JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Introduction of High Efficiency LED Lighting Utilizing Wireless Network

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

The project involves introduction of total of 5,672 units of high efficiency LED lighting utilizing wireless network technology in the vicinity of the capital city of Phnom Penh and Siem Reap Province in Cambodia.

Project site	Number of units
(1) Diamond Island (DI, Phnom Penh)	766
(2) Chroy Chong Var (CCV, Phnom Penh)	1,288
(3) APSARA area (APSARA, Siem Reap)	1,670
(4) Siem Reap Province Hall area (SRPH, Siem Reap)	1,948
Total	5,672

The proposed project will reduce fossil-fuel based grid electricity consumption and thereby contribute to greenhouse gas (GHG) emissions reduction in Cambodia by installing less energy consuming LED lights aided by wireless network technology that is capable of controlled dimming compared to the conventional type of street lights which would otherwise be installed.

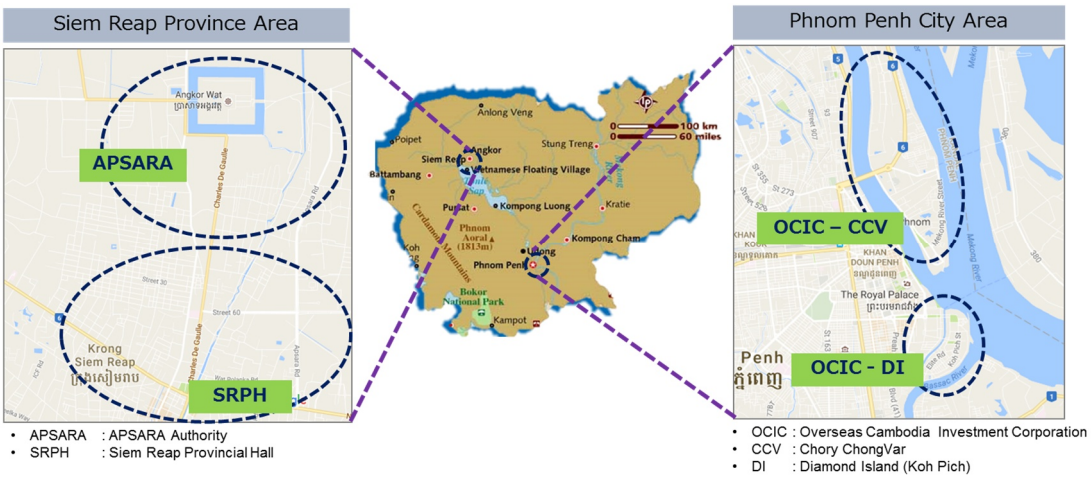

Figure 1: Location map of the Project

A.3. Location of project, including coordinates

Country	Kingdom of Cambodia
Region/State/Province etc.:	(1) Phnom Penh (2) Phnom Penh (3) Siem Reap (4) Siem Reap
City/Town/Community etc:	(1) Diamond Island, Tonie Bassac Commune, Chomkamon District, Kingdom of Cambodia (2) Sangkat Chroy Chong Var, Phnom Penh, Cambodia (3) Apsara National Authority, Bang Korng Village, Ampil Commune, Siem Reap City, Siem Reap Province, Kingdom of Cambodia (4) 60 street, Boeung Donnpa, Slorkram, Siem Reap Province, Kingdom of Cambodia
Latitude, longitude	(1) 11°33'04.8"N 104°56'26.8"E (2) 11°36'34.3"N 104°55'34.7"E (3) 13°23'12.6"N 103°58'30.9"E (4) 13°22'51.1"N 103°52'50.0"E

A.4. Name of project participants

The Kingdom of Cambodia	(1) Overseas Cambodian Investment Corporation (OCIC) (2) Authority for the Protection of the Site and the Management of the Region of Angkor (APSARA Authority) (3) Siem Reap Provincial Hall
Japan	MinebeaMitsumi Inc.

A.5. Duration

Starting date of project operation	01/01/2018
Expected operational lifetime of project	10 years (duration for each site) 11 years (total duration for the entire project)

A.6. Contribution from Japan

The proposed project was partially supported by the Ministry of the Environment, Japan (MOEJ) through the financing program for JCM model projects, which provided financial support of less than half of the initial investment for the projects in order to acquire JCM credits. Further, implementation of the proposed project promotes diffusion of low carbon technology within Cambodia as well as technology transfer.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	KH_AM001
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 installs LED street lighting system utilizing wireless network control, which is connected to an electricity grid system.	The LED street lighting systems utilizing wireless network control installed by the project are connected to electricity grid system of the project area.
Criterion 2	All lighting equipment in one lighting system has the same specifications.	All lighting equipment in one lighting system has the same specifications.
Criterion 3	Wireless network technology enables controlling of the volume of lighting.	Wireless network technology installed by the project is capable of controlled dimming of the street lighting systems.

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
Grid electricity consumption by the HID street lighting system.	CO_2
Project emissions	
Emission sources	GHG type
Grid electricity consumption by the LED street lighting system with wireless network control.	CO_2

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

Both monitoring points (1) total operating hours of project lighting system *i* during the period *p* (hrs/p) and (2) total amount of electricity consumed in the project lighting

system *i* during the period *p* (Wh/p) will be monitored by nodes installed together with the street lighting system.

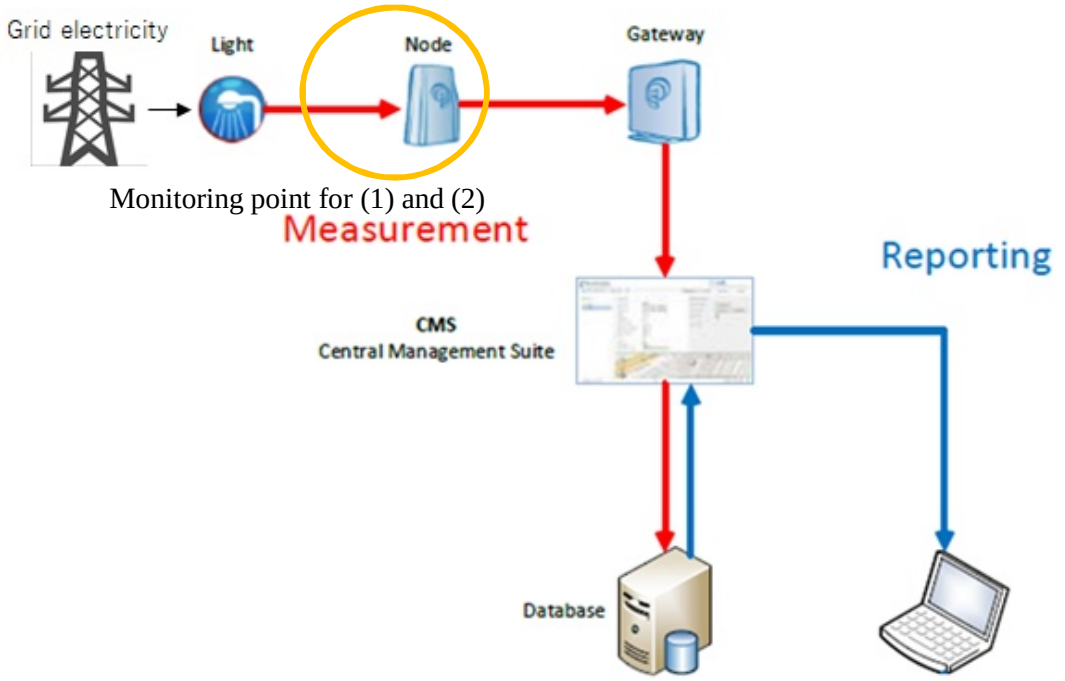

Figure 2: Monitoring point

C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO_{2e})	Estimated Project Emissions (tCO_{2e})	Estimated Emission Reductions (tCO_{2e})
2018	290.8	167.0	123
2019	1,272.7	713.7	559
2020	1,272.7	713.7	559
2021	1,272.7	713.7	559
2022	1,272.7	713.7	559
2023	1,272.7	713.7	559
2024	1,272.7	713.7	559
2025	1,272.7	713.7	559
2026	1,272.7	713.7	559
2027	1,272.7	713.7	559
2028	981.9	546.7	435
2029			
2030			

Total (tCO_{2e})	5,589

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 main stakeholders of the proposed JCM project have been identified by the project participants with an advice from the Ministry of Environment of Cambodia. Invitation letters were sent to the stakeholder to attend the local stakeholder consultation (LSC) meetings. Two sessions of LSC were held to explain about the Project implemented in Phnom Penh and Siem Reap respectively and solicit comments.

[LSC in Phnom Penh]

- Date and Time: 12 February 2019, 14:00~16:00
- Venue: CEO Meeting, Koh Pich City Hall, Diamond Island
- Attendees (Total 13 representing the following organizations):

- Ministry of Environment, Cambodia
- Ministry of Industry and Handicraft, Cambodia
- Overseas Cambodia Investment Corporation
- MinebeaMitsumi Inc.
- Minebea (Cambodia) Co., Ltd.
- Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.

[LSC in Siem Reap]

- Date and Time: 13 February 2019, 14:00~16:00
- Venue: Meeting Room 1, Ground Floor, Siem Reap Provincial Hall
- Attendees (Total 20 representing the following organizations):

- APSARA Authority
- Siem Reap Province Hall
- MinebeaMitsumi Inc.
- Minebea (Cambodia) Co., Ltd.
- Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.

[Meeting agenda]

- Opening remarks
- Presentation on Project and Technology
- Presentation on MRV
- Closing Remark

[Conclusion]

In general, the project was received positively, and many stakeholders showed their appreciation of the JCM scheme and expressed their view towards welcoming more JCM Projects with particular focus on promoting private business cooperation between Japan and Cambodia. There were also several questions and comments on welcoming technology transfer through JCM.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Ministry of Environment, Cambodia	What is the relationship between project implementation plan including installation and operation of equipment and JCM project cycle? Can JCM project cycle start after equipment installation?	An explanation was provided that there are cases, such as this project where equipment installation precedes JCM project cycle and it is within the scope of JCM rules. (No further action is required)
Ministry of Industry and Handcraft, Cambodia	How can JCM further be promoted in Cambodia and solicit more companies to participate?	A comment was provided that project participants plan to build upon the JCM project to engage in more business in Cambodia. (No further action is required)
Ministry of Industry and Handcraft, Cambodia	What kinds of technology transfer took place?	An explanation was provided on the training of monitoring system which was done very smoothly and local operators were able to quickly learn how to operate the system. The installation of streetlights was also carried out by local partners which contributed to developing their technical capacity. (No further action is required)

Siem Reap Provincial Hall	Does energy saving translate into energy cost saving?	A comment was given that although energy saving and energy cost saving are theoretically the same, however, it may vary depending on energy pricing with additional information that in JCM project, energy saving amount is compared to a conservatively determined reference case. (No further action is required)
Siem Reap Provincial Hall	Do project participants have plans to pursue JCM with the private sector?	The JCM Project with the private sector is already being pursued in Phnom Penh. (No further action is required)

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
Ver1.0	02/10/2019	Initial version
Ver1.1	20/12/2019 21/02/2020	Revised based on validation. Revisions include changes in the monitoring point diagram and estimation of emissions reduction. Initial registration at JC5