

JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Installation of gas engine cogeneration system to supply electricity and heat to the vehicle manufacturing factory of PT. Toyota Motor Manufacturing Indonesia

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

The proposed JCM Project aims to reduce emissions of greenhouse gas (GHG) by utilizing gas engine cogeneration system (CGS) to supply electricity and heat to facility in the vehicle manufacturing factory of PT. Toyota Motor Manufacturing Indonesia in Karawang, the Republic of Indonesia.

The project CGS consists of power generator, which is a gas engine, and boiler supplying both electricity and heat, recovering waste heat exhausted by the power generator.

The gas engine introduced in the project is manufactured by Kawasaki Heavy Industries, Ltd. and its model number is "KG-18-V".

Electricity and heat generated by the project CGS substitutes a part of grid electricity consumed and heat generated by fossil fuel before implementation of the project, which leads to improvement of total energy efficiency and in turn GHG emission reductions.

A.3. Location of project, including coordinates

Country	The Republic of Indonesia
Region/State/Province etc.:	Jawa Barat 41361
City/Town/Community etc:	Jl. Permata Raya Lot DD-1, Kawasan Industri KIIC, Karawang
Latitude, longitude	6°21'22.8"S 107°17'39.7"E

A.4. Name of project participants

The Republic of Indonesia	PT. Toyota Motor Manufacturing Indonesia
Japan	Toyota Tsusho Corporation

A.5. Duration

Starting date of project operation	01/12/2017
Expected operational lifetime of project	9 years

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.

As for technology transfer, the proposed JCM Project implemented a series of technical lectures and created opportunities for on-the-job training (OJT) of PT. Toyota Motor Manufacturing Indonesia's Indonesian technical engineers on operation and maintenance of the CGS, which require special skills unique to the system, as follows.

Date: May 10th 2017, 28th May-10th June 2017, 3rd September-14th September 2018

Participants: Technical engineers of PT. Toyota Motor Manufacturing Indonesia

Place: Karawang Plant

Lecturers and trainers: Engineers from Japanese engineering company and manufacturer

2 engineers for May 10th 2017, 2 engineers for 28th May-10th June 2017, 1 engineer for 3rd September-14th September 2018

Contents: Guidance for operation and maintenance

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	JCM_ID_AM016
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	Gas engine CGS(s) is installed and supplies electricity and heat to facility(ies).	A gas engine CGS manufactured by Kawasaki Heavy Industries, Ltd. (model number is "KG-18-V") is installed and supplies electricity and heat to the vehicle manufacturing factory of PT. Toyota Motor Manufacturing Indonesia where electricity and heat are consumed.
Criterion 2	The power generation efficiency of the CGS(s) stated in catalogs or other information prepared by its	Electrical output of the project CGS is 7.8 MW and its power generation efficiency is provided as 49.0% on a manufacturer's

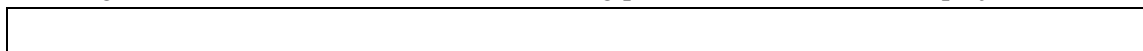
	<p>manufacturer is equal to or greater than the threshold value in the following table corresponding to the electrical output of CGS(s) installed.</p>		<p>catalog and 48.6% is ensured by the trial result report implemented by the manufacturer.</p>
	Electrical output	Efficiency threshold	
	$x < 2$ [MW]	40 [%]	
	2 [MW] $\leq x$	47 [%]	

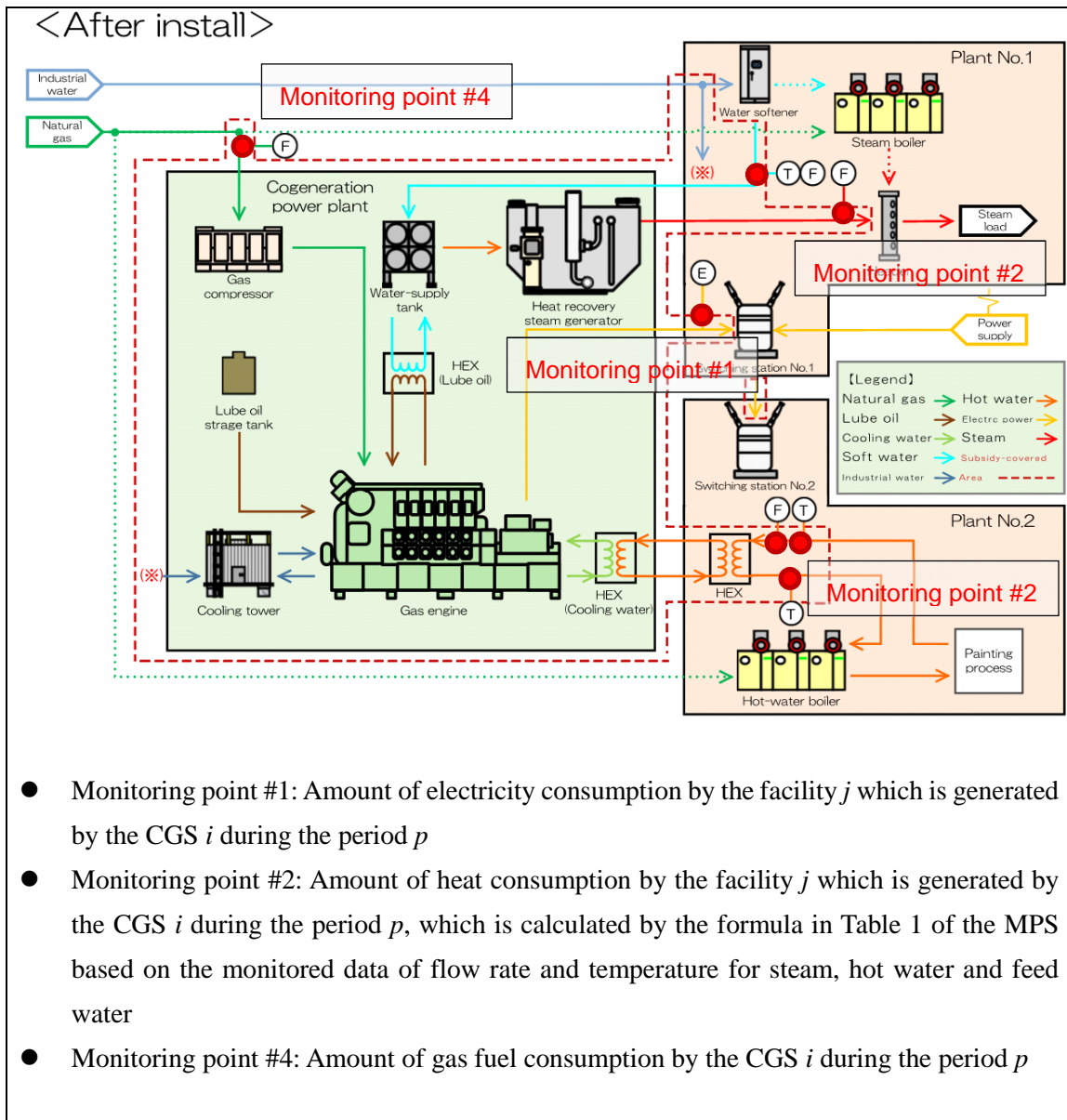
C. Calculation of emission reductions

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

Reference emissions	
Emission sources	GHG type
Electricity consumed in facility(ies)	CO ₂
Fossil fuel to generate heat in facility(ies)	CO ₂
Project emissions	
Emission sources	GHG type
Gas fuel consumption by CGS(s)	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 emissions (tCO ₂ e)	Reference	Estimated Emissions (tCO ₂ e)	Project	Estimated Reductions (tCO ₂ e)	Emission
2013		-		-		-
2014		-		-		-
2015		-		-		-
2016		-		-		-
2017		3,390.7		1,574.6		1,816
2018		40,689.2		18,895.5		21,793
2019		40,689.2		18,895.5		21,793

2020	40,689.2	18,895.5	21,793
2021	40,689.2	18,895.5	21,793
2022	40,689.2	18,895.5	21,793
2023	40,689.2	18,895.5	21,793
2024	40,689.2	18,895.5	21,793
2025	40,689.2	18,895.5	21,793
2026	37,298.4	17,320.8	19,977
2027	-	-	-
2028	-	-	-
2029	-	-	-
2030	-	-	-
Total (tCO ₂ e)			196,137

Note:

The estimated emission reductions in each year are rounded down after the decimal point.

D. Environmental impact assessment

Legal requirement of environmental impact assessment for the proposed project	No
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E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

In order to cover a diverse group of stakeholders, a local stakeholder consultation was conducted on 6/3/2018. The participants are listed in the table below.

The list of attendees to the meeting was consulted to the JCM Secretariat of Indonesia side, and the local stakeholders to be invited were fixed. The project participants sent invitation letters to notify of convening local stakeholder consultation meeting.

The schedule and participants list of the meetings are provided below.

Date: 6th March 2018
Venue: TOYOTA Lounge, Karawang plant, PT. Toyota Motor Manufacturing Indonesia
J1.Permata Raya Lot DD-1, Kawasan Industri KIIC, Karawang-41361, Jawa Barat, Indonesia
Time: 9:30-11:30
Agenda:
1. Opening remarks

2. Scheme of JCM
3. Outline of PT. Toyota Motor Manufacturing Indonesia
4. Overview of the project and technology introduced
5. Site tour
6. Questions and answers
7. Wrap up and closing

Participants:

[Local stakeholders]

No.	Organization	Position
1	Ministry of Energy and Mineral Resources	Deputy Director, Program Preparation for Energy Utilization
2	Ministry of Energy and Mineral Resources	Staff
3	Coordinating Ministry for Economic Affairs	Acting Head of Sub-Division for Development Financing Cooperation
4	PT. Astra Daihatsu Motor	Executive Coordinator, Production Engineering Division
5	PT. Sugity	Safety and Utility, Staff
6	PT. Sugity	Safety and Utility, Staff
7	Environmental Management District Board Karawang	Head of the Board
8	Karawang International Industrial City	Estate Management
9	PT. Toyota Motor Manufacturing Indonesia	Staff

[Project participants]

Project participants: [Indonesia] PT. Toyota Motor Manufacturing Indonesia, [Japan] Toyota Tsusho Corporation

A summary of the comments received and consideration of those comments are provided in Section E.2. below.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Executive Coordinator,	How was this project initiated and by who?	The project was initiated by PT. Toyota Motor Manufacturing

Production Engineering Division, PT. Astra Daihatsu Motor		Indonesia. Further action is not needed.
Estate Management, Karawang International Industrial City	How to calculate CO ₂ emission reductions by implementing this project and how to distribute the reduction credits amongst stakeholders?	CO ₂ emission reductions are calculated based on the methodology developed under the JCM initiative. Electricity and steam generated by the CGS substitutes grid electricity and fossil fuel to generate heat at the factory, which are the source of calculating CO ₂ emission reductions. Reduction credits will be shared amongst stakeholders based on their contribution to this project. Further action is not needed.
Head of the Board, Environmental Management District Board Karawang	This project applies an environmentally friendly good technology. Since Karawang agency has a voluntary standard to publish CO ₂ reduction activities, it is recommended to TMMIN to publish this project in line with the standard “Indeks Pencemaran Udara” (IPU).	No action is needed.
Deputy Director, Program Preparation for Energy Utilization, Ministry of Energy and Mineral	Since the main purpose is to generate electricity and then to utilize excess heat in boilers, total system needs to be optimized to secure energy efficiency. This project is a good activity to support the Indonesian government who has a target to reduce 29% of CO ₂ emissions in 2030. And thank you	No action is needed.

Resources	very much to PT TMMIN, this project will contribute to achieve such target.	
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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
1.0	09/10/2018	First Edition
2.0	25/02/2019	Revisions based on the findings from validation; <ul style="list-style-type: none"> ● Section A.2 ● Section C.2 ● Section F ● Annex