

JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Low carbon hotel project in Vietnam: Improving the energy efficiency of commercial buildings by utilization of high efficiency equipment

A.2. General description of project and applied technologies and/or measures

The proposed JCM project aims to reduce CO₂ emissions in Vietnam by introducing multiple energy efficiency measures to existing commercial buildings. This project involves installation of energy efficiency measures at two project sites, Hotel Nikko Hanoi [Location 1], and Renaissance Riverside Hotel Saigon in Ho Chi Minh City [Location 2].

The energy efficiency measures to be installed at two project sites are described as follows:

Project Site	Energy efficiency measures
[Location 1] Hotel Nikko Hanoi	<ul style="list-style-type: none"> • a high efficiency boiler • a heat recovery heat pump • LED lamps
[Location 2] Renaissance Riverside Hotel Saigon	<ul style="list-style-type: none"> • a high efficiency boiler

High efficiency equipment installed by the proposed project is supplied by leading energy efficient equipment manufacturers, such as oil fired boilers from Miura, heat recovery heat-pump from Mayekawa Manufacturing Company, and LED lamps from Panasonic.

In addition to the high efficiency equipment installed by the proposed project, Hibiya Engineering Ltd., a Japanese engineering company, has designed the building energy management system suitable in Vietnam (V-BEMS) to optimize the operation of the high efficiency equipment introduced by the proposed project. Although the energy efficiency effect of V-BEMS is not counted for the emission reduction calculation under the applied JCM methodology, introduction of V-BEMS through the JCM project will further enhance efficient energy use at commercial buildings in Vietnam.

Consequently, the proposed project will improve the energy efficiency at the two hotels, resulting in the emission reduction of 289 ton CO₂ annually.

A.3. Location of project, including coordinates

Country	The Social Republic of Viet Nam
Region/State/Province etc.:	N/A
City/Town/Community etc:	<ul style="list-style-type: none"> • Hanoi • Ho Chi Minh City
Latitude, longitude	<p>[Location1] Hotel Nikko Hanoi: N21.017979,E105.841959 84 Tran Nhan Tong Street, Hanoi</p> <p>[Location2] Renaissance Riverside Hotel Saigon: N10.775501,E106.69736 8-15Ton Duc Thang Street, District 1, Ho Chi Minh City</p>

A.4. Name of project participants

The Socialist Republic of Viet Nam	Hochiminh City University of Natural Resources and Environment (HCMUNRE)
Japan	Hibiya Engineering, Ltd. Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.

A.5. Duration

Starting date of project operation	01/04/2016
Expected operational lifetime of project	10 years

A.6. Contribution from developed countries

The proposed project receives financial support from the government of Japan. The project has been selected as one of the JCM demonstration projects by the New Energy and Industrial Technology Development Organization (NEDO), Japan's largest public management organization promoting research and development. As a result of the financial support provided by NEDO's program, implementation cost of the proposed project will be partially provided by Japanese government. Further, implementation of the proposed project promotes technology transfer of low carbon technologies in Vietnam. Through the NEDO program, operation of the high efficiency equipment will be monitored for a period set by the NEDO program. During this monitoring period, knowhow transfer to the operators in Vietnam for the optimum operation and utilization of the equipment is expected.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	JCM-VN-AM003
Version number	Ver.01.0

B.2. Explanation of how the project meets eligibility criteria of the approved methodology

Eligibility criteria	Descriptions specified in the methodology	Project information												
Criterion 1	<p>The project involves implementation of one or more energy efficiency measures categorized in Table 1 by using high efficiency equipment at an existing facility.</p> <p>Projects involving installation of high efficiency lighting need to be coupled with another energy saving measure(s) in order to be eligible under this methodology.</p> <p>High efficiency equipment introduced by the project replaces the existing equipment or substitutes the output of the existing equipment, and it is included in the applicable technologies as shown in Table 1:</p> <p>Table 1 Applicable Technologies</p> <table border="1"> <thead> <tr> <th>No</th> <th>Energy efficiency measures</th> <th>Applicable technologies and their criteria</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Energy efficiency improvement by reducing fossil fuel consumption</td> <td>High efficiency boiler with the following features: - Energy efficiency is greater or equal to 93% (e.g. small once-through boiler); - Equipped with automatic unit number control device; and - Individual performance test report is provided.</td> </tr> <tr> <td>2</td> <td>Fuel switch to electricity and/or efficiency improvement</td> <td>Heat recovery heat pump using electricity, which generates both cooling and heating energy (temperature of hot water $\geq 80^{\circ}\text{C}$) and uses non-HFC refrigerant with zero Ozone Depletion Potential (ODP)</td> </tr> <tr> <td>3</td> <td>Installation</td> <td>LED lighting</td> </tr> </tbody> </table>	No	Energy efficiency measures	Applicable technologies and their criteria	1	Energy efficiency improvement by reducing fossil fuel consumption	High efficiency boiler with the following features: - Energy efficiency is greater or equal to 93% (e.g. small once-through boiler); - Equipped with automatic unit number control device; and - Individual performance test report is provided.	2	Fuel switch to electricity and/or efficiency improvement	Heat recovery heat pump using electricity, which generates both cooling and heating energy (temperature of hot water $\geq 80^{\circ}\text{C}$) and uses non-HFC refrigerant with zero Ozone Depletion Potential (ODP)	3	Installation	LED lighting	<p>The project involves implementation of the following energy efficiency measures:</p> <p>[Location 1] Measure 1: High efficiency boiler with energy efficiency higher than 93%, equipped with automatic unit number control device; and individual performance test report will be provided.</p> <p>Measure 2: Heat recovery heat pump using electricity, which generates both cooling and heating energy (temperature of hot water $\geq 80^{\circ}\text{C}$) and uses non-HFC refrigerants with zero ODP.</p> <p>Measure 3: LED lighting</p> <p>[Location 2] Measure 1: High efficiency boiler with energy efficiency higher than 93%, equipped with automatic unit</p>
No	Energy efficiency measures	Applicable technologies and their criteria												
1	Energy efficiency improvement by reducing fossil fuel consumption	High efficiency boiler with the following features: - Energy efficiency is greater or equal to 93% (e.g. small once-through boiler); - Equipped with automatic unit number control device; and - Individual performance test report is provided.												
2	Fuel switch to electricity and/or efficiency improvement	Heat recovery heat pump using electricity, which generates both cooling and heating energy (temperature of hot water $\geq 80^{\circ}\text{C}$) and uses non-HFC refrigerant with zero Ozone Depletion Potential (ODP)												
3	Installation	LED lighting												

	<table border="1"> <tr> <td></td> <td>n of high efficiency lighting</td> <td></td> </tr> </table>		n of high efficiency lighting		number control device; and individual performance test report will be provided.
	n of high efficiency lighting				
Criterion 2	If the existing equipment is a chiller containing CFCs, HFCs, or HCFCs and is removed due to the project, a plan to prevent release of refrigerant used for the existing chiller into the atmosphere is prepared. Execution of the prevention plan is checked at the time of verification, in order to confirm that the refrigerant used for the existing chiller is not released to the air.	The project does not involve removal of existing chiller.			
Criterion 3	High efficiency equipment in the project guarantees a better performance than the reference equipment for a minimum of one year. The performance level can be confirmed by comparing the efficiency or rated electricity consumption between the high efficiency equipment and the reference equipment, with an evidence of either a manufacturer's performance guarantee or energy saving company's (ESCO) energy saving guarantee of high efficiency equipment. Where such evidence is not available for the reference equipment, high efficiency equipment in the project guarantees a better performance than the default efficiency values provided in the methodology.	Manufacturer's guarantee for a minimum of one year along with the specification of high efficiency equipment in the project have been provided as the evidence.			

C. Calculation of emission reductions

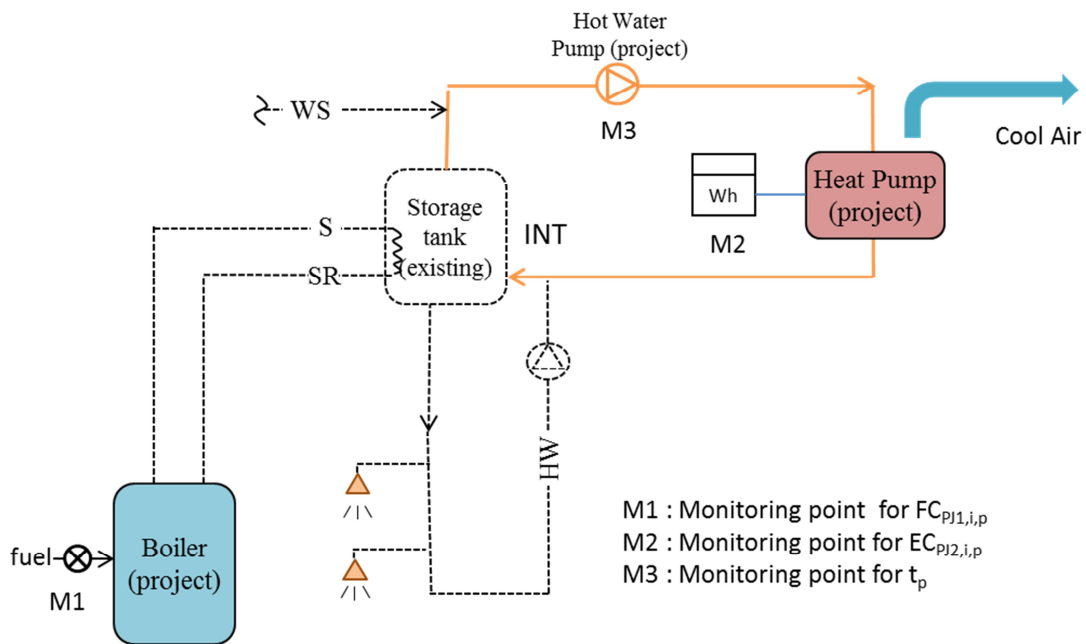
C.1. All emission sources and their associated greenhouse gases relevant to the JCM project

Reference emissions	
Emission sources	GHG type
Fossil fuel consumption by the reference equipment	CO ₂
Electricity consumption by the reference equipment	CO ₂
Project emissions	
Emission sources	GHG type
Fossil fuel consumption by the high efficiency equipment	CO ₂
Electricity consumption by the high efficiency equipment	CO ₂
Electricity consumption by the auxiliary equipment for the high efficiency equipment	CO ₂

C.2. Figure of all emission sources and monitoring points relevant to the JCM project

[Location 1] Hotel Nikko Hanoi

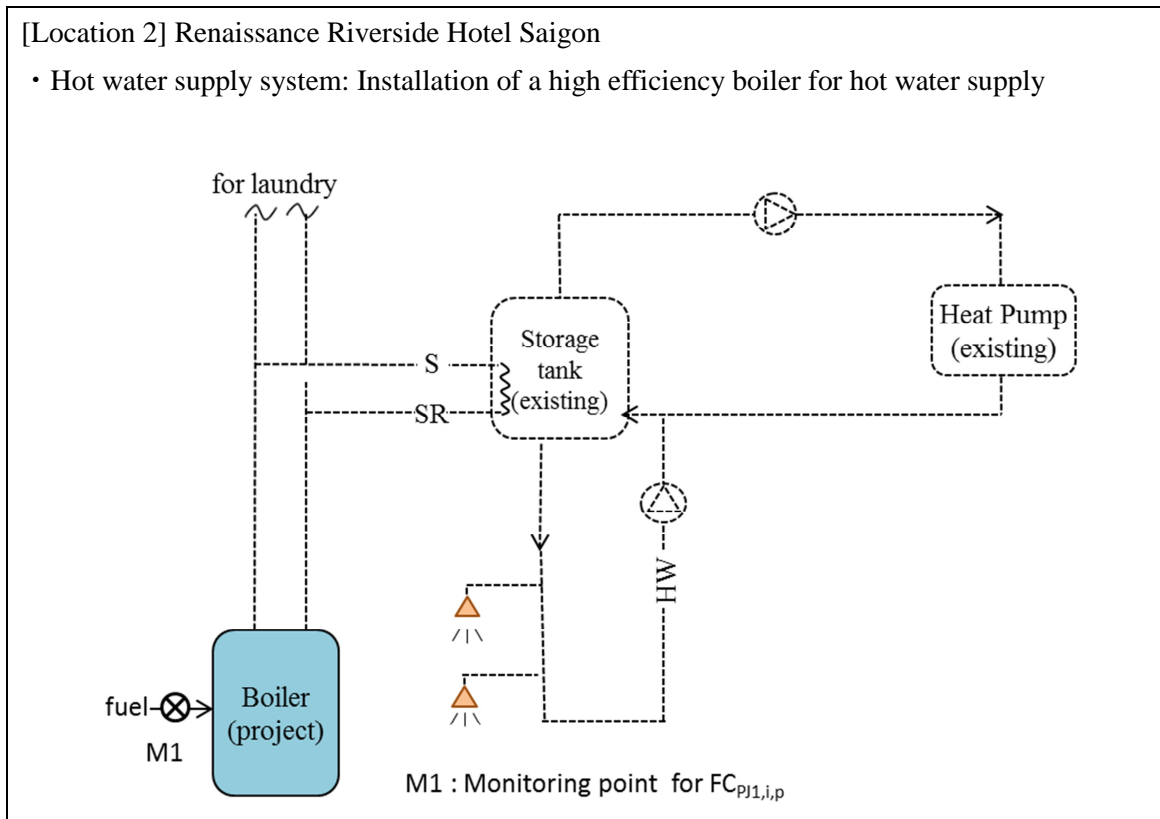
- Hot water supply system: Installation of a heat pump and a high efficiency boiler for hot water supply



- LED lamps: replacement of fluorescent / halogen lamp at the hotel lobby



M4: Operating hours of LED lamps (Monitoring of $t_{i,p}$) are checked against the operation schedule of the hotels



C.3. Estimated emissions reductions in each year

(Total)

Year	Estimated Reference emissions (tCO _{2e})	Estimated Project Emissions (tCO _{2e})	Estimated Emission Reductions (tCO _{2e})
2016	2,124	1,917	207
2017	2,836	2,547	289
2018	2,836	2,547	289
2019	2,836	2,547	289
2020	2,836	2,547	289
Total (tCO _{2e})	13,468	12,105	1,363

D. Environmental impact assessment

Legal requirement of environmental impact assessment for the proposed project	NO
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E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

The project activity, installation of new high efficiency boilers, heat pump, and replacement of existing lighting by high efficiency LED lamps, will benefit the two hotels hosting the project by satisfying their heating and lighting demand with less energy consumption. As such a nature of the project activity, the direct stakeholders of the project activity are the hotels where the project activities are located. Since early stage of the project development, the project participants communicated closely with the hotels hosting the project. Face-to-face interviews with the facility management representatives have been conducted frequently. Benefits of the proposed project, such as energy saving and financial assistance, and carbon emission reduction, are recognized, and no negative comment toward the proposed project was provided from hotels. Both hotels showed their support toward the proposed project, and they have requested prompt project implementation.

In the course of project development as one of NEDO's demonstration projects, through which the partial financial support from Japanese government is provided, there have been opportunities to invite comments from governmental authorities, such as Ministry of Natural Resources and Environment (MONRE), about the project. Project participants organized a briefing session for the project and invited stakeholders as follows:

[Date / Time] 17th September 2014 / 15:00-16:30

[Venue] Meeting Room at Hotel Nikko Hanoi

[Agencies participated in the consultation]

- Ministry of Natural Resources and Environment (MONRE)
- Ministry of Industry and Trade (MOIT)
- Department of Meteorology, Hydrology and Climate Change (DMHCC)
- Institute for Meteorology, Hydrology and Climate Change (IMHEN)

Comments received from the sequence of communication with the local stakeholders were summarized in the following section E.2. below. No negative opinions towards the project were received. Most comments showed high expectation toward the energy saving effect through the project.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Officer, Ministry of Natural Resources and Environment	We see no adverse effect by the project in terms of technology and environment. How the project host and the project developer cooperate for the project? Is there a structure/function of cooperation between Japan and Viet Nam? How much is Viet Nam's expense? At the end of project, what is the merit of Viet Nam?	According to the NEDO demonstration project's procedure, the initial cost (designing and apparatus procurement) is first paid by NEDO, and it becomes the property of NEDO during project duration. Vietnam side will pay the expense in connection with installation work. At the end of the duration of NEDO demonstration project, ownership of project equipment will be transferred to the hotels at the residual value. No further action is required.
Officer, Ministry of Natural Resources and Environment	Who enjoys the benefit of emission reductions?	After the completion of the demonstration project (usually within three years), JCM credits will be shared among the project participants. The Japanese side expects that the amount of credits corresponding to Japan's contribution will be allocated to the Japanese side.

F. References
N/A

Reference lists to support descriptions in the PDD, if any.

Annex

Estimated emissions reductions in each year at each project location

Location 1: Hotel Nikko Hanoi

Year	Estimated Reference emissions (tCO _{2e})	Estimated Project Emissions (tCO _{2e})	Estimated Emission Reductions (tCO _{2e})
2016	1,314	1,125	189
2017	1,752	1,497	255
2018	1,752	1,497	255
2019	1,752	1,497	255
2020	1,752	1,497	255
Total (tCO _{2e})	8,322	7,113	1,209

Location 2: Renaissance Riverside Hotel Saigon

Year	Estimated Reference emissions (tCO _{2e})	Estimated Project Emissions (tCO _{2e})	Estimated Emission Reductions (tCO _{2e})
2016	810	792	18
2017	1,084	1,050	34
2018	1,084	1,050	34
2019	1,084	1,050	34
2020	1,084	1,050	34
Total (tCO _{2e})	5,146	4,992	154

Revision history of PDD

Version	Date	Contents revised
01.0	18/06/2015	First Edition
02.0	12/02/2016	Second Edition