JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Energy saving and work efficiency improvement by introducing a new chip-on-board LED system in Vietnam

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

The proposed JCM project aims to reduce CO_2 emissions in Socialist Republic of Vietnam by replacing existing High-Intensity Discharge (HID) Lamp with Light Emitting Diode (LED) lighting as fishing lights for diesel powered fishing boats. As LED light has high energy-saving effects with a chip-on-board (COB) module and can control wavelength, the LED's installation can theoretically achieve energy efficiency improvement by 70% compared to the existing HID or filament lamp. The LED lights replaced by the project are supplied by Stanley Electric Co., Ltd. of Japan, one of the leading companies to manufacture a variety of electric lighting equipment. Two fishing villages (Cua Viet and Cua Tung) located in Dong Ha, the capital city of the Quang Tri Province located in northern central coastal region of Vietnam, have been selected as the project site. The existing 40 fishing boats with HID are targeted for replacement into LED in the project. The project LED lighting has been designed to maintain equivalent luminance of the existing HID of the fishing boats prior to the project implementation, to avoid negative impact toward fishing due to the change of lighting. The project is expected to improve energy efficiency of totally 40 fishing boats, resulting in the total emission reduction of 878 ton CO2 annually. The actual emission reduction may vary depending on the frequency of fishing trips and the actual lighting hours of the LED installed.

A.3. Location of project, including coordinates

Country	The Socialist Republic of Viet Nam
Region/State/Province etc.:	Quang Tri Province
City/Town/Community etc:	Dong ha
Latitude, longitude	N 16.49.49, E 107.5.50

A.4. Name of project participants

The Socialist Republic of Viet Nam	Department of Science and Technology of Quang Tri

	Province (DOST)
Japan	Stanley Electric Co., Ltd.

A.5. Duration

Starting date of project operation	24/03/2017
Expected operational lifetime of project	8 years

A.6. Contribution from Japan

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 (hereafter referred to as NEDO), one of the largest national public research and development management organisation in Japan. The purpose of NEDO's JCM demonstration projects is to demonstrate the effectiveness of advanced clean energy and low-carbon technologies which leads to GHG emission reductions through the introduction of such technologies in the partner country.

As a result of the support provided by NEDO's program, implementation cost of the proposed JCM project has been financed by Japanese government. The project implementation includes low-carbon technologies, i.e. LED lightings for fishing boats, to the Vietnamese side.

After the installation of the project, the know-how transfer of the actual monitoring procedures, operation, and maintenance of LED lightings will be conducted as part of the NEDO programme during the monitoring period set by the programme.

B. Application of an approved methodology(ies)

B.1. Selection of methodology (ies)

Selected approved methodology No.	VN_AM008
Version number	Ver01.0

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 project newly installs LED lights or replaces existing lamps with LED lights as fishing lights for diesel powered fishing boats whose horsepower is over 90 in Vietnam.	This project replaces the existing HID lamps with LED lights as fishing lights to 40 targeted fishing boats in two fishing villages in Dong Ha of Quang Tri Province. Horsepower of all boats are confirmed to be over 90 HP.

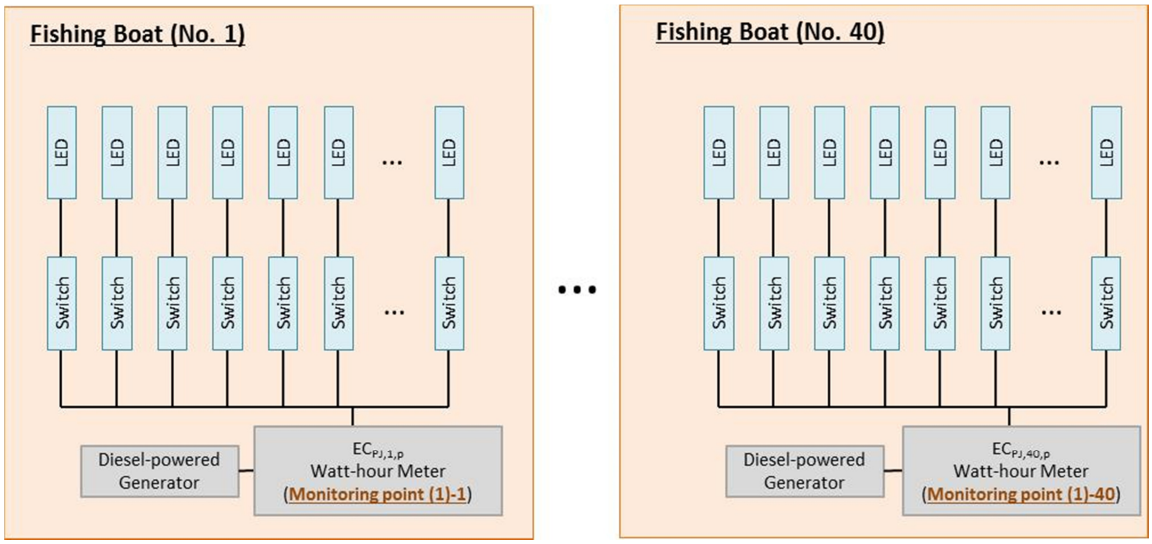
Criterion 2	Project LED lighting meets the following specification - Water proof and dust proof ratings are equal to or higher than the international standard IP65	The water proof and dust proof ratings of LED light used for the project is IP66 based on manufacturer's inspection results, which is higher than IP65.
Criterion 3	In case existing lamps are replaced, a plan for proper treatment (including re-use and recycling) and disposal of replaced existing lamps is prepared and implemented according to the relevant legislation in Vietnam to avoid the mercury release to the environment.	A plan for proper treatment and disposal of replaced existing lamps is prepared. Although there is no special regulation to treat lamps in Vietnam, the proper management will be conducted on the basis of the DOST's' Plan for Treatment of Existing Lamps under JCM Methodology.' The DOST also provides the education for proper management to ship owners, and the Installation and Commission Completion Certificate (Schedule 1) shows such educational activity.

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 lighting equipment	CO2
Project emissions	
Emission sources	GHG type
Electricity consumption by project LED light	CO2

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



*1: $\underline{\Sigma EC_{PJ,i,p}}$: Parameter for Monitoring point (1), the sum of 40 watt-hour meters, located at each fishing boat (index variable (*i*) from 1 to 40).

*2: The number of LED bulbs in a boat varies depending on size of fishing boat.

C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO_{2e})	Estimated Project Emissions (tCO_{2e})	Estimated Emission Reductions (tCO_{2e})
2017	907.0	249.0	658
2018	1,209.6	331.0	878
2019	1,209.6	331.0	878
2020	1,209.6	331.0	878
Total (tCO_{2e})	4,534	1,242	3,292

D. Environmental impact assessment	
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 of the LED installation into fishing boats instead of the HID lamps will directly give local fishermen benefits with less energy consumption. In order to extensively

solicit comments from the related stakeholders, the three stakeholders meetings were implemented by the project participants during the NEDO's programme. The details of local stakeholders meetings are summarised as follows.

<1st Stakeholder Meeting>

Date	21 February 2017
Venue	Office of the Ministry of Natural Resource and Environment (MONRE) in Hanoi
Vietnamese Participant	・ Department of Meteorology, Hydrology, and Climate Change, the Ministry of Natural Resource and Environment (MONRE)
Number of participants	4

<2nd Stakeholder Meeting>

Date	21 June 2017
Venue	Office of People's Committees of Cua Viet Town in Dong Ha
Vietnamese Participant	・ Department of Science and Technology (DOST) of Quang Tri Province ・ Technology Energy Stock Company (ETES) ・ People's committee in Cua Viet Town ・ Fishery Association in Cua Viet Town ・ Ship Owner
Number of participants	8

<3rd Stakeholder Meeting>

Date	22 June 2017
Venue	Office of Department of Science and Technology (DOST) of Quang Tri Province
Vietnamese Participant	Department of Science and Technology (DOST) of Quang Tri Province
Number of participants	3

At the respective meetings, the brief introduction of the JCM Scheme, the project outline, and the introduced technology were provided from the project participant. Through the Q&A session followed after the explanation, the proposed project was positively recognised and welcomed by the meeting attendees without any objections. Most comments showed the appreciation and the expectation toward the energy saving effects through the project, and the points to note for further development and dissemination in Vietnam. The summarised comments are shown in the E.2. below.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Officer, MONRE	Would there be maintenance supports available for broken LED lights even after the introduction of the LED technology in Vietnam?	In order to further promote local industries, the Stanley's Vietnam office is planned to provide a support system for maintenance of not only the installed LED lights in the project site but also other new installation. The Stanley's Vietnam plant will produce the LED lighting equipment. **<No further action is necessary.>**
Officer, MONRE	In spite of widespread dissemination of LED lights in other sectors of Vietnam, the possible reasons behind the weak LED growth in the fishery sector may include cost issues.	The reason may be the one that LED lighting equipment has not been developed yet to withstand the severe condition like the one fishing boats go through. In this sense, we will develop and introduce the LED lighting equipment suitable for the specific condition of Vietnamese fishing industry. The budget for the development and various preparations for actual manufacturing are supported by the NEDO's programme. LED lights can save energy compared with the HID lamps, which result in reducing fuel consumption of fishing boats. This would enable fishermen to fish for longer period and travel to further distant fishing points. In spite of higher initial costs of LED lights than HID lamps, it is important for us to promote LEDs' cost advantage for the medium- and long-term perspectives. **<No further action is necessary.>**

Stakeholders	Comments received	Consideration of comments received
Officer, MONRE	Fishery is one of the prioritised industries that the Government of Vietnam focuses on and we do expect this project's success. Not only Quang Tri Province but also our government would like to participate in seminars and kick-off meeting for the diffusion of the LED lights.	Noted. **<No further action is necessary.>**
People's Committee	We appreciate the government of Japan for supporting this project as a JCM project.	Noted. **<No further action is necessary.>**
Representative, Fishery Association	The boats with LED lights looked darker than those with HID lamps.	Boats with HID lamps look brighter because they illuminate surroundings by 360 degree light distribution. Their illuminance into an irradiated sea surface required to lure fish is the equivalent level as that of LED lights. This means the light change from HID to LED does not affect fishery yields. **<No further action is necessary.>**
Representative, Fishery Association	The project team had tested various LED colour such as white or green LED through this project. As a result, the white ones were adopted in this time. However, some fishermen would insist that yellow light should be more effective on luring squid.	We will review the effectiveness of illuminant colours in the future development/standardization. **<No further action is necessary.>**
Staff, ETES	We are concerned about the weight of the LED lights. It should be examined to fit the Vietnamese wooden boats.	Noted **<No further action is necessary.>**
Vice Director, DOST	The related people in fishing villages with this project are still	We will conduct the capacity building activities in the next 6 months.

Stakeholders	Comments received	Consideration of comments received
	missing a concept of the JCM scheme.	**<No further action is necessary.>**

F. References
N/A

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

Annex
N/A

Revision history of PDD		
Version	Date	Contents revised
01.0	31/10/2017	First edition
02.0	21/12/2017	Second edition