JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Yangon Waste to Energy plant by introducing power generation and avoidance of landfill gas emissions through combustion of municipal solid waste (MSW)

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

The proposed JCM project aims to generate electricity by the project facility which displaces electricity from a grid or captive power generator which is generated using fossil fuels, and to avoid emissions of methane associated with disposed organic waste in a solid waste disposal site (SWDS). The key technology is to introduce an incinerator to combust the MSW and generate electricity from the heat generated from the incinerator (Waste to Energy, "WtE"). The proposed JCM project utilizes the MSW in Yangon city as resource to generate electricity and reduces the amount of landfilled waste. Yangon City Development Committee (YCDC) is the project owner. JFE Engineering Corporation (JFEE) is the engineering, procurement, and construction (EPC) contractor for this project. The 0.76 MW electricity output plant has a capacity to treat 60 tonnes of waste per day and has been designed and built using technology developed by JFEE.

A.3. Location of project, including coordinates

Country	Republic of the Union of Myanmar
Region/State/Province etc.:	Yangon Region
City/Town/Community etc:	Shwe Pyi Thar, Shwe Pyi Thar Township, Yangon City
Latitude, longitude	17°01'03.3"N 96°05'38.4"E

A.4. Name of project participants

The Republic of the Union of Myanmar	Yangon City Development Committee
Japan	JFE Engineering Corporation

A.5. Duration

Starting date of project operation	01/06/2017
Expected operational lifetime of project	15years

A.6. Contribution from Japan

The proposed project was partially supported by the Ministry of the Environment, Japan (MOEJ) through the Financing Programme 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 the technology of Yangon Waste to Energy plant which has been developed by the Japanese project participant, JFEE. The Japanese project participant transfers the operational technology through training to the Myanmar project participants, YCDC by dispatching the supervisor for a year from starting the operation.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	JCM_MM_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 newly installs an incinerator, waste heat recovery boiler, exhaust gas treatment equipment and turbine generator.	An incinerator, waste heat recovery boiler, exhaust gas treatment equipment and turbine generator are newly installed. Manufacturer:JFE Engineering Corporation Combustion Type: JFE Hyper Grate Stoker Furnace
Criterion 2	The project incinerates municipal solid waste (MSW) which has been disposed at a SWDS where the generated landfill gas is not recovered, and generates electricity from steam produced in waste heat recovery boiler.	MSW incinerated and utilized in this project has been disposed at a SWDS where the generated landfill gas is not recovered. The SWDS is owned by YCDC and located near Yangon city. Electricity is generated by turbine generator utilizing steam produced in waste heat recovery boiler whose heat source is incinerated MSW.
Criterion 3	There is a plan to operate the project facility for more than 5 years.	As for the waste treatment plan of YCDC, the project facility is contracted to operate for 15 years under the international

		consortium between YCDC and JFEE.

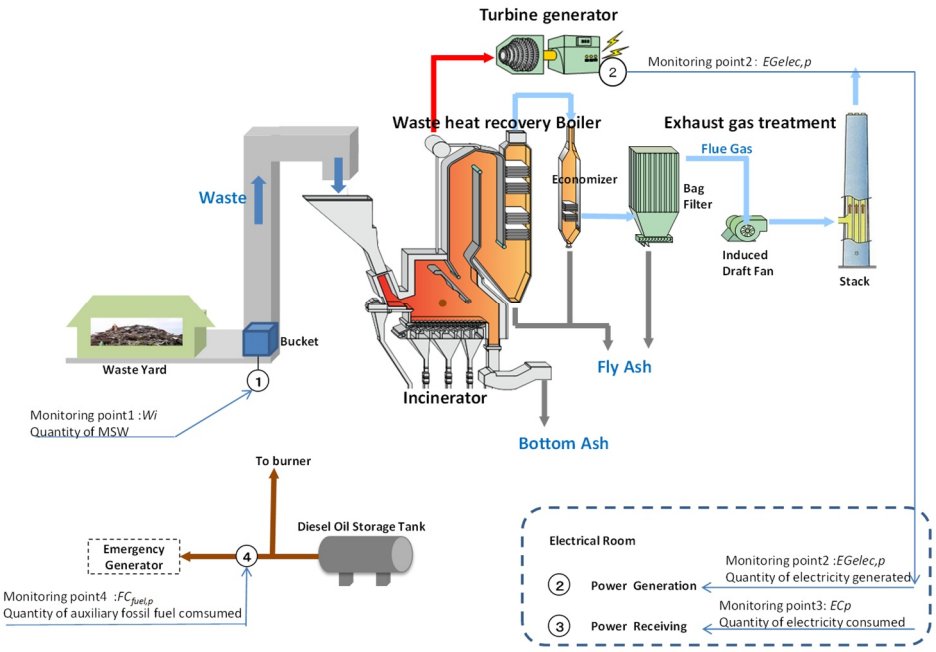
C. Calculation of emission reductions

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

Reference emissions	
Emission sources	GHG type
Decomposition of waste at a SWDS	CH_4
Electricity generation	CO_2
Project emissions	
Emission sources	GHG type
Combustion of fossil carbon contained in waste	CO_2
Incineration of waste	N_2O
Electricity use by the project facility	CO_2
Consumption of auxiliary fossil fuels needed to be added into incinerator	CO_2

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

PROCESS FLOW DIAGRAM OF WASTE TREATMENT



Monitoring points are shown as No.1, 2, 3, and 4 in this diagram.

C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO_{2e})	Estimated Project Emissions (tCO_{2e})	Estimated Emission Reductions (tCO_{2e})
2015	-	-	-
2016	-	-	-
2017	1,280.5	3,214.4	-1,933
2018	3,656.7	5,510.3	-1,853
2019	5,772.6	5,510.3	262
2020	7,343.7	5,510.3	1,833
2021	8,541.3	5,510.3	3,030
2022	9,480.5	5,510.3	3,970
2023	10,239.2	5,510.3	4,728
2024	10,869.7	5,510.3	5,359
2025	11,407.7	5,510.3	5,897
2026	11,877.5	5,510.3	6,367
2027	12,295.8	5,510.3	6,785
2028	12,674.0	5,510.3	7,163
2029	13,020.2	5,510.3	7,509
2030	13,339.9	5,510.3	7,829
Total (tCO_{2e})			56,946

D. Environmental impact assessment	
Legal requirement of environmental impact assessment for the proposed project	Yes

E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

Since the Initial Environmental Examination (IEE) was required for this proposed project under "Myanmar Environmental Impact Assessment Procedure"(EIA Procedure), Notification No. 616/2015 published by Ministry of Environmental Conservation and Forestry, local stakeholder consultation for local residents who would feel comparative impact from the project was carried out twice as a part of IEE on 13th October 2015, and 6th March 2016.

13th October 2015

[Venue]

Project site

[Agencies participated in the consultation]

A group discussion was done with 12 local authorities from Hlawkar Village. Summary of comments received and their consideration is shown on E.2.

6th March 2016

[Venue]

Project site

[Agencies participated in the consultation]

53 people from local community employees of YCDC working at the project site, representatives from the project site and representatives from Myanmar Engineering Society (MES)

[Participant organization]

No.	organization	No.	organization
1	C.C. MES	28	Hlawkar Resident
2	C.C. MES	29	Hlawkar Resident
3	C.C. MES	30	Hlawkar Resident
4	C.C. MES	31	Shwe Pyi Tar Township Cleaning Incharge
5	CES, MES	32	Shwe Pyi Tar Township Director General
6	JGS, MES	33	Shwe Pyi Thar EC
7	Hlawkar Electric Committee Chairman	34	Mingalardon Director General
8	Hlawkar Resident	35	Mingalardon Resident
9	Hlawkar Resident	36	PCCD Accountant
10	Hlawkar Resident	37	PCCD AE
11	Hlawkar Resident	38	PCCD Deputy HoD
12	Hlawkar Resident	39	PCCD. ACE
13	Hlawkar Resident	40	PCCD. ACE
14	Hlawkar Resident	41	PCCD. AS
15	Hlawkar Resident	42	PCCD. LD
16	Hlawkar Resident	43	PCCD. SAE
17	Hlawkar Resident	44	PCCD. SAE
18	Hlawkar Resident	45	PCCD. SAE
19	Hlawkar Resident	46	PCCD. Section Chief
20	Hlawkar Resident	47	PCCD. Temporary Deputy HoD

21	Hlawkar Resident	48	Yangon Northern District Chief
22	Hlawkar Resident	49	YCDC. Mingalardon Township Chairman
23	Hlawkar Resident	50	YCDC. Mingalardon Township Committee
24	Hlawkar Resident	51	JFE
25	Hlawkar Resident	52	JFE
26	Hlawkar Resident	53	JFE
27	Hlawkar Resident		

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
local authority A	It seems that job opportunity is not provided much enough for local community by the project.	Even though the number of new employees provided is not so much, local community will be prioritized for the job opportunities for the project. Further comment was not received related to this issue. No further action is needed.
local authority B	How much experience do JFE Engineering and MES have for this kind of project?	There were more than 160 plants constructed by JFE Engineering in Japan and the latest technologies will be used for this project. Further comment was not received related to this issue. No further action is needed.
local authority C	What kind of truck will be used for waste collecting truck?	Compactor Garbage Trucks will be used for waste collecting. Further comment was not received related to this issue. No further action is needed.
local authority D	Which route will be used for waste collection and transport?	The waste from Mingalardon Tsp will be transported via Mingalardon route and the waste from Shawe Pyi Thar Tsp will be transported via Hlawkar route. Waste collection and sorting will be carried out only on paved concrete floor. Current waste dump site is managed by YCDC

		and new RCV (refuse collection vehicle) are planning to provide to transport the piled up waste to Htain Pin dump site. Further comment was not received related to this issue. No further action is needed.
local authority E	The number of new employees created by the project is not so much.	Local community will be prioritized for the job opportunities even though opportunities are not so much. Further comment was not received related to this issue. No further action is needed.
local authority F	I would like to know if air pollution measuring apparatus could be provided for local village.	In operational phase, a screen displaying current emission value and limit value of five gasses will be provided at the entrance of the plant. Further comment was not received related to this issue. No further action is needed.
local authority G	How waste water from the plant will be treated and discharged?	Closed circuit system will be used for the plant, so there is no waste water discharge from the plant. Further comment was not received related to this issue. No further action is needed.

F. References

INITIAL ENVIRONMENTAL EXAMINATION REPORT FOR YANGON WASTE TO ENERGY PLANT (April 2017)
PREPARATED BY:ESIA TEAM , and MYANMAR ENGINIEERING SOCIETY

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

Annex

N/A

Revision history of PDD		
Version	Date	Contents revised
01.0	10/08/2018	First Edition
02.0	22/03/2019 16/01/2020	Second Edition Initial registration by the Joint Committee through electronic decision