Progress of
The Joint Crediting Mechanism (JCM)
In Indonesia
August 2016

The JCM Project information provided by the participant companies

JCM Indonesia Website : http://jcm.ekon.go.id
# Table of Contents

## What is the JCM?

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. History of the JCM in Indonesia</td>
<td>3</td>
</tr>
<tr>
<td>B. Basic Concept of the JCM Cooperation between Japan and Indonesia</td>
<td>4</td>
</tr>
<tr>
<td>C. MRV Methodology</td>
<td>5</td>
</tr>
<tr>
<td>D. Project Cycle of the JCM</td>
<td>5</td>
</tr>
</tbody>
</table>

## JCM Promotion Scheme

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Financing Programme for JCM Model Projects by MOEJ</td>
<td>7</td>
</tr>
<tr>
<td>B. Promotion Scheme for JCM Demonstration Projects by METI/NEDO</td>
<td>7</td>
</tr>
<tr>
<td>C. New Support Program Enabling “Leapfrog” Development (Fund/ADB) by MOEJ</td>
<td>8</td>
</tr>
<tr>
<td>D. JCM REDD+ Model Projects by MOEJ</td>
<td>9</td>
</tr>
<tr>
<td>E. JCM Feasibility Study (FS) by MOEJ and METI/NEDO</td>
<td>9</td>
</tr>
</tbody>
</table>

## Ongoing JCM Projects in 2016

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sectoral Scope</td>
<td>11</td>
</tr>
<tr>
<td>A. JCM Model Project</td>
<td>12</td>
</tr>
<tr>
<td>B. JCM REDD+ Model Project</td>
<td>21</td>
</tr>
<tr>
<td>C. JCM Demonstration Project</td>
<td>22</td>
</tr>
<tr>
<td>D. JCM Registered Project</td>
<td>24</td>
</tr>
<tr>
<td>E. JCM Credit Issuance</td>
<td>28</td>
</tr>
</tbody>
</table>

MOEJ : Ministry of Environment of Japan  
METI : Ministry of Economy, Trade and Industry of Japan  
NEDO : New Energy and Industrial Technology Development Organization  
ADB : Asian Development Bank
What is the JCM?

The Joint Crediting Mechanism (JCM) encourages cooperation between Japanese and Indonesian institutions to promote implementation of low carbon development activities in Indonesia.

A History of the JCM in Indonesia

- 2010: Initial discussions between National Council on Climate Change of Indonesia as JCM focal point and Japanese Government Delegation
- 2011: Formal meeting on the JCM between National Council on Climate Change of Indonesia and related ministries and Japanese Government Delegation
- 2012: Establishment of Coordination Team for Inter-State Carbon Trade Negotiation (Tim Koordinasi Perundingan Perdagangan Karbon Antarnegara (TKPPKA))
- 2013: Signing on JCM Cooperation between the Governments of Indonesia and Japan, and establishment of JCM Joint Committee consisting of members from Indonesia and Japan
- 2014: Establishment of Indonesia JCM Secretariat
- 2016: First JCM credit issuance in Indonesia and in the world
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 from Japan to GHG emission reductions or removals in a quantitative manner, by applying measurement, reporting, and verification (MRV) methodologies, and using 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.
The reference emissions are calculated to be below or at least on the same level business-as-usual (BaU) emissions, by conservatively estimating/identifying plausible emission or by other methods determined in the methodologies to be approved by the Joint Committee.

Approved JCM MRV methodologies (as of August 2016):
1. Power generation by waste heat recovery in cement industry
2. Energy saving by introduction of high efficiency centrifugal chiller
3. Installation of energy-efficient refrigerators using natural refrigerant at food industry cold storage and frozen food processing plant
4. Installation of inverter-type air-conditioning system for cooling for grocery store
5. Installation of led lighting for grocery store
6. GHG emission reductions through optimization of refinery plant operation in Indonesia
7. GHG emission reductions through optimization of boiler operation in Indonesia
8. Fridge-freezer showcase by using natural refrigerant for grocery store
9. Replacement of conventional burners with regenerative burners for aluminum holding furnaces
10. Introducing double-bundle modular electric heat pumps to a new building

Methodology update and public comments are available on http://jcm.ekon.go.id

The image describes the steps to follow for project participants, third-party entities (TPEs), the Joint Committee, the secretariat, both Government sides, and other stakeholders, for approval of a methodology, registration of JCM project, issuance of credits and related actions.
JCM Promotion Scheme

A  Financing Programme for JCM Model Projects by MOEJ

Scope of the financing: facilities, equipment, vehicle, etc. which reduce CO₂ from fossil fuel combustion as well as construction cost for installing those facilities, etc.

Figure 4. Financing Programme for JCM Model Projects

B  Promotion Scheme for JCM Demonstration Projects by METI/NEDO

- JCM Demonstration Projects are funded by METI Japan and implemented by NEDO (New Energy and Industrial Technology Development Organization), which supports the project costs necessary to verify the amount of GHG emission reduction in line with JCM rules and guidelines.
- Coverage of project cost: Cost of the JCM Demonstration Projects necessary for MRV: e.g. Cost of design, machines, materials, labor, travel, etc.
C ADB Trust Fund : Japan Fund for Joint Crediting Mechanism (JFJCM)

The Scheme:
The JFJCM seeks to increase the sustainability of ADB-financed and administered projects through the use of advanced low carbon technologies. The use of grants under the JFJCM will demonstrate the effectiveness of the JCM and provide a source of additional funding to eligible ADB developing member countries (DMCs).

Purpose:
The fund aims to provide financial incentives for the adoption of advanced low carbon technologies in ADB-financed and administered sovereign and non-sovereign projects. The JFJCM will provide grants and technical assistance to ADB projects utilizing the Joint Crediting Mechanism (JCM).

Figure 5.  
Japan Fund for Joint Crediting Mechanism
D

JCM REDD+ Model Projects by MOEJ

Background

• Degradation of forests in developing countries

Expected outcome

• Participatory monitoring of illegal logging, disaster prevention and forest restoration.
• Provision of alternative livelihood.

Project Outline

• At least half or ratio of financial support to project cost of JCM credits issued are expected to be delivered to the government of Japan except the amount which is allocated to the partner country based on its legislation.
• These projects may be carried out with the cooperation of other organization such as like JICA.

E

JCM Feasibility Study by MOEJ and METI/NEDO

The study aims to promote potential JCM projects, survey their feasibility, check the practicality of the MRV methodology, and elaborating investment plan.
Ongoing JCM Projects in 2016

Model/Demonstration Projects are promoted to follow the steps described in the JCM project cycle (see page 5). Official MRV (measurement, reporting, and verification) of emissions reduction starts after a project is registered.
**A  JCM Model Project**

### Energy Saving by Installation of Double Bundle-type Heat Pump

**Energy Demand**

- **Estimated Emission Reduction**
  - 170 tCO₂/year

**Parties Involved**
- Toyota Tsusho Corporation
- PT. TTL Residences
- PT Toyota Tsusho Indonesia

In order to reduce natural gas consumption, a double bundle-type heat pump, generating both heating and cooling energy, is installed into the thermal supply system in serviced apartments. The reduction of natural gas consumption and coal-fired electricity consumption through the utilization of the heat pump contributes to GHG emission reductions. The heat pump is capable of high temperature heating (more than 60 degrees C), and its efficiency combining heating and cooling is expected to be 450 – 500 %.

### Power Generation by Waste-heat Recovery in Cement Industry

**Energy Industries (renewable/non-renewable sources)**

- **Estimated Emission Reduction**
  - 122,000 tCO₂/year

**Parties Involved**
- JFE Engineering Corporation
- PT. Semen Indonesia Tbk

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) located in Tuban, East Java, Indonesia. The WHR system utilizes unused waste heat currently emitted from the cement factory, 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.
Installation of solar power hybrid system

The project aims to install the solar power hybrid system. It is expected that the implementation of the project will reduce the utilization on fossil fuel electricity generation and increase the proportion of renewable energy installed capacity in Indonesia.

Energy Industries (renewable/non-renewable sources)

Estimated Emission Reduction

ITOCHU Corporation

TBA

Model Project (JFY 2014)

Energy Saving through Introduction of Regenerative Burners to the Aluminum Holding Furnace of the Automotive Components Manufacturer

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.

Estimated Emission Reduction

Toyotsu Machinery Corporation, Hokuriku Techno Co., Ltd.

PT. Toyota Tsusho Indonesia, PT. Yamaha Motor Parts Manufacturing Indonesia (YPMI), PT. Matahari Wasiso Tama, PT. Hokuriku Techno Indonesia

856 tCO₂/year

Model Project (JFY 2014)
Indonesia is the highest exporter of textile products in South East Asia, therefore the implementation of energy efficiency in this sector will be crucial.

This “JAT810” has an air-saving technology to reduce air consumption for weft insertion 20% more than the conventional model. The effect is not only reducing CO₂ emission by saving the power consumption of air-compressors but also reducing the running cost.

This project aims to achieve electricity usage reduction per ton produced (by about 10%) by introducing a Japanese high-efficient system for the old corrugated carton (OCC) process for PT. Fajar Surya Wisesa, thereby contributing to CO₂ reduction.

This OCC process is a process to prepare clean raw materials containing dissolved paper fibers by mixing used corrugated board into water for defiberization and removing foreign substances.

Since a large amount of material (water) is used in this process, the electricity is significantly consumed to the power motors.
Energy Saving for Air-Conditioning at Shopping Mall with High Efficiency Centrifugal Chiller

NTT FACILITIES, INC and PT. Pakuwon Jati Tbk have agreed to collaborate in energy saving project by installing high efficiency centrifugal chiller at Tunjungan Plaza in Surabaya. This project is expected to save 1,136 MWh of electricity and 996 tCO₂ of carbon emission annually.

Energy Saving for Industrial Park with Smart LED Street Lighting System

The replacement of existing high pressure sodium lighting with the highly efficient street lighting system for Industrial Parks is estimated to reduce the electricity usage of 1,106 MWh annually. This project is a collaboration between NTT FACILITIES, INC with PT. Maligi Permata Industrial Estate, PT. Harapan Anang Bakri & Sons, and PT. Karawang Tatabina Industrial Estate.
**Introduction of High-efficiency Once-through Boiler System in Film Factory**

The objective of the project is to save energy by installing once through boiler in PT MC PET Film Indonesia, Merak factory, to replace the existing water tube boiler. The implementation of this project is estimated to increase the efficiency from 87% to 96% thus reducing GHG emission by 428.5 tCO₂ per year. This project is a cooperation between Mitsubishi Plastic, Inc and PT. MC PET Film Indonesia.

**Installation of Gas Co-generation System for Automobile Manufacturing Plant**

The purpose of this project is to reduce energy consumption and CO₂ emission by installing a gas co-generation system. This system adopts a high efficiency gas-engine and heat recovery system to generate steam and hot water.

This project contributes to the reduction of energy consumption at coal fired power generation prevailed in Indonesia, and to the reduction of GHG and air pollutant emissions.
Introduction of High Efficiency Once-through Boiler and RO Pure Water System in Golf Ball Factory

The project objective is to save energy by installing once through boiler and RO water treatment in a golf ball factory. Once through boiler can achieve higher efficiency (max 96%) compared with conventional smoke tube boiler (max 87%) and water tube boiler (max 88%). It can operate continuous control with better efficiency both on full load and partial load. It also can achieve high stability of steam pressure by PI control system. The RO water treatment system can reduce the blow of boiler water (blow rate: 13% to 3%) and reduce consumption of fossil fuel. High quality RO will be applied for this system.

Jakabaring Sports City Mega Solar Power Plant Project

The project is to install 1.6 MW solar power plant in Jakabaring Sports City complex in South Sumatera, which will be the host of the 2018 Asian Games. The project also aims to appeal the city’s concept of a “green sports city”, in addition to contributing to the development of renewable energy in Indonesia and eventually to reduce the GHG emission.
Introduction of high-efficiency looms in weaving mill

**Model Project (JFY 2016)**

**Energy Demand**

**Estimated Emission Reduction**

1,317 tCO₂/year

**Nisshinbo Textile Inc**

This project aims to save energy consumption by introducing high efficiency to a looms weaving mill in Indonesia. This project will install the JAT 810 series which boasts a diverse range of original features, including an Air-Saving System that reduces energy consumption and new “E-shed” electronic shedding motion.

Energy saving for industrial wastewater treatment system for rubber industry

**Model Project (JFY 2016)**

**Energy Demand**

**Estimated Emission Reduction**

546 tCO₂/year

**EMATEC, Suzuki Sangyo Co. Ltd., Mitsubishi UFJ Research and Consulting Co., Ltd,**

**PT. Anela Bumi Pratama**

This project aims to install energy efficient aerator in existing industrial wastewater treatment facilities at Palembang City. The Aerator was developed by SUZUKI Corp. The installation of the energy efficient aerator is expected to reduce the electricity consumption by 30-50%.
10 MW Mini Hydro Power Plant Project in North Sumatera

This project’s objective is to conduct an electricity power generation by constructing a 10 MW run-of-river mini hydroelectric power plant at North Sumatera Province. The domestic electric power demand in Indonesia has been expanding under recent steady economic growth. In addition, Indonesian government is aggressively promoting the development of renewable energy. The purposes of the project are mainly to contribute to the developments of sustainable society, and additionally to spread and expand the utilization of renewable energy technology to fulfill the electricity demand.

Introduction of LED Lighting to Sales Stores

This project objective is to reduce greenhouse gas emission by introducing high-efficiency lighting, which will be installed in 11 stores in Indonesia. This project is expected to be a showcase for energy efficient store in Indonesia.
Energy saving for air-conditioning utility system in the airport terminal by introducing high-efficiency operating system

Estimated Emission Reduction

585 tCO₂/year

iFORCOM Tokyo Co., Ltd.

Batam Indonesia Free Zone Authority

This project is based on city-to-city collaboration between Yokohama city and Batam city which started in 2014. The project is introducing energy saving for Air-Conditioning Utility System for Hang Nadim International Airport in Batam, including electricity consumption monitoring and automatic control. The major objective of the project is to quantify how much is the electricity consumption and/or cost would be reduced by the installation of the system as well as its CO₂ emission reduction.
The REDD+ model project in Boalemo District is the first REDD+ project under JCM scheme. The collaboration project between Kanematsu Corporation and PT. Dharma Karyatama Mulia aims to reduce the slash-and-burn deforestation by improving agricultural production practices especially cacao in Boalemo District, Gorontalo Provinces.
At oil refinery (a large CO2 emitter), effective & sustainable CO2 emission reduction technologies will be verified, then standardized for JCM roll out.

Introduce Advanced Process Control (APC) system proved at Japan and global oil majors, customize to meet local environment, then verify effective and sustainable CO2 emission reduction by fossil fuel reduction.
This technology can be applied to the existing utility system of factories of various industries and is high return-on-investment (ROI) technology, since it works on simple computer systems, without high-performance hardware or other expensive equipment. It has a great amount CO₂ reduction potential for various industries in Indonesia, such as refineries, chemical plants, district heating and cooling systems, and so on.

Utility Facility Operation Optimization Technology is a “RENKEI” control, which is Japan is leading-edge technology. By using optimization technology, the system determines the optimum selection and optimum load allocation for utility equipment such as boilers, steam turbines, and chillers used in utility facilities, in order to minimize CO₂ emissions. Without any change of utility facility hardware this technology will realize a great amount of CO₂ reduction facilities, in order to minimize CO₂ emissions.

### Demonstration Project (JFY 2013)

<table>
<thead>
<tr>
<th>Energy Demand</th>
<th>Estimated Emission Reduction</th>
<th>Azbil Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Utility Facility Operation Optimization Technology</strong></td>
<td><strong>58,000 tCO₂/year</strong></td>
<td>Azbil Berca Indonesia, PT. Pertamina</td>
</tr>
</tbody>
</table>

KDDI’s unique energy management system for BTS “TRIBRID system” will be installed at 22 locations in Off-grid and Poor-grid area. KDDI’s TRIBRID system enables to replace electricity from diesel generator and grid with solar power by controlling the balance of electricity from diesel, grid and solar, and optimize the usage of solar power. Therefore, it enables BTS to achieve the energy saving and GHG emission reductions.

### Demonstration Project (JFY 2015)

<table>
<thead>
<tr>
<th>Energy Demand</th>
<th>Estimated Emission Reduction</th>
<th>KDDI Corporation, Ernst &amp; Young Sustainability Co., Ltd., PT. Packet Systems Indonesia, PT. Huawei Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The low carbonization of mobile communication’s BTS (Base Transceiver Station) by the Introduction of “TRIBRID system” in Indonesia</strong></td>
<td><strong>163 tCO₂/year</strong></td>
<td><strong>JCM Model Project</strong> <strong>JCM REDD+ Model Project</strong> <strong>JCM Demonstration Project</strong> <strong>JCM Registered Project</strong> <strong>JCM Credit Issuance</strong></td>
</tr>
</tbody>
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**JCM Model Project**

**JCM REDD+ Model Project**

**JCM Demonstration Project**

**JCM Registered Project**

**JCM Credit Issuance**
JCM Registered Project is a Project which has been approved by the Joint Committee to be acknowledged under the JCM scheme after going through validation process.

Registered Project (JFY 2014)

Energy Saving for Air-Conditioning and Process Cooling by Introducing High-efficiency Centrifugal Chiller

Energy Demand

Estimated Emission Reductions (average)

114 tCO₂/year

Ebara Refrigeration Equipment & Systems Co. Ltd.
Nippon Koei Co. Ltd.

PT. Primatexco Indonesia

Reference No.
ID001

Batang, Central Java Province

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 (230 USRt and 250 USRt) 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).

This Project is the first registered project under JCM scheme in the World.
The textile industry is a major industry in Indonesia. To produce high quality products, air-conditioning is of key importance. For reducing GHG for the textile industry, a high-efficiency chiller is one of the best options to choose. The existing 500USRt chiller is replaced by a high-efficiency centrifugal chiller, which consists of a two-stage high efficiency compressor, economizer and sub-cooler system. By applying a purge unit with Activated Carbon, nearly 100% of HFC-245fa refrigerant with 0 ODP is recovered for excellence in GHG reductions.
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 (230 USRt and 250 USRt) with high-efficiency chillers (500USRt), in order to save energy and to reduce CO₂ emissions. High-efficiency chillers adopt a high-performance economizer cycle and a super-cooling refrigerant cycle in order to save energy. In addition, the chillers use low-pressure refrigerant (HFC-245fa) with zero ODP (Ozone Depletion Potential)
Total electricity consumption of food retail convenience stores is decreased by the installation of the latest high-efficiency facilities and high-efficiency chillers with natural refrigerant (CO₂ refrigerant), inverter-controlled air-conditioners, and LED lighting. As a result, CO₂ emissions due to electricity consumption are reduced.

This project involves 12 convenience store of Alfa Midi located in Jakarta, Tangerang, and Depok.
This project is located at PT. Adib Global Food Supplies new site factory at Bekasi, West Java Province.

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. This technology is utilized by PT. Adib not only to reduce the emission reduction but also to improves the efficiency of the refrigerator which used as cold storage for the food industry.
Project of Introducing High Efficiency Refrigerator to a Frozen Food Processing Plant in Indonesia

Estimated Emission Reductions (average)

21 tCO₂/year

Energy Demand

Mayekawa Manufacturing Co., Ltd.

PT Adib Global Food Supplies,
PT Mayekawa Indonesia

Reference No. ID003

Kec. Cilebar, Kab. Karawang, West Java Province

This project is located at PT Adib Global Food Supplies existing frozen food factory at Karawang, West Java Province.

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. This technology is utilized by PT. Adib not only to reduce the emission reduction but also to improve the efficiency of frozen food processing.
## Issuance of Credits

Below is the information about issuance of credits which have been issued by Joint Committee Members of Indonesia and Japan

<table>
<thead>
<tr>
<th>Project No</th>
<th>Project Title</th>
<th>Monitoring period</th>
<th>Indonesia Participant</th>
<th>Japanese Participant</th>
<th>Indonesian Government</th>
<th>Japanese Government</th>
<th>Total Credit Issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID002</td>
<td>Project of Introducing High Efficiency Refrigerator to a Food Industry Cold Storage in Indonesia</td>
<td>2015</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>20</td>
<td>29</td>
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<tr>
<td>ID003</td>
<td>Project of Introducing High Efficiency Refrigerator to a Frozen Food Processing Plant in Indonesia</td>
<td>2015</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>11</td>
</tr>
</tbody>
</table>

Notes: credit is issued in the respective country’s registry system
Progress of The Joint Crediting Mechanism (JCM)
In Indonesia
August 2016

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For Further Information