MOEJ’s support scheme under the JCM and its case studies

Seminar on Low Carbon Technologies
At the Regional Environmental Center for Central and Eastern Europe (REC)
Monday 6, July 2015
Szentendre, HUNGARY

Sota SEKINE, Tokyo Office
Global Environment Centre Foundation (GEC) as the Secretariat of the JCM Financing Programme
Background

Joint Crediting Mechanism (JCM):
• One of various approaches based on Decision 1/CP.18, jointly developed and implemented by Japan and partner countries, and Japan intends to contribute to elaborating the framework for such approaches under the UNFCCC.

JCM Promotion Scheme by MOEJ
• The Ministry of the Environment Japan (MOEJ) launched:
  – Financing Programme for JCM Model Projects;
  – Feasibility Studies for elaborating investment plan on JCM projects;
  – Capacity Building Programmes for the JCM.

Global Environment Centre Foundation (GEC):
• The Secretariat of Financing Programme and Feasibility Study Programme for the JCM, commissioned by the MOEJ
Financing Programme and Study Programme for JCM Project (FY 2015)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>JCM Study Programme</th>
<th>JCM Financing Programme for “Leapfrog” development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Details</td>
<td>The following studies are carried out to assess the feasibility of implementing projects in developing countries to reduce CO(_2) emissions using advanced technologies. I. JCM Project Planning Studies (PS) II. JCM Feasibility Studies (FS)</td>
<td>Up to 50% of initial investment costs is financed by Government of Japan to international consortiums that carry out projects to introduce equipment or facilities in order to reduce CO(_2) emissions from energy sources in both current and future JCM partner countries.</td>
</tr>
</tbody>
</table>
Study Programme for JCM Project

Objectives:

To elaborate investment plan on JCM projects, and investigate feasibility on potential JCM projects

Type of studies

- JCM Project Planning Study (PS)
  - To develop a JCM Project for the next fiscal year
- JCM Feasibility Study (FS)
  - To survey feasibility of potential JCM projects
Overview of JCM Planning/Feasibility Studies in 2014 by MOEJ

Mongolia:
◆ 10MW-scale Solar Power Generation for Stable Power Supply
◆ Efficiency Improvement of Combined Heat and Power Plant by Thermal Insulation

Bangladesh:
◆ Saving Energy through the installation of High efficiency Air Jet Loom in weaving field
◆ Waste Heat Recovery and Utilization in Textile and Garment Factories

Sri Lanka:
◆ 10MW-scale Biomass based Power Generation

Maldives:
◆ Installation of Solar PV and Storage Battery with Energy Management System (EMS)

Ethiopia:
◆ 20MW-scale Geothermal Power Generation

Kenya:
◆ Energy Saving by Micro Flush Toilet

Myanmar:
◆ Introduction of Waste to Energy Plant in Yangon City
◆ Environment Improvement through Utilization of Biogas from POME Fermentation System

Vietnam:
◆ Introduction of Energy-from-Waste Project in Ho Chi Minh City
◆ Saving Energy by introducing optimum pumps in water purification plant
◆ Energy Saving for Irrigation Facility by Introducing High-efficiency Pumps
◆ 40MW-scale Hydro Power Generation in Lao Cai Province
◆ Recovery and Utilization of Biogas from Mixed-treatment of Waste and Septage
◆ Introduction of Co-generation System Using Bagasse in Sugar Factory

Lao PDR:
◆ Biomass Utilization in Cement Kiln

Cambodia:
◆ Energy Saving by Efficiency Improvement of Water Treatment Plants of Phnom Penh Water Supply Authority

Palau:
◆ Solar Power Generation System

Costa Rica:
◆ Promotion of Electric Vehicle for Taxi Usage

Indonesia:
◆ Installation of Combined Heat and Power System in Hotel
◆ Waste Heat Recovery and Electricity Generation in Flat Glass Production Plant
◆ Introduction of High Efficient Old Corrugated Cartons Process at Paper Factory
◆ 3.7MW Run-of-river Hydro Power Generation in Sulawesi
## Financing Programme for JCM Model Project

| Budget for FY 2015 | 2.4 billion JPY (approx. USD18 million) per year by FY2017 (total 7.2 billion JPY) (3.6 billion JPY) |
| Scheme | To finance the projects (up to the half of an investment cost) which have the high efficiency of reducing GHG emission |

## Financing Programme for JCM Model Project in collaboration with JICA and other related institutes

| Budget for FY 2015 | 1.8 billion JPY (approx. USD18 million) per year by FY2018 (total 7.2 billion JPY) (4.2 billion JPY) |
| Scheme | To finance the projects (up to the half of an investment cost) which have the high efficiency of reducing GHG emission in collaboration with projects supported by JICA and other governmental-affiliated financial institutes. |

## ADB Trust Fund

| Budget for FY 2015 | 1.8 billion JPY (approx. USD18 million) |
| Scheme | To provide the financial incentives for the adoption of the advanced low-carbon technologies which are superior in GHG emission reduction but expensive in ADB-financed projects. |
Support Program Enabling “Leapfrog” Development (Finance/ADB) by MOE

- **MOEJ**
- **JICA, others**
- **GEC**
- **ADB Trust Fund**
- **JCM Project**

Financial assistance/financial investments for overseas investment and lending

Collaboration

Supported Project by JICA, etc.

Advanced Low Carbon Technologies

Advanced Low Carbon Technologies

Advanced Low Carbon Technologies

ADB Project

GHG Emission Reduction

Contribution Finance
Government of Japan

Finance part of an investment cost (up to the half)

International consortiums (which include Japanese entities)

Conduct MRV and expected to deliver at least half of JCM credits issued

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 planned period.
JCM Financing programs by MOEJ (FY2013/2014/2015)

Thailand:
- Energy Saving at Convenience Stores with High Efficiency Air-Conditioning and Refrigerated Showcase
- Introduction of Solar PV System on Factory Rooftop
- Reducing GHG Emission at Textile Factory by Upgrading to Air-saving Loom (Samutprakan)
- Energy Saving for Semiconductor Factory with High Efficiency Centrifugal Chiller and Compressor

Mongolia:
- Upgrading and Installation of Centralized Control System of High-Efficiency Heat Only Boiler (HOB)*

Indonesia:
- Energy Saving for Air-Conditioning and Process Cooling at Textile Factory (in Batang city)
- Energy Savings at Convenience Stores
- Energy Efficient Refrigerants to Cold Chain Industry
- Energy Saving by Double Bundle-Type Heat Pump at Beverage Plant
- Energy Saving for Air-Conditioning and Process Cooling at Textile Factory
- Power Generation by Waste Heat Recovery in Cement Industry
- Solar Power Hybrid System Installation to Existing Base Transceiver Stations in Off-grid Area
- Energy Saving through Introduction of Regenerative Burners to the Aluminum Holding Furnace of the Automotive Components Manufacturer
- Energy Saving for Textile Factory Facility Cooling by High Efficiency Centrifugal Chiller
- Introduction of high efficient Old Corrugated Cartons Process at Paper Factory
- Reducing GHG emission at textile factories by upgrading to air-saving loom
- Installation of Cogeneration System in Hotel
- Energy Saving by Utilizing Waste Heat at Hotel
- Energy Saving for Air-Conditioning at Shopping Mall with High Efficiency Centrifugal Chiller
- Energy Saving for Industrial Park with Smart LED Street Lighting System
- Energy Saving for Office Building with High Efficiency Water Cooled Air-Conditioning Unit
- Introduction of High Efficiency Once-through Boiler System in Film Factory

Bangladesh:
- Energy Saving for Air Conditioning & Facility Cooling by High Efficiency Centrifugal Chiller (Suburbs of Dhaka)
- Installation of High Efficiency Loom at Weaving Factory
- Introduction of PV-diesel Hybrid System at Fastening Manufacturing Plant

Cambodia:
- Introduction of High Efficiency LED Lighting Utilizing Wireless Network

Maldives:
- Solar Power on Rooftop of School Building Project
- Smart Micro-Grid System for POISED Project in Addu Atoll

Pakistan:
- Small-Scale Solar Power Plant for Commercial Facilities in Island States Project
- Small-Scale Solar Power Plants for Commercial Facilities Project II
- Solar PV System for Schools Project

Kenya:
- Solar Diesel Abatement Projects

Mexico:
- Domo de San Pedro II Geothermal Power Generation
- Energy Saving by Converting from Hg-Cell Process to Ion-exchange Membrane Process at Chlorine Production Plant

Myanmar:
- Introduction of Waste to Energy Plant in Yangon City

Viet Nam:
- Anaerobic Digestion of Organic Waste for Biogas Utilization at Market
- Eco-driving with the Use of Digital Tachographs
- Introduction of amorphous high efficiency transformers in power distribution systems
- Introduction of High Efficiency Air-conditioning in Hotel
- Energy Saving in Lens Factory with Energy Efficient Air-Conditioners

Malaysia:
- PV power generation and relevant monitoring system for the office building
- Model project in FY 2013 (3 countries, 7 projects)
- Model project in FY 2014 (7 countries, 15 projects)
- ADB project in FY 2014 (1 country, 1 project)
- Model project in FY 2015 (7 countries, 18 projects)

Total 12 countries, 41 projects

- The underlined projects have been registered as the JCM projects (6 projects)
- these projects account for 2 registered JCM projects respectively, as they’re operating in different sites
Typical Sectors for JCM Projects

- Renewable Energy
- Energy Saving
- Waste Handling & Disposal
- Transport
## Registered Projects under the JCM 1/2 (as of July. 3 2015)

<table>
<thead>
<tr>
<th>Country</th>
<th>Reference number</th>
<th>Project title</th>
<th>Emission Reductions(Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>ID001</td>
<td>Energy Saving for Air-Conditioning and Process Cooling by Introducing High-efficiency Centrifugal Chiller</td>
<td>114 tCO₂/year</td>
</tr>
<tr>
<td>Indonesia</td>
<td>ID002</td>
<td>Project of Introducing High Efficiency Refrigerator to a Food Industry Cold Storage in Indonesia</td>
<td>120 tCO₂/year</td>
</tr>
<tr>
<td>Indonesia</td>
<td>ID003</td>
<td>Project of Introducing High Efficiency Refrigerator to a Frozen Food Processing Plant in Indonesia</td>
<td>21 tCO₂/year</td>
</tr>
<tr>
<td>Palau</td>
<td>PW001</td>
<td>Small scale solar power plants for commercial facilities in island states</td>
<td>227 tCO₂/year</td>
</tr>
</tbody>
</table>
# Registered Projects under the JCM 2/2  (as of July. 3 2015)

<table>
<thead>
<tr>
<th>Country</th>
<th>Reference number</th>
<th>Project title</th>
<th>Emission Reductions(Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mongolia</td>
<td>MN001</td>
<td>Installation of high-efficiency Heat Only Boilers in 118th School of Ulaanbaatar City Project</td>
<td>92 tCO2</td>
</tr>
<tr>
<td>Mongolia</td>
<td>MN002</td>
<td>Centralization of heat supply system by installation of high-efficiency Heat Only Boilers in Bornuur soum Project</td>
<td>206 tCO2</td>
</tr>
</tbody>
</table>

Manufactured by CARBOROBOT (Hungary)  
Manufactured by EKOEFEEKT (Czech)
Energy Saving for Air-Conditioning and Process Cooling by Introducing High-efficiency Centrifugal Chiller

Project Owner
Japan: Ebara Refrigeration Equipment & Systems and Nippon Koei Co., Ltd.
Indonesia: PT. Primatexco and PT. Ebara Indonesia

In Indonesia, humidity control is indispensable for the textile industry to maintain product quality and massive energy output, which is required for the adjustment of factory air conditioning. The target factory replaces old-fashioned chillers (230USRt and 250USRt) with high-efficiency chillers (500USRt), in order to save energy and mitigate CO₂ emissions. High-efficiency chillers adopt a high-performance economizer cycle and a super-cooling refrigerant cycle in order to save energy. Also, the chillers use low-pressure refrigerant (HFC-245fa) with zero ODP (Ozone Depletion Potential).
JCM Registered Project 2

- Project of Introducing High Efficiency Refrigerator to a Food Industry Cold Storage in Indonesia
- Project of Introducing High Efficiency Refrigerator to a Frozen Food Processing Plant in Indonesia

**Project Owner**

Japan: Mayekawa Manufacturing Co., Ltd.
Indonesia: PT. Adib Global Food Supplies, PT. Mayekawa Indonesia

The advanced energy efficient cooling system using natural refrigerant (NH₃ and CO₂) is introduced into the food industry and logistics industry in Indonesia, where energy consumption is very high, demonstrating its high energy saving impact as well as a large amount of GHG emission reductions.

A screw compressor and an IPM (interior permanent magnet synchronous) motor are adopted and operated integrally, to achieve highly efficient operation of the cooling facility.

**Expected GHG Emission Reductions**

120+21 tCO₂/year

Bekasi, West Java & Karawang, West Java, Indonesia
Small Scale Solar Power Plants for Commercial Facilities in Island States

Project Owner
Japan: Pacific Consultants Co., Ltd., InterAct Inc.
Palau: Western Caroline Trading Company, Surangel and Sons Company, Melekau Environmental Consulting

A grid-connected photovoltaic (PV) system is installed on the rooftops of commercial facilities (220.5kW on a warehouse in Subproject 1 and 150kW on a supercenter building in Subproject 2). This project uses high quality PV modules of a Japanese manufacturer and general-purpose inverters with easy maintenance suitable for small-scale applications. The power generated by the PV system is normally consumed in-house. When there is a surplus, it is supplied to grid. Taking into account the recent large typhoons, PV modules with strong wind resistance are introduced.

Expected GHG Emission Reductions
227 tCO₂/year
Centralization of heat supply system by installation of high-efficiency Heat Only Boilers in Bornuur soum Project

Installation of high-efficiency Heat Only Boilers in 118th School of Ulaanbaatar City Project

**Project Owner**
Japan: Suuri-Keikaku
Mongolia: Anu-Service

This JCM model project consists of two model sites: Bornuur sum in a rural area and the 118th School in Ulaanbaatar City.

The Bornuur sum project includes the installation of heat only boilers (HOBs) as well as pipe laying work, electrical construction and boiler building construction. This project alters the current heat supply system in Bornuur sum of individual building-based heating, under which low efficiency HOBs and stoves are used. The centralized control system of high-efficiency HOBs is installed in this project. The improvement of boiler efficiency brings about a reduction of coal consumption to reduce CO₂ emissions and other air pollutants.

The other project is the replacement of low-efficiency, old-type boilers with the latest high-efficiency model boilers at the 118th School in Ulaanbaatar City. This project also leads to the reduction of coal consumption to mitigate CO₂ emissions as well as air pollutants.
### Proposed Projects under the JCM (as of July 3, 2015)

<table>
<thead>
<tr>
<th>Country</th>
<th>Project title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td>Eco-Driving by Utilizing Digital Tachograph System</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status</th>
<th>Reference number</th>
<th>Public comments</th>
<th>Emission Reductions (Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open for public inputs</td>
<td>VN001</td>
<td>12 Jun 15 - 11 Jul 15</td>
<td>413 tCO2</td>
</tr>
</tbody>
</table>
Project Owner
Japan: NIPPON EXPRESS
Vietnam: NIPPON EXPRESS (VIETNAM)

In this project, 130 trucks in use by NIPPON EXPRESS (VIETNAM) are fitted with an eco-drive improving system using digital tachographs, so that the quantity of fuel consumption, running distance and relevant data on driving behavior of drivers are continuously analyzed with cloud network in Binh Duong and Hanoi city, Vietnam.

The drivers are given advice in order to improve their driving behavior based on the analyzed data, and feedback linked to the training outcome is provided for further improving the driving behavior.

This project contributes to realizing improvement of transportation quality as well as fuel efficiency, which is directly linked with reduction in CO₂ emissions.
# Possible JCM Projects (Renewable Energy)

<table>
<thead>
<tr>
<th>Country</th>
<th>Title</th>
<th>Type of Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maldives</td>
<td>Solar Power on Rooftop of School Building Project</td>
<td>JCM Model Project</td>
</tr>
<tr>
<td>Mexico</td>
<td>Domo de San Pedro II Geothermal Power Generation</td>
<td>JCM Model Project</td>
</tr>
<tr>
<td>Vietnam</td>
<td>40MW-scale Hydro Power Generation in Lao Cai Province</td>
<td>JCM Feasibility Study</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>20MW-scale Geothermal Power Generation</td>
<td>JCM Feasibility Study</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>10MW-scale Biomass based Power Generation</td>
<td>JCM Feasibility Study</td>
</tr>
</tbody>
</table>

Utilization of solar heat for power generation or desalination can also be future JCM project.
### Possible JCM Projects (Energy Saving)

<table>
<thead>
<tr>
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<th>Title</th>
<th>Type of Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>Energy Saving for Industrial Park with Smart LED Street Lighting System</td>
<td>JCM Model Project</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Installation of Cogeneration System in a Hotel</td>
<td>JCM Model Project</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Energy Saving for Air Conditioning &amp; Facility Cooling by High Efficiency Centrifugal Chiller (Suburbs of Dhaka)</td>
<td>JCM Model Project</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Saving Energy through the installation of High efficiency Air Jet Loom in weaving field</td>
<td>JCM Project Planning Study</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Saving Energy by introducing optimum pumps in water purification plant</td>
<td>JCM Feasibility Study</td>
</tr>
</tbody>
</table>

BEMS and CEMS related project (ex. Introduction of energy management system for efficient use and supply of power in the scale of building or community) can be future JCM project.
## Possible JCM Projects (Waste handling & Disposal)

<table>
<thead>
<tr>
<th>Country</th>
<th>Title</th>
<th>Type of Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td>Anaerobic Digestion of Organic Waste for Biogas Utilization at Market</td>
<td>JCM Model Project</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Introduction of Waste to Energy Plant in Yangon City</td>
<td>JCM Model Project</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Introduction of Energy-from-Waste Project in Ho Chi Minh City</td>
<td>JCM Project Planning Study</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Introduction of Co-generation System Using Bagasse in Sugar Factory</td>
<td>JCM Feasibility Study</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Introducing Advanced Digestion Plant for Wastewater Treatment Process</td>
<td>JCM Feasibility Study</td>
</tr>
</tbody>
</table>
Possible JCM Projects (Transport)

<table>
<thead>
<tr>
<th>Country</th>
<th>Title</th>
<th>Type of Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costa Rica</td>
<td>Promotion of Electric Vehicle for Taxi Usage</td>
<td>JCM Feasibility Study</td>
</tr>
<tr>
<td>Laos</td>
<td>Promotion of Electric Vehicle Usage</td>
<td>JCM Feasibility Study</td>
</tr>
<tr>
<td>Thailand</td>
<td>Improvement of passenger transport efficiency with urban MRT network</td>
<td>JCM Feasibility Study</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Promotion of public transportation usage through Park-and-Drive and</td>
<td>JCM Feasibility Study</td>
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<td></td>
<td>Eco Point systems in collaboration with private commercial facilities</td>
<td></td>
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</tbody>
</table>

Introduction of inverter technology to convert regenerative energy from electric train to AC electricity will be studied to formulate JCM projects in the railway sector.
### Outreach: Side Event and Publications

- **COP20 in Lima, Peru in Dec. 2014**
  - "Actions for low carbon development in developing countries through the Joint Crediting Mechanism"
  - MOEJ, GEC, OECC, Cambodia, Indonesia, Lao PDR, Mongolia, Palau and Vietnam

- **SB42 in Bonn, Germany in June 2015**
  - "The Joint Crediting Mechanism (JCM): Results and current progress of project implementation"
  - MOEJ, GEC, OECC, UNFCCC, Indonesia, Palau, Thailand and Vietnam
Reference:

- Outlines of each JCM Model Project and feasibility study are summarized at GEC website on JCM <http://gec.jp/jcm/>.