JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Rehabilitation Project of Power Generation System at Karai 7 Mini Hydro Power Plant

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

The JCM proposed project aims to reduce GHG emissions by rehabilitating a run-of-river type hydropower generation system, the Karai 7 Hydro Power Project in North Sumatra, Indonesia. By introducing the latest turbine technology of Voith Hydro including High Velocity Oxygen Fuel (HVOF) coating to increase wear resistance and replacement of generators, the maximum output and annual power generation are expected to increase. Through the rehabilitation project, the capacity of the Karai 7 Hydro Power Project increased from 7.08 MW (3.54MW x 2 systems) to 8.5MW (4.25MW x 2 systems). The hydropower project is connected to the national/regional grid, thus the increased amount of electricity by the rehabilitation contributes to reducing the power shortage and increasing green energy with renewable energy in the region. This project is owned and operated by PT Global Karai Energi.

A.3. Location of project, including coordinates

Country	The Republic of Indonesia
Region/State/Province etc.:	North Sumatra
City/Town/Community etc:	Simanambun, Pasir Melayu, Silau Kahean, Simalungun regency
Latitude, longitude	N 3°06'07.1" and E 98°48'30"

A.4. Name of project participants

The Republic of Indonesia	PT Global Karai Energi
Japan	Voith Fuji Hydro K.K.

A.5. Duration

Starting date of project operation	01/01/2023
Expected operational lifetime of project	22years

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. Instructions and on-site training for the operation and maintenance (O&M) for the operator team and the maintenance team were held at the power station on 24 January 2023.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	ID_AM021
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 increases the power generation capacity of an existing run-of-river hydro power generation system(s) by rehabilitation.	This project rehabilitated a 7.08 MW (3.54MW x 2 systems) Hydropower project (a run-of-river type system) in North Sumatra, and increased the capacity to 8.5MW (4.25MW x 2 systems).

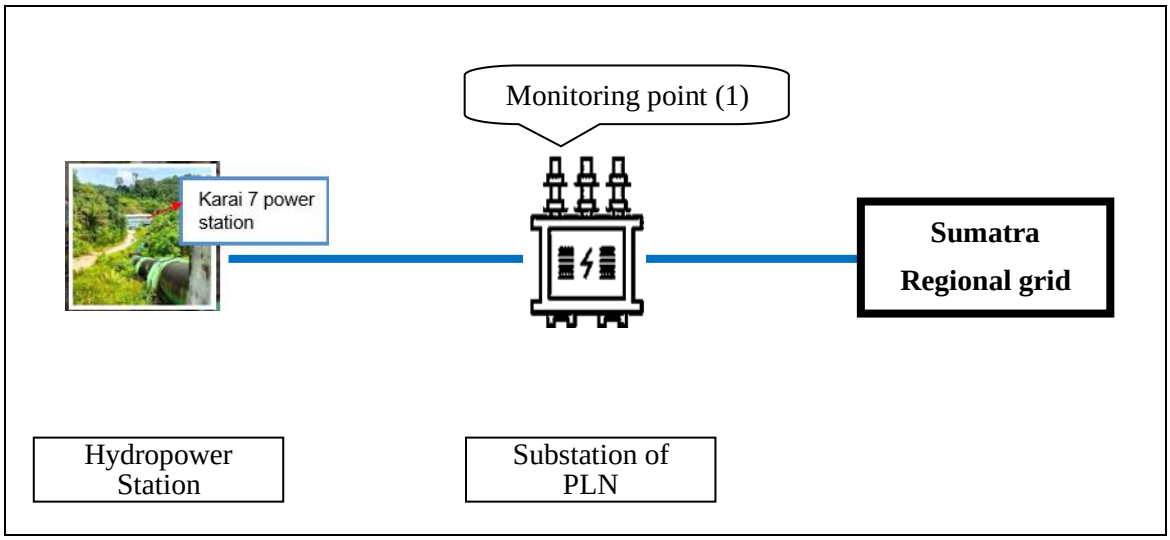
C. Calculation of emission reductions

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

Reference emissions	
Emission sources	GHG type
Consumption of grid electricity including national/regional and isolated grids and/or captive electricity	CO_2
Project emissions	
Emission sources	GHG type
Generation of electricity from the hydro power generation system(s)	N/A

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

The electricity generated by the hydropower station is provided to the Sumatra regional grid through a substation of PLN. And electricity meters are installed at the substation.



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			
2020			
2021			
2022			
2023	3,849	0	3,849
2024	3,849	0	3,849
2025	3,849	0	3,849
2026	3,849	0	3,849
2027	3,849	0	3,849
2028	3,849	0	3,849
2029	3,849	0	3,849
2030	3,849	0	3,849
Total (tCO_2e)			30,792

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	Yes. We found that we had received an evaluation result and approval for The Environmental Management and Monitoring Measures (UKL-UPL) from the Indonesian government (GOVERNMENT KABUPATEN SIMALUNGUN ENVIRONMENT DEPARTMENT) in March 2021.

E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

Local stakeholder consultation has been conducted online, on 4th October 2023.
The list of attendees to the meeting has been determined through the consultation with the Indonesia JCM secretariat.
The overview and participants of the meeting are as follows:

Date and Time: 4th October 2023, 9:00-10:00 (Indonesian Western Standard Time)
Place: Web conference
Agenda:
1. Opening Remarks
2. Introduction of the project
3. Overview of the JCM
4. Question and answer session

Participants:
[Local stakeholders]
1. Indonesia JCM Secretariat / Coordinating Ministry for Economic Affairs of Indonesia
2. Ministry of Energy and Mineral Resources (MEMR)

[Project participants]
1. Voith Fuji Hydro K.K.
2. PT Global Karai Energi (GKE)
3. (Consultant) NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.

Satisfactory response to the comment received during the consultation meeting was provided at the time of the meeting. There is no further action required as for the consideration of comment received. 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
Indonesia JCM Secretariat	The assumed amount of CO_2 reduction is 1855 tons/year. This is different from the value introduced before.	Before, the project participants didn't use the JCM methodology. Upon registration of the project, PP applied the JCM methodology and assumed the amount of CO_2 reduction by the project. (No further action is needed)
Indonesia JCM Secretariat	What is the increasing amount of efficiency or capacity of this project?	Before the project, the capacity factor was 75% of the defined value by the PPA (Power Purchase Agreement), and we almost achieved 100% of the capacity factor in the PPA after the project. (No further action is needed)
Indonesia JCM Secretariat	In the case of the PPA with PLN, the project owner is required to provide the carbon credits to PLN. What is the requirement/ regulation for this project?	That requirement is applied to the projects after 2018. There are no articles about providing carbon credits to PLN in our PPA. After the LSC, PT Global Karai Energi checked the PPA and confirmed that there were no requirements to provide carbon credits to PLN. (No further action is needed)

Indonesia JCM Secretariat	What is your further plan to utilize the JCM scheme?	It seems that the project participants can develop another hydropower station downstream of this project. The capacity might be smaller than this project. And the project participants have another plan to develop a hydropower plant in Sulawesi. (No further action is needed)
Indonesia JCM Secretariat	As an IPP (Independent Power Producer), are there any expectations for JCM and carbon credit?	The concept of JCM and carbon credit is not shared with IPPs. And requirement of carbon credits from PLN should be checked carefully. (No further action is needed)
Ministry of Energy and Mineral Resources	PPA with PLN is for 20 years, and are there any articles in the existing PPA that claim carbon credit?	The PPA that was issued after 2018 requires carbon credit to PLN. Our PPA was issued in 2010 and does not include requirements for providing carbon credits. (No further action is needed)
Ministry of Energy and Mineral Resources	The period of PPA is 20 years, and the period of the JCM project is 22 years. What is the reason for this?	After 20 years, there will be a possibility of extension of the PPA with PLN. The period of the JCM project is based upon a standard in Japan for the hydropower project, so this machinery should be maintained for 22 years. As same as response to the third question, after the LSC, PT Global Karai Energi checked the PPA and confirmed that there were no requirements to provide carbon credits to PLN. (No further action is needed)

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	23/07/2024 18/12/2024	First draft Initial registration at JC10