JCM

November
2015

The Joint Crediting Mechanism (JCM):

Progress of JCM Financing Programme and
Feasibility Studies for JCM Projects by MOEJ

Ministry of the Environment
Japan

GEC

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The Joint Crediting Mechanism (JCM):

Progress of Financing Programme for JCM Model Projects and Feasibility Studies for JCM Projects by MOEJ in 2015

Editor: Global Environment Centre Foundation (GEC)

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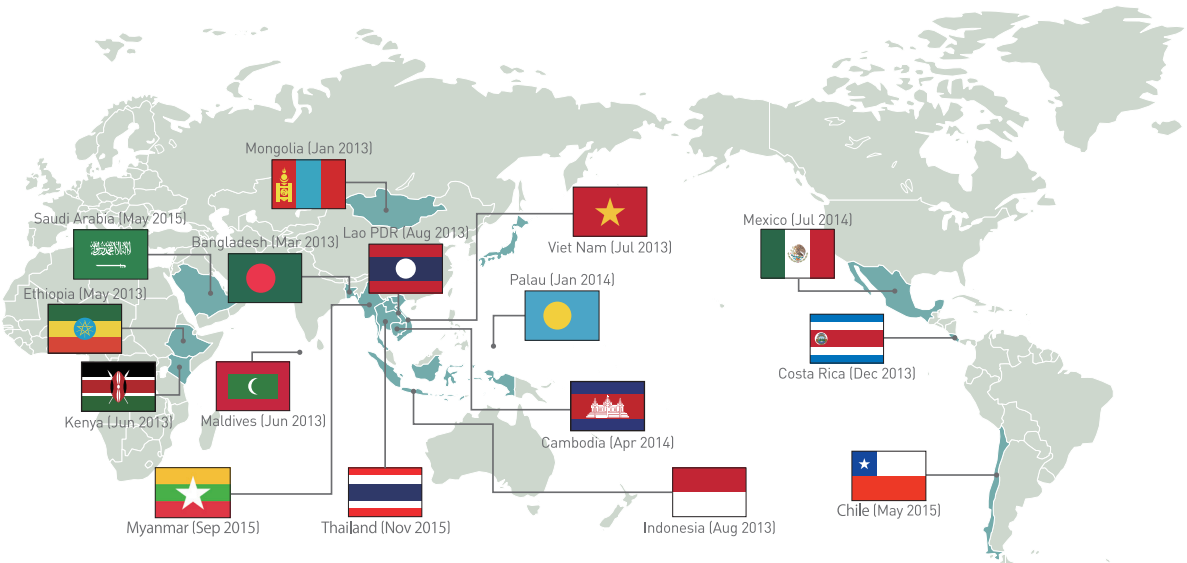
01 Background

1.1 Japan's Proposal towards Low Carbon Growth

In order to effectively address climate change mitigation issue, it is necessary to achieve low-carbon growth all around the world by mobilising technology, market, and finance adequately. Recognising this necessity, the government of Japan has proposed the Joint Crediting Mechanism (JCM) as a means to facilitate the diffusion of leading low-carbon technologies, systems, and so forth in developing countries. Japan has held consultations for the JCM with developing countries since 2011 and started the JCM with 15 countries.

JCM partners (as of November 2015)



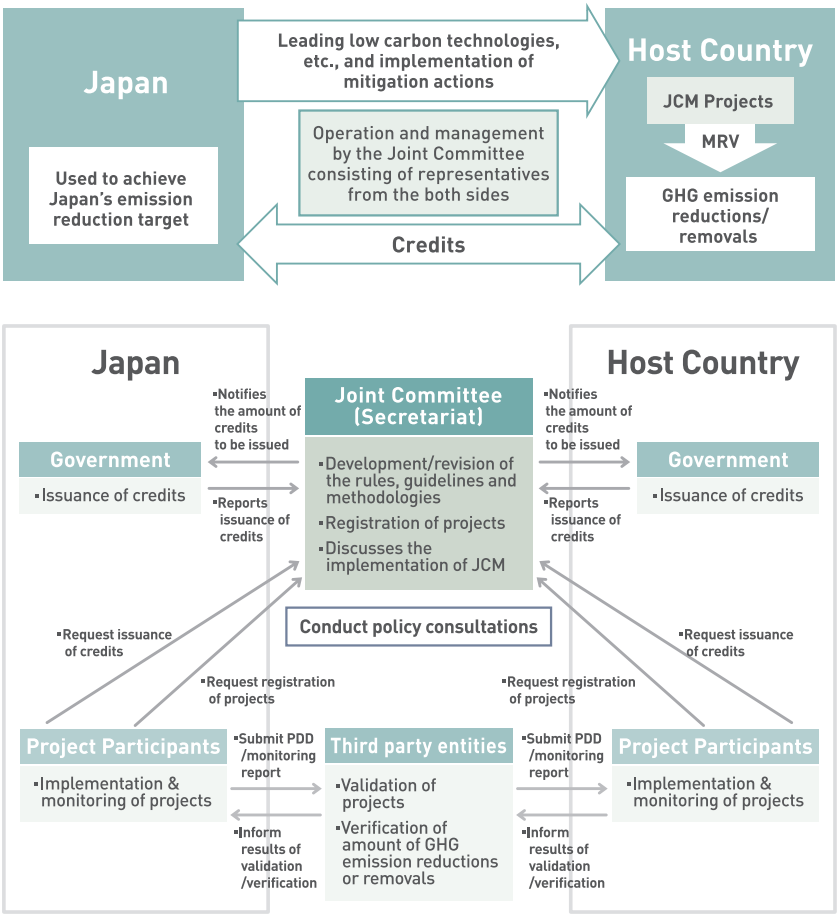
1.2 Basic Concept of the JCM

- 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 from Japan to GHG emission reductions or removals in a quantitative manner, and use them to achieve Japan's emission reduction target;

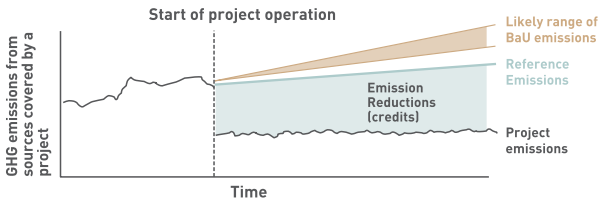
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals.

Scheme of the JCM



In the JCM, 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 that 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.

Basic Concept for Crediting under the JCM



1.3 JCM as Part of Japan's INDC

Japan's INDC(Intended Nationally Determined Contributions) towards post-2020 GHG emission reductions is at the level of a reduction of 26.0% by fiscal year (FY) 2030 compared to FY 2013 (25.4% reduction compared to FY 2005) (approximately 1.042 billion t-CO_2eq. as 2030 emissions), ensuring consistency with its energy mix, set as a feasible reduction target by bottom-up calculation with concrete policies, measures and individual technologies taking into adequate consideration, inter alia, technological and cost constraints, and set based on the amount of domestic emission reductions and removals assumed to be obtained.

The JCM is not included as a basis of the bottom-up calculation of Japan's emission reduction target, but the amount of emission reductions and removals acquired by Japan under the JCM will be appropriately counted as Japan's reduction.

Japan establishes and implements the JCM in order both to appropriately evaluate contributions from Japan to GHG emission reductions or removals in a quantitative manner achieved through the diffusion of low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions in developing countries, and to use them to achieve Japan's emission reduction target.

Apart from contributions achieved through private-sector based projects, accumulated emission reductions or removals by FY 2030 through governmental JCM programs to be undertaken within the government's annual budget are estimated to be ranging from 50 to 100 million t-CO_2.

1.4 JCM Methodologies

19 Methodologies in 5 countries are approved as JCM methodologies by each Joint Committee respectively (as of November 2015).

Country	Number of Approved Methodology	Sectoral scope of the Methodology
Mongolia	2 (AM_MN001~002)	1. Energy industries (Energy-saving transmission lines) 2. Energy distribution (High efficiency Heat Only Boiler (HOB))
Maldives	1 (AM_MV001)	1. Energy industries (renewable-/non-renewable sources) (Solar PV system)
Viet Nam	5 (AM_VN001~005)	2. Energy distribution(energy efficient transformers) 3. Energy demand (Inverter air conditioners, Energy efficient buildings (High efficiency boiler, Heat recovery heat pump and LED lighting)) 7. Transport (Digital tachograph systems) 13.Waste Handling and Disposal (Anaerobic digestion of organic waste)
Indonesia	10 (AM_ID001~010)	1. Energy industries (Waste heat recovery at Cement Plant, PV) 3. Energy demand (High efficiency centrifugal chiller, Energy-efficient refrigerators, Inverter-type air conditioning system, LED lighting, Optimization of refinery plant, Optimization of boiler operation, Separate type fridge-freezer showcase, Regenerative burners for aluminum holding furnaces, Double-bundle modular electric heat pumps)
Palau	1 (AM_PW001)	1. Energy industries (renewable-/non-renewable sources) (Small-scale Solar PV System)

1.5 JCM Projects

The first JCM Project was registered on 31 October, 2014, in Indonesia. So far, 7 projects have been registered, as listed below.

List of Registered JCM Projects

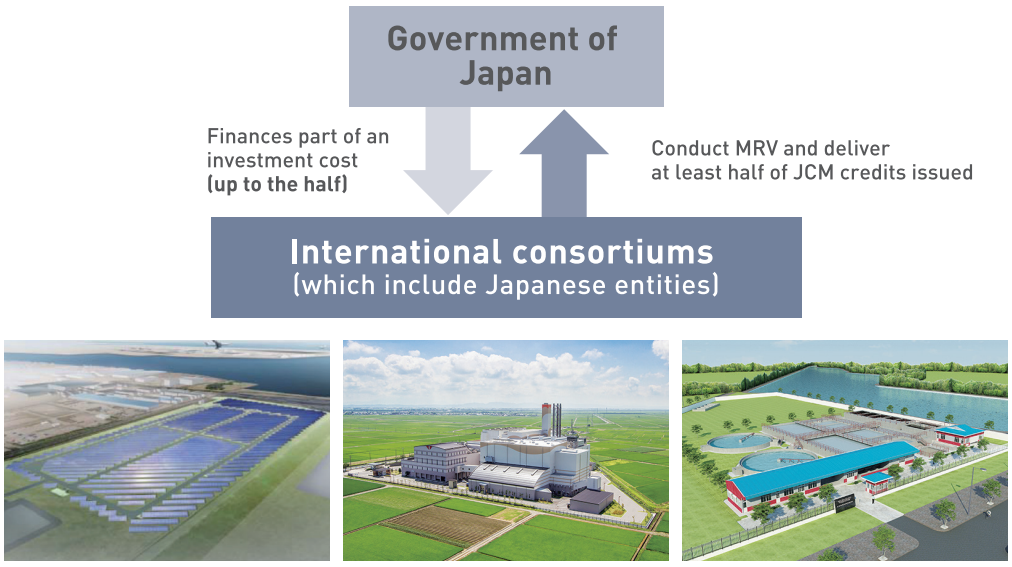
Registration No.	Country	Sectoral Scope	Registration Date	Project Title	Estimated Emission Reductions (average ton per year)
ID001	Indonesia	Energy demand	31 October, 2014	Energy Saving for Air Conditioning and Process Cooling by Introducing High-Efficiency Centrifugal Chiller	114
ID002	Indonesia	Energy demand	29 March, 2015	Project of Introducing High Efficiency Refrigerator to a Food Industry Cold Storage in Indonesia	120
ID003	Indonesia	Energy demand	29 March, 2015	Project Introducing High-Efficiency Refrigerator to a Frozen Processing Plant in Indonesia	21
PW001	Palau	Energy industry	21 April, 2015	Small-Scale Solar Plants for Commercial Facilities in Island States	227
MN001	Mongolia	Energy industry	30 Jun,2015	Installation of high-efficiency Heat Only Boilers in 118th School of Ulaanbaatar City Project	92
MN002	Mongolia	Energy industry	30 Jun,2015	Centralization of heat supply system by installation of high-efficiency Heat Only Boilers in Bornuur soum Project	206
VN001	Viet Nam	Transportation	04 Aug,2015	Eco-Driving by Utilizing Digital Tachograph System	296

(as of October 2015)

02 JCM Financing Programme and Feasibility Studies

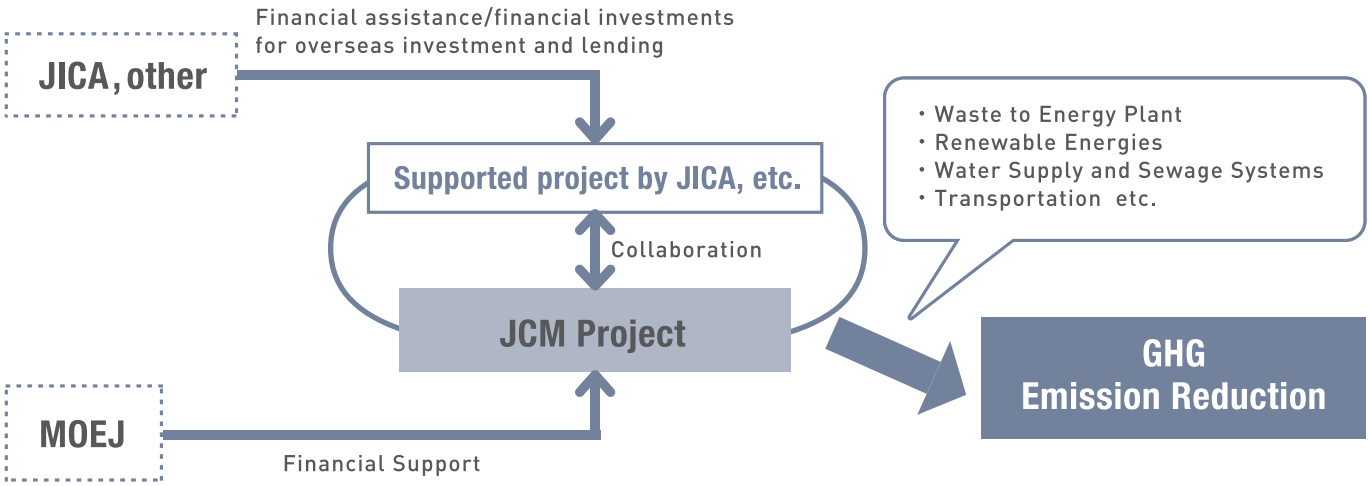
2.1 JCM Model Projects

This programme was launched in 2013. The scope of the financing includes facilities, equipment, and vehicles which reduce CO_2 from fossil fuel combustion as well as construction cost for installing those facilities. Through the programme, MOEJ financially supports part of the initial cost (up to half), on the premise of seeking to deliver at least half of the issued JCM credits to the government of Japan. The budget for FY2015 is 2.4 billion Japanese yen (Approx. USD 20 million) per year by FY2017 (Total 7.2 billion JPY).



2.2 Collaborative Financing Programme

This scheme was launched in 2014. The scheme is to finance the projects which have the better efficiency of reducing GHG emission in collaboration with other projects supported by Japan International Cooperation Agency(JICA) and other governmental-affiliated financial institute. The purpose of the scheme is to expand superior and advanced low carbon technologies for building the low carbon society as the whole city wise and area wise in the wider fields, and to acquire credits by the JCM. The budget for FY2015 is 1.8 billion Japanese yen (Approx. USD 15 million) per year by FY2018 (Total 7.2 billion JPY).



2.3 JCM REDD+ Model Projects

This scheme was launched in 2015. The purpose of the scheme is to implement activities for REDD+ and use them for contributing to achieve Japan's emission reduction target through the JCM. The budget for FY2015 is 80 million Japanese Yen (Approx. USD 0.66 million).
At least half of JCM credits issued are expected to be delivered to the government of Japan except for the amount which is allocated to the partner country based on its legislation.

2.4 Feasibility Studies

The objective of the feasibility studies includes elaboration of investment plan on JCM projects, development of MRV methodologies and investigation of feasibility on potential JCM projects. There are two types of the studies listed below:

JCM Project Planning Study

To make concrete project plans in order to develop a JCM Model Project in the next fiscal year, including financial plans, construction plans, operation plans, implementation schemes and MRV structures.

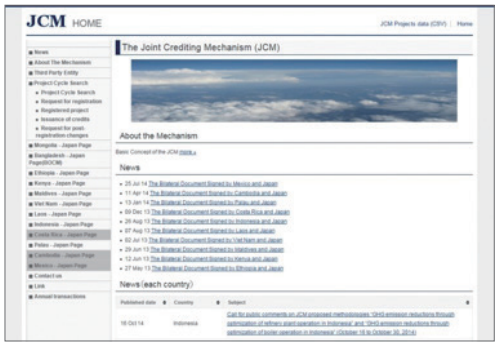
JCM Feasibility Study

To survey potential projects which can be implemented under the JCM in future.

03 Relevant websites

The Joint Crediting Mechanism

The Joint Crediting Mechanism (JCM) website is an official platform providing essential information and updates for the JCM to the public.
https://www.jcm.go.jp/

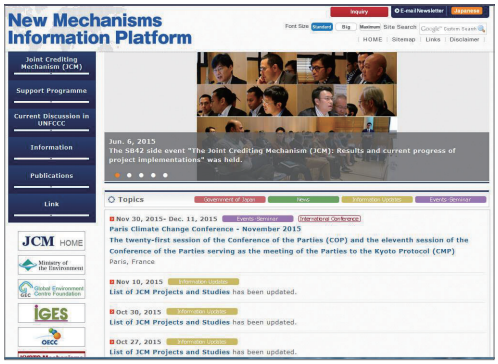


JCM website of GEC

The Global Environment Centre Foundation (GEC) serves as the commissioned secretariat for the Financing Programme and Study Programme of the MOEJ. GEC provides a database for JCM Feasibility Study reports and related information.
GEC: http://gec.jp/
JCM website: http://gec.jp/jcm/

New Mechanism Information Platform

The New Mechanism Information Platform is a platform providing essential information for the JCM as well as periodical updates on the ongoing development of the JCM projects.
http://www.mmechanisms.org/e/index.html



04 Overview of JCM Model Projects and Feasibility Studies

The following pages provide information of the JCM Model Projects and Feasibility Studies.

Sectoral Scope

＊The projects and studies in this section do not necessarily mean that they are registered as the JCM projects.

JCM Model Projects (MP)
P12-19

JCM Project Planning Studies (PS)
P20-24

JCM Feasibility Studies (FS)
P25-28

JCM REDD+ Model Project (REDD+)
P29

Overview of the JCM Model Projects and Feasibility Studies (sel

Bangladesh:
- Installation of High Efficiency Loom at Weaving Factory
- Introduction of PV-diesel Hybrid System at Fastening Manufacturing Plant
- Energy saving by utilizing lithium-ion batteries at base transceiver stations in unstable-grid areas

Mongolia:
- Distributed heat supply system using biomass and coal mixture combustion type boiler

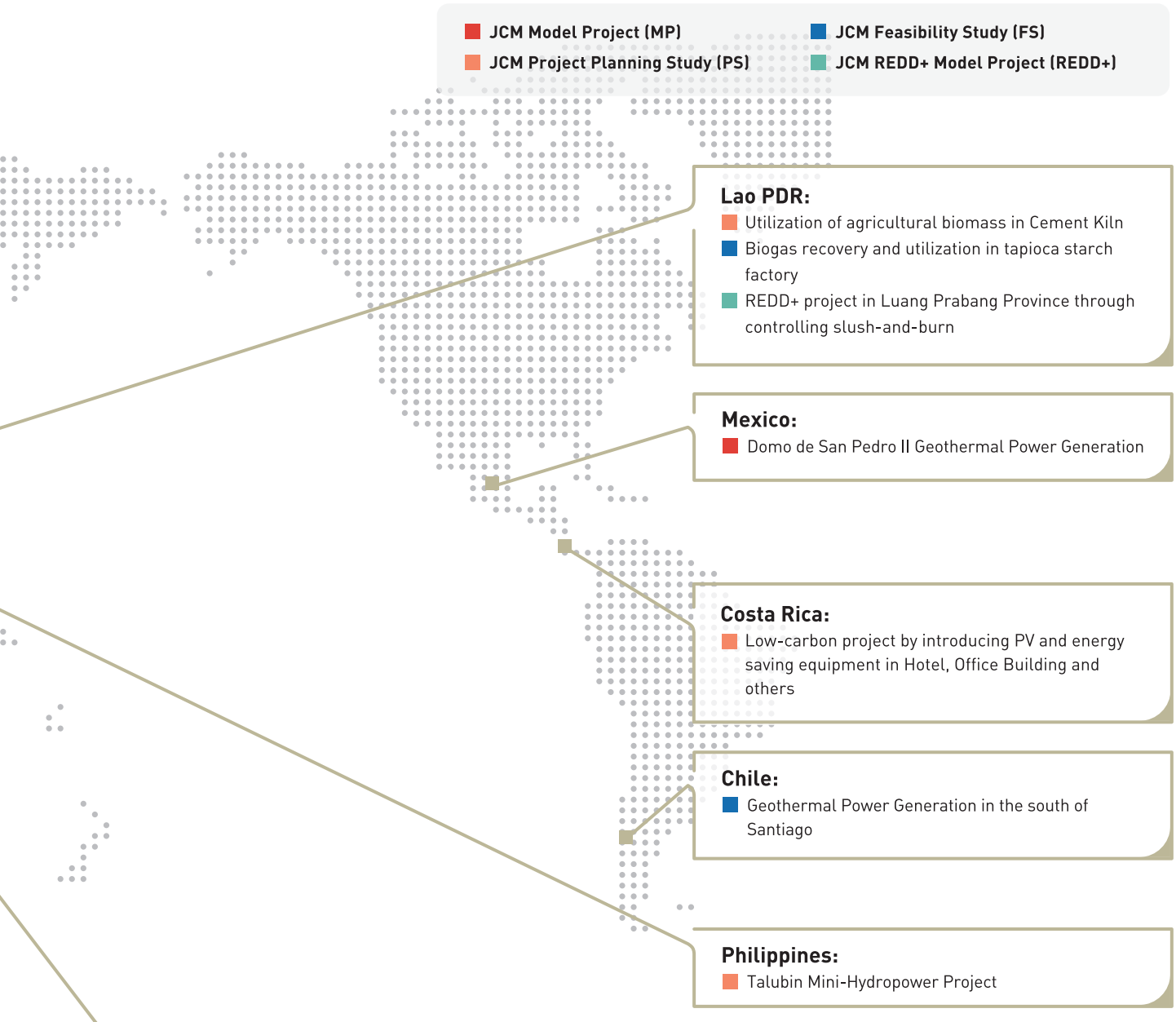
Viet Nam:
- Introduction of High Efficiency Air-conditioning in Hotel
- Energy Saving in Lens Factory with Energy Efficient Air-Conditioners
- Energy Saving in Acid Lead Battery Factory with Container Formation Facility
- Recovery and utilization of biogas from agricultural processing waste in Ninh Binh Province
- Waste Heat Recovery Power Generation at Cement Factory in Quang Ninh Province

Myanmar:
- Introduction of Waste to Energy Plant in Yangon City
- Rice husk power generation in rice mill factory in Ayeyarwady

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 (Samutprakarn)
- Energy Saving for Semiconductor Factory with High Efficiency Centrifugal Chiller and Compressor
- Installation of Co-Generation Plant for On-Site Energy Supply in Motorcycle Factory
- Energy saving by introducing regenerative energy storage system in Skytrain
- Saving Energy for station facilities utilizing regenerative energy from trains
- Energy saving by co-generation project in the fiber factory

Cambodia:
- Introduction of High Efficiency LED Lighting Utilizing Wireless Network
- Installation of High-efficiency Chillers in Large-scale Hotels

ected in FY2015)



Indonesia:

- Energy Saving for Air-Conditioning at Shopping Mall with High Efficiency Centrifugal Chiller
- Energy Saving for Industrial Park with Smart LED Street Lighting System
- Introduction of High Efficiency Once-through Boiler System in Film Factory
- Installation of Gas Co-generation System for Automobile Manufacturing Plant
- Energy saving in industrial wastewater treatment for rubber industry
- Hybrid Power Generation Project Using Biogas and Solar Power
- Development of District Energy Supply Business by introducing co-generation
- Introduction of co-generation and solar power generation systems in large shopping malls
- REDD+ project in Boalemo District

MP2015-01 Introduction of PV-diesel Hybrid System at Fastening Manufacturing Plant

Bangladesh

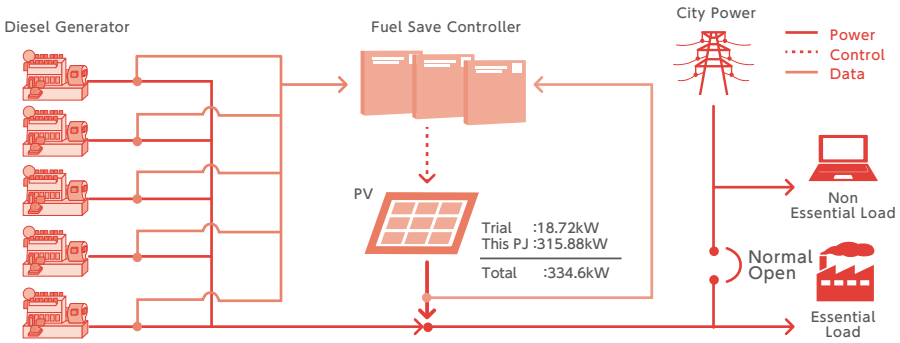
Expected GHG Emission Reductions

265 tCO_2/year

Dhaka, Bangladesh

Project Owner
Japan：YKK Corporation
Bangladesh：YKK Bangladesh Pte Ltd.

This project introduces a hybrid solar-diesel power system to a garment fastener manufacturing plant, which currently uses captive diesel power generators.
Normally, the share of a solar power generation to a capacity of a diesel generator is technically limited to about 20% because of the limitation caused by power-variation of photovoltaic module arrays. However, the fuel save controller used in this system enables the percentage to be raised up to 60% thanks to electricity control, achieving a greater reduction of fuel consumption by the diesel generators.



MP2015-02 Installation of High Efficiency Loom at Weaving Factory

Bangladesh

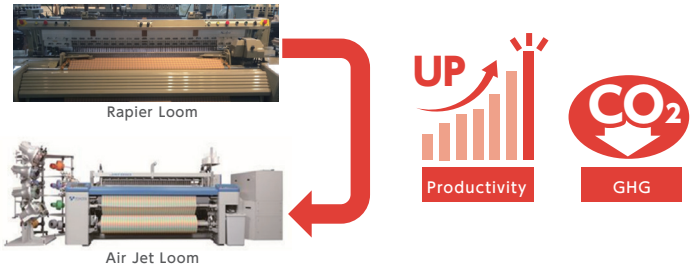
Expected GHG Emission Reductions

1,518 tCO_2/year

Dhaka, Bangladesh

Project Owner
Japan：Toyota Tsusho Corporation
Bangladesh：Hamid Fabrics Limited

The textile industry is a key industry in Bangladesh, accounting for more than 80% of the total exports. This project introduces air jet looms at a weaving factory, which can reduce energy consumption and increase productivity at the same time.
Currently, rapier looms are widely used in Bangladesh and many of them are secondhand. Compared to the rapier looms, air jet looms introduced in this project have 1.8 times higher productivity and 15% higher energy efficiency, which means approximately 53% energy efficient in terms of unit per area of fabric produced.
The air jet looms are environmentally sound not causing problems such as noise and waste water treatment.



MP2015-03 Energy Saving for Air-Conditioning at Shopping Mall with High Efficiency Centrifugal Chiller

Indonesia

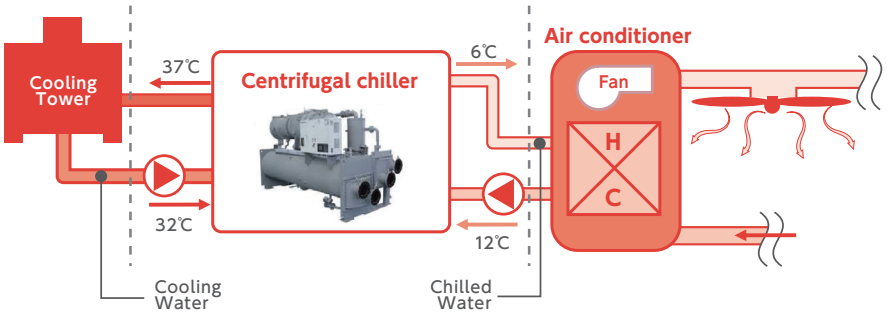
Expected GHG Emission Reductions

996 tCO_2/year

in central Surabaya, Surabaya city, Indonesia

Project Owner
Japan：NTT FACILITIES, INC.,
Indonesia：PT.PAKUWON JATI Tbk

The project aims to reduce electricity consumption in the shopping mall through introducing advanced & efficient centrifugal Chiller system.
The project is to replace existing central cooling system with high efficient centrifugal chiller with capacity of 966TR *4 sets and 569TR * 1 set in Pakuwon's shopping mall, Tunjungan Plaza, as well as to replace existing 8 cooling towers with efficient models.



Centrifugal chiller in the A/C system

MP2015-04 Energy Saving for Industrial Park with Smart LED Street Lighting System

Indonesia

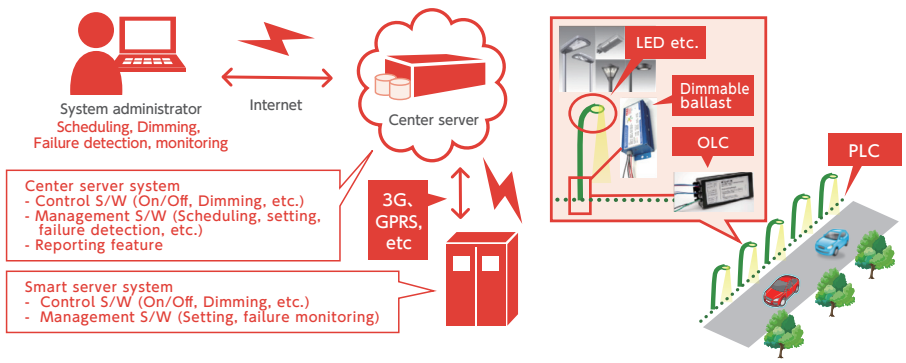
Expected GHG Emission Reductions

908 tCO_2/year

Karawang, Indonesia

Project Owner
Japan：NTT FACILITIES, INC.,
Indonesia：PT. MALIGI PERMATA INDUSTRIAL ESTATE
PT. HARAPAN ANANG BAKRI & SONS
PT. KARAWANG TATABINA INDUSTRIAL ESTATE

The project aims to reduce electricity consumption in the industrial park through introducing advanced & efficient intelligent street lighting system with LED.
The project reduces GHG emissions by following measures:
▸Replacement of existing street lights with high efficient LED lights
▸Introduction of intelligent systems to control modulate light by luminance of surrounding environments



MP2015-05 Introduction of High-efficiency Once-through Boiler System in Film Factory | Indonesia |

Expected GHG Emission Reductions

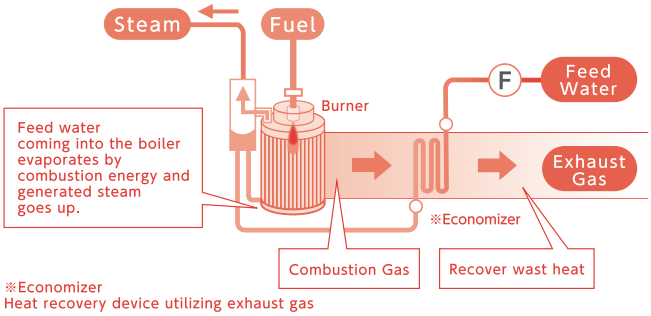
363 tCO_2/year

Banten, Indonesia

Project Owner

Japan：Mitsubishi Plastics Inc.
Indonesia：PT. MC Pet Film Indonesia

The factory has been using a water tube boiler (oil type) for plastic film production. In this project, a high efficiency one-through boiler (gas type) is introduced for energy saving.
This one-through boiler with PI control better manages the combustion and feed water supply, which contribute to increased boiler efficiency and stable steam supply. For instance, it can achieve maximum boiler efficiency of 98% (95-97% under practical condition), whereas the efficiency of conventional fire tube boiler and water tube boiler is around 88%. Also, built-in inverters can reduce electricity consumptions.



※Economizer
Heat recovery device utilizing exhaust gas

MP2015-06 Installation of Gas Co-generation System for Automobile Manufacturing Plant | Indonesia |

Expected GHG Emission Reductions

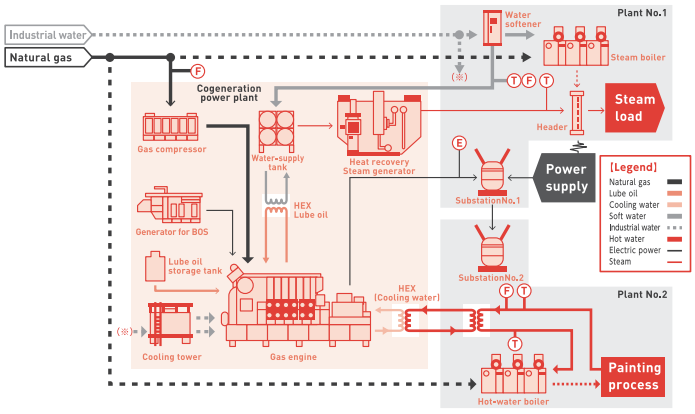
20,439 tCO_2/year

About 70km east of Jakarta, Indonesia

Project Owner

Japan：TOYOTA TSUSHO CORPORATION
Indonesia：PT. Toyota Motor Manufacturing Indonesia (TMMIN)

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.



MP2015-07 Introduction of High Efficiency LED Lighting Utilizing Wireless Network

Cambodia

Expected GHG Emission Reductions

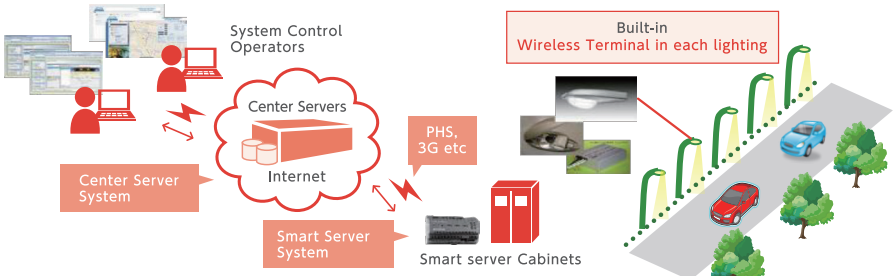
4,191 tCO_2/year

Siem Reap, Cambodia

Project Owner

Japan：Minebea Co., Ltd.
Cambodia：Shukaku Inc. ／ Overseas Cambodian Investment Corporation ／ Siem Reap Provincial Hall ／ APSARA

The project aims to reduce energy consumption and GHG emissions by introducing total of 9,755 units of high efficiency LED Lighting utilizing wireless network technology in Cambodia, where demand for energy has grown with the development of infrastructure. Also, using smart lighting system with wireless network reduces energy consumption.
The proposed project will contribute to reduction of electricity consumption in Cambodia, where electricity price is around the highest level in ASEAN countries due to the dependence on imported electricity, by introducing high efficiency systems.



Smart LED Street Lighting System

MP2015-08 Introduction of Waste to Energy Plant in Yangon City

Myanmar

Expected GHG Emission Reductions

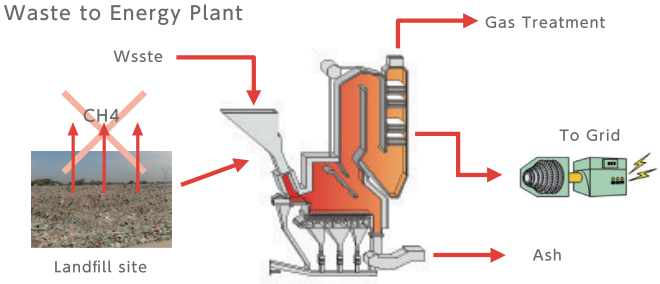
4,732 tCO_2/year

Yangon City, Myanmar

Project Owner

Japan：JFE Engineering Corporation,
Myanmar：Yangon City Development Committee

The objective of this project is to build and operate a waste-to-energy plant that (1) generates electricity, some of which will be supplied to a power company, resulting in reduction of fossil fuel consumption at the power plant, (2) mitigates electricity shortage, (3) reduces CH4 emissions from landfill disposal, and (4) improvement of waste management in Yangon City.
This is a pilot project conducted by Yangon City for promotion of waste-to-energy, with relatively small capacity (60t of waste per day). Groundbreaking was held in October, 2015.



MP2015-09 Domo de San Pedro II Geothermal Power Generation

Mexico

Expected GHG Emission Reductions

87,436 tCO2/year

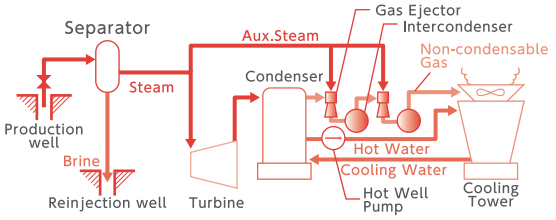
Domo de San Pedro in the State of Nayarit, Mexico

Project Owner

Japan：Mitsubishi Hitachi Power Systems, Ltd.,
Mexico：Geotérmica para el Desarrollo S.A.P.I. de C.V. ／
Mitsubishi Hitachi Power Systems de Mexico S.A. de C.V.

Unlike fossil-fuel-based processes, geothermal power is a clean energy that produces low carbon dioxide and no toxic waste. Also, it has the highest capacity utilization among renewable energy sources, and enables the supply of clean and stable base-load energy. Mexico is located in a favorable location for geothermal power development and ranks 4th in the world in terms of the geothermal-electric installed capacity.In this project, Mitsubishi Hitachi Power Systems, Ltd., (MHPS) supplies one unit of steam turbine and associated equipment for Domo de San Pedro-II Geothermal Power Plant (25MW), which is developed by a IPP. Furthermore, training on operation and maintenance of newly installed equipment will be provided by MHPS at the site.

Single Flash Cycle



Copyright: MHPS

MP2015-10 Reducing GHG Emission at Textile Factory by Upgrading to Air-saving Loom (Samutprakarn)

Thailand

Expected GHG Emission Reductions

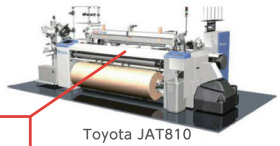
646 tCO_2/year

Bangkok, Thailand

Project Owner

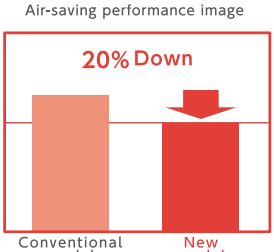
Japan：Toray Industries, Inc.
Thailand：Toray International, Inc. ／ Luckytex(Thailand) Public Company Limited

Energy consumption in Thailand has continuously increased with the economic growth. The economic sector with priority for undertaking energy conservation is the industrial sector. The proposed project aims to reduce electricity consumption and GHG emission by upgrading to air-saving looms at textile factory in Thailand.
The latest air-saving loom is Toyota JAT810. This “JAT810” has original air-saving technology to reduce air consumption for weft insertion by 20% compared to the conventional model.

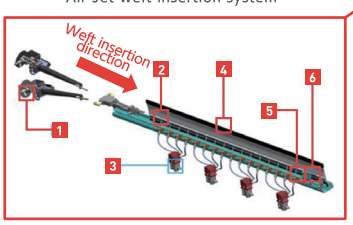


Toyota JAT810

Air-saving performance image



Air-Jet weft insertion system



MP2015-11 Introduction of Solar PV System on Factory Rooftop | Thailand

Expected GHG Emission Reductions

776 tCO_2/year

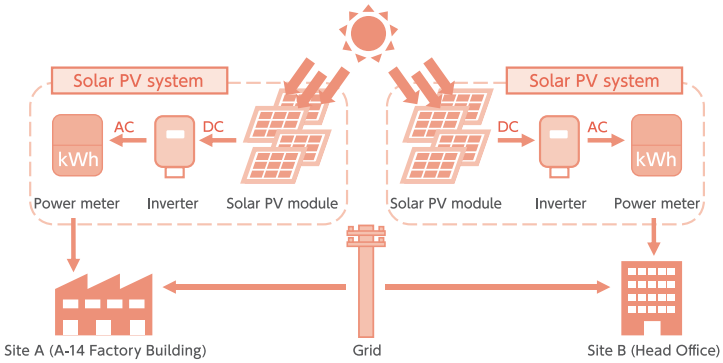
Bangkok, Thailand

Project Owner

Japan：Pacific Consultants Co., Ltd., InterAct Inc.
Thailand：Siam Steel International Public Company Limited

The project aims to reduce CO2 emissions by introducing solar photovoltaic (PV) systems at a factory complex manufacturing steel products and furniture in Samutprakarn, Thailand.

A grid-connected solar PV system will be installed on rooftops of the A-14 Factory Building (Site A: 837kW) and Head Office (Site B: 157kW). The total installed capacity will be 994kW. All of the generated power will be consumed within the factory complex. The project will be a model case utilizing factory roof space and high-efficiency PV modules for self-consumption.



MP2015-12 Energy Saving at Convenience Stores with High Efficiency Air-Conditioning and Refrigerated Showcase | Thailand

Expected GHG Emission Reductions

5,390 tCO_2/year

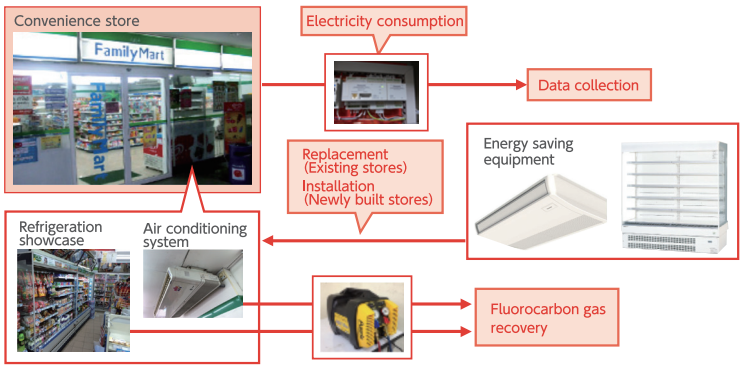
Bangkok, Thailand

Project Owner

Japan：FamilyMart Co., Ltd.
Thailand：Central FamilyMart Co., Ltd.

Implementing this project in grocery stores in Thailand aims to reduce energy-related CO2 emission reductions by installation of energy-saving equipment ,air conditioning system and refrigerating showcase.

In Thailand, refrigerants recovery and destruction has not commonly conducted yet, which lead to ventilations of them into the atmosphere. In this project, the appropriate program for refrigerant recovery and destruction will be considered.



MP2015-13 Energy Saving for Semiconductor Factory with High Efficiency Centrifugal Chiller and Compressor

Thailand

Expected GHG Emission Reductions

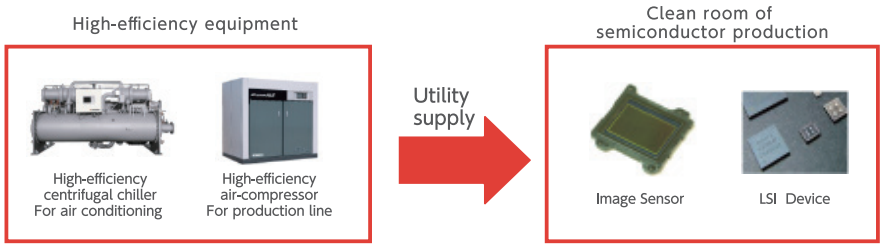
620 tCO_2/year

Bangkok, Thailand

Project Owner

Japan：Sony Semiconductor Corporation
Thailand：Sony Device Technology (Thailand) Co., Ltd.

The project aims to reduce environmental impact, which is mainly carbon dioxide emissions from energy use through replacing existing equipment with better energy-saving equipment, high-efficiency centrifugal chiller and air-compressor, in the clean room of semiconductor plant in Thailand, Bangkadi Industrial Park.
High-efficiency equipments also control the accurate temperature and humidity in the clean room, work well.
The project contributes to the spread of more efficient technology in Thailand.



MP2015-14 Introduction of Energy-Efficient Air Conditioners in a Lens Factory

Vietnam

Expected GHG Emission Reductions

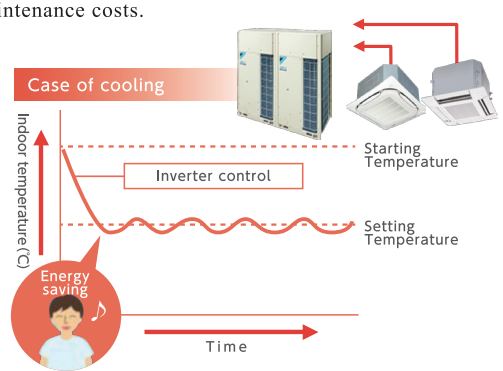
164 tCO_2/year

Hanoi, Vietnam

Project Owner

Japan：RICOH COMPANY, LTD.,
Vietnam：RICOH IMAGING PRODUCTS (Vietnam) CO., LTD.

This project aims to reduce energy consumption of the existing factory which manufactures lens for single-lens reflex camera in the east of Hanoi city, by replacing current air conditioners to more energy-efficient ones. Training for the labours in the factory is planned so as to achieve proper operation and monitoring of the emission.
Such introduction of the technology could also result in improvement of working environment for the labours, and in turn improvement of quality of the products as well as reduction of maintenance costs.



MP2015-15 Introduction of High Efficiency Air-conditioning in Hotel

Vietnam

Expected GHG Emission Reductions

826 tCO_2/year

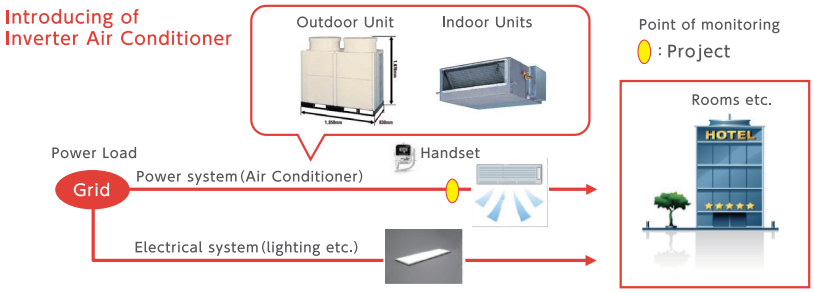
Hanoi, Vietnam

Project Owner

Japan：NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
Vietnam：Peace Real Estate Investment Company Limited

While non-inverter air conditioner with poor energy efficiency is popular in hotels in Vietnam, this project is intended to achieve the energy saving as a whole with the introduction of high efficiency air-conditioning system, which is introduced to the new(total floor area of about 29,000㎡, 17 floors above ground, two floors underground, 200 rooms), and achieves GHG emission reductions from reducing power consumption with introduction of high efficiency air-conditioning.

(Equipment performance : COP 4.53, 73.0kW x 1set, COP4.09, 90kW x 12set, COP4.05, 95.0kW x 2set, COP3.29, 109kW x 1set, COP3.27. 125kW x 1set)



MP2015-16 Energy Saving in Acid Lead Battery Factory with Container Formation Facility

Vietnam

Expected GHG Emission Reductions

2,880 tCO_2/year

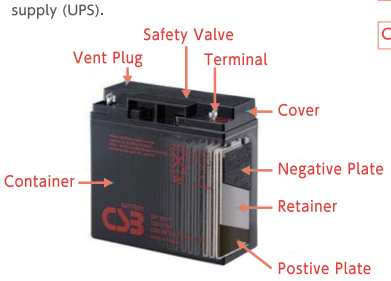
Nhon Trach District, Dong Nai Province, Vietnam

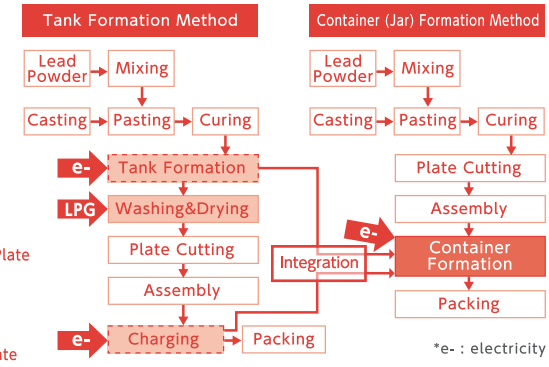
Project Owner

Japan：Hitachi Chemical Company, Ltd. & Shin-Kobe Electric Machinery Co.,Ltd.
Vietnam：CSB Battery (Vietnam) Co.,Ltd.

Currently, CSB Battery (Vietnam) manufactures small valve-regulated lead-acid (VRLA) batteries* (so-called sealed battery) with the tank formation method (See the chart on the right). This project introduces container formation method to some production lines, and about 60% of CO2 from fossil fuel combustion is reduced by integrating formation and charging processes, which consume much of energy in the 11-step battery production, and eliminating a drying process and LPG usage. Furthermore, this new formation method reduces water consumption by removing washing step.

*Compared to flooded lead-acid battery, it doesn't need to refill water and is utilized in various ways, such as in uninterruptible power supply (UPS).





PS2015-01 Energy Saving by Utilizing Lithium-ion Batteries at Base Transceiver Stations in Unstable-grid Areas

Bangladesh

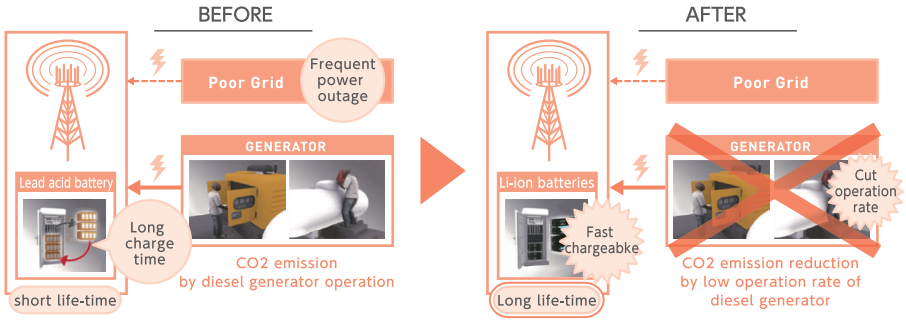
Expected GHG Emission Reductions

2,082 tCO_2/year

Fulbaria&Kapasia, Bangladesh

Implementing Entity :
GS Yuasa International Ltd.

This project introduces fast-chargeable lithium-ion batteries to base transceiver stations (BTS) owned by Grameenphone.
Blackouts occur frequently in Bangladesh due to the gap between demand and supply, especially in poor-grid areas. Thus diesel generators and lead-acid batteries are used together for providing stable power to the BTS.
This project achieves GHG emission reduction by replacing existing lead-acid batteries with lithium-ion batteries, which significantly reduces runtime of the diesel generators at each BTS in unstable-grid areas.



PS2015-02 Recovery and Utilization of Biogas From Agricultural Processing Waste in Ninh Binh Province

Vietnam

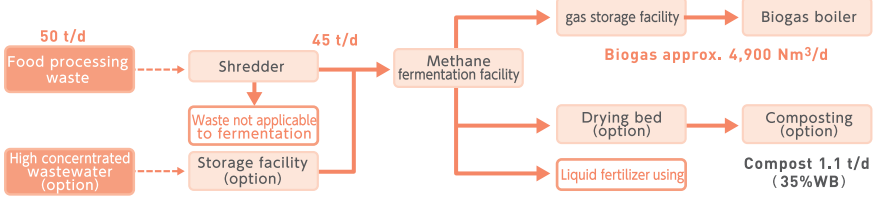
Expected GHG Emission Reductions

997 tCO_2/year

Ninh Binh, Vietnam

Implementing Entity :
Kubota Environmental Service Co., Ltd

The fruits and vegetables processing to make canned food and juice of food processing factory in Ninh Binh, Vietnam causes a lot of waste.
This project intends to introduce a “methane fermentation system” to treat agricultural processing waste and reduce the fossil fuel by supplying the biogas to the facility in the same premise.



PS2015-03 Utilization of Agricultural Biomass in Cement Kiln

Lao PDR

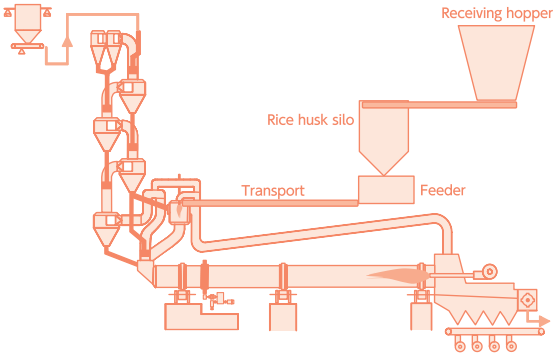
Expected GHG Emission Reductions

31,861 tCO_2/year

Vientiane, Lao PDR

Implementing Entity :
Taiheiyo Engineering Corporation

By utilizing agricultural biomass, abundant in Lao PDR as an alternative fuel to cement manufacturing process, large amount of CO2 emission reduction can be achieved, as well as saving coal resources.
Through the burning test conducted last year in the FS, technical possibility was confirmed. In this year PS, detailed design of equipment, biomass collecting system and financial scheme will be studied. Proposed utilizing process using Japanese technology diagram is shown below.



PS2015-04 Energy Saving in Industrial Wastewater Treatment for Rubber Industry

Indonesia

Expected GHG Emission Reductions

745 tCO_2/year

Palembang city, South Sumatra province, Indonesia

Implementing Entity :
Environmental Management and Technology Center (EMATEC)

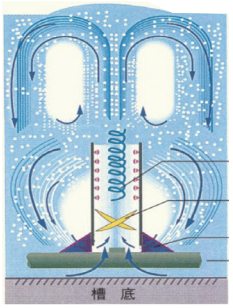
A crumb rubber company in Indonesia needs more efficient wastewater treatment system to meet wastewater quality standard in Indonesia. This project will substitute existing diffuser to Japanese aerator to improve wastewater treatment as well as reduce electricity consumption and cost for changing diffuser.


wastewater treatment facility in PT. ABP


used diffusers

Technology to be adopted (aerator technology)

- This aerator strongly mix air from blower and wastewater to treat wastewater aerobically.
- There is no pressure loss in aerator and can reduce electricity consumption at blower.
- This aerator needs no maintenance more than 15 years.
- This aerator can use existing air pipe.



Functionof aerator

PS2015-05 Hybrid Power Generation Project Using Biogas and Solar Power

Indonesia

Expected GHG Emission Reductions

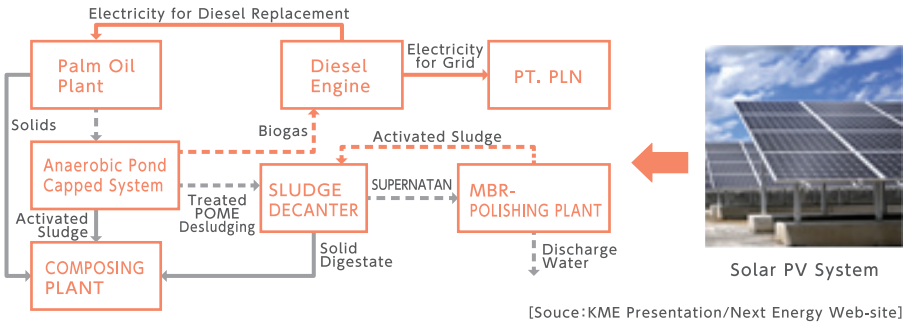
61,197 tCO_2/year

Bandar Pasir Mandoe, Kabupaten Asahan, Sumatera Utara, Indonesia

Implementing Entity :
Next Energy & Resources Co., Ltd.

To generate electricity, by using Biogas collected from POME (Palm Oil Mill Effluent) through anaerobic digestion system and to supply such electricity to the GRID under FIT (Size of Generation: 2MW).

By installing 100kW Solar PV System for self consumption, maximizing the power supply to the grid. The project aims to contribute to the reduction of GHG emission by reducing methane gas emission from POME and CO2 emissions from fossil fuel based grid connected power plants. Furthermore, contributing to the improvement of areal environment by reducing pollution caused by rancid smell from POME.



[Souce:KME Presentation/Next Energy Web-site]

PS2015-06 Low-carbon Project by Introducing PV and Energy Saving Equipment in Hotel, Office Building and Others

Costa Rica

Expected GHG Emission Reductions

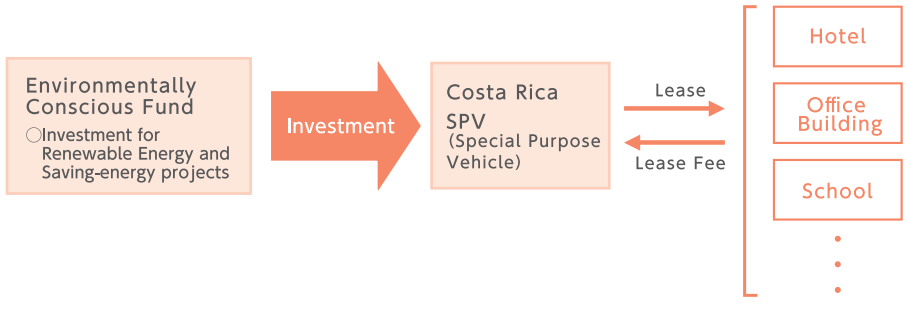
1,135 tCO_2/year

City of San Jose (San Jose State), City of Puerto Viejo (Lemon State), and others, Costa Rica

Implementing Entity :
NTT Data Institute of Management Consulting, Inc.

Photovoltaic generation and energy saving equipment such as high efficiency air conditioning and LED are introduced in hotel, office building, school and others. (14 facilities will be the target.)

Business Model will be realized, which reduce economic burden of owner of hotel, office building, school and others by utilizing Environmentally Conscious Fund & Leasing.



PS2015-07 Energy Saving By Introducing Regenerative Energy Storage System in Skytrain

Thailand

Expected GHG Emission Reductions

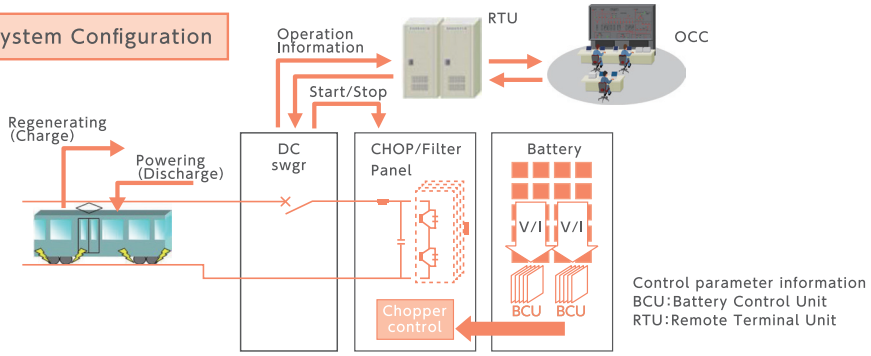
990 tCO_2/year

Bangkok city, Thailand

Implementing Entity :
Nippon Koei Co., Ltd

The project introduces electric power generation saving system into skytrain which operates in Bangkok city, Thailand. The system reduces power consumption which is used for train operation by saving electric power generation.
The project introduces two electric generation saving system and aims to promote the system in Asian countries as well as Thailand, where railway market are in growing.

System Configuration



PS2015-08 Saving Energy for Station Facilities Utilizing Regenerative Energy from Trains

Thailand

Expected GHG Emission Reductions

1,927 tCO_2/year

Bangkok, Thailand

Implementing Entity :
MITSUBISHI ELECTRIC CORPORATION

Bangkok public transportation railway projects of Metro (existing Blue Line) and Sky Train (existing Green Line) consists of 52 kilometers, 49 stations and 261 cars in all. The cars have regenerative braking system which provides electric power in braking to other neighboring cars in driving through the power line. However, in case of no cars nearby, the surplus electric power could be disposed as thermal energy.
Therefore, the project introduces Station Energy Saving Inverters (S-EIV) which can use surplus regenerative energy from trains in braking for the station facilities.

■S-EIV's main features
Convert the surplus regenerative energy from trains, which cannot be consumed by other trains, to low-voltage AC electricity for station facilities such as Lighting, Air-conditioning, Escalators ,Lift and so on.

PS2015-09 Talubin Mini-Hydropower Project

Philippines

Expected GHG Emission Reductions

13,354 tCO_2/year

Talubin River, Mountain Province, Luzon, the Philippines

Implementing Entity :
Tokyo Electric Power Services Co., Ltd.

The project involves the development of a 4.9MW run-of-river hydro power plant in Mountain province located in northern Luzon, the Philippines, utilizing an abundant water resources with mountainous topography. The electricity generated by the project will be fed into the grid. Renewable hydropower development will ensure a stable power supply and improve the local electricity supply and contribute to GHG emissions reduction.

PS2015-10 Rice Husk Power Generation in Rice Mill Factory in Ayeyarwady

Myanmar

Expected GHG Emission Reductions

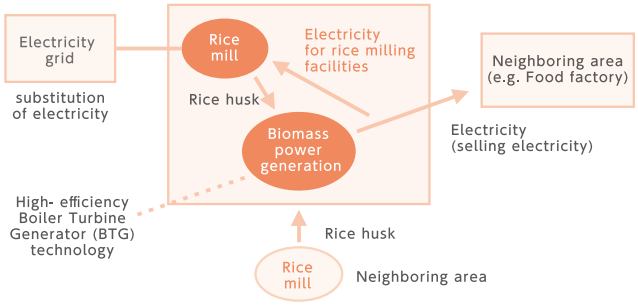
2,534 tCO_2/year

Ayeyarwady Division, Myanmar

Implementing Entity :
Fujita Corporation

Planning study of the rice husk based power generation project (approximately 1.6 MW) in the rice mill factory in Ayeyarwady, the major rice-production area of Myanmar.
Contribution to solving issues of unutilized rice husk in rice mills and stable power supply in Ayeyarwady.
Toward of establishment of the business model and further business development of rice husk power generation in Ayeyarwady and surrounding regions.

Current situation of rice husk



FS2015-01 Distributed Heat Supply System Using Biomass and Coal Mixture Combustion Type Boiler

Mongolia

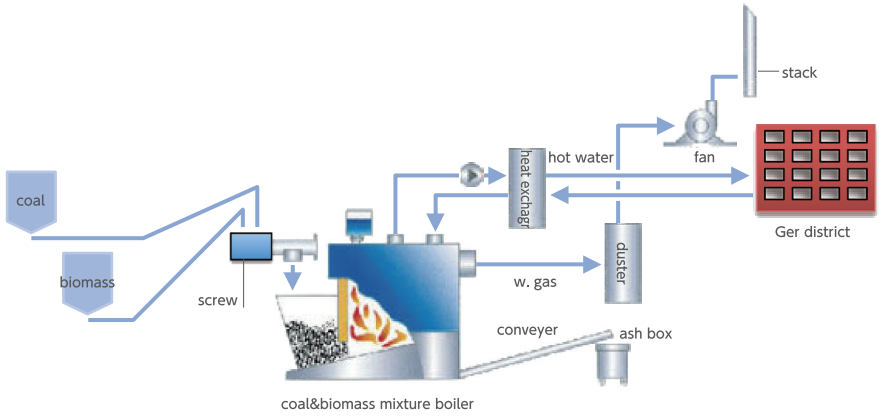
Expected GHG Emission Reductions

3,760 tCO_2/year

Ulaanbaatar, Mongolia

Implementing Entity :
PEAR Carbon Offset Initiative, Ltd.

Air pollution due to coal stoves in Ger district of Ulaanbaatar affects public health seriously and CO2 emission accelerates climate change. Distributed heat supply system will be introduced to Ger district. Air pollution and CO2 emission will be reduced because the system uses mixture coal and solid biomass fuel. Solid biomass fuel consists of agricultural manure and sludge from a sewage treatment plant of the city.

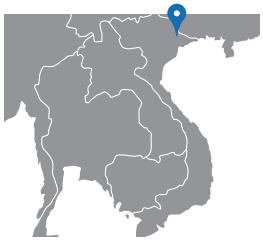


FS2015-02 Waste Heat Recovery Power Generation at Cement Factory in Quang Ninh Province

Vietnam

Expected GHG Emission Reductions

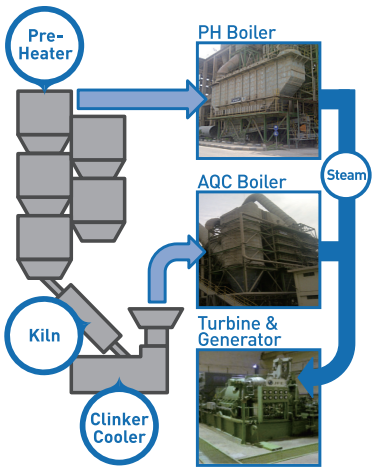
29,415 tCO_2/year



Quang Ninh Province, Vietnam

Implementing Entity :
JFE Engineering Corporation

By introducing Waste Heat Recovery Power Generation System to Thang Long Cement in Quang Ninh Province, the reduction of CO2 and power generation as a substitution of buying power generated by fossil fuel will be materialized.



FS2015-03 Biogas Recovery and Utilization in Tapioca Starch Factory | Lao PDR

Expected GHG Emission Reductions

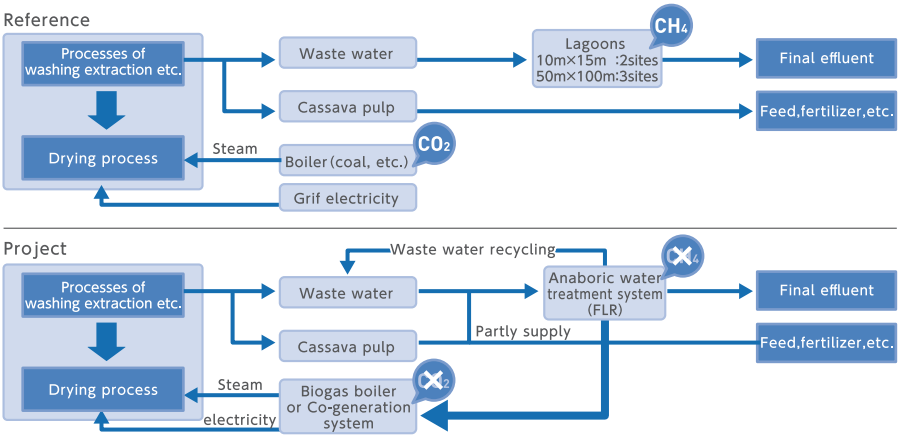
22,824 tCO_2/year

Pakxe, Lao PDR

Implementing Entity :
Pacific Consultants. Co.,Ltd.

The project aims to reduce GHG emissions by introducing a biogas boiler and an anaerobic water treatment system. Biogas collected from which is used to replace the whole amount of coal consumption in the tapioca starch factory.

By avoiding CO2 emissions from coal combustion and CH4 emissions from open lagoons, GHG emission reductions of 22,824tCO2e/year will be achieved.



FS2015-04 Development of District Energy Supply Business by Introducing Co-generation | Indonesia

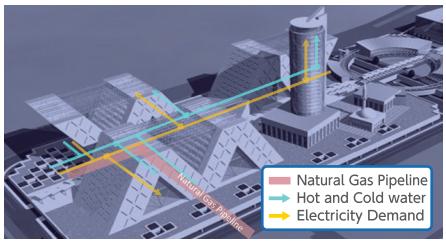
Expected GHG Emission Reductions

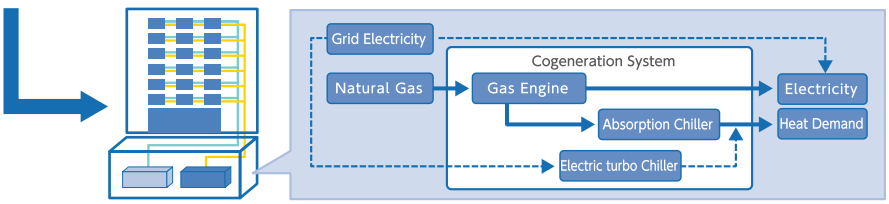
18,762 tCO_2/year

DKI Jakarta, Indonesia

Implementing Entity :
JGC Corporation

JGC corporation plans to develop a district energy supply model by introducing a cogeneration system into complex buildings consisting of office, apartment and convention center in Jakarta. This cogeneration system with high efficiency gas engine (Expected capacity: 4.0 MW) could contribute to GHG emission reductions as well as safe and stable energy supply in the area.





FS2015-05 Introduction of Co-generation and Solar Power Generation Systems in Large Shopping Malls

Indonesia

Expected GHG Emission Reductions

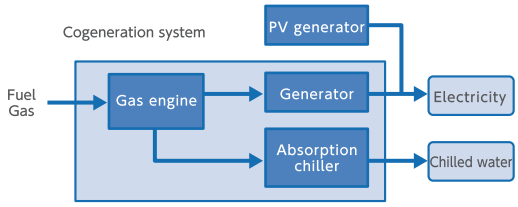
11,325 tCO_2/year

Deltamas City, Bekasi, Indonesia

Implementing Entity：
NRI, AEONMALL, OSAKA GAS

This is the project to reduce CO2 in one of large shopping mall of AEONMALL in Indonesia by introducing Gas Cogeneration system and PV system.
If this research would be successful, we intend to introduce same efficient systems into any other AEONMALLS in Indonesia.
With the help of these projects, the merchandize mall sector would benefit and contribute to Indonesian climate Policy: RAN-GRK.

Whole System



Project members and rolls

AEONMALL	Planning whole mall
AEONMALL INDONESIA	MRV
OSAKA GAS	Energy supply business
Hitachi	Co-generation, PV System's maker

FS2015-06 Installation of High-efficiency Chillers in Large-scale Hotels

Cambodia

Expected GHG Emission Reductions

415 tCO_2/year

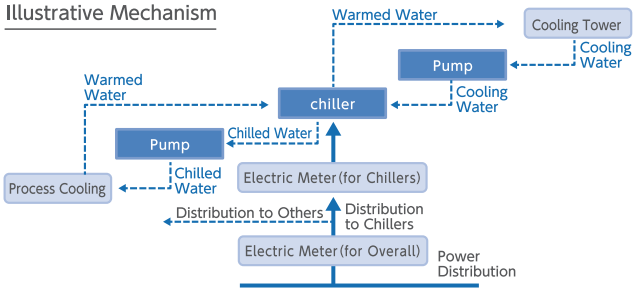
Phnom Penh, Siem Reap, Cambodia

Implementing Entity：
PricewaterhouseCoopers Co., Ltd.

High-efficiency chillers and peripheral equipment are to be installed into large Hotels in Cambodia for energy-saving of air conditioning facilities.

This FS is aimed to
1.Quantitatively comprehend energy-reduction effect and CO2 reduction effect
2.Measure flow volume and energy consumption of chillers, energy consumption of chiller pumps
3.Maximum and minimum energy loads
4.Design specifications of newly-installed chillers and peripheral equipment

Illustrative Mechanism



①Raffles Hotel Le Royal (Phnom Penh)

②Raffles Grand Hotel d'Angkor (Siem Reap)

FS2015-07 Geothermal Power Generation in the South of Santiago | Chile

Expected GHG Emission Reductions

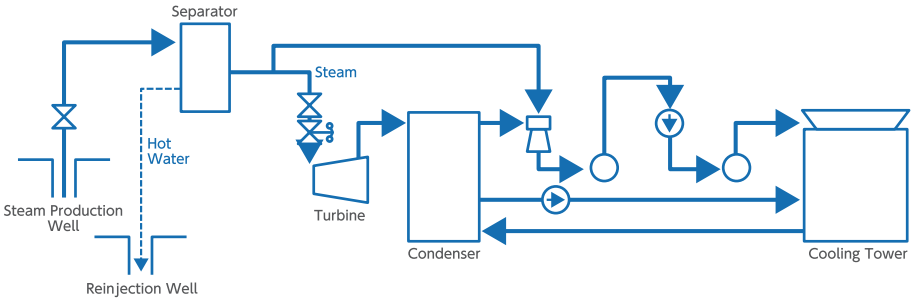
104,800 tCO_2/year

South of Santiago, Republic of Chile

Implementing Entity :
Deloitte Touche Tohmatsu LLC Japan

Currently, more than 75% of energy consumption is dependent on imports in Chile.
As energy demand has been drastically increasing, there is a great need for the enhancement of generation capacity.
The aim of this project is to fill the need and reduce CO2 emissions by utilizing geothermal resources for power generation. In addition, this project can spread geothermal power technology to South American Countries including Chile.

Geothermal Power System Flow (Single Flash)



FS2015-08 Energy Saving by Co-generation Project in the Fiber Factory | Thailand

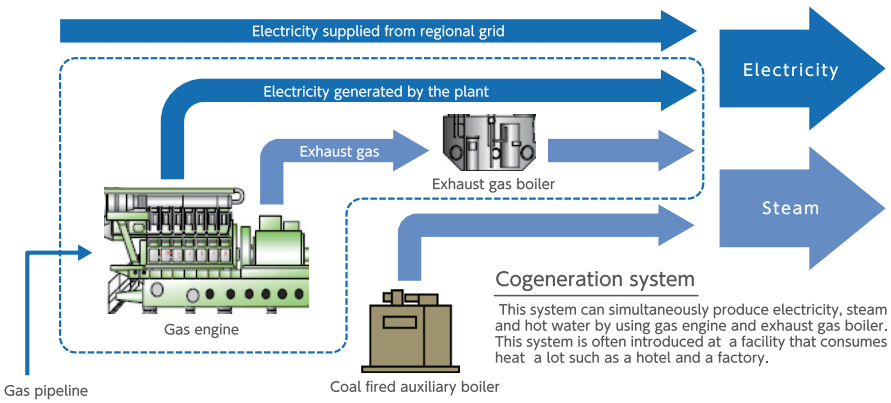
Expected GHG Emission Reductions

Around 20,000 tCO_2/year

Inland area, Thailand

Implementing Entity :
The Kansai Electric Power Co., Inc.

High efficiency gas fired cogeneration plant will be introduced at the fiber factory located in Thailand. In this factory electricity is supplied from the regional grid and steam is supplied from the coal fired auxiliary boiler.
In addition, various methods to increase energy efficiency will be introduced in the utility facilities.



Cogeneration system

This system can simultaneously produce electricity, steam and hot water by using gas engine and exhaust gas boiler. This system is often introduced at a facility that consumes heat a lot such as a hotel and a factory.

REDD+2015-1 REDD+ project in Luang Prabang Province through controlling slash-and-burn

Lao PDR

Expected GHG Emission Reductions

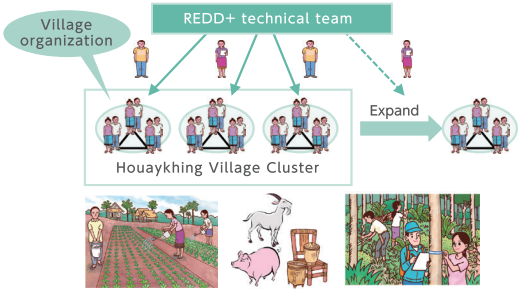
140,000 tCO_2/year

Houaykhing Village Cluster, Phonsay District Luang Prabang Province, Lao PDR

Implementing Entity :
Waseda University

The project site is a part of Phonsay District, Luang Prabang Province (about 30,000ha) where has severe deforestation and forest degradation by shifting cultivation and so on.
REDD+ activities are implemented on the basis of the achievement of JICA's readiness activities (e.g. introduction of alternative livelihoods) and amount of GHG emission reductions by REDD+ activities are quantified.
In this year, the project aims to implement REDD+ activities to verify effectiveness, such as introducing alternative livelihoods.Also, the project organizes the REDD+ technical team to enforce REDD+ activities at village level and to expand them into other areas.

Deforestation caused by slash-and-burn practices in Luang Prabang



Enhancing and expanding REDD+ activities and land and forest management system in a participatory manner

REDD+2015-2 REDD+ project in Boalemo District

Indonesia

Expected GHG Emission Reductions

86,520 tCO_2/year

Gorontalo province (Sulawesi Island), Indonesia

Implementing Entity :
Kanematsu Corporation

This project aims to monitor the effectiveness of REDD+ activities and quantify the amount of GHG emission reductions by REDD+ activities in Boalemo District, Gorontalo Province, where deforestation is occurring by slash-and-burn agriculture for growing corn. The project promotes cacao production and its improvement as an alternative or additional livelihood for corn farmers, and also conducts awareness raising activities and capacity development for monitoring. REDD+ activities will be implemented in cooperation with Boalemo district government and cacao production and its improvement will be promoted in a participatory way with the local people. Database for monitoring will be developed and Japanese experts provide technical assistance on utilizing satellite data to improve monitoring the project, which will be conducted in cooperation with Boalemo government.

Outline of the Project Design

古紙パルプ配合率80％再生紙を使用

VEGETABLE OIL INK