# JCM Project Design Document Form

## A. Project description

A.1. Title of the JCM project

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|---|
| Introduction of Gas Co-generation System and Absorption Chiller to Motor Parts Factory |

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

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| The proposed JCM project aims to reduce emissions of greenhouse gas (GHG) by introducing co-generation system (hereinafter referred to as CGS) and the absorption chiller in the motor parts factory of PT. DENSO Indonesia located in Bekasi, West Java Province.<br><br>Electricity generated by the CGS substitutes a part of grid electricity consumed in the project site. The absorption chiller utilizing heating energy generated by the CGS saves energy for cooling energy demand. Installation of the CGS and the absorption chiller leads to improvement of total energy efficiency and in turn GHG emission reductions.<br><br>The gas engine introduced in the project is manufactured by JENBACHER and its model number is “JMS612GS-N.L.”. The absorption chiller introduced in the project is manufactured by EBARA and its model number is “RFHA066”. |

A.3. Location of project, including coordinates

| | |
|---|---|
| Country | Republic of Indonesia |
| Region/State/Province etc.: | West Java Province |
| City/Town/Community etc: | Bekasi |
| Latitude, longitude | 6°19'52.8"S 107°04'25.3"E |

A.4. Name of project participants

| | |
|---|---|
| The Republic of Indonesia | PT. DENSO Indonesia |
| Japan | DENSO CORPORATION |

A.5. Duration

| | |
|---|---|
| Starting date of project operation | 01/10/2019 |
| Expected operational lifetime of project | 9 years |

A.6. Contribution from Japan

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| The proposed project was partially supported by the Ministry of the Environment, Japan |

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| (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. Furthermore, implementation of the proposed project promotes transfer of low carbon technologies in Indonesia. The proposed JCM project also provides local staff with a technical training for maintenance skill. |

## B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

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|---|---|
| Selected approved methodology No. | ID_AM023 |
| 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 | A CGS, whose electricity is generated by a gas engine(s), with absorption chiller(s) utilizing waste heat from CGS are installed and supplies electricity and heating energy and cooling energy (e.g. steam, hot water and chilled water) to recipient facility(ies). | A gas engine CGS manufactured by JENBACHER (model number is "JMS612GS-N.L.") and an absorption chiller manufactured by EBARA (model number is "RFHA066") are installed to supply electricity and heating energy and cooling energy to recipient facilities. The project absorption chiller utilizes waste heat from the project CGS. |
| Criterion 2 | Electricity and heating energy, each of which is generated in separate systems, is supplied to and consumed by recipient facility(ies) before the installation of a project CGS. | Grid electricity and heating energy generated by a boiler are supplied to and consumed by recipient facilities before installation of the project CGS. |
| Criterion 3 | In the case of replacing the existing chiller with the project chiller, a plan for prevention of releasing refrigerant used in the existing chiller to the air (e.g. re-use of the equipment) is prepared. Execution of this plan is checked at the time of | The existing chiller is NOT replaced with the project chiller. |

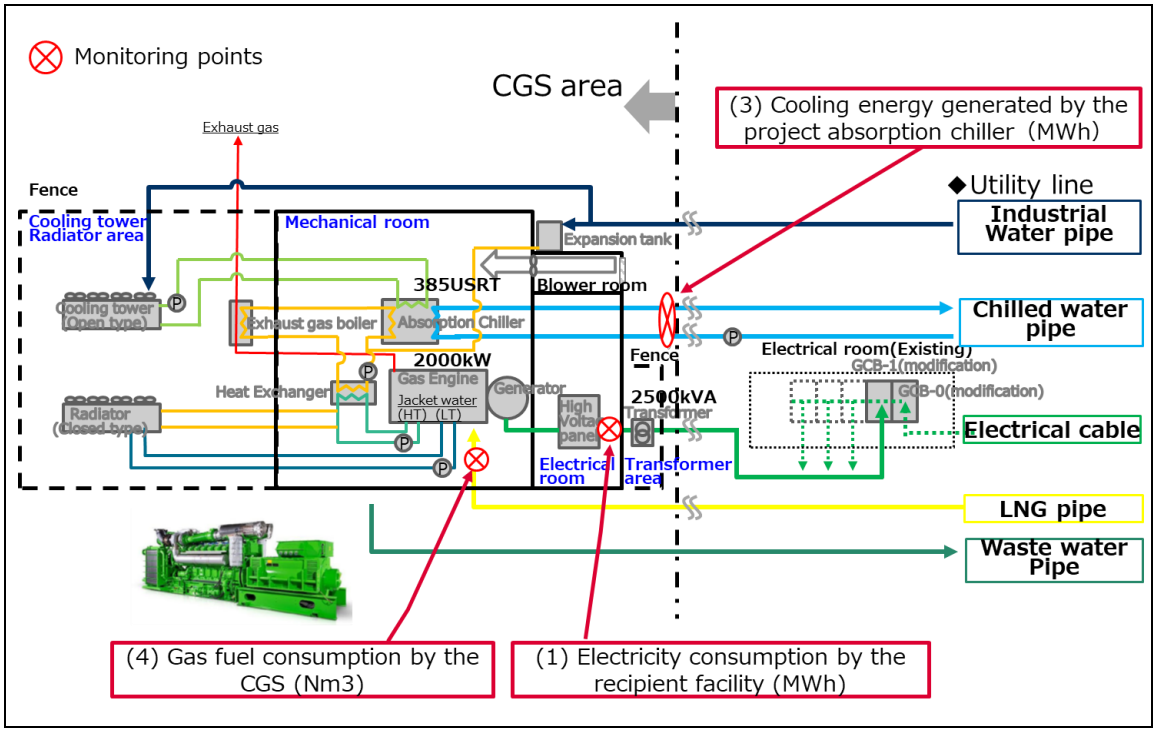
| | | |
|---|---|---|
| | verification, in order to confirm that refrigerant used for the existing one replaced by the project is prevented from being released to the air.<br>In the case that the existing chiller is NOT replaced with the project chiller, this criterion is not applied. | |

## 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 in recipient facility(ies) | $CO_2$ |
| Fossil fuel consumption for production of heating energy consumed in recipient facility(ies) | $CO_2$ |
| Electricity consumption by reference chiller | $CO_2$ |
| Project emissions | |
| Emission sources | GHG type |
| Gas fuel consumption by CGS | $CO_2$ |
| Electricity consumption by project chiller | $CO_2$ |
| Gas fuel consumption by project chiller | $CO_2$ |

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 | - | - | - |
| 2018 | - | - | - |
| 2019 | 2,331.74 | 1,319.24 | 1,012 |
| 2020 | 9,326.94 | 5,276.96 | 4,049 |
| 2021 | 9,326.94 | 5,276.96 | 4,049 |
| 2022 | 9,326.94 | 5,276.96 | 4,049 |
| 2023 | 9,326.94 | 5,276.96 | 4,049 |
| 2024 | 9,326.94 | 5,276.96 | 4,049 |
| 2025 | 9,326.94 | 5,276.96 | 4,049 |
| 2026 | 9,326.94 | 5,276.96 | 4,049 |
| 2027 | 9,326.94 | 5,276.96 | 4,049 |
| 2028 | 6,995.21 | 3,957.72 | 3,037 |

| | | | |
|---|---|---|---|
| 2029 | | | - |
| 2030 | | | - |
| Total ($tCO_2e$) | | | 36,441 |

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

| **D. Environmental impact assessment** | |
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| Legal requirement of environmental impact assessment for the proposed project | No |

## E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

Local stakeholder consultation has been conducted online, on 13th October 2020.
The list of attendees to the meeting has been determined through the consultation with the JC secretariat of Indonesian side.
The overview and participants of the meeting are as follows.

Date: 13th October 2020
Place: web conference

Agenda
1. Opening remarks
2. Outline of PT. DENSO Indonesia
3. Summary of the project and technology introduced (including the video that shows the equipment installed for this project)
4. Questions and answers
5. Closing

Participants:
[Local stakeholders]

| No. | Organization | Position |
|---|---|---|
| 1 | JCM Secretariat | Head of Secretariat |
| 2 | JCM Secretariat | Secretariat |
| 3 | JCM Secretariat | Secretariat |

| | | |
|---|---|---|
| 4 | P.T. Yutaka Manufacturing Indonesia | Energy Auditor |
| 5 | P.T. Yutaka Manufacturing Indonesia | Energy Auditor |

[Project participants]
PT. DENSO Indonesia

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

E.2. Summary of comments received and their consideration

| Stakeholders | Comments received | Consideration of comments received |
|---|---|---|
| Head of Secretariat, JCM Secretariat | 1. Currently do you have additional manpower for operation of CGS?<br>2. Do you conduct special training for CGS operator?<br>3. If training for CGS operator has already been conducted, how and how long has it been conducted? And who was the trainer?<br>4. Have you explained this activity to Astra group? | 1. We have already 3 dedicated manpower to fully operate CGS.<br>2. We have already trained them as gas engine generator operators.<br>3. Training was conducted at Certification Foundation - "Balai Sertifikasi" in Bandung, West Java.<br>4. We have already jointed with Astra Green Energy Award, and held the Co-Generation system explanation at 2019, and got the 1st winner. |
| Energy Auditor, Yutaka Manufacturing Indonesia | 1. What is the working mechanism of ABS Chiller?<br>2. How hot is the water for Chiller input? | 1. ABS chiller uses chemical liquid Lithium bromate (this working principal looks like that of refrigerant gas). The system works when pressure decreases and automatically the temperature also goes down and the liquid turns to gas. The function of hot water is to turn back the low temperature gas to liquid.<br>2. The temperature of the input hot water is between 80-90°C |

| F. References |
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| N/A |

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

| Annex |
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| N/A |

| Revision history of PDD | | |
|---|---|---|
| Version | Date | Contents revised |
| 1.0 | 04/02/2021 | First Edition |
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