JCM Validation Report Form

A. Summary of validation

A.1. General Information

Title of the project	Reducing GHG emission at Textile Factory of Luckytex (Thailand) Public Company Limited by Upgrading to Air-saving Loom
Reference number	TH002
Third-party entity (TPE)	TPE-TH-003 Japan Quality Assurance Organization
Project participant contracting the TPE	Toray Industries, Inc.
Date of completion of this report	08/03/2018

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 Kingdom of Thailand, in line with Thai 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: 08/03/2018

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. ☐	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>

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_TH_F_PDD_ver02.0) appropriate to the type of project and drafted in line with JCM Guidelines for Developing PDD and MR (JCM_TH_GL_PDD_MR_ver02.0).

<Findings>

No outstanding issue was raised.

<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 Thailand by reducing energy consumption of the existing textile factory, Mill No.1, of Luckytex (Thailand) Public Company Limited. The proposed JCM

project replaces existing air jet looms to higher efficient air-saving looms, the model No. JAT810, manufactured by Toyota Industries Corporation. The proposed JCM project consists of 119 units of the newly installed air-saving looms.

The expected emission reductions that would be achieved by the proposed JCM project in its operation are estimated to be 390 tCO_2 annually. The emission reductions of the period from 2016 through 2023 are estimated to be 2,025 tCO_2 in the PDD.

The validation team conducted one-day on-site assessment for this proposed JCM project on 08/02/2018, after its document review, and had a follow-up interview with the project participants. 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 29/01/2016, which is reasonable for starting date of monitoring (refer to Section C.10). The expected operational lifetime of the proposed JCM project is defined as seven 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 and it is confirmed that the manufacturer prepare an instruction manual of operation and maintenance for JAT810 and provide it to the project participants appropriately.

For applied technology of the proposed project, the validation team raised CL01. This was resolved in “Findings” below.

<Findings>

CL01

In order to confirm the contents of the description below, please submit materials showing technical aspects of the project air jet loom.

“JAT810 is equipped with energy saving technologies such as an optimized shape reed’s tunnel of nozzles and a pressure sensor to measure air pressure of nozzles for optimization of compressed air consumption of welt insertion.”

Resolution by the PPs

A catalogue of JAT 810 published by its manufacturer was submitted to the validation team, and a technical aspect of the project air jet loom was confirmed through the submitted document. Therefore, this CL is closed.

<Conclusion based on reporting requirements>

In conclusion, the team determined that the description of the proposed JCM project in the PDD was 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)

Through a review of the PDD and Monitoring Plan (Monitoring Plan Sheet and Monitoring Structure Sheet), it was confirmed that the following latest version of methodology was correctly quoted and applied in the proposed JCM project.

- JCM_TH_AM004_ver01.0

Eligibility criteria

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

Criterion 1

"The project replaces existing air jet looms at a weaving factory with air jet looms equipped with energy saving technologies such as an optimized shape reed's tunnel of nozzles and a pressure sensor to measure air pressure of nozzles for optimization of compressed air consumption of welt insertion."

The project information described in Criterion 1 of the PDD, was checked through review of supporting documents and the physical inspection. The following information was confirmed with a satisfactory result.

- Three installation confirmation letters show that the following number of JAT810 have been introduced successfully on the issue date respectively, in order to replace existing air jet looms at the weaving factory, Mill No.1, of Luckytex (Thailand) Public Company Limited.

  Phase1: 2 units (installation confirmation letter issued on 29/01/2016)
  Phase2: 57 units (installation confirmation letter issued 14/10/2016)
  Phase3: 60 units (installation confirmation letter issued 15/12/2017)

- It was observed through the on-site assessment that total 119 units of the project looms have been installed and operated.

Criterion 2

"The air jet looms which are installed by the project reduce the specific air consumption by at least 15% compared with the reference air jet looms in line with the description in Section I of this methodology."

The project information described in Criterion 2 of the PDD was checked by the validation team through review of supporting documents and interview with the project participants, and then, the validation team raised CL02. This was resolved in "Findings" below.

<Findings>

CL02

At the on-site assessment, there was a detailed explanation on the calculation method of the reduction rate and that the project air consumption is reduced by 20% or more than that of the reference. The applied methodology stipulates that a project participant selects the average value of reduction rate from calculation based on actual values. However, incorrect calculation was found in the result of average value calculation (19.7%) in the initial PDD. Therefore, it is requested to review the calculation process appropriately, and then re-submit the re-calculation results, in which the average value is calculated properly, to the TPE for clarification.

Resolution by the PPs

The reduction rate was re-calculated, resulting in 25.2% instead of 19.7%. It is confirmed that the average value of the reduction rate has been re-calculated properly and the value in the Monitoring Plan Sheet has been revised appropriately. Therefore, this CL is closed.

<Conclusion based on reporting requirements>

The validation team reached the conclusion that the relevant information contained in the revised PDD is in compliance with the eligibility criterion listed in the approved methodology applied. The issue raised by the validation team was fully clarified.

C.4. Emission sources and calculation of emission reductions

<Means of validation>

It is confirmed through desk review that the emission sources and GHGs, which are

described in the PDD, are in line with the evidential documents properly. It is also confirmed through an on-site assessment that they are corroborated as below:

- As illustrated in the PDD, the proposed JCM project includes the project air jet looms (119 units), and the amount of fabric woven produced by each unit is monitored by Monitoring point No.1 respectively.
- The project air jet has been equipped with a production volume measuring device and data collection/transfer system, and the data monitored by each air jet loom unit is automatically sent to a data collection server, in which all of production data are stored for production control.

Since the applied methodology does not allow the PPs to choose any source or gas to be included, all emission sources and their associated GHGs relevant to the proposed JCM project meet the applied methodology. For Monitoring Spreadsheet, the form has been defined in the applied methodology, and the latest appropriate version of the form is used. It is confirmed that the required fields of the spreadsheet are filled in completely.

0.5664 tCO_2/MWh is applied for CO_2 emission factor for consumed electricity at the project factory. It is the most recent value available at the time of validation, published by Thailand Greenhouse Gas Management Organization in 2017. As for the other parameters, both ex post and ex ante, in the Monitoring Spreadsheet, the validation team raised CL03 and CL05. These were eventually resolved in Findings below.

<Findings>

CL03

It is requested to clarify calculation process and the calculation result of annual production of fabric woven produced by one unit of the project air jet loom, considering the following information.

- Daily output of the representative fabric product is 440 yards, which is daily production results of the representative product.
- Annual operational (working) days: 351 days (= 365 days minus 14 legal holidays)
- Exchange rate between yard and meter is 0.9144m/yard
- Number of the installed project air jet looms: total 119 units

Resolution of CL03 by the PPs

Estimation of annual production of fabric woven by one project air jet loom is re-calculated as follows;

- 440 (yards/day) x 351 (days/year) x 0.9144 (meters/yards) = 141,220 (meters/year)

It is confirmed that the re-calculation is conducted properly and it is considered as reasonable. Also, it is confirmed that the result of the re-calculation is reflected to the revised PDD appropriately. Therefore, this CL is closed.

CL05

It is requested to review the parameter, SEC_j, carefully since it might be miscalculated by one digit.

Resolution of CL05 by the PPs

SEC_j was reviewed and found to be miscalculated by one digit. Therefore, estimated emission reductions are also re-calculated by the finding. As a result, it is confirmed that SEC_j is corrected and the estimated emission reductions are re-calculated appropriately. Therefore, this CL is closed.

<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 values for the project-specific parameters to be fixed ex ante, as well as estimated parameters to be monitored ex post, in the MPS and intermediate processes to derive the values. As a result, those were considered reasonable in the context of the proposed JCM project. The issue raised by the team was fully clarified, resulting in the revised PDD and the MPS.

C.5. Environmental impact assessment

<Means of validation>

It is confirmed through document review and interview with the PPs that the proposed JCM project is not required to conduct assessment of environmental impact according to the national legal requirement of assessment in Thailand. It is also confirmed through interview with the PPs that this factory is not permitted to rebuild and/or expand its buildings in accordance with the ordinances of the local government, due to consideration of the influence of environmental impact to the local community.

<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 EIA regulation in Thailand.

C.6. Local stakeholder consultation

<Means of validation>

Through reviewing the initial PDD and the minutes of local stakeholder consultation (LSC) meeting, it was confirmed that a LSC was implemented for the following local stakeholders, and the following information was confirmed with a satisfactory result.

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

- The relevant local stakeholders have been identified by the PPs, and a LSC meeting was held on 13/12/2017, inviting mainly the authorities on greenhouse gases management in Thailand and the factory's employees.

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

- The summary of the comments received has been described in the PDD. Through interview with the PPs, it is confirmed that those comments have 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 information on the LSC meeting has been described in the PDD appropriately. As a result, it is concluded that no additional actions are required for the comments received.

As for the plan of local stakeholder consultation, the validation team raised CL04. This was resolved in Findings below.

<Findings>

CL04

It is requested to submit the invitation letters and the participant list of the local stakeholder consultation to the validation team, in order to clarify that the relevant local stakeholders have been identified preliminarily and appropriately.

Resolution by the PPs

The invitation letters and the participant list of the local stakeholder consultation were

submitted by the PPs. Through the submitted documents, it is confirmed that the local stakeholder consultation has been planned and conducted appropriately. Therefore, this CL is closed.

<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 project participants, 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

- $AP_{PJ,i,j,p}$ (Amount of fabric woven by the project air jet loom type *i* at the project factory *j* during the period *p*)

It is confirmed that the amount of fabric woven produced by the project air-saving jet loom has been equipped with a built-in type volume measuring device for production, in order to monitor the amount of production (the length of each fabric woven) per unit. The measuring device is expected to be properly maintained by the manufacturer. Therefore, the validation team considers that it is reasonable for appropriate monitoring activities.

<Findings>

As for parameters to be monitored ex-post, CL03 was raised in Section C.4 of this report and resolved accordingly. No other outstanding issue else was raised.

<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 Sheet is feasible as for the

means of monitoring.

C.8. Modalities of Communication

<Means of validation>

Through document review, it is confirmed that the signed Modalities of Communication (MoC) 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, Markit Environmental Registry, etc.) 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 project participant, it was confirmed that the project air jet looms have been installed into the factory, divided into three phases as below.

Phase1: 2 units (the delivery date after commissioning is 29/01/2016)
Phase2: 57 units (the delivery date after commissioning is 14/10/2016)
Phase3: 60 units (the delivery date after commissioning is 15/12/2017)

- Starting date of project operation, defined in the revised PDD: 29/01/2016

Through interview with the PPs, it is confirmed that the starting date of project operation is identified as the delivery date after commissioning of Phase1, dated 29/01/2016, and it is considered reasonable and appropriate.

<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. This call for public comments is open from 06 Feb 18 – 07 Mar 18 (24:00 GMT). The specific JCM website of the proposed JCM project is as below:
https://www.jcm.go.jp/th-jp/projects/43

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

- Junya Taniguchi, Senior Staff, Toray Industries, Inc.
- Yoshihiro Hamaguchi, Director, Luckytex (Thailand) Public Company Limited
- Thaworn Rattanaphornpradit, Mill Manager of Mill No.1, Luckytex (Thailand) Public Company Limited
- Wanna Prada, General Manager of Quality Assurance (QA) Department, Luckytex (Thailand) Public Company Limited
- Shinichiro Sano, Chief Consultant, Mitsubishi UFJ Research and Consulting Co., Ltd.

E.2. List of documents received

1. Project Design Document for publication (JCM_TH_F_PDD_ver02.0_Toray.pdf)
2. Monitoring Plan Sheet and Monitoring Structure Sheet for publication (JCM_TH_AM004_ver01.0_Toray.xlsx)
3. Modalities of communications statement for publication (JCM_TH_F_MoC_Toray&Luckytexver01.0.docx)
4. JCM Approved Methodology TH_AM004 (JCM_TH_AM004_ver01.0.pdf)
5. Monitoring Plan Sheet and Monitoring Structure Sheet VN_AM004 (JCM_TH_AM004_ver01.0.xlsx)
6. JCM Modalities of Communication Statement Form (JCM_TH_F_MoC_ver01.0.pdf)
7. JCM Project Design Document Form (JCM_TH_F_PDD_ver02.0.pdf)
8. JCM Validation Report Form (JCM_TH_F_Val_Rep_ver01.0.docx)
9. JCM Guidelines for Developing Project Design Document and Monitoring Report

(JCM_TH_GL_PDD_MR_ver02.0.pdf)

10. JCM Guidelines for Validation and Verification (JCM_TH_GL_VV_ver01.0.pdf)
11. JCM Glossary of Terms (JCM_TH_Glossary_ver01.0.pdf)
12. JCM Project Cycle Procedure (JCM_TH_PCP_ver02.0.pdf)
13. Luckytex (Thailand) Public Company Limited
14. Toray Industries, Inc.
15. Installation confirmation letter (LTX 2units, 2016)
16. Legal useful life of the operational equipment under Japanese tax regulation
17. Product brochure, catalog, or specification sheet of newly installed air-saving looms (JAT810)
18. Installation confirmation letter (LTX 60units, 2017)
19. Loom Production Plan by product number (JAT 810)
20. Calculation summary of the estimated reference emissions of Year 2016 and 2017
21. Guideline for legal requirement of environmental impact assessment in Viet Nam
22. LSC meeting report, including the invitation letters and the participant list
23. Presentation materials for the local stakeholder consultation
24. Explanation materials of monitoring system for the project jet air looms by Toyota Industries Corporation
25. PRODUCT & OPERATING DETAILS　(OCTOBER - DECEMBER '2017)
26. List of air compressor capacity for the project air jet loom
29. CO2 emission factor for consumed electricity at the project factory (0.0005664 tCO2/kWh)
30. Factory layout of Luckytex Mill-1
31. Instruction Manual published by Toyota Industries Corporation
32. Specification of air compressor (TAE-18/TXA-290/TXA-370）
33. Project Design Document for registration (180215_JCM_TH_F_PDD_ver02.0_Toray.pdf)
34. Monitoring Plan Sheet and Monitoring Structure Sheet for registration (180215_JCM_TH_AM004_ver01.0_Toray.xlsx)
35. Modalities of communications statement for registration (JCM_TH_F_MoC_ver01.0_Toray.pdf)

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: 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	-