Introduction of Joint Crediting Mechanism (JCM) and potential of JCM model project in Mexico
FY2019 Project formulation to promote JCM (Latin America)

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funded by Ministry of the Environment, Japan

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- Nippon Koei has its own network in Latin-America especially through its subsidiary, Nippon Koei LAC based in Panama. Recently an office in Mexico City was opened (not in the map yet)
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La presencia de NIPPON KOEI LAC en América Latina se ha consolidado desde su creación y actualmente cuenta con presencia en 11 países, con rango de acción en toda América Latina y el Caribe.
2.1 WHAT IS JCM?

- The JCM starts its operation as the non-tradable credit type mechanism.
- Facilitating diffusion of leading low carbon equipment and systems and contributing to sustainable development of partner countries.
- Evaluating GHG emission reductions by measurement, reporting and verification.
- Appropriately evaluating contributions from Japan to GHG emission reductions or removals in a quantitative manner and use them to achieve Japan’s emission reduction target.

Source: MOEJ
2.1  WHAT IS JCM? -JOINT COMMITTEE

**JC Members from the Mexican side**

- Dr. Rodolfo Godínez Rosales  Ministry of Environment and Natural Resources
- Dr. Claudia Alejandra Octaviano Villasana  INECC
- Dr. Juana Itzchel Nieto Ruíz  INECC
- Ms. Yutsil Sanginés Sayavedra  Ministry of Environment and Natural Resources
- Ms. Iris Adriana Jimenez Castillo  Ministry of Environment and Natural Resources
- Ms. Diana Guzman Torres  Ministry of Environment and Natural Resources
- Ms. Patricia Arendar Lerner  INECC
- Mr. Víctor Escalona Gómez  Ministry of Environment and Natural Resources
- Ms. Bárbara Urtaza  Ministry of Environment and Natural Resources

**JC Members from the Japanese side**

- Mr. Ryosuke KUWANA  Embassy of Japan in Mexico
- Mr. Kaoru MAGOSAKI  Ministry of Foreign Affairs
- Mr. Toshiaki NAGATA  Ministry of Economy, Trade and Industry
- Mr. Kazuhisa KOAKUTSU  Ministry of the Environment
- Ms. Naoko TSUKADA  Forestry Agency
- Mr. Yasuaki SHIMADA  Embassy of Japan in Mexico
- Mr. Hiroki ISSHIKI  Embassy of Japan in Mexico
## 2.2 WHAT IS JCM? – FLOW OF PROJECT

<table>
<thead>
<tr>
<th>JCM</th>
<th>CDM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main actors at each process</strong></td>
<td><strong>Project Participant</strong></td>
</tr>
<tr>
<td>Submission of Proposed Methodology</td>
<td><strong>CDM Executive Board</strong></td>
</tr>
<tr>
<td>Approval of Proposed Methodology</td>
<td><strong>Project Participant</strong></td>
</tr>
<tr>
<td>Development of PDD</td>
<td><strong>Designated Operational Entities (DOEs)</strong></td>
</tr>
<tr>
<td>Validation</td>
<td><strong>CDM Executive Board</strong></td>
</tr>
<tr>
<td>Registration</td>
<td><strong>Project Participant</strong></td>
</tr>
<tr>
<td>Monitoring</td>
<td><strong>DOEs</strong></td>
</tr>
<tr>
<td>Verification</td>
<td><strong>CDM Executive Board</strong></td>
</tr>
</tbody>
</table>

**Source**: MOEJ

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*Can be conducted by the same TPE, can be conducted simultaneously*

**Joint Committee**

- JCM
- CDM Executive Board

**Project Participant**

- JCM
- CDM Executive Board

**Third Party Entities**

- JCM
- CDM Executive Board
2.3 WHAT IS JCM SUPPORT?

Contributions from Japan

- Partner Country government & entities
- Japanese government & entities

Financial support

- Select
- Incentivize selecting low-carbon technologies by the financial support to initial cost
- Emission reductions

Conventional equipment & facility
- GHG emissions
- Initial cost

Low-carbon equipment & facility
- GHG emissions
- Initial cost

Credits

Japan will acquire a part of JCM credits (in return to the financial support)

Source: MOEJ
2.3 WHAT IS JCM SUPPORT?

**JCM Model Projects by MOEJ**

Budget for projects starting from FY 2019 is 9.9 billion JPY (approx. USD 99 million) in total by FY2021

(1 USD = 100 JPY)

- Finance part of an investment cost (less than half)
- Conduct MRV and expected to deliver at least half of JCM credits issued

**Government of Japan**

**International consortiums**
(which include Japanese entities)

- Scope of the financing: facilities, equipment, vehicles, etc. which reduce CO2 from fossil fuel combustion as well as construction cost for installing those facilities, etc.
- Eligible Projects: starting installation after the adoption of the financing and finishing installation within three years.

Source: MOEJ
2.3 WHAT IS JCM SUPPORT?

Technologies Transferred through JCM by MOEJ (FY2013-2018)

- Total of **147 JCM Projects** being developed in 17 partner countries
- 48% are **energy efficiency** and 43% are **renewable energy**
- Effective use of Energy, Transport, Waste to energy, F-gas Recovery and Destruction and REDD+ project shares 9%

- **Waste** 2%
  - Waste to Energy

- **Transport** 2%
  - Digital Tachographs
  - Modal Shift
  - CNG-Diesel Hybrid

- **REDD+** 1%
  - Controlling slash and burn

- **F-gas counter measure** 1%
  - Recovery & Destruction

- **Effective Use of Energy** 3%
  - Waste Heat Recovery
  - Gas Co-generation

- **Renewable energy** 43%
  - Solar
  - Micro hydro
  - wind
  - Biomass

As of August 2, 2019
Source: MOEJ
## 2.3 WHAT IS JCM SUPPORT?

### Overview of JCM Model Projects in FY2019

<table>
<thead>
<tr>
<th><strong>Budget</strong></th>
<th>JPY9.9 billion (Approx. USD90million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Executing Entity</strong></td>
<td>International Consortium that consists of a Japanese entity and a JCM partner-country entity (ies)</td>
</tr>
<tr>
<td><strong>Scope of Financing</strong></td>
<td>Facilities, equipment, vehicles, etc. which reduce CO2 from fossil fuel combustion as well as construction cost for installing those facilities, etc.</td>
</tr>
<tr>
<td><strong>Eligible Projects</strong></td>
<td>Start installation after the Contract of Finance is concluded and finish installation within 3 years.</td>
</tr>
<tr>
<td><strong>Maximum percentage of Financial Support</strong></td>
<td>Maximum of 50% and reduce the percentage according to the number of already selected project(s) using a similar technology in each partner country.</td>
</tr>
</tbody>
</table>
|                     | ※ Number of already selected project(s) using a similar technology in each partner country: 
|                     | none (0) = up to 50%, up to 3 (1-3) = up to 40%, more than 3 (>3) = up to 30%. The percentage of financial support will be determined by GEC. |
| **Cost-effectiveness** | Cost-effectiveness of GHG emission reductions is expected to be JPY4,000/tCO2eq or better. |
|                     | ※ If the number of PV projects in a partner country is 5 or more, cost-effectiveness is expected to be JPY3,000/tCO2eq or better. |

Source: GEC
2.3 WHAT IS JCM SUPPORT?

Memorandum of Cooperation between World Bank Group and MOEJ

- Identify suitable WBG programs where the MOEJ could potentially participate through appropriate identified means and jointly develop mitigation outcomes from the projects using the JCM methodology
- Explore the possibility to scale up the JCM projects under the PMR and PMR Successor Program
- Share information on identified candidate programs with the MOEJ to explore and examine potential arrangements of the pilot projects with the JCM including utilization of Measurement, Reporting and Verification ("MRV") methodologies

Source: MOEJ
# 2.4 Outline of JCM Projects in Mexico

- **Signed on**
  
  **July 25, 2014 Mexico – Japan**

<table>
<thead>
<tr>
<th>#</th>
<th>Project Title</th>
<th>Year</th>
<th>Status</th>
<th>Type</th>
<th>Reduction (t-CO2/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction of 2.4MW Power Generation with Methane Gas Recovery System</td>
<td>2016</td>
<td>Installing</td>
<td>Waste Handling and Disposal</td>
<td>122,314</td>
</tr>
<tr>
<td>2</td>
<td>Introduction of Once-through Boiler and Fuel Switching to Tequila Plant</td>
<td>2016</td>
<td>Active</td>
<td>Energy Efficiency</td>
<td>3,435</td>
</tr>
<tr>
<td>3</td>
<td>20MW Solar Power Project in Guanajuato</td>
<td>2017</td>
<td>Installing</td>
<td>Renewable Energy</td>
<td>14,682</td>
</tr>
<tr>
<td>4</td>
<td>30MW Solar Park Project in Guanajuato</td>
<td>2018</td>
<td>Installing</td>
<td>Renewable Energy</td>
<td>36,416</td>
</tr>
<tr>
<td>5</td>
<td>Introduction of Energy Efficient Distillation System to Tequila Plant</td>
<td>2018</td>
<td>Installing</td>
<td>Energy Efficiency</td>
<td>1,493</td>
</tr>
<tr>
<td>6</td>
<td>30MW Solar Power Project in La Paz city</td>
<td>2019</td>
<td>Installing</td>
<td>Renewable Energy</td>
<td>36,807</td>
</tr>
</tbody>
</table>

*Source: GEC*
ON-GOING JCM MODEL PROJECTS IN MEXICO

<table>
<thead>
<tr>
<th>#</th>
<th>Project Title</th>
<th>Year</th>
<th>Entity (Representative company)</th>
<th>Status</th>
<th>Type</th>
</tr>
</thead>
</table>

**Outline of the Project:**

These solar power projects contribute to the achievement of Mexico’s policy for a Clean Energy ratio target of 35% by 2024. Project #3 is installed solar trackers to maximize the power generation.

**Location:**

#3 & #4 @Guanajuato  
#6 @ La Paz city

**Expected GHG Emission Reductions**

87,905 tCO2/year in total
### ON-GOING JCM MODEL PROJECTS IN MEXICO

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<thead>
<tr>
<th>#</th>
<th>Project Title</th>
<th>Year</th>
<th>Entity (Representative company)</th>
<th>Status</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Introduction of 2.4MW Power Generation with Methane Gas Recovery System</strong></td>
<td>2016</td>
<td>NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.</td>
<td>Installing</td>
<td>Waste Handling and Disposal</td>
</tr>
</tbody>
</table>

**Outline of the Project:**
This project is **power generation by gas engine using collected methane gas from landfill at two landfill sites** in Mexico. The methane gas recovery system consists of recovery wells, pipelines, gas filters, gas engine generator and transformer. Captured methane gas is transported to the gas engine power generation facilities through pipelines and filters. Electricity generated from the gas engine generator will be sold under long-term PPAs with local municipality. GHG emission reductions are achieved by replacement of grid electricity and avoidance of methane emission from landfill sites.

**Location:**
![Map of Mexico](image)

**Partner Participant:**
- MGM Metano Mexicano, S. de R.L. de C.V.
- Energreen Holdings, S.A.P.I. de C.V.

**Expected GHG Emission Reductions**
*122,314 tCO2/year*
### ON-GOING JCM MODEL PROJECTS IN MEXICO

<table>
<thead>
<tr>
<th>#</th>
<th>Project Title</th>
<th>Year</th>
<th>Entity (Representative company)</th>
<th>Status</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Introduction of Once-through Boiler and Fuel Switching to Tequila Plant</td>
<td>2016</td>
<td>Suntory Spirits Limited</td>
<td>Active</td>
<td>Energy Efficiency</td>
</tr>
</tbody>
</table>

**Outline of the Project:**
In this project, **Once-through boilers** will be installed instead of the existing fire tube boilers at Tequila Plant in Mexico. This project aims to improve boiler efficiency itself and to reduce the loss when the boilers startup and are low loading. This project also aims to reduce about 30% CO2 emission **by fuel switching from oil to natural gas.**

**Location:**

![Map of Mexico showing the location of Tequila Plant](map.png)

**Partner Participant:**
Tequila Sauza S. de R.L. de C.V.

**Expected GHG Emission Reductions:**

3,435 tCO2/year
On-going JCM Model Projects in Mexico

<table>
<thead>
<tr>
<th>#</th>
<th>Project Title</th>
<th>Year</th>
<th>Entity (Representative company)</th>
<th>Status</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Introduction of Energy Efficient Distillation System to Tequila Plant</td>
<td>2018</td>
<td>Suntory Spirits Ltd.</td>
<td>Installing</td>
<td>Energy Efficiency</td>
</tr>
</tbody>
</table>

Outline of the Project:
Tequila Sauza joined Suntory group in 2014, introduces **energy saving distillation system** to reduce the steam in distillation process. Distillation of tequila needs large amount of steam. In this project, half of steam reduction is estimated.

Introduced technology:

```
Distillation Column A (Compressed)  Condenser/Reboiler  Distillation Column B (Vacuum)
Fermented Beer                      Steam
                                        Product
Steam can be reduced by recovering heat from next column
```

Location:

Partner Participant: Tequila Sauza

Expected GHG Emission Reductions

**1,493 tCO2/year**
2.5 Target of CO2 reduction in Mexico

- In 21/09/2016, Mexico voluntarily pledged to reduce GHG emissions and NDC (nationally determined contribution) was submitted to UNFCCC based on Paris Agreement as follows.
- It is targeted that emissions intensity per unit of GDP will reduce by around 40% from 2013 to 2030 (unconditional reduction)

<table>
<thead>
<tr>
<th>Target</th>
<th>By 2030</th>
<th>(CO2)</th>
<th>(Black Carbon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconditional reduction</td>
<td>25%</td>
<td>(22%)</td>
<td>(51%)</td>
</tr>
<tr>
<td>Conditional reduction with international support</td>
<td>40%</td>
<td>(36%)</td>
<td>(70%)</td>
</tr>
</tbody>
</table>

*reduction target is set based on Business as Usual (BaU) scenario projection from 2013*
3 NIPPON KOEI’S EXPERIENCES IN JCM

- Supported the project formation, methodology development and registration of the 1st JCM project in the world (Energy Saving for Air-conditioning and Process Cooling at Textile Factory, in Indonesia)

<table>
<thead>
<tr>
<th>Country</th>
<th>Project Study</th>
<th>Project Formulated</th>
<th>Methodology</th>
<th>Project registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Yes</td>
<td>Yes</td>
<td>On going</td>
<td>On going</td>
</tr>
<tr>
<td>Thailand</td>
<td>Yes</td>
<td>Yes</td>
<td>On going</td>
<td>On going</td>
</tr>
<tr>
<td>Philippines</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td>On going</td>
</tr>
<tr>
<td>Chile</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>Yes</td>
<td>Yes</td>
<td>On going</td>
<td>On going</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Yes</td>
<td></td>
<td>On going</td>
<td></td>
</tr>
<tr>
<td>Maldives</td>
<td>Yes</td>
<td></td>
<td>On going</td>
<td>On going</td>
</tr>
<tr>
<td>Kenya</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Chillers (HVAC)
- Boilers
- PV+EMS+Battery
- Biomass power plant, etc.
Replacing a conventional burner with a high-efficiency regenerative burner for an aluminum holding furnace improves energy saving and reduces GHG emissions. YPMI has an aluminum wheel die casting line with 11 crucible type holding furnaces. Local furnace manufacturer PT. Matahari replaces and modifies the furnaces supervised by the branch of Japanese furnace manufacturer Hokuriku Techno. PT. Matahari acquires sophisticated furnace design and manufacturing knowhow of regenerative burner furnaces and their tuning/maintenance techniques.

Expected GHG Emission Reductions

857 tCO2/year

Sites of JCM Model Project

Kawasan Industri KIIC,
Karawang, West Java, Indonesia
The project aims to reduce electricity consumption in the shopping mall through introducing advanced & efficient Japanese centrifugal Chiller system.

The project is to replace existing central cooling system with high efficient centrifugal chiller with capacity of 966USRT x 4 sets and 569USRT x 1 set in Pakuwon’s shopping mall, Tunjungan Plaza, as well as to replace existing 8 cooling towers with efficient Japanese models.

Expected GHG Emission Reductions

996 tCO2/year
The proposed project is planned to introduce a waste heat recovery (WHR) boiler steam turbine generator system at an existing cement production plant (PT Semen Indonesia, Tuban Plant) located in Tuban, East Java, Indonesia. The WHR system utilizes waste heat currently emitted from the cement factory without utilization. WHR boilers generate steam using the waste heat exhausted from the cement plant, and the steam is fed to the steam turbine generator to generate electricity.

Expected GHG Emission Reductions

149,063 tCO2/year

Sites of JCM Model Project

Tuban, East Java, Indonesia
5 PROJECT DEVELOPMENT IN MEXICO

To develop feasible JCM projects

1. **GHG reduction**: From fossil fuel combustion needs to be reduced, and more than 1,000 tCO$_2$/yr reduction (indicatively) is expected.

**Emission Reduction**

\[
\text{Emission Reduction} = \text{Emission of Reference Scenario} - \text{Emission of Project Scenario}
\]

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Energy Efficiency (EE)</th>
<th>Renewable Energy (RE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BaU</td>
<td>Existing Equipment</td>
<td>n.a.</td>
</tr>
<tr>
<td>Reference</td>
<td>- New equipment normally in the market</td>
<td>Energy produced at conservative grid emission factor</td>
</tr>
<tr>
<td></td>
<td>- Conservative emission factor of fuel</td>
<td></td>
</tr>
<tr>
<td>Project</td>
<td>New equipment to be installed with support</td>
<td>Zero emission</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission Factor</th>
<th>EE, Other case</th>
<th>EE, Self diesel generation only</th>
<th>RE, Other case</th>
<th>RE, Self Diesel generation only</th>
</tr>
</thead>
<tbody>
<tr>
<td>tCO$_2$/MWh</td>
<td>0.528</td>
<td>0.8</td>
<td>0.434</td>
<td>0.533</td>
</tr>
</tbody>
</table>
5 PROJECT DEVELOPMENT IN MEXICO

To develop feasible JCM projects

2. **Maximum subsidy amount:** Smallest among

- GHG reduction (tCO2/yr) x Project duration (yr) x 35 USD/tCO2
- 50% of the cost of core technology to reduce GHG (it will decrease up to 30% in accordance with the approved projects in each country)
- 18 million USD

- Project duration will be set in accordance with Japanese law of Ministry of Finance (ex. 17 yrs for PV, 10 years for food industry)

- 0.5 million USD of subsidy is minimum preferred project scale
- With subsidy, pay-back period should be more than 3 years
5 PROJECT DEVELOPMENT IN MEXICO

To develop feasible JCM projects

3. Partnering with Japanese company: To apply JCM model project, at least one Japanese and one Mexican entity shall form an international consortium.

**International Consortium**

**Japanese Entity**
- Management of JCM model project
- Reporting of monitoring result

**Mexican Entity**
- Site supervision of high-efficiency equipment
- Progress management
- Monitoring

**Ministry of the Environment, Japan (MOEJ)**
- Application
- Subsidy

**Manufacturer**
- Order
- Supply

**Contractor/Supplier**
- Order
- Installation

Joint Implementation
To develop feasible JCM projects

4. Schedule

- **Application period:** From April to November 2020
- **Preliminary selection:** 1 month after the application
- **Official Approval:** Within 3 months after the preliminary selection

- **Start of Project:** After official approval
- **Installation needs to be completed within 2.5 years** (plus 1 year as maximum)
- **Subsidy application:** Every end of Japanese fiscal year (1st application: February - March 2021)
- **Payment of subsidy:** 2-3 months after submission of docs

- **Issuing JCM carbon credit with measuring, reporting, and verification (MRV) process.**
- **This process will be supported by a Japanese consultant**
6 CONSULTING SERVICE BY NIPPON KOEI

Please provide following information to consult with us

1. Project information
   ✓ Project duration (yr) will be set by Japanese law based on the project type with applied technology
   ✓ Project cost with economic analysis (pay-back and/or IRR)

2. Type of GHG reduction
   ✓ A) Energy saving: The original power source is from the grid or the power generated by the project owner
   ✓ B) Renewable energy: power is injected to the grid, or is solely used for self consumption

3. Calculation of CO₂(GHG) reduction
   ✓ Annually saved energy (MWh or fossil fuel amount), or
   ✓ Annually generated renewable energy (MWh)
6 CONSULTING SERVICE BY NIPPON KOEI

Please provide following information to consult with us

4. Project process
   ✓ Necessary permissions and the plan to obtain them
   ✓ Progress of internal decision on investment for the project
     (possibly with the condition of receiving subsidy)

5. Relationship with Japanese companies
   ✓ Potential Japanese partner (Nippon Koei may support)
   ✓ Potential provider for leading low carbon technologies

6. Project schedule
   ✓ Next call for proposal: Apr-Nov 2020 (Tentative)
   ✓ Official selection: Several month after submission (Contract with EPC and purchase order can be made after this timing)
   ✓ The project completion: By the end of Jan 2024 (Max)
6 CONSULTING SERVICE BY NIPPON KOEI

Schedule for 2020
(Tentative, to be officially announced in March 2020)

Call for proposal (tentative): Apr-Nov 2020 until budget ends

Model case:
May: Submission of proposal
July: Initial notification of selection
Sept-Oct: Official contract and start of the model project

*the procurement will be eligible for the subsidy only if the contract or purchase order is made after the official contract signing
6  CONSULTING SERVICE BY NIPPON KOEI

Please feel free to send e-mail to following address

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Lina Silva (Ms.), lsilva@sherpasgroup.cl

Muchas gracias!!