JCM Proposed Methodology Form

Cover sheet of the Proposed Methodology Form	

Form for submitting the proposed methodology

Host Country	Indonesia
Name of the methodology proponents submitting this form	JAPAN NUS CO., LTD.
Sectoral scope(s) to which the Proposed Methodology applies	1. Energy Industries
Title of the proposed methodology, and version number	Run-of-(the)-river Type Hydro Power Generation Connected to the Power Grid Ver. 01
List of documents to be attached to this form (please check):	☐The attached draft JCM-PDD: ☐Additional information
Date of completion	

History of the proposed methodology

Version	Date	Contents revised
00.0		

A. Title of the methodology

Run-of-(the)-river Type Hydro Power Generation Connected to the Power Grid

B. Terms and definitions

Terms	Definitions
Run-of-(the)-river hydropower Generation	"Run-of-(the)-river hydropower generation" is a type of hydropower generation which has no or little storage reservoir and limit the impacts on the original flow of the river and the surrounding environments.
CFD Analysis	"CFD" means Computational Fluid Dynamics. CFD is used to optimize the design of hydro turbine in order to generate electricity as much as possible, to decrease troubles, and to extend the lifetime.

C. Summary of the methodology

Items	Summary
GHG emission reduction measures	Run-of-river hydropower plant constructed by the project is connected to the grid. The electricity generated by the project replaces grid electricity and result in the GHG emission reductions of the grid.
Calculation of reference emissions	Reference emissions are calculated based on the net electricity supplied to the grid of the electricity generated by the project and CO2 emission factor of an Indonesian regional grid to which the hydropower plant by the project connects in a year.
Calculation of project emissions	Project emissions are not considered because a run-of-river hydropower plant does not use any fossil fuel.
Monitoring parameters	The quantity of the electricity supplied to the grid by the project is monitored.

D. Eligibility criteria

This methodology is applicable to projects that satisfy all of the following criteria.

Criterion 1	The project must adopt a run-of-river hydropower generation system. In addition, this methodology should be applied to the newly developed project.
Criterion 2	The project must supply electricity to a national grid or a regional grid, or to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.
Criterion 3	A hydro turbine used by the project must be optimized through the CFD analysis.

E. Emission Sources and GHG types

Reference emissions	
Emission sources	GHG types
Grid electricity generation	CO2
Project emissions	
Emission sources	GHG types
N/A	N/A

F. Establishment and calculation of reference emissions

F.1. Establishment of reference emissions

Reference emissions are calculated on the basis of the net electricity generated by the project which is supplied to the grid and the CO2 emission factor of the grid.

The quantity of electricity supplied to the grid by the project is directly monitored by an electrical power meter. It is also cross-checked by a receipt slip or invoice from the company which control the grid.

The CO2 emission factor of the grid should be referred to the latest version of the CO2 emission factor of the regional electricity interconnection ,which is connected by the project in Indonesia, published by National Committee on Clean Development Mechanism Indonesian DNA for CDM. If the emission factor above is not used, it should be instructed by the Indonesia JCM committee.

As for the CO2 emission factor of the grid in Indonesia, two types of value, “Ex-ante” and “Ex-post”, are published by Indonesia government. In this methodology, one of those values which is smaller than the other should be adopted to calculate the reference emissions conservatively.

F.2. Calculation of reference emissions

Reference emissions is calculated based on the following formula:

$$RE_y = EG_y * EF_{grid}$$

Where,

REy =	Reference emissions in year y	(tCO2/year)
EGy =	The quantity of net electricity generated by the project which is supplied to the grid in year y	(MWh/year)
EFgrid =	CO2 emission factor for the regional grid in Indonesia which is connected by the project	(tCO2/MWh)

G. Calculation of project emissions

Project emissions are not assumed in this MRV methodology, because it is applied only to a run-of-river type hydropower project and such a hydropower plant does not use any fossil fuels in its operation.
Therefore, the project emissions, PEy, should be defined as zero as follows:

PEy = 0

H. Calculation of emissions reductions

Emission reductions in year y are calculated by subtracting the project emissions from the reference emissions, based on the following formula:

ERy = REy – PEy

Where, ERy = Emission reductions in year y (tCO2/year)

I. Data and parameters fixed *ex ante*

The source of each data and parameter fixed *ex ante* is listed as below.

Parameter	Description of data	Source