JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Introduction of 3.4 MW Rooftop Solar Power System in Technical Center and Office Buildings

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

This project aims for the reduction of CO_2 emission by installing a total of 3.4 MW solar photovoltaic (PV) systems at two site; (1) the technical center and office buildings of Toyota Daihatsu Engineering & Manufacturing Co., Ltd. (TDEM): 2,755.2 kW on top of the buildings named Head Office, QD, TB1, TB2, TB3, TB4, and MPF, located in Samutprakarn, and (2) the Toyota Parts Center Asia Pacific (TPCAP): 638.4 kW on top of warehouse-building, located in Chacheongsao. Both project sites are located in eastern part of Bangkok Metropolitan Region. Electricity generated by the project solar power system is consumed in-house and replaces part of grid electricity consumption.

A.3. Location of project, including coordinates

Country	The Kingdom of Thailand
Region/State/Province etc.:	(1) Samutprakarn Province (2) Chacheongsao Province
City/Town/Community etc:	(1) 99 Moo 5 Ban-Ragad, Bang-Bo (2) 99 Moo 2 Ladkwang, Banpho
Latitude, longitude	(1) Latitude: 13°35'43.98"N / Longitude: 100°52'37.22"E (2) Latitude: 13°37'26.60"N / Longitude: 101°00'51.67"E

A.4. Name of project participants

The Kingdom of Thailand	Toyota Daihatsu Engineering & Manufacturing Co., Ltd.
Japan	Toyota Motor Corporation

A.5. Duration

Starting date of project operation	01/08/2019
Expected operational lifetime of project	15 years

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 technologies within Thailand.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	JCM_TH_AM001
Version number	Ver. 02.0

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 proposed project installs solar PV system.
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 system of each site is connected to internal power grid of each site and to the grid.
Criterion 3	The PV modules have 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 modules installed by the proposed project are certified for IEC 61215 and IEC 61730.
Criterion 4	The equipment to monitor output power of the solar PV system and irradiance is installed at the project site.	Inverter which enables to monitor output power of the solar PV system and irradiance with data logger connected with CCG (Control and Communication Gateway) have been installed at each of project site to monitor output power and irradiance respectively.

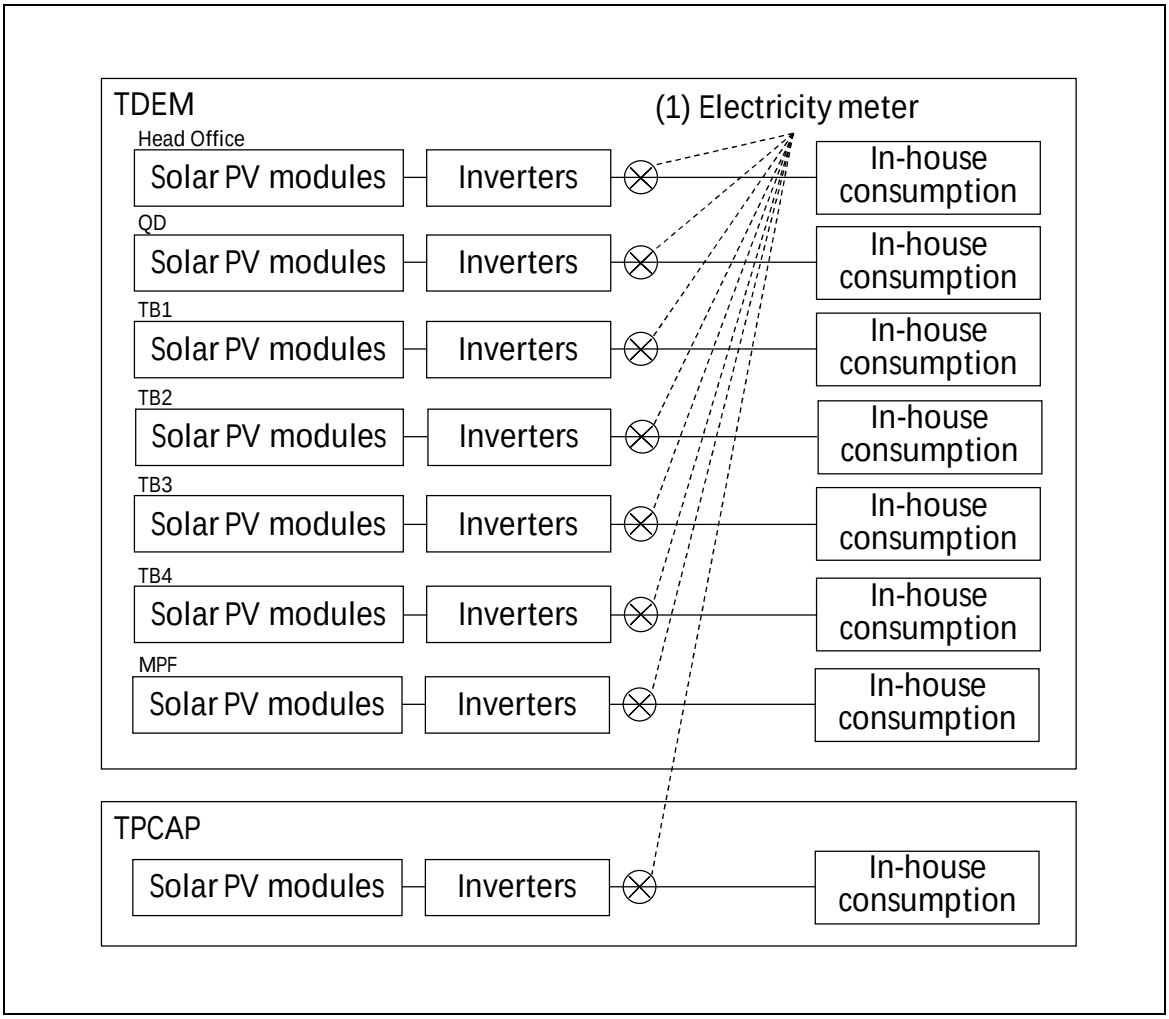
C. Calculation of emission reductions

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

Reference emissions

Emission sources	GHG type
Consumption of grid and/or captive electricity	CO_2
Project emissions	
Emission sources	GHG type
Generation of electricity from solar PV system(s)	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)
2019	552	0	552
2020	1,417	0	1,417
2021	1,417	0	1,417
2022	1,417	0	1,417

2023	1,417	0	1,417
2024	1,417	0	1,417
2025	1,417	0	1,417
2026	1,417	0	1,417
2027	1,417	0	1,417
2028	1,417	0	1,417
2029	1,417	0	1,417
2030	1,417	0	1,417
Total (tCO_2e)			16,139

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 the local stakeholders, the project participant conducted a local stakeholders consultation meeting as follows:

Date /Time :10 October 2019, 9:30-16:00

Venue :Toyota Daihatsu Engineering & Manufacturing, 99 Moo 5, Ban-Ragad, Bang-Bo, Samutprakarn 10560, Thailand

Attendees (total 39 representing the following organizations):

- Department of Alternative Energy Development and Efficiency, Ministry of Energy (DEDE)
- Thailand Greenhouse Gas Management Organization (TGO, JCM secretariat from the Thai side)
- Toyota Motor Corporation (TMC, project participant)
- Toyota Daihatsu Engineering & Manufacturing (TDEM)
- Toyota Parts Center Asia Pacific (TPCAP)
- Toyota Motor Thailand Ban Pho plant (TMTBP)
- Toyota Motor Thailand Gateway plant (TMTGW)
- Toyota Motor Thailand Samrong plant (TMTSR)
- Siam Toyota Manufacturing Co., Ltd. (STM)

- Toyota Motor Thailand (TMT)
- Mitsubishi UFJ Morgan Stanley Securities Co., Ltd. (MUMSS)

Meeting agenda:

- Opening remarks
- TDEM & TPCAP Company Outline
- Outline of the proposed JCM project / Project technology
- MRV of the project
- Q & A
- Closing remark

Received comments from the local stakeholders, along with the responses/action to the comments, are listed in the following section.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
DEDE	What is the total area of 8 buildings that are installed the solar system?	The total installation areas are 33,419 m^2. No further action required.
DEDE	The payback period is approximately 6 years. How much energy is produced per day, in order to calculate 6 years payback period?	The Project will be expected to generate approximately 15 MWh/day. No further action required.
DEDE	Since there is no battery for this system, which infrastructure system will be consumed solar power of this project?	It is correct that it has no battery for this system. Solar power generated from this project is used for utilities, mainly lighting and air conditioning system. No further action required.
DEDE	Apart from JCM subsidy, does the Project apply for another subsidy such as the BOI privilege of Thailand?	Unfortunately, TDEM cannot receive the BOI privilege of Thailand because this project is not TDEM's main business and the business scope does not match with BOI's conditions. No further action required.

TDEM	What is reference source of emission factor (0.319 tCO_2/MWh)?	Emission factor was calculated by taking into account of the most efficient natural gas-fired power plant in Thailand. This value was set in additional information of JCM's approved MRV methodology: TH-AM0001. This methodology and additional information are available to be downloaded at JCM's website between Thailand and Japan. No further action required.
TGO	What will the Project do with the solar panels when the life cycle is ended? And, does the Project have any disposal plan of solar panels?	Yes, TDEM has the disposal policy for solar panels after the end of lifetime. The solar panels will be collected and sent to hazardous waste disposal service company whose is certified by Department of Industrial Works (DIW) for proper treatment. No further action 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
01.0	05/10/2021	1st edition for public input