JCM Validation Report Form

A. Summary of validation

A.1. General Information

Title of the project	Installation of Container Formation Facility at Lead Acid Battery Factory of Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.
Reference number	VN010
Third-party entity (TPE)	Japan Quality Assurance Organization (TPE-VN-002)
Project participant contracting the TPE	Hitachi Chemical Co., Ltd.
Date of completion of this report	06/11/2018

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 Socialist Republic of Viet Nam, in line with Vietnamese 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.	☒
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: 06/11/2018

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. ☐	Koichiro Tanabe	JQA	Team Member	☒	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 the draft 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>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team concluded that the PDD was complete using the valid form in line 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

national grid system in Viet Nam by reducing energy consumption of the existing factory of Hitachi Chemical Energy Technology (Vietnam) Co., Ltd, located in Dong Nai Province, Socialist Republic of Vietnam. The proposed JCM project replace the existing tank formation facility to higher energy-efficient container formation facility. The newly installed container formation facility of the proposed JCM project consist of production Line 1, 2, 3 and 4 with the corresponding cooling system.

The expected emission reductions that would be achieved by the proposed JCM project in its operation are estimated to be 3,825 tCO_2e annually. The emission reductions of the period from 2018 through 2020 are estimated to be 10,519 tCO_2e in the PDD.

The validation team conducted document review and one-day on-site assessment, dated 01/02/2018, for this proposed JCM project, subject to the PDD. The on-site assessment included follow-up interviews with the following project participants (PPs) at the project site.

- Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.
- Hitachi Chemical Co., Ltd.

The location information of the proposed JCM project and the other description stated in Section A (Project description) of the PDD were cross-checked through the physical inspection. Regarding the duration of the proposed JCM project, it is confirmed that the starting date of project operation is 01/04/2018, and it is reasonable for starting date of monitoring. The expected operational lifetime of the proposed JCM project is defined as nine years, which is in compliance with legal useful life of the operational equipment under Japanese tax regulation. Contribution from Japan is also described in the PDD.

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

In conclusion, the team determines that the description of the proposed JCM project in the PDD is accurate, complete, and provided an understanding of the proposed JCM project.

C.3. Application of approved methodology(ies)

<Means of validation>

Selection of methodology(ies)

The approved methodology VN_AM009 “Installation of Container Formation Facility at Lead Acid Battery Factory, Version 01.1” is applied to the proposed JCM project.

Eligibility criteria

The assessment results of the eligibility criteria in the approved methodology are summarized as below:

(Criterion 1)

Descriptions specified in the methodology:

Container formation facility is newly installed or installed to replace tank formation facilities at lead acid battery production line.

Project information in the PDD:

Container formation facility is installed to replace tank formation facilities at conventional lead acid battery production line at the factory of Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.

Assessment and conclusion:

The validation team conducted a physical inspection of the acid battery production lines at the project site, and interviewed with the PPs directly to understand the project boundary. As a result, it is confirmed that the project container formation facility has been installed to replace the existing tank formation facilities. Therefore, the validation team concludes that the Criterion 1 is satisfied.

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

The validation team reached the conclusion that the relevant information contained in the PDD is in compliance with the eligibility criterion listed in the approved methodology applied.

C.4. Emission sources and calculation of emission reductions

<Means of validation>

It was confirmed through desk review that all emission sources and their associated GHGs relevant to the proposed JCM project were in line with the applied methodology, and those were clearly stated in the PDD. For cross-check, the validation team conducted an on-site inspection and a follow-up interview with the PPs, and confirm the following project aspects.

- As illustrated in the figure C.2 of the PDD, the proposed JCM project consists of four container formation lines and the corresponding packing lines, and one cooling system including chillers and cooling towers.
- Three monitoring points (No.1, No.2, and No.3) have been identified to measure/collect data and calculate emission reductions achieved by this proposed JCM project.
- Electricity consumed by the container formation facilities, including chillers and cooling towers, is directly measured by the corresponding electricity meter. Production output of lead acid battery per type is monitored. Production output data is automatically collected by Product Information Management Device.
- As a fuel consumption, only LPG was used for the existed tank formation process in the past, and it is in line with the applied methodology, which does not allow the PPs to choose fuels other than LPG. For the project container formation process, LPG is not used as a container formation process does not have Plate Drying process, which uses LPG. In addition, a captive power generator using diesel fuel exists in the factory. It is for emergency use only, therefore, it is excluded from the boundary of the proposed JCM project.

As a result, it was considered that the PDD was in line with the approved methodology, as well as current conditions of the project site.

For parameters to be monitored, the estimated values are confirmed through the validation. Annual production output of lead acid battery ($N_{j,k,p}$) is estimated to be 800,000 units per battery type, according to target production volume of each battery type, which is based on the production results of the factory. Capacity of each lead acid battery type (AH_i) is based on the relevant values described in the battery product catalog. Electricity consumption by the container formation facilities ($EC_{PJ,k,p}$) is estimated by sum of electricity consumed by electricity chargers and cooling system.

As for the project-specific parameters to be *fixed ex ante*, CO_2 emission factor for grid electricity ($EF_{elec,k}$) is 0.8154 tCO_2/MWh, which is the latest national grid emission factor issued by Ministry of Natural Resources and Environment of Vietnam. CO_2

emission factor for fuel ($EF_{fuel,k}$) is 0.0616 tCO_2/GJ (= 61,600 kg/TJ), which is lower limit default value of effective CO_2 emission factor for Liquefied Petroleum Gases stated in IPCC 2006.

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

The validation team reached the conclusion through the validation that the selected emission sources and GHG types were justified for the JCM project. The validation team assessed the estimated values for project-specific parameters to be fixed *ex ante*, as well as parameters to be monitored *ex post* stated in the MPS, through checking intermediate calculation processes to derive them. As a result, those were considered reasonable in the context of the proposed JCM project.

C.5. Environmental impact assessment

<Means of validation>

It was confirmed that “Construction projects for battery and cell factories”, with capacity at least 50,000 kWh per year or at least 100 metric tons of products per year, was required to conduct environmental impact assessment (EIA) subject to legal requirements of EIA in Socialist Republic of Viet Nam. The validation team reviewed the EIA approval letter, No.1988/QD-BTNMT, dated 17/08/2017, issued by MONRE. Through document review and interviews with PPs, it was confirmed that the conclusion of the assessment was positive.

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

The validation team concludes that the project design of the proposed JCM project is in accordance with the local EIA regulation.

C.6. Local stakeholder consultation

<Means of validation>

Through review of the PDD and the supplemental documents relevant to local

stakeholder consultation (LSC) meeting, it was confirmed that the LSC was successfully implemented as below.

(a) Comments were invited from local stakeholders that are relevant for the proposed project.

- The relevant local stakeholders were identified by the PPs, and the LSC meeting was held on 07/12/2017, in which management and employees of Hitachi Chemical Energy Technology (Vietnam) Co., Ltd were mainly participated.

(b) The summary of the comments received as provided in the PDD is complete.

- The summary of the comment received has been described in the PDD. Through interview with the PPs, it is confirmed that the comment has been described in the PDD appropriately.

(c) The PPs have taken due account of all comments received and have described this process in the PDD.

The validation team determines that the relevant local stakeholders have been identified appropriate and the information on the LSC meeting has been described in the PDD appropriately. As a result, it is concluded that no further action is required for the comment received.

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

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

C.7. Monitoring

<Means of validation>

Through document review and interviews with the PPs, the following information was confirmed.

(a) Assessment of compliance of the monitoring plan with the approved methodology and/or PDD and Monitoring Guidelines

The parameters to be monitored *ex-post* are determined in accordance with

Monitoring Plan Spreadsheet (MPS) of the applied methodology as below

- $N_{j,k,p}$ (Production output of lead acid battery type *i* in the project factory *k* during the period *p*)
- AH_i (Capacity of each lead acid battery type)
- $EC_{PJ,i,p}$ (Electricity consumption by the container formation facilities including chillers and cooling tower in the project factory *k* during the period *p*)

(b) Assessment of the implementation of the plan

Through document review and interview with the PPs, the validation team raised a CL. This CL was resolved in "Findings" below.

<Findings>

CL01

For Monitoring Point No.3 (whatthour meter for $EC_{PJ,i,p}$), it is requested to clarify calibration procedures of the measuring equipment for electricity consumption accordingly.

Resolution by the PPs

Monitoring equipment already calibrated by the manufacturer is installed for this project. Monitoring equipment will be replaced with calibrated new one based on recommendation by the manufacturer.

<Conclusion based on reporting requirements>

The validation 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 project participants have ability to implement the defined Monitoring Plan Sheet. It is also confirmed that the Monitoring Structure is feasible as for the means of monitoring.

C.8. Modalities of Communication

<Means of validation>

Through document review, it is confirmed that the Modalities of Communication (MoC), dated 19/09/2018, have applied the applicable version of MoC form. The validation team also conducted interviews with some of the signatories of the MoC,

and then identified the personnel and their employment status, including the specimen signatures. Therefore, the validation team determines that the information of all project participants, including the focal point provided in the MoC and its correctness of authority, is appropriate.

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

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

C.9. Avoidance of double registration

<Means of validation>

It was confirmed through review of the relevant website (e.g. UNFCCC website) that the proposed JCM project has not been registered under other international climate mitigation mechanisms. Also, the written confirmation of the avoidance of double registration was provided through the signed MoC, and was cross-checked through interview with the project participant, with a satisfactory result.

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

The validation 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>

Through interview with the PPs, it was confirmed that the starting date of project operation is 01/04/2018 stated in the PDD, and it was clarified that the PPs were determined to set the date as the first date of Japanese fiscal year 2018. It was also observed during the on-site assessment conducted in February that the main facilities of the project container formation process had been running and the project site was ready to start monitoring activities for the proposed JCM project. Therefore, the validation team considers that it is reasonable to set the starting date of project

operation to be 01/04/2018

<Findings>

No outstanding issue was raised.

<Conclusion based on reporting requirements>

The validation team concludes that the start of the operating date of the proposed JCM project has been defined appropriately.

C.11. Other issues

<Means of validation>

No other issue was identified.

<Findings>

No outstanding issue was raised.

<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 call for public comments was opened from 20/09/2018 to 19/10/2018 (24:00 GMT). The specific JCM website is as below, and as a result, no comment was received.

- https://www.jcm.go.jp/vn-jp/projects/52

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

- Akira Ishiguro, Assistant Manager, Hitachi Chemical Co., Ltd.
- Wang Tsung Ming, Manufactory Director, Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.
- Lee Chun Sheng, Deputy Manufactory Director, Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.
- Wang Tien Sheng, Deputy Section Manager, Maintenance Section, Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.
- Paul Huang, Supervisor, Manufacture Department, Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.
- Shinichiro Sano, Chief Consultant, Mitsubishi UFJ Research and Consulting Co., Ltd.
- Kei Sato, Associate, Mitsubishi UFJ Research and Consulting Co., Ltd.

E.2. List of documents received

1. Project Design Document for publication (JCM_VN010_PDD_draft.pdf)
2. Monitoring Plan Sheet and Monitoring Structure Sheet for publication (JCM_VN010_MPS_draft.xlsx)
3. Modalities of communications statement for publication ([English]MoC_Hitachi Chemical.pdf)
4. JCM Approved Methodology VN_AM009 (JCM_VN_AM009_ver01.1.pdf)
5. Monitoring Plan Sheet and Monitoring Structure Sheet VN_AM007 (JCM_VN_AM009_ver01.1.xlsx)
6. JCM Modalities of Communication Statement Form (JCM_VN_F_MoC_ver02.0.pdf)
7. JCM Project Design Document Form (JCM_VN_F_PDD_ver02.0.pdf)
8. JCM Validation Report Form (JCM_VN_F_Val_Rep_ver01.0.docx)
9. JCM Guidelines for Developing Project Design Document and Monitoring Report (JCM_VN_GL_PDD_MR_ver02.0)
10. JCM Guidelines for Validation and Verification (JCM_VN_GL_VV_ver01.0.pdf)
11. JCM Glossary of Terms (JCM_VN_Glossary_ver01.0.pdf)
12. JCM Project Cycle Procedure (JCM_VN_PCP_ver03.0.pdf)
13. Product catalog sheet of lead acid battery
14. Conversion formula to calculate the rated capacity of lead acid battery
15. Presentation materials for introducing Hitachi Chemical Energy Technology

(Vietnam) Co., Ltd.

16. Website of Hitachi Chemical Energy Technology (Vietnam) Co., Ltd.
17. Website of Hitachi Chemical Co., Ltd.
18. Report on Completion of M7 Formation Slot's Electric Data Acquisition, dated on 30/11/2017
19. Legal useful life of the operational equipment under Japanese tax regulation
20. layout drawing of lead acid battery production line
23. Calculation summary of the estimated reference emissions of Year 2018, achieved by the proposed JCM project
24. Guideline for legal requirement of environmental impact assessment in Viet Nam
25. The minutes of the local stakeholder consultation meeting, including the invitation letter and the attendees' list
26. Presentation materials for the local stakeholder consultation
27. Energy consumption monitoring data of the production management system (example) for the project container formation facitilies
28. Production catalogues or specifications of lead acid battery, including identification number and the capacity of lead acid battery type
29. Production catalogues or specifications of measuring equipment (WHM) for electricity consumption in the project factory
32. IGES List of Grid Emission Factors (Update version 9.2: Database updated with most recent available data as of July 2017)
33. Ch.1 Vol.2 of 2006 IPCC Guidelines
35. Calculation report on effect of CO2 emission reductions
36. EIA report
37. EIA approval letter, No.1988/QD-BTNMT, dated 17/08/2017, issued by MONRE
38. Project Design Document for registration (JCM_VN010_PDD_draft_rev181031.docx)
39. Monitoring Plan Sheet and Monitoring Structure Sheet for registration (JCM_VN_AM009_ver01.1_HirachiChemical_rev181031.xlsx)

Annex 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: 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. 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	-