fossil fuels.	OK	OK
		DR SV	This project activity produces the electricity of 9.9MW in gross/8.9MW in net. According to PEA, power purchase capacity for VSPP was extended from 1MW up to 10MW by a new regulation since January 2007. As the sale of the electricity to the grid is less than 10MW, the project applies for the VSPP program. The application letter from the Power Prospect to Provincial Electricity Authority (PEA) dated on 16 February 2007 and the acceptance letter from PEA dated on 17 April are obtained. The agreement made in 2005 with Nakorn Luang Rice Mill (NLRM) that is the main supplier of rice husk was confirmed.	OK	OK
	The view of the PPs on Contribution to SD	DR		OK	OK
A.3	Project participants				
	List of PPs and Parties involved	DR	Power Prospect Company Limited (Thailand) Mitsubishi UFJ Securities Co., Ltd. (Japan)	OK	OK
	Provide contact information in Annex 1	DR		OK	OK
A.4	Technical description of the project activity				
A.4.1	Location of the project activity	DR		OK	OK
A.4.1.1	Host Party	DR		OK	OK
A.4.1.2	Region/State/Province, etc.	DR		OK	OK

A.4.1.3	City/Town/Community, etc.	DR		OK	OK
A.4.1.4	Detail of physical location				
	Fill in the field and do not exceed one page.	DR/ SV		OK	OK
A.4.2	Type and category(ies) and technology				
	<ul style="list-style-type: none"> <li>- Specify the type and category of the project activity using the categorization of Appendix B.</li> <li>- Include a description of how environmentally safe and sound technology and know how is being applied by the project activity.</li> </ul>	DR/ SV	Due to the change of application of the methodology, AMS-I.D./Version12 is applied to the PDD (Version Number 02).	OK	OK
		DR SV	Equipment specification of the advanced biomass-fired generation system is obtained. The special design also allows dust removal by hammering, eliminating the risk of erosion by soot blowers.	OK	OK
A.4.3	Estimated amount of emission reductions				
	<ul style="list-style-type: none"> <li>- Indicate the chosen crediting period</li> <li>- Provide the estimation of total emission reductions as well as annual estimates for the chosen crediting period.</li> </ul>	DR		OK	OK
A.4.4	Public funding of the SS project activity				
	<ul style="list-style-type: none"> <li>- In case public funding from Annex 1 Parties, provide information in Annex 2.</li> <li>- Such funding does not result in a diversion of ODA.</li> </ul>	DR		OK	OK
A.4.5	Confirmation that the SS project activity is not a debundled component of a large scale project activity.				

	- Refer to Appendix C to the SSCDM M&P	DR/ SV	No other project has been requested for registration or registered by the same project participants within 1km of the project boundary.	OK	OK
Section B	Application of a baseline and monitoring methodology				
B.1	Title and reference of the approved baseline and monitoring methodology applied to the project activity				
	- Indicate the number and the version of the approved	DR/ SV	AMS-I.D. (version12)	OK	OK
B.2	Justification of the choice of the project activity				
	- Justify the choice of project type and category (refer to the technology/measure of the methodology used). - Demonstrate that the project activity qualifies as a small-scale project activity and that it will remain under the limits of small-scale project activity types during every year of the crediting period.	DR/ SV  DR/ SV  DR	Due to the change of application of the methodology, the new PDD applied by AMS-I.D. (version12) was made publicly available from 02 November to 01 December 2007.  How and why the project activity meets the applicability condition(s) are summarized in B.2. of the PDD in accordance with the technology/measure of AMS-I.D.  As the installed gross capacity is less than the threshold of 15MW for AMS-I.D., the project qualifies as a small-scale project activity.	OK  OK  OK	OK  OK  OK
B.3	Description of the project boundary				
	- Define the project boundary based on the guidance of the applicable project category	DR/ SV		OK	OK
B.4	Details of the baseline and its development				

	<ul style="list-style-type: none"> <li>- Specify the baseline with reference to the chosen project category.</li> <li>- Explain and justify key assumptions and rationales.</li> <li>- Illustrate in a transparent manner all data used to determine the baseline scenario (variables, parameters, data sources etc.), preferably in a table form.</li> </ul>	DR	The Emission factor for the baseline is based on the Combined Margin calculated by Simple OM and BM.	OK	OK
		DR	<i>The option (a) of the paragraph 9 for AMS-I.D. for estimation of baseline emission factor is chosen. The calculation method is in accordance with ACM0002 (version 06) available when the project activity was made public available on 02 November 2007.</i>	-	OK
		DR/ SV	<p><i>There are three official sources for the grid data in Thailand. Mitsubishi UFJ Securities Co., Ltd. provided detailed data of EGAT PDP 2002-2004 Energy Generation and Fuel Requirement/EGAT Actual Energy Generation and Fuel Requirement 1988-2002.</i></p> <p><i>The validation team concludes that EGAT's data provided by the project participants is appropriate for calculation of Operating Margin in accordance with the procedure required by ACM0002 as the chosen option (a) of the paragraph 9 of AMS-I.D.</i></p>	-	OK
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 SSCDM project activity				
	<ul style="list-style-type: none"> <li>- Demonstrate that the proposed project activity is additional as per options provided under attachment A to Appendix B.</li> </ul>	DR/ SV	The capital expenditure for investment is 665 Million THB. The operating expenditure for operational maintenance is 30.8 Million per year.	OK	-
		-	The capital cost used for the IRR calculation is	CL	-

	<ul style="list-style-type: none"> <li>- National policies and circumstances relevant to the baseline of the proposed project activity shall be summarized here.</li> </ul>		<p>revised to the figure (719, 653, 818 THB) in the tender document submitted by the EPC contractor, which was received after the PPCL's steering committee meeting (10/June/2005).</p> <ul style="list-style-type: none"> <li>- <i>The reason of applying the figure of 663,656,000 THB in the original IRR calculation is that this was sourced from the inputs of local consultants and contractors and was the only capital figure cost available at the time of the steering committee meeting. Given that the supporting documents for the original capital cost could not be found, the capital cost applied to the new IRR calculation was revised to 719.7 million THB as indicated in the official tender document submitted by the EPC contractor. The document was firstly received by PPCL on 14/Jun/2005, followed by the revised version dated 11/Aug/2005 as per PPCL's request.</i></li> <li>- <i>The tender proposal was more conservative and realistic. The capital cost of 719.7 million THB was proposed in the lump sum including the plant and equipment, substation and grid connection, land, development and contingency costs.</i></li> <li>- <i>The O&amp;M expenditure (30,777,000 THB/year), which is approximately 4.3% of total capital cost, was estimated based on the project owner's past experience and IPP/SPP literatures. The breakdown of O&amp;M</i></li> </ul>	<ul style="list-style-type: none"> <li>-</li> <li>-</li> <li>-</li> </ul>	<p><b>OK</b></p> <p><b>OK</b></p> <p><b>OK</b></p>
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			expenditure was provided. The estimate was realistic.		
		-	It was confirmed that the rice husk price was sourced from “Study on CDM case studies in Thailand” published by ONEP and the unit steam price was sourced from the website of PTT Public Company Limited. The Board of Investment of Thailand offers the corporate income tax privilege rates to IPPs.	-	OK
		-	The expected operational lifetime of the project is at least 20 years. The reason of putting “at least 21 years” in the original PDD is that this was coincident with the proposed crediting period. Taking into account of the guidance given in “Guidance on the Assessment of Investment Analysis”, the PPs has corrected the operational lifetime and also the period of investment assessment to 20 years.	-	OK
		DR/ SV	The high investment cost with low return is unattractive to investors, taking into account the risks associated with biomass-based power project for utilization of rice husk.	OK	OK
		-	The hurdle rate for the Independent Power Producer (IPP) was sourced from “IPP Bidding” (19/11/2007) published by Ayudhya Securities. It is noted that this is a publicly available document published by an independent financial firm in Thailand. For	-	OK

			<i>Investment Analysis, the rate of 15% in the publication is used as benchmark.</i>		
		-	<i>In accordance with “Guidance on the Assessment of Investment Analysis”, the project IRR was recalculated based on the figures sourced from the tender document and other relevant supporting documents. In the absence of the CER revenues, the resultant project IRR was determined as 12.6%.</i>	-	<b>OK</b>
		-	<i>As the IRR is lower than the rate that is indicated as 15% in “IPP Bidding”, the project activity is unattractive investment in Thailand.</i>	-	<b>OK</b>
		DR/ SV	The technological aspects that need to be overcome are high ash content and abrasive ashes. The technological barrier is discussed in detail in the PDD.	OK	OK
		-	<i>Further clarifications were made for the project timeline and the table was provided in Section B.5. The e-mail correspondence dated on 08 June 2006 was sent from Power Prospect Co., Ltd. to MUS, as the Power Prospect Co., Ltd. intended to look for CDM consultant for the project activity, while inputs for estimating the project’s investment cost are sought from local consultants and contractors during mid-2005. In the Minutes of the Steering Committee Meeting of Power Prospect Co., Ltd. held on 10 June 2005, the project participant</i>	-	<b>OK</b>



		-	<p><i>discusses about CDM Consultant Selection Process based on the low project's returns. It was confirmed that the date for the prior consideration of CDM of the CDM is 10 June 2005.</i></p> <p><i>The stakeholders consultation meeting was held on 17 June 2005 and the IEE report was completed in August 2005. The CDM consultation agreement was made between Mitsubishi UFJ Securities Co., Ltd. and Power Prospect Co., Ltd. on 30 May 2006.</i></p> <p><i>The starting date of the project activity was changed to the date of the purchase contract agreement for equipment (31/03/2007).</i></p>	-	<b>OK</b>
B.6	Emission reductions				
B.6.1.	Explanation of methodological choices:				
	Explain how the procedures, in the approved methodology to calculate project emissions, baseline emissions, leakage emissions and emission reductions are applied to the proposed project activity. Clearly state which equations will be used in calculating emission reductions.	DR SV	<p>Explanation of sources as published literature, official reports, surveys, etc, is given to evaluate annually a surplus of the biomass in the region of the project activity, which is not utilized, in accordance with Attachment C to Appendix B of the SSC M&amp;P.</p> <p>The amount of rice husk waste generated in the Ayutthaya and Sara Buri provinces of the Central Plain region was estimated based on the survey of major and second rice production. The amount was estimated based on the ratio of 0.23 tonne for 1 tonne of rice.</p>	OK	OK
		DR SV	<p>Calculation is made for the both provinces of Ayutthaya and Sara Buri. The value for the surplus of biomass is assessed as 78.3%. This</p>	OK	OK

			means that the surplus is more than 25% of the quantity of biomass that is utilized including the project activity, Therefore. this source of leakage can be neglected.		
B.6.2	Data and parameters that are available at validation				
	Provide for each data or parameter the chosen value or, where relevant, the qualitative information, using the table provided below. Particularly: - Provide the actual value applied.  - Explain and justify the choice for the source of data.	DR/ SV  DR/ SV	For calculation of the Operating Margin, PDP 2002-2004 is used. For BM, the updated data of DEDE and EPPO is used.  <i>The parameter for specific biomass consumption was added. Specific biomass consumption is calculated ex-ante by dividing the energy required to generate a unit of electricity (0.0135TJ/MWh) by the energy content of the biomass used (0.0136TJ/t).</i>	OK  -	OK  OK
B.6.3.	Ex-ante calculation of emission reductions				
	Provide a transparent ex-ante calculation of project emissions, baseline emissions (or, where applicable, direct calculation of emission reductions) and leakage emissions expected during the crediting period, applying all relevant equations provided in the approved methodology.  Document how each equation is applied, in a manner that enables the reader to reproduce the calculation.	DR/ SV  DR/ SV	Regarding the methodological choice for Simple OM, it is explained in the PDD that EGAT's low-cost/must-run resources have constituted less than 50% of the total grid generation in the past 5 years. The summary of "average of the five most recent years" for the chosen option1) should also be provided in B.6.3.  <i>The data of the five most recent years are provided in Table 4, indicating that the average is about 7% of the total grid generation. As the EGAT's low-cost/must-run resources have constituted less than 50%, the</i>	<del>CL1</del>	OK

	Where relevant, provide additional background information and/or data in Annex 3, including relevant electronic files (i.e. spreadsheets).	DR	<i>choice of Simple OM method for this project activity is justified.</i>	<b>CL2</b>	
		DR	IPCC default is used for imported coal in the Table 5. The use of the factor should be explained.		<b>OK</b>
		DR	<i>As local data/statistics for imported coal were not available, the choice of the values used was based on the country-specific NCV of imported coal given in Table 1.2 of IPCC 1996. According to the table, the imported coal in Thailand is hard coal, which is also termed as anthracite coal. Given that no country-specific values are provided in IPCC 2006, it was assumed the imported coal remains anthracite coal and its default values was applied for the grid emission factor calculation.</i>		
		DR/ SV	<i>Operating Margin emission factor ex-ante was calculated to be 0.595 tCO<sub>2</sub>/MWh. Based on the recent power plant capacity additions that comprise 20% of the system generation and that have been built most recently, the Build Margin emission factor ex-ante was calculated to be 0.367 tCO<sub>2</sub>/MWh. The Combined Margin emission factor of the national grid is confirmed to be 0.481 tCO<sub>2</sub>/MWh. Accordingly, the average amount of emission reductions is calculated to be 33,788 t-CO<sub>2</sub>e/year.</i>	-	<b>OK</b>
<b>B.6.4.</b>	<b>Summary of the ex-ante estimation of</b>				

	emission reductions				
	Summarize the results of the ex-ante estimation of emission reductions for all years of the crediting period, using the table	DR		OK	OK
B.7.	Application of the monitoring methodology and description of the monitoring plan				
B.7.1	Data and parameters monitored				
	<p>This section shall include specific information on how the data and parameters that need to be monitored would actually be collected during monitoring for the project activity.</p> <p>Provide for each parameter the following information, using the table provided:</p> <ul style="list-style-type: none"> <li>- The source(s) of data that will be actually used for the proposed project activity (e.g. which exact national statistics).</li> <li>- Where data or parameters are supposed to be measured, specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is</li> </ul>	DR  DR	<p>Monitoring items should be added in accordance with the paragraph 14 &amp; 15 of AMS-I.D.</p> <p><i>In line with AMS-I.D., the parameter for quantity of fossil fuel input "FC<sub>i,y</sub>" was added in B.7.1.</i></p> <p><i>The parameter will be monitored by mass or volume meters. Data is to be aggregated monthly and yearly and will be archived electronically. Maintenance and calibration of the meters will be carried out according to the national or international approved standards and procedures. The consistency of the data will be verified through the actual sale records between PPCL and the fuel suppliers.</i></p> <p><i>The parameter for specific biomass consumption was added in B.6.2. in accordance with the paragraph 15 of AMS-I.D.</i></p>	CL3	OK

	<p>undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval.</p> <p>- A description of the QA/QC procedures (if any) that should be applied.</p>				
B.7.2.	Description of the monitoring plan				
	<p>Provide a detailed description of the monitoring plan. Describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects generated by the project activity.</p> <p>Clearly indicate the responsibilities for and institutional arrangements for data collection and archiving.</p> <p>The monitoring plan should reflect good monitoring practice appropriate to the type of project activity.</p>	<p>DR</p> <p>DR/ SV</p>	<p>The explanation of monitoring plan, including operational and management structure and the internal staff training is provided. However, "DOE verification" to the data archiving in Figure 3, B.7.2., should be deleted, because the role is outside the scope of the project activity.</p> <p><i>The description of "DOE verification" in Figure 3 "Planned operational and management structure for monitoring" of Section B.7.2. was deleted.</i></p>	CL4	OK
B.8.	Date of completion of the application of the baseline and monitoring methodology and the name of responsible person(s)/entity(ies):				

	Provide date of completion of the application of the methodology to the project activity study in DD/MM/YYYY. Provide contact information of the persons(s)/entity(ies) responsible for the application of the baseline and monitoring methodology to the project activity and indicate if the person/entity is also a project participant listed in Annex 1.	DR	Date of completion of the baseline study and monitoring methodology: 14/01/2008	OK	OK
		DR	Entities determining the baseline and monitoring methodology: Clean Energy Finance Committee, Mitsubishi UFJ Securities Co., Ltd.	OK	OK
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				
	The starting date of a CDM project activity is the date on which the implementation or construction or real action of a project activity begins.	DR  DR/SV	The starting date should be set in accordance with the CDM glossary of terms, taking into account the descriptions in D.2. and E.1.  <i>The starting date of the project activity was changed to the date of the purchase contract agreement for equipment (31/03/2007). The date is after the CDM consultation agreement between project participants (30 May 2006). Refer to B.5.</i>	<b>CL5</b>	<b>OK</b>
C.1.2	Expected operational lifetime				
	State the expected operational lifetime in years and months	DR		OK	OK
C.2	Choice of crediting period and related information				
C.2.1	Renewable crediting period				
C.2.1.1	Starting date of the first crediting period				
	State the dates in DD/MM/YYYY	DR		OK	OK

C.2.1.2	Length of the first crediting period				
	State the length of the first crediting period in years and months	DR		OK	OK
C.2.2	Fixed crediting period				
	Fixed crediting period shall be at most 10 years.	DR		N/A	N/A
C.2.2.1	Starting date of the first crediting period				
	State the dates in DD/MM/YYYY	DR		N/A	N/A
C.2.2.2	Length				
	State the length in years and months	DR		N/A	N/A
Section D	Environmental impacts				
D.1	Documentation on the analysis of the environmental impacts, including transboundary impacts:				
		DR/ SV	Information of the relevant environmental laws and regulations is provided. “Emission standard from a new biomass fired power plant in all sizes” sourced from the Notification of the Ministry of Industry, B.E.2547 (2004), issued under Factory Act (B.E.2535 (1992)), is provided in the PDD. Legal limit for ambient noise standards is also provided. The project is to be compliant with the Environmental laws and regulation in Thailand.	OK	OK
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.				
		DR SV	It was confirmed that the Project is not required to carry out an EIA because the capacity for power generation is less than 10MW.	OK	OK
		DR/ SV	The IEE report dated on August 2005 has been submitted to the Tambon Administration Organization (TAO) of Salaloy sub-district. The report was checked at the Site-visit. The submission of the IEE report to the local government was confirmed through the interview with the official. The validation team interviewed the local government official with an interpreter about the report and confirmed that no significant environment impacts is expected.	OK	OK
		DR/ SV	The Initial Environmental Evaluation (IEE) Report was submitted to DNA.	OK	OK
Section E	Stakeholders' comments				
E.1	How comments by local stakeholders have been invited and compiled				
	Describe the process by which comments by local stakeholders have been invited and compiled.  An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for	DR SV	The local stakeholders consultation meeting with TAO, Heads of Tambon and local villagers was held on 17 June 2005, during Initial Environmental Evaluation. The meeting was held as part of the IEE process and the IEE report was completed in August 2005.	OK	OK
		DR/ SV	In addition to those participants, stakeholder comments were sought from potential stakeholders in several ways, including a	OK	OK



	<p>comments to be submitted.</p> <p>In this regard, project participants shall describe a project activity in a manner, which allows the local stakeholders to understand the project activity, taking into account confidentiality provisions of the CDM modalities and procedures. The local stakeholder process shall be completed before submitting the proposed project activity to a DOE for validation.</p>		questionnaire survey.		
E.2	Summary of the comments received				
	Identify stakeholders that have made comments and provide a summary of these comments	DR SV	Key concerns raised during the consultation meeting were about impact on the local environment, potential benefits to the local community, and potential adverse effects on the local population.	OK	OK
E.3	Report on how due account was taken of any comments received				
	Explain how due account have been taken of comments received.	DR SV	<p>Concerns raised by local stakeholders were duly answered and there was no negative comments raised, during the meeting.</p> <p>It was confirmed through the interview with the official of the Tambon Administration Organization (TAO) of Salaloy sub-district.</p>	OK	OK
Annex 1	Contact information on PPs				
	<p>Copy and paste table as needed.</p> <p>Fill for each organization listed in section A.3 the following mandatory fields:</p> <p>Organization, Name of contact person, Street, City, Postfix/ZIP,</p>	DR  DR	The address of Mitsubishi UFJ Securities Co., Ltd. was changed. Its contact details were also updated.	OK  -	OK

	Country, Telephone and Fax or e-mail.				
<b>Annex 2</b>	<b>Information regarding public funding</b>				
	Provide information from Parties included in Annex I on sources of public funding for the project activity which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties	DR		OK	OK
<b>Annex 3</b>	<b>Baseline information</b>				
	Provide any further background information used in the application of the baseline methodology.	DR		OK	OK
<b>Annex 4</b>	<b>Monitoring information</b>				
	Provide any further background information used in the application of the monitoring methodology.	DR		OK	OK

Remarks: MoV: Means of Validation (Desk Review (DR), Site-visit (SV) including interviews)

CAR: Corrective Action Request

CL: Clarification Request

OK

N/A : Not Applicable

# Certificate

Mr. Toshimizu OKADA

Grade:	<u>Assessor</u>
Assessor No.:	<u>CDM - AS004</u>
Assigned Date:	<u>2003.10.01</u>

This is to certify that Mr. Toshimizu OKADA is assigned as CDM Assessor by the Japan Quality Assurance Organization.

Date: February 26, 2007

Japan Quality Assurance Organization

*M. Ueda*

President Matahiro UEDA

## Grant of sectoral scope to CDM/JI assessor


Assessor Name: Mr. Toshimizu OKADA  
Grade: Assessor  
Assessor No.: CDM-AS004 / JI-AS004

Sectoral Scope	Granted date
1. Energy industries (renewable - / non-renewable sources)	1 Nov. 2006
2. Energy distribution	-
3. Energy demand	-
4. Manufacturing industries	-
5. Chemical industry	-
6. Construction	-
7. Transport	-
8. Mining/Mineral production	-
9. Metal production	-
10. Fugitive emissions from fuels (solid, oil and gas)	-
11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	1 Nov. 2006
12. Solvents use	-
13. Waste handling and disposal	25 Sep 2003
14. Afforestation and reforestation/Land use, land-use change and forestry	27 Jul. 2004
15. Agriculture	27 Jul. 2004

This is to certify that Mr. Toshimizu OKADA is granted by the Japan Quality Assurance Organization.

Date: 18/APR/2007

Director of the Global Environment Department  
Japan Quality Assurance Organization



Masaki MAEGAITO

# Certificate

Mr. Itaru WATANABE

Grade: Lead Assessor

Assessor No.: CDM - LA002

Assigned Date: 2003.08.11

This is to certify that Mr. Itaru WATANABE is assigned as  
CDM Lead Assessor by the Japan Quality Assurance Organization.

Date: February 26. 2007

Japan Quality Assurance Organization

*M. Ueda*

President Matahiro UEDA

## Grant of sectoral scope to CDM/JI assessor

Assessor Name: Mr. Itaru WATANABE  
Grade: Lead Assessor  
Assessor No.: CDM-LA002 / JI-LA002

Sectoral Scope	Granted date
1. Energy industries (renewable - / non-renewable sources)	1 Jun. 2003
2. Energy distribution	1 Jun. 2003
3. Energy demand	17 Sep. 2004
4. Manufacturing industries	1 Jun. 2003
5. Chemical industry	1 Jun. 2003
6. Construction	-
7. Transport	-
8. Mining/Mineral production	1 Jun. 2003
9. Metal production	-
10. Fugitive emissions from fuels (solid, oil and gas)	1 Jun. 2003
11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	1 Jun. 2003
12. Solvents use	1 Jun. 2003
13. Waste handling and disposal	17 Sep. 2004
14. Afforestation and reforestation/Land use, land-use change and forestry	-
15. Agriculture	-

This is to certify that Mr. Itaru WATANABE is granted by the Japan Quality Assurance Organization.

Date: 18/APR/2007

Director of the Global Environment Department  
Japan Quality Assurance Organization

  
Masaki MAEGAITO