JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Supplies electricity and chilled water produced by Combined Heat and Power

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

Combined Heat and Power (CHP) System which consists of an 1,000 kW class gas engine and an absorption chiller will be installed in Hotel A, located in Surabaya, East Java Province. A part of electricity supplied by grid and electricity consumption by chillers are displaced with electricity and chilled water produced by CHP. High overall efficiency of CHP enables the reduction of both CO2 emission and utility cost.

A.3. Location of project, including coordinates

Country	Republic of Indonesia
Region/State/Province etc.:	East Java province
City/Town/Community etc:	Surabaya
Latitude, longitude	7°S, 112°E

A.4. Name of project participants

The Republic of Indonesia	Hotel A
Japan	Fuji Electric Co., Ltd.

A.5. Duration

Starting date of project operation	01/05/2016
Expected operational lifetime of project	5 years

A.6. Contribution from developed countries

The proposed project was financially supported by the Ministry of the Environment, Japan through the financing programme for JCM model projects which seeks to acquire JCM credits. As for technology transfer, Fuji Electric Co., Ltd. is going to provide the following supports to A Hotel: ・ Direct instruction on proper operation, and capacity building

・ Training and capacity building on operation and monitoring of CHP system

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	ID_AMxxx
Version number	1.0
Selected approved methodology No.	ID_AM002
Version number	1.0

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	CHP consists of gas engine generator fueled by natural gas and absorption chiller which uses waste heat from generator. CHP generates both electricity and heat which displaces grid electricity imported from the grid.	CHP consists of gas engine generator fueled by natural gas and absorption chiller which uses waste heat from generator. CHP generates both electricity and heat which displaces grid electricity import from the grid.
Criterion 2	A cooling capacity of project absorption chiller per unit is less than 1,200 USRt. (1 USRt = 3.52 kW), and total cooling capacity of absorption chiller does not exceed that of existing centrifugal chiller.	A cooling capacity of project absorption chiller per unit is 275USRt.
Criterion 3	Chilled water produced by absorption chiller displaces water produced by existing centrifugal chillers.	Chilled water produced by absorption chiller displaces water produced by existing centrifugal chillers.
Criterion 4	Electricity generated by gas engine generator is not sold to the grid and used only for self-consumption.	Electricity generated by gas engine generator is not sold to the grid and used only for self-consumption.
Criterion 5	COP of project absorption chiller calculated under the standard temperature conditions is not less than 0.7. $COP_{absorp,tc,i}$ is derived	COP of project absorption chiller is 0.71, which is calculated under the standard temperature conditions.

	from the recalculation of COP of project absorption chiller i ($COP_{absorp,spec,i}$) by adjusting temperature conditions from the project specific condition to the standardizing conditions. $COP_{absorp,spec,i}$ is given from the specifications prepared for the quotation or factory acceptance test data at the time of shipment by manufacturer. [Equation to calculate $COP_{absorp,tc,i}$] $COP_{absorp,tc,i} = COP_{absorp,spec,i} * [(T_{cooling\ out,i} - T_{chilled\ out,i} + TD_{chilled} + TD_{cooling}) / (37 - 7 + TD_{chilled} + TD_{cooling})]$	
Criterion 6	Electricity generation efficiency of gas engine generator is not less than 40% (LHV basis) in specifications prepared for the quotation or test data at the time of shipment by manufacturer.	Electricity generation efficiency of gas engine is 43.6%.
Criterion 7	In the case of replacing the existing chiller with the project chiller, the plan for not releasing refrigerant used for the existing centrifugal chiller is prepared.	The existing centrifugal chiller is not replaced and used altogether with project chiller.

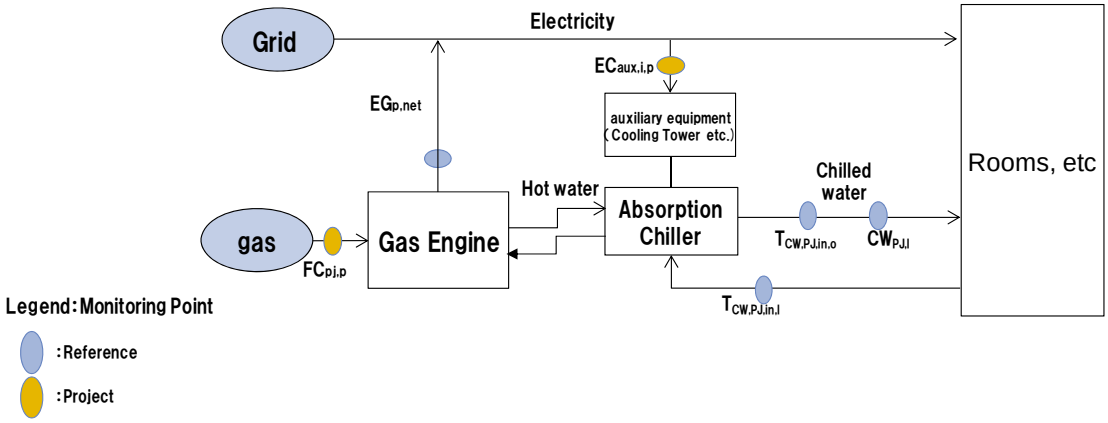
C. Calculation of emission reductions

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

Reference emissions	
Emission sources	GHG type
Grid electricity consumption displaced by gas engine generator	CO_2
Grid electricity consumption by centrifugal chiller calculated from the amount of chilled water produced by absorption chiller	CO_2

Project emissions	
Emission sources	GHG type
Natural gas consumption by gas engine generator	CO_2
Electricity consumption by auxiliary equipment of absorption chiller	CO_2

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



The monitoring of NCV is not included in this figure.

C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO_{2e})	Estimated Project Emissions (tCO_{2e})	Estimated Emission Reductions (tCO_{2e})
2016	5,531	3,664	1,867
2017	8,296	5,496	2,800
2018	8,296	5,496	2,800
2019	8,296	5,496	2,800
2020	8,296	5,496	2,800
Total (tCO_{2e})	38,715	25,648	13,067

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

it is concerned about the recent electricity price increase. (25% increase since 2013) We are seriously concerned about how to reduce the increasing energy cost to maintain the Hotel.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Director of engineering	We are seriously concerned about how to reduce the increasing energy cost to maintain the Hotel. Applying highly energy efficient Combined Heat & Power System under JCM Program is a good solution, for reducing energy cost, providing power security, as well as reducing CO2 emission, which is a good promotion for the Hotel in contributing to the Environment.	The Hotel shows a sound management system and record, with a good standing in credit limit screening. However, it is concerned about the recent electricity price increase. (25% increase since 2013)

F. References

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

Annex

Revision history of PDD		
Version	Date	Contents revised
1.0	#/#/2015	First edition