

JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Installation of Tribrid System to mobile communication's Base Transceiver Stations in Republic of Indonesia

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

The proposed JCM project aims to reduce CO₂ emissions from electricity and fossil fuel consumption by introducing Tribrid System at mobile communication's Base Transceiver Stations (BTS) in Republic of Indonesia. Tribrid System is defined as a combined system of solar PV, batteries, and electric power control system. Tribrid System controls charge-discharge of battery, and also improves the operational efficiency of diesel generators with its electric power control system.

The proposed JCM project plans to install Tribrid Systems to a total of 20 BTSs owned by PT. XL Axiata located in Java island, Sumatra island, Riau islands, and Kalimantan island (locations of BTS are indicated in section A.3).

The project is expected to reduce a total of 363 tCO₂ annually.

A.3. Location of project, including coordinates

Country	Republic of Indonesia		
Region/State/Province etc.:	Java island, Sumatra island, Riau islands, and Kalimantan island		
City/Town/Community etc.:	Site No.	Site Name	Province
	1	Pulau Putri	Jakarta
	2	Pulau Pantara	Jakarta
	3	Gunung Kramaian	South Kalimantan
	4	Perdau	East Kalimantan
	5	Matamanis	East Kalimantan
	6	Sei Mayang	East Kalimantan
	7	Muara Lesan	East Kalimantan
	8	Kota Bangun Empat	East Kalimantan
	9	Gunung Kuku	East Kalimantan
	10	Pulau Galang Baru	Batam Island
	11	Pantai Pasir Panjang	Batam Island
	12	Galang Baru Tengah	Batam Island
	13	Sungsang	South Sumatera
	14	Karanganyar2	South Sumatera
	15	Bukit Barapung	Central Sumatera
	16	HUT Tanah Merah	Central Sumatera
17	Tirta Agung Mangsang	Central Sumatera	

	18	Gunung Sari Kampar	Central Sumatera
	19	Kulim2	Central Sumatera
	20	Sukamakmur Kampar Kiri	Central Sumatera
Latitude, longitude	The exact location (latitude, longitude) of the BTS cannot be disclosed in order to ensure the security of telecommunication.		

A.4. Name of project participants

The Republic of Indonesia	PT XL Axiata Tbk.
Japan	KDDI Corporation

A.5. Duration

Starting date of project operation	Site No.	Starting Date
	1	01/01/2018
	2	01/01/2018
	3	31/01/2018
	4	01/01/2018
	5	01/01/2018
	6	31/01/2018
	7	31/01/2018
	8	31/01/2018
	9	01/01/2018
	10	01/01/2018
	11	31/01/2018
	12	31/01/2018
	13	01/01/2018
	14	01/01/2018
	15	01/01/2018
	16	01/01/2018
	17	01/01/2018
	18	31/01/2018
	19	31/01/2018
20	31/01/2018	
Expected operational lifetime of project	10 years	

A.6. Contribution from Japan

The proposed project receives financial 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 (NEDO). As a result of the financial support provided by NEDO's program, implementation cost of the proposed project has been partially financed by Japanese government. Furthermore, implementation of the proposed project promotes technology transfer of low carbon technologies in Indonesia. Through the NEDO program, operation of Tribrid System will be monitored during the project operation. During the

construction, installation, and operation, KDDI will provide technical knowhow to the local operators in Indonesia.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	ID_AM014
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 installs Tribrid system(s) to new and/or existing BTS.	The Tribrid system(s) are installed in 20 existing BTSs.
Criterion 2	The project BTS is located at the telecom tower sites equipped with diesel generator.	All 20 BTSs covered by the project are located at telecom tower sites equipped with diesel generator.
Criterion 3	The PV modules have obtained a certification of design qualifications (IEC 61215, IEC 61646, or IEC 62108), and safety qualification (IEC 61730-1, and IEC 61730-2) at the time of validation based on the latest version of international or national standard.	The PV modules installed in the project have been certified for IEC 61215, IEC 61730.
Criterion 4	The battery installed by the project is Li-ion battery.	All batteries installed at all 20 sites by the project are Li-ion batteries.
Criterion 5	In the case of replacing existing Lead-Acid battery with the project Li-ion battery, lead contained in existing Lead-Acid battery is not released to the environment.	Lead-Acid batteries will be replaced with Li-ion batteries by the project. After removal, Lead-Acid batteries are either reused at other BTS sites or stored in warehouse. Therefore no lead contained in Lead-Acid battery will be released to the environment.

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
Emissions from grid electricity and/or captive electricity	CO ₂
Project emissions	
Emission sources	GHG type

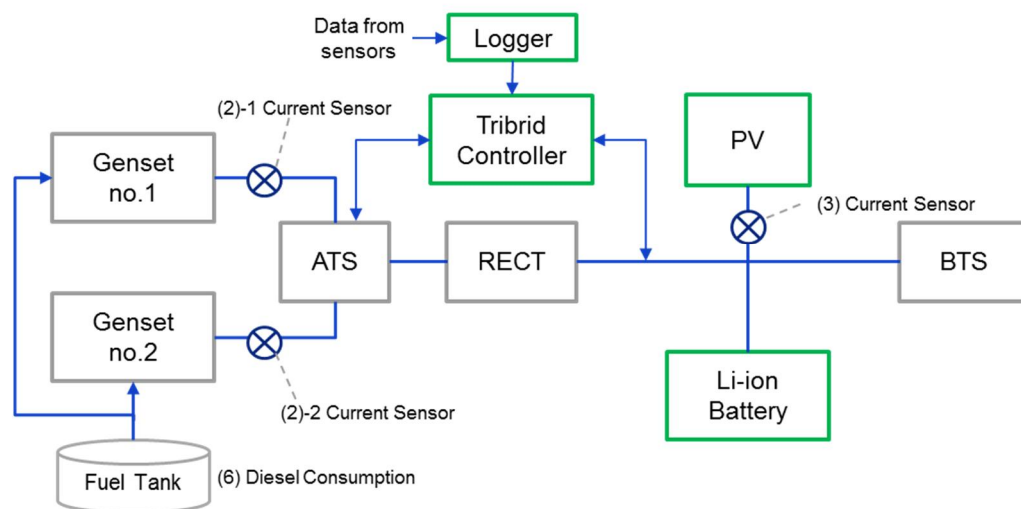
Emissions from grid electricity and/or captive electricity

CO₂

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

【Off Grid Sites (Site No. 1-13, 15-17)】

The monitoring points are shown below. The current sensors are installed to measure electricity generated by the project diesel generators no.1, and no.2 ((2)-1, and (2)-2), and electricity generated by the project solar PV system (3). In addition, diesel consumption (6) is monitored by recording the quantity of the filled fuel which is refilled to fill up the tank.

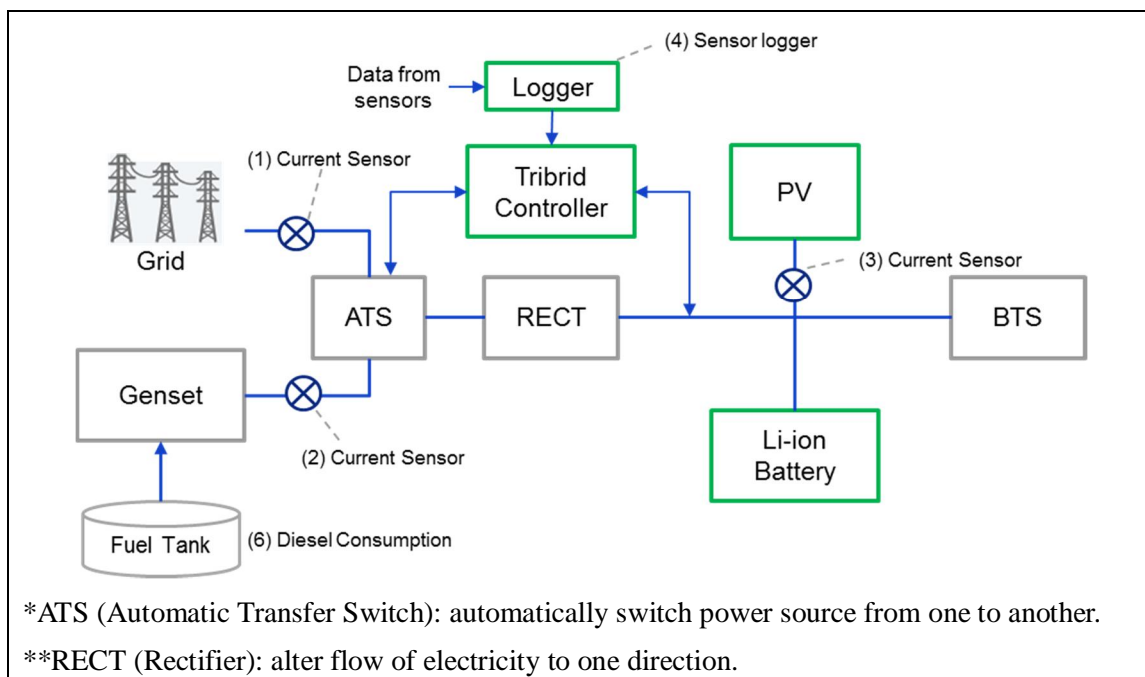


*ATS (Automatic Transfer Switch): automatically switch power source from one to another.

**RECT (Rectifier): alter flow of electricity to one direction.

【Poor Grid Sites (Site No. 14,18-20)】

For poor grid sites, the current sensors are installed to measure electricity supplied from the grid (1), electricity generated by the project diesel generator (2), and electricity generated by the project solar PV system (3). Hours for which electricity is available from grid is measured by sensor logger (4). In addition, diesel consumption (6) is monitored by recording the quantity of the filled fuel which is refilled to fill up the tank.



C.3. Estimated emissions reductions in each year

Year	Estimated emissions (tCO _{2e})	Reference	Estimated Emissions (tCO _{2e})	Project	Estimated Emission Reductions (tCO _{2e})
2018		775.1		422.9	352
2019		803.4		440.4	363
2020		805.4		441.6	363
Total (tCO _{2e})		2,383.9		1,304.9	1,078

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

Since the project activity is limited to installation of Tribrid systems in existing BTSs owned by PT. XL Axiata Tbk with a limited level of potential social and environmental impact, the direct stakeholders are identified to be staff member of PT. XL Axiata Tbk, and PT. Huawei Service who is subcontractor of PT. XL Axiata Tbk for operation and maintenance of BTSs at telecom tower sites. As a JCM project, officers of Ministry of Industry, officers of Coordinating Ministry for Economic Affairs, and JCM secretariat of Indonesian side also joined the meeting as indirect

stakeholders.

Notices were sent to stakeholders a week before the meeting. To complement the process, the project participants also sent out emails with official invitations the same day.

Outline of the meeting is as below:

Date: 6th November 2017

Time: 13:00 – 15:00

Venue: Meeting room of the office of PT. XL Axiata Tbk.

Total 22 participants from the following organization:

No.	Organization	No. of participants
1.	KDDI Corporation	2
2.	KDDI Indonesia	2
3.	PT. XL Axiata Tbk.	6
4.	PT. Huawei Service	3
5.	Ministry of Industry	4
6.	Coordinating Ministry for Economic Affairs	2
7.	JCM Secretariat Indonesian side	2
8.	Ernst & Young ShinNihon LLC	1

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Pt. Huawei Service	Currently, monitoring is conducted on-site at Pulau Putri project site. Will this be replaced to on-line monitoring in the future?	At Pulau Putri, the monitoring is conducted off-line but the on-line monitoring is under preparation. On-line monitoring will be prepared for all project sites.
Pt. Huawei Service	What measures will be implemented to prevent theft. It will be difficult to find some spare parts, such as Li-ion battery, in Indonesia when they are stolen.	Anti-theft belts will be applied to protect from theft, and spare parts will be stored at the warehouse of constructor under contract.
Pt. Huawei Service	Does installed equipment have warranty?	Yes, the installed equipment has warranty.
Ministry of Industry	Where will be the project site locations and how many project sites	A total 20 project sites in Java island, Sumatra island, Riau islands, and

	are planned?	Kalimantan island are planned.
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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	29/01/2018	First Edition
2.0	22/02/2018	Second Edition