# JCM Validation Report Form

## A. Summary of validation

A.1. General Information

| | |
|---|---|
| Title of the project | Power Generation by Waste Heat Recovery in Cement Industry |
| Reference number | TH006 |
| Third-party entity (TPE) | Lloyd's Register Quality Assurance Limited (LRQA) |
| Project participant contracting the TPE | NTT Data Institute of Management Consulting, Inc. |
| Date of completion of this report | 27/02/2019 |

A.2 Conclusion of validation

| | |
|---|---|
| Overall validation opinion | ☒ Positive<br>☐ Negative |

A.3. Overview of final validation conclusion

*Only when all of the checkboxes are checked, overall validation opinion is positive.*

| Item | Validation requirements | No CAR or CL remaining |
|---|---|---|
| Project design document form | The TPE determines whether the PDD was completed using the latest version of the PDD forms appropriate to the type of project and drafted in line with the Guidelines for Developing the Joint Crediting Mechanism (JCM) Project Design Document, Monitoring Plan and Monitoring Report. | ☒ |
| Project description | The description of the proposed JCM project in the PDD is accurate, complete, and provides comprehension of the proposed JCM project. | ☒ |
| Application of approved JCM methodology (ies) | The project is eligible for applying applied methodology and that the applied version is valid at the time of submission of the proposed JCM project for validation. | ☒ |
| Emission sources and calculation of emission reductions | All relevant GHG emission sources covered in the methodology are addressed for the purpose of calculating project emissions and reference emissions for the proposed JCM project. | ☒ |
| | The values for project specific parameters to be fixed *ex ante* listed in the Monitoring Plan Sheet are appropriate, if applicable. | ☒ |
| Environmental impact assessment | The project participants conducted an environmental impact assessment, if required by the Kingdom of Thailand, in line with Thai procedures. | ☒ |
| Local stakeholder | The project participants have completed a local stakeholder consultation process and that due steps were taken to engage | ☒ |

| Item | Validation requirements | No CAR or CL remaining |
|---|---|---|
| consultation | stakeholders and solicit comments for the proposed project. | |
| Monitoring | The description of the Monitoring Plan (Monitoring Plan Sheet and Monitoring Structure Sheet) is based on the approved methodology and/or Guidelines for Developing the Joint Crediting Mechanism (JCM) Project Design Document, Monitoring Plan, and Monitoring Report.<br>The monitoring points for measurement are appropriate, as well as whether the types of equipment to be installed are appropriate if necessary. | ☒ |
| Public inputs | All inputs on the PDD of the proposed JCM project submitted in line with the Project Cycle Procedure are taken into due account by the project participants. | ☒ |
| Modalities of communications | The corporate identity of all project participants and a focal point, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories are included in the MoC. | ☒ |
| | The MoC has been correctly completed and duly authorized. | ☒ |
| Avoidance of double registration | The proposed JCM project is not registered under other international climate mitigation mechanisms. | ☒ |
| Start of operation | The start of the operating date of the proposed JCM project does not predate January 1, 2013. | ☒ |

| Authorised signatory: | Mr. ☒ Ms. ☐ |
|---|---|
| Last name: Chiba | First name: Michiaki |
| Title: Climate Change Manager - Asia & Pacific | |
| Specimen signature: [redacted] | Date: 27/02/2019 |

## B. Validation team and other experts

| | Name | Company | Function* | Scheme competence* | Technical competence* | On-site visit |
|---|---|---|---|---|---|---|
| Mr. ☒ Ms. ☐ | Michiaki Chiba | LRQA Ltd. | Team leader | ☒ | Technical competence authorised | ☒ |
| Mr. ☒ Ms. ☐ | Srikanth Meesa | LRQA India | Team member | ☒ | N/A | ☒ |
| Mr. ☐ Ms. ☒ | Kannika Thiemtad | LRQA Thailand | Host country expert | ☐ | N/A | ☒ |
| Mr. ☒ Ms. ☐ | Stewart Niu | LRQA China | Internal reviewer | ☒ | N/A | ☐ |

*Please specify the following for each item.*

* *Function: Indicate the role of the personnel in the validation activity such as team leader, team member, technical expert, or internal reviewer.*

* *Scheme competence: Check the boxes if the personnel have sufficient knowledge on the JCM.*

* *Technical competence: Indicate if the personnel have sufficient technical competence related to the project under validation.*

## C. Means of validation, findings, and conclusion based on reporting requirements

C.1. Project design document form

**<Means of validation>**

The initial version of PDD was checked and confirmed as complete against the JCM Guidelines for Developing Project Design Document (PDD) and Monitoring Report (MR) No. JCM_TH_GL_PDD_MR_ver02.0. A valid form of the JCM PDD Form as of the time of commencement of the public comment period No. JCM_TH_F_PDD_ver02.0 was used. The completeness was also checked for the revised PDD Version 1.1 dated 05/02/2019 submitted by the PPs for resolution of validation findings as below mentioned.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

No issue was raised to the requirements of this section.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed that the PDD was completed using the valid form of the JCM PDD Form and in accordance with the JCM Guidelines for Developing PDD and MR.

C.2. Project description

**<Means of validation>**

The project is to introduce 12 MW Waste Heat Recovery (WHR) power generation system to improve energy efficiency of a cement plant of Siam City Cement Public Company Limited (SCCC) in Saraburi Province, Thailand. The project installs WHR boilers at the preheater (PH) section and Air Quenching Cooler (AQC) section of Kiln No. 3 (5,600 TPD), and steam generated from the boilers is used to generate electricity by a steam turbine and generator. The electricity produced by the project WHR power generation system is used for operation of the cement kiln displacing a part of grid electricity consumption. There is 1 MW back up diesel generator but it is not used for operation of the cement kiln.

The project WHR power generation system is introduced by Shanghai Conchi Kawasaki Engineering Co., Ltd. that technology is provided by Kawasaki Engineering Co., Ltd.

The project is implemented by Siam City Power Company Limited (SCP) and NTT Data Institute of Management Consulting Inc. SCP is a subsidiary of SCCC that operate plants to generate electricity utilising waste heat of cement production plants.

The start date of project operation is on 28/03/2018 and the expected operational lifetime of the project is for 15 years. The PPs referred to the Statutory useful life for the calculation of depreciation and amortization for machinery and equipment issued by Japan's Ministry of Finance for the basis of the expected operational lifetime of the machinery and equipment for the power industries indicated as for 15 years that covers the duration of the crediting period.

The project receives financial support for JCM model projects from the Ministry of the Environment, Japan. The PP from Japan assists transfer of low carbon technology on waste heat recovery and power generation in Thailand.

The validation team assessed the PDD and the supporting documents, interviewed the PPs to validate the requirements concerning accuracy and completeness of the project description.

Through the processes taken, CL 1 was raised as the resolution detailed below.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

Grade / Ref: CL 1

Nature of the issue raised: The PPs were required to clarify how the start date of project operation stated in the PDD section A.5 is determined and provide the evidence.

Nature of responses provided by the PPs: The PDD Section A.5. was revised with the start date of the project operation dated 28/03/2018 based on the date of Performance Guarantee Acceptance Certificate.

Assessment of the responses: The validation team reviewed the revised PDD with supporting

documents and confirmed that the start date indicated in the revised PDD (changed from 13/02/2018 to 28/03/2018) is in accordance with the date of the Performance Guarantee Acceptance Certificate for the project WHR power generation system. The CL was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team assessed the project description provided in the PDD with the supporting documents to the requirements on the accuracy and completeness. The validation team confirmed that the proposed JCM project in the PDD is described in accurate and complete manners that is understandable the nature of the proposed project activity.

C.3. Application of approved methodology(ies)

**<Means of validation>**

The project applied the approved methodology JCM_TH_AM007_ver01.0 Power Generation by Waste Heat Recovery in Cement Industry, Version 01.0.

LRQA assessed if the selected methodology is applicable to the proposed project. The project applicability was checked against each eligibility criterion in the selected approved methodology. The steps taken to validate each eligibility criterion and the conclusions about its applicability to the proposed project are summarised as below.

Criterion 1: The project installs waste heat recovery (WHR) system in the cement production facility.

Justification in the PDD: The project installed WHR & 12MW of electricity generation system in the site.

Steps taken for assessment: Document review was conducted on the project documentation, technical specification, the performance test report, and the on-site visit and interviews were conducted at the project site.

Conclusion: Based on the validation processes taken, the validation team confirmed that the project installed 12 MW WHR power generation system in the cement production plant and the criterion is met.

Criterion 2: WHR system utilizes only waste heat and does not utilize fossil fuels as a heat source to generate steam for power generation.

Justification in the PDD: Installed WHR system utilizes only waste heat and does not utilize fossil fuels as a heat source to generate steam for power generation.

Steps taken for assessment: Document review was conducted on the technical specification, diagrams, drawings, and the on-site visit and interviews were conducted at the project site.

Conclusion: Based on the validation processes taken, the validation team confirmed that the

project WHR power generation system utilises only waste heat from PH and AQC sections of the cement kiln and no fossil fuel is used as heat source to generate steam and electricity. Therefore, the criterion is met by the proposed project.

Criterion 3: WHR system has not been introduced to a corresponding cement kiln of the project prior to its implementation.
Justification in the PDD: This is the first WHR system introduced to Cement kiln of the project.
Steps taken for assessment: Document review was conducted on the request for approval of the project, explanatory documents of the project, the technical specification, the performance test report, and the on-site visit and interviews were conducted at the project site.
Conclusion: Based on the validation processes taken, the validation team confirmed that the Kiln No. 3 did not have WHR system prior to implementation of the project. The criterion was therefore fulfilled.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

No issue was raised to the requirements of this section.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed that the project applied the valid version of the approved methodology and the applicability was demonstrated to the eligibility criteria as appropriate.

C.4. Emission sources and calculation of emission reductions

**<Means of validation>**

The project supplies electricity generated by 12 MW WHR power generation system installed to the existing cement production plant for the self-consumption and displaces electricity purchased from the public power grid system.
The source of GHG emissions is consumption of grid electricity and CO2 emissions in the reference scenario are considered to determine the reference emissions (REs), while the project emissions (PEs) are assumed to be zero as the project WHR system does not use fossil fuels and electricity consumption by the WHR system is deducted to determine net electricity supply to the cement production facility in accordance with the applied methodology. The electricity generated by the project WHR system displaces a part of the electricity consumption of the cement kiln that is sourced from the public electricity grid. There is 1 MW back up diesel power generator but it is not used for operation of the cement plant. The annual electricity generation of the project is estimated ex-ante at 68,456.31 MWh. The estimation is based on the actual net electricity generation since start of the commercial operation and the validation team confirmed it is reasonable in consideration of the normal operation continued over the time and the

guaranteed average gross power output of 9.92 MW (the plant load factor is 68,456.31 MWh/y / 9.92 / 8,760 hrs/y = 78.8%). The guaranteed power output is based on the available heat energy from the waste heat source (cement kiln) and energy balance analysis, although the name plate power output capacity of the plant is 12 MW. The plant was normally operated on approximately 80% of days during the period and the estimation is considered realistic for the operational conditions that the WHR system can operate only with the associated cement plant. Electricity consumption by the WHR system is calculated by the total maximum rated capacity of equipment of the WHR system in MW and 24 hours/day x 365 days/y regardless of the non-operating days (e.g. for regular maintenance) for conservativeness. The total maximum rated capacity of equipment of the WHR system is determined as 1.81934 MW based on the name plate capacity that includes safety margin (approx. 25% in average) for conservativeness, while the capacity of standby equipment (0.5745 MW in total) is excluded from the calculation since those equipment is not operated at the same time. The most recent value of CO2 emission factor at the time of validation 0.5664 t-CO2/MWh is applied and fixed ex-ante in accordance with the Grid Emission Factor of Thailand published by Thailand Greenhouse Gas Management Organisation (TGO). There is back up diesel generator but electricity generated by the project WHR system displaces a part of electricity consumption of the cement plant that is sourced from the public electricity grid system. The CO2 emission factor applied is lower than the default CO2 emission factor for diesel fuel as given by the applied methodology. The annual GHG emission reductions (ERs) are calculated: ERs = REs - PEs = (68,456.31 MWh – 1.81934 MW x 24 hrs/d x 365 days/y) x 0.5664 – 0 = 29,746.7 t-CO2e. The project started operation from 28/03/2018 and the ERs in the first year is estimated as: 29,746.7 x 279/365 days = 22,737.9 tCO2e.

The validation team assessed the documented evidence and confirmed that all the relevant GHG emission sources covered in the applied methodology are addressed, and the steps taken and the equations applied to calculate REs for the proposed project comply with the requirements of the approved methodology.

Through the processes taken, CL 2 and CL 3 were raised as the resolution detailed below.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

Grade / Ref: CL 2

Nature of the issue raised: The PPs were required to provide evidence of total maximum rated capacity of equipment of the WHR system which consumes electricity to justify the estimation of the auxiliary energy consumption from the rated capacity of each equipment installed. The PPs were also required to confirm whether the Booster Fan installed next to AQC boiler is for

WHR and power generation.
Nature of responses provided by the PPs: The PPs provided the formal list of motors and consumers that shows maximum rated capacity of equipment. The original calculation used the utilised load of auxiliary equipment, that was corrected using the maximum rated capacity of each equipment.
The PPs also confirmed the Booster Fan is equipment required for the WHR system and its capacity is added in the calculation of the total maximum rated capacity of equipment.
The PPs revised ex-ante calculation to address estimated electricity generation in a year based on the actual generation and to reflect revision of the capacity of equipment of the WHR system.
Assessment of the responses: The validation team reviewed the revised spreadsheet calculation with the supporting evidence including the formal list of motors, specification and drawings of the booster fan. The figure of total capacity is changed from 0.9 MW to 1.81934 MW in the revised monitoring spreadsheet. The ex-ante estimation of ERs in a year was changed from 37,688 tCO2e to 29,746 tCO2e. The CL was closed.

Grade / Ref: CL 3
Nature of the issue raised: The applied CO2 emission factor for consumed electricity is based on the data of year 2016 and was published in September 2017. The PPs were required to confirm whether there is any latest emission factor, i.e. the one based on the data of the year 2017 made available at the time of commencement of the validation in 2018.
Nature of responses provided by the PPs: The PPs confirmed with IGES that the CO2 emission factor of 0.5664 tCO2/MWh is the latest one.
Assessment of the responses: The validation team reviewed confirmation from IGES that the referenced grid emission factor of Thailand is the latest one, and confirmed that the factor is the most recent one as published by TGO.
The CL was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed that:
- The methodology was applied correctly to calculate PEs and REs and no other significant emission source was identified that would be affected and reasonably attributed by implementation of the proposed project but not addressed by the applied methodology;
- The choice of whether an emission source or gas is to be included where the applied methodology allows was reasonably justified by the PPs;
- The Monitoring Plan Sheet (MPS) was not altered and the fields were filled in as required so that all estimates of the REs could be replicated using the data and parameter values provided

in the PDD;
- The values for the project specific parameters fixed ex ante listed in the MPS were appropriate with all the data sources and assumptions and the calculations were correct to the proposed JCM project;
- All assumptions and data used by the PPs were listed in the PDD, including their references and sources; and
- All values used in the PDD were considered reasonable in the context of the proposed JCM project.

C.5. Environmental impact assessment

**<Means of validation>**

The proposed project is to install 12 MW WHR power generation system to the existing cement production facility. An environmental impact assessment was conducted and the approval letter No. 1009.3/8804 was issued in August 2016 by the Office of Natural Resources and Environmental Policy and Planning. The validation team assessed the applicable legal requirements in the host country using its local sources/expertise and confirmed that an environmental impact assessment has been conducted following the host country procedures.

The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

No issue was raised to the requirements of this section.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed by assessing the relevant documents and using the local sources/expertise that the project does not need an environmental impacts assessment to be conducted to meet the legal requirement of the host country and the PDD satisfies the requirements of the JCM.

C.6. Local stakeholder consultation

**<Means of validation>**

The PPs identified staff of SCP as the main local stakeholders and held a consultation meeting. Representatives of the local stakeholders attended the meeting provided comments mainly related to the implementation of the project and no negative issue was raised through the process.

The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

No issue was raised to the requirements of this section.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed that the PPs have invited comments to the proposed project from the relevant local stakeholders, the summary of the comments received is provided in the PDD in a complete manner and the PPs have taken due account of all the comments received from the local stakeholders as the processes described in the PDD.

C.7. Monitoring

**<Means of validation>**

The MP consisting of the MPS and Monitoring Structure Sheet (MSS) is based on the approved methodology.

The net electricity supplied from the project WHR system to the cement production facility is conservatively calculated by deduction of maximum rated electricity consumption of equipment of the WHR system regardless of the actual operational load from electricity generated by the project WHR system. The quantity of electricity generation from the WHR power generation system is directly and continuously measured by an electricity meter. The accuracy class of the electricity meter is 0.2s and the test report for type approval has been provided by an external testing entity.

The roles and responsibilities of the persons are described in the MSS in accordance with the requirements of the applied methodology. The reading results of electricity meter are recorded, monthly checked by the QA/QC team, Deputy Project Manager and confirmed by Project Manager.

The validation team confirmed that the MP complied with the requirements in the approved methodology and that the PPs will be able to apply the MP following the monitoring arrangements described in it. CAR 1, CL 4 and CL 5 were issued that the details of resolution are as described below.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

Grade / Ref: CAR 1

Nature of the issue raised: The Monitoring Plan was not completed with the specific information of the project including the QA/QC procedures and the details of the measuring equipment on accuracy level and calibration information (frequency, date of calibration and

validity).
The energy production data (EG SUP,p) measured by an electricity meter is manually recorded in log book and transferred to the electronic sheets, while the DCS system is installed to collect data automatically. The PPs were required to clarify the monitoring procedures on data collection and to demonstrate how they implement the monthly check of recorded data and its integrity and avoid errors due to manual transaction.
Provision of type approval certificate of electricity meter was also required as evidence, if applied.
Nature of responses provided by the PPs: The PPs revised the monitoring spreadsheet to include specific information of the measurement methods and procedure. The PPs also provided the Monitoring Procedure including QA/QC and the certificate for type approval of the electricity meter.
Assessment of the responses: The validation team reviewed the revised MP that includes information of QA/QC procedures and the measuring equipment, the monitoring and QA/QC procedures including the monthly check of recorded data, the type approval certificate, and confirmed the specific information addressed for the project.
The CAR was closed.

Grade / Ref: CL 4
Nature of the issue raised: The PPs needed to clarify how the PPs ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the final issuance of credits.
Nature of responses provided by the PPs: The PPs provided the monitoring procedure referenced in the MP including the procedures to keep the required data.
Assessment of the responses: The validation team reviewed the revised MP, the monitoring procedures and confirmed that the PPs established the procedures to ensure keeping of data for the required time period.
The CL was closed.

Grade / Ref: CL 5
Nature of the issue raised: The PPs were requested to clarify the personnel who have been assigned to the roles described in the Monitoring Structure Sheet.
Nature of responses provided by the PPs: The PPs provided the monitoring procedure referenced in the MP including assignment of the responsible persons.
Assessment of the responses: The validation team reviewed the revised MP, the monitoring procedures and confirmed the responsible persons are assigned the relevant roles in accordance with the MSS.

The CL was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed that the MP was described in compliance with the requirements of the approved methodology and the Guidelines for developing PDD and MR, and the PPs have demonstrated feasibility of the monitoring structure and their ability to implement the MP.

C.8. Modalities of Communication

**<Means of validation>**

The MoC was submitted to LRQA in the form JCM_TH_F_MoC_ver01.0. The MoC nominates NTT Data Institute of Management Consulting, Inc. as the focal point entity and was signed by the authorized representatives of all the PPs with the contact details. The form used is the latest one as of the time of validation. The validation team assessed the personal identities including specimen signatures and employment status of the authorized signatories through directly checking the evidence for corporate and personal identity of the PPs and their authorised signatories. The validation team also confirmed through reviewing the corporate information of the PPs and by meeting the persons representing the PPs that the information provided in the MoC is correct.

CAR 2 was issued that the details of resolution are as described below.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

Grade / Ref: CAR 2

Nature of the issue raised: The MoC was not completed with the date of submission.

Last name and first name were opposite for signatories of the focal point entity.

Nature of responses provided by the PPs: The PPs submitted the revised MoC for review by the validation team.

Assessment of the responses: The validation team reviewed the revised MoC and confirmed it is completed with the date of submission on 10/01/2019 and names of signatories of the focal point entity in a correct order.

The CAR was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed that the MoC was completed using the latest form after assessment conducted on relevance of the MoC in compliance with the requirements of the JCM Guidelines.

C.9. Avoidance of double registration

**<Means of validation>**

The validation team assessed and confirmed relevance of the written confirmation in the MoC from the PPs that the proposed JCM project was not registered under the other international climate mitigation mechanisms.

The team in addition to the interviews with the PPs checked publicly accessible information of Clean Development Mechanism (CDM), Joint Implementation (JI), Verified Carbon Standard (VCS) and Gold Standard (GS) and found no identical project as the proposed JCM project in terms of the name of entities, applied technology, scale and the location. The result of researches confirmed that the proposed project was not registered under the other international climate mitigation mechanisms than JCM and it will not result in a double counting of GHG emission reductions.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

No issue was raised to the requirements of this section.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The validation team confirmed that the proposed JCM project was not registered under the other international climate mitigation mechanisms.

C.10. Start of operation

**<Means of validation>**

The start date for the operation of the proposed JCM project is indicated in the PDD as 28/03/2018.

The validation team confirmed correctness/relevance of the information by reviewing the supporting evidence, including but not limited to assessing of the contracts and commissioning report, and that the date is not before 01/01/2013 as required to be eligible as a JCM project.

**<Findings>**

*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*

No issue was raised to the requirements of this section.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

The start date for the operation of the proposed JCM project is indicated in the PDD as 28/03/2018.

| |
|---|
| The validation team confirmed correctness/relevance of the information by reviewing the supporting evidence, including but not limited to assessing of the contracts and commissioning report, and that the date is not before 01/01/2013 as required to be eligible as a JCM project. |

C.11. Other issues

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|---|
| **<Means of validation>**<br>No issue was identified as relevant element not covered above.<br>**<Findings>**<br>*Please state if CARs, CLs, or FARs are raised, and how they are resolved.*<br>Not applicable<br>**<Conclusion based on reporting requirements>**<br>*Please state conclusion based on reporting requirements.*<br>Not applicable |

## D. Information on public inputs

D.1. Summary of public inputs

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| In line with the JCM Project Cycle Procedure, the PDD is to be made publicly available for 30 days to invite public comments. The PDD was made publicly available in line with the requirements of the procedure for the period of 26/09/2018 to 25/10/2018 as per https://www.jcm.go.jp/th-jp/projects/53. |

D.2. Summary of how inputs received have been taken into account by the project participants

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|---|
| No comment was received during the above period to receive public inputs.<br>Thus no action was required to be taken by the PPs to satisfy the JCM requirement. |

## E. List of interviewees and documents received

E.1. List of interviewees

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|---|
| Siam City Power Company Limited<br>Niti Kaewwannasri, Electrical maintenance section head, Operations Dept<br>Suwicha Nummeechai, Technical Capacity Development (Production), Division Manager |

| |
|---|
| Chaninkorn Channgam, Mechanical Engineer<br><br>NTT Data Institute of Management Consulting, Inc.<br>Ajiro Atsushi, Senior Consultant, Socio& Eco Strategic Consulting Unit<br><br>Shanghai Conch Kawasaki Engineering Co., Ltd.<br>Wang Shan, Assistant Manager, Marketing & Sales Dept |

E.2. List of documents received

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| Category A documents (documents prepared by the PP)<br>- PDD Version 1.0 dated 19/09/2018 with the monitoring spreadsheet<br>- PDD Version 1.1 dated 05/02/2019 with the monitoring spreadsheet<br>- Original version of MoC submitted on 21/09/2018<br>- Revised MoC dated 10/01/2019<br>- Siam City Power Company Limited company overview and introduction of Waste Heat Recovery Power Plant project<br>- Request for Approval – K3 Upgrading & WHR Power Plant Project<br>- Project implementation schedule<br>- General layout the WHR project<br>- Heat and water balancing diagrams<br>- PH Boiler arrangement drawing<br>- PH boiler system and AQC boiler system drawings<br>- Cooling tower system drawing<br>- Flow sheet of demineralizer system<br>- Flow sheet of raw water treatment system and layout<br>- P&I drawing of the PH boiler<br>- P&I drawing of the AQC boiler<br>- Wastewater treatment for the boiler blow down<br>- PEA electricity bills before and after the project<br>- Calculation sheet for boiler casing<br>- List of hoists<br>- Pneumatic equipment list<br>- Technical specifications of the booster fans and fan chrematistic curve<br>- Booster fan assembly drawing<br>- Data sheet of the energy production for year 2018 |

- Organizational Structure
- Single Line Diagram
- Energy balance of WHR system
- Performance Guarantee Test Acceptance Certificate dated 28/03/2018
- Performance Guarantee Test Report
- Performance Test Report dated 29/12/2017
- Evidence for MoC
- Useful lifetime based on the act of Japan's Ministry of Finance for calculation of useful lifetime for depreciation and amortization
- Motor and Load list
- Monitoring Procedure including Quality Assurance / Quality Control (QA/QC) for K3 WHR Project
- Letter of Monitoring Procedure and Data Archiving for JCM project dated 24/01/2019
- Three Phase Electronic Digital Energy Meter User Manual, Wasion Group Limited
- Permission for manufacturing of measuring equipment
- Report for type approval of measuring equipment No. 201312179
- GB/T 17215.323-2008/IEC 62053-23:2003 Electricity metering equipment (a.c.) – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3)
- Confirmation of the latest grid emission factor of Thailand with IGES
- Letter for approval of EIA issued by Office of Natural Resources and Environmental Policy and Plannning No. 1009.3/8804
- Air and water testing report after the project implementation dated 6th March 2018
- Meeting Minutes of local stakeholder consultation meeting dated 07/11/2017
- List of LSC attendees

Category B documents (other documents referenced)
- JCM_TH_AM007_ver01.0 Power Generation by Waste Heat Recovery in Cement Industry, Version 01.0
- Additional Information to the Proposed Methodology "Power Generation by Waste Heat Recovery in Cement Industry, Version 1.0"
- JCM Project Cycle Procedure JCM_TH_PCP_ver02.0
- JCM Guidelines for Validation and Verification JCM_TH_GL_VV_ver01.0
- JCM Guidelines for Developing PDD and MR JCM_TH_GL_PDD_MR_ver02.0
- JCM Glossary of Terms JCM_TH_Glossary_ver01.0
- JCM PDD Form JCM_TH_F_PDD_ver02.0
- JCM MoC Statement Form JCM_TH_F_MoC_ver01.0
- JCM Validation Report Form JCM_TH_F_Val_Rep_ver01.0

- Approved CDM Methodological Tool to calculate the Emission Factor for an electricity system
- Proposed and registered projects under CDM, VCS, Gold Standard, and the other international schemes
- IEC 62053-22:2003, Electricity metering equipment (ac) - Particular requirements. Part 22: Static meters for active energy (classes 0,2 S and 0,5 S)
- IEC 62053-23:2003, Electricity metering equipment (ac) - Particular requirements. Part 23: Static meters for reactive energy (classes 2 and 3)
- APLMF Economy Report Thailand, Central Bureau of Weights and Measures
- Weights and Measures Act B.E. 2542 (1999)

## Annex Certificates or curricula vitae of TPE's validation team members, technical experts and internal technical reviewers

*Please attach certificates or curricula vitae of TPE's validation team members, technical experts and internal technical reviewers.*

Certificate of Appointment is attached to this report.

## Joint Crediting Mechanism Certificate of Appointment

Title of Project: Validation for Power Generation by Waste Heat Recovery in Cement Industry (Project Ref # TH006)

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the JCM project.

| Name of Person | Assigned Roles |
|---|---|
| Michiaki Chiba | Team Leader |
| Srikanth Meesa | Team Member |
| Kannika Thiemtad | Host Country Expert |
| Stewart Niu | Technical Reviewer |

Signed by

[redacted]

Michiaki Chiba
Climate Change Manager – Asia & Pacific
18/12/2018