JCM Validation Report Form

A. Summary of validation

A.1. General Information

Title of the project	Introduction of High Efficiency Water Pumps in Da Nang City
Reference number	VN012
Third-party entity (TPE)	TPE-VN-002 Japan Quality Assurance Organization (JQA)
Project participant contracting the TPE	Yokohama Water Co., Ltd.
Date of completion of this report	20/03/2019

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 Socialist Republic of Viet Nam, in line with Vietnamese 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. 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: 20/03/2019

B. Validation team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☐ Ms. ☒	Sachiko Hashizume	JQA	Team leader	☒	Authorized	☒
Mr. ☒ Ms. ☐	Tadashi Yoshida	JQA	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>

Through a review of PDD, it was checked and confirmed that the PDD was completed using the latest version of the PDD form (JCM_VN_F_PDD_ver02.0) appropriate to the type of project and drafted in line with JCM Guidelines for Developing PDD and MR (JCM_VN_GL_PDD_MR_ver02.0).

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team (herein after referred to as the team) concluded that the PDD was completed using the valid form in line with the JCM Guidelines for Developing PDD and MR.

C.2. Project description

<Means of validation>

The title of the proposed JCM project is “Introduction of High Efficiency Water Pumps

in Da Nang City" (herein after referred to as the proposed JCM project).

This project aims to replace existing conventional water pumps with high efficiency double suction volute pumps in two water pump stations of Cau Do water treatment plant owned by Danang Water Supply Joint Stock Company (DAWACO).

The following water pumps produced by EBARA VIETNAM PUMP CO., LTD. are installed in this project.

・Raw water intake pump (450X350CWDM)　(3 units)

・Distribution pump (500X350CWDM)　(6 units)

Pump efficiencies of the project pumps at a condition for operational use are 86% for raw water intake pump and 89% for distribution pump. Installation of high efficiency water pumps leads to energy savings, hence GHG emission reductions.

The project participant (PPs) from Vietnam is Danang Water Supply Joint Stock Company (herein after referred to as DAWACO) and from Japan is Yokohama Water Co., Ltd. (herein after referred to as Yokohama Water).

The proposed JCM project is expected to achieve the amount of 738 tCO_2e emission reduction annually. The estimated emission reductions of the period between 2017 and 2020 are 2,398 tCO_2e as calculated in the PDD.

The starting date of project operation is defined as 01/10/2017 and the expected operational lifetime of the proposed JCM project is defined as 18 years based on the legal useful life of the water supply system under Japanese tax regulation.

The proposed JCM project was partially supported by the Ministry of the Environment, Japan (MOEJ) 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 acquire JCM credits. As for technology transfer, training has been conducted by EBARA VIETNAM PUMP CO., LTD. with a manual on operation, maintenance and safety measures of the project pumps. Maintenance services after project implementation are provided by Yokohama Water, which also contribute to transfer a technical skill to the staff of DAWACO through maintenance experiences.

The team conducted document review, interviews and an on-site visit to confirm the accuracy and completeness of the project description. The documents reviewed during desk review are listed in Section E.2. of this report. The one-day on-site visit to Vietnam was undertaken on 17/01/2019 including the interviews with PPs. The interviewees are listed in Section E.1 of this report.

Regarding the language used in the PDD, an issue was raised and resolved as mentioned section below.

<Findings>

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

(Issue raised as CL01)

In section E.1. of PDD, the address of DAWACO is provided in Vietnamese language. It is requested to complete the PDD in English.

(Summary of response by PP)

Please refer the attached PDD file.

In section E.1. of PDD, the address of DAWACO is added in English.

(Assessment comment by TPE)

It was confirmed that the address of DAWACO is provided in English and confirmed that the PDD is completed in English. Therefore, this issue is closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team concludes that the proposed JCM project description in the PDD is accurate and complete.

C.3. Application of approved methodology(ies)

<Means of validation>

The project applies the approved methodology JCM_VN_AM013 " Energy saving by introduction of high-efficiency double suction volute pumps in water supply system", version 01.0. This methodology was approved by JC on 29 August 2018. It was confirmed that this methodology is applicable to the proposed JCM project and the applied version of 01.0 is valid at the time of submission of the project for validation. The fulfilment of each eligibility criterion defined in the methodology is confirmed by checking the documentation referred to in the PDD and by reviewing comparable information.

Criterion 1: Double suction volute pump(s) with efficiency of more than 80% at a condition for operational use is installed for water supply system at a water treatment plant.

Through reviewing the data sheets for project centrifugal pump Model 450x350CWDM and Model 500x350CWDM, it was confirmed that both models are double suction volute pumps and the efficiency is 86% and 89% respectively. Through

the on-site visit to the Cau Do water treatment plant, it was confirmed that 3 units of Model 450x350CWDM and 6 units of Model 500x350CWDM had been installed there.

Based on the confirmation the above, the team confirmed that criterion 1 was satisfied.

Criterion 2: Project pump uses environmental friendly paints such as paints with 0.1% or less lead, cadmium and tar during the production process.

Through the reviewing the "Painting inspection record for water pumps" issued by EBARA Vietnam pump Co.,Lt.d, the team confirmed that pump uses environmental friendly paints which contain 0.1% or less of lead, cadmium and tar.

Based on the confirmation the above, the team confirmed that criterion 2 was satisfied.

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team confirmed that the project meets each eligibility criterion of JCM_VN_AM013_ver01.0 which is the latest version of the methodology at the time of the validation. Therefore the team concluded that the project is eligible for applying selected methodology and that the applied version is valid at the time of submission of the proposed JCM project for validation.

C.4. Emission sources and calculation of emission reductions

<Means of validation>

The sources of reference emissions is electricity consumption by reference pumps. The sources of project emissions is electricity consumption by project pumps.

Through document review, it was confirmed that all emission sources covered in the applied methodology are included.

The Monitoring Plan Sheet (MPS) has been prepared by using JCM_VN_AM013_ver01.0.xlsx. The team confirmed that it is not altered, and its required fields are appropriately filled in.

As for three project specific parameters to be fixed ex ante, the team assessed the

applied value for each of them as described below;

- EF_{elec} (CO_2 emission factor of consumed electricity [tCO_2/kWh])
  PPs apply the emission factor for grid electricity which is derived from a document issued by Ministry of Natural Resources and Environment of Vietnam (MONRE), Vietnamese DNA for CDM.
  Through reviewing the single line diagram and on-site observation at Cau Do plant, it was confirmed that only grid electricity is supplied to the plant and there is no captive generator at site. Therefore the team confirmed that the applied value (CO2 emission factor (0.9185tCO2/MWh) issued by Ministry of Natural Resources and Environment of Vietnam (MONRE) in 2016) is appropriate.
- $\eta_{PJ,i}$ (Pump efficiency of project pump i at a condition for operational use [%])
  The team confirmed that PPs apply the value derived from the factory acceptance test data sheet of the project pumps appropriately.
- $\eta_{RE,I}$ (Pump efficiency of reference pump i [%])
  As for the pump efficiency of each reference pump corresponding to the project pump Model 450x350CWDM (capacity 20m^3/min) and Model 500x350CWDM (capacity 40m^3/min) is selected from the default value in the applied methodology in line with the capacity of each model. The team confirmed that PPs apply the default value in accordance with the applied methodology appropriately.

Regarding the description of source of data in the Table 2 of MPS(input) sheet, an issue (CL03) was raised and resolved as mentioned section below.

As for the parameter to be monitored ex post, PPs provide an estimated value of $EC_{PJ,i,p}$ (Power consumption of project pump *i* during the period *p*) to complete the ex-ante estimation of CO_2 emission reductions to be achieved by the proposed JCM project. PPs estimate the value based on the actual electricity consumption by the replaced pumps in 2014 and 2015, also taking the efficiency of project pumps into account. The team confirmed that the estimation is appropriate and accurate.

As for the estimated emission reductions in each year indicated in Section C.3 of the PDD, an issue (CAR01) was raised and resolved as mentioned section below.

<Findings>

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

(Issue raised as CL03)

The source of data for EF_{elec} (CO_2 emission factor of consumed electricity [tCO_2/kWh]) is not clearly specified in Table 2 of MPS(input) sheet.

(Summary of response by PP)
The description of the source of data is revised.

(Assessment comment by TPE)
It was confirmed that the source of data is clearly specified in the Table 2. Therefore, this issue is closed.

(Issue raised as CAR01)
The estimated emission reductions in 2017 is not correct.

(Summary of response by PP)
Please refer the attached PDD file.
In section C.3. of PDD, the estimated value in 2017 is modified.

(Assessment comment by TPE)
It was confirmed that the estimated value for reference emissions, project emissions and emission reductions in 2017 are appropriately revised.
Therefore, this issue is closed.

<Conclusion based on reporting requirements>
Please state conclusion based on reporting requirements.
The team confirmed that the selected emission sources and GHG types were justified for the proposed JCM project. The team assessed the estimated values for project-specific parameters both to be fixed ex ante and to be monitored ex post in the MPS including intermediate processes to derive the values. As a result, those estimated values fixed ex-ante, and ex-ante estimation of CO_2 emission reductions were considered appropriate in the context of the proposed JCM project.

C.5. Environmental impact assessment

<Means of validation>
On the PDD, it was mentioned that no environmental impact assessment (EIA) is required for the project through the following documents;
- Decree No.18/2015/ND-CP, ON ENVIRONMENTAL PROTECTION PLANNING, STRATEGIC ENVIRONMENTAL ASSESSMENT, ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL PROTECTION PLANS of February 14, 2015
Through review of the document above, it was confirmed that no EIA is required for

the project.

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team confirmed that PPs did not conduct EIA in line with procedures as required by the Socialist Republic of Viet Nam.

C.6. Local stakeholder consultation

<Means of validation>

Local stakeholder consultation meeting (LSC) has been conducted on 22nd September 2017 at the Head Office of DAWACO in Da Nang, Viet Nam. The local stakeholders below were identified through the consultation with the JC secretariat of Vietnamese side.

-Da Nang Department of Planning and Investment (DPI)

- Danang Water Supply Joint Stock Company (DAWACO)

The overview of the LSC is as below

Agenda:

1. Outline of the project
2. Introduction of the product and technology
3. Benefits of the project
4. Q&A

Participants:

[Local stakeholders]

No.	Organization	Position
1	Da Nang Department of Planning and Investment (DPI)	Manager of Economy - Foreign Affairs Division
2	Danang Water Supply Joint Stock Company (DAWACO)	Manager, Planning Department
3		Deputy Manager, Planning Department
4		Staff, Planning Department
5		Manager, Technical Department

6		Staff, Technical Department
7		Staff, Technical Department
8		Manager, Finance and Accounting Department
9		Manager, Water Production Enterprise

[Project participants]
[Viet Nam] Danang Water Supply Joint Stock Company (DAWACO)
[Japan] Yokohama Water Co., Ltd.

The comments received at the meeting were fully taken into account and the results were reflected in the PDD. It was confirmed through the interview with PPs at the on-site visit that the above-mentioned process and due steps taken for the local stakeholder consultation are appropriate.

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team concluded that the local stakeholder consultation of the proposed JCM project was adequate.

C.7. Monitoring

<Means of validation>

Through the review of the MPS and Monitoring Structure Sheet (MSS), it was confirmed that they are described based on the applied methodology JCM_VN_AM013 ver 01.0.

The team confirmed through the on-site visit that, an electricity meter was installed to monitor the amount of electricity consumption for each project pump. Through the interview with PPs during the on-site visit, it was confirmed that the monitoring data is stored in a SCADA system and PPs can check and obtain the data on a daily basis through the on-line system.

With respect to the monitoring structure, it was confirmed through document review and the interview with PPs that, the monitoring plan is feasible and the means of

implementation of the monitoring plan, including the data management, quality assurance and quality control procedures, are sufficient for ex post reporting and verification.

By the interview with PPs at the on-site visit, it was found that PPs determined that the interval of calibration or replacement of the electricity measuring equipment is 10 years based on the interview with the manufacturing company. Regarding the measurement method and procedure, an issue was raised and resolved as mentioned section below.

<Findings>

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

(Issue raised as CL02)

Regarding the measuring equipment of power consumption of project pumps, it is requested to clarify the plan of replacement or calibration in accordance with the applied methodology.

(Summary of the response by PP)

Please refer the attached manufacturer's specification and recommendation (Subject: Designed lifetime for M-System products. & Subject: Wattmeter_L53U(DD-15438)).

According to the approved JCM methodology and the manufacturer's specification and recommendation, the designed lifetime of the project measuring equipment including performance on accuracy is 10 years, and therefore the measuring equipment is replaced every 10 years.

The next replacement is scheduled for 2028.

(Assessment comment by TPE)

Through reviewing the provided documents and explanation, it was confirmed that the measuring equipment is replaced every 10 years according to the manufacturer's recommendation. Validation team determined that it is in line with the applied methodology. Therefore, this issue is closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team concluded that Monitoring Plan of the proposed JCM project complied with the requirements of the methodology and/or PDD and Monitoring Guidelines, and the PPs had ability to implement the described Monitoring Plan including feasibility of

MSS.

C.8. Modalities of Communication

<Means of validation>

The Modalities of Communication (MoC) was submitted to JQA on 30/11/2018 together with the PDD for public comments. It was confirmed that PPs applied the latest version of MoC form. All the two entities listed as the PPs in the PDD are included in the MoC. Yokohama Water Co.,Ltd. is nominated as a focal point entity.
The corporate and personal details, employment status and specimen signatures in the MoC were confirmed through a direct communication during the on-site visit.
Therefore, JQA determined that the information of all PPs, including the focal point provided in the MoC and its correctness of authority, was appropriate.

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team concluded that the MoC complied with all relevant forms and requirements.

C.9. Avoidance of double registration

<Means of validation>

It was confirmed preliminarily through the review of the relevant website (e.g. UNFCCC website, Markit Environmental Registry, etc.) that the proposed JCM project had not been registered under other international climate mitigation mechanisms. The written confirmation of the avoidance of double registration was also provided through the signed MoC, and was cross-checked through the interview with PPs at the on-site visit, with a satisfactory result.

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team concluded that the proposed JCM project was not registered under the other international climate mitigation mechanisms at the stage of validation.

C.10. Start of operation

<Means of validation>

PPs determined the starting date of operation as 01/10/2017. Through reviewing the "Construction completion report dated on 30 August 2017", it was confirmed that the installation of the project pumps was completed on 30 August 2017. Through interview with PPs, it was explained that the there was one-month commissioning period and the actual operation was started after the period. Based on above, it was confirmed that starting date of project operation, 01/10/2017 is appropriately defined. It was also confirmed that this date is not before January 1, 2013.

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The team concluded that the start of the operating date of the proposed JCM project did not predate 01/01/2013, and it had been defined appropriately.

C.11. Other issues

<Means of validation>

No other issue was identified.

<Findings>

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

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Not applicable.

D. Information on public inputs

D.1. Summary of public inputs

The PDD of the proposed JCM project, which was submitted in line with the Project Cycle Procedure, was made publicly available through the JCM website for public inputs. The duration of call for public inputs on the PDD was 30 calendar days subsequent to the publication of the PDD, and it started from 04/12/2018. The specific JCM website is as below:

https://www.jcm.go.jp/vn-jp/projects/55

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

No comment was received during the period of the public comments, covering 04/12/2018 to 02/01/2019; therefore, no action was required to be taken into due account by PPs.

E. List of interviewees and documents received

E.1. List of interviewees

Ho Minh Nam	Vice General Director, Danang Water Supply Joint Stock Company (DAWACO)
Phan Luu	Manager of the Water Production Enterprise, Danang Water Supply Joint Stock Company (DAWACO)
Ong Van My	Techinical Department, Danang Water Supply Joint Stock Company (DAWACO)
Nguyen Quang Hung	Director, Danang Water Supply Joint Stock Company (DAWACO)
Ho Thang Thong	Vice Manager of the Water Production Enterprise, Danang Water Supply Joint Stock Company (DAWACO)
Pham Viet Hung	Vice Manager of the Water Production Enterprise, Danang Water Supply Joint Stock Company (DAWACO)
Junji Emori	Yokohama Water Co., Ltd.

Kei Sato	Consultant, Mitsubishi UFJ Research and Consulting Co.,Ltd.

E.2. List of documents received

1	Project Design Document (draft) (JCM_VN012_PDD_draft.pdf)
2	Monitoring Plan Sheet and Monitoring Structure Sheet (draft) (JCM_VN012_MPS_draft.xlsx)
3	Modalities of communications statement submitted together with the PDD for public comments ([English]JCM_VN_F_MoC_ver02.0_YokohamaWater.pdf)
4	JCM Approved Methodology JCM_VN_AM013 " Energy saving by introduction of high-efficiency double suction volute pumps in water supply system, ver. 01.0"
5	JCM_VN_AM013 Monitoring Plan Sheet
6	JCM Glossary of Terms (JCM_VN_Glossary_ver01.0)
7	JCM Project Cycle Procedure (JCM_VN_PCP_ver03.0)
8	JCM Modalities of Communication Statement Form (JCM_VN_F_MoC_ver02.0.pdf)
9	JCM Guidelines for Developing Project Design Document and Monitoring Report (JCM_VN_GL_PDD_MR_ver02.0)
10	JCM Project Design Document Form (JCM_VN_F_PDD_ver02.0.pdf)
11	JCM Guidelines for Validation and Verification (JCM_VN_GL_VV_ver01.0.pdf)
12	JCM Validation Report Form (JCM_VN_F_Val_Rep_ver01.0.docx)
13	Location information and layout map of the project site
14	Company profile of Danang Water Supply Joint Stock Company (DAWACO)
15	Company profile of Yokohama Water Co., Ltd. http://yokohamawater.co.jp/
16	Construction completion report dated on 30 August 2017
17	Legal useful life of the water supply system under Japanese tax regulation
18	Centrifugal pump data sheets Doc. No.E161098/1210/A0101 for Model 450x350CWDM Doc. No.E161098/1210/A0201 for Model 500x350CWDM

19	Painting inspection record for water pump Model No.450X350CWDM Model No.500X350CWDM
20	Record of training conducted by EBARA VIETNAM PUMP CO.,LTD. Including a manual on operation, maintenance and safety measures of the project pumps
21	Single line diagram
22	Specification of electricity meter for power consumption of project pump
23	Laws or legislation on the environmental impact assessment of Viet Nam
24	The minutes of the local stakeholder consultation meeting, including the invitation letter and the attendees' list
25	Presentation materials for the local stakeholder consultation
26	Explanation document of the applied value for $EC_{PJi,p}$ (Power consumption of project pump I during the period p [MWh/p])
27	Evidence document of CO2 emission factor (0.9185tCO2/MWh) issued by Ministry of Natural Resources and Environment of Vietnam (MONRE) in 2016
28	Designed lifetime for M-System products. & Subject: Wattmeter_L53U(DD-15438)
29	Project Design Document (final) (JCM_VN_F_PDD_ver02.0_YokohamaWater_190314.docx)
30	Monitoring Plan Sheet and Monitoring Structure Sheet (final) (JCM_VN_AM013_ver01.0_YokohamaWater_190215.xlsx)

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.

Statement of competence

Name: Ms. Sachiko Hashizume

Qualified and authorized by Japan Quality Assurance Organization.

Function	Date of qualification
Validator	2015/11/20
Verifier	2015/11/20
Team leader	2018/6/22

Technical area within sectoral scopes	Date of qualification
TA 1.1. Thermal energy generation	2015/11/20
TA 1.2. Renewables	2015/11/20
TA 3.1. Energy demand	2015/11/20
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	2015/11/20
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	-