JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Lao PDR Energy Efficient Datacenter Project (LEED)

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

The proposed JCM project aims to reduce CO_2 emissions in Lao PDR by introducing energy-efficient container based data center to fulfill increasing needs for data center in the country and in the region.

The proposed project introduces the first full-fledged container based data center with the total power receiving capacity of 500kW in Lao PDR at Vientiane Capital. Compared to the conventional building type data centers, the module type data center, installed by the proposed project which was designed by Internet Initiative Japan (IIJ), achieves higher energy efficiency by utilizing indirect-outside-air-cooling system which ventilate the inside heat using the outside air. Depending on the condition of outside air, the air cooling block of the data center selects its operation mode by taking advantage of outside air throughout the year, leading to the greater energy saving. In addition, unlike traditional building type data centers entire structure needs to be built at the beginning, module type or container based data center can be expanded based on the data processing demand. Such flexibility is considered as a suitable feature for the data center to be built in developing countries.

The expected emission reduction that would be achieved by the LEED project in its first year of operation is 300 ton CO_2. The actual emission reduction may vary depending on the rate of data center utilization[1]. When the data center demand reaches to its full capacity of currently installed equipment, the emission reductions that would be achieved by the proposed project are estimated to be 695 ton annually.

A.3. Location of project, including coordinates

Country	The Lao People's Democratic Republic
Region/State/Province etc.:	Vientiane Capital
City/Town/Community etc:	[redacted]

[1] For the purpose of ex-ante estimation, the project developer forecasted the data center demand as follows: Utilization rate of the data center at the start of operation is 20% of its capacity, and then it increases linearly to 100% by the third year of operation.

Latitude, longitude	[redacted]

A.4. Name of project participants

The Lao People's Democratic Republic	Ministry of Science and Technology, Lao P.D.R
Japan	Toyota Tsusho Corporation Internet Initiative Japan Inc. Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.

A.5. Duration

Starting date of project operation	17/01/2017
Expected operational lifetime of project	5 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 (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 project promotes transfer of low-carbon technologies in Lao PDR. In addition, as a part of NEDO program, know-how transfer to the operators in Lao PDR for the optimum operation and maintenance of the container-type data-center has been planned.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	LA_AM001
Version number	Ver1.0

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 DC is newly introduced, highly efficient with designed PUE value under 1.3.	The project DC is newly introduced. The designed PUE value of the project DC is 1.28, which is under 1.3.

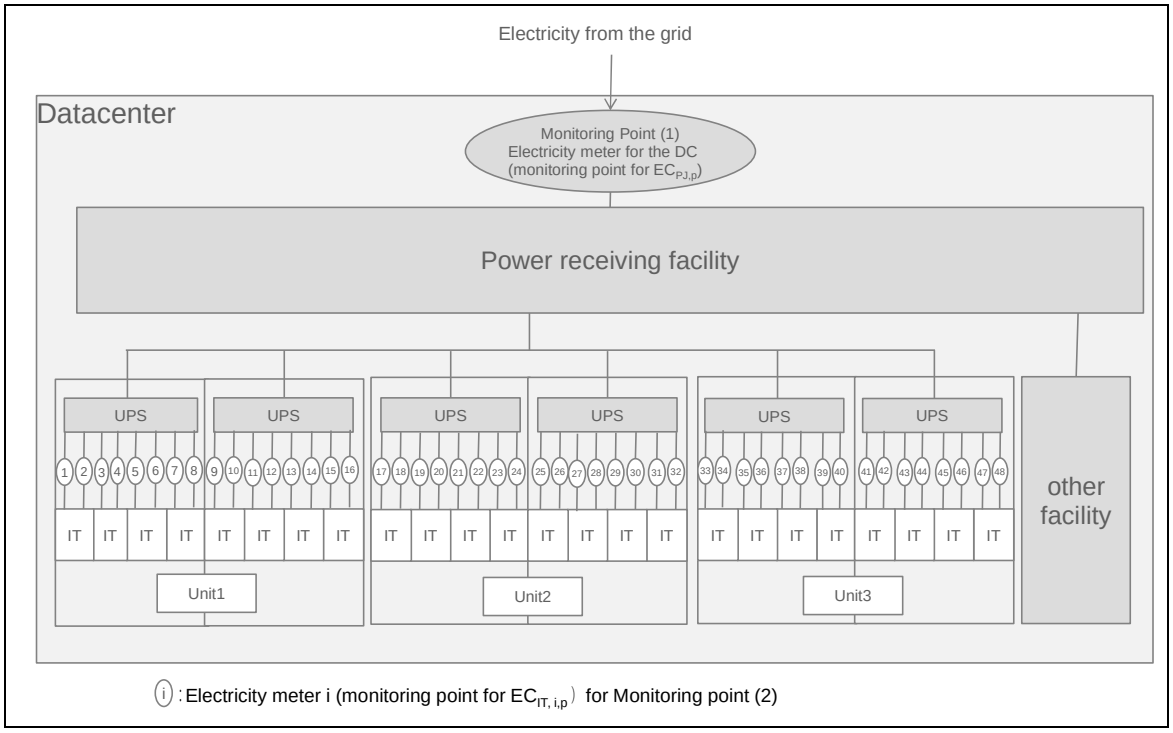
Criterion 2	The container is highly air-tight with IEC60529 value of IP-54 or higher based on manufacturer's inspection results.	The container is highly air-tight with IEC60529 value of IP-54 based on manufacturer's inspection results.
Criterion 3	The project DC installs IT equipment that has operating temperature recommended by manufacturer with upper limit of 40 degrees C or higher.	The project DC installs IT equipment that is capable of stable operation at 40 degrees C.
Criterion 4	Ozone Depletion Potential (ODP) of the refrigerant used for the project DC is zero.	The refrigerant used for the project DC is R410a, whose ODP is zero.
Criterion 5	A plan for not releasing refrigerant used for project DC is prepared.	A plan for not releasing refrigerant used for project DC is prepared. Refrigerant leakage from the project DC will be prevented by conducting periodical check in line with "Guide of simplified fluorocarbons leak check" corresponding to "Act on rational use and proper management of fluorocarbons" to prevent release of refrigerant used for project DC.

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 DC	CO_2
Project emissions	
Emission sources	GHG type
Electricity consumption by project DC	CO_2

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})
2013	-	-	-
2014	-	-	-
2015	-	-	-
2016	-	-	-
2017	833	533	300
2018	1,609	1,030	579
2019	1,931	1,236	695
2020	1,931	1,236	695
Total (tCO_{2e})	6,304	4,035	2,269

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 participant, and the project participant invited various stakeholders. Details of the local stakeholders consultation meeting is summarized as follows:

Date and Time: 18th August 2016, 10:50 – 12:05
Venue: Subnakhone Hotel (SNK Hotel)
Address: ASEAN road, Sibounheuang Village Chanthabuli District, Vientiane Capital, Lao PDR

The following organization from Lao side participated to the consultation meeting:

- Department of Disaster Management and Climate Change (DDMCC), Ministry of Natural Resource and Environment (MONRE)
- International Relation Division, Lao Women Union
- REDD Office, Department of Forestry, Ministry of Agriculture and Forestry (MAF)
- Department of Industry and Handicraft, Ministry of Industry and Commerce (MOIC)
- Institute of Public Work and Transport, Ministry of Public Works and Transport (MPWT)
- Ministry of Health
- Ministry of Education and Sport
- Renewable Energy Institute, Ministry of Science and Technology (MOST)
- Renewable Energy Promotion Institute, Ministry of Energy and Mines (MEM)
- Department of Information and Technology, Ministry of Science and Technology (MOST)
- E-Government Center, Ministry of Post and Telecommunication
- Electricite Du Laos (EDL)
- ESL Sole, Co. Ltd.

At the meeting, a brief introduction about JCM procedures was provided first. The details of the proposed JCM project and the technology introduced by the project were explained by representative of Internet Initiative Japan (IIJ) who is in charge of the technical design of the project, followed by a Q and A session. Total of twenty one attendees to the meeting from Lao side actively expressed their comments to the proposed JCM project at the consultation meeting. In general, the proposed project was received positively by the attendees to the consultation meeting. Many stakeholders showed their interest to the JCM scheme. At the meeting, no negative comments toward the proposed project were expressed by the attendees. The 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
Director of Division DDMCC, MONRE	As similar to the CDM, it is my understanding that the length of the crediting period affects the amount of emission reduction generated from the project. How long is the crediting period for the proposed project?	The maximum duration of the crediting period for a JCM project is determined by the project lifetime. The project lifetime for a JCM project is often defined as the technical lifetime of the equipment/system installed by the project. However, as a JCM demonstration project, the crediting period for the LEED project needs to be decided among relevant entities, including NEDO and project participants prior to the project registration. **No further action is necessary.**
Technical officer DDMCC, MONRE	Does the capacity of data center implemented by the proposed project cover the demand of the government and the private sector?	Based on the result of the feasibility study, the capacity of the data center installed by the proposed project covers the demand of the government and the private sector for the near future (from 5 to 10 years), provided that the demand projection of the Lao PDR used in the FS is valid. **No further action is necessary.**
Technical officer DDMCC, MONRE	Participant of the proposed JCM project from Lao PDR is a government agency. If any private sector candidate start using the data center of the proposed project, can the private sector entity claim emission reduction due to the use of the energy efficient data center? Or, can it be considered as a sub-JCM	First of all, only the project participants of the LEED project can claim emission reductions achieved by the use of the data center implemented by the LEED project. Emission reduction achieved by the use of the project data center will be counted as the reduction by this proposed JCM project, regardless of

	project?	the types of the data center users. To avoid double counting of GHG emission reduction by the project, the JCM prohibits double registration of the same project in other climate mitigation mechanism. Therefore, the private sector entity is not allowed to claim emission reduction due to the use of the energy efficient data center installed by the LEED project. **No further action is necessary.**
Technical officer DDMCC, MONRE	It is suggested that project proponents conduct a cost-benefit analysis for the private sector who may be interested in the container datacenter.	The project participants understand the importance of marketing for the private sector in Lao PDR and will study how to conduct the marketing which includes the cost benefit analysis. **No further action is necessary.**
Senior Officer DDMCC, MONRE	Who will manage the project?	The project will be managed by Japan side until the end of the JCM demonstration project, which ends in 2018. After 2018, the project will be handed to Lao PDR. **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	19/12/2016	First Edition
02.0	20/02/2017	Second Edition