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	Nomura Research Institute., Ltd
Sectoral scope(s) to which the Proposed Methodology applies	Manufacturing Industries
Title of the proposed methodology, and version number	REDUCTION OF ENERGY CONSUMPTION BY INTRODUCING AN ENERGY-EFFICIENT OLD CORRUGATED CARTON PROCESSING SYSTEM INTO A PAPER FACTORY
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
Ver. 1.0	08/01/2015	

A. Title of the methodology

REDUCTION OF ENERGY CONSUMPTION BY INTRODUCING AN ENERGY-EFFICIENT OLD CORRUGATED CARTON PROCESSING SYSTEM INTO A PAPER FACTORY

B. Terms and definitions

Terms	Definitions
Old Corrugated Carton Line (OCC Line)	It refers to the process for adjusting materials to be delivered to a PM line in the corrugated carton production process. The energy used is electricity.
Paper Machine (PM)	It refers to the process for making paper, usually called PM line, which is part of an old corrugated carton production process.
Paper Yield	It is calculated as the ratio of materials of paper net of impurities, from the recycled paper inputs.

C. Summary of the methodology

Items	Summary
GHG emission reduction measures	The OCC line has eight processes, consists of approximately 30 element devices in total, and consumes nearly half of the total electricity consumption of the entire paper production process. Improvement of mechanical efficiency of each element device can save the motor electricity, and reduction of the electricity consumption can lead to a CO_2 reduction.
Calculation of reference emissions	Energy intensity (specific energy consumption) is set based on the performance of the existing production lines in the company under study. It is then multiplied by the project production and an emission factor of electricity consumed to calculate reference emission.
Calculation of project emissions	Electricity consumption in a newly built line is measured.

Monitoring parameters	Electricity consumption, Paper production.

D. Eligibility criteria

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

The project is introducing a high energy-efficient device in expansion of the OCC lines in an existing factory.

Criterion 1	A monitoring system for measuring electricity consumption per hour of each OCC line is provided.
Criterion 2	The designed energy intensity in the OCC line is 140kWh/product 1t or less.
Criterion 3	Instructions by an expert for adjustment, replacement, and improvements of machines are planned to be given regularly (at least once every three months).
Criterion 4	The paper yield of the OCC line is 87% or more.
Criterion 5	The water consumption in the OCC line is 10 tons/product 1t or less.
Criterion 6	The targeted company has more than 4 operating existing OCC lines which have more than one year operating records.

E. Emission Sources and GHG types

Reference emissions	
Emission sources	GHG types
Electricity Generation	CO_2
Project emissions	
Emission sources	GHG types
Electricity Generation	CO_2

F. Establishment and calculation of reference emissions

F.1. Establishment of reference emissions

In this methodology, the reference emissions are calculated based on the best past performance of the existing OCC lines of the same factory.

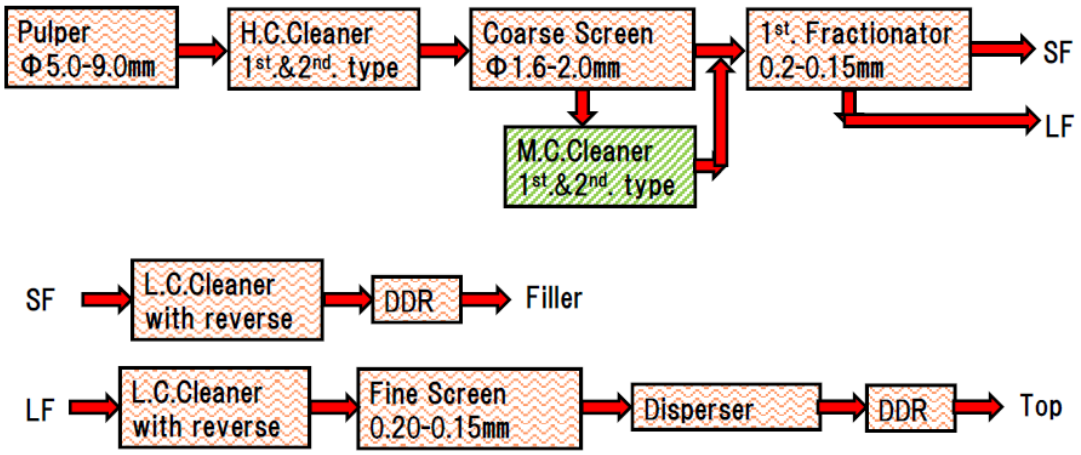
As specified in the eligibility criterion 6, the factory has a historical annual record of more than 4 existing OCC lines.

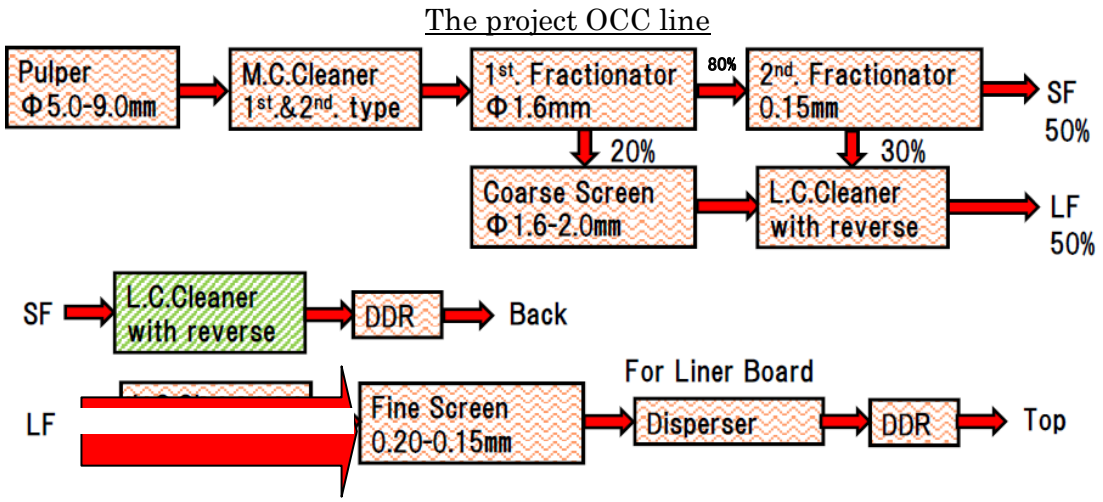
It is assumed to be natural that the company will choose the system with the same operation techniques and proven performance. Even the same technological system is introduced, its performance varies dependent on many operating factors and conditions.*

Here, the methodology chooses the reference 'specific energy consumption (SEC^{REF})' as that of an existing line which showed the best annual performance in the latest 3 years. If the line's operating record is less than 3 years, choose the 1 or 2 year annual performance on the SEC.

*Main equipment of reducing CO2 is Fractionator in the line below,

The reference OCC line





A total amount of raw materials are usually input into a rough selection screen, and then into a fractionator which separates between long fibers and short fibers. In the subsidized project, a fractionator is installed before the rough selection screen so that long fibers and short fibers are separated in advance. This reduces a throughput of the post process. Reduction of a throughput makes the capacity of equipment and motor power smaller, contributing to energy conservation.
Cleaning to eliminate foreign substances is usually conducted in 3 stages at high concentration, medium concentration and low concentration. In this subsidized project, the ability of the medium-concentration cleaner to eliminate foreign substances is improved. This obviates the need for a high-concentration cleaner, for which energy can be saved.

F.2. Calculation of reference emissions

Reference Specific Electricity Consumption:

$$SEC^{REF} = \min_{latest\ 3\ years}\left[\min_{i}\left[\left(\sum_{m\ over\ a\ year} EC_{i,m}\right)\Big/\left(\sum_{m\ over\ a\ year} PP_{i,m}\right)\right]\right]$$

where

"$EC_{i,m}$" denotes electricity consumption by the existing line *i* in a month *m*;

"$PP_{i,m}$" denotes paper production by the existing line *i* in a month *m*;

"minimum" over latest 3 years is for the annual values of the last 3 years; and

"minimum" over *i* is weighted by production $\left(\sum_{m\ over\ a\ year} PP_{i,m}\right)$ of each line *i* for the latest 3 years each.

Reference Emissions:

$$RE_y = \sum_{j,m} SEC^{REF} \cdot PP_{j,m} \cdot CEF_m^{EL}$$

where

"j" denotes the new OCC lines introduced by the project.

"CEF_m^{EL}" denotes the CO_2 emission factor of the electricity used in the month *m* in a year *y*. If the grid electricity is used, the latest value supplied by the Indonesian JCM Website is used. If other sources is used, the CEF is calculated by using the latest 1 year data provided by the source. The weighted average by the paper production is applied for the monthly CEF if plural sources are used in the month.

G. Calculation of project emissions

Project Emissions:

$$PE_y = CEF_m^{EL} \cdot \sum_{m\ over\ a\ year} EC_{j,m}$$

H. Calculation of emissions reductions

Emission Reductions:

$$ER_y = RE_y - PE_y$$

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
Grid electricity CO_2 emission factor	The latest grid electricity emission factor of the relevant grid	http://www.jcmindonesia.com/en/projects/projref (ex-post data)