JCM Verification Report Form

A. Summary of verification

A.1. General Information

Title of the project	Introduction of Amorphous High Efficiency Transformers in Northern, Central, and Southern Power Grids
Reference number	VN013
Monitoring period	01/01/2018 - 31/12/2018
Date of completion of the monitoring report	22/11/2019
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	27/12/2019

A.2 Conclusion of verification and level of assurance

Overall verification opinion	☒ Positive ☐ Negative
☒ Unqualified opinion	Based on the process and procedure conducted, *Deloitte Tohmatsu Sustainability Co., Ltd.* (TPE's name) provides reasonable assurance that the emission reductions for *Introduction of Amorphous High Efficiency Transformers in Northern, Central, and Southern Power Grids* (project name) ✓ Are free of material errors and are a fair representation of the GHG data and information, and ✓ Are prepared in line with the related JCM rules, procedure, guidelines, forms and other relevant documents
(If overall verification opinion is negative, please check below and state its reasons.) ☐ Qualified Opinion ☐ Adverse opinion ☐ Disclaimer	<State the reasons> N/A

A.3. Overview of the verification results

Item	Verification requirements	No CAR or CL remaining
The project implementation with the eligibility criteria of the applied methodology	The TPE determines the conformity of the actual project and its operation with the eligibility criteria of the applied methodology.	☒
The project implementation against the registered PDD or any approved revised PDD	The TPE assesses the status of the actual project and its operation with the registered/validated PDD or any approved revised PDD.	☒
Calibration frequency and correction of measured values with related requirements	If monitoring Option C is selected, the TPE determines whether the measuring equipments have been properly calibrated in line with the monitoring plan and whether measured values are properly corrected, where necessary, to calculate emission reductions in line with the PDD and Monitoring Guidelines.	☒
Data and calculation of GHG emission reductions	The TPE assesses the data and calculations of GHG emission reductions achieved by/resulting from the project by the application of the selected approved methodology.	☒
Avoidance of double registration	The TPE determines whether the project is not registered under other international climate mitigation mechanisms.	☒
Post registration changes	The TPE determines whether there are post registration changes from the registered PDD and/or methodology which prevent the use of the applied methodology.	☒

Authorised signatory:	Mr. ☒ Ms. ☐
Last name: Sugiyama	First name: Masahiko
Title: Representative Executive	
Specimen signature: [redacted]	Date: 27/12/2019

B. Verification team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☒ Ms. ☐	Kunio Tada	DTSUS	Team Leader	☒	Authorized	☒
Mr. ☒ Ms. ☐	Chikara Ishigai	DTSUS	Internal Reviewer	☒	Authorized	☐
Mr. ☐ Ms. ☐				☐		☐
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 verification, findings and conclusions based on reporting requirements

C.1. Compliance of the project implementation and operation with the eligibility criteria of the applied methodology

<**Means of verification**>

Criteria 1: Single-phase and/or three-phase oil-immersed transformer with amorphous metal core is installed in the distribution grid.

The verification team checked the specification information in the project transformers list with 1) the product specification and 2) the brochure of the project transformers by the manufacturer. The verification team confirmed that all types of transformers by the project were single-phase and/or three-phase oil-immersed transformers with amorphous metal core. Additionally, the verification team conducted the on-site visits and checked the project transformers by sampling. Every checked transformer was single-phase or three-phase transformer with amorphous metal core.

The verification team confirmed that some project transformers were replaced or relocated during the monitoring period as reported in Section C.2.

As for replacements, the newly exchanged transformers also satisfied the criteria of the methodology. The verification team confirmed this during the on-site visit based on interviews with the project participants (PPs) and a review of the acceptance records of those transformers.

As for relocations, they are not related to exchanges of transformers and do not affect the applicability of the methodology.

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.
The verification team confirmed that their products were tested based on the IEC 60076 standards according to the brochure from the manufacturer.
The verification team checked the tender specification of the project transformers of the PPs (the four power companies), the product specification of the project transformers issued by the manufacturer, and the acceptance records of the PPs. In doing so, the verification team also confirmed that the load losses of the project transformers were equal or smaller than that required by the PPs.
Additionally, the verification team conducted on-site visits and checked the project transformers by sampling. Every checked transformer was actually installed and operating, and the information corresponded to the list managed by the PPs.

<**Findings**>
Please state if CARs, CLs, or FARs are raised, and how they are resolved.
No issue was raised on the compliance of the project implementation with the eligibility criteria of the applied methodology.
<**Conclusion based on reporting requirements**>
Please state conclusion based on reporting requirements.
The verification team concluded that project implementation complied with the eligibility criteria of the applied methodology.

The verification team has undertaken a reasonable assurance engagement based on ISO14064-3. 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 for the areas of EVN Southern Power Corporation (EVNSPC) and EVN Hanoi (EVNHN).
- Sampling is applied according to Paragraph 17 of the ‘Joint Crediting Mechanism

Guidelines for Validation and Verification' (Version 1.0), and sampling size was 61 transformers.
- Evidence obtained included information that cannot be externally obtained.
- Implemented procedures involve assessing the suitability in the circumstances of the project participant's use of the 'Joint Crediting Mechanism Guideline for Developing Project Design Document and Monitoring Report' (Version 2.0), the Project Design Document (Version 2.0) of the project, and the approved methodology (VN AM005 Version 1.0) as the basis for the preparation of the monitoring report.
- As for the presentation, the PDD of the project complies with the requirement for the 'JCM Guidelines for Developing Project Design Document and Monitoring Report' (Version 2.0).

C.2. Assessment of the project implementation against the registered PDD or any approved revised PDD

<**Means of verification**>

The verification team implemented on-site visits and checked whether the project transformers were installed and operating according to the approved PDD and the monitoring plan by sampling.

The verification team confirmed that information on the physical features of the project transformers (type (phase 1 or 3), capacity (kVA), location, and serial number) was managed properly by such methods as the use of electricity distribution system diagram (EVNSPC and EVNHN), and the project transformers were installed according to the PDD, the monitoring plan and the transformers list by the PPs.

The verification team checked the monitoring structure in the monitoring plan sheet. All the responsible personnel listed in the structure sheet were identified during interviews with the PPs. Through the verification process, it was confirmed that the structure was valid during the monitoring period, and each role was performed properly according to the monitoring plan.

<**Findings**>

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

The verification team confirmed that some of the project transformers have been replaced or relocated during/after the monitoring period because of breakdown by thunderbolt, change of electricity demand in the installed area, etc. based on interviews with the PPs, on-site visits, and a review of the event list that recorded event information, such as replacements, relocations, etc..

The verification team checked evidence of events (construction (operation stoppage) and

restart records) whether information in the event list was consistent with that in evidence and found that information (date of operation stoppage and/or restart, i.e., nonoperation time) of some transformers was not consistent.
The verification team raised CAR1 and requested the PPs to revise the event information.
The verification team received the revised event list and confirmed that the list information (i.e., nonoperation time of the project transformers) was revised appropriately.
The CAR1 was closed.

<**Conclusion based on reporting requirements**>
Please state conclusion based on reporting requirements.
The verification team concluded that the CAR1 was closed and the project was implemented according to the registered PDD.
As for the changes reported above (replacements and relocations of some project transformers), the verification team concluded that such changes do not affect the applicability of the methodology as reported in Section C.6.

C.3. Compliance of calibration frequency and correction of measured values with related requirements

<**Means of verification**>
The monitoring parameter is 'Energizing time of the project transformer (Hi,p)' of which the monitoring option is 'Option C.'
The parameter is measured by counting the number of hours of the monitoring period according to the monitoring plan. The number of hours is actually calculated by multiplying 24 hours/day by the number of days during the monitoring period (in case of nonoperation by replacements, relocations, etc., the nonoperation time is deducted), and no measuring equipment is used.

<**Findings**>
Please state if CARs, CLs, or FARs are raised, and how they are resolved.
No issue was raised on compliance of calibration frequency and correction of measured values.

<**Conclusion based on reporting requirements**>
Please state conclusion based on reporting requirements.
The verification team concluded that no measuring equipment is used to monitor the parameter, and therefore, the requirements in this section are not applicable.

C.4. Assessment of data and calculation of GHG emission reductions

<**Means of verification**>

The verification team checked the Monitoring Report Sheet (MRS) form and confirmed that the MRS form used is appropriate and corresponds to the applied methodology that is being used.

Transformers are basically assumed to be in operation continuously, and the monitoring parameter 'Energizing time of the project transformer (Hi,p)' is calculated by multiplying 24 hours/day by the number of days during the monitoring period.
The verification team concluded that the assumption made was reasonable considering the typical operational situation of transformers being installed in an electricity distribution grid.
In the event of replacement and relocations, the nonoperation time is raised and deducted from the value of the monitoring parameter (Hi,p).
Nonoperation time is calculated by multiplying 24 hours/day by the number of nonoperation days (from the date of operation stoppage to the date of operation restart) during the monitoring period.
The verification team concluded that the calculation of nonoperation time was conservative considering that the actual nonoperation time within an operation stoppage day and an operation restart day is less than 24 hours).
The verification team checked the event information of the project transformers during the monitoring period from the event list of transformers that recorded event information such as those related to replacements, relocations, etc. The verification team also checked the evidences associated with the events (the construction (operation stoppage) records and operation restart records) and confirmed that the event information on the list was basically consistent with the recorded evidence (i.e., the set of data for the monitoring period was complete).

The verification team checked the parameters to be fixed ex ante, and confirmed the values of these parameters were not changed from the monitoring plan and corrected as shown below.

NLLRE,i,j,k (No load losses of the reference transformer): The value was checked by the monitoring plan and no changes to the monitoring plan were confirmed.

NLLPJ,i,j,k (No load losses of the project transformer): The value was checked by the monitoring plan and no changes to the monitoring plan were confirmed. The values of all types of project transformers were also checked by the product specifications.

Brp (Blackout rate): The value was checked by the default value in the applied methodology and no changes to the monitoring plan were confirmed.

UNCi (Maximum allowable uncertainty for the no-load losses): The value (0.15: 15%) was adopted from the tolerance of component losses defined in IEC 60076-1 and no changes to the monitoring plan were confirmed.

EFgrid (CO_2 emission factor of the grid): The source of the emission factor issued by Ministry of Natural Resources and Environment (MONRE) was checked and no changes to the monitoring plan were confirmed.

Parameters	Monitored values	Method to check values in the monitoring report with sources
Hi,p Energizing time of the project transformer i during the period p	48 – 8,760 hours for each transformer	Checked the event information of the project transformers during the monitoring period from the event list for transformers, which records event information such as replacements, relocations, etc.. Also, checked the evidence for these events (the construction (operation stoppage) records and operation restart records). Lastly, checked whether the nonoperation time was reflected (deducted) correctly from the value of Hi,p in the MRS.

<Findings>

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

The verification team raised CAR2 and requested the PPs to revise the values of Hi,p in the MRS to reflect the revision by CAR1 in Section C.2. The verification team checked the revised MRS and confirmed that the revision of CAR1 was reflected (the nonoperation time was deducted) appropriately.

The CAR2 was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team concluded that the CAR2 was closed, the data was monitored appropriately, and the amount of GHG emission reductions was calculated correctly according

to the monitoring plan.

C.5. Assessment of avoidance of double registration

<**Means of verification**>

The verification 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 verification 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 in Viet-Nam which are similar to the proposed project (VN004 and VN008). The verification team received the transformers list 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 avoidance of double registration.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The verification team concluded that the projects were not registered under other international climate mitigation programs.

C.6. Post registration changes

<**Means of verification**>

The verification team confirmed that some project transformers were replaced or relocated during the monitoring period as reported in Section C.2.

As for replacements, the newly exchanged transformers also satisfied the criteria of the methodology. The verification team confirmed this during the on-site visit based on interviews with the PPs and a review of the acceptance records of those transformers.

As for relocations, they are not related to exchanges of transformers and do not affect the applicability of the methodology.

<**Findings**>

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

No issue was raised on post registration changes.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team concluded that there was no issue raised that prevents the use of the applied methodology and the need to post registration change approvals during the verification.

D. Assessment of response to remaining issues

An assessment of response to the remaining issues including FARs from the validation and/or previous verification period, if appropriate

There are no remaining issues including FARs from the validation. This verification is the first. There was no previous verification.

E. Verified amount of emission reductions achieved

Year	Verified Reference Emissions (tCO_2e)	Verified Project Emissions (tCO_2e)	Verified Emission Reductions (tCO_2e)
2013			
2014			
2015			
2016			
2017			
2018	5804.2	2331.1	3473
2019			
2020			
Total (tCO_2e)			3473

F. List of interviewees and documents received

F.1. List of interviewees

EVN Southern Power Corporation (EVNSPC)
Nguyen Huynh An Phu

Can Tho Power Company (a subsidiary of EVNSPC)
Bui Tinh Thien
Nguyen Thanh Tuan

EVN Hanoi (EVNHN)
Nguyen Khac Hung
Hoang Minh Thong
Vu Kim Huong
Tran Thanh Thuy
Nguyen Viet Hung
Pham Truc Kien
Nguyen Xuan Duy
Nguyen Ha Anh

Yuko-Keiso Co., Ltd.
Toshihide Sugawara
Yukihiro Sakai

Takeo Matsuda Shiro Tokura Saori Iwasaki Vu Huy Hieu Mitsubishi UFJ Morgan Stanley Securities Co., Ltd. Chisato Nakade

F.2. List of documents received

- Approved project design document (PDD) - Validation report - List of all transformers installed by the project (EVNSPC, EVNHN, KHPC, Dong Nai PC) - Product specification of the project transformers - Brochure from the manufacturer for the project transformers - Tender specification for the project transformers (EVNSPC, EVNHN, KHPC, Dong Nai PC) - Acceptance (operation start) records by the PPs (EVNSPC, EVNHN, KHPC, Dong Nai PC) - Location map of transformers installed by the proposed project (EVNSPC, EVNHN, KHPC, Dong Nai PC) - Electricity distribution system diagram (Evidence to identify the detailed location of transformers) by EVNSPC (Only on-site check) - Electricity distribution system diagram (Evidence to identify the detailed location of transformers) by EVNHN (Only on-site check) - Event list of the project transformers (Records of replacement, exchange, etc., of the installed transformers during the monitoring period) (EVNSPC, EVNHN, KHPC) (No event and Dong Nai PC) - Evidence of events (relocation, replacement and others: Construction records and energization records) - IEC 60076-1 - National/industrial standard adopted to determine losses of transformers (TCVN6306-1: 2015) - Source of the emission factor (0.9185 tCO_2/kWh) issued by the MONRE - MoC (Written confirmation by the PPs (four power companies and Yuko-Keiso) that confirms there is no double counting with other projects registered by the JCM and/or other mechanisms)

- List of transformers installed by another JCM project (VN004 and VN008)

Annex Certificates or curricula vitae of TPE's verification 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 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 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.

JCM Verification Report Form

A. Summary of verification

A.1. General Information

Title of the project	Introductioin of Amorphous High Efficiency Transformers in Northern, Central and Southern Power Grids
Reference number	VN013
Monitoring period	01 January 2019 – 31 December 2020
Date of completion of the monitoring report	05 March 2024
Third-party entity (TPE)	Japan Management Association (JMA)
Project participant contracting the TPE	Yuko-Keiso Co., Ltd.
Date of completion of this report	15 March 2024

A.2 Conclusion of verification and level of assurance

Overall verification opinion	☒ Positive ☐ Negative
☒ Unqualified opinion	Based on the process and procedure conducted, *Japan Management Association* (TPE's name) provides reasonable assurance that the emission reductions for *Introductioin of Amorphous High Efficiency Transformers in Northern, Central and Southern Power Grids* (project name) ✓ Are free of material errors and are a fair representation of the GHG data and information, and ✓ Are prepared in line with the related JCM rules, procedure, guidelines, forms and other relevant documents
(If overall verification opinion is negative, please check below and state its reasons.) ☐ Qualified Opinion ☐ Adverse opinion ☐ Disclaimer	<State the reasons>

A.3. Overview of the verification results

Item	Verification requirements	No CAR or CL remaining
The project implementation with the eligibility criteria of the applied methodology	The TPE determines the conformity of the actual project and its operation with the eligibility criteria of the applied methodology.	☒
The project implementation against the registered PDD or any approved revised PDD	The TPE assesses the status of the actual project and its operation with the registered/validated PDD or any approved revised PDD.	☒
Calibration frequency and correction of measured values with related requirements	If monitoring Option C is selected, the TPE determines whether the measuring equipments have been properly calibrated in line with the monitoring plan and whether measured values are properly corrected, where necessary, to calculate emission reductions in line with the PDD and Monitoring Guidelines.	☒
Data and calculation of GHG emission reductions	The TPE assesses the data and calculations of GHG emission reductions achieved by/resulting from the project by the application of the selected approved methodology.	☒
Avoidance of double registration	The TPE determines whether the project is not registered under other international climate mitigation mechanisms.	☒
Post registration changes	The TPE determines whether there are post registration changes from the registered PDD and/or methodology which prevent the use of the applied methodology.	☒

Authorised signatory:	Mr. ☒ Ms. ☐
Last name: Hirakawa	First name: Masahiro
Title: Senior Executive of GHG Certification Center, JMA	
Specimen signature: [redacted]	Date: 15 Mar. 2024

B. Verification team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☒ Ms. ☐	Masao Tomizawa	JMA	Team Leader	☒	Technical competence qualified	☐
Mr. ☒ Ms. ☐	Masataka Ajiki	JMA	Team Member	☒	-	☐
Mr. ☒ Ms. ☐	Motoyuki Matsumoto	JMA	Internal Reviewer	☒	Technical competence qualified	☐
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 verification, findings and conclusions based on reporting requirements

C.1. Compliance of the project implementation and operation with the eligibility criteria of the applied methodology

<Means of verification>

Approved methodology "Installation of energy efficient transformers in a power distribution grid, Ver.1.0 (Ref.2)" was applied to the JCM project. Verification team assessed the compliance of the project implementation and operation with the eligibility criteria of the applied methodology. Verification team conducted the assessment of the project implementation and operation for the monitoring period (from 1 Jan. 2019 to 31 Dec. 2020) to confirm the eligibility criteria in the registered PDD (Ref.1).

- Document review was conducted using the checklist based on the "JCM Guidelines for Validation and Verification (Ref.12)".
- Follow-up interviews with all project participants were conducted through the internet on 20, 26 and 27 February 2024.
-The information required for verification was verified by document and photographs and video reviews, via internet and e-mail.

Each criterion in the registered PDD was checked as follows by document review and interviews.

Verification team confirmed with relevant references and interviews with PPs via internet that the PPs installed and operated transformers with amorphous metal core in line with the eligibility criteria of the applied methodology.
Detailed assessment by criterion is shown below:

Criterion 1:
Single-phase and/or three-phase oil-immersed transformer with amorphous metal core is installed in the distribution grid.
All transformers described in the registered PDD was confirmed by desk review, checking photographs and videos through internet and interviews with PPs, checking "Specifications relating to transformers (Ref.3-1-1, Ref.3-1-2, Ref.3-1-3, Ref.3-1-4, Ref.3-2)" , and interviews with project participants (PPs). Verification team confirmed that the proposed project had installed a total of 3,857 units of single-phase and/or three-phase oil-immersed transformer with amorphous metal core in the area of the three distribution grids. Verification team confirmed that the proposed project satisfied the eligibility criterion 1.

Criterion 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.
Verification team confirmed that IEC60076-1 and TCVN6306-1 had been valid in Viet Nam during the monitoring period. Verification team checked THIBIDI and HANAKA Tender Specifications of Amorphous Transformers (No-load losses / load losses of the project transformers) (Ref.3-1-1) and Pre-delivery Inspection Reports of Transformers Installed in the 4 Power Companies (Ref.3-1-2). Verification team confirmed that the installed transformers fulfil the requirements by sampling check. Additionally, Verification team conducted interviews with all PPs to confirm above.
Verification team confirmed that the project transformers were satisfied with eligibility criterion 2.

<Findings>

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

No CAR, CL, or FAR was raised for this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team assessed the application of approved methodology of the JCM project with the supporting documents including photographs/videos and interviews with PPs.

Verification team confirmed the compliance of the project implementation and operation with the eligibility criteria of the applied methodology.

C.2. Assessment of the project implementation against the registered PDD or any approved revised PDD

<Means of verification>

Verification team assessed the project implementation against the registered PDD by means of checking documents including photographs or videos of current status of project sites and interviews with PPs for this second verification.

Verification team checked that physical features of the project in the registered PDD were in place and that the project participants operated the project for the monitoring period as per the registered PDD.

During desk review, Monitoring Report (Ref.10) provided by the PPs with following references were checked:

- The registered PDD including Monitoring Plan Sheet and Monitoring Structure Sheet,
- Final version of the validation report (Ref.11),
- Approved methodology.

The physical features of the project in the registered PDD were checked by interviews with PPs, photographs and videos via internet with following references:

- Lists of Transformers Installed in the 4 companies (Ref.3-1-3-A～3-1-3-D),
- Event lists of Transformers for 4 companies (Ref.3-2-A～3-2-D),
- Reference of "Expected operational lifetime of project" (Ref.3-4-1, 3-4-2) and
- Photographs and videos of current status of transformers (Ref.3-8).

Also, project operation as per the registered PDD was checked by interviews with following references:

- Monitoring Structure Sheet of the registered PDD,
- Monitoring manual (Ref.3-7),
- Reference of EIA (Ref.4-1, 4-2),
- Local stakeholder consultation meeting summary (Ref.5) and
- Reference of “JCM Modalities of Communications” (Ref.8-1, 8-2)

Through the interview with PPs, it was found that one of KHPC's transformers was removed due to power supply and demand adjustment. Verification team confirmed that the removal

date was after the monitoring period, and the removal would not affect the amount of CO2 reduction during the monitoring period.

Verification team found that the address of a transformer of EVNSPC in the event list was not the same as the address in the energization report. Verification team asked PPs to check and correct the event list properly. CL1 was raised.

<Findings>

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

CL1:

Verification team found that the address of a transformers for EVNSPC in the event lists was not consistent with the address in the energizing report. Verification team requested PPs to check both the event list and the energizing report, and correct and provide proper documents.

⇒Summary of Response and Verification team Conclusion :

PPs revised the event lists correctly. Verification team confirmed that the revised event lists were proper and consistent with evidence. CL1was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that there was no change from the PDD during the monitoring period. In addition, it was confirmed that operational and management structure described in the Monitoring Structure Sheet of the PDD was conducted during the monitoring period. The monitoring has been carried out in accordance with the monitoring plan contained in the PDD. Verification team confirmed that the project was operated during the monitoring period in accordance with the PDD.

C.3. Compliance of calibration frequency and correction of measured values with related requirements

<Means of verification>

Compliance of calibration frequency and correction of measured values with related requirements were checked in accordance with the applied methodology and the registered PDD.

The monitoring parameter is 'Energizing time of the project transformer (H,i,p)' of which the monitoring option is ‘Option C’.

The parameter is measured by counting the number of hours of the monitoring period according to the monitoring plan. The number of hours is actually calculated by multiplying 24 hours/day by the number of days during the monitoring period. If there are non-operation days by replacements, relocations and etc., the non-operation days are deducted.

<Findings>

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

No CAR, CL, or FAR were raised for this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that the requirements in this section were satisfied by counting the number of hours of the monitoring period.

C.4. Assessment of data and calculation of GHG emission reductions

<Means of verification>

Verification team confirmed that the corresponding Monitoring Report Sheet of the applied methodology was used.

Also, verification team confirmed that the calculation of CO2 emission reductions was conducted appropriately according to the applied methodology by conducting document review and interviews with PPs.

Monitoring Report was checked as follows during document review and interviews with PPs to confirm the data and calculation of GHG emission reductions. Monitoring Report was checked with the description of Monitoring Plan Sheet in the registermoed PDD and the approved methodology.

Verification team compared the operational time based on the event lists with the energizing time of the project transformer during the monitoring period in the Monitoring Report . Verification team found no differences in the operational time for 4 companies (EVNSPC, EVNHN, KHPC and Dong Nai PC). On the other hand, verification team found an error in the theoretical total operating hours for year 2020. CAR1 was raised.

Parameters used for calculations were checked as follows.

The values of NLLRE,i,j,k and NLLPJ,i,j,k for all types of transformers were checked by “Specifications relating to transformers” (Ref. 3-1-1), “Standards related to transformers” (Ref.3-6-1, 3-6-2), “Tender Specifications of the 4 Companies” (Ref. 6) and the monitoring plan, and no changes was confirmed.

Brp was checked by the applied methodology and no changes was confirmed.

UNCi was checked by the value (0.15) defined in IEC60076-1 and no changes was confirmed.

EFgrid was checked by the default value provided Ministry of Natural Resources and Environment (Ref.7) and no changes was confirmed.

After CAR1 was closed, the comparison of actual CO2 emission reductions with estimates in the registered PDD has been checked by verification team. The amount of actual CO2 emission reductions (3,472 tCO2 for year 2019 and 3,480 t-CO2 for year 2020) was almost same as the amount of estimated emission reductions (3,477 tCO2 for year 2019 and year 2020 each) in

the registered PDD.

Verification team conducted interviews with PPs and desk review of documents related monitoring (Ref.3-7) to confirm the monitoring of energizing time of the project transformers in accordance with the registered PDD and the applied methodology.
Also, monitoring structure was checked by interviews of the following responsible personnel described in the Monitoring Structure Sheet of the registered PDD:
- JCM Project Manager
- JCM Monitoring Manager
- JCM Facilities Manager

Verification team confirmed that the monitoring was conducted appropriately.

Parameters	Monitored values	Method to check values in the monitoring report with sources
Hi,p	0-8760 for each transformer	Verification team checked the event information such as replacement, relocations, etc. of each transformer during monitoring period based on event lists (Ref. 3-2) and evidence of these events (Ref. 3-3). Verification team checked that the outage time, which was calculated according to the event information, was subtracted from Hi,p correctly.

<Findings>

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

CAR1:

Verification team found that there was an error in the calculation of theoretical total annual operating hours of year 2020. Verification team requested PPs to recalculate and submit the proper Monitoring Report based on the exact theoretical annual operating hours.

⇒Summary of Response and Verification team Conclusion：

PPs corrected theoretical annual operating hours and revised Monitoring Report properly. Verification team confirmed that the result of recalculation was correct and that the revised Monitoring Report was consistent with the theoretical total annual operating hours.

CAR1 was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that the appropriate Monitoring Report Sheet of the applied methodology was used for Monitoring Report.

CO2 emission reductions during monitoring period are almost the same as the estimated value in the registered PDD.

Verification team concluded that the data was monitored appropriately and the amount of CO2 emission reductions was calculated correctly.

C.5. Assessment of avoidance of double registration

<Means of verification>

The following websites of CDM, JI and VCS were checked whether the projects with similar technology and location had been registered.

1) Website of UNFCCC (Project Search for CDM, JI Projects)

2) Website of Institute for Global Environmental Strategies (IGES) (IGES CDM Project Database, IGES JI Project Database)

3) Website of Verified Carbon Standard

Verification team confirmed in the interview that the registration status had not changed since then.

<Findings>

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

No CAR, CL or FAR were raised for this section..

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that the project was not registered under other international climate mitigation mechanisms during the monitoring period.

C.6. Post registration changes

<Means of verification>

There was no post registration change from the registered PDD and/or methodology which prevented the use of the applied methodology.

<Findings>

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

No CAR, CL, or FAR was raised for this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that there was no post registration change during the monitoring

period.

D. Assessment of response to remaining issues

An assessment of response to the remaining issues including FARs from the validation and/or previous verification period, if appropriate

There is no remaining issue.

E. Verified amount of emission reductions achieved

Year	Verified Reference Emissions (tCO_2e)	Verified Project Emissions (tCO_2e)	Verified Emission Reductions (tCO_2e)
2013			
2014			
2015			
2016			
2017			
2018			
2019	5,803.8	2,331.3	3,472
2020	5,817.5	2,336.8	3,480
Total (tCO_2e)			6,952

F. List of interviewees and documents received

F.1. List of interviewees

YUKO KEISO CO., LTD.
Shiro Tokura
Saori Iwasaki
Aya Yamamoto

EVN Southern Power Corporation (EVNSPC)
Ho Minh Quang
Nguyen Hoang Viet

EVN Hanoi (EVNHN)
Nguyễn Thế Thắng
Đàm Chí Dũng
Lý Thùy Liên
Phạm Trúc Kiên
Nguyễn Thị Vân Trang
Lê Thị Hoài
Hoàng Văn Điền
Nguyễn Quang Vinh
Trần Mạnh Đại
Vũ Kim Oanh

Nguyễn Quốc Hưng Nguyễn Tịnh Tâm Khanh Hoa Power Joint Stock Company (KHPC) Nguyễn Đặng Thanh Lợi Nguyễn Xuân Thu Bùi Hoàng Lâm Nguyễn Văn Hưng Dong Nai Power Company (Dong Nai PC) Do Huu Hoang Dinh Van Quyet Nguyen Ngoc Tuan Thai Nhu Hai Le Minh Hoang NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc. Shintaro Higashi Mena Yoshikawa

F.2. List of documents received

Ref.1: Project Design Document for JCM project "Introduction of Amorphous High Efficiency Transformers in Northern, Central and Southern Power Grids" (Registration date: 28/May/2019) Ref.2: Approved Methodology "Installation of energy efficient transformers in a power distribution grid, ver1.0" Ref.3-1-1: THIBIDI and HANAKA Tender Specifications of Amorphous Transformers (No-load losses/load losses of the project transformers) Ref.3-1-2: Pre-delivery Inspection Reports of Transformers Installed in the 4 Power Companies Ref.3-1-3Lists of Transformers Installed in the 4 companies Ref.3-1-3-A: List of transformers installed by EVNSPC Ref.3-1-3-B: List of transformers installed by EVNHN Ref.3-1-3-C: List of transformers installed by KHPC Ref.3-1-3-D: List of transformers installed by Dong Nai PC Ref.3-1-4: Maps of Transformer Installation Locations

Ref.3-2: Event lists of transformers

Ref.3-2-A: Event list of EVNSPC

Ref.3-2-B: Event list of EVNHN

Ref.3-2-C: Event list of KHPC

Ref.3-2-D: Event list of Dong Nai PC

Ref.3-3: Documents related to events

Ref.3-4: Reference of "Expected operational lifetime of project

Ref.3-4-1: "Guiding Regulations on Management , Use and Depreciation of Fixed Asset" No.:45/2013/TT-BTC Circular, MoF of Viet Nam, April 25,2013

Ref.3-4-2: Legal durable years issued by Japan Tax Office

Ref.3-6: Standards related to transformers

Ref.3-6-1: International Standard IEC 60076-1

Ref.3-6-2: Viet Nam Standard TCVN6306-1:2015

Ref.3-7: Documents related to monitoring (Prepared by YUKO-KEISO)

Ref.3-8: Photographs and videos of current status of transformers

Ref.4: Reference of "EIA"

Ref.4-1: Law on Environmental Protection", No.55/2014/QH13. The National Assembly, June 23, 2014

Ref.4-2: Decree 18: "ON ENVIRONMENTAL PROTECTION PLANNING, STRATEGIC ENVIRONMENTAL ASSESSMENT, ENVIRONMENTAL IMPACTASSESSMENT AND ENVIRONMENTAL PROTECTION PLANS", The Government, February 14, 2015

Ref.5: Local Stakeholder Consultation

Ref.6: Tender Specifications of the 4 Companies

Ref.7: Emission factor for electricity grid

Ref.8: Modalities of Communications

Ref.8-1: MoC (submission date: 18/12/2023)

Ref.8-2: Declaration for MoC

Ref.10: Monitoring Report Sheet

Ref.11: Final version of the validation report

Ref.12: JCM Guidelines for Validation and Verification (JCM_VN_GL_VV_ver01.0)

Ref.13: Joint Crediting Mechanism Guidelines for Developing Project Design Document and Monitoring Report (JCM_VN_GL_PDD_MR_ver02.0)

Ref.14: Joint Crediting Mechanism Project Cycle Procedure (JCM_VN_PCP_ver04.0)

Ref.15: Joint Crediting Mechanism Glossary of Terms (JCM_VN_Glossary_ver01.0)

Annex Certificates or curricula vitae of TPE's verification 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.

Certificate of Competence
for Validation/Verification team

GHG Certification Center
Japan Management Association

Scheme:

The Joint Crediting Mechanism (JCM)

Project Title:

Introduction of Amorphous High Efficiency Transformers in Northern, Central and Southern Power Grids

Validation or Verification:

Verification

Name	Qualification*1	Leader/Member/ Technical expert/ Technical Reviewer(TR)	Qualification of Technical area*2	JCM scheme competence
Mr. Masao Tomizawa	Lead Validator/ Verifier	Leader	☑	☑
Mr. Masataka Ajiki	Lead Validator/ Verifier	Member	☐	☑
Competence of Verification Team	-	-	☑	☑

*1Qualification in accordance with "JMACC's Procedures for Contract and Evaluation of Validators/Verifiers and Technical Experts (GA-110)"

*2Competence Requirement in accordance with Competence for Technical area sheet (GA-110-08)

Date : 16 Oct. 2023

[redacted]

Kenji Suzuki
Director of Validation & Verification Dept.
GHG Certification Center
Japan Management Association

Certificate of Competence for Technical Review team

GHG Certification Center
Japan Management Association

Scheme:

The Joint Crediting Mechanism (JCM)

Project Title:

Introduction of Amorphous High Efficiency Transformers in Northern, Central and Southern Power Grids

Validation or Verification:

Verification

Name	Qualification*1	Leader/Member/ Technical expert/ Technical Reviewer(TR)	Qualification of Technical area*2	JCM scheme competence
Mr. Motoyuki Matsumoto	Lead Validator/ Verifier	Technical Reviewer	☑	☑
Competence of Technical Review Team	-	-	☑	☑

*1Qualification in accordance with "JMACC's Procedures for Contract and Evaluation of Validators/Verifiers and Technical Experts (GA-110)"

*2Competence Requirement in accordance with Competence for Technical area sheet (GA-110-08)

Date : 16 Oct. 2023

[redacted]

Kenji Suzuki
Director of Validation & Verification Dept.
GHG Certification Center
Japan Management Association