JCM Validation Report Form

A. Summary of validation

A.1. General Information

Title of the project	Introduction of Amorphous High Efficiency Transformers in Northern, Central and Southern Power Grids
Reference number	VN013
Third-party entity (TPE)	Deloitte Tohmatsu Sustainability Co., Ltd. (DTSUS)
Project participant contracting the TPE	Yuko-Keiso Co., Ltd.
Date of completion of this report	15/03/2019

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	The project participants have completed a local stakeholder	☒

Item	Validation requirements	No CAR or CL remaining
stakeholder consultation	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: Sugiyama	First name: Masahiko
Title: Representative Executive	
Specimen signature: [redacted]	Date: 15/03/2019

B. Validation team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☒ Ms. ☐	Kunio Tada	DTSUS	Team Leader	☒	Authorized	☒
Mr. ☒ Ms. ☐	Yuichi Otani	DTSUS	Team Member	☒		☐
Mr. ☒ Ms. ☐	Chikara Ishigai	DTSUS	Internal Reviewer	☒	Authorized	☐
Mr. ☐ Ms. ☐				☐		☐

Please specify the following for each item.

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

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

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

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

C.1. Project design document form

<Means of validation>

The validation team checked the received project design document (the PDD) and confirmed that the latest version of the form was applied. The information required by the PDD and Monitoring Guidelines was described completely in the PDD.

<Findings>

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

No issue was raised in the PDD form.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team concluded that the PDD was completed using the latest version of the form and drafted in line with the PDD and Monitoring Guidelines.

C.2. Project description

<Means of validation>

The proposed project is replacing existing silicon steel core transformers by setting highly efficient (less no load loss) amorphous transformers at areas of the four power companies (the project participants: the PPs) listed in the PDD.

The validation team conducted on-site visits at KHPC and Dong Nai PC areas (Although more than half of the project transformers were installed within the EVNSPC area, the EVNSPC had already participated in other similar JCM projects (VN004 and VN008) and have experience about the JCM. So the validation team selected KHPC and Dong Nai PC for on-site visit.
The location of the project listed in the PDD was checked by Google Map and the listed location was the site of the PP's office.
The validation team received the list of project transformers with information such as type (capacity, phase), location (address, installed power pole number) and the serial number, and checked during their on-site visits in the KHPC and Dong Nai PC areas whether the project transformers were installed correctly by sampling and checking the electricity distribution map/diagram by which every transformer was managed by the PPs. Based on the procedures performed, the project transformers were installed correctly and managed appropriately.
The validation team also confirmed that the expected operational time in the PDD (18 years) is the legal life for a pole-mounted transformer in Japan.
The proposed project was financially supported by the Ministry of the Environment of Japan (MOEJ) through the financing program. The validation team checked the grant notification letter issued by the MOEJ and confirmed that the financial support was implemented as reported in the PDD.

<**Findings**>
Please state if CARs, CLs, or FARs are raised, and how they are resolved.
The validation team found some project transformers had been relocated, stopped, or changed their address notation (no relocation) between the start of the project operation and the on-site visits based on interviews with the PPs and a review of the event list with information such as replacement, relocation and address notation change.
The validation team raised CL1 and requested evidence or information from the PPs to support the event list to check whether these events were managed appropriately. Such evidence or information included construction records or operation stop/restart records were received and confirmed that the event details were reflected correctly in the event list and events were managed appropriately.
The CL1 was closed.
<**Conclusion based on reporting requirements**>
Please state conclusion based on reporting requirements.
The validation team concluded that the description of the proposed JCM project in the

PDD was accurate, complete, and met the requirements of the PDD and Monitoring Guidelines as it provided an understanding of the project.

C.3. Application of approved methodology(ies)

<**Means of validation**> The applied methodology for the proposed project is 'Installation of energy efficient transformers in a power distribution grid' (VN-AM005). The validation team confirmed that the latest version (1.0) of the methodology was applied. The validation team checked the eligibility of the criteria of the applied methodology as follows. Criteria 1: Single-phase and/or three-phase oil-immersed transformer with amorphous metal core is installed in the distribution grid. The validation team checked the product specification, the brochure of the project transformers by the manufacturer, tender specification by the PPs and the project transformers list with specification information, and confirmed that all types of project transformers were single-phase and/or three-phase oil-immersed transformers with amorphous metal core. Additionally, the validation team conducted the on-site visits and checked the project transformers by sampling. Every checked transformer was single-phase or three-phase transformers with amorphous metal core. Although some transformers had been relocated between the project operation start and the on-site visit, relocation is not exchange of transformers to those not satisfying the criteria, and does not affect the applicability of the criteria. Criteria 2: Load losses of the project transformer determined in line with IEC 60076-1 or national/industrial standards complying with IEC 60076-1 is equal or smaller than the standard values or specification values of load loss, required by the power company of the grid where the project transformer is installed, corresponding to its capacity and number of phases. According to the brochure from the manufacturer and tender specification of the project transformers by the PPs, their products were tested based on the IEC60076 standards, which the validation team confirmed. TCVN63606-1 is Viet Nam's equivalent to IEC60076 and is basically a translation of IEC60076, which the validation team confirmed. It was also confirmed from the interviews with the PPs that, in the event of a time-lag between the update of these

standards, IEC60076 would be prior to TCVN6306-1.

The validation team checked the tender specification of the project transformers with the PPs, the product specification of the project transformers with the manufacturer and the acceptance records with the PPs. In doing so, the validation team also confirmed that the load losses of the project transformers were equal to or smaller than that required by the PPs.

<**Findings**>

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

No issue was raised on the applicability of the approved methodology.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team concluded that the proposed project was eligible for applying the methodology. The applied version was valid and met the requirements of the PDD and Monitoring Guidelines.

C.4. Emission sources and calculation of emission reductions

<**Means of validation**>

The validation team checked the product specification of the project transformers and reference transformers (tender specification of the 'silicon' transformers), conducted the on-site visits, and interviewed the PPs. In the process, the validation team confirmed that reference emission sources and project emission sources were no-load losses of grid electricity from the transformers and correspond with the applied methodology.

The validation team also confirmed that the applied methodology did not allow PPs to choose whether a source or gas was to be included which is indicated in paragraph 41 of the JCM Guidelines for Validation and Verification.

The validation team checked the Monitoring Plan Sheet (the MPS) and confirmed that the calculation spreadsheet of the applied methodology was applied without changes being made.

The validation team checked the appropriateness and correctness of the parameter values fixed ex ante as shown below.

Brp (Blackout rate): The default value fixed in the applied methodology was applied.

UNCi (Maximum allowable uncertainty for the no-load losses of the project

transformer): The value (0.15: 15%) was applied from the tolerance of component losses as defined in IEC60076-1, which was conservative, the validation team concluded.

EFgrid (CO_2 emission factor of the grid): The source of the emission factor issued by the Ministry of Natural Resources and Environment (the MONRE) was checked and an appropriate value was applied.

<**Findings**>

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

The validation team checked the appropriateness and correctness of the values of the below parameters fixed ex ante and found that the values of these parameters for some types of the project/reference transformers were incorrect (the values of some types did not correspond to the evidence (product specification and tender specification).

NLLRE,i,j,k (No load losses of the reference transformer)

NLLPJ,i,j,k (No load losses of the project transformer)

The validation team raised CAR1 and requested the PPs to revise the applied values in the MPS. The validation team checked the revised MPS and confirmed the incorrect values were revised appropriately. CAR1 was closed.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team concluded that all relevant GHG emission sources covered in the methodology were addressed appropriately, and that the parameter values to be fixed ex ante were appropriate.

C.5. Environmental impact assessment

<**Means of validation**>

The validation team checked the decree of the environmental impact assessment (EIA) issued by the Viet-Nam government and interviewed the PPs, and confirmed that the proposed project did not require an EIA.

<**Findings**>

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

No issue was raised on the EIA.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team concluded that the EIA was not required for the proposed project and the requirements for the EIA were not applicable.

C.6. Local stakeholder consultation

<**Means of validation**>

According to the received PDD, stakeholders' consultation meetings were held three times for the direct stakeholders (the four power companies). Satisfactory responses were received and, therefore, no further action was required.

The validation team checked the following evidences and confirmed that the local stakeholder consultation (the LSC) invitation in the PDD was consistent with the evidences received as follows:

- Invitation letter to LSC meetings
- Presentation documents in the meetings
- Attendees list

The LSC was, therefore, held appropriately.

The validation team also checked the records of the LSC meetings and the results of the LSC in the PDD were confirmed and found to be consistent with the records and, therefore, no further action was required.

Additionally, the validation team interviewed the PPs at the on-site visit and confirmed that their opinion on the proposed project was consistent with the PDD.

<**Findings**>

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

No issue was raised on the LSC.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team concluded that the LSC process was completed appropriately, and met the requirements of the PDD and Monitoring Guidelines.

C.7. Monitoring

<**Means of validation**>

The following is the monitoring parameter list for the proposed project. The validation team confirmed that the list (one parameter was listed) was consistent with the approved methodology.

Parameter	Description of data

Hi,p	Energizing time of the project transformer i during the period p

The means of monitoring the parameter was not regulated specifically in the applied methodology, which the validation team confirmed.
According to the monitoring plan, the measurement methods and procedures of monitoring the parameter is counting the number of hours during the monitoring period and then the monitoring frequency is once at the end of the monitoring period.
Actually, it was assumed that the project transformers were always energized in principle (i.e. calculated by multiplying the number of days of the monitoring period by 24 hours/day). In case of non-operation (because of such events as replacement, relocation and etc.), the non-operation time was deducted. The validation team confirmed by checking the MPS and interviewing the PPs. No equipment was used for monitoring and there was no monitoring point specified. The validation team concluded that the means for monitoring was reasonable considering the characteristics of the transformers. The non-operation time was calculated by multiplying the number of non-operation days by 24 hours/day. The validation team concluded it was conservative and reasonable.
As for data management on non-operational time, the validation team confirmed its appropriateness by checking the event list and its evidences as reported in Section C.2. of this report.
As for the monitoring structure, the validation team identified the responsible personnel in each PP based on the monitoring plan explanation document (in which the responsible personnel and the role of each PP was listed) and interviews with the PPs. The validation team also checked the monitoring manual and meeting records with the PPs on the JCM monitoring and confirmed that the data management and QA/QC procedures were established appropriately.

<**Findings**>

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

No issue was raised on monitoring.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team concluded that the monitoring plan complied with requirements of the approved methodology. The PPs had the ability to implement the monitoring so the monitoring plan would be feasible.

C.8. Modalities of Communication

<**Means of validation**>
The validation team received the MoC from one of the PPs, Yuko-Keiso Co., Ltd. with whom the TPE (DTSUS) contracted this validation.
The validation team checked the minutes of agreements for the proposed project between Yuko-Keiso and each PP (the four power companies) in Viet-Nam and confirmed that Yuko-Keiso has responsibility as the representative of the PPs.
In addition, the validation team received written confirmation letters from every PP, including Yuko-Keiso that declared all corporate and personal details, including specimen signatures, were valid and accurate.
The validation team also checked name cards of Yuko-Keiso, including the official who signed the MoC and, additionally, confirmed the personnel who signed the MoC and the written confirmation letter of the PPs (KHPC and Dong Nai PC) by checking the list of interviewees for this validation, including the PPs who were interviewed.
The validation team also checked the received MoC and confirmed that the latest version of the form was used and the required information was completed correctly.

<**Findings**>
Please state if CARs, CLs, or FARs are raised, and how they are resolved.
No issue was raised on the MoC.
<**Conclusion based on reporting requirements**>
Please state conclusion based on reporting requirements.
The validation team validated the corporate identities of all project participants and the focal point included in the MoC, as well as the personal identities.

C.9. Avoidance of double registration

<**Means of validation**>
The validation team checked the MoC and confirmed that the PPs declared as a written confirmation that the proposed project has not been registered under other international climate mitigation mechanisms.
As a cross-check, the validation team checked the project lists on the websites of the UNFCCC (CDM/JI) and the Verified Carbon Standard (VCS) and there was no similar project.
There have already been registered JCM projects which are similar to the proposed project (VN004 and VN008). The validation team received the transformers lists of these existing projects and checked the serial numbers of these transformers with the numbers of the proposed project transformers. There was no duplication among the lists.

<**Findings**>

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

No issue was raised on the avoidance of double registration.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team concluded that the proposed project was not registered under other international climate mitigation mechanisms, and that the avoidance of double registration met the requirements of the PDD and Monitoring Guidelines.

C.10. Start of operation

<**Means of validation**>

The validation team checked the correctness of the start date of operations of each project transformer on the lists by checking the records for the operation start date by sampling and confirmed that the operation start date of the checked transformers were correct (the dates on the lists were consistent with those in the records). The validation team concluded that the operation start date of each project transformer was managed appropriately.

The validation team checked the latest operation start date of the project transformers and found that the project transformer whose operation start is the latest was that installed by the EVNSPC (i = 652) and the latest operation start date was 22 December 2017.

The validation team concluded that it is conservative and appropriate to set the operation start date of the proposed project as of 1 January 2018, which was later than the latest operation start date (22 December 2017).

<**Findings**>

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

No issue was raised on the start of operation.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team concluded that the starting date of project operation in the PDD was appropriate. The starting date did not predate 1 January 2013 and did meet the requirement of the PDD and Monitoring Guidelines.

C.11. Other issues

<**Means of validation**>

Through the validation process reported in C.1 - C.11, the validation team states the conclusion as shown below.

<**Findings**>

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

N/A

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team undertook a reasonable assurance engagement based on ISO14064-3 and the engagement has not been undertaken based on the International Standard on Assurance Engagement (ISAE) 3000 'Assurance Engagements Other than Audit or Reviews of Historical Financial Information' issued by the International Auditing and Assurance Standards Board (IAASB).

The implemented procedures are as shown below:

- On-site visits were implemented in the areas of KHPC and Dong Nai PC,
- Sampling is applied according to Paragraph 17 of the 'Joint Crediting Mechanism Guidelines for Validation and Verification' (Version 1.0), and the sampling size was 61 transformers
- Evidence obtained included information that cannot be externally obtained,
- Validation is the process of independent evaluation of a proposed JCM project by a third-party entity against the validation guidelines as developed by the Joint Committee on the basis of the PDD, but does not assure the feasibility and achievability of the proposed project,
- The implemented procedures involve assessing the suitability in the circumstances of the project participant's use of 'Joint Crediting Mechanism Guidelines for Developing Project Design Document and Monitoring Report' (Version 2.0) and the approved methodology (VN AM005 Version 1.0) as the basis for the preparation of the PDD.

D. Information on public inputs

D.1. Summary of public inputs

Call for public inputs was opened from 24 January 2019 to 22 February 2019, and no public input was submitted.

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

No public input was submitted.

E. List of interviewees and documents received

E.1. List of interviewees

Khanh Hoa PC (KHPC)
Do Thanh Son
Tran Dang Hien
Thai Quoc Hung
Nguyen Xuan Thu
Vo Ngoc Tuan
Phan Manh Hung
Nguyen Quang Tien

Vinh Nguyen PC (a subsidiary of KHPC)
Nguyen Dang Thanh Loi
Bui Hoang Lam

Nha Trang Center PC (a subsidiary of KHPC)
Nguyen Van Hung
Dinh Van Tuan

Vinh Hai PC (a subsidiary of KHPC)
Nguyen Thanh Nam
Nguen Thanh Hai

Dong Nai PC (DNPC)
Thinh Xuan Dung
Nguyen Ngoc Tuan
Le Minh Hoang
Thai Nhu Hai
Tran Nguyen Tuong
Bui Cong Tuan
Do Huu Hoang

Bien Hoa PC (a subsidiary of DNPC)
Tran Nam Long

Bien Hoa 2 PC (a subsidiary of DNPC) Vo Van Bao Duy Yuko-Keiso Co., Ltd. Shiro Tokura Saori Iwasaki Vu Huy Hieu Mitsubishi UFJ Morgan Stanley Securities Co., Ltd. Chisato Nakade

E.2. List of documents received

- Modalities of Communication (MoC) - Financial support documents by the Ministry of Environment of Japan - List of transformers installed by the proposed project (EVNSPC, EVNHN, KHPC, DNPC) - Event list of the project transformers (EVNSPC, EVNHN, KHPC: No event by DNPC) - Evidence of events (relocation, replacement and others: Construction records, Installation Records) - Product specification for the project transformers - Tender specification for the project transformers (EVNSPC, EVNHN, KHPC, DNPC) - Tender specification for the reference transformers (EVNSPC, EVNHN, KHPC, DNPC) - Manufacturer's brochure for the project transformers - Acceptance (Operation start) records by the PPs (EVNSPC, EVNHN, KHPC, DNPC) - Pre-delivery inspection reports of the installed transformers by the manufacturer - Location map of transformers installed by the proposed project (EVNSPC, EVNHN, KHPC, DNPC) - Transmission line map by KHPC (sampling) - Transmission line diagram by DNPC (sampling) - Evidence of expected operational lifetime (18 years) of the proposed project - DECREE on environmental protection planning, strategic environmental assessment, environmental impact assessment and environmental protection plans

(No.18/2015/ND-CP)
- Invitation letter/email to stakeholder meetings
- Presentation materials for stakeholder meetings
- Attendees list for each meeting
- Records of each meeting
- Brochure of the PPs (Yuko-Keiso, EVNSPC, EVNHN, KHPC, DNPC)
- Document that explains the monitoring plan
- Written confirmation in which all corporate and personal details are valid and accurate
- Minutes of agreement on the JCM between Yuko-Keiso and PPs in which all the PPs are listed and Yuko-Keiso is assigned as the focal point (EVNSPC, EVNHN, KHPC, DNPC) for communication
- Monitoring manual about the proposed project (to check and record events such as replacement, relocation, address change)
- Education record about the JCM, the proposed project, and monitoring of the power companies
- IEC 60076-1
- National/industrial standard adopted to determine loss losses of transformers (TCVN6306-1: 2015)
- Source of the emission factor (0.9185 tCO_2/kWh) issued by the Ministry of Natural Resources and Environment (the MONRE)
- List of transformers installed by EVNSPC in the registered JCM projects (VN004, VN008)

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.

Team Leader

Name:	TADA, Kunio		
Position:	☒ 1. Lead Auditor ☐ 2. Auditor ☐ 3. Technical Expert		
Fields of Expertise:	Sectoral Scopes (SS)	Technical Areas (TA)	
	SS 1: Energy industries (renewable/non-renewable sources)	☒	TA 1.1: Thermal energy generation
		☒	TA 1.2: Renewables
	SS 2: Energy distribution	☒	TA 2.1: Electricity distribution
	SS 3: Energy demand	☒	TA 3.1: Energy demand
	SS 4: Manufacturing industries	☐	TA 4.1: Cement and lime production
	SS 5: Chemical industry	☐	TA 5.1: Chemical process industries
		☐	TA 5.2: Caprolactam, nitric and adipic acid
	SS 6: Construction	☐	TA 6.1: Construction
	SS 7: Transport	☐	TA 7.1: Transport
	SS 8: Mining/mineral production	☐	TA 8.1: Mining and mineral production
	SS 9: Metal production	☐	TA 9.1: Aluminum and magnesium production
		☐	TA 9.2: Iron steel and ferro-alloy production
	SS 10: Fugitive emissions from fuels (solid, oil and gas)	☐	TA 10.1: Fugitive emissions from oil and gas
	SS 11: Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	☐	TA 11.1: Emissions of fluorinated gases
		☐	TA 11.2: Refrigerant gas production
	SS 12: Solvents use	☐	TA 12.1: Chemical industries
	SS 13: Waste handling and disposal	☒	TA 13.1: Solid waste and wastewater
		☐	TA 13.2: Manure
	SS 14: Afforestation and reforestation	☐	TA 14.1: Afforestation and reforestation
	SS 15: Agriculture	☒	TA 15.1: Agriculture
	SS 16: Carbon capture and storage of CO2 in geological formations	☐	TA 16.1: Carbon capture and torage
Approved by:	TATSUWAKI, Keiko, Chief Executive Officer of DTSUS		

NOTE: In accordance with "Auditor's List with Technical Areas of Sectoral Scopes" by DTSUS.

Team Member

Name:	OTANI, Yuichi		
Position:	☒ 1. Lead Auditor ☐ 2. Auditor ☐ 3. Technical Expert		
Fields of Expertise:	Sectoral Scopes (SS)	Technical Areas (TA)	
	SS 1: Energy industries (renewable/non-renewable sources)	☒	TA 1.1: Thermal energy generation
		☒	TA 1.2: Renewables
	SS 2: Energy distribution	☐	TA 2.1: Electricity distribution
	SS 3: Energy demand	☒	TA 3.1: Energy demand
	SS 4: Manufacturing industries	☐	TA 4.1: Cement and lime production
	SS 5: Chemical industry	☐	TA 5.1: Chemical process industries
		☐	TA 5.2: Caprolactam, nitric and adipic acid
	SS 6: Construction	☐	TA 6.1: Construction
	SS 7: Transport	☐	TA 7.1: Transport
	SS 8: Mining/mineral production	☐	TA 8.1: Mining and mineral production
	SS 9: Metal production	☐	TA 9.1: Aluminum and magnesium production
		☐	TA 9.2: Iron steel and ferro-alloy production
	SS 10: Fugitive emissions from fuels (solid, oil and gas)	☐	TA 10.1: Fugitive emissions from oil and gas
	SS 11: Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	☐	TA 11.1: Emissions of fluorinated gases
		☐	TA 11.2: Refrigerant gas production
	SS 12: Solvents use	☐	TA 12.1: Chemical industries
	SS 13: Waste handling and disposal	☒	TA 13.1: Solid waste and wastewater
		☐	TA 13.2: Manure
	SS 14: Afforestation and reforestation	☐	TA 14.1: Afforestation and reforestation
	SS 15: Agriculture	☒	TA 15.1: Agriculture
	SS 16: Carbon capture and storage of CO2 in geological formations	☐	TA 16.1: Carbon capture and storage
Approved by:	TATSUWAKI, Keiko, Chief Executive Officer of DTSUS		

NOTE: In accordance with “Auditor’s List with Technical Areas of Sectoral Scopes” by DTSUS.

Internal Reviewer

Name:	ISHIGAI, Chikara		
Position:	☒ 1. Lead Auditor ☐ 2. Auditor ☐ 3. Technical Expert		
Fields of Expertise:	Sectoral Scopes (SS)	Technical Areas (TA)	
	SS 1: Energy industries (renewable/non-renewable sources)	☒	TA 1.1: Thermal energy generation
		☒	TA 1.2: Renewables
	SS 2: Energy distribution	☒	TA 2.1: Electricity distribution
	SS 3: Energy demand	☒	TA 3.1: Energy demand
	SS 4: Manufacturing industries	☐	TA 4.1: Cement an lime Production
	SS 5: Chemical industry	☒	TA 5.1: Chemical process industries
		☐	TA 5.2: Caprolactam, nitric and adipic acid
	SS 6: Construction	☐	TA 6.1: Construction
	SS 7: Transport	☐	TA 7.1: Transport
	SS 8: Mining/mineral production	☐	TA 8.1: Mining and mineral production
	SS 9: Metal production	☐	TA 9.1: Aluminum and magnesium production
		☐	TA 9.2: Iron steel and ferro-alloy production
	SS 10: Fugitive emissions from fuels (solid, oil and gas)	☒	TA 10.1: Fugitive emissions from oil and gas
	SS 11: Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	☐	TA 11.1: Emissions of fluorinated gases
		☐	TA 11.2: Refrigerant gas production
	SS 12: Solvents use	☒	TA 12.1: Chemical industries
	SS 13: Waste handling and disposal	☒	TA 13.1: Solid waste and wastewater
		☐	TA 13.2: Manure
	SS 14: Afforestation and reforestation	☐	TA 14.1: Afforestation and reforestation
	SS 15: Agriculture	☐	TA 15.1: Agriculture
	SS 16: Carbon capture and storage of CO2 in geological formations	☐	TA 16.1: Carbon capture and storage
Approved by:	TATSUWAKI, Keiko, Chief Executive Officer of DTSUS		

NOTE: In accordance with “Auditor’s List with Technical Areas of Sectoral Scopes” by DTSUS.