JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

GHG emission reductions through utility facility operation optimization system for refineries in the Republic of Indonesia

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

The proposed project aims to achieve GHG emission reductions at an existing oil refinery in Indonesia through introduction of a utility facility operation optimization technology. The project involves introduction of a utility facility operation optimization technology to the utility facility at one of the existing refineries of PERTAMINA[1], Refinery Unit IV (hereafter referred to as RU IV), located in Cilacap, Central Java. The target utility facility at RU IV consists of 10 boilers, which supply high pressure steam to the steam turbine generators. "RENKEI Control", or the utility facility operation optimization technology by Azbil Corporation (hereafter referred to as Azbil) to be introduced by the project optimizes the operation of existing utility facilities at RU IV through application of software algorithm using linear programming method and advanced process control. A remote monitoring system to monitor the performance of the system is also installed. As a result, a great saving in fuel consumption for the utility facility is achieved. The expected annual emission reduction that would be achieved by the proposed project is 20,000 ton CO_2. The actual emission reduction may vary depending on the actual operation of the target utility facility.

A.3. Location of project, including coordinates

Country	Republic of Indonesia
Region/State/Province etc.:	Central Java
City/Town/Community etc:	Jl. Letjen Haryono MT. 77 Lomanis, Cilacap
Latitude, longitude	S 7.703388 E 109.005269

[1] A state-owned energy company in Indonesia

A.4. Name of project participants

The Republic of Indonesia	PT. PERTAMINA (PERSERO)
Japan	Azbil Corporation

A.5. Duration

Starting date of project operation	01/01/2018
Expected operational lifetime of project	5 years

A.6. Contribution from Japan

The proposed project receives 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 (hereafter referred to as NEDO), one of the largest national public research and development management organizations in Japan. The purpose of NEDO's JCM demonstration projects is to demonstrate the effectiveness of advanced clean energy and low-carbon technologies which leads to GHG emission reductions through the introduction of such technologies in the partner country, i.e. Indonesia. As a result of the financial support provided by NEDO's program, implementation cost of the proposed JCM project has been financed by Japanese government. Further, implementation of the demonstration project promotes dissemination of low-carbon technologies in Indonesia. In addition, as a part of NEDO program, know-how transfer to the operators in Indonesia for operation and maintenance of the utility facility operation optimization technology has been planned.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	ID_AM007
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 is implementation of operation optimization of boilers to generate steam, through introduction of Utility Facility Operation Optimization Technology.	One of the utility facility operation optimization technologies, "RENKEI-Control” of Azbil is implemented in this project.

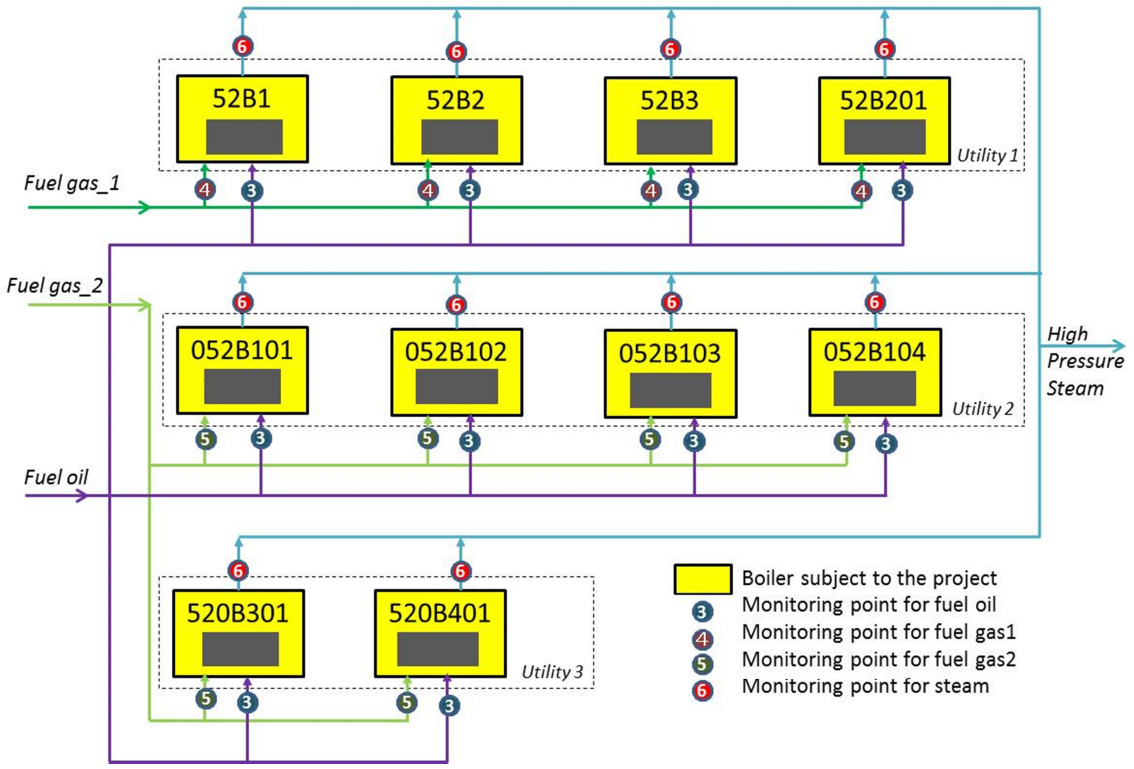
Criterion 2	The site of introduction is an existing industrial facility which includes two or more boilers to generate steam.	The target utility facility consists of 10 boilers, which supply high pressure steam to the steam turbine generators.
Criterion 3	Historical data for fuel consumption, fuel characteristics (type of fuel, net calorific value) and generation of steam is identifiable for individual boiler for at least one year, as specified in the methodology.	Distributed Control System of the target utility facility has a capability of historical data collection at least one year for each utility boiler.
Criterion 4	All steam demand is met internally and not sourced from outside the industrial facility.	The demand of high pressure steam generated by boilers is mainly for the steam turbine generators and some is for process unit consumption. All steam demand is met internally and not sourced from outside the industrial facility.

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 fuel oil and fuel gas of each boiler	CO_2
Project emissions	
Emission sources	GHG type
Consumption of fuel oil and fuel gas of each boiler	CO_2

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



All monitored data which are required for verification/issuance will be kept and archived electronically for two years after the final issuance of the credits.

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	-	-	-
2018	1,206,432.4	1,186,432.4	20,000
2019	1,206,432.4	1,186,432.4	20,000
2020	1,206,432.4	1,186,432.4	20,000
Total (tCO_{2e})	3,619,296	3,559,296	60,000

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: 18 July 2017, 9:00-12:00
Venue: Hotel Ciputra Semarang
Address: Jl. Simpang Lima, Semarang , Central Java, Indonesia

Following organization from Indonesia side were invited to the consultation meeting:

- Indonesia JCM Secretariat
- Coordinating Ministry of Economic Affairs (CMEA)
- Department of Industry and Trade (Dinperindag), Central Java Province
- Department of Energy and Mineral Resources (DESDM), Central Java Province
- Department of Environment and Forestry (DLHK), Central Java Province
- Regional Environment Management Board of Central Java Province
- Bureau of Regional Autonomy and Cooperation, PPI Secretariat of Central Java Regional Secretariat
- Department of Manpower and Industry (Disnakerin), Cilacap Regency
- Department of Environment, Cilacap Regency
- Directorate of Technical and Environment, Directorate General of Oil and Gas, Ministry of Energy and Mineral Resources (MEMR)
- Indonesia Petroleum Association (IPA)
- Society of Indonesia Petroleum Engineer
- Society of Indonesia Oil and Gas Production Facility Expert

The total of twenty six stakeholders from the invited agencies and the project developers attended the meeting. At the meeting, JCM implementation status in Indonesia was first presented by Indonesian JCM Secretariat. Then the details of the proposed JCM project and the technology to be introduced were explained by representative of Azbil who is in charge of the technical design of the project. Any queries in relation to JCM application in Indonesia was answered by Indonesian JCM Secretariat. 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, along with the responses/action to the

comments, are summarized in the following section.

For those who were invited and were unable to attend the meeting, the project participants sent presentation materials used during the meeting, requesting them to send their comments, if any. The project did not receive any comments from those who were invited and were not able to attend the local stakeholders' consultation meeting.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Department of Energy and Mineral Resources, Central Java Province	Can JCM be used to finance / assist for the development of new renewable energy power plants, such as a geothermal Power Plant? There are a few potential places for Geothermal to be developed in Central Java, but investment towards geothermal is not attractive for investors and private sectors.	There are 3 renewable energy JCM projects under development in Indonesia: 1.6MW solar power project at Jakabaring stadium at South Sumatera for Asian Games in 2018, 600 kW rooftop solar panel project at an industry in Cileungsi, West Java; 10 MW hydropower plant in North Sumatera. As such, JCM can be used to assist for development of new renewable energy project. JCM support may not be sufficient to overcome the risks associated with geothermal projects, however. Investors may be interested at the later stage after successful exploration, especially for locations in Eastern part of Indonesia, where electricity selling price is much higher. (answered by Indonesia JCM Secretariat) *No further action required.*
Department of Environment and Forestry (DLHK), Central Java Province	DLHK has been assigned to do GHG inventory for Central Java Province. PERTAMINA RU IV is requested to cooperate by submitting relevant data to the local government.	PERTAMINA will certainly cooperate to submit the required data once it receives the official request from Local Government of Central Java. *No further action required.*

Directorate of Technical and Environment, Directorate General of Oil and Gas, Ministry of Energy and Mineral Resources	How does JICA involve in JCM project?	JICA in the case of JCM in Indonesia is having cooperation with Coordinating Ministry of Economic Affairs to give assistance / funding to operate the Indonesia secretariat. (answered by Indonesia JCM Secretariat) *No further action required.*
	In the presentation by the secretariat, there have been a total of 30 projects under JCM with total investment of about USD 150 million. What are the total reductions of CO_2 from these 30 projects?	The emission reductions from each project vary. There are projects reducing only 29 tCO_2 / year or 549 tCO_2 / year. Some projects on the other hand can reduce more than 10,000 tCO_2 / year, with much higher investment costs. *No further action required.*
Pertamina RU IV	Pertamina RU IV would like to have assistance from Indonesia government during the process of validation and verification, to maintain objectivity and to avoid any potential dispute in the future	Following the JCM standard procedures, both validation and verification is conducted in a transparent manner. So it is unlikely there will be any dispute happening. Should there is any trouble; it is free to seek advice from JCM secretariat or Coordinating Ministry of Economic Affairs. (answered by Indonesia JCM Secretariat) *No further action required.*
	Does the Implementation of Azbil technology affect the scoring under the performance rate assessment program in environmental management (PROPER) for the company?	The expected effect of installation of Azbil technology towards PROPER evaluation would be positive albeit minimal. (answered by Indonesia JCM Secretariat) *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	01/09/2017	First Edition
02.0	09/02/2018	Second Edition