

## JCM Project Design Document Form

### A. Project description

#### A.1. Title of the JCM project

Promotion of green hospitals by improving efficiency / environment in national hospitals in Vietnam

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

The proposed JCM project aims to reduce CO<sub>2</sub> emissions by facilitating the utilization of inverter room air conditioners (RACs) in place of the conventional and more energy intensive non-inverter RACs in Vietnam. Inverter technology enables air conditioners to operate with less electricity consumption compared to the conventional types by varying revolution speed of the compressor according to the desired room temperature and operating conditions.

Through the JCM project, energy requirement for air conditioning at two national hospitals in Vietnam, namely People's Hospital 115 in Ho Chiming City [Location 1] and Viet Duc Hospital in Hanoi [Location 2], will be improved.

Approximately 1,000 units of inverter RACs by Mitsubishi Electric Corporation, one of the Japan's leading appliance suppliers, are installed by the proposed project. By electronically controlling the electrical voltage, current, and frequency of compressor motor in the air conditioner, inverter technology enables the optimum control of operating frequency, resulting in elimination of the excessive electricity consumption while providing the comfortable room environment.

In addition, to optimize operation of multiple inverter room air conditioners, the project introduces Energy Management System (EMS) which is also designed and developed by Mitsubishi Electric Corporation. Although energy efficiency improvement by EMS is not counted toward the emission reduction achieved by the project under the applied JCM methodology, introduction of EMS will enhance efficient energy use of public sector buildings in Vietnam.

The project is expected to improve energy efficiency of those two hospitals, resulting in the emissions reduction of 574 ton CO<sub>2</sub> annually.

## A.3. Location of project, including coordinates

Country	The Socialist Republic of Viet Nam
Region/State/Province etc.:	N/A
City/Town/Community etc:	[Location 1] Ho Chi Minh City / Ward 12, District 10  [Location 2] Hanoi / Hoan Kiem District
Latitude, longitude	[Location 1] People's Hospital 115: N10° 46' 29.42", E106° 40' 2.69"  [Location 2] Viet Duc Hospital: N21° 1' 38.40", E105° 50' 49.31"

## A.4. Name of project participants

The Socialist Republic of Viet Nam	Energy Conservation Center Ho Chi Minh City (ECC)
Japan	Mitsubishi Electric Corporation Mitsubishi Corporation Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.

## A.5. Duration

Starting date of project operation	06/08/2015
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 has been partially financed by Japanese government. Further, implementation of the proposed project promotes technology transfer of low carbon technologies in Vietnam. Through the NEDO program, high efficiency RACs are installed, and operation and performance of RACs and EMS will be monitored for the monitoring period set by the NEDO program. During this monitoring period, knowhow transfer to the operators in Vietnam for the optimum operation of both RACs and EMS is expected.

## B. Application of an approved methodology(ies)

### B.1. Selection of methodology(ies)

Selected approved methodology No.	JCM-VN-AM002
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	The methodology is applicable to the following types of projects: <ul style="list-style-type: none"> <li>• Installation of inverter RACs to public sector buildings.</li> <li>• Replacement of existing non-inverter RACs by inverter RACs in all types of buildings.</li> </ul>	The project newly introduces RACs equipped with inverters, and replaces some existing non-inverter RACs by inverter RACs at Peoples Hospital 115 and Viet Duc Hospital. Both People’s Hospital 115 and Viet Duc Hospital are national hospitals, administrated by national government.
Criterion 2	Rated cooling capacity of a project RAC is within the applicable range of the Vietnamese national standard TCVN7831:2012.	TCVN7831:2012 is applicable to non-ducted air conditioners with a rated cooling capacity up to 14kW. Rated cooling capacity of project RACs are between 2.6kW and 3.65kW, within the applicable range of the standard.
Criterion 3	Ozone Depletion Potential (ODP) of the refrigerant used for project RAC is zero.	Refrigerant used for project RACs is R410A whose ODP is zero.
Criterion 4	Plans to prevent release of refrigerants into the atmosphere at the time of RAC removal are prepared for both project RACs and the existing RACs replaced by the project. In the case of replacing existing RACs by project RACs, execution of the prevention plan is checked at the time of verification, in order to confirm that refrigerant	To prevent release of refrigerants into the atmosphere due to the project, at the time of RAC removal, the project plans to collect refrigerants from RACs removed and ensure storage of collected refrigerants by using refrigerant recovery check sheet. In addition, the project plans to provide relevant training for local workers to acquired adequate refrigerant collecting technique.

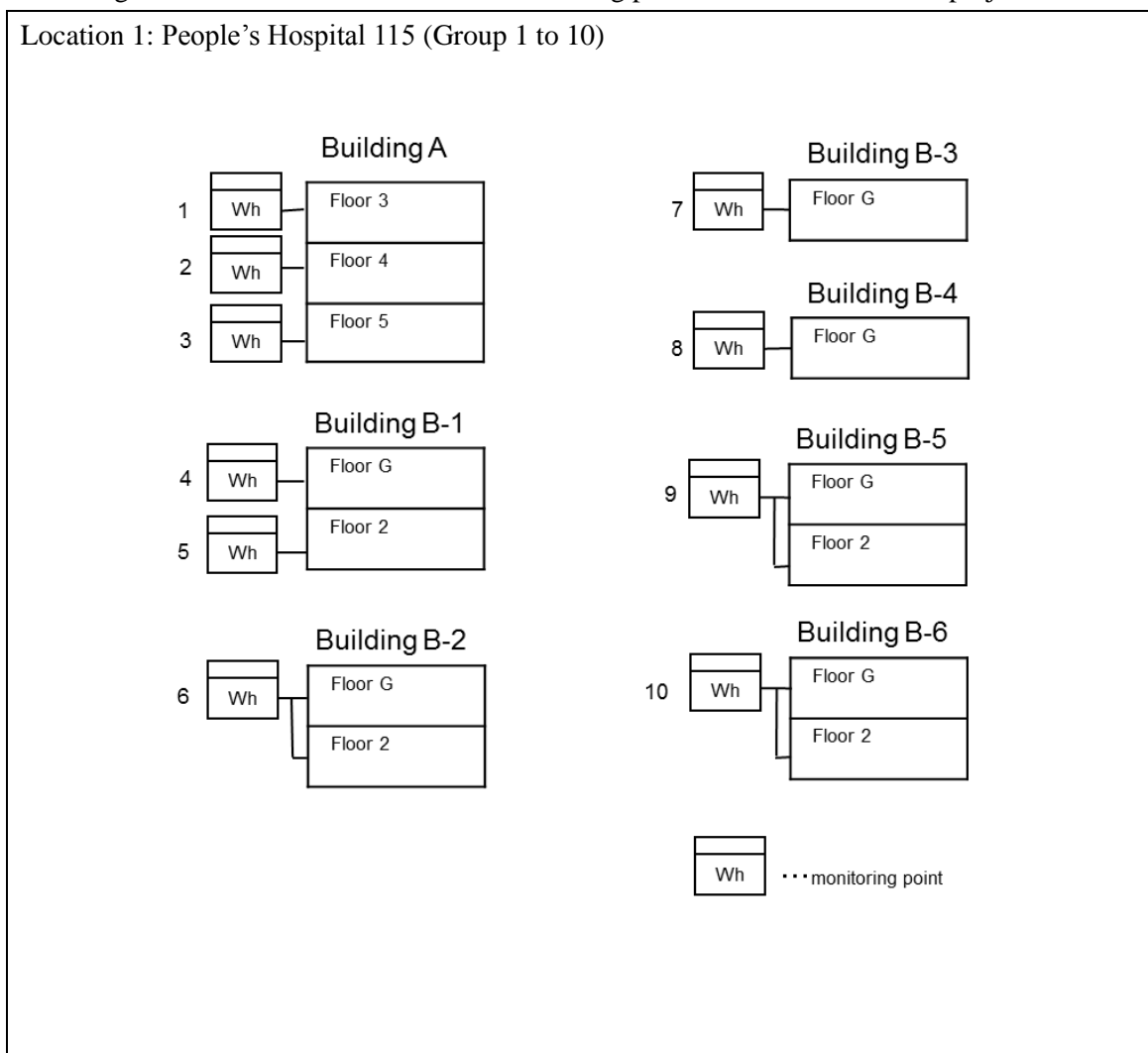
	used for the existing RACs removed by the project is not released to the air.	Procedures of refrigerant collection are outlined in refrigerant recovery process.
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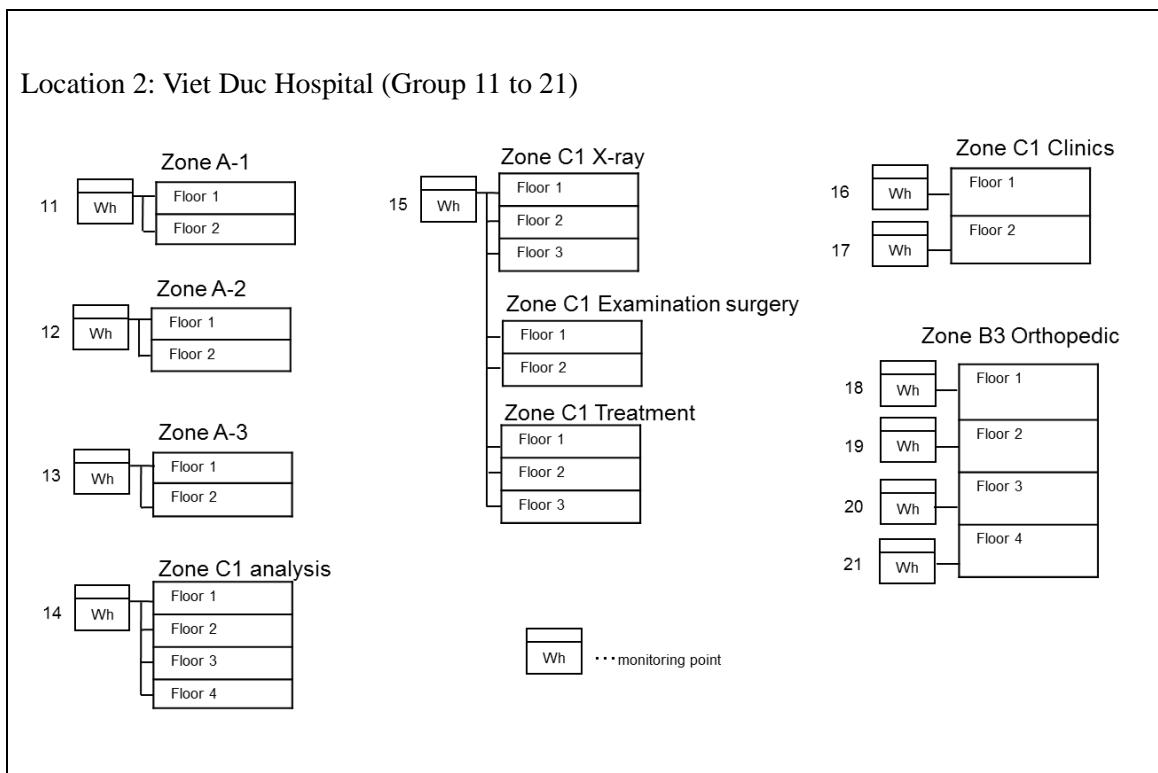
**C. Calculation of emission reductions**

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

Reference emissions	
Emission sources	GHG type
Electricity consumption by reference RACs	CO <sub>2</sub>
Project emissions	
Emission sources	GHG type
Electricity consumption by project RACs	CO <sub>2</sub>

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





C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO <sub>2e</sub> )	Estimated Project Emissions (tCO <sub>2e</sub> )	Estimated Emission Reductions (tCO <sub>2e</sub> )
2015	729	506	223
2016	1,903	1,329	574
2017	1,903	1,329	574
2018	1,903	1,329	574
2019	1,903	1,329	574
2020	1,903	1,329	574
<b>Total (tCO<sub>2e</sub>)</b>	<b>10,244</b>	<b>7,151</b>	<b>3,093</b>

<b>D. Environmental impact assessment</b>	
Legal requirement of environmental impact assessment for the proposed project	NO

## E. Local stakeholder consultation

### E.1. Solicitation of comments from local stakeholders

The project activity, installation of RACs equipped with inverter technology at two national hospitals, will benefit the hospitals hosting the project by meeting the facilities' air conditioning demand with reduced energy cost. Due to such a nature of the project activity, the direct stakeholders of the project activity are the hospitals where the project activities are located. Since early stage of the project development, the project participants communicated closely with the two hospitals hosting the project. Face-to-face interviews with hospital's facility management representatives have been conducted frequently. No negative comment toward the proposed project was provided from the hospital side. Both hospitals have welcomed the project, and they requested prompt project implementation in order to improve clinical environment for their patients.

In the course of project development as one of NEDO's JCM demonstration projects, through which the partial financial support from Japanese public funding is provided, there have been opportunities to invite comments from governmental authorities, such as Department of Health HCMC, Ministry of Natural Resources and Environment (MONRE), and Ministry of Industry and Trade (MOIT), about the project. Most of their comments were positive, and they expect the effect of energy cost saving, carbon emission reduction, as well as the improved clinical environment for the patients.

In addition to the individual face-to-face meetings, the project participant 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, Department of Health Ho Chi Minh City	Project's energy saving effect is evaluated highly. We would like to introduce inverter air conditioner to the newly planned hospital as well. We expect that Japanese integrated energy saving/energy efficiency improvement technologies, not limited to inverter technology, will effectively improve energy efficiency of hospitals in Viet Nam. We expect that this project becomes the first step.	No action is required
Officer, Ministry of Natural Resources and Environment	We see no adverse effect by the project in terms of technology and environment. How the hospital (i.e. 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 hospitals 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: People's Hospital 115

Year	Estimated Reference emissions (tCO <sub>2e</sub> )	Estimated Project Emissions (tCO <sub>2e</sub> )	Estimated Emission Reductions (tCO <sub>2e</sub> )
2015	475	318	157
2016	1,140	763	377
2017	1,140	763	377
2018	1,140	763	377
2019	1,140	763	377
2020	1,140	763	377
Total (tCO <sub>2e</sub> )	6,175	4,133	2,042

Location 2: Viet Duc Hospital

Year	Estimated Reference emissions (tCO <sub>2e</sub> )	Estimated Project Emissions (tCO <sub>2e</sub> )	Estimated Emission Reductions (tCO <sub>2e</sub> )
2015	254	188	66
2016	763	566	197
2017	763	566	197
2018	763	566	197
2019	763	566	197
2020	763	566	197
Total (tCO <sub>2e</sub> )	4,069	3,018	1,051

**Revision history of PDD**

Version	Date	Contents revised
01.0	16/06/2015	First Edition
02.0	25/08/2015	Second Edition