JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Introduction of 5MW Floating Solar Power System on Industrial Water Reservoir in Thailand

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

The project involves installation of 5MW Floating solar farm equipment utilizing industrial Reservoir pond inside of Kabinburi Industrial Zone. The project is implemented by TSB Bangkok Co., Ltd., a company utilizing the crystalline silicon photovoltaic (PV) modules of Econess Energy Co., Ltd. as well as Power Optimizer of GNE New Energy Technology Co., Ltd.. PV system on the water will give higher power generation efficiency compared to the solar system on the ground under high atmosphere temperature due to the lower surface temperature of PV module. The optimizer has a power shutdown function for each PV module. It can prevent an electric shock for Firefighters in case of fire. And monitoring function of the optimizer can detect leakage accident of PV module. The use of optimizer also minimizes the power generation loss of PV module string by PV module's specification variation. The electricity produced by the project is supplied to a Factory in Kabinburi Industrial Zone to displace grid electricity mostly derived from fossil-fuel based thermal power plants, which contributes to the reduction of greenhouse gas emissions in Thailand.

A.3. Location of project, including coordinates

Country	The Kingdom of Thailand
Region/State/Province etc.:	Kabinburi Province
City/Town/Community etc:	Kabinburi Industrial Zone
Latitude, longitude	N14°03'35.1" E101°50'54.6"

A.4. Name of project participants

The Kingdom of Thailand	TSB Bangkok Co., Ltd.
Japan	TSB Co., Ltd.

A.5. Duration

Starting date of project operation	20/01/2020

Expected operational lifetime of project	17 year

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. The technology of advanced and efficient solar power system is introduced in the proposed project by the Japanese project participant. Further, implementation of the proposed project promotes technology transfer of low carbon technologies in Thailand.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	TH_AM001
Version number	ver01.0

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

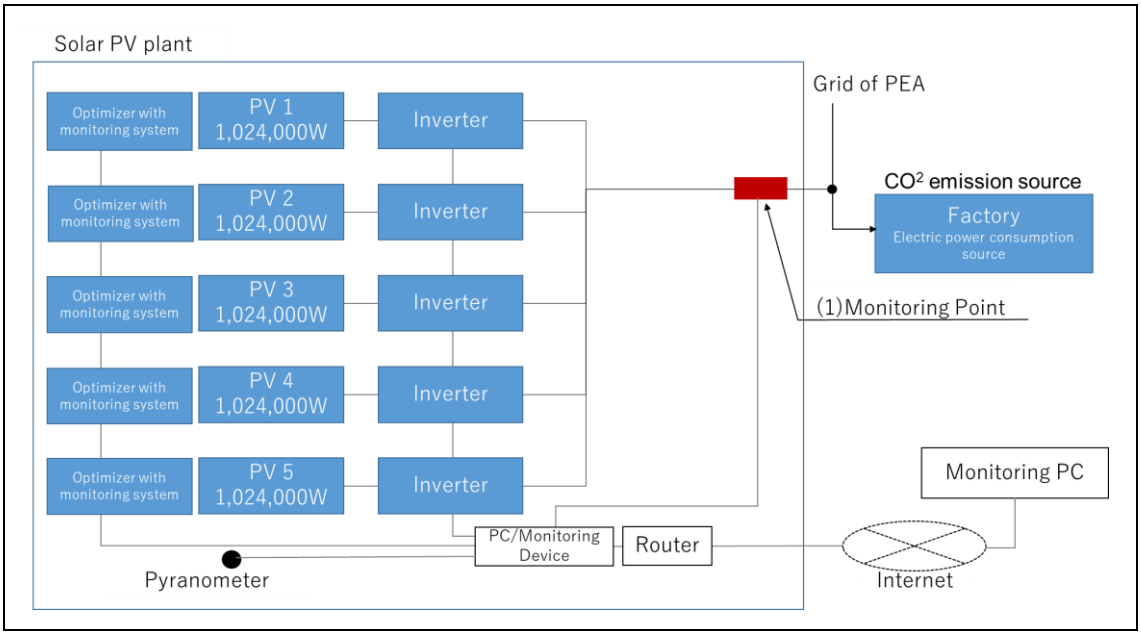
Eligibility criteria	Descriptions specified in the methodology	Project information
Criterion 1	The project installs solar PV system(s).	The solar PV system is installed at industrial Reservoir pond in Kabinburi industrial zone.
Criterion 2	The solar PV system is connected to the internal power grid of the project site and/or to the grid for displacing grid electricity and/or captive electricity at the project site.	The solar PV systems are connected to the internal power grids of the project sites (factory) for displacing grid electricity at the project sites.
Criterion 3	The PV modules obtained a certification of design qualifications (IEC 61215, IEC 61646 or IEC 62108) and safety qualification (IEC 61730-1 and IEC 61730-2).	The PV module installed in the project have been certified for IEC 61215, IEC 61730-1, IEC 61730-2.
Criterion 4	The equipment used to monitor output power of the solar PV system(s) and irradiance is installed at the project site.	Electricity meter and pyranometer have been installed at the project site to monitor output power and irradiance respectively

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
Consumption of national grid electricity	CO_2
Project emissions	
Emission sources	GHG type
Generation of electricity from the Solar PV system	N/A

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_2e)	Estimated Project Emissions (tCO_2e)	Estimated Emission Reductions (tCO_2e)
2020	2,419.3	0.0	2,419
2021	2,552.2	0.0	2,552
2022	2,552.2	0.0	2,552
2023	2,552.2	0.0	2,552
2024	2,552.2	0.0	2,552
2025	2,552.2	0.0	2,552
2026	2,552.2	0.0	2,552
2027	2,552.2	0.0	2,552

2028	2,552.2	0.0	2,552
2029	2,552.2	0.0	2,552
2030	2,552.2	0.0	2,552
Total (tCO_2e)			27,939

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

To solicit comments from local stakeholders, a consultation meeting was planned by the project participants, and the project participants invited various stakeholders. Details of the local stakeholders consultation meeting is summarized as follows:

Date and Time: 17th December 2019, 10:00-11:00
Venue: TSB Bangkok Co., Ltd.
Address: 50 1057 Bueng Yitho, Thanyaburi District, Pathum Thani 12130

Following organizations from Thailand side were invited to the consultation meeting:

- Thailand Greenhouse Gas Management Organization (TGO)
- TSB Co., Ltd
- TSB Bangkok Co., Ltd.

At the meeting, the details of the proposed JCM project and the technology to be introduced were explained by the representative of TSB Co., Ltd.
There were no negative comments toward the proposed project expressed during the stakeholders meeting by the attendees. The comments received during the local stakeholders meeting are summarized in the following section.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
TGO	How will be PV panels recycled?	PV modules might be recycled by

		two ways. One is recycled as some separated materials. Other one is recycled as second-hand PV modules. Now in Japan, there are companies which own dedicated recycling lines for PV panels and perform separation processing. In other words, they are operating as a business as well as at the development stage. However, it is still in a state where it is limited and expensive in terms of cost. We are considering installing this machine and line in future also. (No further action is needed)
	Who is the supplier of PV panels?	It is a brand of TSB Co., Ltd but is sourced as OEM product. TSB Co., Ltd is a fabless company and offers design and quality control. PV modules manufacture is Econess Energy Co., ltd. (No further action is needed)
	How much is the total efficiency of electricity generation of this project?	It is about 89.7%. Detail of calculation: A: Temperature compensation coefficient 0.98 B: Power Conditioner efficiency 0.984 C: Cable loss coefficient 0.93 A*B*C=0.897 (89.7%) (No further action is needed)
	When do you think that all of permits will be received?	All of permits were received. Monitoring will be started at latest by the beginning of January next year.

		(No further action is needed)

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	15/01/2019	First edition
02.0	11/03/2020	Second edition
03.0	13/03/2020 28/09/2020	Third edition Initial registration by the Joint Committee through electronic decision