Third Party Audit for GHG Projects

Training for TPE Candidates

November 10, 2015
ERM Japan
Tsuyoshi Nakao
- Joint Crediting Mechanism (JCM)
- Registration of Methodology
- PDD and Registration as a JCM project
- Monitoring and Issue of Credit
- Validation and Verification
1. Joint Crediting Mechanism (JCM)
Basic Concept of the JCM

Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.

Appropriately evaluating contributions to GHG emission reductions or removals from Japan in a quantitative manner, by applying measurement, reporting and verification (MRV) methodologies, and use them to achieve Japan’s emission reduction target.

Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals, complementing the CDM.

Refer to “Recent Development of The Joint Crediting Mechanism (JCM)” Japanese Government, 2014,
Features of the JCM

(1) The JCM starts its operation as the non-tradable credit type mechanism.

(2) Both Governments continue consultation for the transition to the tradable credit type mechanism and reach a conclusion at the earliest possible timing, taking account of implementation of the JCM.

(3) The JCM aims for concrete contributions to assisting adaptation efforts of developing countries after the JCM is converted to the tradable credit type mechanism.

(4) The JCM covers the period until a possible coming into effect of a new international framework under the UNFCCC.

Refer to “Recent Development of The Joint Crediting Mechanism (JCM)” Japanese Government, 2014,
Governance Scheme of the JCM

Refer to “Recent Development of The Joint Crediting Mechanism (JCM)” Japanese Government, 2014,
Basic Concept for Crediting under the JCM

Emission reduction is determined by;

• Baseline level

• Crediting lifetime

![Graph showing GHG Emission reduction over time with Baseline, Emission Reduction, and Project phases.]
Basic Concept for Crediting under the JCM

JCM ⇒ Emission reduction is determined by:

- Reference level
- Crediting lifetime

BaU Emission
Reference Emission
Determined by Methodology

Emission Reduction (Credits)
Project Emission

Credit Start
Credit End

Reduce the burden of
- Analyzing hypothetical scenarios
- Demonstration of additionality

Increase transparency for calculation of GHG emission reductions.
Reference Emissions

Emission reductions to be credited are defined as the difference between “reference emissions” and project emissions. The 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. This approach will ensure a net decrease and/or avoidance of GHG emissions.

## Documents for the JCM

<table>
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<th>Rules and Guidelines</th>
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<td><strong>Overall</strong></td>
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<tr>
<td>- Rules of Implementation</td>
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<td>- Project Cycle Procedure</td>
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<td>- Glossary of Terms</td>
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<td>- Guidelines for Designation as a Third-Party Entity (TPE guidelines)</td>
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<tr>
<td><strong>Joint Committee</strong></td>
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<tr>
<td>- Rules of Procedures for the Joint Committee (JC rules)</td>
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<td><strong>Methodology</strong></td>
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<tr>
<td>- Guidelines for Developing Proposed Methodology (methodology guidelines)</td>
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<td><strong>Project Procedures</strong></td>
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<tr>
<td>- Developing a PDD</td>
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<td>- Monitoring</td>
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<td>- Validation</td>
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<td>- Verification</td>
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<tr>
<td>- Guidelines for Developing Project Design Document and Monitoring Report (PDD and monitoring guidelines)</td>
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<td>- Guidelines for Validation and Verification (VV guidelines)</td>
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Templates for the JCM

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<tr>
<th>Templates</th>
<th>Methodology</th>
<th>Project Planning</th>
<th>Project Implementation</th>
<th>TPE</th>
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<tr>
<td></td>
<td>• Proposed Methodology Form</td>
<td>• Project Design Document Form</td>
<td>• Post-Registration Changes Request Form</td>
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<td></td>
<td>• Approved Methodology Revision Request Form</td>
<td>• Project Registration Request Form</td>
<td>• Registration Request Withdrawal Form</td>
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<td></td>
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<td>• Proposed Methodology Spreadsheet Form</td>
<td>• Project Withdrawal Request Form</td>
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<td>• Modalities of Communication Statement Form</td>
<td>• Credits Issuance Request Form</td>
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<td></td>
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<td>• Issuance Request Withdrawal Form</td>
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</table>

Refer to “Recent Development of The Joint Crediting Mechanism (JCM)” Japanese Government, 2014,
JCM Project scope

Sectoral Scopes

1. Energy industries (renewable - / non-renewable sources)
2. Energy distribution
3. Energy demand
4. Manufacturing industries
5. Chemical industry
6. Construction
7. Transport
8. Mining/Mineral production
9. Metal production
10. Fugitive emissions from fuels (solid, oil and gas)
11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
12. Solvents use
13. Waste handling and disposal
14. Afforestation and reforestation
15. Agriculture
JCM Japan project (FY2013)

**Mongolia:**
- Wind-Power generation
- Energy efficient housing complex at Ger area
- High efficiency and low loss power transmission and distribution system

**Myanmar:**
- Run-of-river Micro Hydro Power Generation

**Bangladesh:**
- CCGT power generation

**Kenya:**
- Dissemination of Solar lantern

**Kenya, Ethiopia:**
- Micro Hydro power plant

**Djibouti, Rwanda:**
- Geothermal Power Generation

**Vietnam:**
- Highly Efficient Coal Power Plants (Ultra Super Critical)
- Water purification/sludge reduction
- Energy recovery using organic waste
- Wind-Power generation
- Energy saving by inverter air conditioner optimum operation at National Hospital
- Energy saving by BEMS optimum operation at Hotel

**Lao PDR:**
- Energy saving at beer plant
- REDD+

**Indonesia:**
- Biomass Power Generation
- Energy saving stores based on CO2 refrigerant
- REDD+ (4 projects)
- Energy saving by optimum operation at Oil factory
- Utility facility operation optimization technology into Oil factory
- Thin-Film solar power plant

**Thailand:**
- Energy saving at Industrial Estate
- Air Conditioners using CO2 refrigerant

**Mexico:**
- CCS (Carbon dioxide Capture and Storage)

**Peru:**
- REDD+
JCM Japan project (FY2014)

Mongolia:
- High efficiency and low loss power transmission and distribution system (since FY2013)
- FA utilization for Cement manufacture process

Bangladesh:
- CCGT power generation (since FY2013)

Saudi Arabia:
- Solar power generation and gas-fired combined power generation

Kenya:
- Geothermal power generation

Ethiopia, Kenya:
- Mega-solar power generation and Hydro power generation
- Rural electrification without power grid

Ethiopia:
- Bioethanol from molasses

Malaysia:
- Woody biomass power generation
- Medium-size wind power generation

Cambodia:
- Energy efficiency LED streetlight
- Hybrid (solar + diesel) power generation in SEZ (Special Economic Zone)

Myanmar:
- Energy saving at supermarket

Lao PDR:
- Energy efficiency container date center

Vietnam:
- Energy efficiency technologies for steel industry
- Low carbon technology application for eco-city
- Energy efficiency operation for ships
- Installing LED lighting into Fishing vessel
- Energy efficient paper making process
- Energy saving by inverter air conditioner optimum operation at National Hospital (since FY2013)
- Energy saving by BEMS optimum operation at Hotel (since FY2013)
- Ecological convenience store

Indonesia:
- Energy efficiency for mobile communication system
- Low carbon waste treatment
- LNG supply chain development and energy conversion
- REDD+ (6 projects)
- Energy saving by operation at material factory
- Energy efficiency at data center
- CCS
- Energy saving by optimum operation at Oil factory (since FY2013)
- Utility facility operation optimization technology into Oil factory (since FY2013)
- Thin-Film solar power plant (since FY2013)

Mexico:
- Energy efficiency technology in commerce and industrial sector
- Geothermal power plant for IPPs
- Ion exchange membrane in caustic soda and chlorine production
- Energy efficiency beverage and food factory

Costa Rica:
- Mega Solar power generation

Chile:
- Energy efficiency power generation
- Rooftop solar power generation

Maldives:
- Medium-size wind power generation

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2. Registration of Methodology
Implementation of GHG Project

Planning phase

- methodologies
- Development of PDD
- Validation
- Project registration

Project design

Implementation phase

- Monitoring / Calculation
- Monitoring Report
- Verification
- Credits Issuance

Project Activities

Project participants
- TPE
- JC
JCM Methodology

Project design

Select registered methodology

Proponent of methodology
1st Step: Registration of Methodologies

- **Submits a proposed methodology.**
- **Completeness check by Secretariat.** Within 7 calendar days
- **Publicly available for public comments.** 15 calendar days
- **Review the proposed methodology by Secretariat.**
- **Submit the outcomes to the JC.** Within calendar 60 days
- **Conclusion by JC.**
  - Approval
  - Approval with revision
  - Non-approval
- **Publicly available the outcome.** Within 5 calendar days
JCM Methodology

JCM methodology consists of the followings.

- Approved Methodology Document
- Monitoring Spreadsheet
  - Monitoring Plan Sheet (including Input Sheet & Calculation Process Sheet)
  - Monitoring Structure Sheet
  - Monitoring Report Sheet (including Input Sheet & Calculation Process Sheet)

## JCM Methodology

Easily to use for project participants and verifier. To reduce monitoring burden ⇒ default values, conservative manner.

<table>
<thead>
<tr>
<th>Eligibility criteria</th>
<th>• A “check list” will allow easy determination of eligibility of a proposed project under the JCM and applicability of JCM methodologies to the project.</th>
</tr>
</thead>
</table>
| Data (parameter)     | • List of parameters will inform project participants of what data is necessary to calculate GHG emission reductions/removals with JCM methodologies.  
• Default values for specific country and sector are provided beforehand. |
| Calculation          | • Premade spreadsheets will help calculate GHG emission reductions/removals automatically by inputting relevant values for parameters, in accordance with methodologies. |

Refer to “Recent Development of The Joint Crediting Mechanism (JCM)” Japanese Government, 2014,
JCM Methodology

Eligibility criteria;

Criteria 1

The requirements in order to be registered as a JCM project.

Examples,

Regarding the electrolysis of brine, the ion-exchange membrane method is employed in electrolyzers in place of the mercury method. The cation exchange membrane used for this brine electrolysis is a laminate that incorporates a porous base material made of woven fabric, and has either of the following features: (i) surface contour composed of protrusions of the porous base material directed toward the anode side that are at least 1/2 of the thickness of the porous base material, or (ii) grooves on the surface of the laminate’s porous base material.

Criteria 2

The requirements to be able to apply the JCM methodology.

Examples

Power consumption of the existing electrolyzer of mercury method is monitored and the specific electricity consumption of the electrolyzer over the past three years, up to the year previous to the year the draft PDD was submitted for validation, can be calculated.
JCM Methodology

Guidance for

1. Calculation for emission reductions
   • Emission sources
   • Reference emissions
   • Project emissions
   • Emission reductions
   • Data and parameters fixed ex ante

2. Monitoring and reporting.
   • Procedures
   • List of data and parameters monitored
## Registered methodologies (Example)

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Country</th>
<th>Sectoral scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN_AM001</td>
<td>Installation of energy-saving transmission lines in the Mongolian Grid</td>
<td>Mongolia</td>
<td>02</td>
</tr>
<tr>
<td>ID_AM001</td>
<td>Power Generation by Waste Heat Recovery in Cement Industry</td>
<td>Indonesia</td>
<td>01</td>
</tr>
<tr>
<td>ID_AM002</td>
<td>Energy Saving by Introduction of High Efficiency Centrifugal Chiller</td>
<td>Indonesia</td>
<td>03</td>
</tr>
<tr>
<td>ID_AM003</td>
<td>Installation of Energy-efficient Refrigerators Using Natural Refrigerant at Food Industry Cold Storage and Frozen Food Processing Plant</td>
<td>Indonesia</td>
<td>03</td>
</tr>
<tr>
<td>ID_AM004</td>
<td>Installation of Inverter-Type Air Conditioning System for Cooling for Grocery Store</td>
<td>Indonesia</td>
<td>03</td>
</tr>
<tr>
<td>MN_AM002</td>
<td>Replacement and Installation of High Efficiency Heat Only Boiler (HOB) for Hot Water Supply Systems</td>
<td>Mongolia</td>
<td>01</td>
</tr>
<tr>
<td>PW_AM001</td>
<td>Displacement of Grid and Captive Genset Electricity by a Small-scale Solar PV System</td>
<td>Palau</td>
<td>01</td>
</tr>
<tr>
<td>VN_AM001</td>
<td>Transportation energy efficiency activities by installing digital tachograph systems</td>
<td>Viet Nam</td>
<td>07</td>
</tr>
<tr>
<td>VN_AM002</td>
<td>Introduction of Room Air Conditioners Equipped with Inverters</td>
<td>Viet Nam</td>
<td>03</td>
</tr>
<tr>
<td>VN_AM003</td>
<td>Improving the energy efficiency of commercial buildings by utilization of high efficiency equipment</td>
<td>Viet Nam</td>
<td>03</td>
</tr>
<tr>
<td>MV_AM001</td>
<td>Displacement of Grid and Captive Genset Electricity by Solar PV System</td>
<td>Maldives</td>
<td>01</td>
</tr>
</tbody>
</table>
3. PDD and Registration as a JCM project
Reporting of GHG Project

Planning phase

- **methodologies**
  - PDD
    - Emission sources (Boundary)
    - GHG emission reductions
    - Monitoring Plan
- **Validation**
- **Project registration**

Implementation phase

- **Monitoring / Calculation**
- **Monitoring Report**
- **Verification**
- **Credits Issuance**

Project Activities

Project participants

- TPE
- JC
Reporting of GHG Project

1. General description of project
2. Boundary (GHG sources)
3. Baseline scenario
4. Quantifying GHG emission reductions
5. Monitoring Plan
6. Documentation

Admitted as project

Validation

Implementation

Confirm reduction

Verification

9. Monitoring report
   Documentation
   Monitoring

PDD
# Principles of Reporting of GHG Projects

## Principles

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relevance</strong></td>
<td>Select GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user.</td>
</tr>
<tr>
<td><strong>Completeness</strong></td>
<td>Include all relevant GHG emissions and removals. Include all relevant information to support criteria and procedures.</td>
</tr>
<tr>
<td><strong>Consistency</strong></td>
<td>Enable meaningful comparisons in GHG-related information.</td>
</tr>
</tbody>
</table>
Principles of Reporting of GHG Projects

Principles

Accuracy
Reduce bias and uncertainties as far as practical.

Transparency
Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.

Conservativeness
Use conservative assumptions, values and procedures to ensure that GHG emission reductions or removal enhancements are not over-estimated.
2nd Step: PDD development

- Draft PDD and submits to TPE and JC secretariat.
- Issues a unique reference number by JC secretariat
- Publicly available through the JCM website for public comments.
- Validation

Name of the proposed JCM project
Location of the proposed JCM project
Name of all project participants
Name of the TPE for validation
Estimated annual ERs o removals
Name of an approved methodology applied
Proposed starting date and operation period
Project Design Document (PDD)

A. Project Description
B. Application of approved methodology
C. Emission Reduction
D. Environmental impact assessment
E. Local stakeholder consultation

Others,

Refer to “Joint Crediting Mechanism Guidelines for Developing Project Design Document and Monitoring Report”
4th Step: Registration

- Receives a positive opinion from TPE
- Requests for registration
- Publicly available though the JCM website
- Conducts completeness check
- Reviews the submitted documents by PPs.
- Decides whether to register the proposed JCM project

Register | Reject

Within 7 calendar days.

PPs | TPE | JC
4. Monitoring and Issue of Credit
Implementation of GHG Project

**Planning phase**
- Methodologies
- Development of PDD
- Validation
- Project registration

**Implementation phase**
- Monitoring / Calculation
- Monitoring Report
- Verification
- Credits Issuance

Project activities

Project participants
- TPE
- JC

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5th and 6th Step: Monitoring and Report

Conduct monitoring in line with the monitoring plan of the registered PDD

Making a Monitoring Report

- Made by filling cells for data input (ex post) in the Monitoring Report Sheet with monitored values.

- Prepare supporting documents which include evidence for stated values in the cells for data input.
Monitoring

Head office

- Department of project & New Development
  - Check the spread sheet
  - Report of operation
  - Consortium (Japan side)
  - JC (XXX-Japan)

Plant

- Plant Manager
  - Approve
  - Submission
- Environmental Department
  - Calculation of GHG emission reduction with spread sheet
- Maintenance Department
  - Data submission
  - Data Check
  - Activity Data Collection and Aggregation
- Production Department
  - Data submission
  - Data Check
  - Collection of Heat Value and Emission Factor
  - Heat Value
  - Natural Gas: Figure for the provider
  - Emission Factor: Default Value

TPE

Verification

JCM Monitoring Report

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8th Step: Issuance of credits

1. Monitoring and monitoring report.
   Open an account in the registry
2. Verification
3. JCM credits issuance request
5. Decides the amount of credits to be issued.
6. Each side issues the amount of credits in the registry.
7. Make all the data of issuance of credits publicly available through the website.

Within calendar 7 days

PPs
TPE
JC
5 Validation and Verification
Process of GHG projects

Ex-ante
- Project design
  - Emission sources (Boundary)
  - Reference level
  - GHG emission reductions
  - Monitoring Plan

Ex-post
- Project Activities
  - Implementation
    - Monitoring Report
      - Monitoring
      - GHG emission reductions
  - Monitoring Plan

Validation
- Monitoring Plan

Verification
- Emission reduction

Planning
- Project design document
  - Emission sources (Boundary)
  - Reference level
  - GHG emission reductions
  - Monitoring Plan

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Validation

Evaluation of the project design by independent third party.

- Ex-ante assessment (before project activity)
  : Forecast – based on presumption about future.

Verification

Review and determination of project performance/emission reduction by independent third party.

- Ex-post review (after project activity)
  : Based on actual data - verifiable
Validation and Verification

Ex-ante

Project activity

Monitoring Report
- Monitoring
- GHG emission reductions

Implementation

Project design document
- Application of methodology
- Emission sources (Boundary)
- GHG emission reductions
- Monitoring Plan

Ex-post

Opinion

Verification

Credit

Project design

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Validation and Verification

What is Validation? ISO14064-3

Systematic, independent and documented process for the evaluation of a GHG assertion in a GHG project Plan

against agreed validation criteria

(ISO14064-3, 2.32)
Validation and Verification

What is Validation? JCM

Process of independent evaluation of a proposed JCM project by a TPE.

Against these Guidelines

(JCM Guidelines for Validation and Verification, 5)
Validation and Verification

What is Validation?

- JCM rule, guideline
- Methodologies
- and so on

• Validation report

Requirements ➔ Assessment ➔ Report

TPE

- PDD
Validation and Verification

What is Verification? ISO14064-3

Systematic, independent and documented process for the evaluation of a GHG assertion against agreed verification criteria

(ISO14064-3, 2.36)
Validation and Verification

What is Verification? JCM

Periodic independent review, ex post determination of the monitored GHG emissions reductions by a TPE

As a result of a registered JCM project

(JCM Guidelines for Validation and Verification, 6)
Validation and Verification

What is Verification?

Requirements

• PDD
• JCM rule, guideline
• Methodologies
• and so on

Assessment

• Monitoring report

TPE

Report

• Verification report
• (Certification)
Validation and Verification

- **Validation:**
  - More assess on qualitative information; assumptions, justifications etc.
  - Get more evidence through interview with stakeholders

- **Verification:**
  - More assess on quantitative information; monitoring data etc.
  - Confirm implementation of project follows project plan; PDD
Validation and Verification

Planning (project design)

Project Participants

- Project Design Document (PDD) (including Monitoring Spreadsheet)
  - Project description
  - Application of approved methodology
  - Calculation of emission reductions
  - Environmental impact assessment
  - Local stakeholder consultation
  - Monitoring plan (Spreadsheet)
  - Other relevant items

Modalities of Communications (MoC)
- Nomination of focal point
- List of project participants
- Other relevant items

TPE steps for validation

- PDD
- MoC
  (refer to relevant JCM guidelines)

Implementation

Project Participants

- Monitoring Report (MR)
  - Monitoring system
  - Calculation of emission reductions
  - Other relevant items

TPE steps for verification

- Monitoring Report
  (refer to relevant JCM guidelines)

Verification Report
  (use Verification Report Form)