

JCM Verification Report Form

A. Summary of verification

A.1. General Information

Title of the project	Introduction of High Efficiency Air-conditioning in Hotel
Reference number	VN005
Monitoring period	06/10/2016 – 30/09/2017
Date of completion of the monitoring report	24/02/2019
Third-party entity (TPE)	Lloyd's Register Quality Assurance Limited (LRQA)
Project participant contracting the TPE	NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
Date of completion of this report	27/02/2019

A.2 Conclusion of verification and level of assurance

Overall verification opinion	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
<input checked="" type="checkbox"/> Unqualified opinion	<p>Based on the process and procedure conducted, <i>Lloyd's Register Quality Assurance Limited (LRQA)</i> (TPE's name) provides reasonable assurance that the emission reductions for <i>Introduction of High Efficiency Air-conditioning in Hotel</i> (project name)</p> <ul style="list-style-type: none"> ✓ 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
<p><i>(If overall verification opinion is negative, please check below and state its reasons.)</i></p> <input type="checkbox"/> Qualified Opinion <input type="checkbox"/> Adverse opinion <input type="checkbox"/> Disclaimer	<p><State the reasons> Not applicable</p>

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.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>
Avoidance of double registration	The TPE determines whether the project is not registered under other international climate mitigation mechanisms.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>

Authorised signatory:	Mr. <input checked="" type="checkbox"/>	Ms. <input type="checkbox"/>
Last name: Chiba	First name: Michiaki	
Title: Climate Change Manager - Asia & Pacific		
Specimen signature:		Date: 27/02/2019

B. Verification team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Michiaki Chiba	LRQA Ltd.	Team leader	<input checked="" type="checkbox"/>	Technical competence authorised	<input checked="" type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Nguyen Thang	External expert	Host country expert	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Stewart Niu	LRQA China	Internal reviewer	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
Mr. <input type="checkbox"/> Ms. <input type="checkbox"/>				<input type="checkbox"/>		<input type="checkbox"/>

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>

LRQA has determined during the verification process that the actual implementation and operation of the project has been conducted in conformance with the eligibility criteria of the applied methodology.

The project applied the approved methodology: JCM_VN_AM006_ver01.0 "Introduction of air conditioning system equipped with inverters, Version 01.0".

LRQA assessed by means of an on-site visit that the physical features of the project are in place and that the PPs have operated the project as per the eligibility criteria of the applied methodology. The steps taken to verify each eligibility criterion and the conclusions about implementation of the project are summarised as below.

Criterion 1: Air-conditioning system with inverter is newly installed or installed to replace existing non-inverter air conditioning system.

Justification in the PDD: The project newly introduces air-conditioning system with inverter into the new hotel in 6th Oct 2016.

Steps taken for assessment: The verification team assessed the project documentation, technical specification, the commissioning report, opening announcement of the hotel, and conducted physical on site assessment.

Conclusion: The verification team confirmed that the project installs air-conditioning system with inverter in the newly constructed hotel and the criterion is met.

Criterion 2: Cooling capacity of project air conditioning system is more than or equal to 14kW. Justification in the PDD: The cooling capacities of project air conditioning system are 73kW, 90 kW, 95 kW, 109 kW and 125 kW. So the cooling capacities of project air conditioning system are more than 14 kW.

Steps taken for assessment: The verification team assessed the project documentation, technical specification, the commissioning report, and conducted physical on site assessment.

Conclusion: The verification team confirmed that the cooling capacity of project air conditioning system is greater than 14 kW and the criterion is met by the project.

Criterion 3: COP of project air-conditioning system has a COP value higher than that of the value indicated in the table below.

COP for Reference Air Conditioning System (COP_{RE,i})

Cooling Capacity [kW]	Reference COP
$14 \leq x < 28$	2.97
$28 \leq x < 42$	2.94
$42 \leq x < 56$	2.91
$56 \leq x$	2.56

Justification in the PDD: The COPs of project air-conditioning system are 3.27, 3.29, 4.05, 4.09 and 4.53. So each COP of project air-conditioning system has a COP value higher than 2.56 indicated in the table.

Steps taken for assessment: The verification team reviewed the technical specification, and conducted physical on site assessment.

Conclusion: The verification team confirmed that the cooling capacity of the project air conditioning systems is greater than 56 kW and the COP values are higher than 2.56. Therefore the criterion is fulfilled by the project.

Criterion 4: Ozone Depletion Potential (ODP) of the refrigerant used for project air conditioning system is zero.

Justification in the PDD: Refrigerant used for project air-conditioning system is R410A whose ODP is zero. So ODP of the refrigerant used for project air conditioning system is zero.

Steps taken for assessment: The verification team reviewed technical specification of project

RACs and the Safety Data Sheet of refrigerant used and physically observed through the on site assessment.

Conclusion: The verification team confirmed that the project RACs use R410A as the refrigerant and its ODP is zero. Therefore the requirement of the criterion is met by the project.

Criterion 5: Plans to prevent release of refrigerants into the atmosphere at the time of air conditioning system removal are prepared for both project air conditioning system and the existing air conditioning system replaced by the project. In the case of replacing existing air conditioning system by project air conditioning system, execution of the prevention plan is checked at the time of verification, e.g. re-use of the refrigerant, in order to confirm that refrigerant used for the existing air conditioning system removed by the project is not released to the air.

Justification in the PDD: To prevent release of refrigerants into the atmosphere due to the project, at the time of air-conditioning system removal, the project owner plans to collect refrigerants from project air-conditioning system removed by using refrigerant recovery machine, and ensure storage of collected refrigerants, meanwhile project owner will check by own check sheet and pictures of refrigerant recovery procedure. Letter of consent on not releasing refrigerant used for project chiller was prepared by participants from both sides.

Steps taken for assessment: The verification team reviewed the letter of consent and interviewed the PPs during the on site assessment.

Conclusion: The verification team raised CL 3 and confirmed that the plan to prevent release of refrigerants into the atmosphere at the time of air conditioning system removal are prepared for project air conditioning system by the PPs through resolution of CL 3 as below. There is no existing air-conditioning system as the project is implemented in a new hotel. Thus the criterion was confirmed as satisfied by the project.

The verification team confirmed that the eligibility conditions are satisfied by the project by reviewing the supporting documents and the on site assessment.

The details of the persons interviewed and the documents reviewed are shown in the Section F of this report.

<Findings>

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

Grade / Ref: CL 3

Nature of the issue raised: The PPs were requested to clarify preparation of effective procedures to prevent atmospheric release of refrigerant gas through the operation, maintenance, removal, replacement and disposal of the project air-conditioning system.

Nature of responses provided by the PPs: The PPs provided the procedures to prevent release

of refrigerants into the atmosphere at the time of air conditioning system removal and Construction method for air-conditioning and ventilation system of office, commercial and hotel project for review by the verification team.

Assessment of the responses: The verification team reviewed the procedures to prevent release of refrigerants into the atmosphere at the time of air conditioning system removal and Construction method for air-conditioning and ventilation system of office, commercial and hotel project, and confirmed that the PPs prepared procedures to prevent atmospheric release of refrigerant gas through the operation, maintenance, removal, replacement and disposal of the project air-conditioning system. The CL was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team confirmed that the project has been implemented in conformity 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>

The project introduces high efficiency inverter air conditioners in newly opened hotel Novotel Suites Hanoi in Hanoi City, Vietnam. The project includes 301 indoor units and 17 outdoor units that COP values are 3.27, 3.29, 4.05, 4.09 and 4.53. Use of high efficiency air conditioners contributes saving of electricity supplied by the public electricity grid system and reduces GHG emissions from generation of grid electricity. The project employs Hitachi high efficiency air conditioning system SET-FREE. The key technology is new type DC inverter scroll compressor that largely improves the intermediate pressure performance for energy saving by use of a release valve to prevent over compression and optimising orbiting scroll lifting force to reduce leakage loss in the improved new compression mechanism.

Diesel power generators are kept for emergency purpose only. Heat pump units are used to supply hot water and there is no boiler. There are other air-conditioning units not included in the project that service areas are separated (kitchen and corridors) and the electricity supply to those units is also separated from the project.

The project is implemented by Peace Real Estate Investment Company Limited from the Socialist Republic of Viet Nam and NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc. from Japan. The start date of project operation is on 06/10/2016 and the expected operational lifetime of the project is for 10 years.

The project receives financial support for JCM model projects from the Ministry of the Environment, Japan (MOE).

The verification team assessed the Monitoring Report (MR) that consists of Monitoring Report

Sheet (MRS) parts of the Monitoring Spreadsheet and the supporting documents, conducted a physical site visit to assess the status of the actual project and its operation in accordance with the registered PDD. No revision to the registered PDD was requested.

The verification team determined through the verification process that the implementation and operation of the project has been in accordance with the description contained in the registered PDD. The verification team, by means of a desk review and an on-site visit, assessed that:

- all physical features of the JCM project described in the registered PDD are in place, and
- the PPs have operated the JCM project as per the registered PDD.

The MR follows the Monitoring Plan (MP) of the registered PDD that has been established based on the approved methodology. The parameters to be monitored ex-post are (1) EC_PJ,outdoor,p Electricity consumption of outdoor unit of project air conditioning system i during the period p (in MWh/p) and (2) EC_PJ,indoor,p Total electricity consumption of indoor units of project air conditioning system during the period p (in MWh/p). Total 18 electricity meters are installed to directly and continuously measure electricity consumption for each 17 outdoor unit and one for total 301 indoor units respectively.

The roles and responsibilities of the persons are described in the Monitoring Structure Sheet (MSS) in accordance with the requirements of the applied methodology. There was no change in the organizational structure during the monitoring period.

Through the processes taken, CL 1, CL 2 and CL 4 were raised as the resolution detailed below.

The details of the persons interviewed and the documents reviewed are shown in the Section F of this report.

<Findings>

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

Grade / Ref: CL 1

Nature of the issue raised: The PPs were requested to clarify implementation of the procedures to keep the relevant data and information required for the verification and issuance.

Nature of responses provided by the PPs: The PPs submitted the procedures to keep the relevant data and information.

Assessment of the responses: The verification team reviewed the procedures to keep the relevant data and information submitted by the PPs and confirmed that the relevant data and information required for the verification and issuance will be kept and backed up on the local server for a period of 17 years that is considered sufficient to cover the period of 2 years after the final issuance of the credits. The CL was closed.

Grade / Ref: CL 2

Nature of the issue raised: The PPs were requested to clarify the implementation of the monitoring procedures including checking of the monitored data, maintaining of the monitoring equipment and calibration, and training of the monitoring personnel.

Nature of responses provided by the PPs: The PPs provided the monitoring procedures including checking of the monitored data and maintaining of the monitoring equipment and calibration.

Assessment of the responses: The verification team reviewed the monitoring procedures and confirmed the implementation by the PPs during the monitoring period. The CL was closed.

Grade / Ref: CL 4

Nature of the issue raised: The PPs were requested to clarify procedures and keep record of time switching operational mode and the duration that the heating function is used.

Nature of responses provided by the PPs: The PPs provided the procedures and keep record of time switching operational mode and duration that the heating function is used.

Assessment of the responses: The verification team reviewed the procedures to keep record of operational mode changes applied by the PPs and confirmed relevance. The CL was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team confirmed that the project was implemented and operated in accordance with the registered PDD and no revision to the same was requested for the monitoring period.

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

<Means of verification>

The parameter Nos. (1) EC_PJ,outdoor,p and (2) EC_PJ,indoor,p EGi,p apply the monitoring Option C and the monitoring of the parameters uses electricity meters as the measuring equipment. The electricity meters measure electricity consumed by the project air conditioning systems out of the total electricity imported from the public electricity grid system, that are not for trade measurement and subject of regulations in the host country. The electricity meters are type approved to JIS C 1216 (class 2.0). The PPs apply calibration of the electricity meters on annual basis in the monitoring procedures. No correction was required to the measured values to calculate emission reductions in line with the PDD and Monitoring Guidelines during the monitoring period as confirmed through the resolution of CAR 3 below.

The details of the persons interviewed and the documents reviewed are shown in the Section F of this report.

<Findings>

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

Grade / Ref: CAR 3

Nature of the issue raised: The details of the electricity meters were not indicated in the MRS for the monitoring parameters EC_PJ,outdoor,p and EC_PJ,indoor,p, including the accuracy level and calibration information (frequency, date of calibration and validity). Relevant evidence was not provided for the calibration of the electricity meters.

Nature of responses provided by the PPs: The PPs provided the revised MR and monitoring procedures including checking of the monitored data and maintaining of the monitoring equipment and calibration, and the calibration certificate for measuring equipment for electricity consumption.

Assessment of the responses: The PPs added the details of the electricity meters in the revised MRS, provided the monitoring procedures and the calibration certificate. The measuring equipment is to be calibrated yearly according to the monitoring procedures but the calibration of electricity meters were conducted on 18/12/2017 after the monitoring period. The accuracy level of electricity meters is class 2.0 according to the technical specification and error identified by the delayed calibration was within the specified accuracy for all the electricity meters used in the project. The verification team reviewed the results of the delayed calibration and confirmed that a correction of measured data is not required according to the JCM Guidelines for developing PDD and MR. The CAR was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team confirmed that the measuring equipment applied for the parameter satisfied the requirements of the MP concerning the regular calibration and no correction was required to the measured values during the monitoring period.

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

<Means of verification>

The MR is developed using the MRS applied to the registered JCM project that is confirmed fulfilment of the requirements of the MRS of the applied methodology.

LRQA has determined that:

1. a complete set of data for the specified monitoring period is available,
2. information provided in the MR has been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis,
3. calculations of reference emissions (REs) and project emissions (PEs), as appropriate, have been carried out in accordance with the formulae and methods described in the MP and the applied methodology,
4. any assumptions used in emission calculations have been justified, and
5. appropriate emission factors, default values and other reference values have been correctly

applied.

The sources of GHG emissions are consumption of grid electricity and CO₂ emissions by the reference air conditioning systems to determine the reference emissions (REs) and consumption of grid electricity and CO₂ emissions by the project air conditioning systems including the indoor units and outdoor units to determine the project emissions (PEs) in accordance with the applied methodology.

The REs are calculated by electricity consumption of project air conditioning systems, ratio of COPs of project and reference air conditioning systems, and CO₂ emission factor of the electricity. The CO₂ emission factor of the grid electricity is 0.5657 tCO₂/MWh as fixed ex-ante at the validation.

COPs of outdoor unit of the project air conditioning systems are fixed ex-ante at the validation based on the manufacturer's specification at 3.27, 3.29, 4.05, 4.09 and 4.53.

The default value is applied for COP of the reference air conditioning system that is fixed ex-ante with 2.56 for all the system since the cooling capacity of all the project air conditioning system is greater than 56 kW.

The GHG emission reductions during the monitoring period (each for year 2016 and 2017) are calculated as: $ER_p = RE_p - PE_p = \sum_i \{EC_{P,J,i,outdoor,p} \times (COP_{P,J,i,outdoor} \div COP_{RE,i})\} \times EF_{elec} - (\sum_i EC_{P,J,i,outdoor,p} + EC_{P,J,indoor,p}) \times EF_{elec}$

From 06/10/2016 to 31/12/2016

$$\begin{aligned} & \{(12.18 \times 4.53 / 2.56) + (13.55 \times 4.05 / 2.56) + (12.09 \times 4.05 / 2.56) + (6.62 \times 3.29 / 2.56) + \\ & (7.19 \times 4.09 / 2.56) + (8.71 \times 4.09 / 2.56) + (7.02 \times 4.09 / 2.56) + (7.47 \times 4.09 / 2.56) + (8.17 \times \\ & 4.09 / 2.56) + (7.00 \times 4.09 / 2.56) + (7.10 \times 4.09 / 2.56) + (7.31 \times 4.09 / 2.56) + (6.40 \times 4.09 / \\ & 2.56) + (8.37 \times 4.09 / 2.56) + (6.66 \times 4.09 / 2.56) + (16.31 \times 4.09 / 2.56) + (7.94 \times 3.27 / 2.56)\} \\ & \times 0.5657 \text{ tCO}_2/\text{MWh} - (12.18 + 13.55 + 12.09 + 6.62 + 7.19 + 8.71 + 7.02 + 7.47 + 8.17 + 7.00 \\ & + 7.10 + 7.31 + 6.40 + 8.37 + 6.66 + 16.31 + 7.94 + 24.74) \times 0.5657 \text{ tCO}_2/\text{MWh} \\ & = (21.55 + 21.44 + 19.13 + 8.51 + 11.49 + 13.92 + 11.22 + 11.93 + 13.05 + 11.18 + 11.34 + \\ & 11.68 + 10.23 + 13.37 + 10.64 + 26.06 + 10.14) \times 0.5657 \text{ tCO}_2/\text{MWh} - (150.10 + 24.74) \times \\ & 0.5657 \text{ tCO}_2/\text{MWh} \\ & = 236.88 \text{ MWh} \times 0.5657 \text{ tCO}_2/\text{MWh} - 174.84 \text{ MWh} \times 0.5657 \text{ tCO}_2/\text{MWh} = 134.0 - 98.9 \\ & = 35.1 \text{ tCO}_2\text{e} \end{aligned}$$

From 01/01/2017 to 30/09/2017

$$\begin{aligned} & \{(70.71 \times 4.53 / 2.56) + (53.89 \times 4.05 / 2.56) + (51.88 \times 4.05 / 2.56) + (24.15 \times 3.29 / 2.56) + \\ & (27.84 \times 4.09 / 2.56) + (34.17 \times 4.09 / 2.56) + (23.66 \times 4.09 / 2.56) + (27.08 \times 4.09 / 2.56) + \\ & (28.40 \times 4.09 / 2.56) + (23.25 \times 4.09 / 2.56) + (24.26 \times 4.09 / 2.56) + (26.41 \times 4.09 / 2.56) + \\ & (23.73 \times 4.09 / 2.56) + (31.06 \times 4.09 / 2.56) + (27.36 \times 4.09 / 2.56) + (74.64 \times 4.09 / 2.56) + \end{aligned}$$

$$\begin{aligned}
 & (29.52 \times 3.27 / 2.56) \} \times 0.5657 \text{ tCO}_2/\text{MWh} - (70.71 + 53.89 + 51.88 + 24.15 + 27.84 + 34.17 \\
 & + 23.66 + 27.08 + 28.40 + 23.25 + 24.26 + 26.41 + 23.73 + 31.06 + 27.36 + 74.64 + 29.52 + \\
 & 80.69) \times 0.5657 \text{ tCO}_2/\text{MWh} \\
 & = (125.12 + 85.26 + 82.08 + 31.04 + 44.48 + 54.59 + 37.80 + 43.26 + 45.37 + 37.15 + 38.76 + \\
 & 42.19 + 37.91 + 49.62 + 43.71 + 119.25 + 37.71) \times 0.5657 \text{ tCO}_2/\text{MWh} - (602.02 + 80.69) \times \\
 & 0.5657 \text{ tCO}_2/\text{MWh} \\
 & = 955.3 \text{ MWh} \times 0.5657 \text{ tCO}_2/\text{MWh} - 682.7 \text{ MWh} \times 0.5657 \text{ tCO}_2/\text{MWh} = 540.4 - 386.2 \\
 & = 154.2 \text{ tCO}_2\text{e}
 \end{aligned}$$

Total electricity consumption in first monitoring period of 12 months is 857.55 MWh and it is 23% of ex-ante estimate in PDD of 3,743 MWh. In the absence of data and information for accurate estimation, the electricity consumption was calculated ex-ante in the registered PDD by the rated electricity consumption of the equipment and 24 hours a day and 365 days a year. The project air conditioning system is operated 24 hours a day and 365 days a year as the hotel operates but in a various load conditions. The actual electricity consumption of the air conditioning system is considered as reasonable under the weather conditions of Hanoi City in years 2016 and 2017 although the GHG emission reductions that will be achieved by the project will be dependent on the weather conditions over the crediting period.

The verification team assessed the reported data with documented evidence and by means of on site visit. Through the processes taken, CAR 1 and CAR 2 were raised as the resolution detailed below.

The details of the persons interviewed and the documents reviewed are shown in the Section F of this report.

Parameters	Monitored values	Method to check values in the monitoring report with sources
EC_PJ,outdoor,p (2016)	150.10 MWh/p	Assessment was conducted based on records of meter readings and on site assessment.
EC_PJ,outdoor,p (2017)	602.02 MWh/p	
EC_PJ,indoor,p (2016)	24.74 MWh/p	Assessment was conducted based on records of meter readings and on site assessment.
EC_PJ,indoor,p (2017)	80.69 MWh/p	

<Findings>

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

Grade / Ref: CAR 1

Nature of the issue raised: The electricity consumption of the project air conditioning system in a month was calculated by difference of meter reading at 23:45 on the last day of the month and meter reading at 00:00 on the first day of the month where the amount of electricity consumption from 23:45 to 24:00 of the last day of the month was not accounted.

Nature of responses provided by the PPs: The PPs submitted revised MR and the calculation sheet for review by the verification team.

Assessment of the responses: The verification team reviewed the revised MR and the calculation sheet, and confirmed the correctness of the calculation. The total electricity consumption during the monitoring period was changed from 831.91 MWh to 857.55 MWh in the revised MR (inclusive of the change to below CAR 2). The CAR was closed.

Grade / Ref: CAR 2

Nature of the issue raised: The monitored values of the parameter EC_PJ,indoor,p were not correctly reported for July, August and September 2017. The reported values during those months were one tenth of the monitored values.

Nature of responses provided by the PPs: The PPs submitted revised MR and the calculation sheet for review by the verification team.

Assessment of the responses: The verification team reviewed the revised MR and the calculation sheet and, confirmed the correctness. The output pulse unit of the electricity meter for the parameter EC_PJ,indoor,p is 10 kWh/imp as specified by the manufacturer and the data recorded in CSV format needs multiplying by 10 to be accounted in the unit of kWh. The CAR was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team confirmed that appropriate methods and formulae for calculating REs and PEs have been followed. The verification team is of the opinion that all assumptions, emission factors and default values that were applied in calculations have been justified.

C.5. Assessment of avoidance of double registration

<Means of verification>

The verification team assessed and confirmed relevance of the written confirmation from the PPs that the project is not registered under the other international climate mitigation mechanisms.

The team, in addition to the interviews with the PPs, checked publicly accessible information

of Clean Development Mechanism (CDM), Joint Implementation (JI), Verified Carbon Standard (VCS) and Gold Standard (GS) and found no identical project as the proposed JCM project in terms of the name of entities, applied technology, scale and the location. The result of researches confirmed that the proposed project was not registered under the other international climate mitigation mechanisms than JCM and it will not result in a double counting of GHG emission reductions.

Through the processes taken, CAR 4 was raised as the resolution detailed below.

The details of the persons interviewed and the documents reviewed are shown in the Section F of this report.

<Findings>

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

Grade / Ref: CAR 4

Nature of the issue raised: A written confirmation was not submitted by the PPs on that the project is not registered under other international climate mitigation mechanisms at the initial stage of verification.

Nature of responses provided by the PPs: The PPs submitted a written confirmation for review by the verification team.

Assessment of the responses: The verification team received the written confirmation from the PPs as relevant for avoidance of double registration of the project. The CAR was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team confirmed that the project is not registered under other international climate mitigation programs.

C.6. Post registration changes

<Means of verification>

The verification team assessed the project documentation and through the on site visit and confirmed that there was no post registration change from the registered PDD or the approved methodology.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification through the verification processes determined that there was no post registration change from the registered PDD or approved methodology which prevent from use of the applied methodology.

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

No FAR was issued in the validation and this is the first verification of the project.

E. Verified amount of emission reductions achieved

Year	Verified Emissions (tCO ₂ e)	Reference Emissions (tCO ₂ e)	Verified Project Emissions (tCO ₂ e)	Verified Emission Reductions (tCO ₂ e)
2013				
2014				
2015				
2016		134.0	98.9	35
2017		540.4	386.2	154
2018				
2019				
2020				
Total (tCO ₂ e)				189

F. List of interviewees and documents received

F.1. List of interviewees

Peace Real Estate Investment Company Limited
Do Xuan Chien, Chief Engineer, Novotel Suites Hanoi

NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
Mikiko Saito, Manager, Socio & Eco Strategic Consulting Unit
Minami Kobayashi, Consultant, Socio & Eco Strategic Consulting Unit

Kume Design Asia Co., Ltd.
Nguyen Van Dong, Architect - Design Director

F.2. List of documents received

Category A documents (documents prepared by the PPs)

- Monitoring Report completed on 11/10/2017
- Revised Monitoring Report completed on 23/01/2018 and 24/02/2019
- Monitored data and the revision
- Outline of project construction
- Technical specification and pictures of project air-conditioning systems
- Specification and pictures of measuring equipment

- Profile of Novotel Hotel
 - Announcement of Novotel Suites opening
 - Report of construction completion
 - Minutes of meeting for commissioning test of the air-conditioning system
 - Letter of consent including plan to prevent release of refrigerants
 - Main Single Diagram, Kume Design Asia, Co., Ltd.
 - Power Supply System Schematic Diagram, Kume Design Asia, Co., Ltd.
 - Drawing for B1 Cabinet Place, Yuko Keiso
 - Drawing for 12F Cabinet Place, Yuko Keiso
 - Drawing for 13F Cabinet Place, Yuko Keiso
 - Drawing for 14F Cabinet Place, Yuko Keiso
 - Drawing for 15AF Cabinet Place, Yuko Keiso
 - Drawing for 15BF Cabinet Place, Yuko Keiso
 - Drawing for 17F Cabinet Place, Yuko Keiso
 - Maintenance records
 - Standard operation procedure – Guest room air conditioning units
 - Standard operating procedure – Preventive maintenance FCU
 - Standard operating procedure – Preventive maintenance AC Split Unit
 - Revised calculation sheet
 - Instruction on indication of electricity meter
 - Monitoring procedures including checking of the monitored data and maintaining of the monitoring equipment and calibration
 - Calibration certificate for measuring equipment for electricity consumption dated 18/12/2017
 - Procedures to keep the relevant data and information
 - Declaration letter from the project participants on avoidance of double registration
- Construction method for air-conditioning and ventilation system of office, commercial and hotel project
- Procedures and keep record of time switching operational mode and the duration that the heating function is used
 - Procedures to prevent atmospheric release of refrigerant gas through the operation, maintenance, removal, replacement and disposal of the project air-conditioning system
- Category B documents (other documents referenced)
- PDD Version 01.0 dated 15/03/2017 including the annexes
 - Validation Report dated 24/03/2017
 - JCM_VN_AM006_ver01.0 Introduction of air conditioning system equipped with inverters, Version 01.0

- JCM Project Cycle Procedure JCM_VN_PCP_ver03.0
- JCM Guidelines for Validation and Verification JCM_VN_GL_VV_ver01.0
- JCM Guidelines for Developing PDD and MR JCM_VN_GL_PDD_MR_ver02.0
- JCM Glossary of Terms JCM_VN_Glossary_ver01.0
- JCM Verification Report Form JCM_VN_F_Vrf_Rep_ver02.0
- TCVN 5687: 2010 Ventilation-air conditioning Design standards
- JIS C 1216-1: 2009 Alternating-current watt-hour meters (for connection through instrument transformer) - Part 1: General measuring instrument
- Approved Small Scale Methodology AMS II.C. Demand-side energy efficiency activities for specific technologies
- ISO 5151:2010 Non-ducted air conditioners and heat pumps – Testing and rating for performance
- JIS C 9612:2013 Room Air Conditioner
- Safety Data Sheet of R410A refrigerant
- The Ministry of Science and Technology Circular No. 23/2013/TT-BKHHCN on Group 2 Measuring Instruments dated 26/09/2013
- Decision No.02/2007/QD-BCN Issuing the provisions required technical equipment for electricity meters counting the power plant, the Ministry of Industry, 09/01/2007
- DLVN 07:2012 Alternating current induction watt-hour meters Verification procedures, 2012
- DLVN 39:2012 Alternating current static watt-hour meters Verification procedures, 2012
- TCVN 7589-11:2007 (IEC 62053-11:2003) Electricity metering equipment (a.c.) – Particular requirements - Part 11: Electromechanical meter for active energy (classes 0.5, 1 and 2)

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 Appointment is attached to this report.

Joint Crediting Mechanism Certificate of Appointment

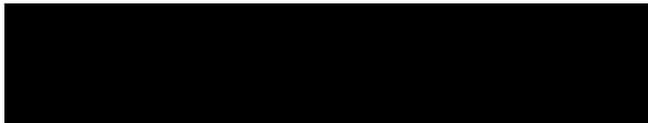
Title of Project: Introduction of High Efficiency Air-conditioning in Hotel
(Ref# VN005)

Verification for the first monitoring period: 06/10/2016 – 30/09/2017

We hereby certify that the following personnel have engaged in the verification process that has fully satisfied the competence requirements of the verification of the JCM project.

Name of Person	Assigned Roles
Michiaki Chiba	Team Leader
Nguyen Tri Thang	Host Country Expert
Stewart Niu	Technical Reviewer

Signed by



Michiaki Chiba
Climate Change Manager – Asia & Pacific
24/11/2017