JCM Validation Report Form

A. Summary of validation

A.1. General Information

Title of the project	Power generation by waste heat recovery in the PT Semen Indonesia (Persero) Tbk factory in Tuban
Reference number	ID013
Third-party entity (TPE)	Japan Quality Assurance Organization (TPE-ID-003)
Project participant contracting the TPE	JFE Engineering Corporation
Date of completion of this report	06/03/2018

A.2 Conclusion of validation

Overall validation opinion	☒ Positive ☐ 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 Republic of Indonesia, in line with Indonesia's procedures.	☒

Item	Validation requirements	No CAR or CL remaining
Local stakeholder consultation	The project participants have completed a local stakeholder consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed project unless a local stakeholder consultation has been conducted under an environmental impact assessment.	☒
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. 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: Asada First name: Sumio

Title: Senior Executive

Specimen signature:

[redacted]

Date: 06/03/2018

B. Validation team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☒ Ms. ☐	Koichiro Tanabe	JQA	Team Leader	☒	Authorized	☐
Mr. ☒ Ms. ☐	Irhan Febijanto	External individual	Team Member	☒	Authorized	☒
Mr. ☒ Ms. ☐	Tadashi Yoshida	External individual	Internal reviewer	☒	Authorized	☐

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>

A series of the JCM approved forms, including Project Design Document (hereinafter referred to as "PDD") form, was checked and confirmed as complete against the JCM Guidelines for developing Project Design Document and Monitoring Report (hereinafter referred to as "JCM Guidelines"): JCM_ID_GL_PDD_MR_ver02.1.

A valid form of the PDD of JCM_ID_F_PDD_ver01.1 is used for the PDD version 01.0, dated 26/09/2017 (as the first edition) and for the PDD version 02.0, dated 30/11/2017 (as the second edition). The validation was conducted on the first edition, and the result was reflected on the second edition of PDD appropriately.

<Findings>

No issues were identified to the requirement.

<Conclusion based on reporting requirements>

JQA confirms that the PDD is completed using the valid form of the JCM PDD form and drafted in accordance with the JCM Guidelines for developing PDD and MR.

C.2. Project description

<Means of validation>

The purpose of the proposed JCM project is to reduce CO_2 emission emitted by the regional grid system through an implementation of Waste Heat Recovery Power Generation (hereinafter referred to as WHRPG) system. The WHRPG utilizes waste heat generated from the cement production facility to generate electricity and supply the generated electricity to the facilities in PT Semen Indonesia (Persero) Tbk factory located in Tuban, East Java, Indonesia. The technology of WHRPG is proposed and installed by JFE Engineering Corporation (hereinafter referred to as JFE). WHRPG consists of four units of Suspension Preheater (SP) Boiler and four units of Air Quenching Cooler (AQC) boiler and one unit of steam-turbine generator having a capacity of 30.6MW. Waste heat from preheater tower with temperature of 400ºC and from clinker cooler with temperature of 300ºC are used to generate steam in SP Boiler and AQC Boiler, respectively. The steam is flowed to the steam turbine-generator and generates electricity of 165,076 MWh/year, which equal with 20% of imported electricity amount from PT. PLN (The state-owned electricity company). By using the WHRPG, CO_2 emission emitted from the regional grid system will be reduced to 149,063 t-CO_2, annually.

The proposed JCM project is implemented by PT Semen Indonesia (Persero) from Indonesian side and JFE from Japan side. The starting date for the project is 30/04/2018, which is the day for starting to monitor data collected. The expected operational lifetime of the proposed JCM project is 9 (nine) years, which is required based on the legal durable of the Ministry of Finance, JAPAN, No.15/1965 concerning the equipment life time. Based on the JFE experience, the oldest WHRPG have been operating since 1985 until today, it has been operating for 32 years continuously.

The proposed JCM Project was partially supported by the Ministry of Environment, Japan through the financing programme for JCM model projects, which provided financial support of less than half of the initial investment for the projects in order to facilitate GHG emission reduction project in Indonesia and to acquire JCM credits.

Regarding the technology transfer, JFE conducted operation and maintenance training for the boiler, steam-turbine, and generator on 11/01/2017 and trial operation period, On Job Training (OJT) is scheduled to be conducted in the actual work under the guidance of JFE. JQA assessed the first version of PDD and the supporting documents and conducted on-site assessment on 23/11/2017 to validate the requirements about accuracy and completeness of the project description. The details

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

Regarding the latitude and the longitude of the project site and the sentences used to explain the purpose of the project, JQA raised CL01. This was resolved in "Findings".

<Findings>

CL01

The latitude and the longitude of the project site of the proposed JCM project are not written in line with JCM_ID_GL_PDD_MR_ver02.1. Therefore, it is requested to clarify the latitude and the longitude of the project site of the proposed JCM project accordingly.

Resolution of CL01 by the PPs

The PP revised the latitude and the longitude of the project site written in A.3. The revision of the latitude and the longitude is in line with JCM_ID_GL_PDD_MR_ver02.1. Therefore, JQA concludes that this revision is correct, and the CL is closed.

<Conclusion based on reporting requirements>

It is confirmed that the project description of the PDD is reasonable and appropriate. The issue raised by the team validation has been fully clarified.

C.3. Application of approved methodology(ies)

<Means of validation>

The project applied the approved methodology of JCM_ID_AM001_ver01.0, "Power Generation by Waste Heat Recovery in Cement Industry". The methodology is approved by the Joint Committee on 19/05/2014 and valid as of the time of the validation.

JQA assessed whether the selected methodology was applicable to the proposed JCM project. The proposed JCM project applicability was checked against six eligibility criteria stipulated in the Approved Methodology. The steps taken to validate each eligibility criterion and the conclusion about its applicability to the proposed JCM project are summarized as below.

Criterion 1: The project utilizes waste heat from the cement production facility by waste heat recovery (WHR) system to generate electricity."

Justification in the PDD: Four WHR systems are planned to be installed by JFE Engineering Corporation at the facility of PT Semen Indonesia (Persero) Tbk in Tuban to utilize waste heat from the cement production facility and generate electricity.

Assessment and conclusion: It is confirmed through the review of the relevant documents provided by JFE and interview with by JFE and PT Semen Indonesia during the on-site assessment that the four WHR systems of WHRPG are installed for four kilns of the cement factory respectively. Waste heat recovered from a clinker cooler and a preheater tower in each cement kiln is utilized to generate electricity, and it reduces 20% of the electricity amount imported from the regional grid system. The reduction of electricity import results in emission reduction emitted from the regional grid system, which is 149,063t-CO2 annually. Therefore, the validation team concludes that the Criterion 1 is satisfied.

Criterion 2: WHR system consists of a Suspension Preheater boiler (SP boiler) and/or Air Quenching Cooler boiler (AQC boiler), turbine generator and cooling tower.

Justification in the PDD: The project WHR systems consist of four Suspension preheater boilers (SP boilers), four air quenching cooler boilers (AQC boilers), one turbine generator and one cooling tower originally designed by JFE Engineering Corporation.

Assessment and conclusion: It is confirmed through the review of the general arrangement of WHR generation in Tuban Plant and from the interview with JFE and PT SI during on-site assessment that the proposed JCM project has four WHR systems and each WHR system consists of one unit of Suspension Preheater boiler (SP boilers) and one unit of Air Quenching Cooler (AQC) boiler. The waste heat (steam) from four unit of SP boiler and four unit of AQC boiler is flowed to the steam header and the steam is supplied to a steam turbine-generator with a capacity of 30.6 MW. Therefore, JQA concludes that the Criterion 2 is satisfied.

Criterion 3: 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: The project WHR systems utilize only waste heat and do not utilize fossil fuels as a heat source to generate steam for power generation.

Assessment and conclusion: It is confirmed through the review of the general arrangement drawing and process flow diagram of WHR system in Tuban Plant and the interview with JFE and PT SI during on-site assessment that the waste heat to be used for producing steam in each Suspension Preheater (SP) boiler and Air Quenching Cooler (AQC) boiler is only recovered from a clinker cooler and a suspension preheater, respectively. Therefore, JQA concludes that the Criterion 3 is satisfied.

Criterion 4: WHR system has not been introduced to a corresponding cement kiln of the project prior to its implementation.

Justification in the PDD: At the facility of PT Semen Indonesia (Persero) Tbk in Tuban, no WHR system has been introduced to a corresponding cement kiln of the project prior to its implementation

Assessment and conclusion: It is confirmed from photo showing the situation around Turban factory on February 2015 that there was no WHR system before the proposed JCM project implemented. Therefore, JQA concludes that the Criterion 4 is satisfied.

*Criterion 5: The cement factory where the project is implemented is connected to a grid system and the theoretical maximum electricity output of the WHR system, which is calculated by multiplying maximum electricity output of the WHR system by the maximum hours per year (24 * 365 = 8,760 hours), is not greater than the annual amount of the electricity imported to the cement factory from the grid system:*

- *During the previous year before the validation, if the validation of the project is conducted before the operation of the project, or*
- *During the previous year before the operation of the project, if the validation of the project is conducted after the operation of the project*

Justification in the PDD: The cement factory of PT Semen Indonesia (Persero) Tbk is connected to an Indonesian grid system and its theoretical maximum electricity output is 268,056 MWh (rated generation capacity is 30.6 MW). It is not expected to be

greater than the annual amount of the electricity imported to the cement factory from the grid system during the previous year before the validation, which is 1,217,155 MWh.

Assessment and conclusion: It is confirmed through the review of relevant documents list related to the capacity of each auxiliary equipment installed in four units of SP boiler and AQC boiler, including one unit of the steam-turbine generator, that the total capacity of auxiliary equipment is 3,681.84 kW. The maximum of electricity generated by the WHR system is = 268,023.76 MWh (= (30,600-3.69) x 8,760 hr/yr), which is lower than the imported electricity in the previous year of 1,217,155 MWh. The imported electricity of the previous year is cross-checked with the invoice of electricity imported from PT. PLN. Therefore, JQA concludes that the Criterion 5 is satisfied.

Criterion 6: The WHR system is designed to be connected only to an internal power grid of the cement factory.

Justification in the PDD: This project WHR systems are connected only to the internal power grid of the cement factory of PT Semen Indonesia (Persero) Tbk.

Assessment and conclusion: It is confirmed through the review of single line diagram of the proposed JCM project and the interview with PPs that the project WHR systems are connected only to the internal power grid of the cement factory. Therefore, JQA concludes that the Criterion 6 is satisfied.

<Findings>

No issues were identified to the requirement.

<Conclusion based on reporting requirements>

JQA confirms that the project applies the valid version of the approved methodology and the applicability is demonstrated to the eligibility criteria of the methodology as appropriate.

C.4. Emission sources and calculation of emission reductions

<Means of validation>

The proposed project aims to reduce electricity imported from the regional grid system by WHR system proposed by JFE. The technology utilizes waste heat of flue gas from a suspension preheater and a clinker cooler to produce steam which used to generate electricity in a steam-turbine generator. The generated electricity contributes

to reduce the GHG emission of the regional grid system.

The net electricity generated by WHRPG is totally 165,076 MWh/yr. It is calculated based on parameters, includes:

- 28MW: substantial capacity of electricity generation in dry season;
- 22MW: substantial capacity of electricity generation in season;
- 164.5 days: average operation days in dry season;
- 164.5 days: average operation days in rainy season;
- 100%: operating rate of kiln facility
- 3.69MW: substantial capacity of auxiliary power consumption

CO_2 emission factor for the grid electricity in the regional grid system is 0.903 tCO_2/MWh adopted from the ex-post value of Jamali grid system published by the JCM Indonesian Secretariat on the dedicated website as below.

http://jcm.ekon.go.id/en/index.php/content/Mzg%253D/emission_factor

Reference emission, RE_p is calculated ex-ante by multiplying the quantity of net electricity generated by WHR system(EG_p) which replaces grid electricity import during a given time period (p) with CO_2 emission factor, for the regional grid system (EF_{grid}). The CO_2 emission reduction during the period p are calculated by the following equations, in line with the approved methodology.

$EG_p = EG_{SUP,p} – EC_{CAP}$ x 24 hours/day x Dp
= (28 MW x 24 hours/day x 164.5 day + 22 MW x 24 hours/day x 164.5 day) -
(3.69 MW x 24 hours/day x 365 day
= 197,400 MWh – 32,324 MWh
= 165,076 MWh

$RE_p = EG_p$ x EF_{grid}
= 165,076 MWh x 0.903 tCO_2/MWh
= 149,063 tCO_2

Therefore, CO_2 emission reduction is estimated to be 149,063 tCO_2 annually, and the sum of the emission reductions up to 2020 is estimated to be 397,501 tCO_2.

It is confirmed through the review of the relevant documents and on-site assessment that all CO_2 emission source specified by the applied methodology are identified, and the reference emissions, project emissions and emission reductions in

the PDD (ver. 2.0) and Monitoring Plan Sheet are correctly calculated, in accordance with the methodology ID_JCM_ID_AM001_ver01.0

The value of operating time for WHRPG and auxiliary equipment are higher than the real time in the previous years. JQA raised CAR01. This was resolved in Findings below.

<Findings>

CAR01

As for $EG_{SUP,p}$ (the quantity of the electricity supplied from the WHR system to the cement production facility during given time period), a given time period p is higher than the real operational time of four kilns in PT Semen Indonesia in Tuban Factory. Therefore, it is requested to review it accordingly.

Resolution of CAR01 by the PPs

The PPs revised the explanation regarding WHR system which was conducted during the on-site visit. The WHR system basically does not stop as long as any one of the kilns continues to operate, and actually, until today all the kiln never stopped at the same time. The operating days is revised from 182.5 days to 164.5 days to each dry season and rainy season in accordance with the annual operation day of the past operation record. In addition, there is a revision of the availability factor of WHR system, from the assumed 0.85 to 1 and the own electricity consumption, from 2.4 to 3.69 MW.

The revision related to the number of the operating day of WHR system, the value of availability factor of WHR system and the own electricity consumption can be accepted and logical. Due to these revisions, the amount of emission reductions is also revised. Therefore, JQA concludes that these revisions are correct, appropriate and in line with the real condition. CAR01 is closed.

<Conclusion based on reporting requirements>

The validation team has reached the conclusion through the validation that the selected emission sources and GHG types are justified for the JCM project. The validation team has assessed values for project-specific parameters to be fixed ex ante in the MPS and intermediate processes to derive the values. As a result, these

are considered reasonable in the context of the proposed JCM project. The issue raised by the team has been fully clarified, which resulted in a revision of the PDD and the MPS.

C.5. Environmental impact assessment

<Means of validation>

The proposed JCM project is to reduce CO_2 emission by the reduction of electricity import from the regional grid through the electricity generation by use of the WHR system. The PDD states that an Environmental Impact Assessment (hereinafter referred to as EIA) is not required.

According to Ministerial Regulation of Environment No. 5/2012, a power generation having a capacity over than 10 MW must prepare ANDAL (Indonesian Environmental Impact Analysis). PT Semen Indonesia has been granted the ANDAL for the proposed JCM project through the addendum of ANDAL issued by Head of Tuban Regency, No.188.45/158/KPTS/414.012/2015, dated June 9, 2015. JQA raised CAR02. This was resolved in “Findings”.

<Findings>

CAR 02

The explanation related to the Environmental Impact Assessment in section D of PPD does not meet the requirement written the Environmental Impact Assessment issued by Head of Tuban Regency, No.188.45/158/KPTS/414.012/2015 in 2015.

Resolution of CAR02 by the PPs

The PPs revised the answer for a requirement of environmental impact assessment for the proposed project, from “NO” to “YES” in Section of D. The answer revised by the PPs is in line with the existence of EIA, No.188.45/158/KPTS/414.012/2015, signed by Head of Tuban Regency. It is also confirmed through reviewing the EIA report and the relevant Environmental Permit that the proposed JCM project has not substantially affected the results of the EIA report. Therefore, JQA concludes that this revision is correct and in line with the real condition. CAR2 is closed.

<Conclusion based on reporting requirements>

The validation team has concluded that the project design of the proposed JCM

project is in accordance with the EIA regulation in Indonesia.

C.6. Local stakeholder consultation

<Means of validation>

PPs conducted the stakeholder consultation on 15/08/2017 at Plant Site Dormitory of Tuban Cement Factory in Tuban City. The invitation letter was distributed to the stakeholders on 15/01/2017. The participants are listed as follows:

- Representative of Indonesia JCM Secretariat
- Representative of Cement Association
- Representative of JFE Engineering Corporation
- Representative of Semen Indonesia
- Representative of PT PLN
- Representative of Tuban Local Governemnt
- Represenataive of Villages

The local stakeholders provided positive comments for the proposed JCM project. There was no negative issue that requires action to be taken by the PPs which raised through the consultation. It is confirmed through the review of the relevant documents and the interview with the PPs during on-site assessment that the stakeholder consultation process was appropriately conducted to collect stakeholder's opinion. The summary of the comments received in the consultation and due account of all comments taken by the PPs are fully described in the PDD.

The date of stakeholder meeting is not consistent with the date in Minute of Meeting of the stakeholder meeting. Also, the stakeholder implementation process is described incompletely. JQA raised CL02 and CL03. These were resolved in Findings below.

<Findings>

CL02

The date of local stakeholder consultation in the PDD is not consistent with the date in the Minute of Meeting.

Resolution of CL02 by the PPs

The date of local stakeholder meeting in E.1 is correctly revised to 15/08/2017, which is consistent with the date in. the Minute of Meeting of the local stakeholder

meeting. Therefore, CL02 is closed. .

CL03

The description of stakeholder implementation process is not written completely in line with JCM_ID_GL_PDD_MR_ver02.1.

Resolution of CL03 by the PPs

The PPs added the stakeholder consultation explanation in E.1 with explanation related to the invitation process. The additional explanation related to the invitation process (the date of invitation and the answer from the invited institutions/companies) is in line with the JCM_ID_GL_PDD_MR_ver02.1. Therefore, JQA concludes that this revision is appropriate. CL03 is closed.

<Conclusion based on reporting requirements>

The validation team has concluded that the local stakeholder consultation of the proposed JCM project is adequate.

C.7. Monitoring

<Means of validation>

The Monitoring Plan consists of the Monitoring Plan Sheet and Monitoring Structure Sheet, which complies with the Approved Methodology of JCM_ID_AM001_ver01.0. There is one parameter “the quantity of the electricity supplied from the WHR system to the cement production facility during a given time period p ($EG_{sup,p}$)”, which is measured by electricity meter installed in the generator. The measured data is automatically transmitted to the server for recording in the control room.

The generated electricity is monitored continuously, and the data recorded is double-checked by a responsible staff monthly to prevent a data missing. The factory calibration of electricity meter is carried out by Schneider Electric in accordance with Schneider Electric’s verification procedures on 07/08/2015.

The roles and responsibility of the personnel are described in the Monitoring Structure Sheet in accordance with the requirements of the applied methodology. The monitoring structure consists of:

- Manager, Sales and Marketing, Overseas Business Div., Energy Sector, JFE Engineering Corporation, who has a responsibility for monitoring results and reporting;
- General Manager, Raw Material Production Department, KSO SG-Semen Indonesia, who has a responsibility for monitoring results;
- Senior Manager, Bureau of WHRPG, KSO SG-Semen Indonesia, who has a responsibility for appointing to be in charge of approving the archived data after being checked and corrected when necessary;
- Maintenance Manager, Section of WHRPG, KSO SG-Semen Indonesia, which has a responsibility for appointment to be in charge of monitoring procedure (data collection and storage), including monitoring equipment and calibrations, and training of monitoring personnel, and;
- Maintenance Manager, Section of WHRPG, KSO SG-Semen Indonesia, which has a responsibility for appointment to be in charge of checking the archived data.

After interview with Responsible personnel, the monitoring structure was required to revise due to an inappropriate position for the archiving and checking data. JQA raised CL04. These were resolved in Findings below.

<Findings>

CL04

Based on explanation from the PT Semen Indonesia, the responsible personnel in Monitoring Structure Sheet should be revised for a role of charge of checking the archived data.

Resolution of CL04 by the PPs

The PPs revised the responsible personnel for monitoring procedure (data collection and storage), including monitoring equipment and calibrations and training of monitoring personnel, and for checking the archived data in the Monitoring Structure Sheet (MSS). The revised MSS shows that the following personnel will be assigned respectively. As a result, the validation team concludes that this revision is appropriate. Therefore, CL04 is closed.

Before revision of MSS	After revision of MSS
Maintenance Manager, Section of WHRPG, KSO SG-Semen Indonesia,	Manager, who is appointed to be in charge of monitoring procedure (data

which has a responsibility for appointment to be in charge of monitoring procedure (data collection and storage), including monitoring equipment and calibrations, and training of monitoring personnel	collection and storage), including monitoring equipment s and calibrations, and training of monitoring personnel.
Maintenance Manager, Section of WHRPG, KSO SG-Semen Indonesia, which has a responsibility for appointment to be in charge of checking the archived data.	Supervisor, who is appointed to be in charge of checking the archived data.

<Conclusion based on reporting requirements>

The validation team has concluded that Monitoring Plan of the proposed JCM project complies with the requirements of the methodology and/or PDD and Monitoring Guidelines, and the project participants have ability to implement the described Monitoring Plan, including Monitoring Structure Sheet.

C.8. Modalities of Communication

<Means of validation>

The latest version of MoC was submitted to JQA for review at the time of validation, JCM_ID_F_MoC_ver.01.0, in which a person of JFE is nominated as the focal point. The MoC was signed by the authorized representatives of all the PPs with the contact details.

JQA has assessed the personal identities including specimen signatures and employment status of the authorized signatories directly through the interview with PPs during on-site assessment. Primary authorized signatory of JFE is Mr. Hiroshi OKUDA as Manager, Sales and Marketing, Overseas Business Division, Energy Sector, and alternate authorized signatory is Mr. Akira TAN as General Manager, Sales and Marketing, Overseas Business Division, Energy Sector. Primary authorized signatory of PT. Semen Indonesia (PERSERO) is Mr. Teguh SUTRISNO as GM of Process and Technology Development, and alternate authorized signatory is Mr. Afifudin ZUHRI, as SM of Process and Technology Development.

It is confirmed that all corporate and personal details including specimen signatures and the information in the MoC are valid and accurate as requested in the JCM Guidelines for Validation and Verification.

<Findings>

No issues were identified to the requirement.

<Conclusion based on reporting requirements>

The validation team has concluded that the MoC complies with all relevant forms and requirements.

C.9. Avoidance of double registration

<Means of validation>

The representative of focal point entity in MoC, Mr. Hiroshi OKUDA, Manager, Sales and Marketing, Overseas Business Division, Energy Sector of JFE Engineering Corporation declares in the MoC that the proposed JCM project is not registered under any other international climate mitigation mechanism other than the JCM.

It is confirmed through the check of publicly available information of Clean Development Mechanism (CDM), Verified Carbon Standard (VCS), etc. that the proposed JCM project is not registered under other international climate mitigation mechanisms in terms of the name of entities, applied technology, scale, and the location. Thus, it can be concluded that the proposed JCM project will not result in double counting of GHG emission reductions.

<Findings>

No issue was raised to the requirement.

<Conclusion based on reporting requirements>

JQA confirms that the proposed JCM project is not registered under the other international climate mitigation mechanisms and hence will not result in double accounting of GHG emission reductions.

C.10. Start of operation

<Means of validation>

The starting date of the proposed JCM project was initially set as 20/12/2017 in the PDD. It is confirmed through the review of relevant documents, on-site assessment and the interview with the PPs that the operation of the proposed JCM project is planned to start on the date. In the meantime, it is also confirmed that the starting date of monitoring activities is behind the schedule, since the PPs need to align the monitoring activities and the maintenance schedule of four kilns in normal operation. Thus, JQA raised CAR 03, and this issue was resolved in Findings below.

<Findings>

CAR03

The starting date in section A.5 of the PDD does not meet with the kiln maintenance schedule to be planned by PT Semen Indonesia (Persero) Tbk. Therefore, it is necessary to reschedule based on the kiln maintenance schedule of Tuban factory.

Resolution of CAR03 by the PPs

The PP revised the starting date of project operation in A.5. The starting date of 20/12/2017 is revised to 30/04/2018. According to the explanation of PPs during the on-site visit, this date is set based on PT Semen Indonesia's maintenance schedule, and consequently, the estimation of emission reduction in the year of 2017 is deleted. Therefore, JQA concludes that this revisions are correct and in line with the actual condition, and the CAR3 is closed.

<Conclusion based on reporting requirements>

JQA confirms through the relevant documents and during on-site assessment that the starting date of the proposed JCM project operation has been set appropriately as required by the Guideline of the JCM project.

C.11. Other issues

<Means of validation>

No issue was identified as relevant element not covered above

<Findings>

Not applicable.

<Conclusion based on reporting requirements>

Not applicable.

D. Information on public inputs

D.1. Summary of public inputs

In line with the JCM Project Cycle Procedure, the PDD was made publicly available for the period of 13/12/2017 to 11/01/2018 to invite public comments, in line with the requirements of the procedure. https://www.jcm.go.jp/id-jp/projects/36

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

Not applicable

E. List of interviewees and documents received

E.1. List of interviewees

1. JFE Engineering Company
   - Hiroshi Okuda, Manager, Sales and Marketing, Overseas Business Division, Energy Sector
   - So Wakita, Assistant Manager of Energy Plant Engineering Dept.
   - Yoshiyuki Yuyama, Project Manager, Biomass Energy Plant Division
   - Yani M Jaya, Consultant

2. PT. Semen Indonesia (PERSERO), Tbk.
   - Teguh Sutrisno, General Manager of Process & Technology Development
   - Yuli Yastoro, Manager of Process & Technology Development
   - Wiwied Bhakti, Senior Manager of Project Management Plant Performance and DI
   - Sholihin, Senior Manager of Project Management Plant Performance and DI
   - Adi Suprayono, Senior Manager of Electrical Instrument Maintenance
   - Risqul Hidayat, Senior Manager of Project Service
   - Rachmad Dwiyanto, Supervisor of Project Service.
   - Rahadi Mahardika, Senior Manager of Environmental Monitoring
   - Mochammad Farid, Manager of Waste Heat Recovery Power Generation Maintenance
   - Kokoh Adicaraka, Manager of Waste Heat Recovery Power Generation Operation

- Ajiono Rahmadhani, Manager of Project Service
- Marissa A.R., Staff of Project Control and Risk Management
- Shinta M, Staf of Project Management Plant Performance and DI

3. Mitsubishi UFJ Research and Consulting Co., Ltd.
   - Shinichiro Sano, Chief Consultant
   - Hiroaki Sakai, Senior Consultant

E.2. List of documents received

1. Project Design Document, for publication (JCM_ID_PDD_JFEE_ver01_171106.pdf)
2. Monitoring Plan Sheet and Monitoring Structure Sheet, for publication (JCM_ID_AM001_JFEE_ver01_171106.xlsx)
3. Modalities of communications statement, for publication (JCM_ID_F_MoC_ver01.0_171106.pdf)
4. JCM Approved Methodology ID_AM001 (JCM_ID_AM001_ver01.0.pdf)
5. Monitoring Plan Sheet of JCM Approved Methodology ID_AM001 (JCM_ID_AM001_ver01.0.xlsx)
6. JCM Glossary of Terms (JCM_ID_Glossary_ver02.0)
7. JCM Project Cycle Procedure (JCM_ID_PCP_ver05.0.pdf)
8. JCM Modalities of Communication Statement Form (JCM_ID_F_MoC_ver01.0.pdf)
9. JCM Guidelines for Developing Project Design Document and Monitoring Report (JCM_ID_GL_PDD_MR_ver02.1.pdf)
10. JCM Project Design Document Form (JCM_ID_F_PDD_ver01.1.docx)
11. JCM Guidelines for Validation and Verification (JCM_ID_GL_VV_ver01.0.pdf)
12. JCM Validation Report Form (JCM_ID_F_Val_Rep_ver01.0.docx)
13. Company profile of PT Semen Indonesia (Persero) Tbk
14. Company profile of JFE Engineering Corporation
15. Explanation about net power generation alternative to power consumption
16. Legal useful life table of the machinery and equipment, issued by Japanese government
17. Materials for the technical lecture, which was held on 11-12 January 2017 at PT Semen Indonesia (Persero) Tbk. Gresik Office
18. A brochure of WHR systems installed by JFE Engineering Corporation at the facility of PT Semen Indonesia (Persero) Tbk in Tuban

19. Design documents of the component of WHR system (four Suspension preheater boilers (SP boilers), four air quenching cooler boilers (AQC boilers), one turbine generator and one cooling tower)
20. Process flow diagram of the project WHR systems, showing that they utilize only waste heat and do not utilize fossil fuels as a heat source to generate steam for power generation.
21. Photos of vacant land, showing no WHR system has been introduced to a corresponding cement kiln of the project prior to its implementation at the facility of PT Semen Indonesia (Persero) Tbk in Tuban.
22. Power Purchase Agreement between the facility of PT Semen Indonesia (Persero) Tbk in Tuban and the grid connected power company
23. Contract on Equipment Supply of Waste Heat Recovery Power Generation System for Tuban Plant, showing that the rated generation capacity is 30.6 MW and the annual amount of the electricity imported to the cement factory from the grid system during the previous year before the validation is 1,217,155 MWh.
24. Single-line diagram, showing that this project WHR systems are connected only to the internal power grid of the cement factory of PT Semen Indonesia (Persero) Tbk.
25. Scope and Division of Supply, including y A list/ledger of the equipments, which are described in section C.2. of the PDD
26. Calculation summary of the estimated reference emissions of Year 2017, achieved by the proposed JCM project
27. Guideline for legal requirement of environmental impact assessment in Indonesia, issued by IGES
28. The Environmental Permit, issued by Ministry of Environment and Forestry under the Environmental regulation in Indonesia for the cement factory, including “Addendum ANDAL RKL-RPL Industri Sement Portland PT Semen Indonesia (Persero) Tbk. (2015)”
29. Minute of Meeting for the local stakeholder consultation meeting, including the invitation letter and the attendees' list
30. Presentation materials for the local stakeholder consultation
31. Specification of the measuring equipment (Monitoring point No.1)
32. Calibration report of the measuring equipment (Monitoring point No.1)
33. CO_2 emission factor for the grid system in Indonesia, published by JCM Indonesia
34. Summary of Auxiliary Power Consumption, and Specifications of Aux System, including rated capacity of all installed equipment of the WHR system

35. Attendance list of the onsite assessment
36. Project Design Document, for registration
    (JCM_ID_PDD_JFEE_ver01_180115.docx)
37. Monitoring Plan Sheet and Monitoring Structure Sheet, for registration
    (JCM_ID_AM001_JFEE_ver02_180115.xlsx)

F. References

1. Ministry of Environment Decree No:05/2012 concerning About Types of Business Plan and / or Activities Requiring Has the Environmental Impact Assessment
2. Environmental Impact Assessment issued by Head of Tuban Regency, No.188.45/158/KPTS/414.012/2015 in 2015.

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

Statement of competence

Name: Mr. Koichiro Tanabe

Qualified and authorized by Japan Quality Assurance Organization.

Function	Date of qualification
Validator	-
Verifier	2014/12/22
Team leader	2014/12/22

Technical area within sectoral scopes	Date of qualification
TA 1.1. Thermal energy generation	2014/12/22
TA 1.2. Renewables	2014/12/22
TA 3.1. Energy demand	2014/12/22
TA 4.1. Cement and lime production	-
TA 4.6. Other manufacturing industries	2014/12/22
TA 5.1. Chemical industry	2014/12/22
TA 10.1. Fugitive emissions from oil and gas	2014/12/22
TA 13.1. Solid waste and wastewater	2014/12/22
TA 14.1. Afforestation and reforestation	-

Statement of competence

Name: Dr. Irhan Febijanto

Qualified and authorized by Japan Quality Assurance Organization.

Function	Date of qualification
Validator (JCM project only)	2017/8/21
Verifier (JCM project only)	2017/8/21
Team leader	-

Technical area within sectoral scopes	Date of qualification
TA 1.1. Thermal energy generation	2014/12/22
TA 1.2. Renewables	-
TA 3.1. Energy demand	2014/12/22
TA 4.1. Cement and lime production	-
TA 4.6. Other manufacturing industries	-
TA 5.1. Chemical industry	-
TA 10.1. Fugitive emissions from oil and gas	-
TA 13.1. Solid waste and wastewater	-
TA 14.1. Afforestation and reforestation	-

Statement of competence

Name: Dr. Tadashi Yoshida

Qualified and authorized by Japan Quality Assurance Organization.

Function	Date of qualification
Validator	2014/12/22
Verifier	2014/12/22
Team leader	2014/12/22

Technical area within sectoral scopes	Date of qualification
TA 1.1. Thermal energy generation	2014/12/22
TA 1.2. Renewables	2014/12/22
TA 3.1. Energy demand	2014/12/22
TA 4.1. Cement and lime production	2015/11/12
TA 4.6. Other manufacturing industries	2014/12/22
TA 5.1. Chemical industry	2014/12/22
TA 10.1. Fugitive emissions from oil and gas	2014/12/22
TA 13.1. Solid waste and wastewater	2014/12/22
TA 14.1. Afforestation and reforestation	-