

### Joint Crediting Mechanism Proposed Methodology Form

#### Cover sheet of the Proposed Methodology Form

Form for submitting the proposed methodology

Host Country	Kingdom of Cambodia
Name of the methodology proponents submitting this form	Metawater Co., Ltd.
Sectoral scope(s) to which the Proposed Methodology applies	2. Energy distribution
Title of the proposed methodology, and version number	Reduction of Electricity Transmission Loss between Water Treatment Plants and Water Intake Plants_ver01.0
List of documents to be attached to this form (please check):	<input checked="" type="checkbox"/> The attached draft JCM-PDD: <input checked="" type="checkbox"/> Additional information
Date of completion	February 17, 2015

History of the proposed methodology

Version	Date	Contents revised
1.0	February 17, 2015	First version

### A. Title of the methodology

Reduction of electricity transmission loss between water treatment plants and water intake plants.

### B. Terms and definitions

Terms	Definitions
Individual electricity receiving system	An electricity receiving system through which water treatment plants (WTP) and water intake plants (WIP) receive electricity individually from a grid.
Project electricity receiving system	Installed in a JCM project, an electricity transmission cable and/or an electric transformer used to receive electricity from a grid.
Reference electricity receiving system	An electricity transmission cable and/or an electric transformer used to transmit electricity from one facility to others, if a JCM project is NOT implemented.

### C. Summary of the methodology

Items	Summary
<i>GHG emission reduction measures</i>	Electricity loss occurs when electricity is transmitted through electric transformer and transmission cable. By changing to the individual receiving system, GHG emissions will be decreased through reduction of electricity transmitted from a grid.
<i>Calculation of reference emissions</i>	Reference emissions are GHG emissions calculated by multiplying the amount of electricity transmission loss caused by parts of reference electricity receiving system which are not used in a JCM project by the weighted average emission factor of a grid.
<i>Calculation of project emissions</i>	GHG emissions reduction is defined to be equal to reference emissions. Project emissions can be considered as 0.
<i>Monitoring parameters</i>	N/A

## D. Eligibility criteria

This methodology is applicable to projects that meet all of the following criteria:

Criterion 1	A project which changes the electricity receiving system which transmits electricity from water treatment plants to water intake plants via private transmission cables to individual electricity receiving system.
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## E. Emission Sources and GHG types

Reference emissions	
Emission sources	GHG types
Electricity transmission loss of reference electricity receiving system	CO <sub>2</sub>
Project emissions	
Emission sources	GHG types
Electricity transmission loss of project electricity receiving system	CO <sub>2</sub>

## F. Establishment and calculation of reference emissions

### F.1. Establishment of reference emissions

Reference emissions are the amount of GHG emissions calculated by multiplying the amount of electricity transmission loss caused by parts of reference electricity receiving system which are not used in a project by the emission factor of a grid. Based on the actual type (A or B) of electricity receiving system, the amount of electricity transmission loss caused by parts of reference electricity receiving system will be determined for each water treatment plant.

### F.2. Calculation of reference emissions

(1) WTP type A

$$RE_p = (EL_{REF,1,p} + EL_{REF,2,p}) * EF_{grid}$$

$RE_p$  Reference emissions during a given period  $p$  [tCO<sub>2</sub>/p]

$EL_{REF,1,p}$ ,  $EL_{REF,2,p}$

Amount of electricity transmission loss of parts of reference electricity receiving system during a given period  $p$  [MWh/p] (refer to Fig. 1)

$EF_{grid}$  CO<sub>2</sub> emission factor of a grid [tCO<sub>2</sub>/MWh]

$EL_{REF,1,p}$  and  $EL_{REF,2,p}$  are the difference of the electric transformers and transmission cables

between the reference electricity receiving system in Fig. 1 and the project electricity receiving system in Fig. 2.

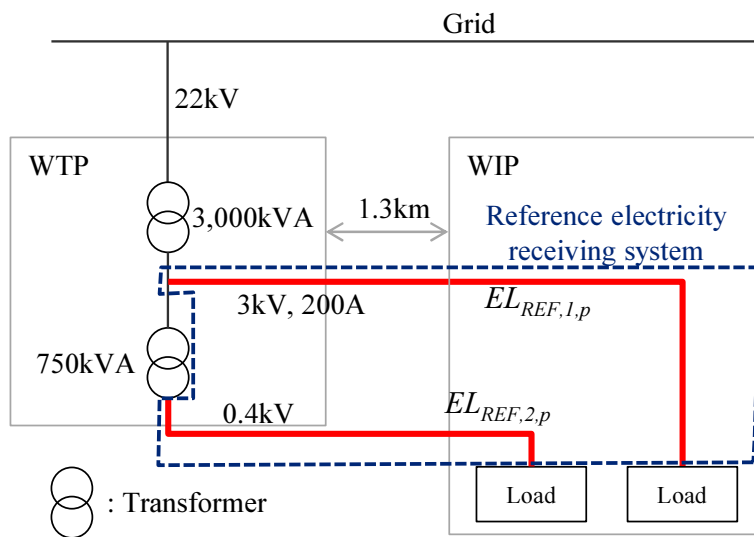


Fig. 1. Reference electricity receiving system at WTP type A

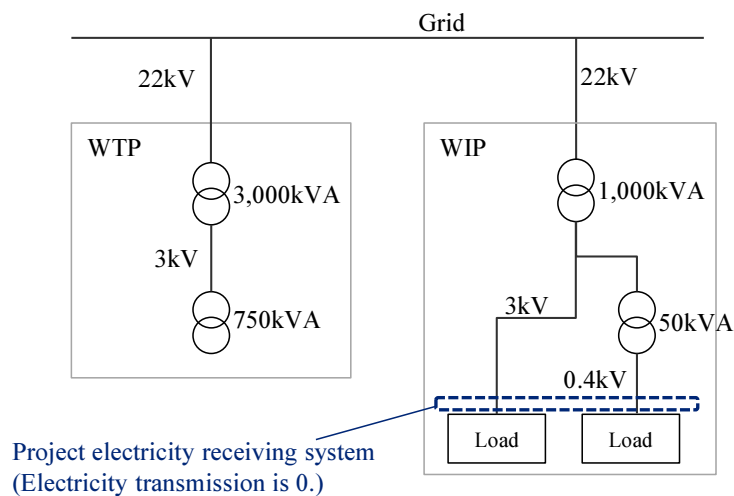


Fig. 2. Project electricity receiving system at WTP type A

(2) WTP type B

$$RE_p = (EL_{REF,3,p} + EL_{REF,4,p} + EL_{REF,5,p}) * EF_{grid}$$

$EL_{REF,3,p}, EL_{REF,4,p}, EL_{REF,5,p}$

Amount of electricity transmission loss of parts of reference electricity receiving system during a given period  $p$  [MWh/ $p$ ] (refer to Fig. 3)

$EL_{REF,3,p}, EL_{REF,4,p}$  and  $EL_{REF,5,p}$  are the difference of the electric transformers and transmission cables between the reference electricity receiving system in Fig. 3 and the project electricity

receiving system in Fig. 4.

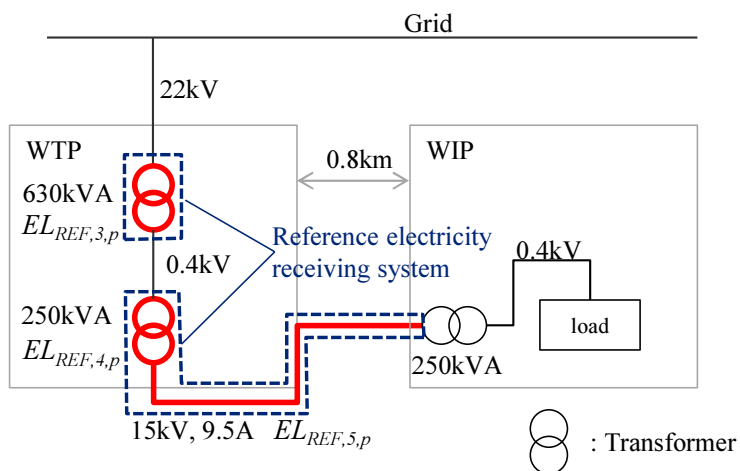


Fig. 3. Reference electricity receiving system at WTP type B

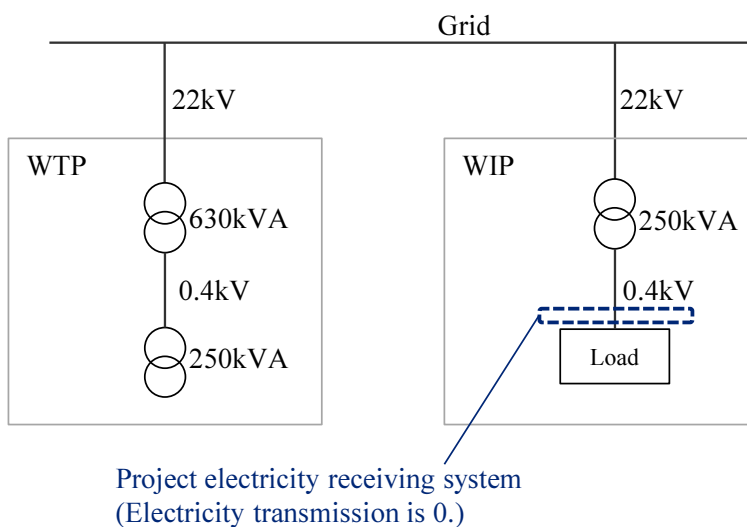


Fig. 4. Project electricity receiving system at WTP type B

## G. Calculation of project emissions

$$PE_p = EL_{PJ,p} * EF_{grid}$$

$PE_p$  Project emissions during a given period  $p$  [tCO<sub>2</sub>/p]

$EL_{PJ,p}$  0 MWh/p

$EF_{grid}$  CO<sub>2</sub> emission factor of a grid [tCO<sub>2</sub>/MWh]

## H. Calculation of emissions reduction

Emissions reduction is the difference between the reference emissions and the project emissions, and calculated as follows:

$$ER_p = RE_p - PE_p$$

## I. Data and parameters fixed *ex ante*

The sources of each data and parameter fixed *ex ante* are listed as below.

Parameter	Description of data	Sources
$EL_{REF,1,p}$ $EL_{REF,2,p}$ $EL_{REF,3,p}$ $EL_{REF,4,p}$ $EL_{REF,5,p}$	<p>Default value:</p> <p>Electricity transmission loss of electric transformers and transmission cables in the reference electricity receiving system which are not used in a JCM project.</p> <p>(1) <math>EL_{REF,1,p} = 40.2\text{MWh/p}</math>            (2) <math>EL_{REF,2,p} = 0.1\text{MWh/p}</math>            (3) <math>EL_{REF,3,p} = 17.8\text{MWh/p}</math>            (4) <math>EL_{REF,4,p} = 17.2\text{MWh/p}</math>            (5) <math>EL_{REF,5,p} = 3.4\text{MWh/p}</math></p>	Measured values at WTP type A and B, or estimated values based on the above measured values.
$EF_{grid}$	<p>Fixed ex-ante: 0.6257 tCO<sub>2</sub>/MWh</p> <p>CO<sub>2</sub> emission factor of a grid to which a target plant connects.</p>	<p>Data is obtained from Climate Change Department, Ministry of Environment, Cambodia.</p> <p>This value will be updated each year, if necessary.</p>