Indonesia JCM Methodology Development

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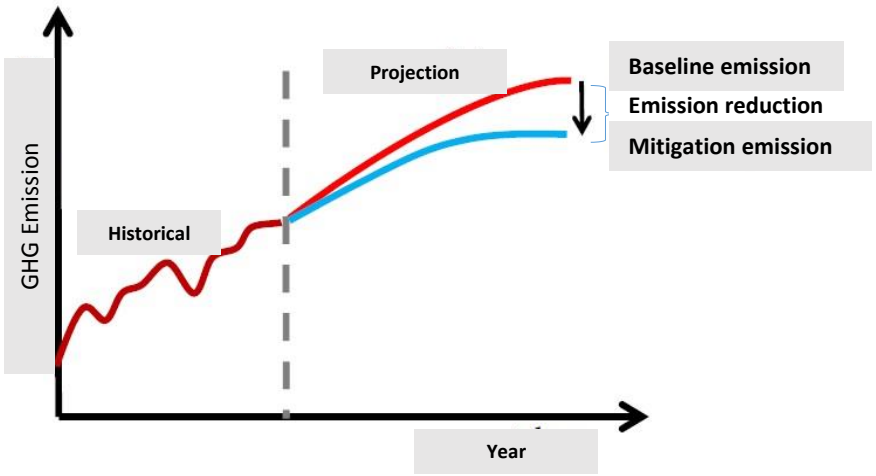
Presentation structure

1. Basic principles of the JCM MRV
2. JCM methodology development processes
3. The energy saving by high centrifugal chiller methodology
4. Power generation by waste heat recovery in cement industry

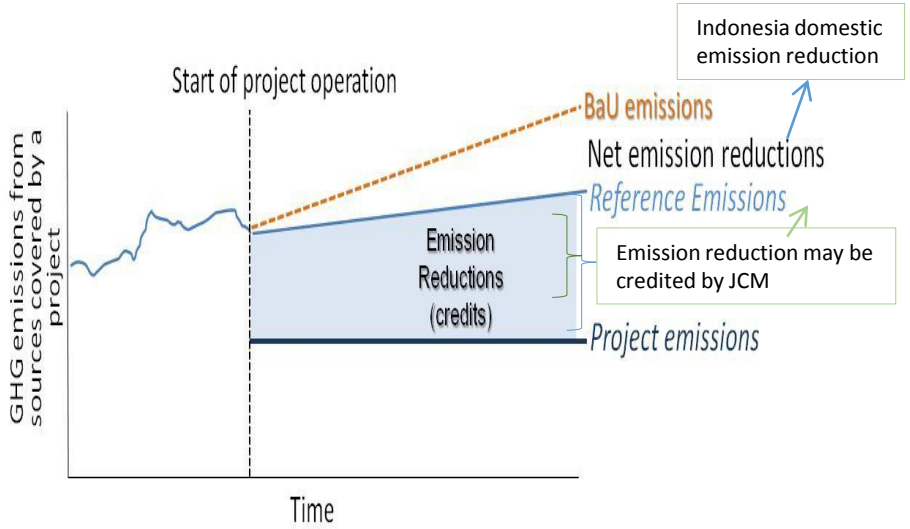
Comparison between JCM basic MRV with other schemes

Baseline emission based calculation



Other mitigation project in Indonesia

Reference emission based calculation



JCM project

1. In the JCM, *emission reductions* to be credited are defined as the difference between **reference emissions** and project emissions.
2. *Reference emissions* are calculated below business-as-usual (BaU) emissions which represent **plausible emissions** in providing the same outputs or service level of the proposed JCM project in the host country.
3. JCM approach will ensure a net decrease and/or avoidance of GHG emissions.
4. *The value of Reference Emissions in JCM depends on the methodology. Therefore, the value can be equal or different with Baseline Emission.*

JCM Indonesia infrastructures

Since JCM establishment in 2013, it has developed several guidelines, procedure, rules, registry system and methodologies

Guideline:

1. Project Design Document
2. Proposed Methodology
3. Third Party Entity
4. Validation and Verification
5. Sustainable Development Implementation Plan and Report

Procedure:

1. Project Cycle Procedure

Rules:

1. Rules of Implementation
2. Rules of Procedure

Registry system:

Developed with the collaboration with IGES and it is expected to connect with the National Registry

Status of JCM methodologies in Indonesia

The role of Indonesia JCM Secretariat in the review of proposed methodologies

- **Experts review**
- **Using methodology review form**
- **Discussion meetings between related ministries**
- **Prepare website for public comment**

10 Approved Methodologies

1. Power Generation by Waste Heat Recovery in Cement Industry
2. Energy Saving by High-Efficiency Centrifugal Chiller
3. Installation of Energy-Efficient Refrigerators Natural Refrigerants at Food Industry Cold Storage and Frozen Food Processing Plant
4. Installation of Air-Conditioning for Grocery Store
5. Installation of LED lighting for grocery store
6. GHG emission reductions through optimization of refinery plant
7. GHG emission reductions through optimization of boiler operation in Indonesia
8. Installation of a separate type fridge-freezer showcase by using natural refrigerant for grocery store to reduce air-conditioning load inside the store
9. Replacement of conventional burners with regenerative buners for aluminum holding furnaces
10. Introducing double-bundle modular electric heat pumps to a new building

Current guideline and forms for methodology

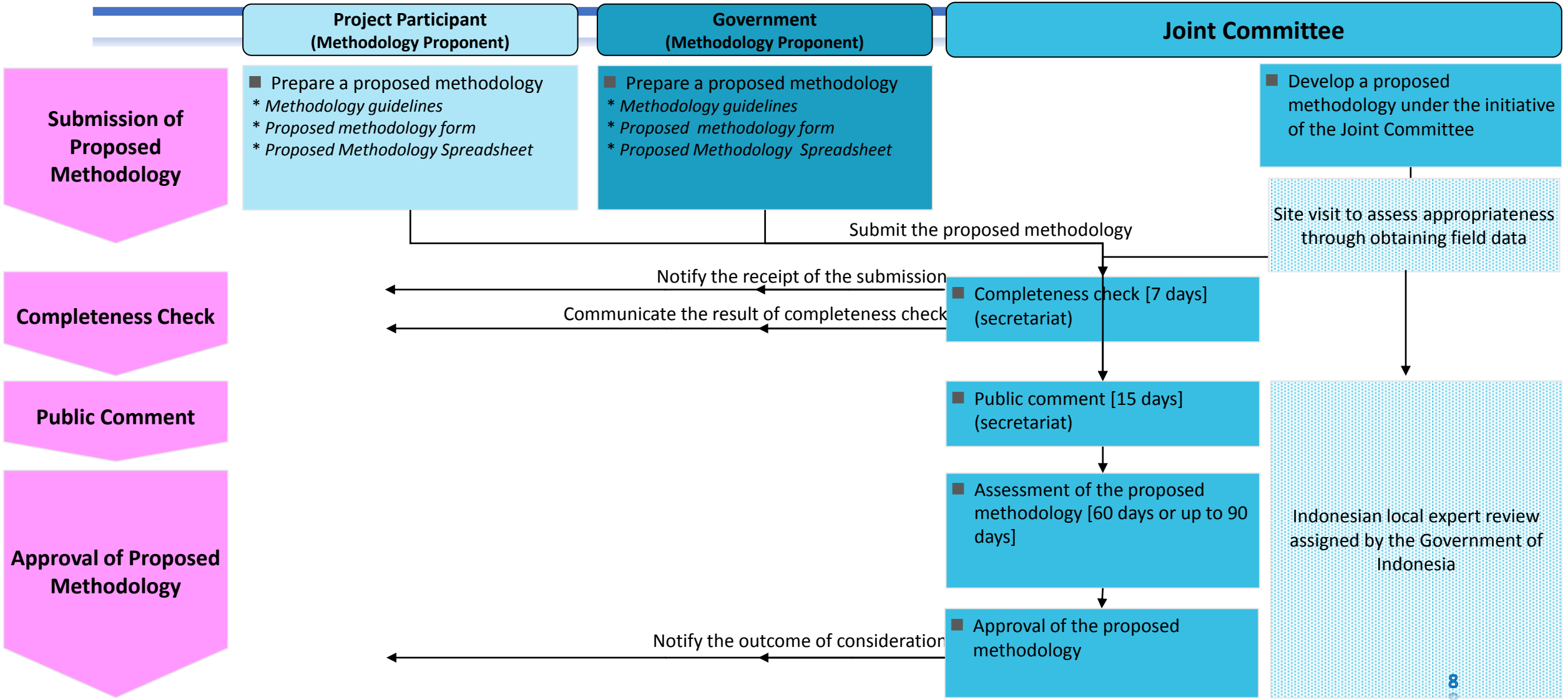
- *Joint Crediting Mechanism Guidelines for Developing Proposed Methodology ver 01.0*
- *JCM Proposed Methodology Form ver 01.0*
- *JCM Proposed Methodology Spreadsheet Form ver 01.0*

Methodology and national standard

- **Indonesia JCM Secretariat receives proposed methodology from project participants.**
- **The proposed methodology are reviewed by the Secretariat, experts, and JC technical team before it reviewed on the JC meeting.**
- **The longest JCM methodology review took 9 months to be approved**

- Every methodology must comply with the Indonesian national standard (Standar Nasional Indonesia/SNI).
- If national standard is unavailable, international standards or scientific approaches will be used.
- Example of the utilisation of the Indonesia National Standard is SNI 16-7062-2004: Measurement standard of light intensity in the workplace, as a based of the JCM methodology for“Installation of LED lighting for grocery store”.
- The Indonesia national emission factor is utilised for the methodology calculation.

JCM methodology development steps



General outline of JCM methodology

1. Proposed Methodology Form

Cover sheet of the Proposed Methodology Form

A. Title of the methodology
B. Terms and definitions
C. Summary of the methodology
D. Eligibility criteria
E. Emission Sources and GHG types
F. Establishment and calculation of reference emissions
   F.1. Establishment of reference emissions
   F.2. Calculation of reference emissions
G. Calculation of project emissions
H. Calculation of emissions reductions
I. Data and parameters fixed *ex ante*

2. Proposed methodology spreadsheet (Input sheet)

Table 1: Parameters to be monitored ex post
Table 2: Project-specific parameters to be fixed *ex ante*
Table3: Ex-ante estimation of CO2 emission reductions

3. Proposed methodology spreadsheet (Calculation Process Sheet)

1. Calculations for emission reductions
2. Selected default values, etc.
3. Calculations for reference emissions
4. Calculations of the project emissions

List of default values

Example 1:

AM_002 Energy Saving by High-Efficiency Centrifugal Chiller (1/3)

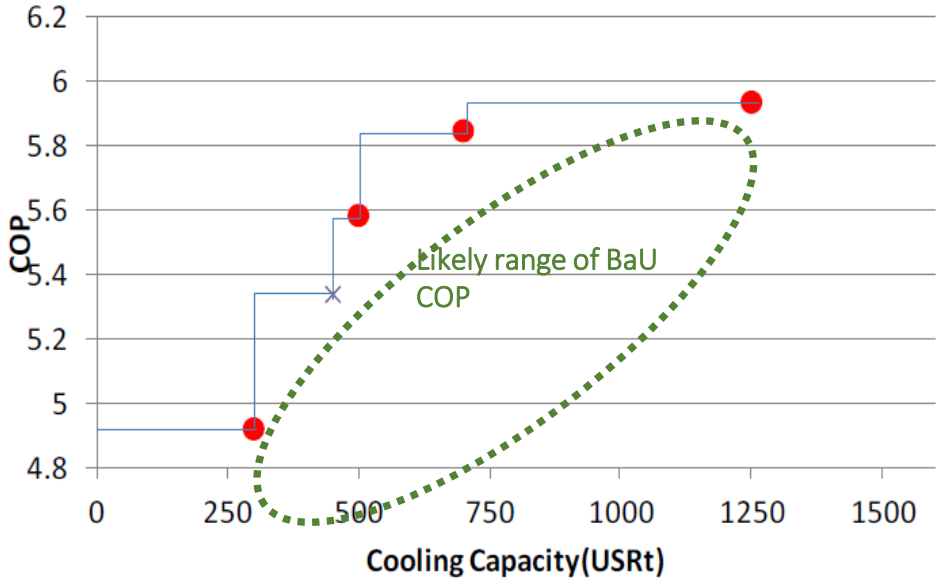
- **Applied to the first JCM registered project:** *Energy Saving for Air-Conditioning and Process Cooling by Introducing High-efficiency Centrifugal Chiller,* PT Primatexco – Ebara – Nippon Koei
- Introducing high efficiency centrifugal chiller for the factories etc., which is characterized by:
  - ✓ Non ozone-depleting refrigerant (e.g. HFC 245fa)
  - ✓ Coefficient Of Performance (COP) more than 6.0 (higher than the COP of chillers widely available in the Indonesian market, based on survey)
- Periodical check is planned to be more than four (4) times annually.
- Plan for not releasing refrigerant used for project chiller has been included. In the case of replacing the existing chiller with the project chiller, refrigerant used for the existing chiller is not released to the air e.g. re-use of the refrigerant.

Example 1:

AM_002 Energy Saving by High-Efficiency Centrifugal Chiller (2/3)

- Emission reductions are calculated based on the difference between the amount of project power consumption and reference power consumption which is derived from the ratio of the project COP to the reference COP.
- The reference COP is conservatively set as a default value by taking **maximum COP of commercially available chillers** in the certain cooling capacity.
- The survey was conducted to review the maximum COP of the chillers in Indonesia market for 5 most biggest market share.
- The data of the survey should be renewed every 3 years in order to check the commercially available condition.

Maximum COP value in the respective cooling capacity range



Source: Ministry of the Environment, Japan

Example 1:

AM_002 Energy Saving by High-Efficiency Centrifugal Chiller (3/3)

Reference Emission (RE_P):

$$RE_p = \sum_i \left(EC_{PJ,i,p} \times COP_{PJ,i} \div COP_{RE,i} \times EF_{grid} \right)$$

$EC_{PJ,i,p}$ = Energy consumption from a project i chiller during p period [MWh/p]
$COP_{PJ,i}$ = COP of a project i chiller
$COP_{RE,i}$ = COP of a reference chiller i
Ef_{grid} = National factor emission from national grid [tCO_2/MWh)

Project Emission (PE_P):

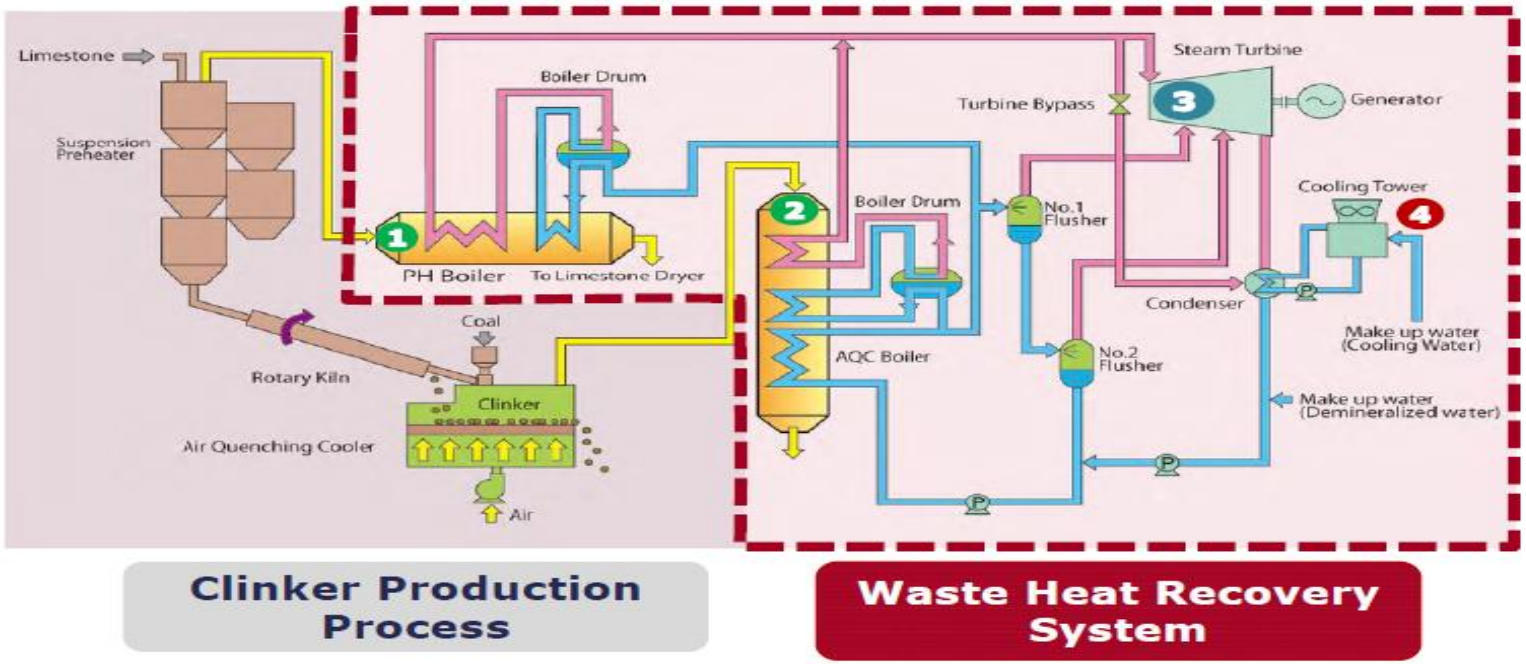
$$PE_p = \sum_i \left(EC_{PJ,i,p} \times EF_{grid} \right)$$

Emission Reduction (ER_P): RE_P - PE_P

Example 2:

AM_001 Power Generation by Waste Heat Recovery in Cement Industry (1/2)

The WHR power generation will be built in PT. Semen Indonesia (Persero). It will utilize 4 kiln waste heat which only been released to the open air. The WHR power generation will generate 30,4 MW electricity which will be used for the internal consumption.

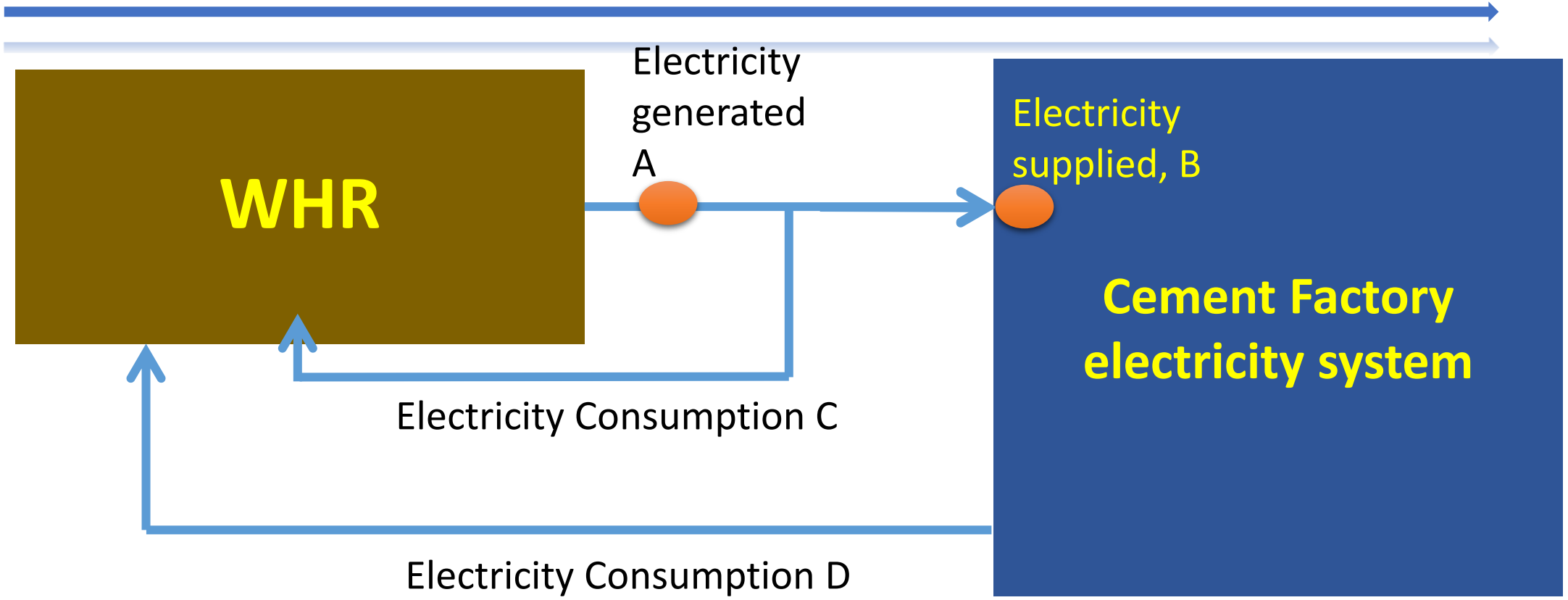


Source: JFE Engineering Corporation

Expected GHG emission reduction: 122,000 tCO_2/year

Example 2:

AM_001 Power Generation by Waste Heat Recovery in Cement Industry (1/2)

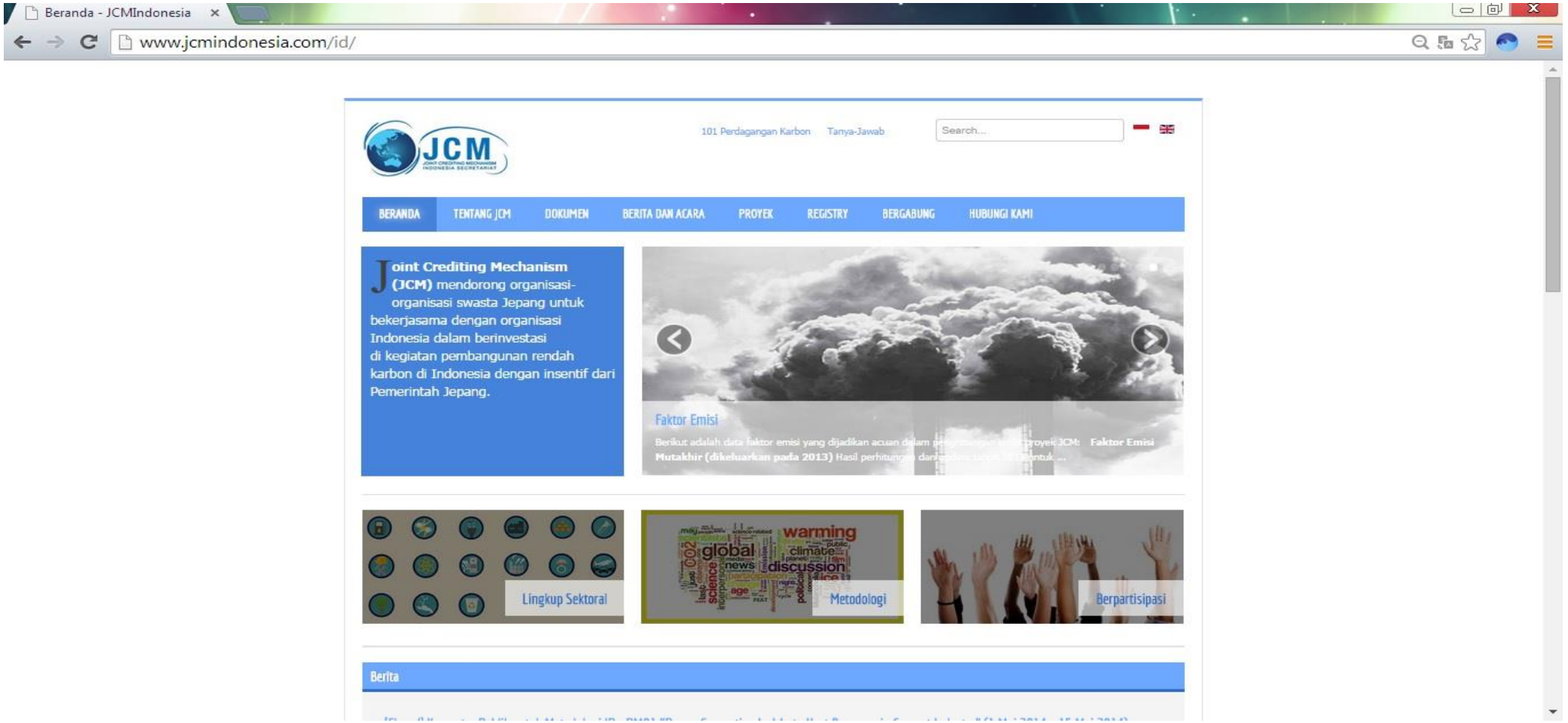


Emission reduction = (B – D) x emission factor

Remarks:

- ✓ B will be monitored and measured using continues electric power meter.
- ✓ D will be counted based on the maximum consumption of installed the electricity equipment.

All of the methodologies and processes are available at www.jcmindonesia.com



Thank you!

Terima kasih!

Mercy beaucoup!

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