VALIDATION REPORT
ELECTRICITY GENERATING AUTHORITY OF THAILAND

VALIDATION OF THE
5MW THAP SAKAE PHOTOVOLTAIC SOLAR CELL POWER PLANT PROJECT, THAILAND

REPORT NO.BVC/THAILAND-VD/0001/2015
REVISION NO. 04

BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château
92571 Neuilly Sur Seine Cdx - France

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VALIDATION REPORT

Date of first issue:	Organizational unit:
19/08/2015	Bureau Veritas Certification Holding SAS
Client:	Client ref.:
Electricity Generating Authority of Thailand	Mrs. Waraporn Kunawanakit

Summary:

Bureau Veritas Certification has conducted the validation of 5MW Thap Sakae Photovoltaic Solar Cell Power Plant Project, Thailand, owned by Electricity Generating Authority of Thailand, which is located in Thap Sakae District, Prachuap Khiri Khan Province, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design document and additional background documents; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the validation process is a list of Clarification Requests, Corrective Actions Requests, and Forward Actions Requests (CLs, CARs and FARs), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology AMS-I.D Version 18 and meets all relevant UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas Certification thus requests the registration of the project as a CDM project activity.

Report No.:	Subject Group:
BVC/Thailand-VD/0001/2015	CDM
Project title:	
5MW Thap Sakae Photovoltaic Solar Cell Power Plant Project, Thailand	
Work carried out by:	
Mr. Natchawat CHARNYAPORNPONG - Team Leader	
Internal Technical Review carried out by:	
Dr. Chumpol SRIPRAPARKORN	

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Indexing terms

Work approved by:

Sanjay Patankar

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Abbreviations

BVCH	Bureau Veritas Certification Holding SAS
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Green House Gas(es)
MoV	Means of Verification
MP	Monitoring Plan
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Table of Contents *Page*

1. INTRODUCTION

Electricity Generating Authority of Thailand (hereafter called “EGAT”) has commissioned Bureau Veritas Certification to validate its CDM project 5MW Thap Sakae Photovoltaic Solar Cell Power Plant Project, Thailand (hereafter called “the Project”) at Thap Sakae District, Prachuap Khiri Khan Province.

This report summarizes the findings of the validation of the Project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1. Objective

The objective of a validation is to provide a through and independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan, and the project’s compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meets the applicable CDM requirements and the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2. Scope

The validation scope is defined as an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against the requirements of paragraph 37 of the CDM M&Ps, the applicability conditions of the selected methodology and guidance issued by the Board.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3. Validation Team

The assessment team and internal technical reviewer team consist of the following personnel:

FUNCTION	NAME	TA 1.2	TA X.X	TASK PERFORMED*
Team Leader	Mr. Natchawat CHARNYAPORNPONG	☒	☐	☒**DR** ☒**SV** ☒**RI** ☐**TR**
Technical Specialist	N.A.	☐	☐	☐**DR** ☐**SV** ☐**RI** ☐**TR**
Internal Technical Reviewer (ITR)	Dr. Chumpol SRIPRAPARKORN	☒	☐	☐**DR** ☐**SV** ☐**RI** ☒**TR**
Specialist supporting ITR	N.A.	☐	☐	☐**DR** ☐**SV** ☐**RI** ☐**TR**

*DR = Document Review; SV = Site Visit; RI = Report issuance; TR = Internal Technical Review

2. METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 07.0 of the Clean Development Mechanism Validation and Verification Standard, issued by CDM Executive Board after its 79th meeting on 01/06/2014 (Ref/B1/). The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The completed validation protocol is enclosed in Appendix A to this report.

2.1. Review of Documents

The Project Design Document (PDD) submitted by Advance Energy Plus Co., Ltd. and additional background documents related to the project design and baseline were reviewed.

Furthermore, cross checks were made between information provided in the PDD and information from sources other than those used.

To address Bureau Veritas Certification corrective action and clarification requests, Advance Energy Plus Co., Ltd. revised the PDD and resubmitted it on 28/08/2015.

The validation conclusions presented in this report relate to the project as described in the PDD version 07.

2.2. Follow-up Interviews

On 11/03/2015, Bureau Veritas Certification performed a site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Electricity Generating Authority of Thailand and Advance Energy Plus Co., Ltd. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Electricity Generating Authority of Thailand (the Project Owner)	➢ Project background information and CDM consideration. ➢ Project technology, operation and maintenance. ➢ Project approval and implementation status. ➢ Project management and monitoring plan. ➢ Stakeholder consultation process. ➢ Common practice in the area.

	➢ Government policies related to the project activity.
Local Stakeholder	➢ Project background in details ➢ Stakeholder comments ➢ Social and environmental impact of the project
Advance Energy Plus Co., Ltd. (the Consultant)	➢ Applicability of selected methodology. ➢ Baseline determination. ➢ Emission reductions calculation. ➢ Emission reduction monitoring plan.

2.3. Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the validation is to resolve issues that require further elaboration, research or expansion prior to Bureau Veritas Certification's positive conclusion on the project design.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable, verifiable and additional emission reductions;

(b) The applicable CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A Forward Action Request (FAR) may also be raised during validation, to identify issues related to project implementation that require review during the first verification of the project activity.

To guarantee the transparency of the validation process, the issues raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the PDD or supporting annexes are documented in the Validation Protocol in Appendix A.

2.4. Internal Technical Review

The validation report underwent an Internal Technical Review (ITR) before requesting registration of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas Certification procedures.

The Team Leader provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme. This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

- The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs and CLs during the validation exercise, review of sample documents.

The reviewer may raise Clarification Requests to the validation team and will discuss these matters with the Team Leader.

After the agreement of the responses to the Clarification Requests from the validation team as well as the PP(s), the finalized validation report is accepted for further processing such as uploading via the UNFCCC interface.

3. VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 13 CAR(s), 28 CL(s).

The CARs and CLs were closed out based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVS paragraph.

3.1. Approval (43-44)

The letters of approval have been received from the project participant and the following support documentation has been verified by Bureau Veritas Certification:

The DNA of Thailand has issued a Letter of Approval (Ref/18/) on 29/09/2014 authorizing Electricity Generating Authority of Thailand as the Project Participant and confirms that the Project contributes to Thailand's Sustainable development.

Bureau Veritas Certification received these letters of approval from the project participants and does not doubt the letters' authenticity.

The letters of approval do not refer to a specific version of the validation report.

In accordance with para. 39 – 42/VVS, Bureau Veritas Certification considers that:

(a) Each letter confirms the Party is a Party to the Kyoto Protocol;

(b) Each letter confirms the participation is voluntary;

(c) In the case of the host Party, the letter confirms that the proposed project activity contributes to the sustainable development of the country;

(d) Each letter refers to the precise proposed project activity title in the PDD being submitted for registration.

(e) The letter(s) of approval is unconditional with respect to the items above.

(f) The letter(s) of approval has been issued by the respective Party's DNA and is valid for the proposed project activity under validation.

3.2. Authorization (49)

The participation for each project participant has been authorized by a Party of the Kyoto Protocol.

The validation team concludes this by mean of review of the Letter of Approval (LOA) reference number TGO No.02/693 issued by Thailand Greenhouse Gas Management Organization (Public Organization) dated 29/09/2014 (Ref/18/).

3.3. Sustainable Development (52)

The host Party's DNA has confirmed the contribution of the Project to the sustainable development of the host Party. Please refer to section 3.1 of this report.

3.4. Modalities of Communications (58,61)

The validation team has performed due diligence on the MoC statement and validated the corporate identity of all project participants and focal points included in the Modalities of Communication (MoC) statement (Ref/19/), as well as the personal identities, including specimen signatures and employment status, of their authorized signatories.

Bureau Veritas Certification confirms that the MoC statement complies with all relevant forms and requirements.

3.5. Project Design Document (63)

Bureau Veritas Certification hereby confirms that the PDD complies with the latest forms of the guidance documents for completion of PDD.

3.6. Changes in the Project Activity (17)

During the site visit, no physical changes pertaining to the project design was observed as compared to details mentioned in the webhosted PDD.

The major differences between the final version PDD and the webhosted PDD are listed in Table 2 below:

Table 2 Changes between the final PDD and the webhosted PDD

Item	PDD version 1.0 (Webhosted)	PDD version 6.0 (Final)	Validation Opinion
Emission Factor	*Table 7: Emission factor* Operating margin CO_2 emission factor = 0.5944 Build margin CO_2 emission factor = 0.4231 Combined margin CO_2 emission factor = 0.5554 *Appendix 4* Referred to Grid Emission calculation by Thai DNA based on data from 2008-2010.	*Table 7: Emission factor* Operating margin CO_2 emission factor = 0.5383 Build margin CO_2 emission factor = 0.2996 Combined margin CO_2 emission factor = 0.4786 *Appendix 4* Calculated based on most recent data from 2012-2014.	Validation team raised CAR07 (see detail in Appendix A) for the calculation of grid emission factor according to requirement in "Tool to calculate the emission factor for an electricity system version 04.0". Based on calculation revision from PP, the grid emission factor was recalculated based on data from 2012-2014. Validation team reviewed the revised calculation as per applicable tool, and CAR08 – CAR13 and CL20 – CL28 were raised under review of grid emission factor calculation. Based on sufficient evidence provided with transparency (see detail in Appendix A), validation team confirmed that grid emission factor was correctly calculated based on conservative approach according to applied tool. Hence, this is accepted.

Project Chronological activity	See Table 8: Project chronological activity of webhosted PDD	*Table 8: Project chronological activity* - Addition of UNFCCC Notification activity on 24/04/2013 - Rearrange according to chronological order - Revision of date on Feasibility study from 04/2011 to 10/2011 - Various revision of evidences	Validation team had raised CL08 (see detail in Appendix A) to request for evidences of chronological activity provided in Table 8 of PDD. In response to this, PP revised the date. Validation team reviewed all evidence submitted (see section 3.9.1 below). It is found that each chronological activity was supported by reliable evidence. Hence, this is accepted.
Leakage Emission	*Section B.6.1* Leakage emission: As per AMS-I.D, Version18, leakage has to be considered if there is any energy generating equipment transfer from another activity. This project will not involve any transfer of equipment from another activity. Hence, the leakage emission due to equipment transfer is not considered.	*Section B.6.1* Leakage emission: As per AMS-I.D, Version18, para 42, General guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues. This project will not involve any use of biomass residues. Hence, the leakage emission due to use of biomass residues is not considered.	Validation team raised CAR03 (see detail in Appendix A) for the justification provided for leakage emission. In response to this, the justification was revised according to AMS-I.D version 18. Hence, this is accepted.
Summary of ex-ante estimates of emission reduction	*Section B.6.4* Total = 41,988 tCO_2 Annual Average = 4,199 tCO_2/yr	*Section B.6.4* Total = 36,180 tCO_2 Annual Average = 3,618 tCO_2/yr	Validation team ER calculation spreadsheet (Ref/39/) and found that this latest estimation is correct. This is accepted.
Accuracy level	*B.7.1* $EG_{PJ,export,y}$ - Measured continuously by using on-site electricity meter	*B.7.1* $EG_{PJ,export,y}$ - Measured continuously by using on-site electricity meter	Validation team raised CL12 (see detail in Appendix A) to request for evidence of accuracy level claimed.

	with accuracy at least 1% referred to PEA's standard. The amount of export electricity is recorded on monthly basis. $EG_{PJ,import,y}$ - Measured continuously by using on-site electricity meter with accuracy at least 1% referred to PEA's standard. The amount of import electricity is recorded based on monthly.	with accuracy class 0.2s. The amount of export electricity is recorded on monthly basis. $EG_{PJ,import,y}$ - Measured continuously by using on-site electricity meter with accuracy class 0.5s. The amount of import electricity is recorded based on monthly.	In response to this, PP provided the supporting evidence for accuracy class of monitoring equipment (Ref/16/-/17/). It is found that accuracy class was revised according to the evidence. Hence, this is accepted.
Quality assurance and quality control	*Section B.7.3* EGAT will take responsibility in recording and archiving the data by appointing consultants and/or technical support team. EGAT will also provide sufficient number of staff for data collection and monitoring and necessary training in order to improve the efficiency of their work. In case that the responsibility for monitoring is transferred to another person, it needs to be approved by the power plant manager. In case that the meters are malfunction, PEA will fix or replace with a new meter after getting notification and no power reading will be obtained. Thus no CER can be claimed during the meter malfunction and only $EG_{PJ,export,y}$ and	*Section B.7.3* In case of PEA and EGAT cannot calibration the electricity meter in accordance with the national/international standards (at least once in 3 years) due to any reason, the meters will calibrated by an accredited person or institution. EGAT will take responsibility in recording and archiving the data by appointing consultants and/or technical support team. EGAT will also provide sufficient number of staff for data collection and monitoring and necessary training in order to improve the efficiency of their work. In case that the responsibility for monitoring is transferred to another person, it	Validation team considered that this revision is sound and accepted.

	$EG_{PJ,import,y}$ indicated in the invoice from PEA will be used for ER calculation.	needs to be approved by the power plant manager.	
Emergency Procedure	*Section B.7.3* the operator will request PEA to repair the meter soonest. This emergency procedure will be stated in the operation manual. The manual will also show how to collect the monitoring data in the emergency situation.	*Section B.7.3* the operator will request PEA to repair the meter soonest and then PEA will fix or replace with a new meter after getting notification. During emergency situation, monitoring data from backup meter will be used for calculation of emission reduction. In case loss of monitoring data from both main and backup meter at the same time, the emission reduction will not be claimed during this period	Validation team raised CAR04 (see detail in Appendix A) for inconsistency of Emergency procedure provided in section B.7.3. With reference to justification provided in CAR04, validation team considered that the revision is sound and accepted.
Start date of crediting period	*Section C.2.3* 05/12/2014 or when registered with the UNFCCC whichever comes later	*Section C.2.3* 01/01/2016 or when registered with the UNFCCC whichever comes later	Validation team considered that this revision is sound and accepted.
Contact Person	*Appendix 1* Mr. Soonchai Kumnoonsate	*Appendix 1* Mrs. Waraporn Kunawanakit	Validation team considered that this revision is sound and accepted.

3.7. Project Description (69)

The Project is newly built grid-connected Solar Photo Voltaic (PV) Power Plant located in Thap Sakae District, Prachuap Khiri Khan Province, which has central point geographical coordinates of north latitude 11°28'21.60" and east longitude 99°35'52.54" or 11.4726 N and 99.5979 E.

The project activity is an 5 $MW_{(AC)}$ solar PV based power generation aims to generate renewable electricity using the grid-connected PV technology through the utilization of available solar energy. The generated electricity from the project would be sold to the regional grid to displace the electricity in the grid generated through fossil fuel based power plants connected to the grid.

Photovoltaic module

No.	Photovoltaic module type	Quantity ($MW_{(AC)}$)	Quantity (Cell)	Nominal peak (Wp)	Module Efficiency (%)	Applicable Standard
1	Crystalline	1	5,040	250	15.3	IEC61646

	Silicon: c-Si					IEC61730
2	Amorphous Silicon: a-Si	2	40,000	65	≥ 8.22	IEC61646 IEC61730
3	Copper Indium (Gallium) Di-Selenide: Cl(G)S	1	10,880	115	≥ 12.2	IEC61646 IEC61730 UL1703
4	Micro Crystalline Amorphous Silicon: µc/a-Si	1	9,792	130	12	IEC61646 IEC61730

Inverter

Inverter Capacity	Quantity	Efficiency (%)	Applicable Standard
630 kW Inverter	10	100% rate inverter load = 98.39%	EN50178 IEC62109-1 IEC62109-2

Step-up transformer

No.	Transformer Capacity	Quantity	Output/Input	Efficiency (%)
1	1,250 KVA	5	22 KV/315 V	98.58
2	200 KVA	1	22 KV/400 V	98.56

With reference to on-site inspection on 11/03/2015, validation team confirmed that this project activity is greenfield and there was no installation of any equipment observed. Hence, validation team had cross-checked accuracy and completeness of description described above by review the following evidences.

- EPC contract (Ref/1/)
- General design plot plan(Ref/2/)
- Single line diagram (Ref/15/)

It is found that the specification provided in PDD is in line with evidences provided.

The Project will result in annual emission reductions of 3,618 tCO_2e during the ten years of its fixed crediting period.

The validation did not reveal any information indicating that the Project can be seen as a diversion of official development assistance (ODA) funding towards the host country.

The processes undertaken by the validation team to validate the accuracy and completeness of the project description include conducting a physical site inspection, sampling, reviewing available designs and feasibility studies, conducting comparison analysis with equivalent projects.

Bureau Veritas Certification hereby confirms that the project description in the final PDD is accurate and complete in all respects.

3.8. Baseline and Monitoring Methodology

3.8.1. Applicability of the selected Methodology (77)

The Project uses the approved consolidated baseline and monitoring methodology AMS-I.D Version 18 – "Grid connected renewable electricity generation" (Ref/B2/).

The applicability of the selected methodology is justified and assessed as follows:

Applicability Criteria	Project status	Validation team's opinion
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass supplying electricity to a national or a regional grid.	According to EPC contract and General design plot plan, the project activity is an 5 $MW_{(AC)}$ solar PV based power generation project that generates and supply renewable electricity to the Thai national grid. The project activity contains renewable energy generation unit (solar photovoltaic power generation system) that supply electricity to Thai national grid.	Validation team reviewed the following evidences; - EPC contract (Ref/1/) - General design plot plan(Ref/2/) - Application for operational license (Ref/5/) It is confirmed that the project activity is an 5 $MW_{(AC)}$ solar PV based power generation project that generates and supply renewable electricity to the Thai national grid. This justification is accepted.
2. Illustration of respective situations under which each of the methodology (i.e. "AMS-I.D.: Grid connected renewable electricity generation", "AMS-I.F.: Renewable electricity generation for captive use and mini-grid" and "AMS-I.A.: Electricity generation by the user) applies is included in the appendix.	According to Single line diagram, the project activity supplied electricity to a national/regional grid. Therefore, the project is under AMS-I.D, Version 18.	Validation team reviewed the following evidences; - General design plot plan(Ref/2/) - Single line diagram (Ref/15/) - Application for operational license (Ref/5/) With reference to all evidence above, it is confirmed that the project activity plan to supply electricity to the grid. This justification is accepted.
3. This methodology is applicable to project activities that (a) install a Greenfield plant; (b) Involve a capacity addition in (an) existing	According to EPC contract and General design plot plan, the project involves installation of new solar power plant at the site where there is no renewable energy power plant operating	Validation team had conducted onsite inspection on 11/03/2015, with objective finding in the site – it's confirmed that this proposed project activity is new power

Applicability Criteria	Project status	Validation team's opinion
plant(s); (c) involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	prior to the implementation of the project activity. Also, the project activity is a green field project activity. The project activity is not a capacity addition, retrofit and replacement activity.	plant (Greenfield plant) and no renewable energy power plant has been operating prior to the implementation of the Project. This justification is accepted.
4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: (a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir; (b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m^2; (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m^2.	EPC contract and General design plot plan, the project activity involves the installation of Solar PV power plant and does not involve any hydro power plants. Hence, this criterion is not applicable.	Combined with the objective finding in both document review and onsite inspection, it's confirmed that this Project is not hydro power plant. This applicability condition is not applicable to this Project.

Applicability Criteria	Project status	Validation team's opinion
5. If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	EPC contract and General design plot plan, project activity is only 5 $MW_{(AC)}$ solar PV based renewable electricity generation project. It does not include any non renewable unit and co-firing system.	Validation team reviewed the following evidences; - EPC contract (Ref/1/) - General design plot plan(Ref/2/) - Application for operational license (Ref/5/) It is confirmed that the project activity does not include any non-renewable unit and co-firing system.
6. Combined heat and power (co-generation) systems are not eligible under this category.	EPC contract and General design plot plan, the project activity does not involve combined heat and power generation.	Validation team reviewed the following evidences; - EPC contract (Ref/1/) - General design plot plan(Ref/2/) - Application for operational license (Ref/5/) It is confirmed that the project activity does not involve in combined heat and power generation.
7. In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	EPC contract and General design plot plan, the project activity involves new installation of renewable energy generation units and does not involve extension of any existing facility Hence, this criterion is not applicable.	Validation team had conducted onsite inspection on 11/03/2015, with objective finding in the site and interview result with stakeholder – it's confirmed that this proposed project activity is new power plant (Greenfield plant) and no addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW. This justification is accepted.
8. In the case of retrofit, rehabilitation or	EPC contract and General design plot plan, the project	Validation team had conducted onsite inspection

Applicability Criteria	Project status	Validation team's opinion
replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	activity involves new installation of renewable energy generation units and does not involve retrofit or replacement of existing facilities. Hence, this criterion is not applicable.	on 11/03/2015, with objective finding in the site and interview result with stakeholder – it's confirmed that this proposed project activity is new power plant (Greenfield plant) and no retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit. This justification is accepted.
9. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as "AMS-I.C.: Thermal energy production with or without electricity" shall be explored.	EPC contract and General design plot plan, the project activity involves new installation of Solar PV renewable energy generation units and does not involve to the landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions. Hence, this criterion is not applicable.	Validation team reviewed the following evidences - EPC contract (Ref/1/) - General design plot plan(Ref/2/) - Application for operational license (Ref/5/) It is confirmed that the project activity involves does not involve to the landfill gas, waste gas, wastewater treatment and agro-industries projects. This justification is accepted.
10. In case biomass is sourced from dedicated plantations,	EPC contract and General design plot plan, the project activity involves new installation	Validation team reviewed the following evidences

Applicability Criteria	Project status	Validation team's opinion
the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	of Solar PV renewable energy generation units and does not involve to the biomass power generation. Hence, this criterion is not applicable.	- EPC contract (Ref/1/) - General design plot plan(Ref/2/) Application for operational license (Ref/5/) It is confirmed that the project activity involves does not involve to the biomass power generation. This justification is accepted.

It is also confirmed that the proposed project activity has no deviation from the approved methodology observed throughout the validation process.

Bureau Veritas Certification hereby confirms that the selected baseline and monitoring methodology, tool and other methodology component is previously approved by the CDM Executive Board, and is applicable to the Project, which, complies with all the applicability conditions therein.

3.8.2.Project Boundary (86-87)

The validation team has validated the project boundary by:

(a) Assessing the relevant documents including
- General design plot plan(Ref/2/)
- Initial Environmental Evaluation report (Ref/3/)
- Application for operational license (Ref/5/)
- Single line diagram (Ref/15/)

(b) Observing the physical site and equipment used in the process.

The spatial extent of the project boundary is clearly defined in line with AMS-I.D Version 18 as the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

Combined with document review and onsite visit, it's confirmed that there is no greenhouse gases emission generated for the Project.

De-bundling:

Following analysis was performed in order to validate de-bundling as follows:

1. The validation team checked UNFCCC website and CDM Pipeline overview database published by the UNEP Risoe Centre (http://cdmpipeline.org). It is confirmed that the same project participant had other CDM project registered as follows;

- 1 MW Sirindhorn Solar Cell, Thailand (Ref: 5739) (Ubon ratchathani province)
- Energy Efficiency Improvement of Mae Moh Power Plant Through Retrofitting Turbines (Ref:8664) (Lampang province)
- EGAT Irrigation Valve Based Micro Hydro Project (Ref: 8728) (Chiangmai province and Phetchaburi province)
- Chao Phraya Hydropower Project (Ref: 8853) (Chai Nat province)
- Mae Klong Hydropower Project (Ref: 9554) (Kanchanaburi province)
- Pasak Jolasid Hydropower Project (Ref: 9555) (Lopburi province)
- Khun Dan Prakarnchon Hydropower Project (Ref: 10021) (Nakhon Nayok Province)
- Khwae Noi Hydropower Project (Ref: 10103) (Phitsanulok Province)

It is observed that none of the projects above is located in the same area or closed by with the project activity (Thap Sakae District, Prachuap Khiri Khan Province).

2. It is also noted during physical site inspection that there is no CDM project activity or no application to register another CDM project activity within one kilometer of the proposed project activity by the same project participant in previous two years.

With reference to above findings, it is confirmed that the project activity is not deemed to be a debundled component of a large project activity.

Bureau Veritas Certification hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity. The validation team did not identify any emission sources that will be affected by the implementation of the proposed project activity and which are expected to contribute more than 1% of the overall expected average annual emissions reductions, and are not addressed by the selected approved methodology.

3.8.3.Baseline Identification (94-95)

The procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied.

According to the para 19 of AMS-I.D version 18, the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid. Furthermore, there is no alternative baseline scenario required by methodology for Greenfield power plant which is the case for proposed project activity.

The steps taken to assess the baseline scenario identification and description had been performed as below;

(a) Assessing the relevant documents including these following to cross-check the information contained in the PDD;

- EPC contract (Ref/1/)
- General design plot plan (Ref/2/)

- Application for Operational License (Ref /5/)
- Single Line Diagram (Ref/15/)

It's confirmed that the Project is newly built Solar PV power plant that will connected to Thai national grid and this is in line with statement below that:

"The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of other grid-connected power plants and by the addition of new generation sources into the grid."

(b) Review the Emission Reduction calculation

The baseline emissions are the product of Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity expressed in MWh of electricity multiplied by the combined margin CO_2 emission factor in tCO_2 /MWh.

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" version 4.0.0 EB 75, Annex 15 (Ref/B5/). The detail of cross-checking is shown in Table 2-1 under Appendix A below.

With reference to finding above, validation team confirmed that the Project is newly built Solar PV power plant which is connected to Thai National Grid. In addition, the claimed on the baseline that the baseline is electricity delivered to the grid is correct and accepted.

Bureau Veritas Certification hereby confirms that:

(a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;

(b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;

(c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;

(d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;

(e) The approved baseline methodology has been correctly applied to identify the most plausible baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed project activity.

3.8.4. Algorithms and/or Formulae used to determine Emission Reductions (99-100)

The steps taken and the equations and parameters applied in the PDD to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected methodology including applicable tool(s).

Baseline Emission

$BE_y = EG_{PJ,y} \times EF_{grid,y}$

Where:

BE_y = Baseline Emissions in year y (t CO_2)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{grid,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

(a) Calculation of $EG_{PJ,y}$

This project activity is the installation of a greenfield power plant as confirmed by onsite visit, then according to AMS-I.D version 18:

$EG_{PJ,y} = EG_{PJ,facility,y}$

Where:

$EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

$EG_{PJ,facility,y}$ is estimated followed the evidences Application for operational license (Ref/5/) at 7,560 MW(net). Validation team had cross-checked the estimated value by comparing with the alternative calculation based on installed capacity at 5 $MW_{(AC)}$, maximum time of operation at 8,760 hours per year (365 days), and plant load factor at 18% based on feasibility study (Ref/6/). The final result was calculated as 7,884 MW/year. For the internal consumption, the estimation on electricity consumption in control room and lighting system is calculated as 269.808 MW/year. Hence the net electricity generated would be 7,614 MW. Based on result finding, it is confirmed that 7,560 MW is considered as conservative approach. Hence, this is accepted.

(b) Calculation of $EF_{grid,y}$

Emission factor ($EF_{grid,y}$) is calculated following the AMS-I.D., version 18, Data / Parameter table 1, Measurement procedures, "As per the requirements in 'Tool to calculate the Emission Factor for an electricity system". Validation team reviewed the six steps calculation indicated in Appendix 4 of PDD as follows;

STEP 1. Identify the relevant electricity systems;

With reference to Annex 4 of the PDD version 1 dated on 13/01/2015, the proposed project identified the relevant project electricity system by referring to Summary Report: The Study of emission factor for an electricity system in Thailand in year 2010 published by Thailand Greenhouse Gas Management Organization (Public Organization) or TGO (Ref /40/) as follows;

"In Thailand, the electricity transmission line system is considered as a single grid system due to the transmission lines are networked all of the country area.

Electricity Generating Authority of Thailand (EGAT) regulate electricity generation and main transmission system, meanwhile Metropolitan Electricity Authority (MEA) is responsible for electricity distribution system in Bangkok and vicinity area, and Provincial Electricity Authority (PEA) is responsible for electricity distribution system in the rest of country."

It is confirmed that TGO who is the Thai's DNA has published a delineation of the project electricity system and Thailand has only one National Transmission Grid which is authorized by EGAT in roles of country's system operator, managing and controlling via National Control Center and five regional control centers. EGAT also owns and operates the national transmission network which includes transmission lines and substations of various high voltage levels which covers all parts of the country. Hence, this is accepted.

STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional);

With reference to Annex 4 of the PDD version 1 dated on 13/01/2015, the proposed project activity chose option 1 "Only grid power plants are included in the calculation".

STEP 3. Select a method to determine the operating margin (OM);

With reference to Annex 4 of the PDD version 1 dated on 13/01/2015. It is confirmed that option (a) "Simple OM" is chosen using the "Ex-ante option".

With reference to Grid Emission Factor calculation spreadsheet (Ref /20/), the average of the five most recent years that used to calculate the low-cost/must-run resources is based on year 2010 – 2014 by refer to publicly available information from Energy Policy & Planning Office, Ministry of Energy, Thailand[1]. The five years average of the low-cost/must-run resources is "5.46%". Therefore, it is confirmed that this value still constitute less than 50% of total grid generation and It is confirmed that the low-cost/must-run resources are defined as power plants with low marginal generation costs or power plants that are dispatched independently of the daily or seasonal load of the grid including hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.

In case of ex-ante calculation, the 3-year generation-weighted average used for grid power plants is based on year 2012 – 2014 by refer to publicly available information from Energy

[1] Table 5.2-2 : Power Generation Classified by Fuel Type (http://www.eppo.go.th/info/stat/T05_02_02-2.xls)

Policy & Planning Office, Ministry of Energy, Thailand[2]. It is confirmed that the data vintage chosen has been documented and not changed during the crediting period.

STEP 4. Calculate the operating margin emission factor according to the selected method;

It is confirmed that the simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units. The option "Simple OM (Option B)" is chosen that calculation is based on total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Validation team reviewed the public information in Thailand such as www.dede.go.th (Department of Alternative Energy Development and Efficiency), www.eppo.go.th (Energy Policy and Planning Office), and www.egat.co.th (Electricity Generating Authority of Thailand) etc. It is confirmed that there is no available data on their website for project participant to select Option A.

As required by the tool, validation team confirmed these following;

- Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known,
- The off-grid power plants are not included in the calculation,

With reference to the grid emission calculation spreadsheet (Ref /20/), it is confirmed that the simple OM emission factor is calculated based on the following equation.

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y}$$

The energy content of fuel (Net Calorific Value, NCV)

Validation team has review to page number 42 of **"**The Electric Power in Thailand Report Year 2013**"** (Ref /41/) and found that the NCV of natural gas, bituminous, bunker, diesel oil and lignite as follows:

Fuel type	Unit	Net calorific value (MJ/Unit)
Natural gas	*Scf.*	*1.02*
Lignite	*ton*	*10,470*
Bituminous	*ton*	*26,370*
Bunker	*litre*	*39.77*
Diesel	*litre*	*36.42*

[2] Table 3.2-2: Consumption of Natural Gas by sector (http://www.eppo.go.th/info/3ng_stat.htm)
Table 4.1-2: Consumption of Coal and Lignite Classified by Sector (Thousand Tons)
(http://www.eppo.go.th/info/4coal_lignite_stat.htm)
Table 5.4-1: EGAT Fuel Consumption in Power Generation (http://www.eppo.go.th/info/5electricity_stat.htm)

With reference to Annex 4 of the PDD version 05 dated 03/07/2015 (Ref /36/). DOE found that all of NCV's value and unit are comply with the reference source.

The default CO_2 emission factors for combustion (EF_{CO2})

DOE has review table 1.4 chapter 1 volume 2 of "2006 IPCC Guideline for National Greenhouse Gas Inventories" (Ref /42/) and found that 95% confidence interval of the effective CO_2 emission factors of natural gas, bituminous, bunker, diesel oil and lignite as follows:

Fuel type	*Unit*	*CO_2 emission (t CO_2/TJ)*
Natural gas	*Scf.*	*54.30*
Lignite	*ton*	*90.90*
Bituminous	*ton*	*89.50*
Bunker	*litre*	*75.50*
Diesel	*litre*	*72.60*

Validation team found that the "lower" of 95% confidence interval of the effective CO2 emission factors have been chosen to use as the CO2 Emission Coefficient for natural gas, bituminous, bunker, diesel oil, and lignite. It is confirmed that the "lower" value is the "conservative value" for simple OM emission factor calculation.

Amount of fossil fuel consumed ($FC_{i,y}$) and Net electricity generated and delivered to the grid by all power sources serving the system (EG_y)

Validation team has review Table 5.2-2: Power Generation classified by fuel type (http://www.eppo.go.th/info/5electricity_stat.htm) and found that all of $FC_{i,y}$ and EG_y values and units that referred in Annex 4 of the PDD version 5 dated 03/07/2015 (Ref /36/) and the grid emission calculation spreadsheet (Ref /20/) are comply with the reference source.

Validation team validated the result of computation provided in table below and confirmed that their calculation of operating margin (OM) is correct.

Fuel type	Unit	Fuel consumption			
		EGAT	IPP	SPP	Total
2014					
Natural gas	scf.	446,760,000,000	310,980,000,000	247,835,000,000	1,005,575,000,000
Lignite	ton	17,020,430	0	0	17,020,430
Bituminous	ton	0	6,144,030	2,331,890	8,475,920
Bunker	litre	378,890,000	0	0	378,890,000
Diesel	litre	20,830,000	0	0	20,830,000
2013					
Natural gas	scf.	448,585,000,000	318,645,000,000	216,445,000,000	983,675,000,000
Lignite	ton	16,884,950	0	0	16,884,950
Bituminous	ton	0	5,561,210	2,234,080	7,795,290
Bunker	litre	316,710,000	0	0	316,710,000
Diesel	litre	60,350,000	0	0	60,350,000
2012					
Natural gas	scf.	485,450,000,000	336,530,000,000	152,935,000,000	974,915,000,000
Lignite	ton	16,754,280	0	0	16,754,280
Bituminous	ton	0	5,362,170	2,417,070	7,779,240

Fuel type	Unit	Fuel consumption			
		EGAT	IPP	SPP	Total
Bunker	litre	319,340,000	0	0	319,340,000
Diesel	litre	19,060,000	0	0	19,060,000

STEP 5. Calculate the build margin (BM) emission factor;

It is confirmed that the project participants choose "Ex-ante option" to calculate the build margin (BM) emission factor and the build margin emission factor is calculated based on total and each power units produced in most recent year by referred to available data in year 2014 of actual IPP (Independent Power Plant) and SPP (Small Power Plant) commercial-in-operation dates obtained from ERC (Energy Regulatory Commission) website (http://www.erc.or.th/ERCSPP/default.aspx?x=0&muid=23&prid=41 and http://app04.erc.or.th/ELicense/Licenser/05_Reporting/504_ListLicensing_Columns_New.aspx?LicenseType=1) (Ref /43/ - /44/).

According to the tool, there are several steps done by project participant and validation team had validated against the tool as per following detail.

Step A: Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-}units}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);

It is confirmed that the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-}units}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh) has been identified.

Validation team has validated the set of five power units by accessed to ERC (Energy Regulatory Commission) website (http://www.erc.or.th/ERCSPP/default.aspx?x=0&muid=23&prid=41 and http://app04.erc.or.th/ELicense/Licenser/05_Reporting/504_ListLicensing_Columns_New.aspx?LicenseType=1) (Ref /43/ - /44/). It is confirmed that they are the most recently $SET_{5\text{-}units}$ and $AEG_{SET\text{-}5\text{-}units}$ by referred to their Commercial Operating Date (COD).

Step B: Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET\text{-}\geq 20\%}$, in MWh);

With reference to Annex 4 of the PDD version 6 dated 24/07/2015 and grid emission calculation spreadsheet (Ref /45/). It is confirmed that the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} has been identified.

Validation team has validated the set of power units that started to supply electricity to the grid most recently by accessed to ERC (Energy Regulatory Commission) website (http://www.erc.or.th/ERCSPP/default.aspx?x=0&muid=23&prid=41 and http://app04.erc.or.th/ELicense/Licenser/05_Reporting/504_ListLicensing_Columns_New.aspx?

LicenseType=1) (Ref /43/ - /44/). It is confirmed that they are the most recently ($SET_{\geq 20\%}$) by referred to their Commercial Operating Date (COD).

Validation team has validated the generation capacity of each power unit from evidences monthly electricity report (Ref /23/). It is confirmed that their total generation comprise more than 20% of AEG_{total} as follows:

Total of electricity produced in 2014 (AEG_{total})	171,885.34 GWh
20% of AEG_{total}	34,377.07 GWh
total generation of the set of power units that started to supply electricity to the grid most recently	**35,124.94 GWh**

Therefore it is consistent with data that used to calculate the Build Margin in Annex 4 of the PDD version 6 dated 24/07/2015 and grid emission calculation spreadsheet (Ref /45/).

Validation team has validated the generation capacity of each power unit from evidences monthly electricity report (Ref /23/). It is confirmed that their power generation are consistent with data that used to calculate the Build Margin in Annex 4 of the PDD version 6 dated 24/07/2015 (Ref /38/) and grid emission calculation spreadsheet dated on 24/07/2015 (Ref /45/).

Step C: From $SET_{5\text{-units}}$ and $SET_{\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample}); Identify the date when the power units in SET_{sample} started to supply electricity to the grid.

It is confirmed that $SET_{\geq 20\%}$ that comprises annual electricity generation at 35,124.94 GWh has been selected to be the SET_{sample} for build margin emission factor calculation according to its annual electricity generation is larger than 6,507.55 GWh of $SET_{5\text{-units}}$.

With reference to COD date reviewed, validation team confirmed that the power units in SET_{sample} started to supply electricity to the grid are less than 10 years. The oldest power unit is Chana Power Plant Co., Ltd. (Unit 01) that its Commercial Operating Date (COD) is 15 July 2008. The step D, step E and step F of the build margin can be ignored as per the tool's suggestion.

The build margin emissions factor is calculated by following equation.

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

It is found that for each power unit was determined as per guidance in Step 4 section 6.4.1 for the simple OM as follows;

- *For power unit which data on consumption and electricity generation are available*

Option A1 was chosen with using data from 2014 which the most recent historical year for which electricity generation data is available. PP was able to show consumption and electricity generation of 6 power units as follows;

- Bang Pa Kong power plant (unit 05)
- Wang Noi power plant (unit 04)
- Chana power plant (unit 01)
- Chana power plant (unit 02)
- South Bangkok Power Plant (unit 03)
- North Bangkok Power Plant (unit 01)

Validation team reviewed the evidence Ref/22/-/23/ and /28/-/29/ for the amount of fuel consumption ($FC_{i,m,y}$) and electricity generation ($EG_{m,y}$) for each power unit and correction in revised calculation. It is confirmed that the value was correctly applied in grid emission calculation and the evidence is referred from reliable source to calculate $EF_{EL,m,y}$ by using equation as follows;

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_{m,y}}$$

Hence, this is accepted

- *For a power unit which only data on electricity generation is available*

Option A3 was chosen and an emission factor of 0 t CO_2/MWh was assumed. Validation team reviewed the BM emission factor calculation and confirmed that conservative approach was properly used in the calculation.

The result of computation is provided in table below.

Year	CO_2 emission (t CO_2)	Grid consumption (GWh)	OM Emission Factor	
			(t CO_2/MWh)	(kg CO_2/KWh)
2014	10,522,399	35,124.94	0.2996	299.60

STEP 6. Calculate the combined margin (CM) emission factor.

It is confirmed that the "Weighted average CM" is chosen and the combined margin emissions factor is calculated by following equation.

$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$

It is confirmed that W_{OM} = 0.75 and W_{BM} = 0.25 for wind and solar power generation project activity had been used in the calculation for this proposed solar power project activity and gridd emission factor from this calculation is 0.4786 tCO_2/MWh. Validation team confirmed that their computation is correct.

The grid emission factor is calculated as follows;

Emission Factor	Value	Units
Weighted average Operating Margin	0.5383	t CO2e/MWh
Built Margin	0.2996	t CO2e/MWh
Combined Margin	**0.4786**	t CO2e/MWh

It should be noted that the combined margin grid emission factor calculated is lower than latest grid emission calculated by Thai DNA for 2010 which published on 30 December 2011 (Ref/40/), at which their emission factor is 0.5554 tCO_2/MWh.

Project Emission

Combined with document review and onsite visit with AMS-I.D version 18, validation team confirmed that there is no evidence of project emission observed from this project activity.

Leakage Emission

Combined with document review and onsite visit with AMS-I.D version 18, validation team confirmed that there is no evidence of leakage emission observed from this project activity.

Emission Reduction

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission reductions in year y (t CO_{2e})

BE_y = Baseline emissions in year y (t CO_{2e})

PE_y = Project emissions in year y (t CO_{2e})

LE_y = Leakage emissions in year y (t CO_{2e})

Hence,

Year	ER_y	=	BE_y	-	PE_y	-	LE_y
1	3,618	=	3,618	-	0	-	0
2	3,618	=	3,618	-	0	-	0
3	3,618	=	3,618	-	0	-	0
4	3,618	=	3,618	-	0	-	0
5	3,618	=	3,618	-	0	-	0
6	3,618	=	3,618	-	0	-	0
7	3,618	=	3,618	-	0	-	0
8	3,618	=	3,618	-	0	-	0
9	3,618	=	3,618	-	0	-	0
10	3,618	=	3,618	-	0	-	0

Bureau Veritas Certification hereby confirms that:

(a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;

(b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;

(c) All values used in the PDD are considered reasonable in the context of the proposed project activity;

(d) The baseline methodology and corresponding tool(s) have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;

(e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

3.9. Additionality (104)

As required by the selected methodology, the additionality of the Project has been demonstrated by applying EB 68 Annex 27 paragraph 2 - Guidelines on the demonstration of Additionality of small-scale project activity (Ref/B4/) which stated that

"2. Documentation of barriers, as per paragraph 1 above, is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of:

(a) The following grid-connected and off-grid renewable electricity generation technologies:

(i) Solar technologies (photovoltaic and solar thermal electricity generation);

(ii) Off-shore wind technologies;

(iii) Marine technologies (wave, tidal);

(iv) Building-integrated wind turbines or household rooftop wind turbines of a size up to 100 kW;"

The Project employing Solar Photovoltaic (PV) technology with 5 $MW_{(AC)}$ installed capacity is eligible under positive list as per (2.a.i) Solar technologies (photovoltaic and solar thermal electricity generation); of para 2 of EB 68 Annex 27 qualifies for positive list of grid-connected renewable electricity generation technologies that are automatically defined as additional. Combined with onsite inspection and review of relevant documents, validation team confirmed that the Project is additional.

3.9.1. Prior consideration of the Clean Development Mechanism (112)

The timeline of the Project has been validated as in Table 3 below:

Table 3: Timeline of the Project

Date	Events	Reference
10/2011	EGAT conducted the feasibility study	Ref/6/
24/02/2012	Board of EGAT approved to implement the project	Ref/7/

24/04/2013	UNFCCC Notification	Prior Consideration of the CDM (cross-checked on UNFCCC website[3])
25/04/2013	EGAT submitted a Letter of Intent (LoI) to Thai DNA	Ref/24/
21/05/2013	EGAT conducted the public consultation	Ref/3/
19/07/2013	Thai cabinet approved the project	Ref/25/
08/05/2014	EGAT signed the Engineering Procurement and Construction contract (EPC)	Ref/1/
14/08/2014	EGAT submitted the project documents to Thai DNA for requesting Letter of Approval (LoA)	Ref/9/
11/03/2015	DOE started onsite validation	Ref/8/
03/06/2015	EGAT plan for started commercial export electricity to Thai national grid (COD)	Ref/10/

From the table above, the validation team is able to verify that the project activity start date determined as 08/05/2014 in the PDD is appropriate and is the earliest of the dates at which either the implementation or construction or real action of the Project began. This is in accordance with the latest CDM glossary.

It is a project activity with a start date after 2 August 2008, for which a PDD had not been published for global stakeholder consultation before the project activity start date. By referring to the list of prior consideration notifications from the UNFCCC website and communication between the project proponent, the secretariat (on 24/04/2013) and the host Party DNA (on 25/04/2013) regarding the commencement of a new project activity, the validation team confirms that the notifications have been provided by the project participants within 180 days of the project activity start date. According to Table 3 above, there is less than two years of a gap between the documented evidence. Hence, it is concluded that continuing and real actions were taken to secure CDM status for the project activity.

Bureau Veritas Certification hereby confirms that the proposed project activity complies with the requirements related to the prior consideration of the CDM (Ref/B3/).

3.9.2.Identification of Alternatives (116)

Based on demonstration of Additionality described in section 3.9 above, Bureau Veritas Certification considers the identification of alternative is not applicable.

3.9.3.Investment Analysis (123)

Based on demonstration of Additionality described in section 3.9 above, Bureau Veritas Certification considers the investment analysis is not applicable.

[3] https://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html

3.9.4.Barrier Analysis (127)

Based on demonstration of Additionality described in section 3.9 above, Bureau Veritas Certification considers the barrier analysis is not applicable.

3.9.5.Common Practice Analysis (130)

Based on demonstration of Additionality described in section 3.9 above, Bureau Veritas Certification considers the common practice analysis is not applicable.

3.10. Monitoring Plan (133)

The Project uses the approved consolidated monitoring methodology AMS-I.D Version 18.

Applicability of this methodology is justified in PDD as newly built Solar PV Power Plant with 5 $MW_{(AC)}$. Referring to the discussions on the applicability of the methodology in section 3.8.1 above, the validation team considers that the selected monitoring methodology is applicable to the Project.

Data and Parameters Monitored

Parameter	Measurement methods and procedures	QA/QC procedures	Validation team's opinion
$EG_{PJ,facility,y}$	Calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid ($EG_{PJ,export}$); and (b) the quantity of electricity the project plant/unit from the grid ($EG_{PJ,import}$). The plant officer is responsible for this calculation. Continuous monitoring, hourly measurement and at least monthly recording.	Quantity of net electricity supplied to the grid shall be crosschecked with records for sold or purchased electricity (e.g. invoices/receipts issued by PEA).	This is in line with AMS-I.D version 18
$EG_{PJ,export,y}$	Monitored continuously by the electricity meter. The amount of export electricity is recorded based on monthly basis by plant officer.	Meter will be calibrated periodically as per national standard by PEA or accredited person or institution or EGAT. Data measured will be crosschecked by	This is in line with AMS-I.D version 18

		electricity receipt monthly.	
$EG_{PJ,import,y}$	Monitored continuously by the electricity meter. The amount of import electricity is recorded on monthly basis by plant officer.	Meter will be calibrated periodically as per national standard by PEA or accredited person or institution or EGAT. Data measured will be crosschecked by electricity receipt monthly.	This is in line with AMS-I.D version 18

The validation team considers that the description of the monitoring plan contains all necessary parameters, that they are described and that the means of monitoring described in the plan complies with the requirements of the methodology including applicable tool(s).

Implementation of the Monitoring Plan

The validation team validated the monitoring plan in section B.7.1 and B.7.3 of the revised PDD version 06.0 dated 24/07/2015 combined with interviewed result with Mr.Chusak Thanakulmas, chief of Thap Sakae power plant development project, EGAT and Mr.Jetsada Falert, consultant, AEP on 11/03/2015, it is confirms that the monitoring plan contains all necessary parameters that are clearly described and that the means of monitoring described in the plan complies with the requirements of AMS-I.D version 18. The data and parameters monitored are as follows:

- Quantity of electricity supplied by the project activity to the Grid ($EG_{PJ,Export,y}$)
- Quantity of net electricity delivered to the project activity from the Grid ($EG_{PJ,Import,y}$)
- Quantity of net electricity generation supplied by the project activity to Grid ($EG_{PJ,facility,y}$)

The validation team considers that the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed project activity can be reported ex post and verified.

Bureau Veritas Certification hereby confirms that the monitoring plan complies with the requirements of the methodology including applicable tool(s), the monitoring arrangements described in the monitoring plan are feasible within the project design and the project participants are able to implement the described monitoring plan.

3.11. Environmental Impacts (137)

The project participants conducted an analysis of the environmental impacts in form of Initial Environment Evaluation (IEE) which is required by host country in approval of LoA. Validation team confirmed that the Project does not fall in category that need full Environmental Impact Assessment (EIA) study.

With reference to IEE report, it's confirmed that there is no environmental impact results from the Project.

Bureau Veritas Certification hereby confirms that the project participants have undertaken an analysis of environmental impacts as required by the host Party.

3.12. Local Stakeholder Consultation (140)

The project participants have completed a local stakeholder consultation (LSC) process and that due steps were taken to engage stakeholders and solicit comments for the proposed project activity.

The LSC meeting was conducted on 21/05/2013 and there were three questions had been raised by villagers. In light of this, validation team had conducted interview session during onsite visit (11/03/2015) with these following villagers who had attended LSC meeting conducted by EGAT;

- Mr.Sawai Supanuson
- Mr.Phairat Khamfaeng
- Ms.Maria Phaopratarn
- Mr.Wichit Tangkanakul
- Mr.Therasak Thekayuwattana

Based on interview session with these abovementioned persons, it's confirmed that the comments had been raised as claimed in PDD and EGAT had taken their comments into account.

Bureau Veritas Certification hereby confirms that comments that are relevant for the proposed project activity have been invited from local stakeholders, the summary of the comments received as provided in the PDD is complete, the project participants have taken due account of all comments received and have described this process in the PDD.

4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD using methodology AMS-I.D version 18 was webhosted on the UNFCCC for global stakeholders comments as per CDM requirements. The project was webhosted from 07/02/2015 to 08/03/2015.

No comments were received during this period.

5. VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the 5MW Thap Sakae Photovoltaic Solar Cell Power Plant Project, Thailand, which is located in Thap Sakae District, Prachuap Khiri Khan Province. The validation was performed on the basis of UNFCCC criteria for the CDM, and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) desk review of the project design document and additional background documents; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion.

The project correctly applies the approved consolidated baseline and monitoring methodology AMS-I.D Version 18 and uses the latest guidelines for demonstration of the additionality.

By employing Solar Photovoltaic technology, the project is likely to result in reductions of GHG emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated annual emission reductions of 3,618 tCO_2e during the ten years of its fixed crediting period.

The review of the project design documentation and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas Certification thus requests registration of the project as a CDM project activity.

Dr. Chumpol SRIPRAPARKORN	Mr. Natchawat CHARNYAPORNPONG
Internal Technical Reviewer	Team Leader
30/09/2015	30/09/2015

6. REFERENCES

Category 1 Documents:

Documents provided by project participants that relate directly to the GHG components of the project.

/1/ EPC contract
/2/ General Design Plot Plan
/3/ IEE report
/4/ General Drawing of Fence Lighting
/5/ Application form to request for operational license
/6/ Feasibility Study
/7/ Minute of Meeting for the project
/8/ Validation Plan
/9/ Submission letter to request for LoA
/10/ Progress report on September 2014
/11/ Grid Emission Factor 2014-2 (2).xlsx
/12/ Fuel consumption for BM.xlsx
/13/ Power Generation for BM 260515.xlsx
/14/ CL04 Basics human needs
/15/ Single Line Diagram
/16/ Technical specification of Import meter
/17/ Technical specification of Export meter
/18/ Letter of Approval by Thai DNA
/19/ Modalities of Communication (MoC)
/20/ Grid Emission Factor 2014
/21/ Power Generation for BM
/22/ Data source of fuel consumption for BM
/23/ Data source of power generation for BM
/24/ Letter of Intent (LOI) submitted to DNA on 25/04/2013
/25/ Approval letter by Thai Cabinet
/26/ Notification of The Board of Directors of Thailand Greenhouse Gas Management Organization on Sustainable Development Criteria for Clean Development Mechanism Project B.E. 2553 (2010) No. 1/2553
/27/ Electricity supply to Grid from CDM projects.xlsx
/28/ Updated Grid Emission Factor for Thap Sakae1.msg
/29/ Updated Grid Emission Factor for Thap Sakae2.msg
/30/ Webhosted PDD version 01
/31/ Emission Reduction (ER) calculation spreadsheet version 01
/32/ PDD version 2.0 dated on 19/02/2015
/33/ PDD version 3.0 dated on 03/04/2015
/34/ PDD version 4.0 dated on 08/06/2015
/35/ ER Thap Sakae (08062015)
/36/ PDD version 5.0 dated on 03/07/2015
/37/ ER Thap Sakae 07072015

/38/ PDD version 6.0 dated on 24/07/2015

/39/ ER Thap Sakae 24072015

/40/ Summary Report: The Study of emission factor for an electricity system in Thailand in year 2010 published by Thailand Greenhouse Gas Management Organization (Public Organization) or TGO

/41/ The Electric Power in Thailand Report Year 2013

/42/ 2006 IPCC Guideline for National Greenhouse Gas Inventories (http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf)

/43/ List of SPP and IPP producers.xlsx

/44/ EE producer (EGAT).xls

/45/ Grid Emission Factor 2014 (24072015)

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents used for cross-check.

/B1/ Validation and Verification Standard, version 7.0, EB 79

/B2/ Applied small scale methodology AMS I D, version 18

/B3/ Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM, Version 04, EB 62

/B4/ Guidelines on the demonstration of Additionality of small scale project activities, version 9, EB 68 Annex 27

/B5/ Tool to calculate the emission factor for an electricity system version 04.0

Persons interviewed:

Persons interviewed during the validation or persons that contributed with other information that are not included in the documents listed above.

	Electricity Generating Authority of Thailand	
/1/	Ms.Waraporn Kunawanakit	Chief, GHG Management Department
/2/	Mr.Panit Terdsudthironapoom	Engineer
/3/	Mr.Nutdanai Utthajak	Engineer
/4/	Mr.Chusak Thanakulmas	Chief of Thap Sakae power plant development project
	Advance Energy Plus Co., Ltd.	
/5/	Jetsad FaLert	Consultant
/6/	Chayaphol Aroontherawong	Consultant
	Local Stakeholder	
/7/	Mr.Sawai Supanuson	
/8/	Mr.Phairat Khamfaeng	
/9/	Ms.Maria Phaopratarn	
/10/	Mr.Wichit Tangkanakul	
/11/	Mr.Therasak Thekayuwattana	

7. CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Mr. Natchawat CHARNYAPORNPONG	Bureau Veritas Certification, Thailand	Team Leader, Climate Change Lead Verifier, Natchawat has been involved in climate change and sustainable development of more than 20 CDM/VCS/IEE/ISO14064 projects in Thailand and Cambodia. He is also trained for ISO 9000 QMS Lead Auditor, ISO 14000 EMS Lead Verifier, Gold Standard Verifier. His project experiences are renewable energy (i.e. Solar PV, Biomass, Biogas, Energy crop, and etc.), waste heat recovery system for cement industry and improved cook stove for under-development area. He was part of verification team whom verified 2011 Carbon Footprint of Suvarnabhumi Airport

Dr. Chumpol SRIPRAPARKORN	Bureau Veritas Certification, Thailand	Technical Reviewer, Climate Change Lead Verifier. Chumpol has more than ten years of experience in area of environmental services, at which the last five years he has been involved in climate change and sustainable livelihood for development of CDM/VCS/WCD/EIA projects in Thailand, Cambodia, Lao PDR and Singapore. Chumpol also obtaining remarkable records for validation and verification services for the projects that claimed its sustainable development and well-acceptance from local villagers who lived nearby the projects. His extensive project experiences are including renewable energy for power generation (i.e., solar PV, hydro, biomass, biogas), waste water treatment, replacing traditional chillers with more advance technology, waste heat recovery system for cement industry and improved cook stove for under-development area. He has excellence skills to complete onsite investigation, at which data collection, analytical thinking and interviewing skills are the most essential needs for validator/verifier to complete the tasks.

APPENDIX A: CDM PROJECT VALIDATION PROTOCOL

Table 1 Validation requirements based on VVS version 07.0 (EB 79, Annex 4), PS version 07.0 (EB 79, Annex 3), PCP version 07.0 (EB 79, Annex 5), and Project Design Document form for Small-Scale CDM project activities version 05.0

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Part I Cover Page					
(a) Is the title of the project activity provided?	PDD		**Yes.** 5MW Thap Sakae Photovoltaic Solar Cell Power Plant Project, Thailand	OK	OK
(b) Is the version number of the PDD indicated?	PDD		**Yes.** Version 01	OK	OK
(c) Is the completion date of the PDD provided in DD/MM/YYYY format?	PDD		**Yes.** 13/01/2015	OK	OK
(d) Are project participants indicated?	PDD		**Yes.** Electricity Generating Authority of Thailand	OK	OK
(e) Is the host party(ies) indicated?	PDD		**Yes.** Thailand	OK	OK
(f) Is the sectoral scope and selected methodology(ies) indicated?	PDD		**Yes.** Sectoral scope 01: Type I, Category D "Grid connected renewable electricity generation, version 18" with reference to EB 81, November 2014	OK	OK
(g) Is the estimated amount of annual average GHG emission reductions indicated?	PDD		**Yes.** 4,199 tCO_2e – Version 01 dated 13/01/2015	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Part II PDD					
Description of project activity					
A.1 Purpose and general description of project activity					
A.1.1 Is a brief description of the project activity provided, including a summary of the scope of activities/ measures that are to be implemented within the project activity?	PDD PS	37(b)	**Yes.** Section A.1 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The purpose of this project is to generate clean electricity by utilizing solar energy and to reduce the greenhouse gas (GHG) emissions by displacing equivalent amount of electricity from carbon intensive the national grid.* **Mean of Validation:** The validation team had reviewed Engineering Procurement and Construction Contract for Thap Sakae Photovoltaic power plant between Electricity Generating Authority of Thailand and Consortium of Hydrochina international Engineering Co., Ltd. Yingli Energy (Beijing) Co., Ltd. Hebei Electric Power Design & Research Institute and Wattanasuk Engineering Co., Ltd. <Ref /01/>. It's found the phrase clearly stated that "..the overall power output is 5075.313	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			kW (AC) for whole plant.". Please refer to the change in installed capacity in CL18 below.		
A.1.2 Are the scenarios existing prior to the start of project and baseline scenario indicated?	PDD		**Yes.** Section A.1 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of other grid-connected power plants included fossil based power plants.*	OK	OK
A.1.3 Does it explain how the project activity will reduce GHG emissions or increase GHG removals?	PS	37(c)	**Yes.** Section A.1 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The project activity involves generation of electricity by utilizing the available solar energy and exporting it to the Thai National Grid. By displacing the fossil fuel based grid electricity, the project activity contributes to the GHG emission reduction*	OK	OK
A.1.4 Is the estimated of annual average and total GHG emission reductions for the chosen	PDD		**Yes.** Section A.1 of the PDD version 1.0 dated	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
crediting period provided?			13/01/2015 stated as follows: *The project activity contributes to the GHG emission reduction and is expected to reduce an average of 4,199 tCO_2e per year or total GHG emission reduction for entire 10-year crediting period is 41,988 tCO_2e*		
A.1.5 Is a brief description of how the project activity contributes to sustainable development provided?	PDD		**Yes.** Section A.1 of the PDD version 1.0 dated 13/01/2015 stated as follows: *In Thailand, sustainable development requires the effective integration of four key elements namely, the environmental, social, technological and economical indicators. By providing positive impacts on these four dimensions, the project activity will facilitate multi-dimensional sustainable development benefits to the local communities as well as to the nation.* **CL17** Please provide 'Factory License' as reference in section A.1 for validation.	~~CL17~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			With reference to closure of CL17, PP revised the reference source to publication by Thai DNA which can be accessed from http://www.tgo.or.th/download/Announce/CDM/ApprovalNotification_2010_EN.pdf. Validation team reviewed the reference soured and found that the description was referred correctly. Hence, this is accepted.		
A.1.6 In order to determine whether the description of the proposed project activity in the PDD is accurate, complete, and provides an understanding of the proposed CDM project activity, does the DOE conducted a physical site visit to assess the Project? If not, please justify.	VVS	65	**Yes.** The validation team had conducted onsite visit on 11/03/2015. These following persons are interviewed by validation team; Project participant • Mr Chusak Thanakulmas • Ms Waraporn Kunawanakit • Mr Nutdanai Utthajak • Mr Panit Terdiudthironaporn CDM Consultant • Mr Jetsada Falert • Mr Chayaphol Aroontherawong These following issues are discussed and interviewed during onsite visit.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			• Technical description • Monitoring Plan • Project operation • Environmental Impact		
A.1.7 For all other proposed CDM project activities not referred to in VVS paragraphs 66-67, does the DOE undertaken the validation of project description by reviewing available designs and feasibility studies and should conduct comparison analysis with equivalent projects, as appropriate.	VVS	68	Not applicable. This is individual proposed small-scale CDM project activities with emission reductions not exceeding 15,000 tonnes per year. This project is subjected to conduct site visit.	OK	OK
A.1.8 If the proposed CDM project activity involves the alteration of an existing installation or process, does the project description state the differences resulting from the project activity compared to the pre-project situation?	VVS	69	Not applicable. This proposed project activity is Greenfield project and not involves the alteration of an existing installation or process.	OK	OK
A.2 Location of project activity					
A.2.1 Is the host party(ies) indicated?	PDD		**Yes.** Thailand	OK	OK
A.2.2 Is region/state/province etc. indicated?	PDD		**Yes.** Prachuap Khiri Khan province	OK	OK
A.2.3 Is City/Town/Community etc. indicated?	PDD		**Yes.** Thap Sakae District	OK	OK
A.2.4 Are the details of physical location of the	PDD		**Yes.**	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
project activity, including information allowing the unique identification of this project activity and a map, provided?			Section A.2.4 of the PDD version 1.0 dated 13/01/2015 provides a map and the unique identification of this project activity as follows: *"The total site area available for this project is approximately 250 rai. The co-ordinates of each corner of the project site are (11°28'31.52"N Latitude, 99°35'41.62"E Longitude), (11°28'21.90"N Latitude, 99°35'39.33"E Longitude), (11°28'10.62"N Latitude, 99°36'0.87"E Longitude) and (11°28'29.92"N Latitude, 99°36'1.69"E Longitude). The central point of the project activity is located at 11°28'21.60"N Latitude 99°35'52.54"E Longitude."* **Mean of validation**: With reference to onsite visit on 11/03/2015, validation team had measured the geographical coordination at the site. It's found that the coordination is consistent with detail in PDD.		
A.3 Technologies and measures					
A.3.1 Are there a list and the arrangement of the main manufacturing/ production technologies,	PDD		**Yes.** Section A.3 of the PDD version 1.0 dated	~~CL01~~ ~~CL18~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
systems and equipment involved?			13/01/2015 Photovoltaic module Inverter Step-up transformer **CL01** Please provide the supporting evidence to confirm that the amount of inverter and transformer would be installed in project activity as follows: - 10 units of 630 kW Inverter - 5 units of 1,250 KVA and 1 unit of		

Photovoltaic module

No.	Photovoltaic module type	Quantity ($MW_{(AC)}$)	Quantity (Cell)	Nominal peak (Wp)	Module Efficiency (%)	Applicable Standard
1	Crystalline Silicon: c-Si	1	5,004	250	≥ 15.3	TUV/UL/IEC/MCS
2	Amorphous Silicon: a-Si	2	38,460	65	≥ 8.22	IEC61646 IEC61730
3	Copper Indium (Gallium) Di-Selenide: CI(G)S	1	10,860	115	≥ 12.2	IEC61646 IEC61730 ULI1703
4	Micro Crystalline Amorphous Silicon: μc/a-Si	1	9,620	130	≥ 12	IEC61646 IEC61730

Inverter

Inverter Capacity	Quantity	Efficiency (%)	Applicable Standard
630 kW Inverter	10	25% rate inverter load = 98.62% 50% rate inverter load = 98.78% 75% rate inverter load = 98.56% 100% rate inverter load = 98.39%	EN50178 IEC62109-1 IEC62109-2

Step-up transformer

No.	Transformer Capacity	Quantity	Output/Input	Efficiency (%)
1	1,250 KVA	5	22 KV/315 V	98.58
2	200 KVA	1	22 KV/400 V	98.56

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			200 KVA transformer With reference to closure of CL01, validation team reviewed that evidence 'Application form to request for factory license.pdf'. It is found that this document was stamped for notification of application acceptance No. 3225 by Prachuapkhirikhan' industry office on 10 November 2014. Hence, validation team agreed that this is reliable source and data is correctly applied to PDD. With reference to 'General design plot plan' Ref/2/ dated on 3/3/2015 received during onsite visit on 11/03/2015, the amounts of PV module and total installed capacity (are found to be different with the EPC contract Hence, CL18 is issued as followed. **CL18** Please clarify why the amounts of PV module and total installed capacity indicated in 'General plot plan' are found to be different from 'EPC contract' and which value is applicable for this project activity. With reference to closure of CL18, validation team accepted the justification and		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			confirmation by PP to follow the latest evidence available. Total installed capacity is now changed from 6.2504 MW (DC) which is based on EPC Contracted in 2014 to 6.304 MW (DC) which is based on General design Plot Plan (updated 03/03/2015). This change does not alter their applicability and additionality which is still below 15 MW. Hence, the justification is accepted.		
A.3.1.1 Is the information about the age and average lifetime of the equipment based on manufacturer's specifications and industry standards, and existing and forecast installed capacities, load factors and efficiencies included in the description?	PDD		**Yes.** Section A.3 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The technical lifetime of the project activity is 25 years with 18 % of plant load factor.* **CAR01** The Module efficiency and Applicable standard of the following PV type stated in Table 1 of PDD version 1.0 dated 13/01/2015 are found inconsistency with the EPC contract - Efficiency of Crystalline silicon: C-Si - Applicable Standard of Copper Indium Gallium Di- Selenide: CIGS	~~CAR01~~ ~~CL02~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			- Efficiency of Micro crystalline amorphous silicon: µC/A-Si Validation team reviewed the correction in revised PDD and confirmed that all discrepancy was corrected. **CL02** Please provide the supporting evidences for technical lifetime of the project activity at 25 years and plant load factor of 18% as stated in section A.3 of PDD version 1.0 dated 13/01/2015 With reference to evidence provided (Ref/6/), validation team confirmed that PDD was correctly referenced from submitted evidence.		
A.3.1.2 Are the monitoring equipments and their location in the systems included in the description?	PDD		**Yes.** Section A.3 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The monitoring equipment consists of 2 electricity meters which are an export meter and import meter. The export meter shall be installed after step-up transformer to monitor*	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			the amount of supplied electricity to the grid while the import meter shall be installed before a main breaker to monitor the amount of project electricity consumed from the grid.		
A.3.2 Are energy and mass flows and balances of the systems and equipment included in the project activity provided?	PDD		Not Applicable.	-	-
A.3.3 Are the types and levels of services provided by the systems and equipment that are being modified and/or installed under the project activity and their relation, if any, to other manufacturing/ production equipment and systems outside the project boundary provided?	PDD		Not Applicable.	-	-
A.3.4 Does the description clearly explain how the same types and levels of services provided by the project activity would have been provided in the baseline scenario?	PDD		Not Applicable.	-	-
A.3.5 Is a list of facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project activity provided?	PDD		Not Applicable.	-	-
A.3.6 Is a list of facilities, systems and equipment in the baseline scenario provided?	PDD		Not Applicable.	-	-
A.3.7 Is a description of how technologies and	PDD		Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
measures and know-how to be used are transferred to the Host Party(ies) included?					
A.4 Parties and project participants					
A.4.1 Are following information provided in a tabular format?					
A.4.1.1 List of project participants and parties	PDD		**Yes.** - Party involved is Thailand - Public entity project participant is Electricity Generating Authority of Thailand	OK	OK
A.4.1.2 Identification of Host Party	PDD		**Yes.** Thailand	OK	OK
A.4.1.3 Indication whether the Party wishes to be considered as project participant	PDD		**Yes.** There is indication that Thailand is not considered as project participant.	OK	OK
A.5 Public funding of project activity					
A.5.1 Is it indicated whether the project activity receives public funding from Annex I Parties?	PDD		**Yes.** Section A.5 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The project involves no public funding from Parties that are Annex I signatories to the Kyoto Protocol.*	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A.5.2 In case where public funding from Annex I Parties is involved, are followings provided? (a) Information on Parties providing public funding (b) Attached in Appendix 2: the affirmation obtained from such Parties that such funding does not result in a diversion of official development assistance, is separate from, and is not counted towards the financial obligations of those Parties	PS	40	Not Applicable	-	-
A.6 Debundling for project activity					
A.6.1 Do the project participants demonstrate that the project activity is not a debundled component of a large-scale project activity?	PDD PS	95	**Yes.** The project participant demonstrates in sections A.6 of the PDD version 1.0 dated 13/01/2015 that the project activity is not a de-bundled activity of a large-scale project activity.	OK	OK
A.6.2 Do the project participants follow the applicable provisions in the “Guidelines on assessment of debundling for SSC project activities”?	PS	96	**Yes.** Section A.6 of the PDD version 1.0 dated 13/01/2015 referred to the para 2 of the guidelines on assessment of debundling for SSC project activities, Version 03.0, EB54 Annex 13.	OK	OK
B. Application of selected approved baseline and monitoring methodology					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.1 Reference of methodology					
B.1.1 Is the selected methodology (ies) indicated with exact reference (number, title and version)?	PDD		**Yes.** With reference to the PDD version 1.0 dated on 13/01/2015, the selected methodology is AMS-I.D – "Grid connected renewable electricity generation" (Version 18)	OK	OK
B.1.2 Are the baseline and monitoring methodologies selected by the project participants the valid versions of those approved by the Board?	VVS	71	**Yes.** The AMS-I.D version 18 is still valid since from 28 November 2014 onward. (*http://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK*)	OK	OK
B.1.3 Are there any tools and other methodologies to which the selected methodology indicated?	PDD		**CAR02** The version of both tools indicated in section B.1 of PDD version 1.0 dated on 13/01/2015 are found inconsistency with latest tool available on UNFCCC website (http://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK) With reference to closure of CAR02, validation team reviewed the revised PDD and confirmed that version of both tools are now consistent with the latest tool available	~~CAR02~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			on UNFCCC website.		
B.1.4 Has specific guidance and/or clarifications provided by the Board with respect to the approved methodology and any applicable tools been applied?	VVS	72	**Yes.** The AMS-I.D version 18 refers to these following guidance; 1) General guidelines for SSC CDM methodologies, information on additionality (attachment A to Appendix B) 2) General guidance on leakage in biomass project activities (attachment C to Appendix B)	OK	OK
B.1.5 Is there any deviation or clarification requested for the approved methodology?	VVS	80-82	Not Applicable.	-	-
B.2 Project activity eligibility					
B.2.1 Is the selected baseline and monitoring methodology applicable to the project activity and that the selected version valid at the time of submission of the proposed project activity for registration?	VVS	74-76	**Yes.** As of 13/01/2015, the AMS-I.D version 18 is still valid for the proposed project activity to request for registration (Valid from 28 Nov 2014 onwards).	OK	OK
B.2.2 Is the choice of the selected methodology(ies) justified by showing that the project activity meets each applicability conditions of the selected methodology(ies)?	PDD VVS	78	Refer to table 2 below.	OK	OK
B.2.3 Is it demonstrated that the project activity qualifies as Type I, II, and/or III during every	PDD		**Yes.** Type I: Renewable energy project activities	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
year of the crediting period in accordance with applicable provisions for project activity eligibility in the Project standard?			with a maximum output capacity of 15 MW (or an appropriate equivalent).		
B.2.4 Is it determined that the project activity conforms to one or more of the approved small-scale methodologies applied in conjunction with the general guidelines to SSC CDM methodologies?	VVS	159	**Yes.** The project activity conforms only to type I with approved small-scale methodology AMS-I.D version 18.	OK	OK
B.2.5 Do the project participants explain the documentation that has been used as a basis for justification and provide the references, or include the documentation in Appendix 3 of the PDD?	PDD		**CL19** With reference to para 78 of VVS version 07.0 (EB79 Annex 4), please explain the documentation that has been used as a basis for justification and provide the references in Table 5 of PDD, or include the documentation in Appendix 3 of the PDD for the justification on applicability criterion of the project activity to the selected methodology (AMS-I.D version18). With reference to closure of CL19, validation team reviewed the revised PDD and confirmed that justification provided with supporting evidences are reasonable for all applicability criteria of AMS-I.D version 18.	~~CL19~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.3 Project boundary					
B.3.1 Is the project boundary of the project activity defined based on the guidance of the selected methodology(ies)?	PDD		**CL03** According to para 18 of AMS-I.D version 18, please clarify how Fossil fuel power plants as shown in figure 4 in section B.3 of PDD version 1.0 dated 13/01/2015 are in the scope of the project boundary. With reference to closure of CL03, validation team reviewed the revised PDD and confirmed that that fossil fuel power plant was removed from figure 4.This is in line with AMS-I.D version 18.0.	~~CL03~~	OK
B.3.2 Is a flow diagram of the project boundary presented, physically delineating the project activity?	PDD		**Yes.** Figure 4 in section B.3 of the PDD version 1.0 dated 13/01/2015 presented the project boundary, physically delineating the project activity	OK	OK
B.3.3 Does the flow diagram include the equipment, systems and flows of mass and energy described? In particular, is the emission sources and GHGs included in the project boundary and the data parameters to be monitored indicated in the diagram?	PDD VVS	82	**Yes.** As per diagram in Figure 4, section B.3 of the PDD version 1.0 dated 13/01/2015, it's found that flow and data parameters to be monitored indicated are provided.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.4 Establishment and description of baseline scenario					
B.4.1 Is an explanation how the baseline scenario is established in accordance with the selected baseline methodology provided?	PDD VVS	90-91	**Yes.** Section B.4 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The project activity is the installation of a new grid connected renewable energy based power plant….. In accordance with the methodology, the baseline scenario for the project activity is the generation of net electricity by the power plants connected to Thai national grid.* **Mean of validation** Validation team reviewed description above against paragraph 19 of AMS-I.D and found that baseline defined by project participant is in line with methodology. This is accepted.	OK	OK
B.4.2 When establishing the baseline scenario, and where "future anthropogenic emissions by sources are projected to rise above current levels due to the specific circumstances of the host Party", do the project participants follow the "Guidelines on the consideration of suppressed demand in CDM methodologies"?	PS	48	**CL04** As per description in section B.4 of the PDD version 1.0 dated 13/01/2015, please clarify on how project participant defines situation that "future anthropogenic emissions by sources are projected to rise above current levels due to the specific circumstances of	~~CL04~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			the host Party" and how project participant follows the "Guidelines on the consideration of suppressed demand in CDM methodologies" in establishment of baseline scenario for this proposed project activity. With reference to justification by PP, validation team confirmed that suppressed demand is not applicable because the basic human needs were met.		
B.4.3 Does the PDD explain and justify the key assumptions and rationale, provide and explain all data used to establish the baseline scenario (variables, parameters, data sources etc.) preferably in a tabular form, and provide all relevant documentation and/or references?	PDD		**Yes.** Section B.4 of the PDD version 1.0 dated 13/01/2015 stated as follows: *The detailed calculation of emission factor is given in Appendix 4.*	OK	OK
B.4.4 To determine the performance of equipment used in the proposed small-scale CDM project activity, do project participants use:	PS	99			
B.4.4.1 The appropriate value specified in the selected methodology;	PS	99(a)	**CL05** As per indication in Table 1-3 of the PDD version 1.0 dated on 13/01/2015, please clarify on how performances/efficiencies of Solar panel, Inverter and Transformer are	~~CL05~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			compliance with para 99 of Project Standard version 07.0 (EB 79 Annex 3). At 2nd response, project participant submitted the documents to confirm its efficiency based on IEC standard.		
B.4.4.2 The national standard for the performance of the equipment type (project participants shall identify the standard used) if the value specified in B.4.4.1 is not available;	PS	99(b)	See response in CL05	OK	OK
B.4.4.3 An international standard for the performance of the equipment type, such as International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) standards (project participants shall identify the standard used) if the value specified in B.4.4.2 is not available;	PS	99(c)	See response in CL05	OK	OK
B.4.4.4 The manufacturer's specifications, provided that they are tested and certified by national or international certifiers, if the value specified in B.4.4.3 is not available;	PS	99(d)	See response in CL05	OK	OK
B.4.4.5 Performance data from test results conducted by an independent entity for equipment installed under the project activity if the value specified in B.4.4.4 is not available.	PS	99(e)	See response in CL05	OK	OK
B.4.5 Are the documents and sources referred to in	VVS	94	Refer to table 2 below.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the PDD correctly quoted and interpreted and are they crosschecked with other verifiable and credible sources, such as local expert opinion, if available?					
B.4.6 Does the PDD provide a description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed project activity?	VVS	95	Refer to table 2 below.	OK	OK
B.4.7 Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed project activity?	VVS	96	Refer to table 2 below.	OK	OK
B.4.8 Has relevant national and/or sectoral policies and circumstances (type E+ or E-), such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector been taken into account?	VVS	96	**CL06** As per detail in section B.4 of the PDD version 01 dated on 13/01/2015, please clarify on how national and/or sectoral policies and circumstances (type E+ or E-), such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector have been taken into account in compliance with para 96 of VVS version 07.0 (EB 79 Annex 4).	~~CL06~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			With reference to closure of CL06, validation team accepted and agreed with justification by PP that E- policy was not be taken into account in establishing the baseline scenario. Hence, this is accepted.		
B.4.9 Does the PDD provide a transparent description of the baseline scenario?	PDD		**Yes.** As per detail in section B.4 of the PDD version 01 dated on 13/01/2015, transparent description of the baseline scenario is provided.	OK	OK
B.5 Demonstration of additionality					
B.5.1 Is the project activity demonstrated additional in accordance with one of options below?	PDD				
B.5.1.1 Attachment A of Appendix B: In such cases, project participants should also follow the "Non-binding practice examples to demonstrate additionality for SSC project activities".	PS VVS	104(a) 165	**Yes.** Section B.5 of the PDD version 01 dated 13/01/2015 demonstrates additionality following para 2 of Guidelines on the demonstration of additionality of small-scale project activities version 09.0 (EB68 Annex27) under positive list of grid-connected renewable electricity generation technology (Solar PV)	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.5.1.2 Any applicable additionality tool;	PS	104(b)	Not applicable	-	-
B.5.1.3 Guidelines for demonstrating additionality of microscale project activities"? if the proposed project activity meets one of the following criteria: a) Type I: Project activities up to 5 MW that employ renewable energy as their primary technology; b) Type II: Energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year; or c) Type III: Other project activities not included in Type I or Type II that aim to achieve GHG emissions reductions at a scale of no more than 20 $ktCO_2e$ per year.	PS VVS	104(c) 160	**CL07** Please clarify on how the guideline of demonstrating additionality of Microscale project activities version 05.0 (EB73 Annex13) has been taken into account with the project activity With reference to closure of CL07, although project activity qualifies to be termed as Micro Scale project activity as the total capacity is 5MW and meets the requirement of TYPE I criterion. However the project activity does not fulfill 4 sub-criteria. Hence it was concluded that project activity do not meet this guideline.	~~CL07~~	OK
B.5.2 If investment analysis is used:					
B.5.2.1 Are all relevant assumptions and parameters used in the analysis listed?	PDD		Not Applicable. The project activity falls under the positive list of grid-connected renewable electricity generation technologies that are automatically defined as additional the "Guidelines on the demonstration of	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			additionality of small-scale project activities Version 09.0" (EB68 Annex27)		
B.5.2.2 Is the latest version of the "Guidelines on the assessment of investment analysis" applied?	VVS	125	Not Applicable.	-	-
B.5.2.3 Is project activity one of the following cases in regards to investment analysis:	VVS	126			
B.5.2.3.1 The proposed project activity would produce no financial or economic benefits other than CDM-related income;	VVS	126(a)	Not Applicable.	-	-
B.5.2.3.2 The proposed project activity is less economically or financially attractive than at least one other credible and realistic alternative;	VVS	126(b)	Not Applicable.	-	-
B.5.2.3.3 The financial returns of the proposed project activity would be insufficient to justify the required investment.	VVS	126(c)	Not Applicable.	-	-
B.5.2.4 Has the accuracy of financial calculations carried out for investment analysis been verified as follows:	VVS	127			
B.5.2.4.1 Determine the suitability of the financial indicator selected by the project participants and conduct a thorough assessment of all parameters and assumptions used in calculating such financial indicators, and determine the accuracy and suitability of	VVS	127(a)	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
these parameters using available evidence and applying its expertise in relevant accounting practices					
B.5.2.4.2 Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices	VVS	127(b)	Not Applicable.	-	-
B.5.2.4.3 Review, as appropriate, feasibility reports, public announcements and annual financial reports related to the proposed project activity and the project participants	VVS	127(c)	Not Applicable.	-	-
B.5.2.4.4 Assess the correctness of computations carried out and documented by the project participants; and	VVS	127(d)	Not Applicable.	-	-
B.5.2.4.5 Assess, where applicable, the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions.	VVS	127(e)	Not Applicable.	-	-
B.5.2.5 If benchmark analysis is used:					
B.5.2.5.1 Is the benchmark clearly indicated?	PDD		Not Applicable.	-	-
B.5.2.5.2 Is the type of benchmark applied suitable for the type of financial indicator presented?	VVS	128(a)	Not Applicable.	-	-
B.5.2.5.3 Does the risk premiums applied in determining the benchmark reflect the risks	VVS	128(b)	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
associated with the project type or activity?					
B.5.2.5.4 Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark?	VVS	128(c)	Not Applicable.	-	-
B.5.2.6 If cost comparison is used:					
B.5.2.6.1 Are the scenarios compared described?	PDD		Not Applicable.	-	-
B.5.2.7 If PPs rely on values from FSR:	VVS	129			
B.5.2.7.1 Has the FSR been the basis of the decision to proceed with the investment in the project?	VVS	129(a)	Not Applicable.	-	-
B.5.2.7.2 Are the values used in the PDD and associated annexes fully consistent with the FSR? If inconsistencies occur, was the appropriateness of the values validated?	VVS	129(b)	Not Applicable.	-	-
B.5.2.7.3 On the basis of its specific local and sectoral expertise, is confirmation provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision?	VVS	129(c)	Not Applicable.	-	-
B.5.3 If barriers analysis is used:					
B.5.3.1 Is the “Guidelines for objective demonstration and assessment of barriers” followed?	PS	55	Not Applicable.	-	-
B.5.3.2 Is it ensured that only the most relevant	PDD		Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
barriers selected?					
B.5.3.3 Is the credibility of the barriers justified with key facts and/or assumptions and the rationale?	PDD		Not Applicable.	-	-
B.5.3.4 Is it ensured that issues that have a direct impact on the financial returns of the project activity are not considered as barriers but assessed by investment analysis? This does not refer to either: (a) Risk related barriers (b) Barriers related to the unavailability of sources of finance for the project activity	VVS	132	Not Applicable.	-	-
B.5.3.5 Were the barriers determined as real?	VVS	133(a)	Not Applicable.	-	-
B.5.3.6 Were the barriers determined as preventing the implementation of the project activity but not the implementation of at least one of the possible alternatives?	VVS	133(b)	Not Applicable.	-	-
B.5.4 Prior consideration of the clean development mechanism					
B.5.4.1 If the project activity start date prior to the date of publication of the PDD for stakeholder comments, were the CDM benefits considered necessary in the decision to undertake the project as a proposed CDM project activity?	PDD VVS	111	**Yes.** Table 8 in section B.5 of the PDD version 1.0 dated 13/01/2015 provide evidence of the prior consideration of the CDM in accordance with applicable provisions related to the demonstration of prior	~~CL08~~	OK

<table>
<tr><th>CHECKLIST QUESTION</th><th>Ref.</th><th>§</th><th>COMMENTS</th><th>Draft Concl</th><th>Final Concl</th></tr>
<tr><td></td><td></td><td></td><td>consideration of the CDM in the Project standard as follows:

<table><tr><th>Event</th><th>Project implementation activity</th><th>CDM application activity</th><th>Evidence</th></tr><tr><td>EGAT conducted the feasibility study</td><td>04/2011</td><td></td><td>The feasibility study</td></tr><tr><td>Board of EGAT approved to implement the project</td><td>02/2012</td><td></td><td>Approval letter</td></tr><tr><td>EGAT submitted a Letter of Intent (LoI) to Thai DNA</td><td></td><td>25/04/2013</td><td>Letter of Intent</td></tr><tr><td>EGAT conducted the public consultation</td><td>21/05/2013</td><td></td><td>Initial Environment Evaluation and Sustainable Development report</td></tr><tr><td>Thai cabinet approved the project</td><td></td><td>19/07/2013</td><td>Approval letter from Thai cabinet</td></tr><tr><td>EGAT submitted the project documents to Thai DNA for requesting Letter of Approval (LoA)</td><td></td><td>10/2013</td><td>Submission letter</td></tr><tr><td>DOE started onsite validation</td><td></td><td>12/2013</td><td>Validation service agreement</td></tr><tr><td>EGAT signed the Engineering Procurement and Construction contract (EPC)</td><td>08/05/2014</td><td></td><td>EPC</td></tr><tr><td>EGAT started commercial export electricity to Thai national grid (COD)</td><td></td><td>03/06/2015</td><td>COD record</td></tr></table>
<u>CL08</u>
Please provide supporting evidences of the date of project activity as indicated in Table 8 of PDD version 1.0 dated 13/01/2015.

With reference to closure of CL08, validation team satisfied with evidences and justification provided by PP with no further comments.</td><td></td><td></td></tr>
<tr><td>B.5.4.2 Is the start date of the project activity, reported</td><td>VVS</td><td>112</td><td>Yes.</td><td>OK</td><td>OK</td></tr>
</table>

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
in the PDD, the earliest date at which either the implementation or construction or real action of a project activity begins?			The start date of the proposed project is 08/05/2014. It is the date that EGAT signed the Engineering Procurement and Construction contract (EPC) <Ref/01/>.		
B.5.4.3 If the project activity requires construction, retrofit or other modifications, is it ensured that the date of commissioning not considered as the project activity start date?	VVS	112	As commented in B.5.4.2, the date of commissioning is not considered as the project activity start date.	OK	OK
B.5.4.4 Is it a project activity with a start date on or after 02 August 2008, or before 02 August 2008?	VVS	112	The start date of proposed project activity is indicate as 08/05/2014 which is after 02 August 2008.	OK	OK
B.5.4.5 For a project activity with a start date on or after 02 August 2008, are the following provisions to be satisfied:					
B.5.4.5.1 Has the PP informed the Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status within 180 days of the project activity start date?	PS VVS	33 113	See CL08	OK	OK
B.5.4.5.2 Do the project participants inform the secretariat of the progress of the project activity every subsequent two years after the initial notification, until the PDD regarding the project activity has been published for global stakeholder consultation or, a new baseline and monitoring methodology is proposed or a	PCP	10	Not Applicable	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
revision of an approved baseline and monitoring methodology is requested for the project activity before the start date?					
B.5.4.6 For a project activity with a start date before 02 August 2008, are the following elements to be satisfied:	VVS	114			
B.5.4.6.1 Are evidence of their awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project provided?	PS VVS	34(a) 114	Not Applicable.	OK	OK
B.5.4.6.2 Are evidence that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation provided?	PS VVS	34(b) 114-116	Not Applicable.	OK	OK
B.5.4.6.3 Is an implementation timeline of the proposed CDM project activity provided?	PS	34(c)	Not Applicable.	OK	OK
B.6 Emission reductions					
B.6.1 Explanation of methodological choices					
B.6.1.1 Does the PDD explain how the methods or methodological steps in the selected methodology, for calculating project emissions, baseline emissions, leakage emissions and emission reductions are applied?	PDD VVS	101	**Yes.** As per description in section B.6.1., detail of baseline emission, project emission and leakage are demonstrated below; **Baseline emission:**	~~CAR03~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			$BE_y = EG_{PJ,y} * EF_{grid,y}$ **Project emission:** In accordance with AMS-I.D, Version18, no project emissions are considered because there is no on-site fossil fuel consumption during project activity and the project activity is not the operation of geothermal power plants and not hydro power plants. **Leakage emission:** **CAR03** With reference to section B.6.1 of PDD version 1 dated 13/01/2015, Leakage emission is not considered in accordance with para 42 of AMS-I.D version 18.0 With reference to closure of CAR03, validation team reviewed the revised PDD and confirmed that the revision is now consistent with AMS-I.D version 18.0. **Emission reduction:** $ER_y = BE_y - PE_y - LE_y$ Where:		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			ER_y = Emission reductions in year y (t CO2/y) BE_y = Baseline Emissions in year y (t CO2/y) PE_y = Project emissions in year y (t CO2/y) LE_y = Leakage emissions in year y (t CO2/y)		
B.6.1.2 In case the methodology(ies) provide different options to choose from, does the PDD indicate and justify which option is chosen for the project activity?	PDD VVS	102	Refer to table 2 below.	OK	OK
B.6.1.3 In case the methodology(ies) allow different default values, does the PDD indicate and justify which of the default values have been chosen for the project activity?	PDD		Refer to table 2 below.	OK	OK
B.6.2 Data and parameters fixed ex ante					
B.6.2.1 If data and parameters will not be monitored throughout the crediting period of the proposed project activity but have already been determined and will remain fixed throughout the crediting period, are all data sources and assumptions: a) Appropriate and correct? b) Applicable to the proposed CDM project activity? c) Resulting in a conservative estimate of the emission reductions?	PDD VVS	103	Refer to table 2 below.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.6.2.2 For each piece of data or parameter, are tables provided in accordance with the instructions?	PDD		Refer to table 2 below.	OK	OK
B.6.3 Ex ante calculations of emission reductions					
B.6.3.1 Is 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 provided?	PDD		**CL09** With reference to $EG_{PJ,y}$ calculation in ER calculation spreadsheet version01, please provide the evidence/reference source of the quantity of electricity supplied by the project plant/unit to the grid ($EG_{PJexport,y}$) at 7,560 MW/yr. With reference to closure of CL09, validation team satisfied with the evidences submitted by PP. Validation team had cross-checked the estimated value by comparing with the alternative calculation based on installed capacity at 5 $MW_{(AC)}$, maximum time of operation at 8,760 hours per year (365 days), and plant load factor at 18% based on feasibility study (Ref/6/). The final result was calculated as 7,884 MWh/year. Based on result finding, it is confirmed that 7,560 MW is considered as conservative approach. Hence, this is accepted.	~~CL09~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.6.3.2 Is the information how each equation is applied, in a manner that enables the reader to reproduce the calculation, provided?	PDD		**CL10** With reference to section B.6.3 of PDD version 1 dated 13/01/2015, please clarify on where is indication of the relation between $EG_{PJ,y}$ and $EG_{PJ,facility,y}$ With reference to closure of CL10, validation team reviewed the revised PDD and confirmed that the revision is now clear and consistent with AMS-I.D version 18.0	~~CL10~~	OK
B.6.3.3 Is the information of additional background information and/or data provided in Appendix 4, including relevant electronic spreadsheets?	PDD		**Yes.** The information of additional background information and data is provided and the Emission Reduction Spreadsheet is also provided.	OK	OK
B.6.3.4 Is a sample calculation for each equation used provided, substituting the values used in the equations?	PDD		**Yes.** Emission Reduction Spreadsheet is provided.	OK	OK
B.6.3.5 If the proposed small-scale CDM project activity involves more than one component, does the project participants provide ex ante calculations of baseline, project and leakage GHG emissions as well as GHG emission reductions for each year of the crediting period	PDD PS	98	Not Applicable.	-	-

CHECKLIST QUESTION		Ref.	§	COMMENTS	Draft Concl	Final Concl
	and for each component separately?					
B.6.3.6	In cases where leakage is to be considered in the proposed small-scale CDM project activity, do project participants consider leakage only within the boundaries of non-Annex I Parties?	PS	100	Not Applicable.	-	-
B.6.3.7	In case of replacement of existing equipments, do project participants estimate the point in time where the existing equipments would be replaced in the absence of the proposed small-scale CDM project activity in accordance with the "Tool to determine the remaining lifetime of equipment"? For household devices/ appliances, project participants may disregard the remaining lifetime.	PS PS	101 102	Not Applicable.	-	-
B.6.3.8	Do norms, specifications, standards and test procedures cited in the selected methodology refer to the latest version of the documentation available at the time of submission of the PDD to the DOE for validation?	PS	103	Not Applicable	-	-
B.6.4	Summary of the ex ante estimates of emission reductions					
B.6.4.1	Are the results of the ex ante estimation of emission reductions for all years of the crediting period, provided in a tabular format?	PDD		Yes. With reference to PDD version 1.0 dated 13/01/2015, the summary of ex-ante of estimated emission reduction is presented as below;	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<table><tr><th>Year</th><th>Baseline emissions (t CO_2e)</th><th>Project emissions (t CO_2e)</th><th>Leakage (t CO_2e)</th><th>Emission reductions (t CO_2e)</th></tr><tr><td>1</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>2</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>3</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>4</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>5</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>6</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>7</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>8</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>9</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>10</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr><tr><td>Total</td><td>41,988</td><td>0</td><td>0</td><td>41,988</td></tr><tr><td>Total number of crediting years</td><td colspan="4">10</td></tr><tr><td>Annual average over the crediting period</td><td>4,199</td><td>0</td><td>0</td><td>4,199</td></tr></table>		
B.6.4.2 If the project activity involves more than one component, does the PDD provide a separate table for each of the component or each of the selected methodology(ies), and whether the PDD provide a table showing the aggregate emission reductions of the project activity?	PDD		Not Applicable.	-	-
B.7 Monitoring Plan					
B.7.1 Data and parameters to be monitored					
B.7.1.1 Is specific information on how the data and parameters that need to be monitored would actually be collected during monitoring included?	PDD		**Yes.** The information of Measurement methods and procedures, the monitoring frequency, QA/QC procedures, and responsibility are indicated for each data and parameters to be monitored in section B.7.1 of PDD version 1 dated 13/01/2015.	OK	OK
B.7.1.2 For each data or parameter, is the information					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
completed, in a tabular format:					
B.7.1.2.1 The source(s) of data that will be actually used for the proposed project activity (e.g. which exact national statistics). Where several sources may be used, explain and justify which data sources should be preferred.	PDD		**Yes.** The source of data is provided in each parameter to be monitored.	OK	OK
B.7.1.2.2 Is an estimate of the data/ parameter that will be monitored during the crediting period provided?	PDD		**Yes.** The description regarding how to estimate quantity of net electricity supplied/imported to/from Thailand National Grid in year y ($EG_{PJ,export,y}$ and $EG_{PJ,import,y}$) are provided.	OK	OK
B.7.1.2.3 Is the estimate provided in the PDD for this monitored data or parameter reasonable?	VVS	103	**Yes.** The estimation of Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ,y}$) is following AMS-I.D version 18 **CL11** Please provide more information on the sources of electricity consumption in the	~~CL11~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			project that would be taken into account of parameter $EG_{PJ,import,y}$ With reference to closure of CL11, it is confirmed that all electricity consumption by project activity would be import from Thai national grid. Hence, this is accepted.		
B.7.1.2.4 Where data or parameters are to be measured, does it specify the measurement methods and procedures, standards to be applied, accuracy of the measurements, person/entity responsible for the measurements, and, in case of periodic measurements, the measurement intervals?	PDD		**Yes.** The measurement procedure and responsibility for data to be measured ($EG_{PJ,export,y}$ and $EG_{PJ,import,y}$) are provided in section B.7.1 of PDD version 1 dated 13/01/2015 as follows: **Measurement methods:** Monitored continuously by the electricity meter. The amount of export/import electricity is recorded based on monthly basis by plant officer. **Monitoring frequency:** Measured continuously by using on-site electricity meter with accuracy at least 1% referred to PEA's standard. The amount of import/export electricity is recorded on monthly basis.	~~CL12~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			CL12 Please provide the PEA standard which is referred for accuracy at least 1% for electricity meter. With reference to closure of CL12, validation team reviewed the revised PDD and confirmed that accuracy class of $EG_{PJ,import,y}$ and $EG_{PJ,export,y}$ are in line with the evidence. Validation team found that this is acceptable.		
B.7.1.2.5 Is a description of the QA/QC procedures including the calibration procedures, where applicable, provided?	PDD		**Yes.** The QA/QC procedures including the calibration procedures for data to be measured ($EG_{PJ,export,y}$ and $EG_{PJ,import,y}$) are provided in section B.7.1 of PDD version 1 dated 13/01/2015 as follows: **QA/QC procedures:** Meter will be calibrated periodically as per national standard by an accredited person or institution. Data measured will be crosschecked by electricity receipt monthly Validation team found that this is acceptable.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.7.1.2.6 Is the purpose of data indicated?	PDD		**Yes.** The purpose of data is indicated that calculation of baseline emissions.	OK	OK
B.7.1.3 Is this monitoring plan based on the approved monitoring methodology applied to the proposed CDM project activity?	VVS	138	Refer to table 2 below	OK	OK
B.7.1.4 Does the monitoring plan contain all necessary parameters?	VVS	139(a)	Refer to table 2 below	OK	OK
B.7.1.5 Do the means of monitoring described in the plan comply with the requirements of the methodology including applicable tool(s)?	VVS	139(a)	Refer to table 2 below	OK	OK
B.7.1.6 Are the monitoring arrangements described in the monitoring plan feasible within the project design?	VVS	139(b)	**Yes.** With reference to interviews with relevant personnel during onsite visit on 11/03/2015, it is confirmed that monitoring plan is feasible within the project design.	OK	OK
B.7.1.7 Are the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified?	VVS	139(b)	**Yes.** With reference to interviews with relevant personnel during onsite visit on 11/03/2015, it is ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.7.2 Sampling plan					
B.7.2.1 Are there any data and parameters monitored in section B.7.1 above to be determined by a sampling approach?	PDD		Not Applicable.	-	-
B.7.2.2 Is a description of the sampling plan provided in accordance with the recommended outline for a sampling plan in the "Standard for sampling and surveys for CDM project activities and programme of activities"?	PDD		Not Applicable.	-	-
B.7.3 Other elements of monitoring plan					
B.7.3.1 Is the operational and management structure, that the project operator will implement in order to monitor emission reductions and any leakage generated by the project activity, described in the PDD?	PDD PS	64(a)	**Yes.** Composition of CDM team is described in section B.7.3 of the PDD version 1.0 dated 13/01/2015 as per following detail. - Plant manager - Project consultant or Technical support team - Operation team	OK	OK
B.7.3.2 Are the responsibilities for and institutional arrangements for data collection and archiving clearly indicated?	PDD PS	64(c)	**Yes.** The allocation of responsibility is described in section B.7.3 of the PDD version 1.0 dated 13/01/2015 as per following detail. *Under the supervision of the Plant Manager, the monitoring and archiving are carried out*	~~CAR04~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			by the operational team. All the data is recorded according to the data archiving procedures and stored electronically in a systematic and transparent manner. The Plant Manager will review the archived data. This data will be verified again by an external independent Designated Operational Entity (DOE) annually. **CAR04** It is found inconsistency of procedure when electricity is malfunction as stated in "Quality assurance and quality control" and "Emergency procedure" under section B.7.3 of PDD version 1.0 dated 13/01/2015 With reference to closure of CAR04, validation team reviewed the revised PDD and confirmed that emergency procedure within section B.7.3 is now consistent.		
B.7.3.3 Does the monitoring plan include provisions to ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the end of the crediting period or the last issuance of CERs,	PS	64(b)	**CAR05** It is found inconsistency on period of data to be kept and archived between section B.7.1 and B.7.3 of PDD version 1 dated 13/01/2015	~~CAR05~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
whichever occurs later?			With reference to closure of CAR05, validation team reviewed the revised PDD and confirmed that period of data to be kept and archived between section B.7.1 and B.7.3 is now consistent.		
B.7.3.4 Does the monitoring plan include uncertainty levels, methods and the associated accuracy level of measuring instruments to be used for various parameters and variables?	PS	64(e)	**Yes.** As per description in section B.7.3 of PDD version 1.0 dated on 13/01/2015, there is indication that calibration of the meters would be as per PEA standard which is the National standards for Thailand or at least once in three years. The calibration and maintenance would be done by PEA.	OK	OK
B.7.3.5 Does the monitoring plan include specifications of the calibration frequency for the measuring equipments?	PS	64(f)	**CL13** Please clarify on the different of authority which will take responsible in calibration and maintenance of electricity meter between "accredited person or institution" as mentioned in section B.7.1 and "PEA" as mentioned in section B.7.3 of PDD version 1 dated 13/01/2015 With reference to closure of CL13, validation team took noted and accepted the	~~CL13~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			reasonable justification provided.		
C. Duration and crediting period					
C.1 Duration of project activity					
C.1.1 Start date of project activity					
C.1.1.1 Is the start date of the project activity stated, in the format of DD/MM/YYYY?	PDD		**Yes.** 08/05/2014.	OK	OK
C.1.1.2 Does it describe how the start date has been determined and provide evidence to support this date?	PDD		**Yes.** Demonstration of start date justified by signing date of the Engineering Procurement and Construction contract.	OK	OK
C.1.2 Expected operational lifetime of project activity					
C.1.2.1 Is the expected operational lifetime of the project activity stated in years and months?	PDD		**Yes.** 25 years 0 month.	OK	OK
C.2 Crediting period of project activity					
C.2.1 Type of crediting period					
C.2.1.1 Is the type of crediting period chosen for the project activity stated?	PDD		**Yes.** Fixed crediting period.	OK	OK
C.2.1.2 In case a renewable crediting period was chosen, does it indicate whether it is the first, second or third?	PDD		Not Applicable.	OK	OK
C.2.2 Start date of crediting period					
C.2.2.1 Is the start date of crediting period stated in the	PDD		**Yes.**	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
format of DD/MM/YYYY?			05/12/2014 or when registered with the UNFCCC whichever comes later – PDD Version 01 dated 13/01/2015. Revised to 01/01/2016 or when registered with the UNFCCC whichever comes later – PDD Version 07 dated 28/08/2015.		
C.2.3 Length of crediting period					
C.2.3.1 Is the length of crediting period stated in years and months?	PDD		**Yes.** 10 years and 0 month.	OK	OK
D. Environmental impacts					
D.1 Analysis of the environmental impacts					
D.1.1 If required by the host Party, is an analysis of the environmental impacts of the proposed small-scale CDM project activity carried out and a summary of the analysis of the environmental impacts of the project activity and references to all related documentation provided?	PDD PS	107	**Yes.** The Initial Environmental Evaluation (IEE) is required by Thai's DNA. It shall be submitted along with application of LoA. **CL14** Please provide IEE which was submitted along with application of LoA for validation. In response to this, IEE was submitted for validation.	~~CL14~~	OK
E. Local stakeholder consultation					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
E.1 Solicitation of comments from local stakeholders					
E.1.1 Did the project participants complete a local stakeholder consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed project activity?	VVS	145	**Yes.** With reference to section E.1 of the PDD version 1.0 dated 13/01/2015, it is demonstrated that the public consultation meeting was conducted on 21/05/2013. This is confirmed by interview result with stakeholders during onsite visit on 11/03/2015.	OK	**OK**
E.1.2 Is the process by which comments from local stakeholders have been invited provided?	PDD		**Yes.** With reference to section E.2 of the PDD version 01 dated 13/01/2015. It is demonstrated as follows: *The invitation letters were sent to representatives of the government, local officials, academic institutions, members from the local community living in the project area and others. There were 715 participants including local government officers, leaders and villagers living near the project site.*	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			This is confirmed by interview result with stakeholders during onsite visit on 11/03/2015.		
E.2 Summary of comments received					
E.2.1 Are stakeholders that have made comments identified?	PDD		**Yes.** The stakeholder's comments are identified in section E.2 of the PDD version 1.0 dated 13/01/2015.	OK	OK
E.2.2 Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity been invited?	VVS	146 (a)	**Yes.** The summary of comment received was listed in section E.2 of the PDD version 1.0 dated on 13/01/2015.	OK	OK
E.2.3 Is the summary of comments provided complete?	PDD VVS	146 (b)	**Yes.** This is confirmed by interview result with stakeholders during onsite visit on 11/03/2015.	OK	OK
E.3 Report on consideration of comments received					
E.3.1 Is information provided to demonstrate that all comments received have been considered?	PDD VVS	146 (c)	**Yes.** The summary of comment received was listed in section E.3 of the PDD version 1.0	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
			dated on 13/01/2015. *At the beginning of the meeting, the project developers explained the complete details of the project to the participants. The key environmental benefits from the project activity (reduced air pollution, no negative impact on soil, reduced water usage and no noise issue) were also explained.*			
F. Approval and authorization						
F.1 General						
F.1.1 Is it indicated whether the letter(s) of approval from Party(ies) available at the time of submitting the PDD to the validating DOE?	PDD		**CL15** Please provide LoA from Thailand for validation. In response to this, LoA (Ref/18/) was submitted for validation.		~~CL15~~	OK
F.2 Approval			COUNTRY A	COUNTRY B		
F.2.1 Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.4 of the PDD provided a written letter of approval?	VVS	39	**Yes.** LoA from Thai DNA is submitted to validation team.	Not Applicable	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
F.2.2 Does the letter of approval from DNA of each Party confirm that : (a) The Party is a Party of the Kyoto Protocol (b) The participation is voluntary (c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country (d) Refers to the precise proposed CDM project activity title in the PDD being submitted for registration	VVS	40	**Yes.** As per detail in LoA (Ref/18/), there are indication that (1) The Kingdom of Thailand ratified the United Nations Framework Convention on Climate change on 28 December 1994 and Kyoto Protocol on 28 August 2002, (b) The participation of the EGAT in the proposed CDM project activity is voluntarily in the CDM and (c) The project activity contributes to sustainable development in Thailand. (d) Refers to project name '**5 MW Thap Sakae Photovoltaic Solar**	Not Applicable	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
			Cell Power Plant Project, Thailand'			
F.2.3 Is(are) the letter(s) of approval unconditional with respect to (F.2.2) above?	VVS	41	**No.** There is no condition in LoA	Not Applicable	OK	OK
F.2.4 Has(ve) the letter(s) of approval been issued by the respective Party's DNA? If there is doubt with respect to (F.2.2) above, was it verified with the DNA that the letter of approval is valid for the proposed CDM project activity under validation?	VVS	42,43	**No.** There is no doubt in LoA issued by Thai DNA	Not Applicable	OK	OK
F.2.5 Does the letter of approval by the DNA of the host Party confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party?	VVS	51	**Yes.** The LoA clearly indicated that the project activity contributes to sustainable development in Thailand.		OK	OK
F.3 Authorization						
F.3.1 Has each project participant been authorized by at least one Party involved in a letter of approval?	VVS	46	**Yes.** The EGAT had been authorized by Thai DNA.		OK	OK
F.3.2 Is the information in tabular form in the PDD consistent with the contact information for project participants provided?	VVS	47	**Yes.** It's consistent between two sources.		OK	OK
F.3.3 Are any entities other than those approved as project participants included in the PDD?	VVS	48	**No.**		OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
F.3.4 Has the approval of participation issued from the relevant DNA? And if in doubt, was it verified with the DNA that the approval of participation is valid for the proposed CDM project participants?	VVS	49	**Yes.** The LoA was issued by relevant DNA which is Thai DNA and there is no doubt in the submitted LoA.	OK	OK
Part III Others					
C. Appendixes of PDD					
C.1 Appendix 1: Contact information of project participants	PDD				
C.1.1 For each organization listed in section A.4 of PDD, is the table in PDD completed, with the following mandatory fields: Organization, City, postcode, Country, Telephone and Fax, e-mail and Name of contact person?	PDD		**Yes.**	OK	OK
C.2 Appendix 2: Affirmation regarding public funding					
C.2.1 If applicable, is the affirmation obtained from Parties providing public funding to the project Activity attached?	PDD		Not applicable	-	-
C.3 Appendix 3: Applicability of the selected methodology(ies)					
C.3.1 Is the background information on the applicability of the selected methodology provided?	PDD		**Yes.** It's stated that *"Referring to Section B.2 of PDD, the applicability criterions are met for*	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			the project activity".		
C.4 Appendix 4: Further background information on ex ante calculation of emission reductions					
C.4.1 Is the background information on the ex ante calculation of emission reductions provided?	PDD		Refer to Table 2	OK	OK
C.5 Appendix 5: Further background information on monitoring plan					
C.5.1 Is the background information used in the development of the monitoring plan provided?	PDD		**Yes.** It's stated that "*Referring to section B.7 for details*".	OK	OK
C.6 Appendix 6: Summary of post registration changes					
C.6.1 Is a summary of the post registration changes provided?	PDD		**Yes.** It's stated that *"Not applicable at the validation stage"*.	OK	OK
D. Global Stakeholder Consultation					
D.1.1 Is there any comment on the PDD of the proposed project activity received during Global Stakeholder Consultation process?	VVS	35	**No comment received.**	OK	OK
D.1.2 If yes, have all comments been taken into account during the validation of the proposed project activity?	VVS	36	Not Applicable	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
D.1.3 If comments indicate that the proposed project activity does not comply with the CDM requirements and are not substantiated, is there any further clarification from the entity providing the comment?	VVS	37	Not Applicable	-	-
D.1.4 If yes, how comments received have been taken due account?	VVS	37	Not Applicable	-	-
D.1.5 If no, are the comments as originally provided proceeded to assess?	VVS	37	Not Applicable	-	-
E. Modalities of Communications (MoC)					
E.1.1 Has the corporate identity of all project participants and focal points included in MoC statement, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories been validated by:	VVS	54			
E.1.1.1 Directly checking evidence for corporate, personal identity and other relevant documentation; or	VVS	55(a)	**CL16** Please provide Modality of Communication (MoC) for Validation In response to this, MoC was submitted for validation	~~CL16~~	OK
E.1.1.2 Notarized documentation; or	VVS	55(b)	Not Applicable.	-	-
E.1.1.3 Written confirmation from the project participant or the coordinating/managing entity that all corporate and personal details,	VVS	55(c)	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
including specimen signatures, are valid and accurate.					
E.1.2 If (E.1.1.3) above was chosen, is it ensured that the MoC statement is received from a project participant with whom the DOE has a contractual relationship?	VVS	56	Not Applicable.	-	-
E.1.3 If (E.1.1.3) above was chosen, is it ensured that the official who submits the MoC statement to the DOE and the official who signed the written confirmation (if a different person) is/are duly authorized to do so on behalf of the respective project participant?	VVS	57	Not Applicable.	-	-
E.1.4 If it is unable to validate the requirements by applying E.1.1.1 to E.1.1.3 above, are any further validation activities performed?	VVS	58	Not Applicable.	-	-
E.1.5 Has the latest version of the form “Modalities of Communication statement” (F-CDM-MOC) been used?	VVS	61(a)	**Yes.** After closure of, MoC latest version 02.1 is used.	OK	OK
E.1.6 Is the information required as per F-CDM-MOC, including its annex 1, correctly completed?	VVS	61(b)	**Yes.** Information provided is corrected.	OK	OK
E.1.7 Do the project participant’s authorized signatories signing the F-CDM-MOC correspond to the project participant’s authorized signatories included in F-CDM-MOC, annex 1?	VVS	61(c)	**Yes.**	OK	OK

Table 2 Validation requirements based on AMS.I.D version 18 (EB 81 Annex 24)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1 Applicability			(Please provide your brief comments)		
1.1 Are the following applicability conditions of the methodology met?					
1.1.1 The project activity comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to a national or a regional grid	AMS-I.D v.18	2	**Yes.** The project activity is an 5 MW(AC) solar PV based power generation project that generates and supply renewable electricity to the Thai national grid. The project activity contains renewable energy generation unit (solar photovoltaic power generation system) that supply electricity to Thai national grid.	OK	OK
1.1.2 The project activity (a) install a new power plant at site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition (c) involve a retrofit of (an) existing plant(s) or (d) involve a replacement of (an) existing plant(s)	AMS-I.D v.18	4	**Yes.** The project involves installation of new solar power plant at the site where there is no renewable energy power plant operating prior to the implementation of the project activity. Also, the project activity is a greenfield project activity. The project activity is not a capacity addition, retrofit and replacement activity.	OK	OK
1.1.3 For Hydro power plants with reservoirs, does it satisfy at least one of the following conditions (a) the project activity is implemented in an existing reservoir with no change in the volume of reservoir	AMS-I.D v.18	5	Not Applicable. The project activity involves the installation of Solar PV power plant and does not involve any hydro power plants. Hence, this	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
(b) the project activity is implemented in an exisitng reservoir, where the volume of reservoir is increased and the power density of the project activity, is greater than 4 W/m2 (c) the project activity results in new reservoirs and the power density of the power plant is greater than 4 W/m2.			criterion is not applicable.		
1.1.4 (a) If the new unit has both renewable and non-renewable components (eg.,a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. (b) If the new unit co-fires fossil fuels, the capacity of the entire unit shall not exceed the limit of 15 MW.	AMS-I.D v.18	6	Not Applicable. The project activity is only 5 $MW_{(AC)}$ solar PV based renewable electricity generation project. It does not include any non-renewable unit and co-firing system.	-	-
1.1.5 Combined heat and power (co-generation) systems are not eligible under this category	AMS-I.D v.18	7	Not Applicable. The project activity does not involve combined heat and power generation.	-	-
1.1.6 In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	AMS-I.D v.18	8	Not Applicable. The project activity involves new installation of renewable energy generation units and does not involve extension of any existing facility Hence, this criterion is not applicable.	-	-
1.1.7 In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15	AMS-I.D v.18	9	Not Applicable. The project activity involves new installation of renewable energy generation units and	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
MW.			does not involve retrofit or replacement of existing facilities. Hence, this criterion is not applicable.		
1.1.8 In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as "AMS-I.C.: Thermal energy production with or without electricity" shall be explored.	AMS-I.D v.18	10	Not Applicable. The project activity involves new installation of Solar PV renewable energy generation units and does not involve to the landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions. Hence, this criterion is not applicable.	-	-
1.1.9 In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	AMS-I.D v.18	11	Not Applicable. The project activity involves new installation of Solar PV renewable energy generation units and does not involve to the biomass power generation. Hence, this criterion is not applicable.	-	-
2 Boundary					
2.1.1 Does the spatial project boundary include the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to?	AMS-I.D v.18	18	See CL03.	OK	OK
3 Baseline					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3.1.1 For Greenfield power plant, is it ensured that the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid?	AMS-I.D v.18	19	**Yes.** The project activity is a new grid-connected renewable power plant. The baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.	OK	OK
3.1.2 For retrofit, rehabilitation or replacement, are the baseline scenario followed the following guideline: (a) The baseline scenario is the continuing operation of the existing plant (b) The methodology uses historical electricity generation data to determine the electricity generation of the existing plant in the baseline scenario, assuming that the historical situation observed prior to the implementation of the project activity would continue. (c) In the absence of the CDM project activity, the existing facility would continue to provide electricity to the grid at historical average levels until the time at which the electrical generation facility would be likely to be retrofitted, rehabilitated or replaced in the absence of the CDM project activity. (d) From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline electricity supply	AMS-I.D v.18	20	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
is assumed to equal the project's net electricity supply and no emission reductions are assumed to occur.					
3.1.3 For capacity addition, are the baseline scenario followed the following guideline: (a) the baseline scenario is the existing facility that would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$), and electricity delivered to the grid by the added capacity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. (b) From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and no emission reductions are assumed to occur.	AMS-I.D v.18	21	Not Applicable.	-	-
3.1.4 Is the baseline emissions calculated as the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission $BE_y = EG_{BL,y} * EF_{CO2,grid,y}$	AMS-I.D v.18	22	**Yes.** The baseline emission calculated as per below; $BEy = EG_{BL,y} * EF_{CO2,Grid}$	OK	OK
3.1.5 Is the Emission Factor calculated in a transparent and conservative manner as follows: (a) A combined margin (CM), consisting of the combination of operating margin (OM) and build	AMS-I.D v.18	23	**Yes.** Refer to Table 2-1 However, validation raised CAR06 and	~~CAR06~~ ~~CAR11~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
margin (BM) according to the procedures prescribed in the .Tool to calculate the Emission Factor for an electricity system.. OR (b) The weighted average emissions (in t CO_2/MWh) of the current generation mix. **Note:** • The data of the year in which project generation occurs must be used. • Calculations shall be based on data from an official source (where available) and made publicly available.			CAR07 for the discrepancy found on emission factor calculation as follows; **CAR06** With reference to section B.6.1 and appendix 4 of PDD version 01 dated 13/01/2015, it is found that the Tool to calculate the Emission Factor an electricity system version 3.0 which is referred for calculation of combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) is found inconsistence with version stated in section B.6.2 and is not the latest version available on UNFCCC website. **CAR11** It is found that the revised grid emission factor as calculated in Grid Emission calculation spreadsheet are not correctly applied in ER calculation spreadsheet and Table 10 of PDD With reference to closure of CAR06 and CAR11, validation team reviewed the revised PDD and confirmed that all discrepancies were now properly corrected.		
3.1.6 In the case of greenfield power plant, is the Quantity of net electricity generation that is	AMS-I.D	26	See CL10	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
produced and fed into the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ,y}$) calculated as: $EG_{PJ,y} = EG_{PJ,facility,y}$	v.18				
3.1.7 In the case of capacity addition in wind, solar, wave or tidal power plants/units, is the Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ,y}$) calculated as: $EG_{PJ,y} = EG_{PJ,add,y}$	AMS-I.D v.18	27	Not Applicable.	-	-
3.1.8 In the case of capacity addition in hydro or geothermal power plants, is the Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (EGPJ,y) followed the following guideline: • the approach as in section 5.5.1.5 of AMS-I.D version 18 shall be used for capacity addition in hydro power plants and geothermal power plants. EGfacility,y corresponds to the net electricity generation supplied to a grid by the existing plants/units and the added plants/units together constituting “project plants/units”. • A separate metering of electricity supplied to a grid by the added plants/units is not necessary under this option.	AMS-I.D v.18	28	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3.1.9 In the case of capacity addition to biomass power plants, is the Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ,y}$) calculated as: • $EG_{PJ,y} = EG_{PJ,facilityd,y} - EG_{BL,existing,y}$, until $Date_{BaselineRetrofit}$; or • $EG_{PJ,y} = 0$, after $Date_{BaselineRetrofit}$ where $EG_{BL,existing,y} = MAX(EG_{actual,y},EG_{estimated,y})$	AMS-I.D v.18	29	Not Applicable	-	-
3.1.10 In the case of capacity addition to biomass power plants, is the Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ,y}$) followed the following guideline: • If the existing units shut down, are derated, or otherwise become limited in production, the project activity should not get credit for generating electricity from the same renewable resources that would have otherwise been used by the existing units (or their replacements). Therefore, the equation for $EG_{BL,existing,y}$ still holds, and the value for $EG_{estimated,y}$ should continue to be estimated assuming the capacity and operating parameters are the same as that at the time of the start of the project activity.	AMS-I.D v.18	30	Not Applicable	-	-
3.1.11 In the case of retrofit, rehabilitation or replacement	AMS-	31	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
in hydro, solar, wind, geothermal, wave and tidal plants, is the Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ,y}$) calculated as: • $EG_{PJ,y} = max(EG_{PJ,facilityd,y} - (EG_{historical} + \sigma_{historical}, 0)$, until $Date_{BaselineRetrofit}$; or • $EG_{PJ,y} = 0$, after $Date_{BaselineRetrofit}$	I.D v.18				
3.1.12 In the case of retrofit, rehabilitation or replacement in biomass plants, is the Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ,y}$) calculated as: • $EG_{PJ,y} = EG_{PJ,facilityd,y} - EG_{BL,retrofit,y})$, until $Date_{BaselineRetrofit}$; or • $EG_{PJ,y} = 0$, after $Date_{BaselineRetrofit}$ Where $EG_{BL,retrofit,y,y} = MAX(EG_{historical}, EG_{estimated,y})$	AMS-I.D v.18	32	Not Applicable.	-	-
3.1.13 For determination of $EG_{historical}$, are the following guideline followed?			-		
3.1.13.1 Average of historical net electrical energy levels delivered by the existing facility, spanning all data from the most recent available year (or month, week or other time	AMS-I.D v.18	33	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
period) to the time at which the facility was constructed, retrofit, or modified in a manner that significantly affected output (i.e. by 5 per cent or more), shall be used.					
3.1.13.2 To determine $EG_{historical}$, project participants may choose between two historical periods. This allows some flexibility: the use of the longer time period may result in a lower standard deviation and the use of the shorter period may allow a better reflection of the (technical) circumstances observed during the more recent years.	AMS-I.D v.18	34	Not Applicable.	-	-
3.1.13.3 Project participants may choose among the following two time spans of historical data to determine $EG_{historical}$: (a) The three last calendar years (in case of hydro power plants five years) prior to the implementation of the project activity; or (b) The time period from the calendar year following $DATE_{hist}$, up to the last calendar year prior to the implementation of the project, as long as this time span includes at least three calendar years (in case of hydro power plants five years), where $DATE_{hist}$ is latest point in time between: - The commissioning of the plant/unit; - If applicable: the last capacity addition to	AMS-I.D v.18	35	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the plant/unit; or - If applicable: the last retrofit or rehabilitation of the plant/unit.					
3.1.13.4 In case of rehabilitation where the power plant/unit did not operate for last three (in case of hydro power plants five years) calendar years before the rehabilitation starts, $EG_{historical}$ is equal to zero.	AMS-I.D v.18	36	Not Applicable.	-	-
3.1.14 For calculation of $DATE_{BaselineRetrofit}$, are the following guideline followed?			-		
3.1.14.1 In order to estimate the point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity ($DATE_{BaselineRetrofit}$), project participants may take into account the typical average technical lifetime of the type equipment, which shall be determined and documented as per the "Tool to determine the remaining lifetime of equipment".	AMS-I.D v.18	37	Not Applicable.	-	-
3.1.14.2 The point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity should be chosen in a conservative manner that is, if a range is identified, the earliest date should be chosen.	AMS-I.D v.18	38	Not Applicable.	-	-
4 Project emissions					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
4.1 Are *the following guideline followed*?					
4.1.1 For most renewable energy project activities, *PEy* = 0. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of ACM0002. 1. Emissions related to the operation of geothermal power plants (e.g. noncondensable gases, electricity/fossil fuel consumption); 2. Emissions from water reservoirs of hydro power plants.	AMS-I.D v.18	39	**Yes.** B.6.1 of PDD version 1 dated 13/01/2015 stated that *no project emissions are considered because there is no on-site fossil fuel consumption during project activity and the project activity is not the operation of geothermal power plants and not hydro power plants.*	OK	OK
4.1.2 CO2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"	AMS-I.D v.18	40	Not Applicable	-	-
4.1.3 In case biomass is sourced from dedicated plantations, the procedures in the tool "Project emissions from cultivation of biomass" shall be used.	AMS-I.D v.18	41	Not Applicable.	-	-
5 Leakage					
5.1 Is *the following guideline followed*?					
5.1.1 General guidance on leakage in biomass project activities shall be followed to quantify leakages	AMS-I.D	42	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
pertaining to the use of biomass residues.	v.18				
6 Emission reductions					
6.1.1 Are Emission reductions calculated as follows: $ER_y = BE_y – PE_y$ −LE_y ?	AMS-I.D v.18	43	**Yes.** With reference to section B.6.1 of the PDD version 1.0 dated 13/01/2015, It is confirmed that the baseline emissions is calculated as follows: $ER_y = BE_y - PE_y - LE_y$	OK	OK
7 Monitoring methodology					
7.1 Parameters for monitoring during the crediting period.					
7.1.1 (a) Are the quantities and types of biomass and the biomass to fossil fuel ratio (in case of co-fired system) to be used during the crediting period explained and documented transparently in the CDM-PDD? (b) For the selection of the baseline scenario, is an ex ante estimation of these quantities provided?	AMS-I.D v.18	44	Not Applicable	-	-
7.1.2 Has the CO2 emission factor of the grid electricity measured either by Combined Margin or by the Weighted Average emission?	AMS-I.D v.18	Table 1	The CO2 emission factor of the grid was calculated as per Combined Margin procedure.	OK	OK
7.1.3 Is the Quantity of net electricity supplied by the project plant/unit to the grid in year y monitored as follows:	AMS-I.D v.18	table 2	**Yes.** Section B.7.1 of the PDD version 1.0 dated 13/01/2015 stated $EG_{PJ,facility,y}$ is calculated as difference between (a) the quantity of	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
• Bi-directional energy meters; or, • Calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid; and (b) the quantity of electricity the project plant/unit from the grid.			electricity supplied by the project plant/unit to the grid ($EG_{PJ,export}$); and (b) the quantity of electricity the project plant/unit from the grid ($EG_{PJ,import}$).		
7.1.4 Is the quantity of net electricity supplied to the grid in year y monitored/recorded – Continuous monitoring, hourly measurement and at least monthly recording? **Notes on measurement method:** • Calibration or sampling should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies.	AMS-I.D v.18	Table 2	**Yes.** With reference to section B.7.1 of the PDD version 1.0 dated 13/01/2015. It is confirmed that the data is to be measured continuously and reported monthly. Furthermore, the electricity meter will be calibrated according to the national standards or at least once in 3 years.	OK	OK
7.1.5 Is the Quantity of net electricity supplied to the grid in year y by project plant/unit that has been added under the project activity measured using energy meters?	AMS-I.D v.18	Table 6	Not Applicable.	-	-
7.1.6 Is the quantity of net electricity supplied to the grid in year y by project plant/unit that has been added under the project activity monitored/recorded - Continuous monitoring, hourly measurement and at least monthly recording? **Notes on measurement method:** • Calibration or sampling should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies.	AMS-I.D v.18	Table 6	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
7.1.7 In case it is calculated for $EG_{PJ,facility,y}$ or $EG_{PJ,add,y}$, are the following parameters measured? • The quantity of electricity supplied by the project plant/unit to the grid; and • The quantity of electricity delivered to the project plant/unit from the grid	AMS-I.D v.18	Table 2,6	**Yes.** The quantity of electricity supplied by the project plant/unit to the grid ($EG_{PJ,export}$) and the quantity of electricity the project plant/unit from the grid ($EG_{PJ,import}$) are indicated in section B.7.1 of PDD version 1 dated 13/01/2015. Both values are measured by electricity meter.	OK	OK
7.1.8 Is the Quantity of biomass consumed in year y monitored/recorded continuously or estimate using annual energy/mass balance? **Notes on measurement method:** • Use mass or volume based measurements. • Adjust for the moisture content in order to determine the quantity of dry biomass. • The quantity of biomass shall be measured continuously or in batches. • If more than one type of biomass fuel is consumed, each shall be monitored separately. • Cross-check: 1. Cross-check the measurements with an annual energy balance that is based on purchased quantities (e.g. with sales/receipts) and stock changes. 2. Check the consistency of	AMS-I.D v.18	Table 7	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
measurements *ex post* with annual data on energy generation, fossil fuels and biomass used and the efficiency of energy generation as determined *ex ante*					
7.1.9 Is the Moisture content of the biomass (wet basis) of homogeneous quality determined ex ante? Note: The weighted average should be calculated and used in the calculations	AMS-I.D v.18	Table 8	Not Applicable.	-	-
7.1.10 Is the weighted average of the moisture content calculated and used in the calculations? **Notes on measurement method:** • On-site measurements • Ex ante estimates should be provided in the PDD and used during the crediting period. • In case of dry biomass, monitoring of this parameter is not necessary	AMS-I.D v.18	Table 8	Not Applicable.	-	-
7.1.11 Is Net calorific value of biomass type *k* Determine once in the first year of the crediting period? **Notes on measurement method:** • Measurement in laboratories according to relevant national/international standards. • Measure quarterly, taking at least three samples for each measurement. The average value can be used for the rest of	AMS-I.D v.18	Table 9	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the crediting period. • Measure the NCV based on dry biomass. • Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements.					
7.1.12 Is the Standard deviation of the annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity calculated from data used to establish $EG_{historical}$?	AMS-I.D v.18	Table 10	Not Applicable.	-	-
7.1.13 Are the parameters relevant to reservoir based hydro and geothermal plants monitored following the most recent version of ACM0002?	AMS-I.D v.18	46	Not Applicable.	-	-
8 Project activity under a PoA					
8.1 *Is the following guideline followed*?					
8.1.1 The methodology is applicable to a programme of activities, no additional leakage estimations are	AMS-I.D v.18	47	Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
necessary other than that indicated under leakage section above.					

Table 2-1 Validation requirements based on Tool to Calculate the Emission Factor for an Electricity System Version 04.0 (EB 75 Annex 15)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1 Have project participants applied the six steps provided in the Tool to Calculate the Emission Factor for an Electricity System?	EB75	Annex 15	Yes, the following six steps are applied: STEP 1. Identify the relevant electricity systems; STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional); STEP 3. Select a method to determine the operating margin (OM); STEP 4. Calculate the operating margin emission factor according to the selected method; STEP 5. Calculate the build margin (BM) emission factor; STEP 6. Calculate the combined margin (CM) emission factor.	OK	OK
2 Identify the relevant electricity systems (step 1)					
2.1 Has the project electricity system been identified?			**Yes.**	OK	OK
2.2 Has the connected electricity system been identified? If a connected electricity system is located partially or totally in Annex-I countries, is the emission factor of that connected electricity system considered zero?			**Yes.** A connected electricity system is not located partially or totally in Annex-I countries.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
2.3 Has the DNA of the host country published a delineation of the project electricity system and connected electricity systems?			**Yes.** Thai DNA published Summary Report The Study of emission factor for an electricity system in Thailand 2010 (*http://www.tgo.or.th/english/download/publication/GEF/2010/GEFReport_ENrevise4.pdf?phpMyAdmin=dca95bef987ebc97e3b7810ae297360d*)	OK	OK
2.3.1 If yes, are these delineations used?			In Thailand, the electricity transmission line system is considered as a single grid system due to the transmission lines are networked all of the country area. Electricity Generating Authority of Thailand (EGAT) regulate electricity generation and main transmission system, meanwhile Metropolitan Electricity Authority (MEA) is responsible for electricity distribution system in Bangkok and vicinity area, and Provincial Electricity Authority (PEA) is responsible for electricity distribution system in the rest of country.	OK	OK
2.3.2 If not, has the project participants defined and justified the project electricity system and any connected electricity system.			Not Applicable.	-	-
2.3.2.1 Are following criteria used to determine the existence of significant transmission constraints: ● In case of electricity systems with			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
spot markets for electricity: there are differences in electricity prices (without transmission and distribution costs) of more than 5 percent between the systems during 60 percent or more of the hours of the year; ● The transmission line is operated at 90% or more of its rated capacity during 90% percent or more of the hours of the year.					
2.3.2.2 Where the application of these criteria does not result in a clear grid boundary, use a regional grid definition in the case of large countries with layered dispatch systems (e.g. provincial/regional/national); In other countries, the national (or other larger) grid definition should be used by default.			Not Applicable.	-	-
2.3.2.3 Are the geographical extent of the project electricity system documented transparently and all grid power plants/units connected to the system identified?			Not Applicable.	-	-
2.4 In cases involving international interconnection (i.e. transmission line is between different countries and the project electricity system covers national grids of interconnected			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
countries), are there any legal restrictions for international electricity exchange?					
2.5 For the purpose of determining the build margin emission factor, except where recent or likely future additions to the transmission capacity enable significant increases in imported electricity, is the spatial extent limited to the project electricity system?			**Yes.** The spatial extent for determining build margin is limited to boundary of "project electricity system" which is Thailand boundary. Validation team confirmed that their approach is sound as well as Thailand boundary is reasonable and adequate for determining of build margin	OK	OK
2.6 For the purpose of determining the operating margin emission factor, use one of the following options to determine the CO2 emission factor(s) for net electricity imports from a connected electricity system: (a) 0 tCO2/MWh; or (b) The simple operating margin (OM) emission of the exporting grid; or (c) The simple operating margin emission rate of the exporting grid; or (d) The weight average operating margin emission rate of the exporting grid			With reference to Appendix 4 of PDD, option (b) was used.	OK	OK
2.7 For imports from connected electricity systems located in Annex I country(ies), is the emission factor considered as 0tons CO2 per MWh?			Not Applicable.	-	-
3 Choose whether to include off-grid power plants					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
in the project electricity system (optional) (Step 2)					
3.1 Have project participants chose following two options to calculate the operating margin and build margin emission factor: (a) Option I: Only grid power plants are included in the calculation (b) Option II: Both grid power plants and off-grid power plants are included in the calculation.			The option I: Only grid power plants included in the calculation is selected.	OK	OK
3.2 If option II is chosen, are data on off-grid power generation as per Annex 2 collected and ensure that the conditions outlined therein are met so that option II can be used?			Not Applicable. Option I was chosen.	-	-
3.3 If option II is chosen, have off-grid power plants been classified as per the guidance in Annex 2 in different classes of off-grid power plants?			Not Applicable. Option I was chosen.	-	-
4 Select a method to determine the operating margin (OM) (step 3)					
4.1 Are the calculation of the operating margin emission factor ($EF_{grid,OM,y}$) based on one of the following methods: (c) Simple OM; or (d) Simple adjusted OM; or (e) Dispatch data analysis OM; or (f) Average OM.			The option (a) the simple OM is selected for calculation.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
4.2 If simple OM method (option a) is used, is it ensured that low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.			**CL20** With reference to Grid Emission factor calculation spreadsheet, please clarify how the reference 'Table 5.2-1: Power Generation by Type of Fuel was referred for parameter Coal & Lignite , Natural Gas, and Others in 'LC-MR' sheet. With reference to closure of CL20, validation team reviewed the reference source provided. It is ensured that low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.	~~CL20~~	OK
4.3 If dispatch data analysis OM (option c) is used, is it ensured that off-gird power plants are not included in the project electricity system?			Not Applicable	-	-
4.4 For the simple OM, the simple adjusted OM and the average OM, is the emissions factor calculated using either data vintages of Ex ante option or Ex post option?			With reference to Appendix 4, the Ex-ante option has been selected for calculation.	OK	OK
4.4.1 If ex ante option is chosen,					
4.4.1.1 For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at			**CAR07** With reference to appendix 4, 2008-2010 data which is used for calculation of simple	CAR07	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the time of submission of the CDM-PDD to the DOE for validation.			OM calculation is not based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation in accordance with para 36 of Tool to calculate the emission factor for an electricity system version 04.0 In response to this, PP had revised the grid emission factor calculation using the most recent data in year 2012, 2013, and 2014.		
4.4.1.2 For off-grid power plants, use a single calendar year within the five most recent calendar years prior to the time of submission of the CDM-PDD for validation.			Not Applicable	-	-
4.4.2 If the ex post option is chosen,					
4.4.2.1 Is the emission factor determined for the year in which the project activity displaces grid electricity, is it stated that the emissions factor will be be updated annually during monitoring?			Not Applicable.	-	-
4.4.2.2 If the data required to calculate the emission factor for year y is usually only available later than six months after the end of year y, alternatively the emission factor of the previous year y-1 may be used. If the data is			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
usually only available 18 months after the end of year y, the emission factor of the year proceeding the previous year y-2 may be used. The same data vintage (y, y-1 or y-2) should be used throughout all crediting periods.					
4.5 For the dispatch data analysis OM, is the year in which the project activity displaces grid electricity used and will the emission factor be updated annually during monitoring?			Not Applicable.	-	-
4.6 Has the data vintage chosen been documented in the CDM-PDD?			**Yes.** The calculation has been revised and documented based on data in year 2012, 2013, and 2014	OK	OK
5 Calculate the operating margin emission factor according to the selected method (Step 4)					
5.1 **Simple OM** $EF_{grid,OMsimple,y}$					
5.1.1 Is the simple OM calculated by one of the following two options: Option A: Based on the net electricity generation and a CO2 emission factor of each power unit; or Option B: Based on the total net electricity generation of all power plants serving the			With reference to Appendix 4, the option B is chosen to conduct simple OM calculation	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
system and the fuel types and total fuel consumption of the project electricity system.					
5.1.2 Option A - Calculation based on average efficiency and electricity generation of each plant					
5.1.2.1 Is the simple OM emission factor calculated based on the net electricity generation of each power unit and an emission factor for each power unit?			Not Applicable.	-	-
5.1.2.2 Determination of CO2 emission factor of power unit m in year y ($EF_{EL,m,y}$)					
5.1.2.2.1 If for a power unit *m* data on fuel consumption and electricity generation is available (option A1), is the $EF_{EL,m,y}$ determined **as:** $EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \times NCV_{i,y} \times EF_{C02,i,y}}{EG_{m,y}}$			Not Applicable.	-	-
5.1.2.2.2 If for a power unit *m* only data on electricity generation and the fuel types used is available (option A2), is the emission factor determined based on the CO2 emission factor of the fuel type used and the efficiency of			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the power unit, as $EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}}$					
5.1.2.2.3 If for a power unit *m* only data on electricity generation is available (option A3), is the emission factor determined to be zero as a simple and conservative approach?			Not Applicable.	-	-
5.1.2.3 Determination of $EG_{m,y}$					
5.1.2.3.1 For grid power plants, is EGm,y determined as per the provisions in the monitoring tables?			Not Applicable.	-	-
5.1.2.3.2 For off-grid power plants, is EGm,y determined using one of the following options:			Not Applicable.	-	-
5.1.2.3.2.1 Option 1. EGm,y is determined based on (sampled) data on the electricity generation of off-grid power plants, as per the guidance in Annex 2.			Not Applicable.	-	-
5.1.2.3.2.2 Option 2. EGm,y is determined based on (sampled) data on the quantity of fossil fuels combusted in the class of off-grid power plants m, as per the guidance in			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Annex 2, and the default efficiencies provided in Annex 1, as $EG_{m,y} = \frac{\sum FC_{i,m,y} \times NCV_{i,y} \times \eta_{m,y}}{3.6}$					
5.1.2.3.2.3 Option 3. EGm,y is estimated based on the capacity of off-grid electricity generation in that class and a default plant load factor, as $EG_{m,y} = CAP_m \times PLF_{default,off-grid,y} \times 8760$			Not Applicable.	-	-
5.1.2.3.2.3.1 The default plant load factor for off-grid generation ($PLF_{default,off-grid,y}$) should be determined using one of the following two options: ● Use a conservative default value of 300 hours per year, assuming that the off-grid power plants would at least operate for one hour per day at six days at full capacity (i.e. $PLF_{default,off-grid,y}$=300/8760); or ● Calculate the default plant load factor based on the average grid availability and a default factor of 0.5, assuming that off-grid power plants are operated at full load			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
during approximately half of the time that the grid is not available, as follows: $PLF_{default,off-grid,y} = \left(1 - \frac{T_{grid,y}}{8760}\right) \times 0.5$					
5.1.3 Option B: calculation based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.					
5.1.3.1 Are following requirements satisfied so that Option B can be used: (a) The necessary data for Option A is not available; and (b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and (c) Off-grid power plants are not included in the calculation (i.e. if Option I has been chosen in Step 2).			**Yes.** Validation team reviewed the criteria as followed; (a) Validation team reviewed publication data from Energy Policy and Planning Office, Ministry of Energy, Thailand and Energy Regulatory Commission, Thailand. It is found that the data on the net electricity generation is available for only some power unit. Hence, it is confirmed that necessary data for Option A is not available. (b) Validation team reviewed the calculation spreadsheet of grid emission factor, it is confirmed that only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			these sources is known. (c) Validation team reviewed the calculation spreadsheet of grid emission factor, it is confirmed Off-grid power plants are not included in the calculation. With above reason, validation team confirmed that option B is corrected chosen according to applied tools.		
5.1.3.2 Is the simple OM emission factor calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as $EF_{grid,OMsimple,y} = \frac{\sum_i \left(FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}\right)}{EG_y}$			**Yes.** The following equation was used for calculation of simple OM emission factor. $EF_{grid,OMsimple,y} = \frac{\sum_i \left(FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}\right)}{EG_y}$ - ***$FC_{i,y}$ and EG_y*** Validation team raised CL21, CL22, and CL23 about reference evidence referred in Appendix 4 of PDD as follows; **CL21** Please provide the reference for Grid emission factor calculation spreadsheet and Appendix 4 as follows; - Electric Power in Thailand 2014/ Department of Alternative Energy Development and Efficiency, Ministry of Energy for NCV for Table 1	~~CL21~~ ~~CL22~~ ~~CL23~~ ~~CAR08~~ ~~CAR09~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			- Electricity Statistic Annual Report 2012-2014, Electricity Generating Authority of Thailand for Table 3, Table 6 , Table 7 **CL22** With reference to Table 2 and Table 3 of Appendix 4 and 'OM 2014' sheet of Grid Emission factor calculation, it is found that the same data have different data source, hence please confirm the data source used for calculation. **CL23** Please show the calculation spreadsheet for the result on Table 5 of Appendix 4 In response to this, PP had revised the reference sources and submitted the relevant reference sources and reference links. Validation team confirmed that the value was correctly applied $FC_{i,y}$ and EG_y in simple OM emission factor calculation and low-cost/must-run power plants/units were excluded. - ***$NCV_{i,y}$*** Validation team reviewed the reference source from Department of Alternative Energy Development and Efficiency (DEDE),		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Ministry of Energy for NCV. It is confirmed that values are reliable and documented in regional or national energy statistics/energy balances as per conditions for using the data source under applied Tools. However, CAR08 and CAR09 were raised on incorrect value applied in PDD as follow; **CAR08** With reference to Table 1 under Appendix 4, NCV for Lignite and Bituminous is not corrected **CAR09** With reference to 'OM 2014' sheet of Grid Emission calculation spreadsheet, it is found that the following data is incorrect as per reference for year 2012-2014 provided; - Bituminous - Bunker - Diesel With reference to closure of CAR08 and CAR09, validation team reviewed the correction in revised PDD and found that NCV is now correctly applied. - $EF_{CO2i,y}$ Validation team reviewed the reference		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			source from Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories as referred. It is confirmed that values are correctly applied in simple OM emission factor calculation and the source is consistent with applied tool. With reference to findings above, it is confirmed that simple OM emission factor was correctly calculated according to applied tool.		
5.2 **Simple adjusted OM** $EF_{grid,OM-adj,y}$					
5.2.1 Is Simple adjusted OM calculated using the formula : $EF_{grid,OM-adj,y} = (1-\lambda_y)\frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} + \lambda_y \times \frac{\sum_k EG_{k,y} \times$			Not Applicable.	-	-
5.2.1.1 Are $EF_{EL,m,y}$, $EG_{m,y}$, $EG_{k,y}$ and $EF_{EL,k,y}$ determined using the same procedure as those for parameters $EF_{EL,m,y}$ and $EG_{m,y}$ in option A of the simple OM method?			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
5.2.1.2 Is the parameter λ_y determined as: ● Step (i) Plot a load duration curve. ● Step (ii) Collect power electricity generation data from each power plant/unit. ● Step (iii) Fill the load duration curve. ● Step (iv) Determine the Number of hours for which low-cost/must-run sources are on the margin in year y.			Not Applicable.	-	-
5.3 **Dispatch data analysis OM** $EF_{grid,OM-DD,y}$					
5.3.1 Is the emission factor calculated as $EF_{grid,OM-DD,y} = \frac{\sum_h EG_{PJ,h} \times EF_{EL,DD,h}}{EG_{PJ,y}}$			Not Applicable.	-	-
5.3.2 Determination of $EF_{EL,DD,h}$					
5.3.2.1 If hourly fuel consumption data is available, is $EF_{EL,DD,h}$ determined as $EF_{EL,DD,h} = \frac{\sum_{i,n} FC_{i,n,h} \times NCV_{i,y} \times EF_{CO2,i,y}}{\sum_n EG_{n,h}}$			Not Applicable.	-	-
5.3.2.2 If hourly fuel consumption data is not available, is $EF_{EL,DD,h}$ determined as			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
$EF_{EL,DD,h} = \frac{\sum_{i,n} EG_{n,h} \times EF_{EL,n,y}}{\sum_{n} EG_{n,h}}$					
5.3.2.3 Is CO2 emission factor of the grid power units $EF_{EL,n,y}$ determined as per the guidance for the simple OM, using the Options A1, A2 or A3?			Not Applicable.	-	-
5.3.3 To determine the set of grid power units n that are in the top of the dispatch, are following information obtained from a national dispatch centre: • The grid system dispatch order of operation for each grid power unit of the system including power units from which electricity is imported; and • The amount of power (MWh) that is dispatched from all grid power units in the system during each hour h that the project activity is displacing electricity.			Not Applicable.	-	-
5.3.4 At each hour h, stack each grid power units electricity generation using the merit order. The group of grid power units n in the dispatch margin includes the units in the top x% of total electricity dispatched in the hour			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
h, where x% is equal to the greater of either: (a) 10%; or (b) The quantity of electricity displaced by the project activity during hour h divided by the total electricity generation by grid power plants during that hour h.					
5.4 **Average OM** $EF_{grid,OM-ave,y}$					
5.4.1 Is the average OM emission factor calculated as the average emission rate of all power plants serving the grid, using the methodological guidance as described under (a) for the simple OM, but also including the low-cost/must-run power plants in all equations?			Not Applicable.	-	-
6 Calculate the build margin (BM) emission factor (step 5)					
6.1 In terms of vintage of data, whether ex ante or ex post is chosen? And whether the option chosen is documented in the CDM PDD?			As per description in Appendix 4, the option 1 has been selected for calculation of BM.	OK	OK
6.2 Is the sample group of power units m used to calculate the build margin determine as,					
6.2.1 Identify the set of five power units, excluding CDM;			**CAR10** With reference to Appendix 4, there is no	~~CAR10~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			indication on how $SET_{5\ units}$ and $AEG_{SET\text{-}5\text{-}units}$ were identified and selected for BM emission factor calculation. With reference to closure of CAR10, validation team reviewed the revised PDD and found that $SET_{5\ units}$ and $AEG_{SET\text{-}5\text{-}units}$ were now indicated in Appendix 4. It is also confirmed that CDM project activity was excluded from $SET_{5\ units}$ and $AEG_{SET\text{-}5\text{-}units}$.		
6.2.2 Identify the units that comprise at least 20% of the system generation, excluding CDM;			With reference to evidence received from CL21, validation team reviewed the source for AEG_{total} and $SET_{\geq 20\ per\ cent}$ and raised CL24 and CL25 as follows; **CL24** With reference to table 6 of Appendix 4 and 'BM 2014' sheet of Grid Emission factor calculation spreadsheet, please clarify the different of the following information from 2 sources as follows; - No.21 - Gulf JP THC Co., Ltd. and Gulf JP TLC Co., Ltd. - No.22 - Solar Power (Korat2) Co., Ltd. and K.R. Two Company Limited. **CL25** As per para 71 (b) of Tool to calculate the emission factor for an electricity system	~~CL24~~ ~~CL25~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Version 04.0 which stated that the *'Identify the set of power units, excluding power units registered as CDM project activities',* please clarify that the set of power units provided in table 6 of Appendix 4 and 'BM 2014' sheet of Grid Emission factor calculation spreadsheet did not relevant with power units registered as CDM project as follows; - Pasak Cholasit Dam/CDM project No. 9555 - EA solar nakhonsawan Co., Ltd. /CDM project No. 8446 - Khun Dan Prakanchol Dam/CDM project No. 10021 - K.R. Two Company Limited. /CDM project No. 7650 - First korat wind Co., Ltd. /CDM project No. 7474 - Bangchak Petroleum Pcl. /CDM project No. 6615 - Natural Energy Development Co., Ltd. /CDM project No. 5082 and/or 6787 With reference to closure of CL24 and CL25, validation team reviewed the revised PDD and confirmed that the discrepancies were properly corrected and power units registered as CDM project were excluded from AEG_{total} and $SET_{\geq 20 \text{ per cent}}$.		
6.2.3 Select the set of power units that comprises			**Yes.**	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the larger annual generation			$SET_{\geq 20 \text{ per cent}}$ which have larger annual generation was selected.		
6.2.4 Is there at least one power unit older than 10 years in the set?			**No.** There is no power unit older than 10 years in the set	OK	OK
6.2.4.1 If no, is the resulting set used to calculate the build margin?			**Yes.** The resulting set is sued to calculate the build margin as shown in Appendix 4 and grid emission factor calculation spreadsheet (Ref/20/).	-	-
6.2.4.2 If yes,					
6.2.4.2.1 Are power units older than 10 years and include power units registered in the CDM excluded?			Not Applicable.	-	-
6.2.4.2.2 Does the set comprise at least 20% of generation?			Not Applicable.	-	-
6.2.4.2.2.1 If yes, is the resulting set used to calculate the build margin?			Not Applicable	-	-
6.2.4.2.2.2 If no, are power units older than 10 years until the set comprises 20% of generation considered and the resulting set is used to calculate the build margin?			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
6.3 Is the build margin emissions factor calculated as $EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$			**Yes.** The following equation is used for calculation of build margin emissions factor; $EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$	OK	OK
6.3.1 Is the CO2 emission factor of each power unit m $EF_{EL,m,y}$ determined as per the guidance for the simple OM?			**Yes.** Validation team reviewed the grid emission factor calculation spreadsheet (Ref/20/). It is found that $EF_{EL,m,y}$ for each power unit was determined as per guidance in Step 4 section 6.4.1 for the simple OM as follows; **For power unit which data on consumption and electricity generation is available** Option A1 was chosen with using data from 2014 which the most recent historical year for which electricity generation data is available. PP was able to show consumption and electricity generation of 6 power units as follows; - Bang Pa Kong power plant (unit 05) - Wang Noi power plant (unit 04) - Chana power plant (unit 01) - Chana power plant (unit 02) - South Bangkok Power Plant (unit 03)	~~CL26~~ ~~CL27~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			- North Bangkok Power Plant (unit 01) Validation team raised CL26 and CL27 to request for clarification and evidence of $EF_{EL,m,y}$ calculation as follows; **CL26** Please indicate the reference source of the following spreadsheet; - 'Fuel consumption for BM.xlsx' - 'Power Generation for BM.xlsx' **CL27** With reference to the evidence 'Power Generation for BM.xlsx', please clarify why some power units for example 'Gulf JP NS Co., Ltd.' which was COD on 1 December 2014 had information of electricity generated since January 2014. With reference to closure of CL26 and CL27, validation team reviewed the evidence Ref/22/-/23/ and /28/-/29/ for the amount of fuel consumption ($FC_{i,m,y}$) and electricity generation ($EG_{m,y}$) for each power unit and correction in revised calculation. It is confirmed that the value was correctly applied in grid emission calculation and the evidence is referred from reliable source.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Hence, this is accepted **<u>For a power unit which only data on electricity generation is available</u>** Option A3 was chosen and an emission factor of 0 t CO_2/MWh was assumed. Validation team reviewed the BM emission factor calculation and confirmed that conservative approach was properly used in the calculation.		
6.3.2 If power units included in the build margin m correspond to the sample group $SET_{sample-CDM-\rangle 10\,yrs}$, is option A2 from guidance for simple OM used for conservative purpose?			Not Applicable.	-	-
7 Calculate the combined margin emissions factor (step 6)					
7.1 Is the calculated of combined margin based on one of the following methods: (a) Weighted average CM; or (b) Simplified CM.			The weighted average CM method (option A) is chosen	OK	OK
7.2 If option A is chosen, are the default values used for W_{OM} and W_{BM} correctly followed?			**Yes.**	OK	OK
7.3 If option B is chosen, is it ensured that : ● The project activity is located in a Least			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Developed Country (LDC) or in a country with less than 10 registered CDM projects at the starting date of validation; and ● The data requirements for the application of step 5 above cannot be met.					
7.4 If yes, the W_{BM} and W_{OM} consistent with the value provided in the guideline?			**Yes.** W_{BM} =0.25 and W_{OM} = 0.75 for wind and solar power generation project activity were correctly used in grid emission factor calculation.	OK	OK
7.5 Is this tool applied to a programme of activities (PoA)?			Not Applicable.	-	-
7.5.1 If yes, is this tool applied to each component project activity (CPA)?			Not Applicable.	-	-
7.5.2 If yes, is CDM-PoA-DD described as followed: - Electricity system(s) covered by the PoA - Sources of data used to determine the emission factor(s) for all electricity system(s) to be covered in the PoA - Equations and options used to calculate the emission factor (e.g. ex-ante or ex-post, various options used for determining the OM and BM).			Not Applicable.	-	-
7.5.3 If yes, Is the used option determined and documented in CDM-PoA-DD and			Not Applicable.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
consistently applied to all CPAs connected to a given electricity? **Note** The CME may however select different options for different electricity systems in the case of a PoA covering more than one electricity systems.					

Table 3 Resolution of Corrective Action /Clarification / Forward Action Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
CAR01 The Module efficiency and Applicable standard of the following PV type stated in Table 1 of PDD version 1.0 dated 13/01/2015 are found inconsistency with the EPC contract - Efficiency of Crystalline silicon: C-Si - Applicable Standard of Copper Indium Gallium Di- Selenide: CIGS - Efficiency of Micro crystalline amorphous silicon: µC/A-Si	A.3.1.1 Table 1	**1st Response by PPs on 19/02/2015** The Module efficiency and Applicable standard has been revised to be consistency with the EPC contract as follow: - Efficiency of Crystalline silicon: C-Si has been revised from "≥15.3" to "15.3" - Standard of Copper Indium Gallium Di-Selenide: CIGS has been revised from "ULI1703" to "UL1703" - Efficiency of Micro crystalline amorphous silicon: µC/A-Si has been revised from "≥12" to "12"	**1st Comment by Validation Team on 18/03/2015** Validation team reviewed the revision in Table 1 of section A.3 of PDD version 2.0 dated 19/02/2015, it's found that the revision is in line with EPC contract. This revision is satisfied and CAR01 is closed.
CAR02 The version of both tools indicated in section B.1 of PDD version 1.0 dated on 13/01/2015 are found inconsistency with latest tool available on UNFCCC website (http://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK).	B.1.3 Table 1	**1st Response by PPs on 19/02/2015** The version of tools have been updated according to the latest version available on UNFCCC website -The version of " Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" has been revised from "Version 04.0" to "Version 02.0" - The version of "Tool to calculate the emission factor for an electricity system" has been revised from "Version 02.0" to "Version 04.0"	**1st Comment by Validation Team on 18/03/2015** Validation team reviewed the revision in section B.1 of PDD version 2.0 dated 19/02/2015, it's found that the revision version are in line with latest tool available on UNFCCC website. This revision is satisfied and CAR02 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
CAR03 With reference to section B.6.1 of PDD version 1 dated 13/01/2015, Leakage emission is not considered in accordance with para 42 of AMS-I.D version 18.0	B.6.1.1 Table 1	**1st Response by PPs on 19/02/2015** The description of Leakage emission in section B.6.1 has been revised accordance with para 42 of AMS-I.D version 18.0 as follow; "As per AMS-I.D, Version18, para 42, General guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues. This project will not involve any use of biomass residues. Hence, the leakage emission due to use of biomass residues is not considered"	**1st Comment by Validation Team on 18/03/2015** Validation team reviewed the revision in section B.6.1 of PDD version 2.0 dated 19/02/2015, it's found that the revision is now in line para 42 of AMS-I.D version 18.0. This CAR03 is related to CL19 below, this issue will be closed upon closure of CL19. CAR03 is pending. **2nd comment by Validation team on 29/04/2015** Upon closure of CL19 below, CAR03 is now closed.
CAR04 It is found inconsistency of procedure when electricity is malfunction as stated in "Quality assurance and quality control" and "Emergency procedure" under section B.7.3 of PDD version 1.0 dated 13/01/2015	B.7.3.2 Table 1	**1st Response by PPs on 19/02/2015** The procedure when electricity is malfunction in "Quality assurance and quality control" and "Emergency procedure" under section B.7.3 have been revised to be consistency as follow; "In case that the meters are malfunction, the operator will request PEA to repair the	**1st Comment by Validation Team on 18/03/2015** Validation team reviewed the revision in section B.7.3 of PDD version 2.0 dated 19/02/2015, it's found that the revision is not completed as 1st response. The procedure when electricity is malfunction as stated in "Quality assurance and

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		meter soonest and then PEA will fix or replace with a new meter after getting notification" **2nd Response by PPs on 03/04/2015** There is procedure stated in the operation manual how to collect the monitoring data in the emergency situation, thus, CER can be claimed eve n the meter is malfunction. Correct the description describe in "Quality assurance and quality control" according to "Emergency procedure" **4th Response by PPs on 03/07/2015** As the project is under construction and EGAT has not assigned for the operation team, therefore Operation Manual still not be approved. Therefore PP stated directly in PDD that "During emergency situation, monitoring data from backup meter will be used for calculation of emission reduction. In case loss of monitoring data from both main and backup meter at the same time, the emission reduction will not be claimed	quality control" and "Emergency procedure" are still found to be inconsistent. CAR04 is pending. **2nd comment by Validation team on 29/04/2015** Validation team reviewed the revision in section B.7.3 of PDD version 3.0 dated 03/04/2015, it is found that the information is now corrected. However, to support this claim project participant is requested to submit the reference 'Operation manual' to confirm the justification. CAR04 is pending. **4th comment by Validation team on 15/07/2015** Validation team reviewed the revision in section B.7.3 of PDD version 05 dated 03/07/2015 and the emergency procedures are consistent with the response provided.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		during this period."	CAR04 is closed.
CAR05 It is found inconsistency on period of data to be kept and archived between section B.7.1 and B.7.3 of PDD version 1 dated 13/01/2015	B.7.3.3 Table 1	**1st Response by PPs on 19/02/2015** The period of data to be kept and archived in section B.7.1 and B.7.3 have been revised to be consistency as follow; "All monitored data will be stored for at least two years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later."	**1st Comment by Validation Team on 18/03/2015** Validation team reviewed the revision in section B.7.1 and B.7.3 of PDD version 2.0 dated 19/02/2015, it's found that the revisions are found to be consistent. This revision is satisfied and CAR05 is closed.
CAR06 With reference to section B.6.1 and appendix 4 of PDD version 01 dated 13/01/2015, it is found that the Tool to calculate the Emission Factor an electricity system version 3.0 which is referred for calculation of combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) is found inconsistence with version stated in section B.6.2 and is not the latest version available on UNFCCC website.	3.1.5 Table 2	**1st Response by PPs on 19/02/2015** The version of "Tool to calculate the Emission Factor an electricity system" in section B.6.1, B.6.2 and Appendix 4 have been revised to "Version 04.0" which is the latest available on UNFCCC website. **2nd Response by PPs on 03/04/2015** The version of "Tool to calculate the Emission Factor an electricity system" in section B.6.1, B.6.2, Appendix 4 and B.4 have been revised to "Version 04.0" which is the latest available on UNFCCC website.	**1st Comment by Validation Team on 18/03/2015** Validation team reviewed the revision in section B.6.1 and Appendix 4 of PDD version 2.0 dated 19/02/2015, it's found that the revisions are found to be consistent with the latest tool available on UNFCCC website (version 4.0). However, it is found that section B.4 is still referring to the "Tool to calculate the emission factor for an electricity system", Version 03.0.0. Hence, CAR06 is pending.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			2nd comment by Validation team on 29/04/2015 Validation team reviewed the revision in section B.4 of PDD version 3.0 dated 03/04/2015, it's found that the revisions are found to be consistent with the latest tool available on UNFCCC website (version 4.0). CAR06 is now closed.
CAR07 With reference to appendix 4, 2008-2010 data which is used for calculation of simple OM calculation is not based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation in accordance with para 36 of Tool to calculate the emission factor for an electricity system version 04.0	4.4.1.1 Table 2-1	**1st Response by PPs on 08/06/2015** Calculated simple OM based on the most recent data available at the time as per "GEF calculation" and corrected calculation in PDD.	**3rd comment by Validation team on 23/06/2015** Validation team reviewed the evidence Ref/11/-/13/ and found that the most relevant data in 2012-2014 was now used for grid emission factor following the guideline CAR07 is now closed.
CAR08 With reference to Table 1 under Appendix 4, NCV for Lignite and Bituminous is not corrected	5.1.3.2 Table 2-1	**1st Response by PPs on 03/07/2015** PP corrected the figured in Table 1 under Appendix 4.	**4th comment by Validation team on 15/07/2015** Validation team reviewed the revision in Table 1 under Appendix 4 of PDD version 05 dated on 03/07/2015, it's found that the revision is in line with the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			relevant reference. This revision is satisfied and CAR08 is closed.
CAR09 With reference to 'OM 2014' sheet of Grid Emission calculation spreadsheet, it is found that the following data is incorrect as per reference for year 2012-2014 provided; - Bituminous - Bunker - Diesel	5.1.3.2 Table 2-1	**1st Response by PPs on 03/07/2015** PP corrected the figured as follow; - Bituminous : Corrected the figure for bituminous used in IPP and SPP for year 2012-2014 - Bunker : Corrected the figure according to unit indicated in the support information. - Diesel *:* Corrected the figure according to unit indicated in the support information.	**4th comment by Validation team on 15/07/2015** Validation team reviewed the revision in Grid Emission calculation spreadsheet and Table 3 of PDD version 05 dated on 03/07/2015, it's found that the revision are in line with reference. CAR09 is closed.
CAR10 With reference to Appendix 4, there is no indication on how $SET_{5\ units}$ and $AEG_{SET\text{-}5\text{-}units}$ were identified and selected for BM emission factor calculation.	6.2.1 Table 2-1	**1st Response by PPs on 03/07/2015** PP added information for $SET_{5\ units}$ *and* $AEG_{SET\text{-}5\text{-}units}$ in Appendix 4 of the PDD.	**4th comment by Validation team on 15/07/2015** Validation team reviewed the revision in Appendix 4 of PDD version 05 dated on 03/07/2015, it's found that the information is now provided. CAR10 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
CAR11 It is found that the revised grid emission factor as calculated in Grid Emission calculation spreadsheet are not correctly applied in ER calculation spreadsheet and Table 10 of PDD	3.1.5 Table 1	**1st Response by PPs on 03/07/2015** PP corrected and updated the information in ER calculation spread sheet and Table 11 of the PDD.	**4th comment by Validation team on 15/07/2015** Validation team found that the revised grid emission factor is now correctly applied in ER Calculation spreadsheet and revised PDD version 05 dated on 03/07/2015 CAR11 is closed
CAR12 It is found that the data for calculation of Power Generation for BM are not correctly applied from the reference provided on the following cell; - Q4 - F14 - H24 - F23-Q23		**1st Response by PPs on 24/07/2015** PP corrected the information as below; - Cell Q4 : Corrected information to 495,218,214 kWh - F14 : Corrected information to 55,015,445 kWh - H24 : Corrected information to 10,597,380 kWh - F23-Q23: Information was corrected. The revised calculation of Power Generation for BM is provided in *"Power Generation for BM 24072015.xlsx"*	**5th comment by Validation team on 04/08/2015** Validation team reviewed the revised calculation of Power Generation for BM and Appendix 4 of PDD version 06 dated on 24/07/2015. It is now correctly applied as per evidences received. CAR12 is now closed.
CAR13 With reference to BM emission factor		**1st Response by PPs on 24/07/2015** The fuel consumption for Chana (2) was corrected to be consistency with the	**5th comment by Validation team on 04/08/2015** Validation team reviewed the revised BM

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
calculation, the fuel consumption from Chana (2) is inconsistency with the evidence provided.		evidence provided that included fuel consumption for both Chana (1) and Chana (2) from the list of power units for calculation of BM. Revised information provided in *"Fuel consumption for BM 24072015.xlsx"*	emission factor calculation and Appendix 4 of PDD version 06 dated on 24/07/2015. It is now correctly applied as per evidences received. CAR13 is now closed.
CL01 Please provide the supporting evidence to confirm that the amount of inverter and transformer would be installed in project activity as follows: - 10 units of 630 kW Inverter - 5 units of 1,250 KVA and 1 unit of 200 KVA transformer	A.3.1 Table 1	**2nd Response by PPs on 03/04/2015** • The supporting evidence to confirm the amount of inverter was provided to DOE as per "Factory license.pdf" • The supporting evidence to confirm the amount of transformer was provided to DOE as per "Factory license.pdf" • **3rd Response by PPs on 08/06/2015** PPs confirm that the installed capacity of transformer 1,250 KVA	**2nd comment by Validation team on 29/04/2015** Validation team review the evidence received (Factory license.pdf). It is found that the evidence received is not "Factory license" or Ror Ngor 4 as name stated; however, it is application form (Ror Ngor 3) to request for operational license (Ref/5/). This application form was submitted to Prachuap Khiri khan provincial industry office on 10 Nov 2014. The amount of inverter and transformer which were reported in application form are found to be consistent with PDD. However, it is found that the installed capacity of transformer stated in application form is 1,250 KW where installed capacity reported in PDD at 1,250 KVA. Hence,

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			PP is required to clarify on this difference. CL01 is pending **3rd comment by Validation team on 23/06/2015** Validation team accepted the reasonable justification from PP with no further questions. CL01 is now closed
CL02 Please provide the supporting evidences for technical lifetime of the project activity at 25 years and plant load factor of 18% as stated in section A.3 of PDD version 1.0 dated 13/01/2015	A.3.1.1 Table 1	**2nd Response by PPs on 03/04/2015** The supporting evidences for technical lifetime of the project activity at 25 years and plant load factor of 18% were provided to DOE as per "Plant load factor and Lifetime.pdf"	**2nd comment by Validation team on 29/04/2015** Validation team reviewed the evidence 'Plant Load factor and Lifetime.pdf' (Ref/6/) and found that this is the part of feasibility study of the project activity. The project lifetime at 25 years and plant load factor of 18% in PDD are found to be correctly referenced from submitted evidence. CL02 is now closed.
CL03 According to para 18 of AMS-I.D version 18,	B.3.3 Table 1	**1st Response by PPs on 19/02/2015** There is no fossil fuel power plant in the	**1st Comment by Validation Team on 18/03/2015**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
please clarify how Fossil fuel power plants as shown in figure 4 in section B.3 of PDD version 1.0 dated 13/01/2015 are in the scope of the project boundary.		scope of the project boundary but the figure 4 shows the electricity generates from the project will replace the electricity generated from fossil fuel power plant. However, the fossil fuel power plants have been removed to avoid confusing.	Validation team reviewed the revision in section B.3 of PDD version 2.0 dated 19/02/2015, it's found that fossil fuel power plant was removed from figure 4.This is in line with AMS-I.D version 18.0. Validation team has no further question on this issue. This revision is satisfied and CL03 is closed.
CL04 As per description in section B.4 of the PDD version 1.0 dated 13/01/2015, please clarify on how project participant defines situation that "future anthropogenic emissions by sources are projected to rise above current levels due to the specific circumstances of the host Party" and how project participant follows the "Guidelines on the consideration of suppressed demand in CDM methodologies" in establishment of baseline scenario for this proposed project activity.	B.4.2 Table 1	**2nd Response by PPs on 03/04/2015** According to para 9 of the "Guidelines on the consideration of suppressed demand in CDM methodologies", this guidelines are applicable when the basic human needs were not met. As per section B.4 of the PDD, "The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of other grid-connected power plants included fossil based power plants.", therefore the basic human needs were met and "Guidelines on the consideration of suppressed demand in CDM methodologies" is not relevant in	**2nd comment by Validation team on 29/04/2015** Validation team reviewed the justification. It is found that the reason is unclear on how the justification "*..the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of other grid-connected power plants included fossil based power plants.."* would lead to the result claimed that "*..the basic human needs were met..*" Hence, PP is required to clarify the linkage on the justification and results provided.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		establishment of baseline scenario for the proposed project activity. **3rd Response by PPs on 08/06/2015** PP provided the support evidence "*CL04 Basics human needs.rar*" showing that it has government agencies to take care of the basics human needs in the project area. In the baseline situation of project activity, basics human needs such as electricity, road and drinking water supply were met. Therefore the "Guidelines on the consideration of suppressed demand in CDM methodologies" is not considered.	CL04 is pending. **3rd comment by Validation team on 23/06/2015** Validation team reviewed and cross-checked the existence of the governmental agencies as indicated in evidence Ref/14/. It is confirmed that there are government agencies which taking care of the basics human needs in the project area as claimed. This is consistent with the information received from interview session with stakeholder i.e. village head during onsite visit that there is no concern on the minimum service level in the project activity area. With the reason above, validation team accepted the justification that this guideline is not applicable because the basic human needs were met. CL04 is closed.
CL05 As per indication in Table 1-3 of the PDD	B.4.4.1. Table 1	**2nd Response by PPs on 03/04/2015** As per para 99. of project standard, to	**2nd comment by Validation team on 29/04/2015**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
version 01 dated on 13/01/2015, please clarify on how performances/efficiencies of Solar panel, Inverter and Transformer are compliance with para 99 of Project Standard version 07.0 (EB 79 Annex 3).		determine the performance of equipment, PP used option (c) An international standard for the performance of the equipments (IEC Standard and UL) as options (a) The appropriate value specified in the selected methodology or, where applicable, the selected standardized baseline; and (b) The national standard for the performance of the equipment type is not available. The supporting evidences of performances/efficiencies of Solar panel, Inverter and Transformer were submitted to DOE as per "Solar panel, Inverter and Transformer standard.pdf"	Validation team took noted and accepted the justification. It is confirmed that project participant followed para 99 of Project Standard version 07.0. The response is satisfied and CL05 is closed.
CL06 As per detail in section B.4 of the PDD version 01 dated on 13/01/2015, please clarify on how national and/or sectoral policies and circumstances (type E+ or E-), such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector been taken into account in compliance	B.4.8 Table 1	**2nd Response by PPs on 03/04/2015** According to para 96 of VVS version07.0 (EB 79 Annex 4), there is no national policy or regulation on the electricity generation in the Thai grid which impact on the project activity. Therefore PP added information that "There are no national or sectoral policies (E+/E-) or circumstances affecting the baseline scenario." In revised PDD section B.4	**2nd comment by Validation team on 29/04/2015** Based on sectoral knowledge of validation team and research on Energy Regulatory Commission (ERC) website, the claimed that "*There are no national or sectoral policies (E+/E-) or circumstances affecting the baseline scenario.*" is not corrected. There was national policy related to renewable

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
with para 96 of VVS version 07.0 (EB 79 Annex 4).		**3rd Response by PPs on 08/06/2015** There are national policies from Ministry of Industry since 2010 to increase power generation from renewable energy[§] by provided adder to the renewable power plant that feed electricity to the national grid. This policy can be considered as E- policy, however, this policy not be taken into account in establishing the baseline scenario. **4th Response by PPs on 03/07/2015** PP revised and stated in section B.4 of PDD version 5 to be consistence with the 3rd response.	energy shortly called 'Adder' applicable during past 4 years. However, project participant is freely to provide more clarification on why there are no national or sectoral policies (E+/E-) or circumstances affecting the baseline scenario. CL06 is pending. **3rd comment by Validation team on 23/06/2015** Validation team reviewed the link provided and accepted the justification from project participant, however, it is found that the description in section B.4 of PDD version 04 dated on 08/06/2015 still stated that "*There are no national or sectoral policies (E+/E-) or circumstances affecting the baseline scenario*" which is inconsistent with the 3rd response.

[§] http://www.eppo.go.th/power/powerN/PICP/File/(20).pdf

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			CL06 is pending. **4th comment by Validation team on 15/07/2015** Validation team reviewed the revision in section B.4 of PDD version 05 dated on 03/07/2015, it is found that the information is now consistent with response. CL06 is closed.
CL07 Please clarify on how the guideline of demonstrating additionality of Microscale project activities version 05.0 (EB73 Annex13) has been taken into account with the project activity	B.5.1.3 Table 1	**2nd Response by PPs on 03/04/2015** According to para 8 of *Microscale project activities version 05.0 (EB73 Annex13),* the geographic location of the project activity is *not* in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone (SUZ) of the host country; therefore this guideline is not relevant to the project activity. Hence, Guidelines on the demonstration of additionality of small-scale project activities under footnote 3 of *Microscale project activities version 05.0 (EB73 Annex13)* are taken in to account with the	**2nd comment by Validation team on 29/04/2015** Validation team validated the justification against paragraph 8 of EB73 Annex13 and found that justification towards this guidance is sound and acceptable. Furthermore, according to footnote 1 of the guideline of demonstrating additionality of Microscale project activities version 05.0 (EB73 Annex13), it is confirmed that *A positive list of technologies that are automatically defined as additional are included in "Guidelines on the demonstration of additionality of small-*

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		project activity.	*scale project activities" for which it is not required to satisfy the conditions indicated here* (see EB 68, annex 27). Validation team has no further question on this issue. The response is satisfied and CL07 is closed
CL08 Please provide supporting evidences of the date of project activity as indicated in Table 8 of PDD version 1.0 dated 13/01/2015.	B.5.4.1 Table 1	**1st Response by PPs on 19/02/2015** The supporting evidence has been submitted as attached file. **2nd Response by PPs on 03/04/2015** **- Board of EGAT approved to implement to project 02/2012** The supporting evidences of the date of Board of EGAT approved to implement the project was provided to DOE as per "Board of EGAT approved to implement to project 022012.pdf" **- Thai cabinet approved the project on 19/07/2013** The evidences of the date of Thai cabinet approved the project support by this link	**1st Comment by Validation Team on 18/03/2015** Validation team reviewed the supporting evidence received on 19/02/2015 as followed; - **EGAT conducted the feasibility study on 10/2011** The evidence Ref/6/ is found to be consistent with detail in PDD. **- Board of EGAT approved to implement to project 02/2012** The evidence submitted on 19/02/2015 under name *'Board of EGAT approved to implement the project.pdf'* is a part of unknown report. This is found to be

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		http://www.cabinet.soc.go.th/soc/Program2-3.jsp?top_serl=99308193 **- DOE started onsite validation on 12/2013** Correct the date of DOE started onsite validation from 12/2013 to 11/03/2015 and the supporting evidences was provided to DOE as per "Validation plan.pdf" **- EGAT signed the EPC contract on 08/05/2014** The supporting evidences of the date of EGAT signed the EPC contract was provided to DOE as per "EGAT signed the EPC contract on 08052014.pdf" **- EGAT started commercial export electricity to Thai national grid (COD) on 03/06/2015** The supporting evidences of the date of EGAT started commercial export electricity to Thai national grid (COD) was provided to DOE as per "COD.pdf"	inconsistent with 'Approval letter' which is referred as evidence for this event in PDD. **- EGAT submitted a Letter of Intent (LoI) to Thai DNA on 25/04/2013** The evidence (Ref/24/) is found to be consistent with detail in PDD. **- EGAT conducted the public consultation on 21/05/2013** The evidence (Ref/3/) is found to be consistent with detail in PDD. **- Thai cabinet approved the project on 19/07/2013** The evidence submitted on 19/02/2015 under name '*Thai cabinet approved the proejct.pdf*' is a part of unknown report. This is found to be inconsistent with 'Approval letter from Thai cabinet' which is referred as evidence for this event in PDD. **- EGAT submitted the project documents to Thai DNA for**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		<u>3rd Response by PPs on 08/06/2015</u> **- Board of EGAT approved to implement to project 02/2012** Correct the evidence name stated in PDD from "Approval letter" to "MoM for the project" **- EGAT signed the EPC contract on 08/05/2014** Provided more information in EPC contract as per "Section D-Contract.pdf" **- EGAT started commercial export electricity to Thai national grid (COD) on 03/06/2015** Correct progress report date in PDD from "10/2014" to "09/2014"	**requesting Letter of Approval (LoA) on 14/08/2014** The evidence submitted on 19/02/2015 under name *'EGAT submitted the project document to Thai DNA for requesting LOA.pdf'* is found to be consistent with detail in PDD. **- DOE started onsite validation on 12/2013** There is no evidence submitted on this event. Furthermore, please clarify how the activity on 12/2013 is applicable and accurate with this project activity **- EGAT signed the EPC contract on 08/05/2014** The evidence submitted on 19/02/2015 under name *'EGAT signed the EPC contract'* has no indication on the date of EPC contract. **- EGAT started commercial export electricity to Thai national grid (COD) on 03/06/2015** The evidence submitted on 19/02/2015

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			under name *'EGAT started commercial export electricity to Thai national grid (COD).pdf'* is a part of unknown report. This is found to be inconsistent with 'COD record' which is referred as evidence for this event in PDD. With findings above, the CL08 is pending. **2nd comment by Validation team on 29/04/2015** Validation team reviewed the supporting evidence received as followed; **- Board of EGAT approved to implement to project 02/2012** Validation team noticed that the evidence submitted which is the minute of meeting of EGAT is not the 'approval letter' as claimed in PDD. PP is required to confirm the supporting evidence for Board of EGAT approved to implement to project. **- Thai cabinet approved the project on 19/07/2013**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			Validation team reviewed the link (http://www.cabinet.soc.go.th/soc/Program2-3.jsp?top_serl=99308193) and confirmed that Thai cabinet had approved the project activity on 19/07/2013. **- DOE started onsite validation on 12/2013** Validation team reviewed and accepted the revision of date in PDD version 3.0 dated on 03/04/2015 from 12/2013 to 11/03/2015 with the supporting evidences "Validation plan.pdf". The revision is now corrected and found to be consistent with evidence. **- EGAT signed the EPC contract on 08/05/2014** Validation team reviewed the evidence "EGAT signed the EPC contract on 08052014.pdf". It is the contract between EGAT and Consortium of Hydrochina International Engineering Co., Ltd. on 08/05/2014 as mentioned in PDD. However, this is part of the contract, and

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			validation team could not confirm that it was approved and signed by both parties. Hence, PP is required to submit the full version of EPC contracted. **- EGAT started commercial export electricity to Thai national grid (COD) on 03/06/2015** Validation team reviewed the evidence "COD.pdf" which is the progress report for the project activity on September 2014. Based on evidence, it is confirmed that COD is planned on 03/06/2015. However, the revision in revised PDD version 3.0 dated on 03/04/2015 changed the evidence of EGAT started commercial export electricity to Thai national grid (COD) to 'Progress report (10/2014). This is inconsistent with the evidence submitted which is the progress report for September 2014 (09/2014). **3rd comment by Validation team on 23/06/2015** Validation team reviewed the supporting

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			evidence received as followed; **- Board of EGAT approved to implement to project 02/2012** Validation team confirmed that the revision of evidence on 'Board of EGAT approved to implement to project' in PDD version 04 dated 08/06/2015 is now corrected. And the evidence is accepted. **- EGAT signed the EPC contract on 08/05/2014** Validation team reviewed 'Section D-Contract.pdf', it is found that the date is consistent with the information provided in PDD. Hence, this is accepted. **- EGAT started commercial export electricity to Thai national grid (COD) on 03/06/2015** Validation team confirmed that the revision of evidence on 'EGAT started commercial export electricity to Thai national grid (COD)' in PDD version 04 dated 08/06/2015 is now corrected. CL08 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
CL09 With reference to $EG_{PJ,y}$ calculation in ER calculation spreadsheet version01, please provide the evidence/reference source of the quantity of electricity supplied by the project plant/unit to the grid ($EG_{PJexport,y}$) at 7,560 MW/yr.	B.6.3.1 Table 1	**2nd Response by PPs on 03/04/2015** The evidence source of the quantity of electricity supplied by the project plant to the grid was provided to DOE as per "Factory license.pdf" **3rd Response by PPs on 08/06/2015** PPs confirm that the reference source of evidence for quantity of electricity supplied by the project plant/unit to the grid is an "application form to request for factory license" not an "Factory license" and provided to DOE as per "Application form to request for factory license.pdf"	**2nd comment by Validation team on 29/04/2015** Validation team review the evidence received (Factory license.pdf). It is found that the evidence received is not "Factory license" as name stated; however, it is application form to request for operational license. Hence, PPs is required to provide more clarity and confirmation on the reference source of evidence for quantity of electricity supplied by the project plant/unit to the grid ($EG_{PJexport,y}$) at 7,560 MW/yr. CL09 is pending **3rd comment by Validation team on 23/06/2015** Validation team reviewed that evidence Ref/5/. It is found that this document was stamped for notification of application acceptance No. 3225 by Prachuapkhirikhan' industry office on 10 November 2014. Hence, validation team agreed that this is reliable source of

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			evidence and accepted the used of data for calculation. CL09 is closed.
CL10 With reference to section B.6.3 of PDD version 1 dated 13/01/2015, please clarify on where is indication of the relation between $EG_{PJ,y}$ and $EG_{PJ,facility,y}$	B.6.3.2 Table 1	**1st Response by PPs on 19/02/2015** According to para26 of AMS-I.D version 18.0, $EG_{PJ,y} = EG_{PJ,facility,y}$	**1st Comment by Validation Team on 18/03/2015** Validation team found that the justification in 1st response and newly added description in section B.6.3 of the PDD version 2.0 dated on 19/02/2015 is in line with AMS-I.D version 18.0. CL10 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
CL11 Please provide more information on the sources of electricity consumption in the project that would be taken into account of parameter $EG_{PJ,import,y}$	B.7.1.2.3 Table 1	**1st Response by PPs on 19/02/2015** All electricity generated from the project will export to Thai national grid. The project will import the electricity from Provincial Electricity Authority (PEA) to use in the office consumption and operate the plant. **2nd Response by PPs on 03/04/2015** All electricity generated from the project will export to Thai national grid. The project will import the electricity from Provincial Electricity Authority (PEA) to operate the plant. The sources of electricity consumption are from control room, office building, lighting system and other plant's facility.	**1st Comment by Validation Team on 18/03/2015** Validation team took noted the justification from project participant. However, with reference to 'General Drawing of Fence Lighting' Ref/4/ received during onsite visit on 11/03/2015, please clarify on what is the source of electricity for fence lighting and how the emission from this source would be taken into account. CL11 is pending. **2nd comment by Validation team on 29/04/2015** Validation team agreed with the justification from project participant. This is found to be consistent with the evidence 'General Drawing of Fence Lighting' Ref/4/. CL11 is now closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
CL12 Please provide the PEA standard which is referred for accuracy at least 1% for electricity meter.	B.7.1.2.4 Table 1	**2nd Response by PPs on 03/04/2015** PP provided the specification of power meter use in the project activity instead of PEA standard. The accuracy of meter install is 0.5%. The specification was provided to DOE as per "Power meter.pdf" **3rd Response by PPs on 08/06/2015** PP confirm that the accuracy class of meter for $EG_{PJ,import,y}$ is class 0.5s and for $EG_{PJ,export,y}$ is class 0.2s and provide specification of meter Class 0.2s and Class 0.5s as per "Import meter 0.5s.pdf" and "Export meter 0.2s.pdf" **4th Response by PPs on 03/07/2015** PP revised the accuracy class of $EG_{PJ,import,y}$ and $EG_{PJ,export,y}$ to 0.5s and 0.2s respectively.	**2nd comment by Validation team on 29/04/2015** Validation team reviewed section B.7.1 of revised PDD version 3.0 dated on 03/04/15 and found that the accuracy class of meter for $EG_{PJ,import,y}$ was revised to class 0.5 and for $EG_{PJ,export,y}$ was revised to class 0.2. However, the evidence Ref/16/ and /17/ submitted provided the information for 2 types of meter Class 0.5s and Class 1. This is inconsistency with the response provided. Hence, PP is required to confirm the type of meter chosen for the project activity and provide the supporting evidence as appropriate. CL12 is pending. **3rd comment by Validation team on 23/06/2015** Validation team accepted justification from PP. However, it is found that the accuracy class of meter for $EG_{PJ,import,y}$ and $EG_{PJ,export,y}$ stated in PDD version 04 dated 08/06/2015 are class 0.5 and 0.2

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			respectively, this is inconsistency with the evidence provided which indicated class 0.5s and 0.2s. CL12 is pending. **4th comment by Validation team on 15/07/2015** Validation team reviewed the revision in section B.7 of PDD version 05 dated 03/07/2015, it's found that accuracy class of $EG_{PJ,import,y}$ and $EG_{PJ,export,y}$ are in line with the evidence. This revision is satisfied and CL12 is closed.
CL13 Please clarify on the different of the authority which will take responsible in calibration and maintenance of electricity meter between "accredited person or institution" as mentioned in section B.7.1 and "PEA" as mentioned in section B.7.3 of PDD version 1 dated 13/01/2015	B.7.3.5 Table 1	**1st Response by PPs on 19/02/2015** PEA will take responsibility in calibration and overall maintenance on a regular basis at least once in 3 years throughout the crediting period in accordance with the national/international standards. In case of PEA cannot calibration in accordance with the national/international standards (at least once in 3 years) due to any reason, the meters will calibrated	**1st Comment by Validation Team on 18/03/2015** Validation team took noted the justification provided and this is reasonable. CL13 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		by an accredited person or institution	
CL14 Please provide IEE which was submitted along with application of LoA for validation.	D.1.1 Table 1	**1st Response by PPs on 19/02/2015** The IEE has been submitted as attached file.	**1st Comment by Validation Team on 18/03/2015** Validation team received the IEE. (Ref /3/) This CL14 is closed.
CL15 Please provide LoA from Thailand for validation.	F.1.1 Table 1	**2nd Response by PPs on 03/04/2015** The 'LoA' was provided to DOE as per "Factory License.pdf" **3rd Response by PPs on 08/06/2015** Provide Letter of Approval from authorized organization as per "LoA.pdf"	**2nd comment by Validation team on 29/04/2015** Validation team reviewed the evidences "Factory License.pdf". However, it is found that this is not Letter of Approval. CL15 is pending **3rd comment by Validation team on 23/06/2015** Validation team reviewed Letter of Approval by Thailand Greenhouse Gas Management Organization (Public Organization) (Ref/18/) which stated that the project activity was approved on 30 July 2014. CL15 is now closed.
CL16	C.1.1.1	**2nd Response by PPs on 03/04/2015**	**2nd comment by Validation team on**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
Please provide Modality of Communication (MoC) statement for Validation	Table 1	Modality of Communication (MoC) statement for Validation was provided in Appendix1 of PDD. **3rd Response by PPs on 08/06/2015** Modality of Communication (MoC) statement for Validation was provided as per "Moc.doc" **4th Response by PPs on 24/07/2015** MoC version 2.1 for VVS7 provided as "*MOC-TSK-new.pdf*"	**29/04/2015** Validation team reviewed Appendix 1 of revised PDD version 3 dated on 03/04/2015 and found that there is no MoC form provided in Appendix 1 as informed in 1st response. CL16 is pending **3rd comment by Validation team on 23/06/2015** Validation team received the MoC for validation, it is found that the version of MoC Form used which is 02.2 is not the version available on UNFCCC website which are version 02.1 under VVS 07.0 and version 02.3 under VVS 09.0. Furthermore, the document had not been signed by relevant project participant. CL16 is pending. **5th comment by Validation team on 04/08/2015** Validation team reviewed and accepted

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			the revised MOC (Ref /19/) with no further comments. CL16 is closed.
CL17 Please provide 'Factory License' as reference in section A.1 for validation.	A.1.5 Table 1	**2nd Response by PPs on 03/04/2015** The 'Factory License' was provided to DOE as per "Factory License.pdf" **3rd Response by PPs on 08/06/2015** According to the current progress for factory license request, factory license (Ror Ngor 4) is not yet provided. Hence, correct reference source in section A.1 from "Factory License" to "application form to request for factory license" and provided to DOE as per "Application form to request for factory license.pdf" **4th Response by PPs on 03/07/2015** PP clarified that the reference of 'Factory License' used to provided in section A.1 is not relevant to the topic of sustainable development which it's referred. Therefore PP revised the reference to "*Sustainable development criteria.pdf*" sourced from	**2nd comment by Validation team on 29/04/2015** As indicated in CL09, the evidence "Factory License.pdf" is found to be the application form (Ror Ngor 3) to request for factory license not the actual operational license (Ror Ngor 4). Hence, please provide 'Factory license' (Ror Ngor 4) as referred in section A.1 of PDD. CL17 is pending. **3rd comment by Validation team on 23/06/2015** Validation team reviewed the evidence 'Application form to request for factory license.pdf'(Ref/5/) and could not found any linkage with the statement *'In Thailand, sustainable development requires the effective integration of four key elements…'* which was referred in

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		http://www.tgo.or.th/download/Announce/CDM/ApprovalNotification_2010_EN.pdf in order to be consistence with the referred topic.	section A.1 of PDD version 04 dated 08/06/2015. Furthermore, Validation team noticed that the reference in footnote 2 of section A.1 of revised PDD was changed to 'sustainable development criteria.pdf'. This is inconsistency with the 3rd response. Hence, PP is required to confirm the reference source with evidence. CL17 is pending. **4th comment by Validation team on 15/07/2015** Validation team found that the document from the link provided is official English translation of the evidence Ref/26/ which both are available at Thai DNA's website. It is found that the information is correctly referred from the source provided. CL17 is closed.
CL18 Please clarify why the amounts of PV module	A.3.1 Table 1	**2nd Response by PPs on 03/04/2015** The figure in EPC contract is the tentative	**2nd comment by Validation team on 29/04/2015**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
and total installed capacity indicated in 'General plot plan' are found to be different from 'EPC contract' and which value is applicable for this project activity.		PV module to be installed in the project. After the contract was signed, the detailed engineering was done to fit with the actual situation of the project site. Therefore the value in general design plot plan is the latest updated and will be applied for this project activity.	Validation team agreed with the justification from project participant. Total installed capacity is now changed from 6.2504 MW (DC) which is based on EPC Contracted in 2014 to 6.304 MW (DC) which is based on General design Plot Plan (updated 03/03/2015). This change does not alter their applicability and additionality which is still below 15 MW. Hence, the justification is accepted. CL18 is now closed.
CL19 With reference to para 78 of VVS version 07.0 (EB79 Annex 4), please explain the documentation that has been used as a basis for justification and provide the references in Table 5 of PDD, or include the documentation in Appendix 3 of the PDD for the justification on applicability criterion of the project activity to the selected methodology (AMS-I.D version18.0).	B.2.5 Table 1	**2nd Response by PPs on 03/04/2015** Explained the documentation that has been used as a basis for justification and provided the references in Table 5 of PDD which refer to these 3 document - Single line diagram.pdf - General design plot plan.pdf - EPC contract.pdf	**2nd comment by Validation team on 29/04/2015** Validation team reviewed 3 evidences as follows; - Single line diagram (Ref/15/) - General design plot plan (Ref/2/) - EPC contract (Ref/1/) It is confirmed that the justification provided with supporting evidences are reasonable for all applicability criteria of AMS-I.D version 18.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			CL19 is now closed.
CL20 With reference to Grid Emission factor calculation spreadsheet, please clarify how the reference 'Table 5.2-1: Power Generation by Type of Fuel' was referred for parameter Coal & Lignite , Natural Gas, and Others in 'LC-MR' sheet.	4.2 Table 2-1	**1st Response by PPs on 03/07/2015** PP revised the reference table from "Table 5.2-1" to "Table 5.2-2 : Power Generation Classified by Fuel Type" in order to reflect the correct figures use in the spreadsheet.	**4th comment by Validation team on 15/07/2015** Validation team reviewed the new reference referred through the link provided. It is found that the information is in line with the reference provided. CL20 is closed.
CL21 Please provide the reference for Grid emission factor calculation spreadsheet and Appendix 4 of PDD as follows; - Electric Power in Thailand 2014/ Department of Alternative Energy Development and Efficiency, Ministry of Energy for NCV for Table 1 - Electricity Statistic Annual Report 2012-2014, Electricity Generating Authority of Thailand for Table 3, Table 6 , Table 7	5.1.3.2 Table 2-1	**1st Response by PPs on 03/07/2015** - Correct the reference document from "Electric Power in Thailand 2014" to "Thailand energy efficiency situation 2013" - Correct the reference source in table 3 from "Electricity Statistic Annual Report 2014" to 3 different source from "Energy Policy and Planning Office" as provided in foot note - Change table 6 to table 7 and correct the reference source from "Electricity Statistic Annual Report 2014" to "Data source of power generation for BM.rar" - Change table 7 to table 8 and correct the reference source from "Electricity	**4th comment by Validation team on 15/07/2015** Validation team reviewed the reference "Thailand energy efficiency situation 2013", it is found that the value is correctly applied in Grid emission factor calculation. With reference to table 7 and table 8 (previously table 6 and table 7) under Appendix 4 of revised PDD version 05 dated on 03/07/2015, the source of "Data source of power generation for BM.rar" was reviewed under CL26. Hence, this issue would be closed upon closure of CL26.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
		Statistic Annual Report 2014" to "Data source of power generation for BM.rar **5th Response by PPs on 24/07/2015** The source of Table 7, COD date for IPP and SPP is from **http://www.erc.or.th/ERCSPP/default.aspx?x=0&muid=23&prid=41** and source for COD date of EGAT is from **http://app04.erc.or.th/ELicense/Licenser/05_Reporting/504_ListLicensing_Columns_New.aspx?LicenseType=1** PP also provided information downloaded from this web link in "*List of SPP and IPP producers.xlsx"* and *"EE producer (EGAT).xls"* The source for table 8 is from EGAT. Please referred to "*Updated Grid Emission Factor for Thap Sakae.msg1*" contact number for confirmation of information is 0-2436-1143 (Mr. Panit Terdsudthironapoom)	Moreover, validation team could not find the source of COD data as indicated in table 7 and table 8. Hence, PP is requested to clarify/submit the sources for the COD data in Table 7 and 8. CL21 is pending. **5th comment by Validation team on 04/08/2015** Validation team reviewed the source http://www.erc.or.th/ERCSPP/default.aspx?x=0&muid=23&prid=41, http://app04.erc.or.th/ELicense/Licenser/05_Reporting/504_ListLicensing_Columns_New.aspx?LicenseType=1, and Updated Grid Emission Factor for Thap Sakae (Ref /28/) with the information in PDD. Furthermore, with reference to interview result with Mr. Panit Terdsudthironapoom, Engineer level 5, EGAT on 14/08/2015, it is found that the data source of power generation for BM are from based on reliable source and by responsible authority themselves.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			Hence, this is satisfied and accepted and CL21 is closed.
CL22 With reference to Table 2 and Table 3 of Appendix 4 and 'OM 2014' sheet of Grid Emission factor calculation, it is found that the same data have different data source, hence please confirm the data source used for calculation.	5.1.3.2 Table 2-1	**1st Response by PPs on 03/07/2015** Corrected reference source of Table 2 and Table 3 to be consistency with reference source from sheet of Grid Emission factor calculation.	**4th comment by Validation team on 15/07/2015** Validation team found that the reference sources of Table 2 and Table 3 are now corrected and found to be consistency with Grid Emission factor calculation spreadsheet. The revision is satisfied and CL22 is closed.
CL23 Please show the calculation spreadsheet for the result on Table 5 of Appendix 4	5.1.3.2 Table 2-1	**1st Response by PPs on 03/07/2015** Add calculation spreadsheet for Table 5 of Appendix 4 in Grid Emission factor calculation sheet.	**4th comment by Validation team on 15/07/2015** Validation team found that the details of calculation for the result in Table 5 are now shown in Grid Emission Factor calculation sheet. It is confirmed that the revised calculation is correct and in line with PDD version 05 dated on 03/07/2015. CL23 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
CL24 With reference to table 6 of Appendix 4 and 'BM 2014' sheet of Grid Emission factor calculation spreadsheet, please clarify the different of the following information from 2 sources as follows; - No.21 - Gulf JP THC Co., Ltd. and Gulf JP TLC Co., Ltd. - No.22 - Solar Power (Korat2) Co., Ltd. and K.R. Two Company Limited.	6.2.2 Table 2-1	**1st Response by PPs on 03/07/2015** - Correct reference source in table 6 of Appendix 4 from Gulf JP THC Co., Ltd. to Gulf JP TLC Co., Ltd. - Delete Solar Power (Korat2) Co., Ltd. and/or K.R. Two Company Limited due to they are power units registered as CDM project activities	**4th comment by Validation team on 15/07/2015** Validation team took note the response from PP. However, the information would be confirmed under closure of CL21. CL24 is pending. **5th comment by Validation team on 04/08/2015** With reference to closure of CL21 above, CL24 is closed.
CL25 As per para 71 (b) of Tool to calculate the emission factor for an electricity system Version 04.0 which stated that the '*Identify the set of power units, excluding power units registered as CDM project activities'*, please clarify that the set of power units provided in table 6 of Appendix 4 and 'BM 2014' sheet of Grid Emission factor calculation spreadsheet	6.2.2 Table 2-1	**1st Response by PPs on 03/07/2015** Delete the power units registered as CDM project activities from the list in table 6 of Appendix 4 and 'BM 2014' sheet of Grid Emission factor calculation spreadsheet **5th Response by PPs on 24/07/2015** PP added more electricity generation from registered CDM project on UNFCCC website by used information of electricity	**4th comment by Validation team on 15/07/2015** Validation team reviewed the revision in table 6 under Appendix 4 of PDD version 05 dated on 03/07/2015 and 'BM 2014' sheet of Grid Emission factor calculation spreadsheet, it is confirmed that the power units registered as CDM project activities are now removed. However, validation team reviewed that

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
did not relevant with power units registered as CDM project as follows; - Pasak Cholasit Dam/CDM project No. 9555 - EA solar nakhonsawan Co., Ltd. /CDM project No. 8446 - Khun Dan Prakanchol Dam/CDM project No. 10021 - K.R. Two Company Limited. /CDM project No. 7650 - First korat wind Co., Ltd. /CDM project No. 7474 - Bangchak Petroleum Pcl. /CDM project No. 6615 - Natural Energy Development Co., Ltd. /CDM project No. 5082 and/or 6787		supply to grid, indicated in the registered PDD. Please referred to *"Electricity supply to Grid from CDM projects.xlsx"* The summation of electricity supply to grid will be deducted from annual electricity generation of the project electricity system (AEG_{total})	the CDM registered projects on UNFCCC website which supply electricity to the grid, please clarify why there are only 7 power units which are registered as CDM project activities excluding from the annual electricity generation of the project electricity system (AEG_{total}). CL25 is pending. **5th comment by Validation team on 04/08/2015** Validation team reviewed the revised calculation and evidence "Electricity supply to Grid from CDM projects.xlsx" (Ref /27/). It is confirmed that registered CDM project activities are now excluding from the annual electricity generation of the project electricity system (AEG_{total}) with conservative manner. This is accepted and CL25 is closed.
CL26 Please indicate the reference source of the	6.3.1 Table 3	**1st Response by PPs on 03/07/2015** - Reference source for Fuel consumption for BM.xlsx provided as per "Data source	**4th comment by Validation team on 15/07/2015** Validation team found that the reference

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
following spreadsheet; - 'Fuel consumption for BM.xlsx' - 'Power Generation for BM.xlsx'		of fuel consumption for BM.rar" - Reference source for Power Generation for BM.xlsx provided as per "Data source of power generation for BM" **5th Response by PPs on 24/07/2015** The source for fuel consumption and power generation provided by EGAT, please referred to "*Updated Grid Emission Factor for Thap Sakae1.msg*" and "*Updated Grid Emission Factor for Thap Sakae2.msg*" contact number for confirmation of information is 0-2436-1143	provided are monthly report of fuel consumption and power generation, however, it could not be confirmed the sources of these information. Hence, PP is requested to clarify/provide original reference source of the evidence provided. Validation reviewed the reference provided as follows; **For power generation** It is found that there are some inconsistency of data between reference source and Grid Emission calculation sheet. Hence, CAR12 is raised. **For fuel consumption** - It is found that only 5 power units were referred in this calculation. Hence, please describe on how the fuel consumption for other power units was taken into account. - The fuel consumption from Chana (2) is inconsistency with the evidence provided With above findings, CL28 and CAR13

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
			are raised. CL26 is pending and CL28, CAR12, and CAR13 are raised. **5th comment by Validation team on 04/08/2015** With reference to interview result with Mr. Panit Terdsudthironapoom, Engineer level 5, EGAT on 14/08/2015 , it is confirmed that the evidences *Updated Grid Emission Factor for Thap Sakae1.msg*" (Ref/28/) and "*Updated Grid Emission Factor for Thap Sakae2.msg*" (Ref/29/) are from based on reliable source and provided by responsible authority themselves. Hence, this is satisfied and accepted and CL26 is closed.
CL27 With reference to the evidence 'Power Generation for BM.xlsx', please clarify why some power units for example 'Gulf JP NS Co., Ltd.' which was COD on 1 December	6.3.1 Table 2-1	**1st Response by PPs on 03/07/2015** PP corrected the information of electricity generation for 'Gulf JP NS co.,ltd.' and others.	**4th comment by Validation team on 15/07/2015** Validation team found that the calculation is now correctly revised. CL27 is now closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1, 2, 2-1	Summary of project owner response	Validation team conclusion
2014 had information of electricity generated since January 2014.			
CL28 With reference to BM emission factor calculation, please describe on how the fuel consumption for other power units excepted from 5 power unit provided was taken into account.		**1st Response by PPs on 24/07/2015** For other power units, PP has only information of electricity generation and supply to the grid. Therefore according to para 74 of "Tool to calculate the emission factor for an electricity system" version 04.0, the simple OM, Options A3 was applied for determination of $EF_{EL,m,y}$ of other power units. It is stated that "If for a power unit m only data on electricity generation is available, an emission factor of 0 t CO2/MWh can be assumed as a simple and conservative approach."	**5th comment by Validation team on 04/08/2015** Validation team took noted on justification from PP response, newly added description in Appendix 4 of the PDD version 6 dated on 24/7/2015 and recheck the BM emission factor calculation. The description is in line with "Tool to calculate the emission factor for an electricity system" version 04.0. Therefore, CL28 is closed.