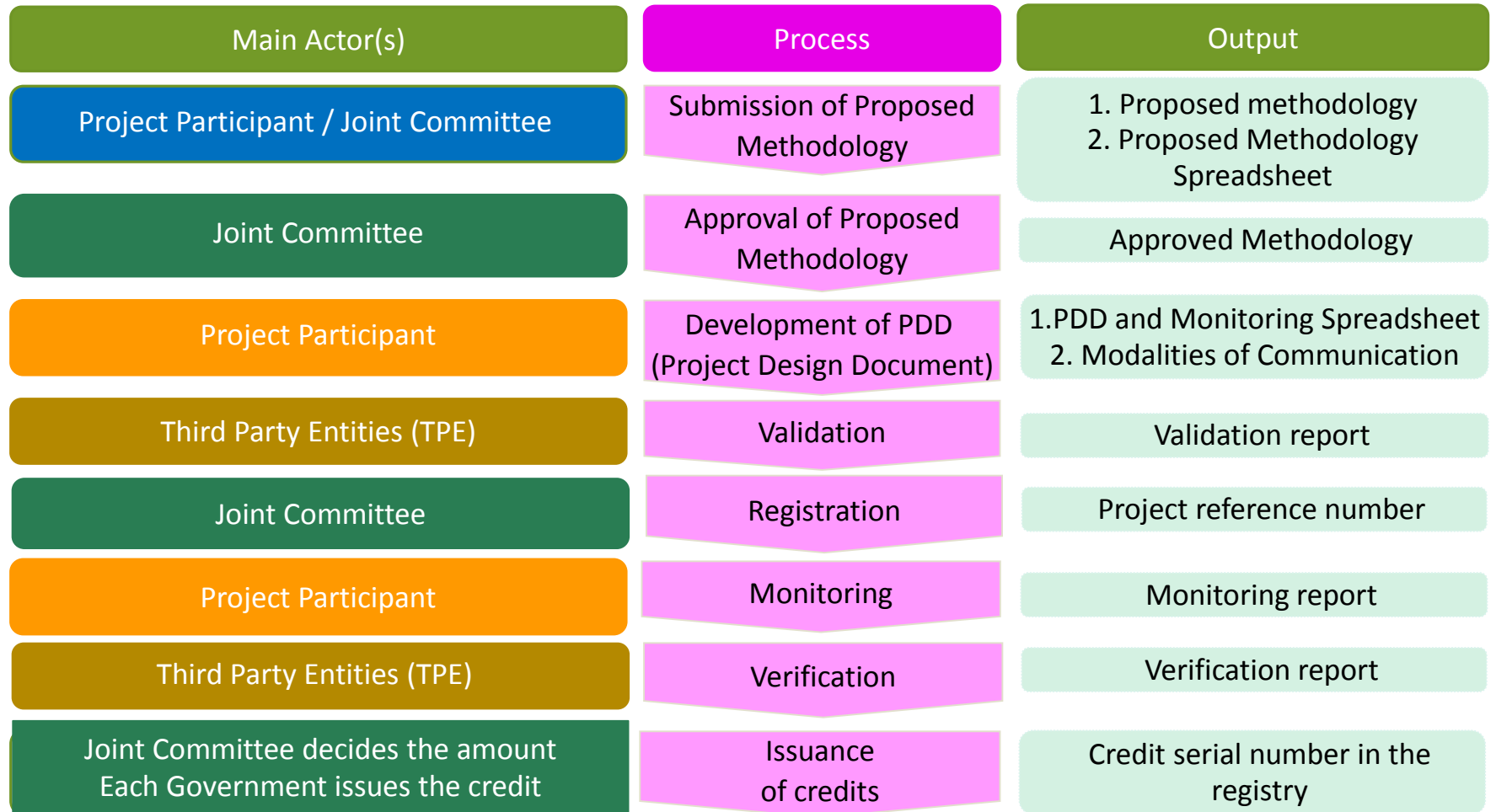# Introduction to JCM MRV and methodologies

10 November 2015

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Climate and Energy Area

Institute for Global environmental Strategies(IGES)

Measurement, Reporting, Verification (MRV): JCM Project Cycle

Main Actor(s)	Process	Output
Project Participant / Joint Committee	Submission of Proposed Methodology	1. Proposed methodology 2. Proposed Methodology Spreadsheet
Joint Committee	Approval of Proposed Methodology	Approved Methodology
Project Participant	Development of PDD (Project Design Document)	1.PDD and Monitoring Spreadsheet 2. Modalities of Communication
Third Party Entities (TPE)	Validation	Validation report
Joint Committee	Registration	Project reference number
Project Participant	Monitoring	Monitoring report
Third Party Entities (TPE)	Verification	Verification report
Joint Committee decides the amount Each Government issues the credit	Issuance of credits	Credit serial number in the registry

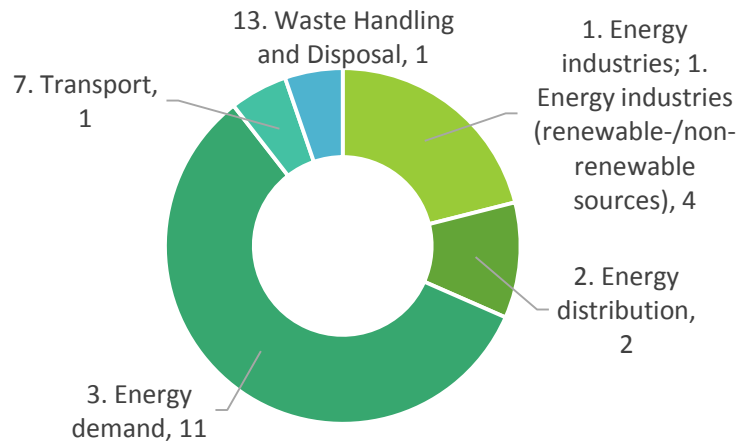Validation and verification be conducted by the same TPE and conducted simultaneously
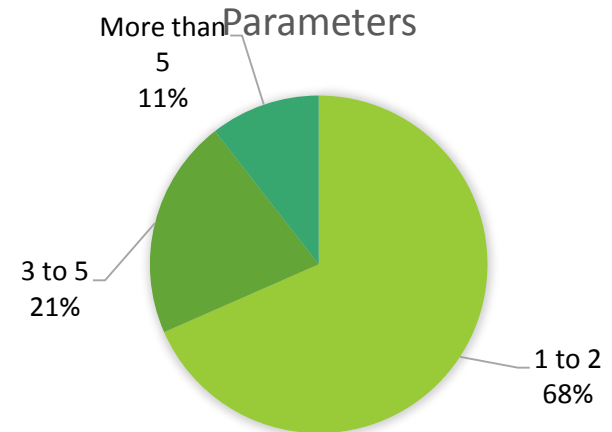
JCM Methodology

➢ A methodology applied to JCM projects for calculating emission reductions achieved by each project and monitoring the JCM project.

➢ Consists of proposed methodology form (Word) and Proposed Methodology Spreadsheet (Excel).

➢ Approved by the Joint Committee.

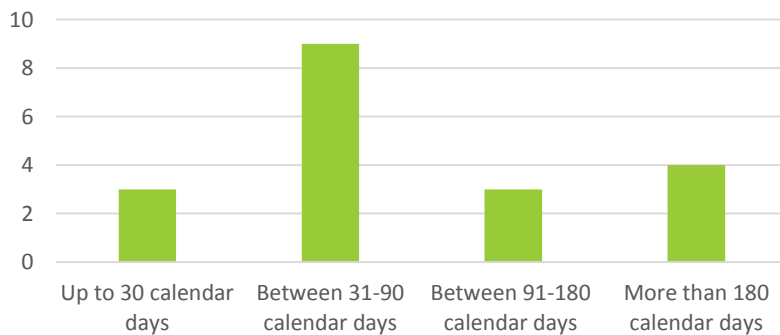# Overview of current JCM methodologies
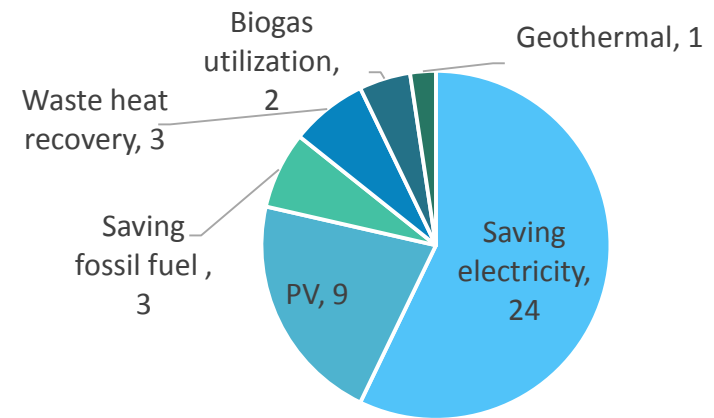
Sectoral scope of methodologies

- 13. Waste Handling and Disposal, 1
- 7. Transport, 1
- 1. Energy industries; 1. Energy industries (renewable-/non-renewable sources), 4
- 2. Energy distribution, 2
- 3. Energy demand, 11

Amount of Key Monitoring Parameters

- More than 5: 11%
- 3 to 5: 21%
- 1 to 2: 68%

Number of days from proposed methodology completion to methodology approval

Up to 30 calendar days	Between 31-90 calendar days	Between 91-180 calendar days	More than 180 calendar days
3	9	3	4

Projects selected for JCM funding

- Biogas utilization, 2
- Geothermal, 1
- Waste heat recovery, 3
- Saving fossil fuel, 3
- PV, 9
- Saving electricity, 24

Source: IGES

4

Key features of JCM methodology

◆The proposed methodology:

- ✓ Sufficiently explicit to be used and applied to projects unambiguously and be reproduced by a third party;
- ✓ Possible for projects following the methodology to be subjected to JCM validation and/or verification;
- ✓ Includes all algorithms, formulae, and step-by-step procedures needed to apply the methodology and validate the project, i.e. calculating reference emissions and project emissions;
- ✓ Provides instructions for making any logical or quantitative assumptions that are not provided in the methodology (to be made by the methodology user);
- ✓ Avoids the intentional increase of credits caused by perverse incentives (e.g. when an increase in output is triggered by incentive to increase credits).

Reference => JCM Guidelines for Developing Proposed Methodology

Key factors on the JCM methodology

Eligibility criteria

Net emission reductions

Simplified monitoring method

Eligibility criteria

◆Eligibility criteria are requirements for the JCM project defined in the JCM methodology and contain the followings:
   (a) Requirements for the project in order to be registered as a JCM project.
   (b) Requirements for the project to be able to apply the approved methodology.

Source: JCM Guidelines for Developing Proposed Methodology

◆ Eligibility criteria is:
   ☞ Clearly defined in the methodology can reduce the risks of rejection of the projects proposed by project participants.
   ☞ Established, in order to reduce emissions by:
      (a) Accelerating the deployment of low carbon technologies, products and services, which will contribute to achieving net emission reductions;
      (b) Facilitating the NAMAs in host countries.
   ☞ A "check list" will allow easy determination of eligibility of a proposed project under the JCM and applicability of JCM methodologies to the project.

Source: Government of Japan

Examples of eligibility criteria

Category	Example of eligibility criteria
Type of technology/devise installed in the project	Technology to be employed in this methodology is coal-fired heat only boiler (HOB) for hot water supply system.
Positive list (detail technical requirement)	WHR system consists of a Suspension Preheater boiler and/or Air Quenching Cooler boiler, turbine generator and cooling tower.
New installation/replacement, status before project implementation	The project activity involves the installation of new HOB and/or the replacement of the existing coal-fired HOB
Scale/capacity	Capacity of the project HOB ranges from 0.10 MW to 1.00MW.
Scope (sector, type/scale of facility)	The transmission line constitutes of a single or double circuit(s) directly connecting a substation and another substation within the country with no branching in between, and does not constitute a part of a loop.
Benchmark (Performance level)	The catalog value of the boiler efficiency for the project HOB is 80% or higher
Treatment to avoid leakage emissions	Plan for not releasing refrigerant used for project chiller is prepared.
Past data availability/ MRV	Data of fuel consumption and distance travelled before activation of digital tachograph system is available for each freight vehicle
Operation	The project includes feedback of a driver's performance with the graphical representation to the driver regularly, at least once in three months.
Other	e.g. Reference scenario change, project car identification

Net emission reductions (1)

◆ In the JCM, emission reductions to be credited are defined as the difference between reference emissions and project emissions.

◆ Generally, there are 2 ways to realize net emissions reduction:

1. Conservative reference scenario: calculate reference emission below business-as-usual (BaU) emissions.

2. Conservative project scenario: Using conservative default values in parameters to calculate project emissions instead of measuring actual values.

1. Conservative reference scenario
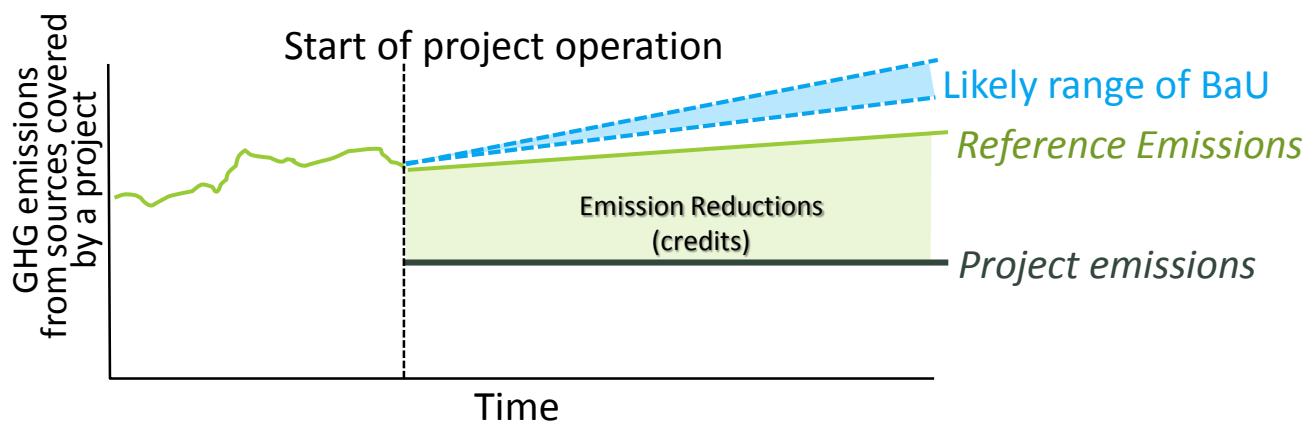
Emission reductions = reference emissions − project emissions

Example:

• MN_AM001 Installation of energy-saving transmission lines in the Mongolian Grid
• ID_AM003 Installation of Energy-efficient Refrigerators Using Natural Refrigerant at Food Industry Cold Storage and Frozen Food Processing Plant

# Example: ID_AM003: Energy-efficient refrigerators using natural refrigerant at cold storage and processing plant

- High efficient secondary loop cooling system:
  - ✓ Refrigerant: Non-fluorocarbon (primary: NH_3, secondary: CO_2)
  - ✓ Key efficiency indicator: **Coefficient of Performance (COP)**
    Eligibility criteria for individual quick freezer: COP more than 1.5
    for cold storage: COP more than 2.0
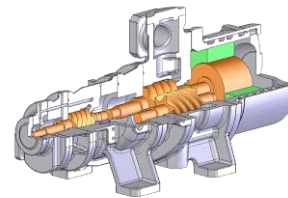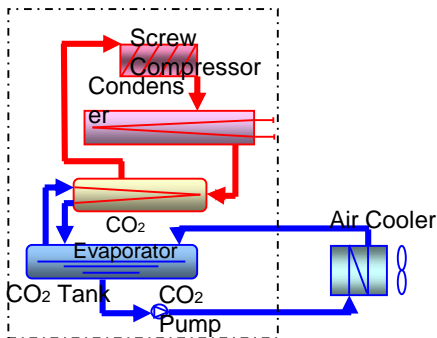
Screw Compressor

Condensing Unit

- The reference emissions are calculated based on the **maximum COP of commercially available** chillers (based on survey)
- Simplified monitoring: three parameters to be monitored
  - ✓ Amount of electricity consumed by project refrigerator
  - ✓ Electricity imported from the grid, where applicable
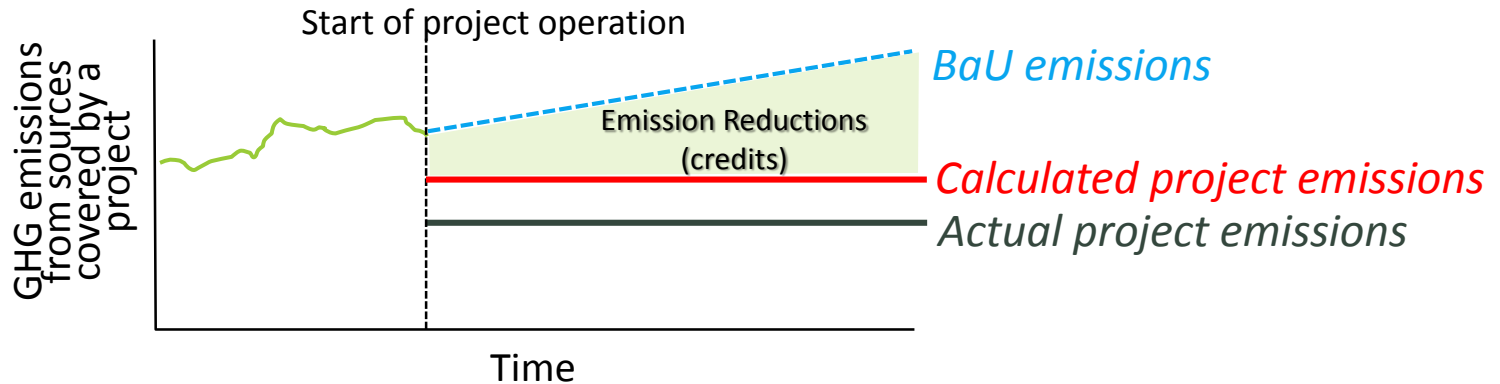 - ✓ Operating time of captive electricity generator, where applicable

Example: MN_AM001: Reduction of GHG emission from transmission loss by introducing low electrical power loss conductors in Mongolian Grid

- Energy-saving transmission lines:
  - ✓ Constitutes a single or double circuit(s) directly connecting a substation and another substation within the country with no branching in between, and does not constitute a part of a loop.
  - ✓ Use *Low Electrical Power Loss Aluminum Conductors, Aluminum-Clad Steel Reinforced (LL-ACSR/SA)* which meets the specific technical criteria described in the methodology (based on Mongolian National Standard and International Electrotechnical Commission)

- The reference emissions are due to transmission loss in ACSR, calculated based on the parameters derived from Mongolian Standard MNS5870: 2008.
- Simplified monitoring: four parameters to be monitored:
  - ✓ Power sent from the point of origin/supply to the transmission line
  - ✓ Power received at the point of receipt of the transmission line
  - ✓ Emission factor of the grid
  - ✓ Direct current resistance of the transmission line

Net emission reductions (2)

2. Conservative project scenario

Using conservative default values in parameters to calculate project emissions instead of measuring actual values will lead calculated project emissions larger than actual project emissions

Start of project operation

GHG emissions from sources covered by a project

BaU emissions

Emission Reductions (credits)

Calculated project emissions

Actual project emissions

Time

Emission reductions = reference emissions – project emissions

➢ Taking into account reductions from other factors: Upper limit in emission reductions

Example: VN_AM001Transportation energy efficiency activities by installing digital tachograph systems

Taking into account possibilities of emission reductions from other factors than installation of digital tachograph system, emission reductions for the project is limited to 10% of the reference emissions.

Example: Power Generation by Waste Heat Recovery in Cement Industry

2. Conservative project scenario

- The default value for electricity consumed for captive use is set as the **maximum rated capacity** of equipment of the WHR system assuming their operation is **24h/day**.
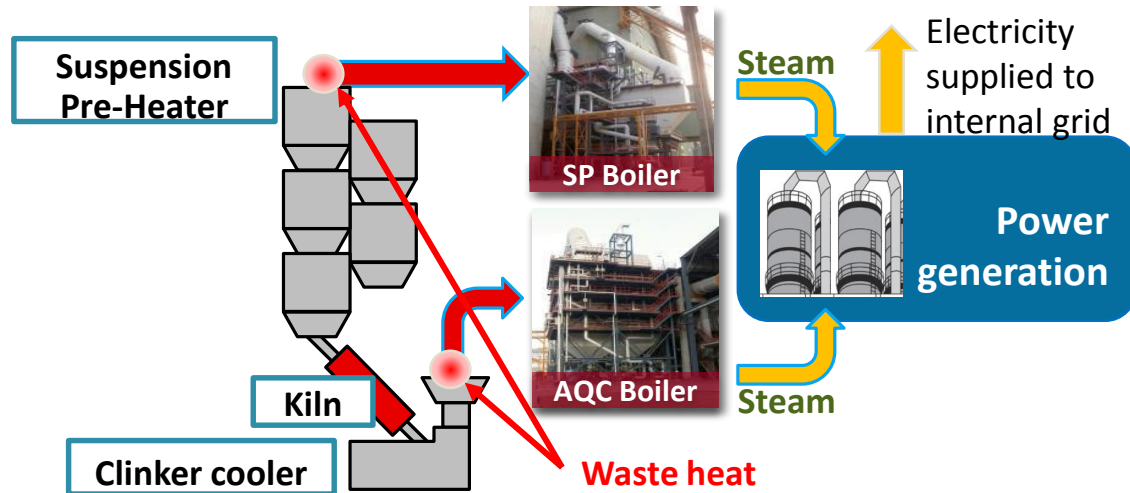
The net amount of electricity supplied to the grid =
The gross amount of electricity generated by the WHR - the electricity consumed for captive use

- Simplified monitoring: two parameters to be monitored
  - ✓ The quantity of the electricity supplied from the WHR system to the cement production facility
  - ✓ The number of days during a monitoring period

Simplified monitoring method

An approved methodology consists of an approved methodology document and a Monitoring Spread Sheet

Monitoring spreadsheet

Monitoring Plan Sheet
is used before validation for developing a monitoring plan and calculating emission reductions *ex ante*.

Monitoring Structure Sheet
is used before validation for developing an operational and management structure to be implemented in order to conduct monitoring.

Monitoring Report Sheet
is used before verification for developing a monitoring report and calculating emission reductions ex post.

An approved methodology provides a default value or an identification method of a value for a crediting threshold which is typically expressed as GHG emissions per unit of output by total outputs for reference emissions.

Average number of key monitoring parameters among 19 approved JCM methodologies is 2

Excel-based Monitoring Spreadsheet

Monitoring Plan Sheet (Input Sheet) [Attachment to Project Design Document]

Table 1: Parameters to be monitored *ex post*

(a) Monitoring point	(b) Parameters	(c) Description of data	(d) Estimated Values	(e) Units	(f) Monitoring option	(g) Source of data	(h) Measurement methods and procedures	(i) Monitoring frequency	(j) Other comments
1	PH_p	Net heat quantity supplied by the project HOB during the period p.		GJ/p	Option C	Logged data of net heat quantity supplied by the project HOB	Measurement methods which are using a heatmeter meet the industrial standards (host country or international standard). Monitoring data is the amount of heat supplied from the project HOB. This monitoring data is recorded in the data logger that is built into the heat meter. Electric data recorded on the data logger is input to the spreadsheet properly. In these monitoring activities, QA/QC be implemented. - In the case that heatmeter with verification is used, the verification validity for the heatmeter does not expire till the last date of the monitoring period. - If the heatmeter with the verification is not required in the industrial standard, uncertainty of the calibration data of the monitoring equipment meet the following conditions; - It is within accepted level of the verification. - It is within the accuracy level of industry standard requires. Required calibration frequency is the frequency which can be confirmed to be within the accuracy level of the requirement of industrial standard.	Measuring frequency: Continuously Recording frequency: Hourly	Trouble shooting procedure of missing data; Completed by the hourly minimum value (excluding abnormal value) of available recorded data during the monitoring period.
2	HMP_p	Total hours of the project HOB operation during the period p.		hours/p	Option C	Identified by monitoring period	Total time from the start time of monitoring to the end time of monitoring	---	---

Table 2: Project-specific parameters to be fixed *ex ante*

(a) Parameters	(b) Description of data	(c) Estimated Values	(d) Units	(e) Source of data	(f) Other comments
$RPC_{p,i,HOB}$	Rated power consumption of the project HOB		kW	Catalog value provided by the manufacturer of the project HOB	
$EF_{CO_2,grid}$	CO_2 emission factor of the grid electricity consumed by the project HOB		tCO$_2$/MW	The most recent value available at the time of validation is applied and fixed for the monitoring period thereafter. The data is sourced from CDM Mongolia unless otherwise instructed by the Joint Committee.	

Table 3: *Ex-ante* estimation of CO$_2$ emission reductions

CO$_2$ emission reduction	Units
0	tCO$_2$/p

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices)
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

MPS(input) | MPS(calc_process) | MSS | MRS(input) | MRS(calc_process)

Key points for developing JCM methodology

Eligibility criteria

- Conduct survey or research to identify what is advanced low carbon technologies and performance level in Mongolia.
- In order to simplify emission reduction calculations and monitoring method, it is better to specify scope.
- If there is possibility of leakage emissions, it needs to include a treatment for avoiding leakage emissions.

Net emission reduction

- Need to clarify BAU scenario and possible scenarios in Mongolia and select a conservative scenario with reasonable explanation.

Simplified monitoring method

- Establish default values or an identification method for crediting threshold
- Number of monitoring parameters (ex-post) should set minimum as much as possible

Potential Sectors to Develop

Renewable energies (solar, wind)

Energy-efficient Buildings and Utilities
(boilers, chillers, etc.)

Transport

Etc...

More information:
"JCM in Charts for Mongolia" ver1.0 (Oct 2015)

- Comprehensive description of the JCM rules and procedures, e.g. for requesting project registration, methodology approval process, validation requirements, etc.

Tree Diagram of Contents

More information:
"JCM in Charts for Mongolia" ver1.0 (Oct 2015)

- Roles of each JCM stakeholders for implementation in Mongolia, duration of processes.

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3. JCM – related body

3-5. Project participants (PP)

◆ Project participants: [RoI ver.1, para 19]
- ☞ Prepare a draft methodology and submit the draft to the JC for its approval
- ☞ Prepare a draft PDD and submit the draft to a TPE for validation and notify the JC
- ☞ Submit the PDD that was validated by the TPE to the JC for its registration of the project
- ☞ Implement the JCM project and conduct monitoring in line with the PDD
- ☞ Prepare a monitoring report and send the report to a TPE for verification
- ☞ Submit a verification report prepared by the TPE to the JC, and request notification to each side for issuance of credits under the JCM.

3-6. Procedures for modalities of communication (MoC)

Procedure for MoC [PCP ver.3, para 37-39, 42]
- ◆ The PPs of a JCM project designate one focal point entity (focal point) from the PPs to communicate on their behalf with the JC and the secretariat in line with scopes of authority and include this information in an MoC.
- ◆ After the submission of an MoC of a proposed JCM project, all official communication between the PPs and the JC, the secretariat, or each side for the specific project is conducted through the focal point.
- ◆ The PPs submit an MoC to the JC and the TPE, at the time of submitting the draft PDD to the TPE for validation and the JC for public inputs, using the latest version of the "JCM Modalities of Communication Statement Form" (MoC form). The contact details of the focal point and other PPs are included in the MoC form.
- ◆ The secretariat publishes the MoC form on the JCM website following the registration of the project. The MoC is shared only among the PPs, the JC, the secretariat and the TPE involved in the JCM project. The secretariat makes sections 1 to 4 of the MoC without specimen signatures publicly available.
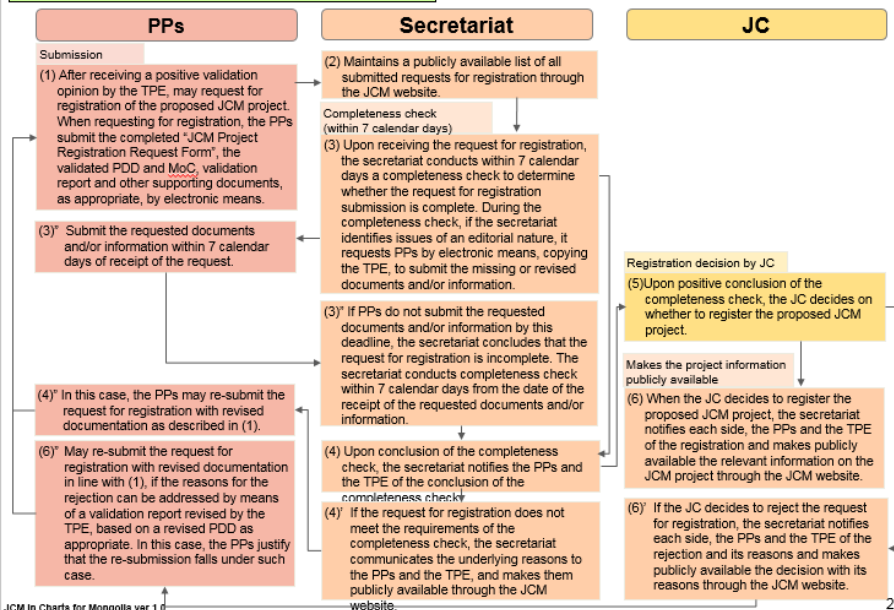
Focal point [PCP ver.3, para 40-42]
- ◆ The PPs grant the focal point the authority to:
  - (a) Communicate in relation to requests for issuance of credits to respective accounts;
  - (b) Communicate in relation to requests for addition and/or voluntary withdrawal of PPs and changes to the focal point, as well as changes to company names, legal status, contact details and specimen signatures; and
  - (c) Communicate on all other project-related matters not covered by subparagraphs (a) and (b) above.
- ◆ The PPs and the focal point designate one primary authorized signatory and one alternate authorized signatory. The signature of either the primary or alternate authorized signatory suffices for authenticating the PP's or the focal point's consent or instruction(s).
- ◆ The PPs do not include or refer to private contractual arrangements in an MoC.

JCM In Charts for Mongolia ver.1.0   12

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6. Registration

6-3. Procedures for requests for registration   [PCP ver.3, para 46-52, 81-85]

PPs	Secretariat	JC
Submission (1) After receiving a positive validation opinion by the TPE, may request for registration of the proposed JCM project. When requesting for registration, the PPs submit the completed "JCM Project Registration Request Form", the validated PDD and MoC, validation report and other supporting documents, as appropriate, by electronic means.	(2) Maintains a publicly available list of all submitted requests for registration through the JCM website. Completeness check (within 7 calendar days) (3) Upon receiving the request for registration, the secretariat conducts within 7 calendar days a completeness check to determine whether the request for registration submission is complete. During the completeness check, if the secretariat identifies issues of an editorial nature, it requests PPs by electronic means, copying the TPE, to submit the missing or revised documents and/or information.	
(3)" Submit the requested documents and/or information within 7 calendar days of receipt of the request.		Registration decision by JC (5)Upon positive conclusion of the completeness check, the JC decides on whether to register the proposed JCM project.
	(3)' If PPs do not submit the requested documents and/or information by this deadline, the secretariat concludes that the request for registration is incomplete. The secretariat conducts completeness check within 7 calendar days from the date of receipt of the requested documents and/or information.	Makes the project information publicly available
(4)" In this case, the PPs may re-submit the request for registration with revised documentation as described in (1).		(6) When the JC decides to register the proposed JCM project, the secretariat notifies each side, the PPs and the TPE of the registration and makes publicly available the relevant information on the JCM project through the JCM website.
(6)" May re-submit the request for registration with revised documentation in line with (1), if the reasons for the rejection can be addressed by means of a validation report revised by the TPE, based on a revised PDD as appropriate. In this case, the PPs justify that the re-submission falls under such case.	(4) Upon conclusion of the completeness check, the secretariat notifies the PPs and the TPE of the conclusion of the completeness check' (4)' If the request for registration does not meet the requirements of the completeness check, the secretariat communicates the underlying reasons to the PPs and the TPE, and makes them publicly available through the JCM website.	(6)' If the JC decides to reject the request for registration, the secretariat notifies each side, the PPs and the TPE of the rejection and its reasons and makes publicly available the decision with its reasons through the JCM website.

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ありがとうございました
Thank you!

IGES