# *Essential Tips for Submitting Proposal for JCM Model Projects in 2021*

**April 7th 2021**

**Global Environment Centre Foundation (GEC)**

# Outline of JCM Model Projects

Global Environment Centre Foundation

| | |
|---|---|
| **Budget** | Approx. USD83million in total for both Financing Program of JCM Model Project and Financing Program to Demonstrate Decarbonization Technology for Realizing Co-Innovation |
| **Executing Entity** | International Consortium that consists of a Japanese entity and a JCM partner-country entity(ies) |
| **Scope of Financing** | Facilities, equipment, vehicles, etc. which reduce CO2 from fossil fuel combustion as well as construction cost for installing those facilities, etc. |
| **Eligible Projects** | Start installation after the Contract of Finance is concluded and finish installation within 3 years. |
| **Maximum percentage of Financial Support** | Maximum of 50% and reduce the percentage according to the number of already selected project(s) using a similar technology in each partner country.<br>※ Number of already selected project(s) using a similar technology in each partner country : none (0) = up to 50%, up to 3 (1-3) = up to 40%, more than 3 (>3) = up to 30%. The percentage of financial support will be determined by GEC. |
| **Cost-effectiveness** | Cost-effectiveness of GHG emission reductions is expected to be JPY4,000/tCO2eq or better.<br>※ If the number of similar technological projects in a partner country is 5 or more, the cost-effectiveness is expected be JPY3,000 or lower. If it is 10 or more, JPY2,500 or lower. |

**Guideline** for Submitting JCM model project proposal

# Basic policy for JCM Model Projects in FY2021

Global Environment Centre Foundation

**Decarbonizing Technologies development strategy**

- Evaluate GHG index
- Exclude power generation system using fossil fuels

Define selection base for Solar Power technology

- Solar Power Module
- Solar Power Plant with Battery

Financing Programme to Demonstrate Decarbonization Technology for Realizing Co-Innovation

Develop technologies in partner countries leads to create projects for JCM Model Project

Financing Pogramme of JCM Model Projects

# JCM Model Projects Schedule in FY2021

Global Environment Centre Foundation

4 April | 5 May | 6 June | 7 July | 8 August | 9 September | 10 October | 11 November | 12 December | 1 January | 2 February | 3 March | 4 April

From April 7 to October 29 : Proposal acceptance period

Call for proposal

Evaluation of proposals
Proposal review & interview with applicants

Submission of application

Review of application documents

Start Model projects

- Selection of model projects
- Documentation briefing for the notice of contract of financing

Notice of contract of financing

Implementation of model projects

1-year project
- ☑ Submission of final reports
- ☑ Onsite inspection

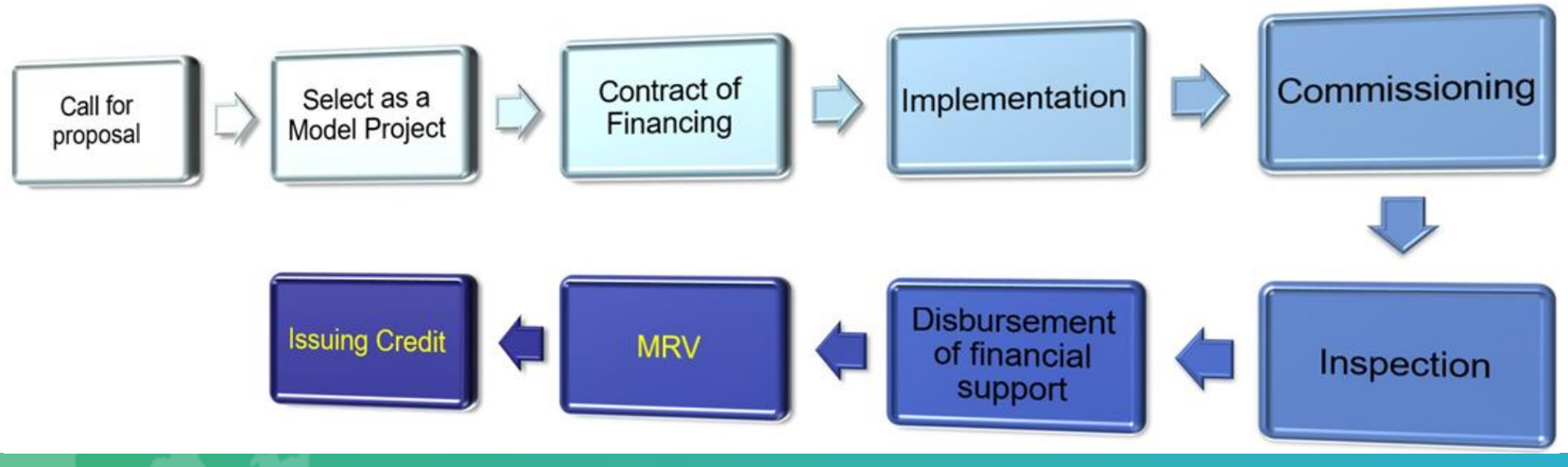
2 or 3-year project
- ☑ Submission of midterm reports
- ☑ Midterm inspection

Inspection

Disbursement of financial support

1-year project:
Disbursement of financial support

2 or 3-year project:
Disbursement of part of financial support




# Guideline for Submitting JCM model project proposal in FY2021

Global Environment Centre Foundation

## What is the criteria of cost-effectiveness?

**JPY4,000/tCO2equivalent**

$$= \frac{\text{Amount of financial support[JPY]}}{\text{Emission reductions of GHG [tCO2equivalent/y]} \times \text{legal durable years[y]}}$$

※ Legal durable years of the facilities is stipulated by the Japanese law, and are dependent on the industry classification.

**JPY3,000/tCO2equivalent**

In case the number of similar technological Projects in each country is 5 to 9.

**JPY2,500/tCO2equivalent**

In case the number of similar technological Projects in each country is 10 or more.

Solar power projects in **Thailand**

Solar power projects in Palau, Philippine and hydropower projects in Indonesia

# JCM for SDGs

Global Environment Centre Foundation

**Possible Contribution of Renewable Energy Projects to SDGs**

**GHG emission reduction can be implemented though renewable energy generation by replacing electric power derived from fossil fuel combustion**

- Photovoltaic Generation
- Hydraulic Power Generation
- Wind Power Generation
- Geothermal Generation
- Biomass・Biogas Generation

<Graph Legends>

Goal to which Renewable Energy Project can contribute

Common Goal to which JCM Projects can contribute

※The listed goals are no more than recommended examples with high potential to contribute through implementing JCM project. These goals are not limited nor mandatory to contribute.

| Planning | Implementation | Operation | Decommission |
|---|---|---|---|

Consider gender equal access to various benefits from the project such as compensation of land acquisition.

- **・Ensure women's participation such as public hearing（5.5）**
- **・Equal rights to ownership and compensation of land acquisition（5.a）**

**Equal rights to basic services（1.4）**

**・Increase share of renewable energy （7.2）**

**・Reduce air pollution(11.6)**

Reducing consumption of electricity derived from fossil fuel, improve the sustainability of the installed facility such as factory, hotel and hospital.

**・ Increase resource-use efficiency and greater adoption of clean and environmentally sound technologies (9.4)**

- **・ Sustainable management and efficient use of natural resources (12.2)**
- **・Environmentally sound management of all wastes throughout their life cycle（12.4）**
- **・ Reduce waste generation through prevention, reduction, recycling and reuse（12.5）**

Reduce air and water pollution, noise and vibration by implementing proper disposal and recycling.

**・Sustainable management of all types of forests（15.2）**

Prevent adverse effects on forestation and biodiversity conducting proper environment assessment according to the laws and regulations in the partner country.

**・Reduce inequality by procurement with fare price（10.3）**

**・Publish sustainability reports (12.6)**

**・Education and training for relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship（4.4）**

**・Increase employment of women to managerial and technical positions（5.5）and gender sensitive work environment (Guideline on Gender Equality for JCM)**

**・Full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.（8.5）**

**・Adopt supply chain without child labor, exploitation, conflict and corruption.（5.2、8.8、16.2、16.5）**

**・Take urgent action to combat climate change and its impacts. （13）**

- **・Promote the development, transfer, dissemination and diffusion of environmentally sound technologies（17.7）**
- **・Enhance the global partnership for sustainable development.（17.16）**

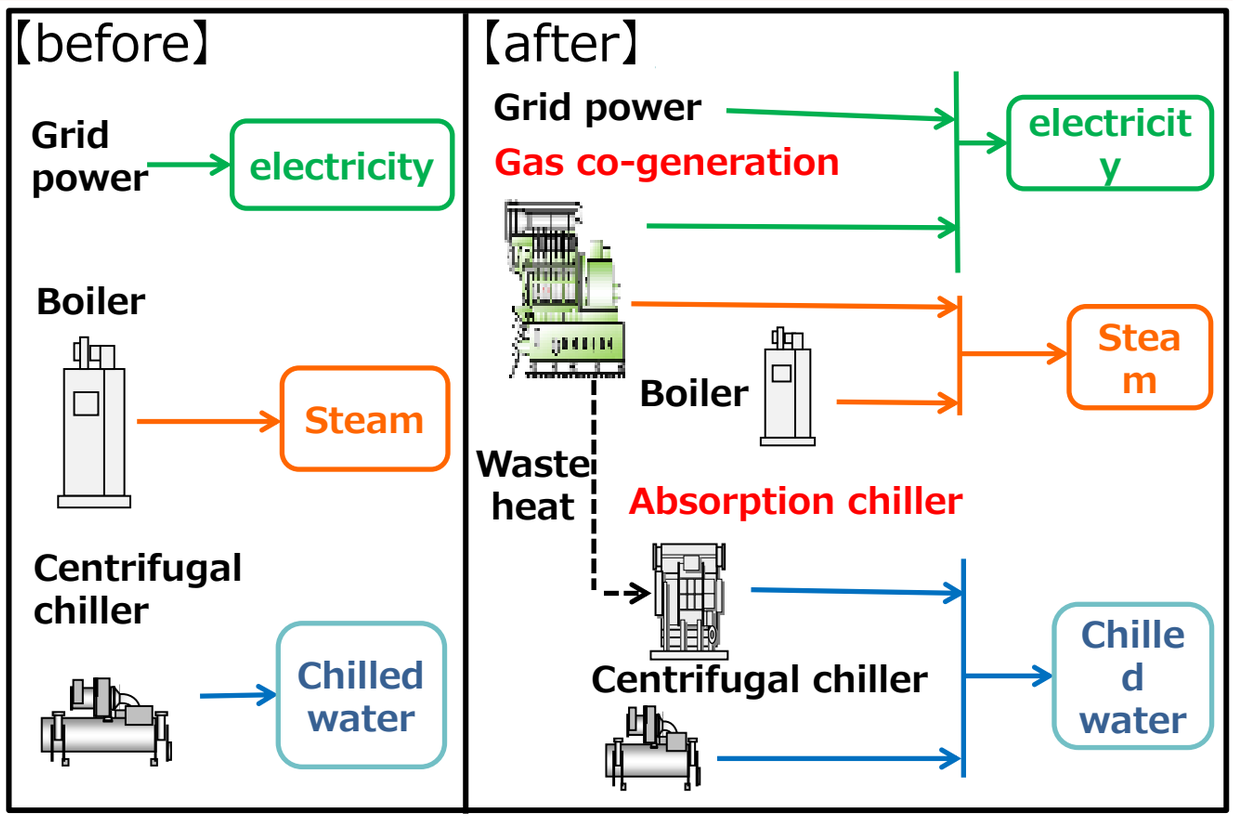
# Eligible Power Generation System

JCM Model Project support Biomass, WtoE power generation system.
Those using fossil fuels are not eligible, except for utilizing heat from generating power

## JCM Model Project（FY2018）: Thailand

### Introduction of Gas Co-generation System and Absorption Chiller to Fiber Factory

PP (Japan): Kansai Electric Power Co., Inc., PP (Thailand): Kansai Energy Solutions (Thailand) Co., Ltd

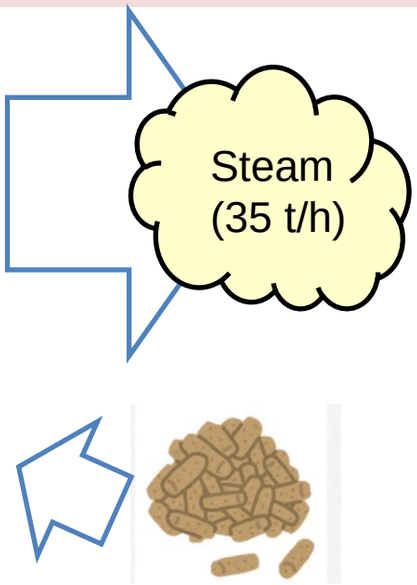



## JCM Model Project（FY2018）: Thailand

### Introduction of Biomass Boiler to Cooking Oil Factory

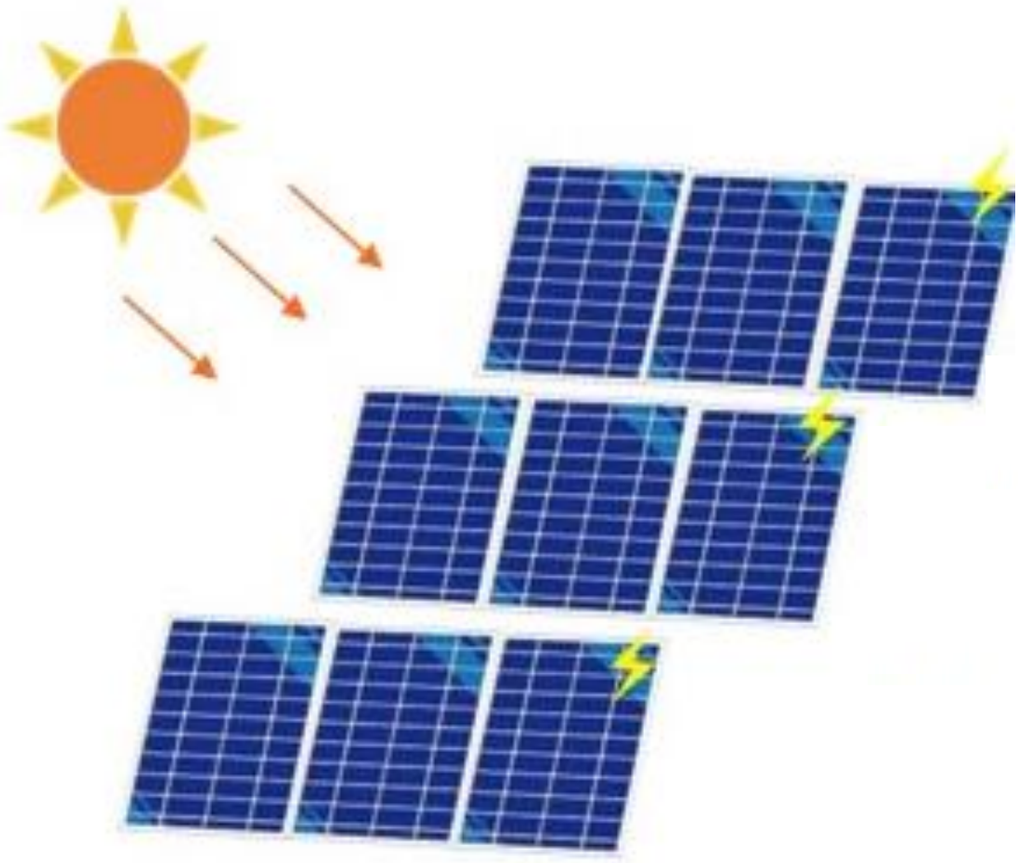
PP (Japan): Tepia Corporation Japan Co., Ltd. PP (Thailand): Thanakorn Vegetable Oil Products Co., Ltd.

Multi Fuel Biomass Boiler
(Water Tube-Fire Tube Combination Boiler with Step Grate)




Biomass
Fuel:
PKS

Guideline for Submitting JCM model project proposal



Photovoltaic module:
Conversion rate of 20% or higher, from optical to electric energy

| Technology | Mongolia | Bangladesh | Ethiopia | Kenya | Maldives | Viet Nam | Lao PDR | Indonesia | Costa Rica | Palau | Cambodia | Mexico | Saudi Arabia | Chile | Myanmar | Thailand | Philippine | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MN | BD | ET | KE | MV | VN | LA | ID | CR | PW | KH | MX | SA | CL | MM | TH | PH | |
| Solar Power Plant | 4 | 1 | 1 | 2 | 1 | 4 | 3 | 3 | 1 | 5 | 4 | 3 | 1 | 4 | 1 | 15 | 6 | 59 |

Photovoltaic(PV) module:
Conversion rate of 20% or higher, from optical to electric energy

Battery

(1) Charges only the power generated by PV modules introduced, and the power supplied from the battery is measured.

(2) Necessity

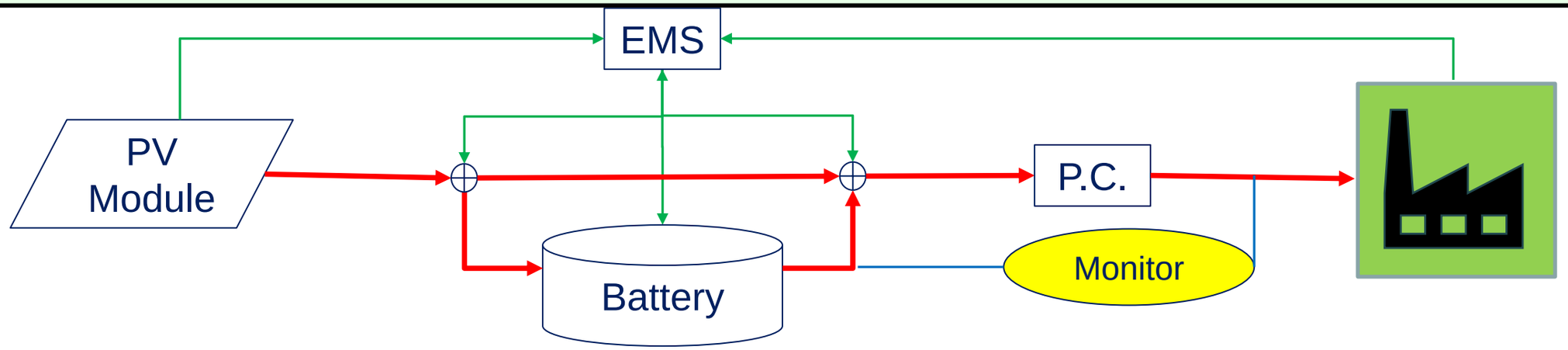
1) Introduction to off-the-grid areas

2) Installation of batteries is required to connect grid by laws or regulations

3) For self-consumption in factories or local power supply business

(a) The battery should be charged and discharged every day

(b) The battery capacity is 20% or larger than wattage of PV module installed, and within maximum daily base chargeable amount




| Technology | Mongolia | Bangladesh | Ethiopia | Kenya | Maldives | Viet Nam | Lao PDR | Indonesia | Costa Rica | Palau | Cambodia | Mexico | Saudi Arabia | Chile | Myanmar | Thailand | Philippine | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MN | BD | ET | KE | MV | VN | LA | ID | CR | PW | KH | MX | SA | CL | MM | TH | PH | |
| Solar Power Plant with Battery | | | | | | | | 1 | | | | | | | | | | 1 |

# Selection of Projects in FY2020

Global Environment Centre Foundation

| Partner Country | Entity | Project Title | Sector | Expected GHG Emission Reductions（tCO2/y） |
|---|---|---|---|---|
| Vietnam | Kanematsu KGK Corp. | 57MW Solar Power Project in An Giang Province | Renewable Energy | 28,208 |
| Vietnam | DAIICHI JITSUGYO CO., LTD. | Introduction of Biomass Co-generation system to Food Factory | Renewable Energy | 24,115 |
| Vietnam | Marubeni Corporation | Introduction of Biomass Boiler to Soluble Coffee Manufacturing Plant | Renewable Energy | 19,498 |
| Vietnam | Acecook Co., Ltd. | Introduction of High Efficiency Boiler System to Food Factory | Energy Efficiency Improvement | 7,631 |
| Vietnam | Hitachi-Johnson Controls Air Conditioning, Inc | Introduction of High Efficiency Air-conditioning System to Hotel in Ho Chi Minh City | Energy Efficiency Improvement | 184 |
| Lao PDR | Kayama Kogyo Co., Ltd. | 14MW Solar Power Project in Vientiane Province and Borikhamxay Province | Renewable Energy | 8,104 |
| Indonesia | NiX Co., Ltd. | 6MW Mini Hydro Power Plant Project in West Pasaman, West Sumatra | Renewable Energy | 18,319 |
| Thailand | The Kansai Electric Power Company, Incorporated | Introduction of 8.1MW Rooftop Solar Power System in Motorcycle Factory and Fiber Factory | Renewable Energy | 3,797 |
| Thailand | The Kansai Electric Power Company, Incorporated | Introduction of Energy Saving Centrifugal Chillers to Machinery Factory | Energy Efficiency Improvement | 225 |
| Philippines | Mitsubishi Heavy Industries, Ltd. | 29MW Binary Power Generation Project at Palayan Geothermal Power Plant | Renewable Energy | 72,200 |
| Saudi Arabia | Marubeni Corporation | 400MW Solar Power Project in Rabigh Region | Renewable Energy | 477,129 |
| Chile | FARMLAND Co., Ltd. | 3MW Solar Power Project Utilizing Farmland in Valparaiso Region | Renewable Energy | 2,397 |
| Myanmar | Tokyo Century Corporation | 7.3MW Solar Power Project in Mandalay International Airport and Yangon City | Renewable Energy | 3,276 |
| Thailand | Sumitomo Mitsui Finance and Leasing Company, Limited | Introduction of 5MW Rooftop Solar Power System to Aluminum Building Materials Factory | Renewable Energy | 2,200 |
| Thailand | The Kansai Electric Power Company, Incorporated | Introduction of 2.6MW Rooftop Solar Power System to Semiconductor Factory | Renewable Energy | 1,188 |
| Thailand | Inabata Co., Ltd. | 2.5MW Solar Power Project with Blockchain Technology in Chiang Mai University Town Community | Renewable Energy | 1,041 |
| Philippines | Tokyo Century Corporation | Introduction of 2MW Solar Power System to Shopping Mall （JCM Eco Lease Scheme） | Renewable Energy | 1,476 |
| Indonesia | Voith Fuji Hydro K.K. | 5MW Hydro Power Project in Bengkulu Province | Renewable Energy | 15,299 |
| Myanmar | Yuko Keiso Co., Ltd. | Introduction of Energy Saving Equipment to Complex Buildings of Smart Urban Development Project in Yangon | Energy Efficiency Improvement | 1,544 |
| Vietnam | Idemitsu Kosan Co., Ltd. | Introduction of 2MW Solar Power System for Pellet Factory | Renewable Energy | 1,024 |
| Indonesia | Alamport Inc. | 4.2MW Rooftop Solar Power Project to Pharmaceutical Factories, Vehicles Dealers, and Timber Factories | Renewable Energy | 3,961 |
| Thailand | SHIZUOKA GAS CO., LTD. | Introduction of 2MW Rooftop Solar Power System to University | Renewable Energy | 868 |
| Indonesia | AURA-Green Energy Co., Ltd. | 8MW Mini Hydro Power Plant Project in Maluku Province | Renewable Energy | 18,034 |
| Chile | Sharp Energy Solutions Corporation | 34MW Solar Power Project in Nuble Region | Renewable Energy | 25,576 |
| Thailand | Shizen Energy Inc. | 30MW Floating Solar Power Project in Industrial Park | Renewable Energy | 13,739 |

# JCM ECO Lease Scheme

**In the fiscal year 2020, "JCM Eco Lease Scheme" is newly introduced to JCM Model Project to cover leasing charges and interests. This scheme has an advantage in reducing the reporting burden of representative participants with shorter monitoring period and simple proposal document.**

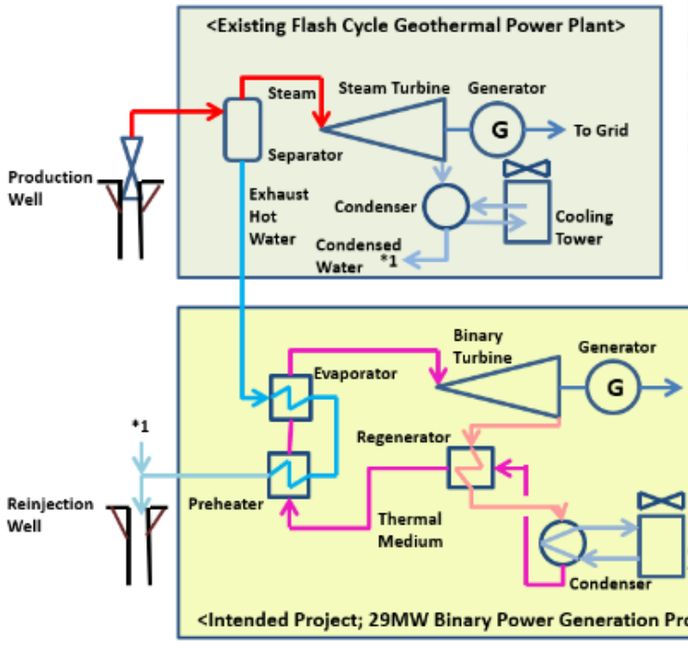
| | |
|---|---|
| Representative Participant | Japanese leasing company |
| Amount of Financial Support | Up to JPY500 million for 3 years in principal |
| Percentage of Financial Support | Uniformly 10% of total leasing charges including leasing interests |
| Period of MRV | Equal to leasing period |
| Leasing Period | At least 5 years |
| Costs Eligible for Financing | Leasing charges of the costs of facilities/equipment and relevant lease interests |
| Eligible Type of Technologies | In principle, technologies with JCM methodology (ies) that have been either approved or proposed |
| Financial Statement for Application | Only financial statements of Representative Participant need to be submitted. |

# 29MW Binary Power Generation Project at Palayan Geothermal Power Plant

PP (Japan): Mitsubishi Heavy Industries, Ltd. PP (Philippines): Bac Man Geothermal Inc.

## Outline of GHG Mitigation Activity

This project introduces a new 29 MW binary geothermal power plant with the Organic Rankine Cycle (ORC) system to the existing 120MW flash type geothermal power plant owned and operated by Bac-Man Geothermal Inc. The power plant is located at Palayan area of southern part of the Luzon island. This binary geothermal power plant effectively utilizes exhaust hot water of low enthalpy from the existing flash geothermal power plant without producing hazardous gasses. This project replaces the grid power produced by fossil fuel with renewable energy and reduces greenhouse gas (GHG) emissions.





**Notes to the picture : Upper right : Existing flash type geothermal power plant**

**Red Frame : New binary geothermal power plant**

## Expected GHG Emission Reductions

**72,200 $tCO_2$/Year**

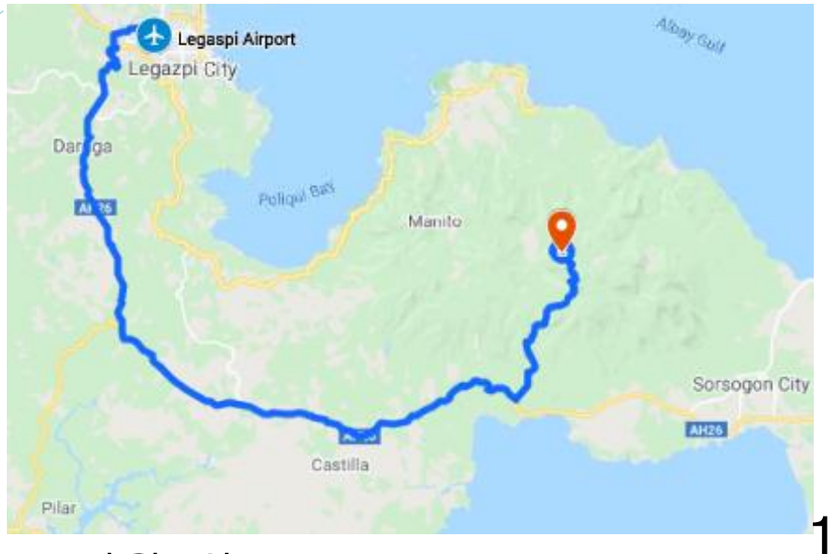
= (Reference $CO_2$ emissions)
- (Project $CO_2$ emissions)

・Reference $CO_2$ emissions
= (Quantity of the electricity generated by the project) [MWh/year]
× Emission factor [$tCO_2$/MWh]

・Project $CO_2$ emissions
= 0 [$tCO_2$/year])

## Sites of Project

**Province of Albay, Luzon**

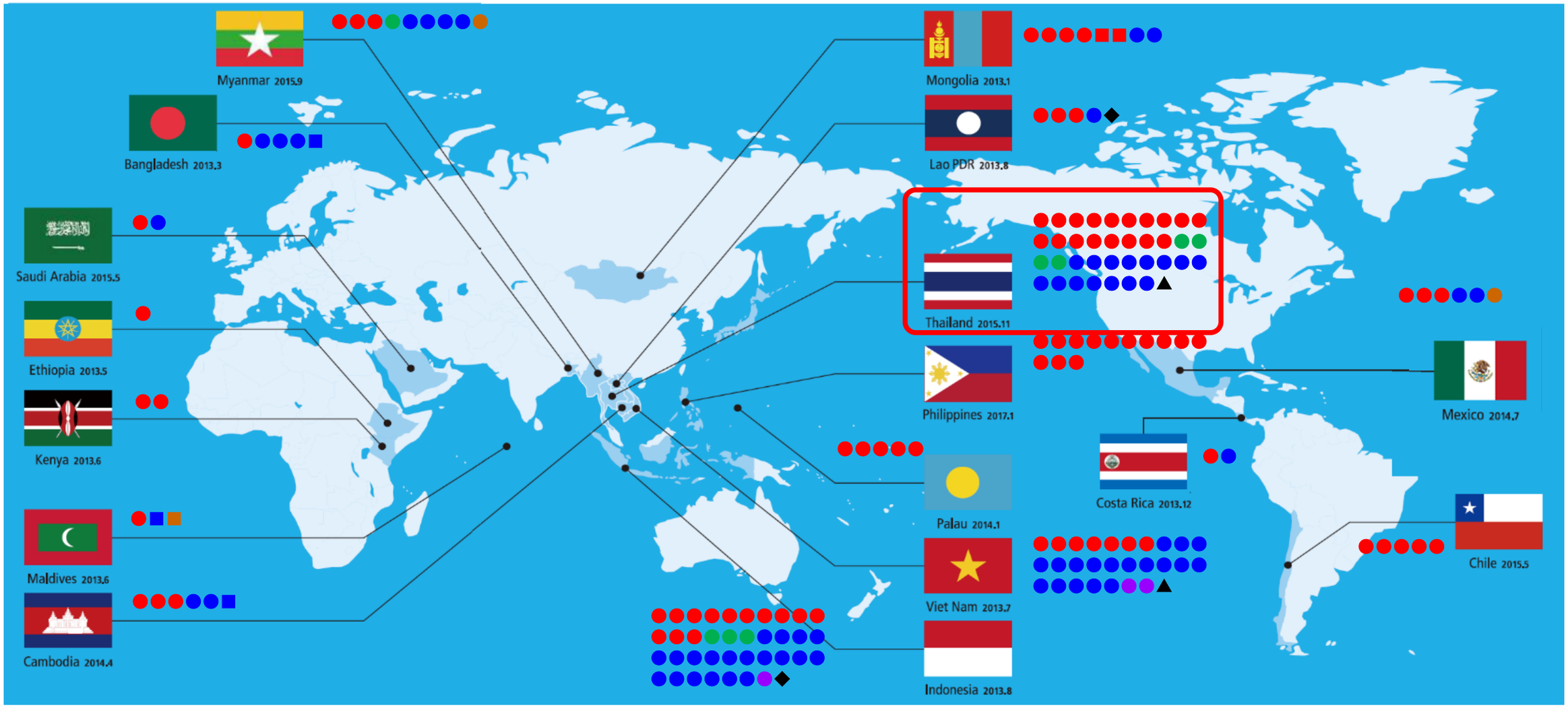



56km Southwest of the Legazpi City Airport

Map data©2020Google

# Project Map of JCM Financing Programme



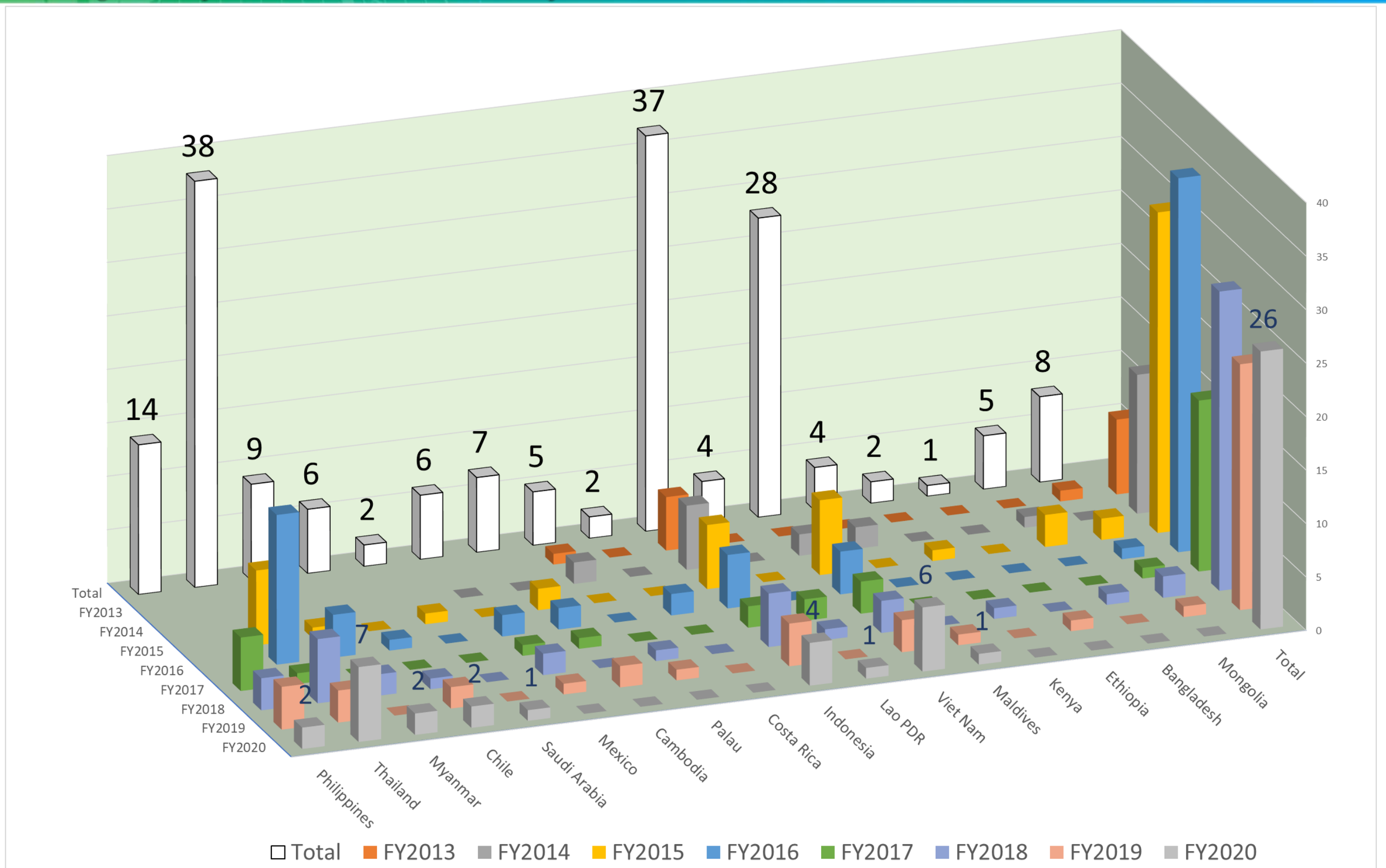



**Total 176 projects / 17 countries**
**(● Model Project:164, ■ ADB:6, ◆ REDD+:2, ▲ F-gas:2)**

- **Renewable Energy**
- **Effective Use of Energy**
- **Energy Efficiency Improvement**
- **Transport**
- **Waste Handling and Disposal**

# Project by Year and Country





# Categorization by applied technology type

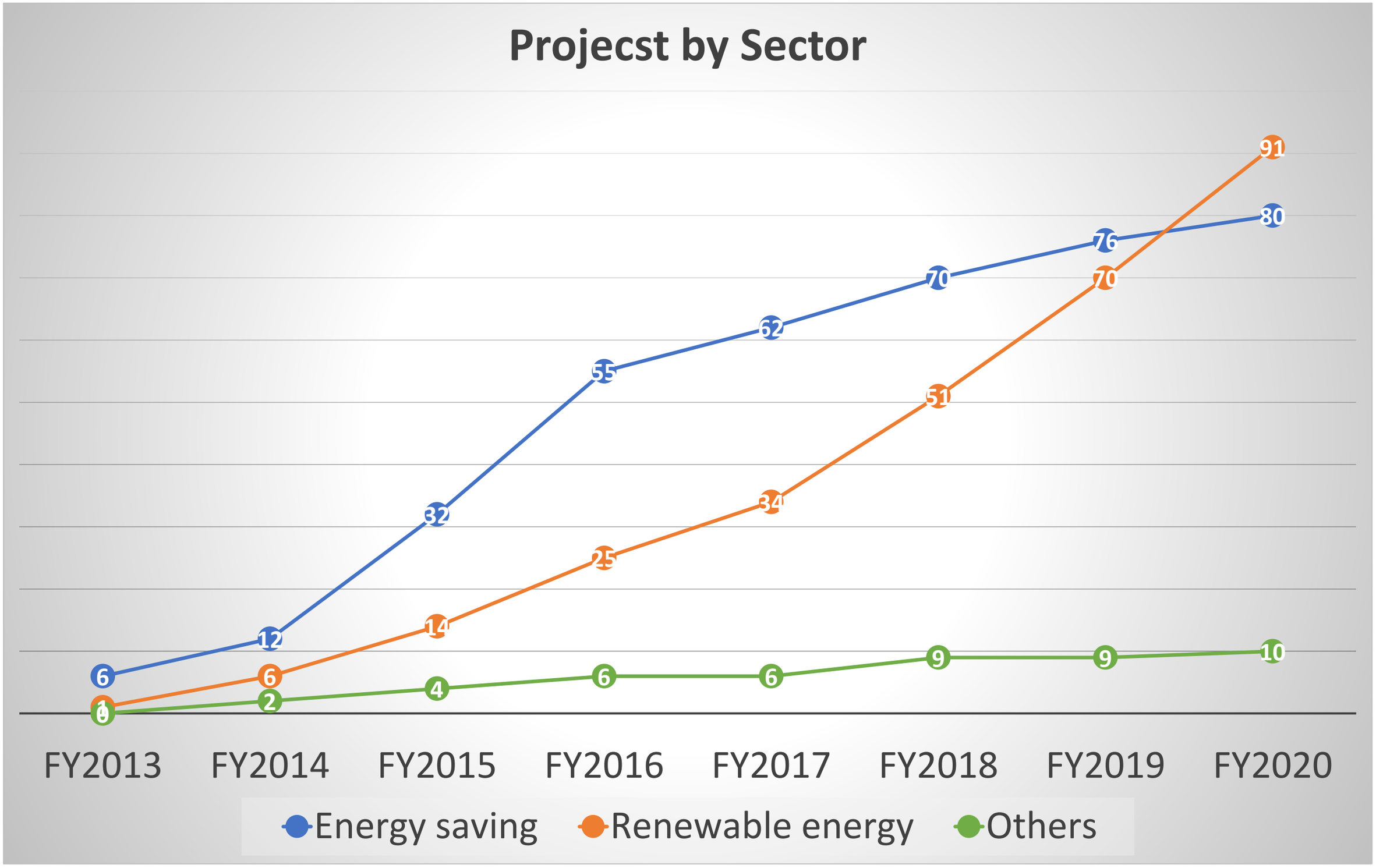
Global Environment Centre Foundation

| Sector | Technology | Mongolia | Bangladesh | Ethiopia | Kenya | Maldives | Viet Nam | Lao PDR | Indonesia | Costa Rica | Palau | Cambodia | Mexico | Saudi Arabia | Chile | Myanmar | Thailand | Philippine | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MN | BD | ET | KE | MV | VN | LA | ID | CR | PW | KH | MX | SA | CL | MM | TH | PH | |
| 1. Energy Efficiency | Air Conditioning System | | | | | | 4 | | 1 | | | | | | | | 1 | | 6 |
| | Chiller | | 2 | | | | 4 | | 4 | 1 | | 1 | | | | 1 | 4 | | 17 |
| | Refrigerator | | | | | | | | 1 | | | | | | | 2 | 4 | | 7 |
| | Absorption Chiller Using Waste Heat | | | | | | | | 2 | | | | | | | | 2 | | 4 |
| | Swirling Induction Type Air-conditioning System | | | | | | | | | | | | | | | | 1 | | 1 |
| | Air Conditioning System with Total Heat Excahnger | | | | | | | | | | | | | | | 1 | | | 1 |
| | Fridge and Freezer Showcase | | | | | | | | 1 | | | | | | | | 1 | | 2 |
| | Boiler | 2 | | | | | 2 | | 3 | | | | 1 | | | 2 | 1 | | 11 |
| | Double Bundle-type Heat Pump | | | | | | 1 | | 1 | | | | | | | | 1 | | 3 |
| | Water Heater Using Waste Heat | | | | | | | | | 1 | | | | | | 1 | | | 2 |
| | Waste Heat Recovery System | | | | | | | | | | | | | | | 2 | 1 | | 3 |
| | Heat Exchanger | | | | | | | | | | | | | | | | 1 | | 1 |
| | Transformer | | | | | | 4 | 1 | | | | | | | | | | | 5 |
| | LED Lighting | | | | | | | | 2 | | | | | | | | 1 | | 3 |
| | LED Street Lighting with Dimming System | | | | | | | | 1 | | | 1 | | | | | | | 2 |
| | Pump | | | | | | 1 | | | | | | | | | | | | 1 |
| | Air Compressor | | | | | | 1 | | | | | | | | | | 1 | | 2 |
| | Aeration System | | | | | | | | 1 | | | | | | | | | | 1 |
| | Regenerative Burners | | | | | | | | 1 | | | | | | | | | | 1 |
| | Gas Fired Furnace | | | | | | 1 | | | | | | | | | | | | 1 |
| | Gas Fired Melting Furnace | | | | | | | | | | | | | | | | 1 | | 1 |
| | Air Conditioning Control System | | | | | | 1 | | | | | | | | | | 1 | | 2 |
| | Freaquency Inverter for Pump | | | | | | 1 | | | | | 1 | | | | | | | 2 |
| | Ventilation Contorl System | | | | | | | | | | | | | | | 1 | | | 1 |
| | Loom | | 1 | | | | | | 2 | | | | | | | | 1 | | 4 |
| | Old Corrugated Cartons Process | | | | | | | | 1 | | | | | | | | | | 1 |
| | Battery Case Forming Device | | | | | | 1 | | | | | | | | | | | | 1 |
| | Electrolyzer in Chlorine Production | | | | | | | | | | | | | 1 | | | 1 | | 2 |
| | Wire Stranding Machines | | | | | | 1 | | | | | | | | | | | | 1 |
| | Autoclave | | | | | | | | 1 | | | | | | | | | | 1 |
| | Multi-effect Distillation System | | | | | | | | | | | | 1 | | | | | | 1 |
| | Injection Modling Machine | | | | | | | | 1 | | | | | | | | | | 1 |
| 2. Renewable Energy | Solar Power Plant | 4 | 1 | 1 | 2 | 1 | 4 | 3 | 3 | 1 | 5 | 4 | 3 | 1 | 4 | 1 | 15 | 6 | 59 |
| | Solar Power Plant with Battery | | | | | | | | 1 | | | | | | | | | | 1 |
| | Small Hydropower Plant | | | | | | | | 8 | | | | | | | | | 3 | 11 |
| | Wind Power Plant | | | | | | | | | | | | | | | | | 1 | 1 |
| | Geothermal Power Plant | | | | | | | | | | | | | | | | | 1 | 1 |
| | Biomass Power Plant | | | | | | | | 1 | | | 1 | | | 1 | 1 | 1 | 1 | 6 |
| | Biogas Power Plant | | | | | | | | | | | | | | | | | 1 | 1 |
| | Biomas boiler | | | | | | 2 | | | | | | | | | | 1 | | 3 |
| | Biogas boiler | | | | | | | | | | | | | | | 1 | | 1 | 2 |
| | Biomass Co-generation | | | | | | 1 | | | | | | | | | | 1 | | 2 |
| 3.Effective Use of Energy | Power Generation by Waste Heat Recovery | | | | | | | | 1 | | | | | | | 1 | 1 | | 3 |
| | Gas Co-generation | | | | | | | | 2 | | | | | | | | 3 | | 5 |
| 4. Waste Handling and Disposal | Waste-to-Energy Plant | | | | | | | | | | | | | | | 1 | | | 1 |
| | Power Generation by Methane Recovery | | | | | | | | | | | | 1 | | | | | | 1 |
| 5. Transportation | Digital Tachograph System | | | | | | 1 | | | | | | | | | | | | 1 |
| | CNG-Diesel Hybrid Bus | | | | | | | | 1 | | | | | | | | | | 1 |
| | Reefer Container | | | | | | 1 | | | | | | | | | | | | 1 |
| Total | Number of technology : 51 | 6 | 4 | 1 | 2 | 1 | 31 | 4 | 40 | 3 | 5 | 8 | 6 | 2 | 5 | 15 | 45 | 14 | 192 |

| White | 0 project = Up to 50% | Yellow | 1-3 project(s) = Up to 40% | Orange | more than 4 projects = Up to 30% |
|---|---|---|---|---|---|

# Project by Sector

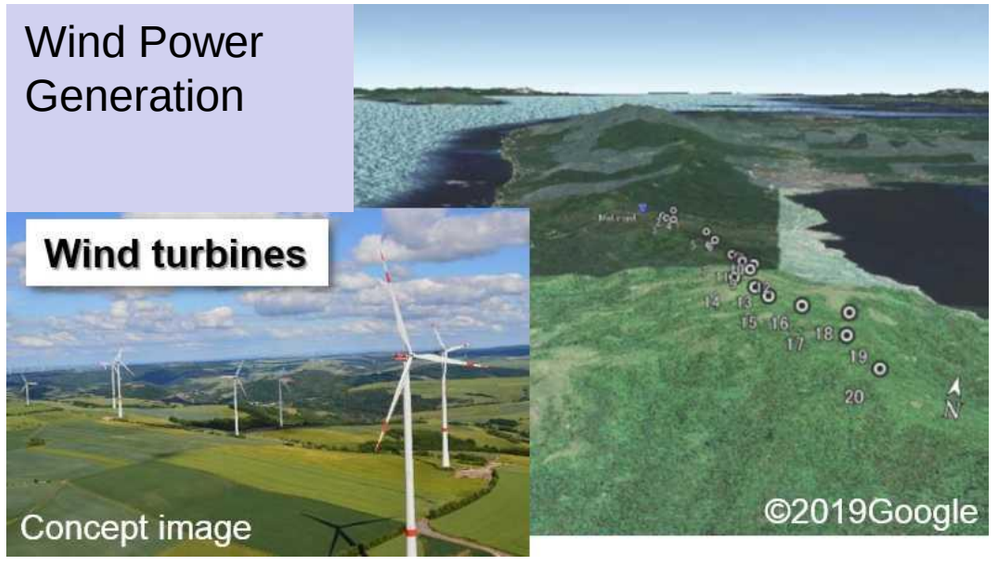


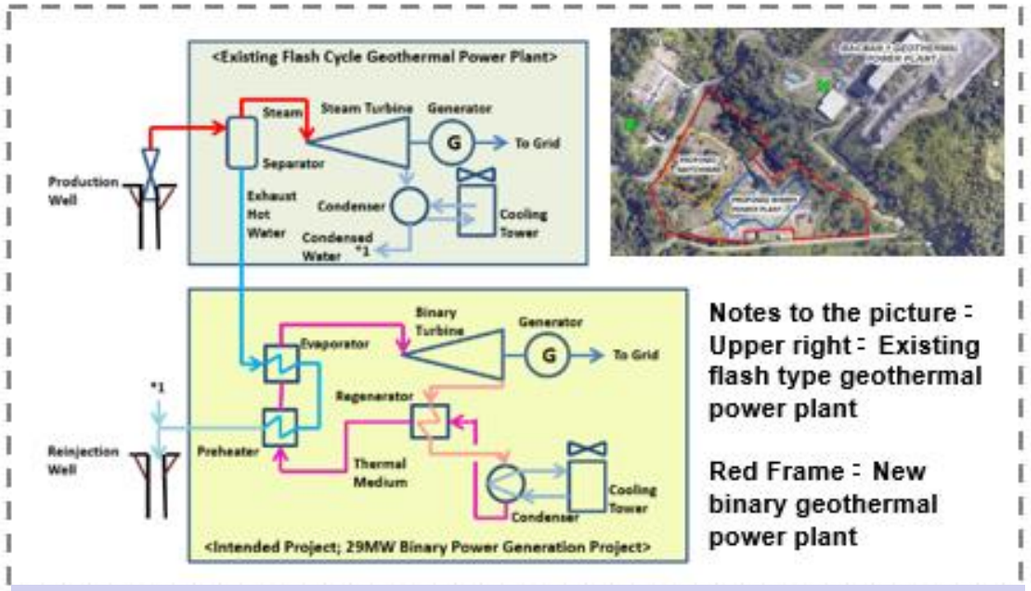


# Renewable Energy

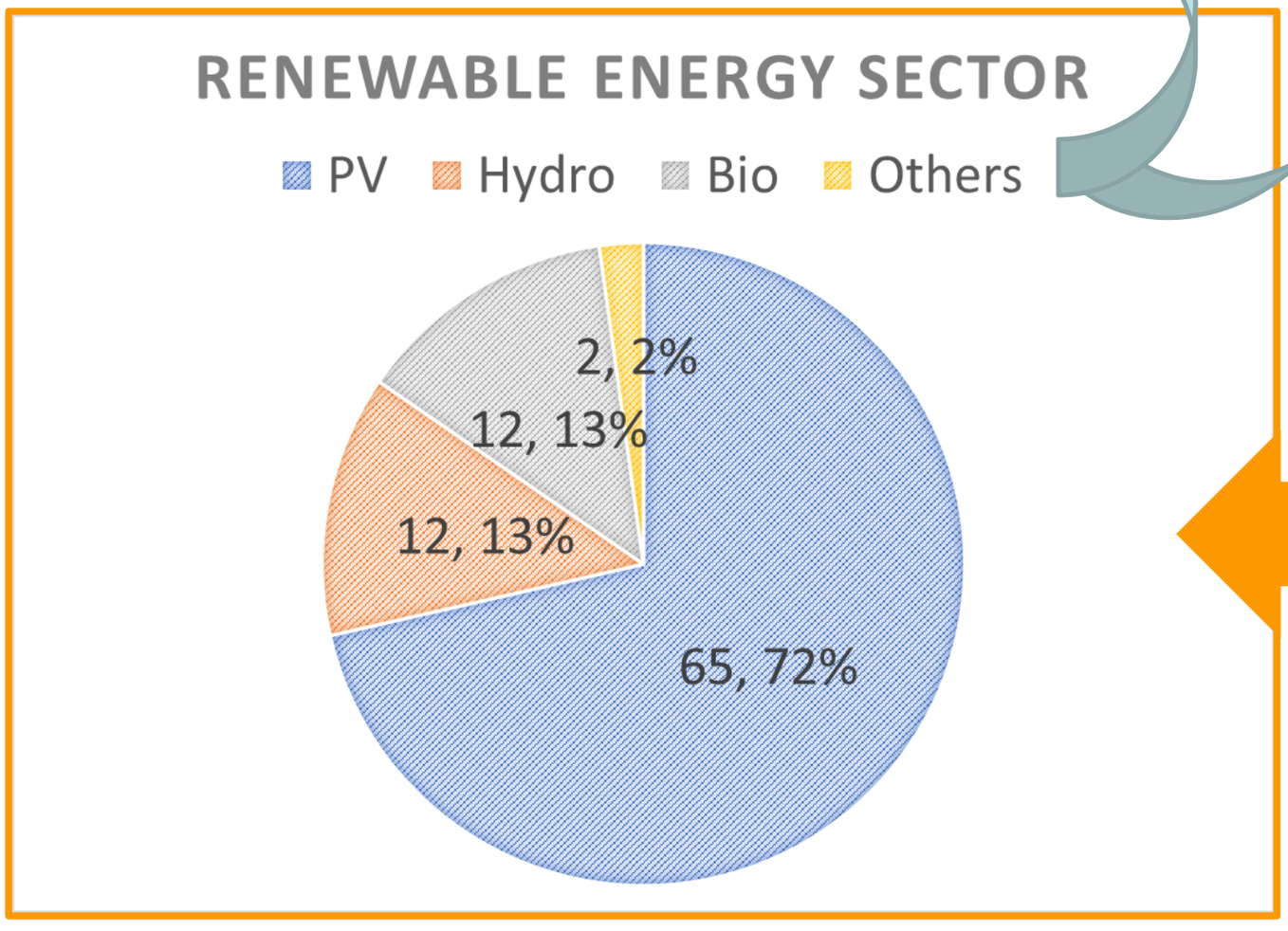


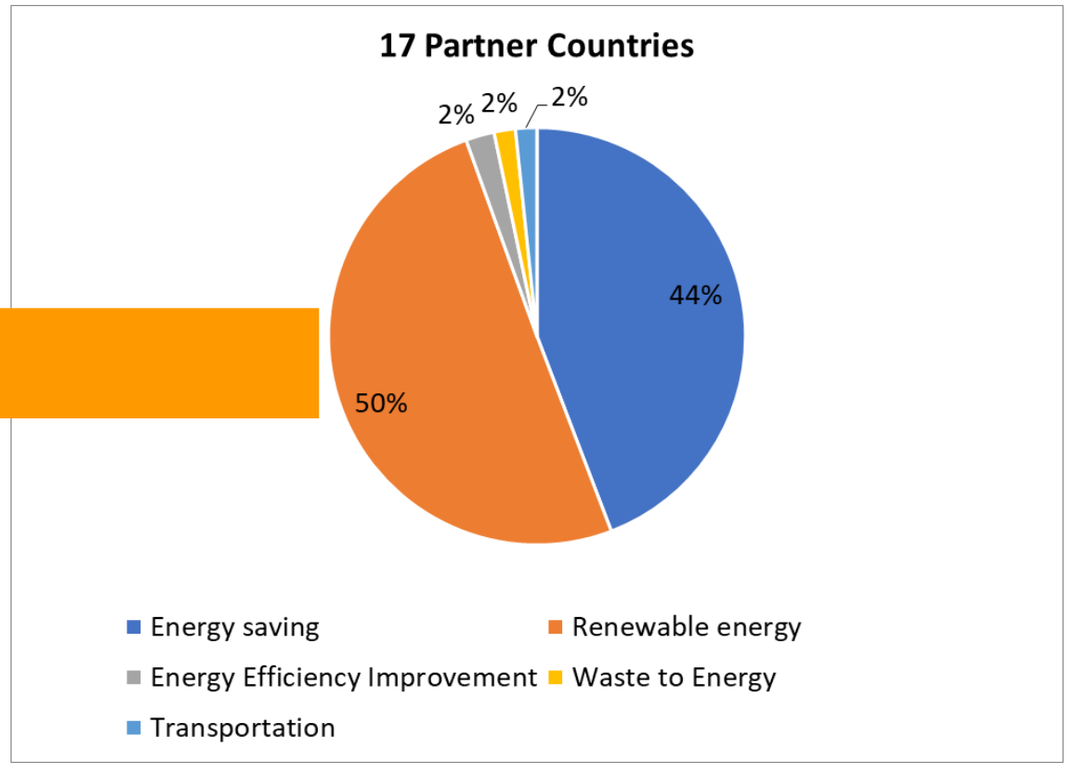
Wind Power Generation




Geothermal Power Plant

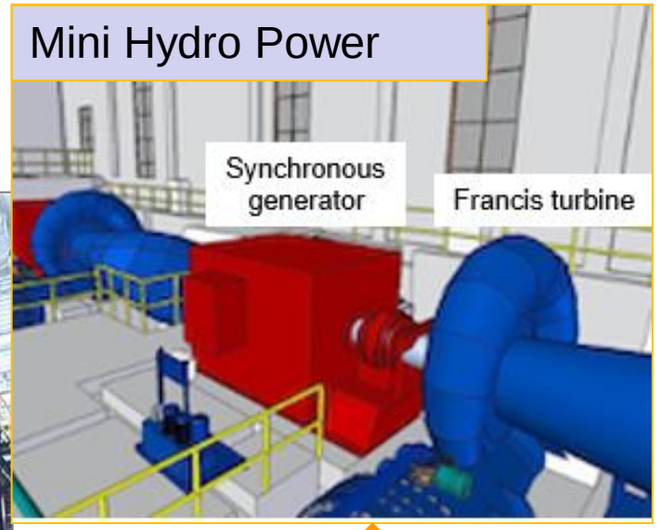


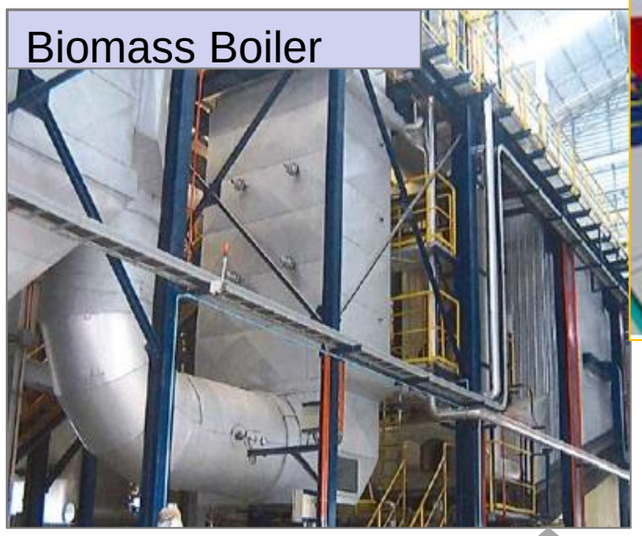
# JCM Projects in Asia Pacific

Global Environment Centre Foundation

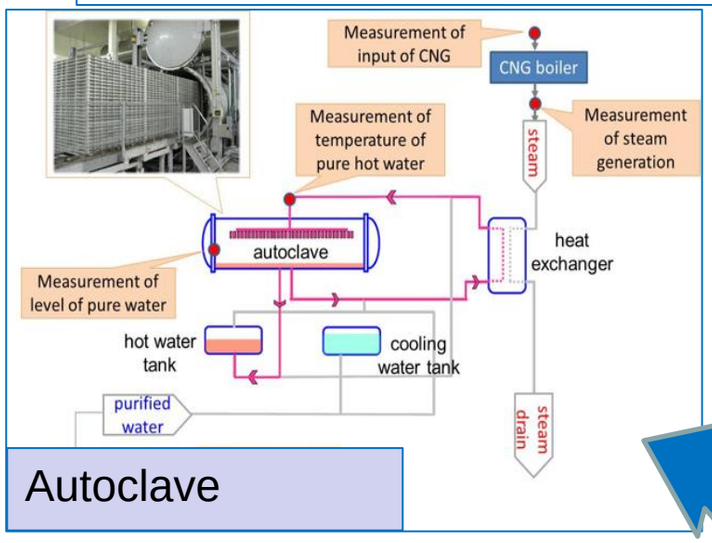
## Mini Hydro Power




## Biomass Boiler

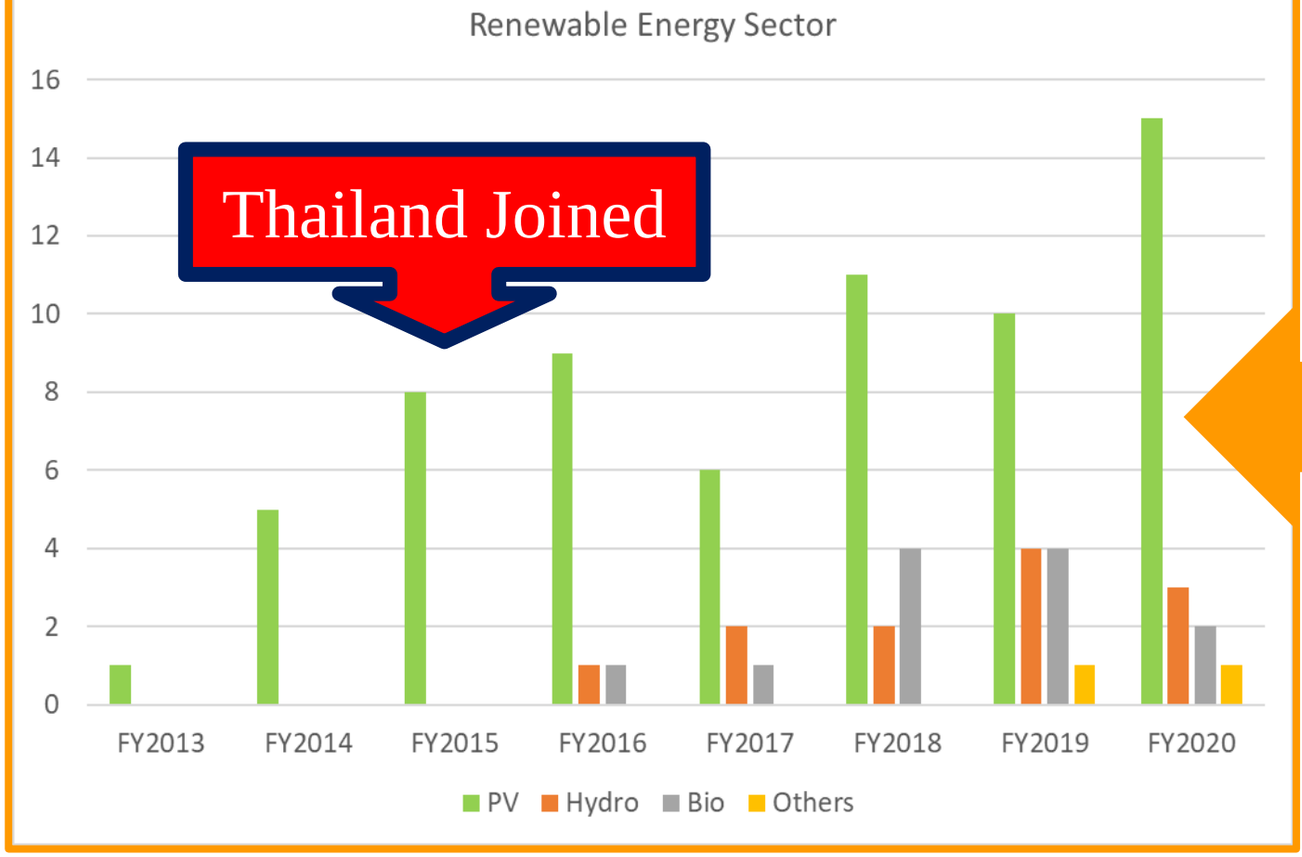


## Injection Molding Machine

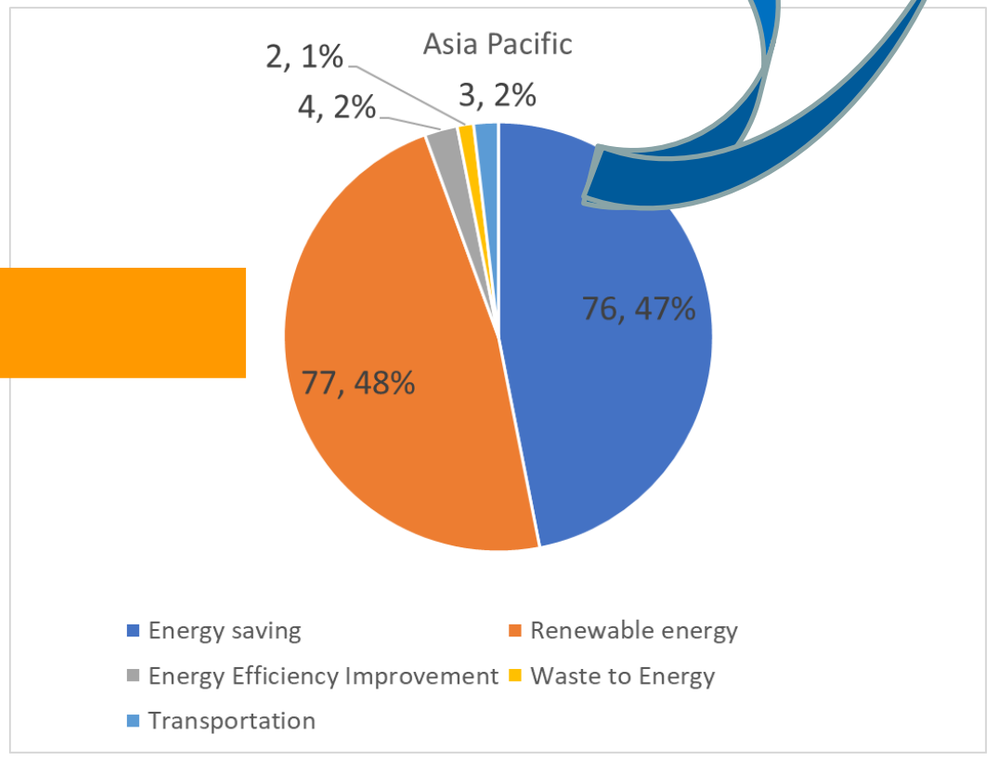



## Autoclave

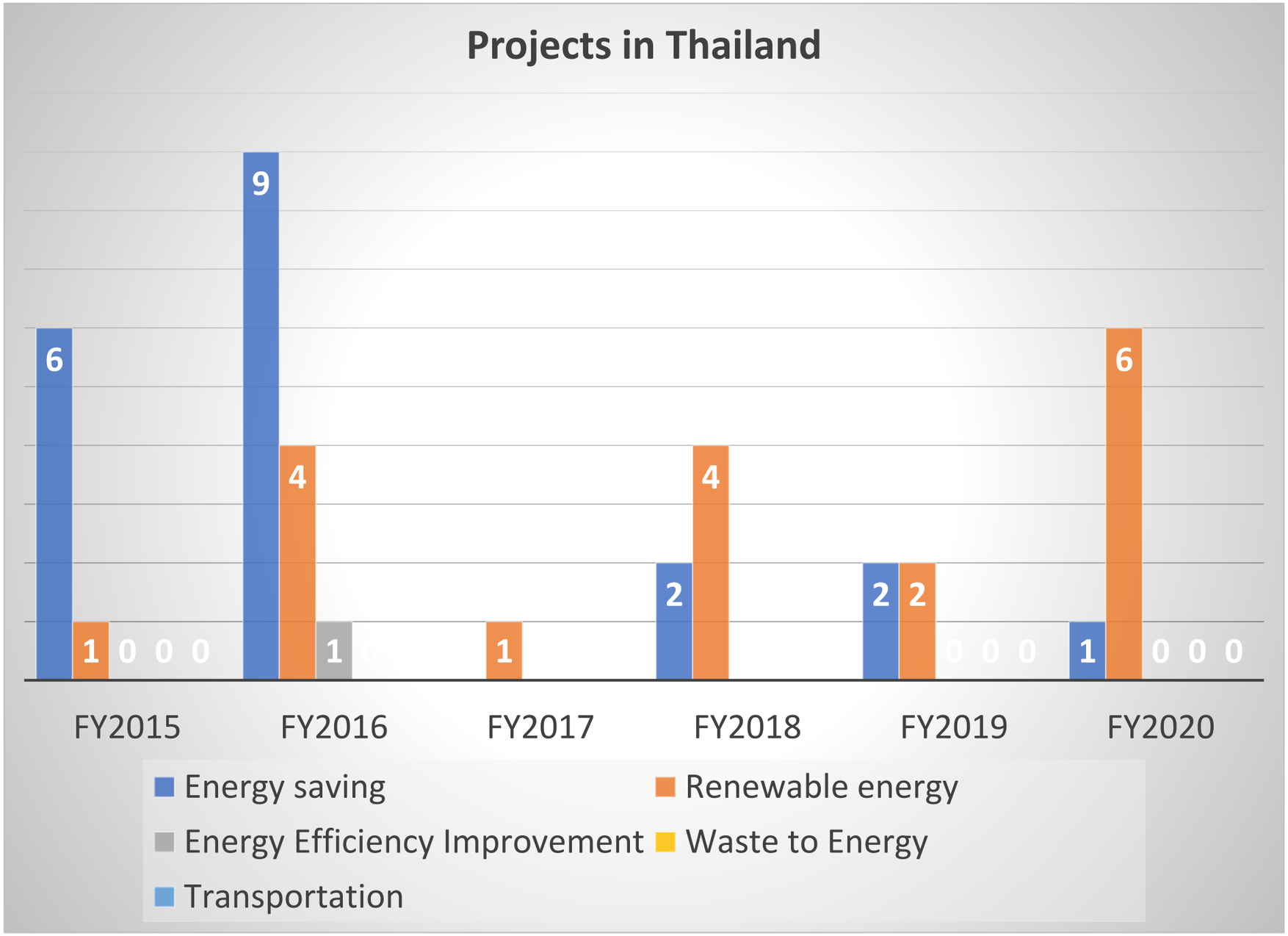
## Renewable Energy Sector




**Thailand Joined**



# Projects in Thailand



# Introduction of 8.1MW Rooftop Solar Power System in Motorcycle Factory and Fiber Factory

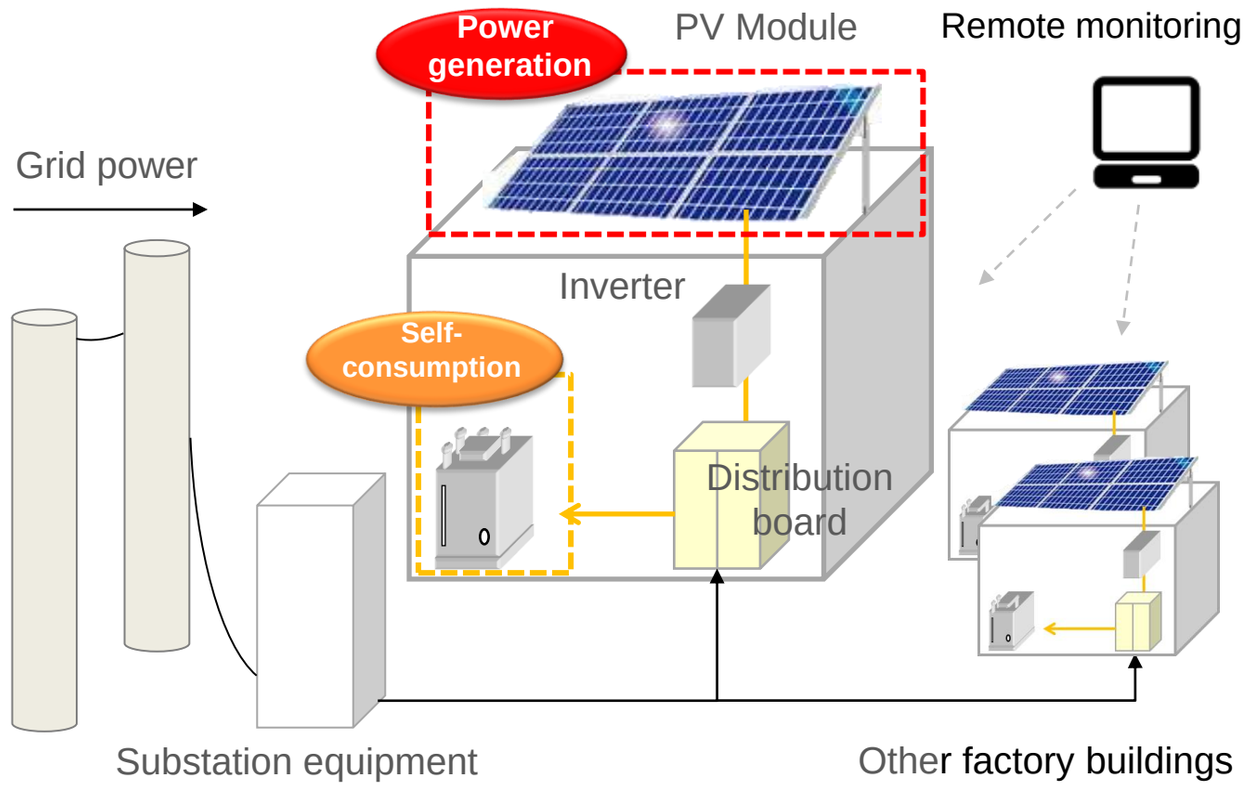
PP (Japan): Kansai Electric Power Co., Inc , PP (Thailand): Kansai Energy Solutions (Thailand) Co., Ltd

## Outline of GHG Mitigation Activity

Solar Power System (total of about 8.1 MW) is installed on the rooftops of motorcycle factory and fiber factory, and all the generated power is consumed by each factory.

By replacing a part of the grid electricity with solar power, the greenhouse gas (GHG) emissions are reduced.

This project realizes energy saving and $CO_2$ saving in Thailand and contributes to the energy saving policy of Thailand.




## Expected GHG Emission Reductions

**3,797 $tCO_2$ /year**

= (Reference $CO_2$ emissions) [$tCO_2$/year]
- (Project $CO_2$ emissions) [$tCO_2$/year]

・Reference $CO_2$ emissions
= (Quantity of the electricity generated by the project) [MWh/year]

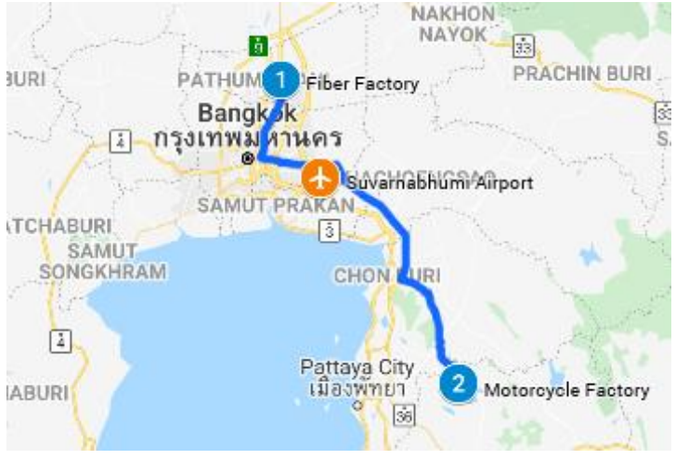
× Emission factor [$tCO_2$/MWh]

・Project $CO_2$ emissions
= 0 [$tCO_2$/year])

## Site of Project


Map Data ©2020 Google

①Approx. 40km north-west of Suvarnabhumi International Airport




②Approx. 90km south-east of Suvarnabhumi International Airport

# Introduction of 2.6MW Rooftop Solar Power System to Semiconductor Factory

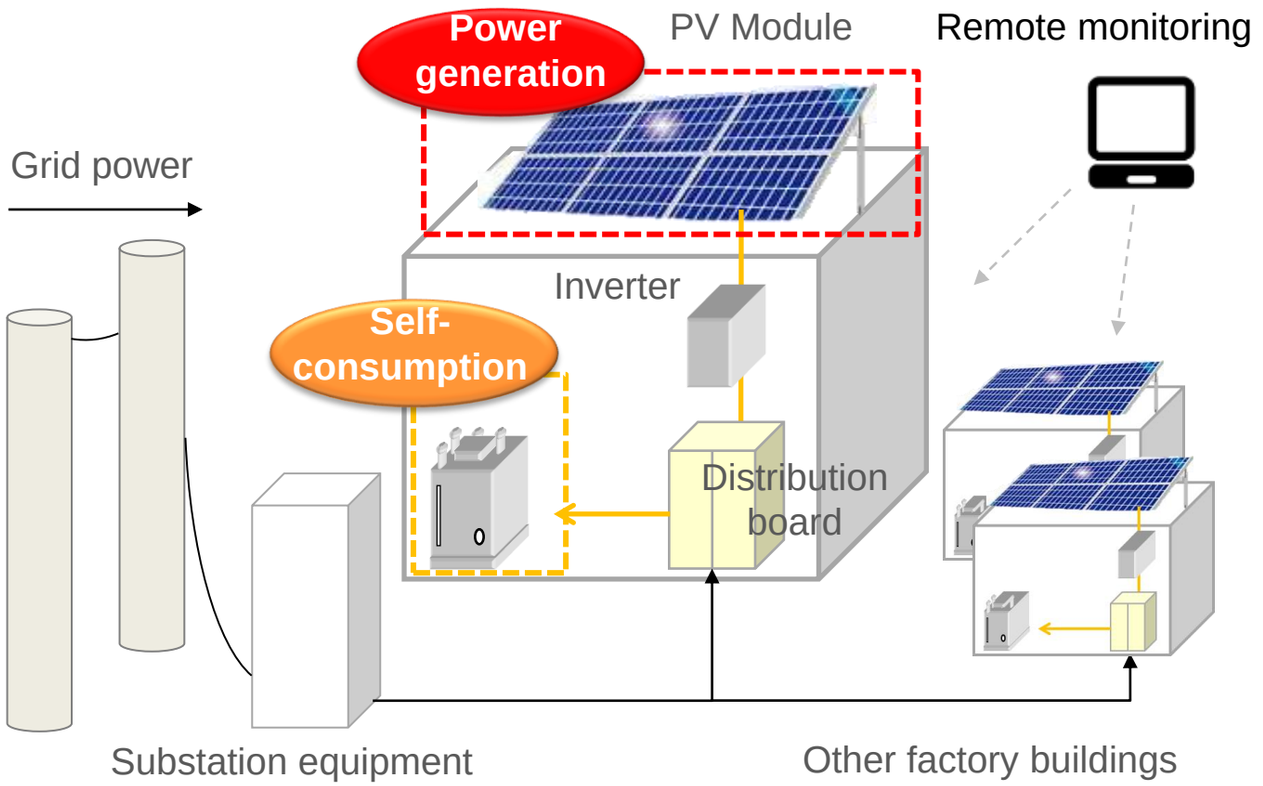
PP (Japan): Kansai Electric Power Co., Inc. , PP (Thailand): Kansai Energy Solutions (Thailand) Co., Ltd.

## Outline of GHG Mitigation Activity

2.6 MW solar power system is installed on the rooftops of a semiconductor factory, and all electricity generated from the project is consumed by the factory.

Greenhouse gas (GHG) emissions are reduced by replacing part of the grid electricity with renewable energy.

This project achieves energy saving and $CO_2$ saving in Thailand and contributes to the energy saving policy of Thailand.




## Expected GHG Emission Reductions

**1,188 $tCO_2$ /year**

= (Reference $CO_2$ emissions)
- (Project $CO_2$ emissions)

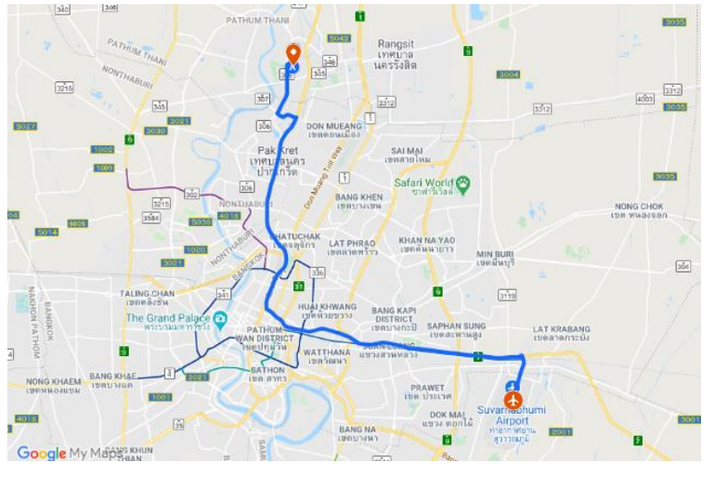
・Reference $CO_2$ emissions
= (Quantity of the electricity generated by the project) [MWh/year]

× Emission factor [$tCO_2$/MWh]

・Project $CO_2$ emissions
= 0 [$tCO_2$/year])

## Site of Project


Map Data ©2020 Google




Approx. 55km northwest of Suvarnabhumi International Airport

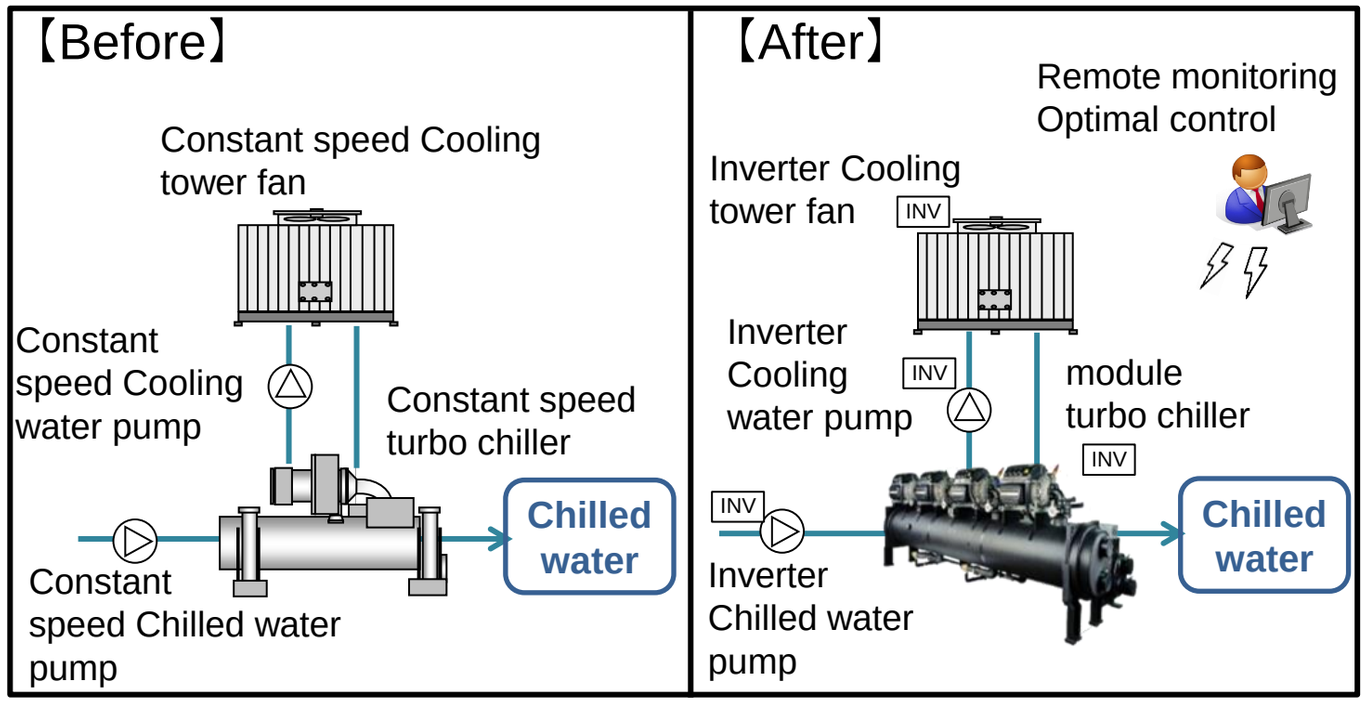
# Introduction of Energy Saving Centrifugal Chillers to Machinery Factory

PP (Japan): Kansai Electric Power Co., Inc, PP (Thailand): Kansai Energy Solutions (Thailand) Co., Ltd

## Outline of GHG Mitigation Activity

This project reduces energy consumption as well as greenhouse gas (GHG) emissions by introducing module turbo chillers (400USRT x 2 unit) and inverter pumps at a machinery factory.

Module turbo chillers include several compressors for 1 unit, which improve their reliability with high redundancy and maintainability.




## Expected GHG Emission Reductions

**225 t $CO_2$ / year**

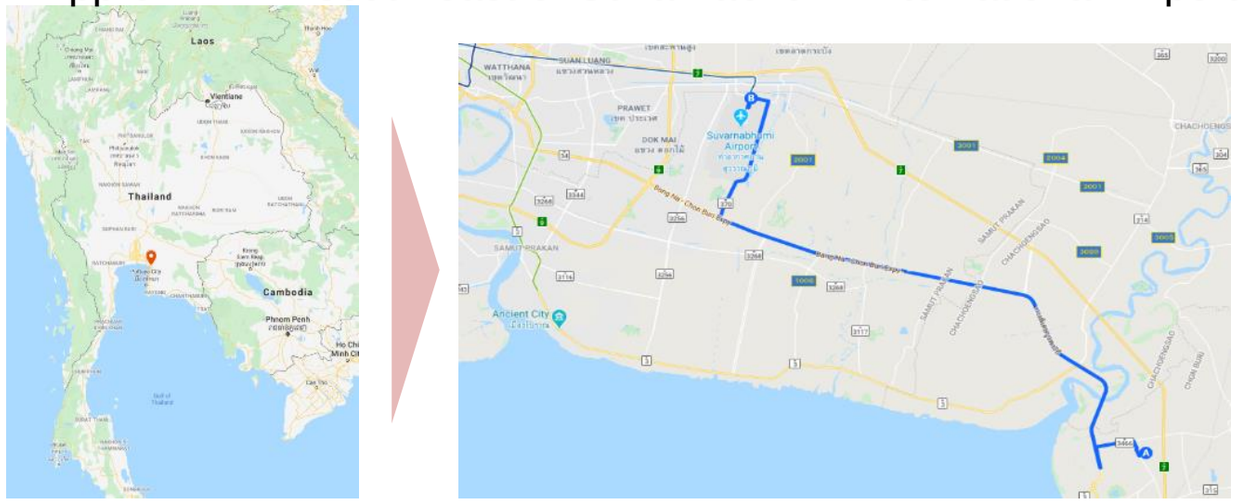
=①Reference emissions – ②Project emissions

①Reference emissions = (Electricity consumption calculated by COP of reference turbo chiller × $CO_2$ emission factor of the grid)

②Project emissions = (Electricity consumption calculated by COP of new turbo chiller × $CO_2$ emission factor of the grid)

## Site of Project

Approx. 42km south-east of Suvarnabhumi International Airport



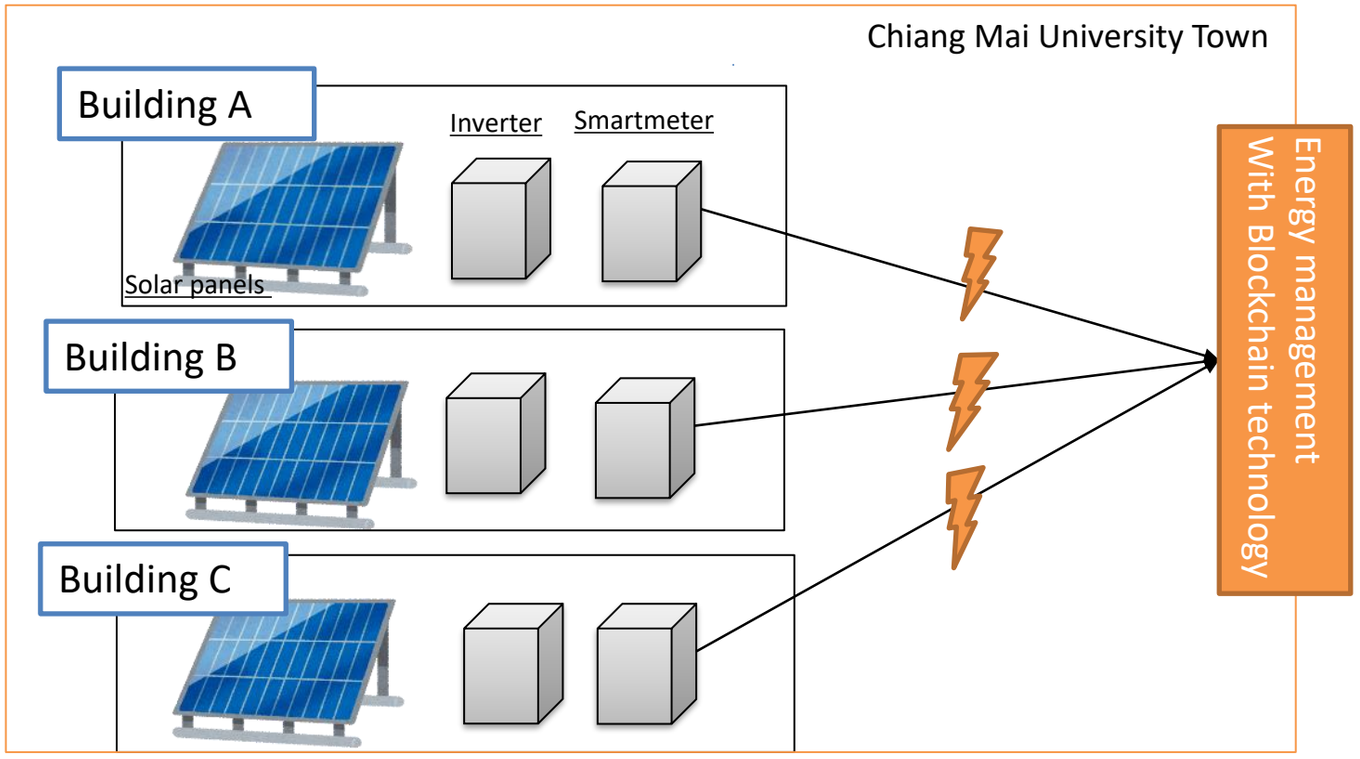

Map Data ©2020 Google

# 2.5MW Solar Power Project with Blockchain Technology in Chiang Mai University Town Community

PP (Japan): Inabata & Co.,Ltd , PP (Thailand): Thai Digital Energy Development Co.Ltd

## Outline of GHG Mitigation Activity

This project introduces a 2.5 MW solar power generation system on the roofs of multiple buildings in Chiang Mai University, Thailand. This project is operated by blockchain technology which realizes the expansion and maximum utilization of renewable energy on campus and reduces greenhouse gas (GHG) emissions by introducing renewable energy.

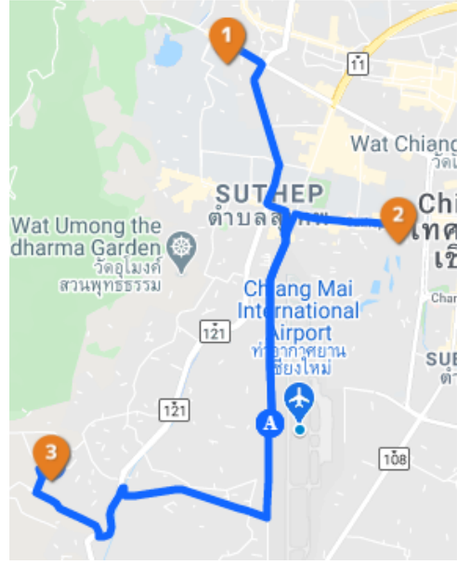



## Expected GHG Emission Reductions

**1,041 $tCO_2$/year**

= [(Reference power consumptions)
– (Project power consumptions)]
x Emission factor (EF)

## Sites of Project


Distance from Chiang Mai International airport

Zone 1:
7 km (NW)

Zone 2:
4 km (NE)

Zone 3:
5 km (SW)

# Introduction of 5MW Rooftop Solar Power System to Aluminum Building Materials Factory

PP (Japan): Sumitomo Mitsui Finance and Leasing Company, Limited, PP (Thailand):TOSTEM THAI CO., LTD., SMFL Leasing (Thailand) Co., Ltd.

## Outline of GHG Mitigation Activity

This project installs 5MW solar power system on the rooftop of an aluminum building materials factory in Nava Nakorn Industrial Estate near Bangkok by lease financing.

All electricity generated from the project is consumed in-house. By replacing the grid electricity with renewable energy, the greenhouse gas (GHG) emissions are reduced.



## Expected GHG Emission Reductions

**2,200 $tCO_2$ /year**

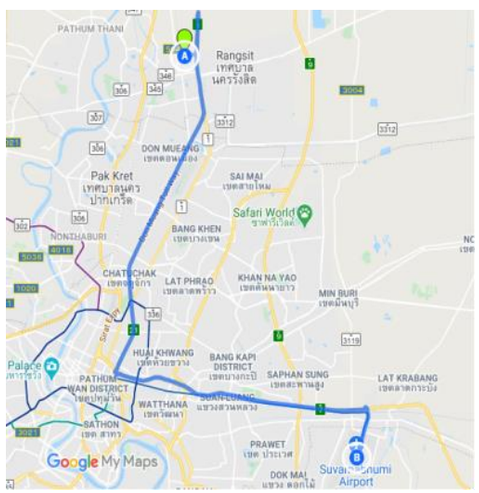
= (Reference $CO_2$ emissions)
- (Project $CO_2$ emissions)

・Reference $CO_2$ emissions
= (Quantity of the electricity generated by the project) [MWh/year]
× Emission factor [$tCO_2$/MWh]

・Project $CO_2$ emissions
= 0 [$tCO_2$/year])

## Sites of Project

Approx. 56km northwest of Suvarnabhumi International airport

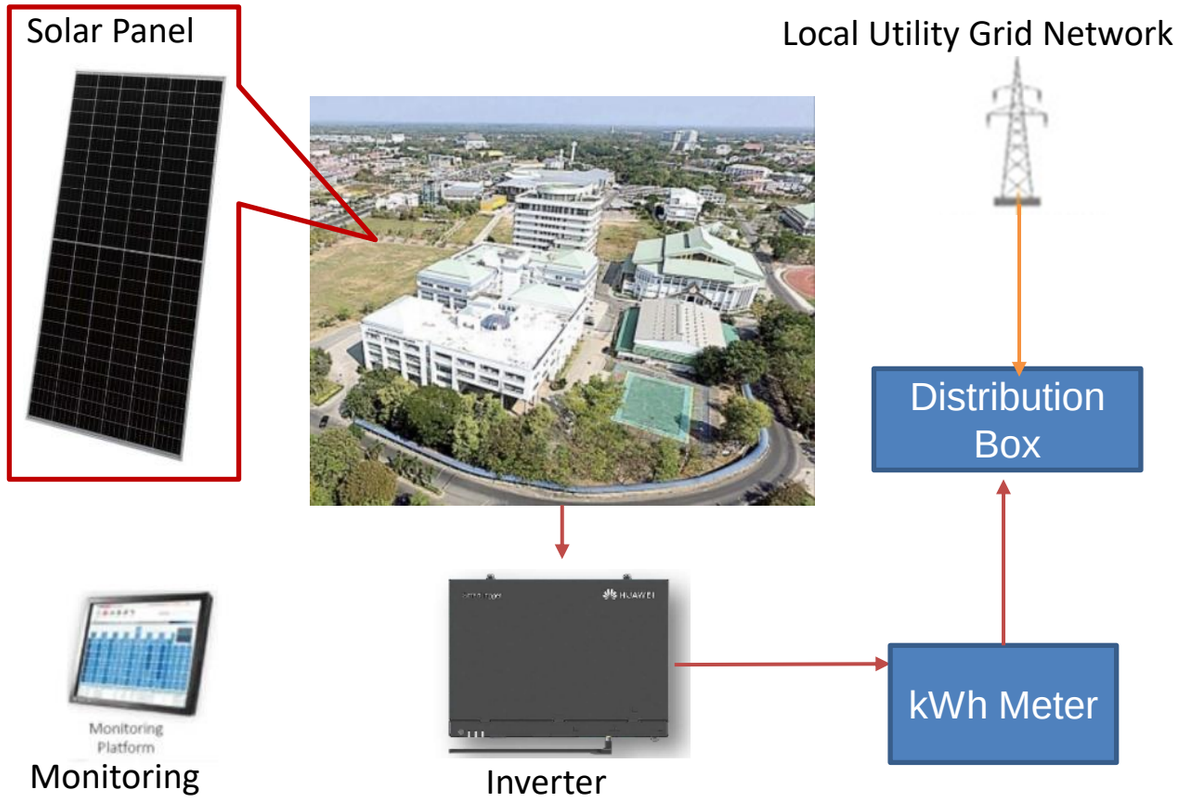

Map Data ©2020 Google

# Introduction of 2MW Rooftop Solar Power System to University

PP (Japan): SHIZUOKA GAS Co., Ltd., PP (Thailand): VNET Power Co., Ltd., VNET SG Power Co., Ltd.

## Outline of GHG Mitigation Activity

A 2MW solar power system is installed for self-consumption on the roofs of university campus buildings located about 480km northeast of Bangkok. A joint venture company of the project participants signs Power Purchase Agreement with the university to supply the electricity generated for 21 years. The electricity generated replaces a portion of grid electricity to reduce greenhouse gas (GHG) emissions.
This project contributes to the achievement of Thailand's policy for increasing the share of renewable energy (excluding imported hydropower) in the total power supply to 20% by 2037.




## Expected GHG Emission Reductions

**868 $tCO_2$/year**

= 868 $tCO_2$/year (Reference $CO_2$ emissions)
- 0 $tCO_2$/year (Project $CO_2$ emissions)

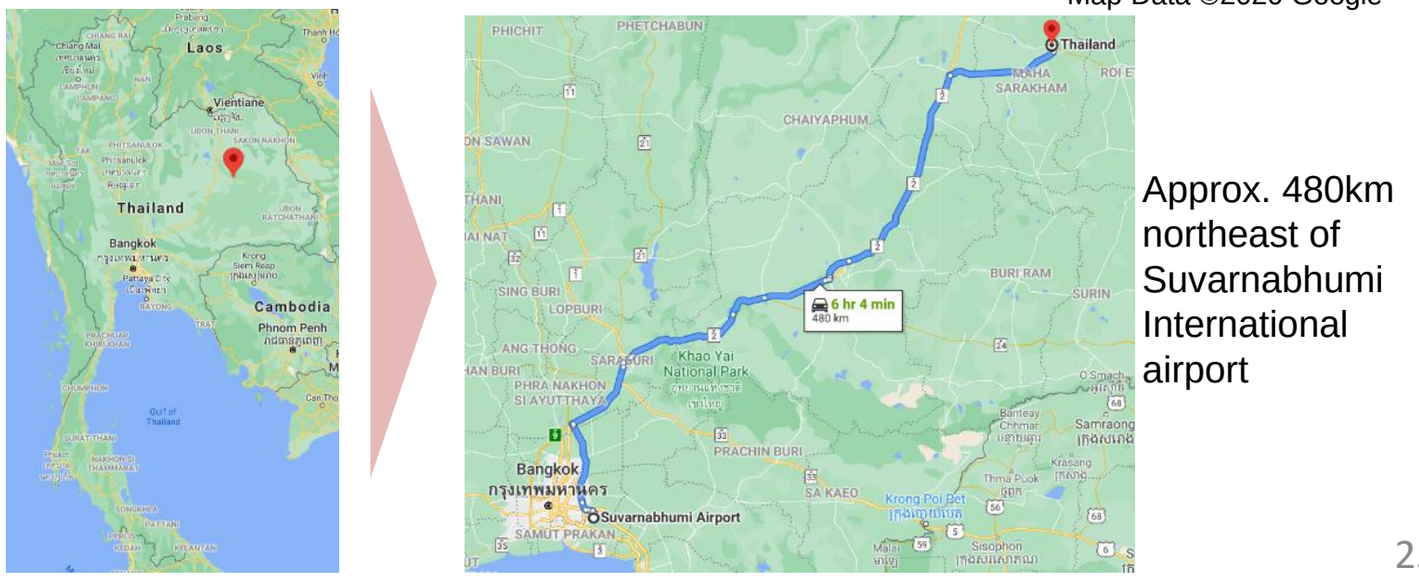
・Reference $CO_2$ emissions
≒2,727,153 [kWh/year]

×0.319 [kg $CO_2$/MWh]÷1,000

※Due to fractional processing in the calculation, the figure is 868 $tCO_2$/year.

・Project $CO_2$ emissions
= 0 [$tCO_2$/year])

## Sites of Project




Approx. 480km northeast of Suvarnabhumi International airport

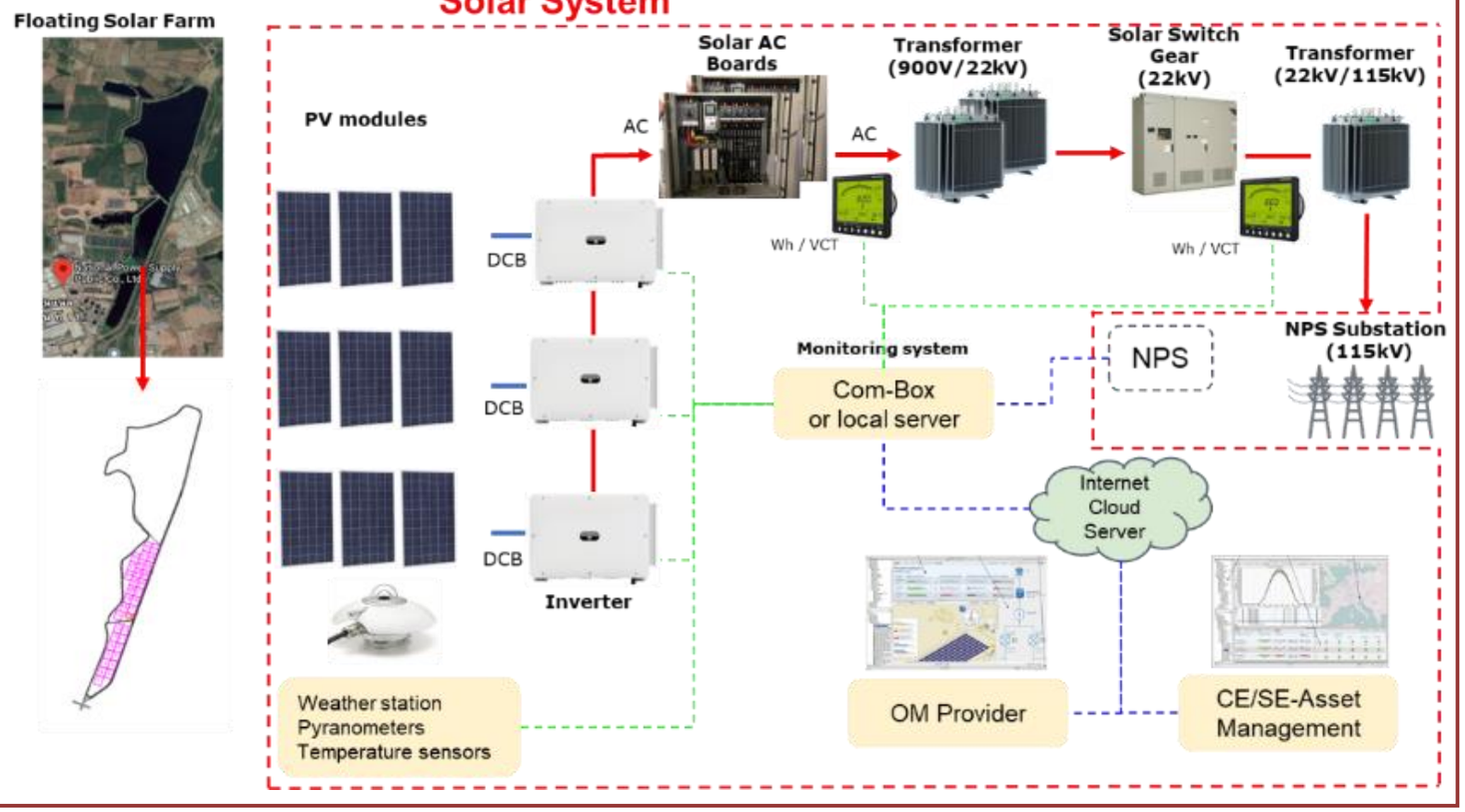
# 30MW Floating Solar Power Project in Industrial Park

PP (Japan): Shizen Energy Inc. , PP (Thailand): Constant Energy Singapore Holding Pte. Ltd.、Solar Floating CE 6 Co., Ltd.

## Outline of GHG Mitigation Activity

30 MW solar power system is installed in an Industrial Park. The generated electricity is sold to the National Power Supply (NPS), a power company that supplies electricity to the Industrial Park, reducing greenhouse gas (GHG) emissions.

This project contributes to the achievement of National Power Development Plan 2018 (PDP 2018) for a renewable energy ratio target of approx. 20% in 2037.




## Expected GHG Emission Reductions

**13,739 $tCO_2$ /year**

= (Reference $CO_2$ emissions)
- (Project $CO_2$ emissions)

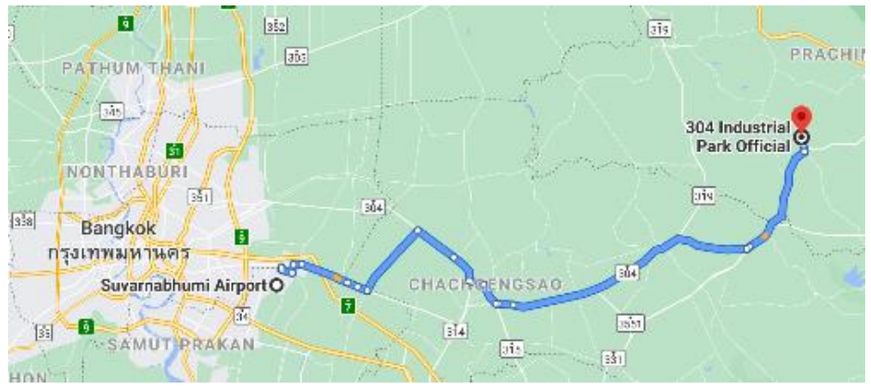
・Reference $CO_2$ emissions
= (Quantity of the electricity generated by the project) [MWh/year]

× Emission factor [$tCO_2$/MWh]

・Project $CO_2$ emissions
= 0 [$tCO_2$/year])

## Site of Project

Approx. 120km east of Suvarnabhumi Airport

# Infrastructure through JCM

Global Environment Centre Foundation

1 Thailand / FAST RETAILING CO., LTD.
High Efficiency LED Lighting
2 Cambodia / AEON MALL Co., Ltd.
Solar Power System and High Efficiency Centrifugal Chiller
1 Bangladesh / Ebara Refrigeration Equipment & Systems Co., Ltd.
High Efficiency Centrifugal Chiller
2 Mexico / Suntory Spirits Limited
Once-through Boiler and Fuel Switching

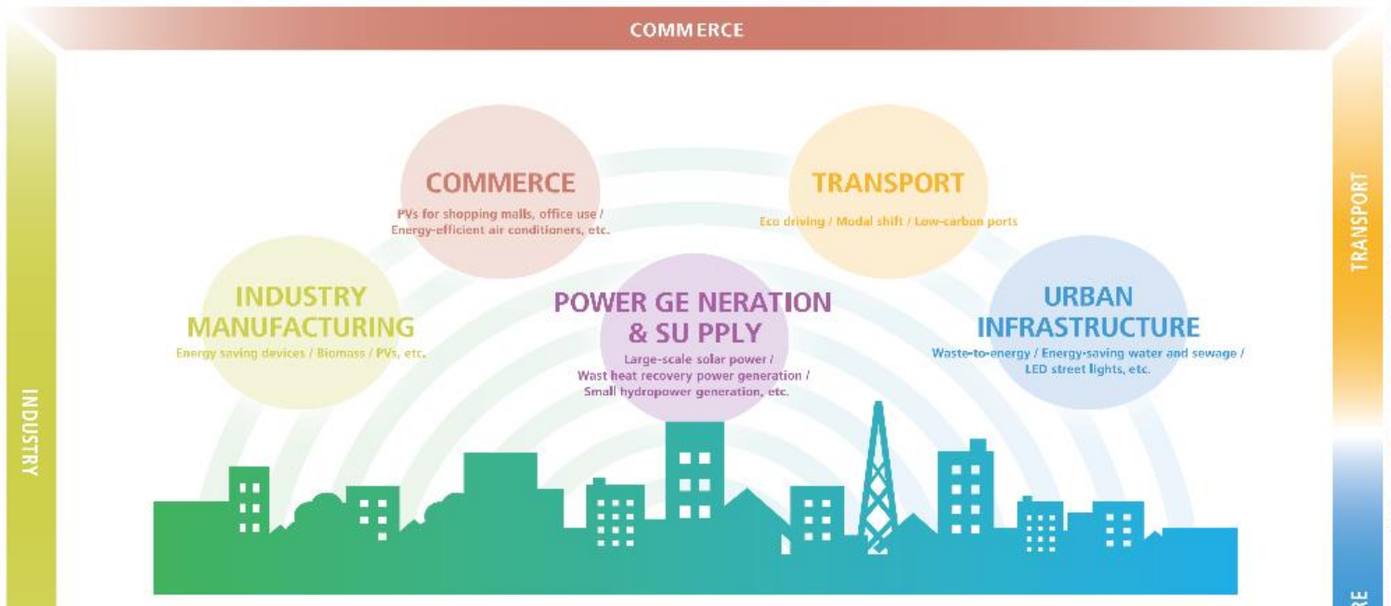



3 Palau / Pacific Consultants Co., Ltd.
Solar Power Plants for Commercial Facilities
4 Indonesia / Toyota Tsusho Corporation
Double-Bundle type Heat Pump
1 Indonesia / Hokusan Co., Ltd.
CNG-Diesel Equipment to Public Bus
2 Thailand / Yokohama Port Corporation
Energy Efficient Equipment to Bangkok Port










## Accelerating International Promotion of Infrastructure through JCM

Along with the Overseas Development Strategy (Environment) compiled by Cabinet Office, Government of Japan in June 2018, the JCM model project aims to contribute to global GHG emission reductions, through the diffusion of leading low carbon or decarbonizing technologies.

3 Indonesia / Environmental Management and Technology Center
Energy Saving in Industrial Wastewater Treatment System
4 Myanmar / Kirin Holdings Company, Limited,
Energy Saving Brewing Systems
1 Thailand / TSD Co., Ltd.
Floating Solar Power System
2 Mexico / NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
Power Generation with Methane Gas Recovery System




1 Viet Nam / Yuko Keiso Co., Ltd.
Amorphous High Efficiency Transformers in power grid
2 Viet Nam / Yokohama Water Co., Ltd.
High Efficiency Water Pumps
3 Myanmar / JFE Engineering Corporation
Waste to Energy Plant in Yangon City
3 Myanmar / Fujita Corporation
Rice Husk Power Generation

# Covid-19 Impact on JCM Model Projects



## Impact on Projects

- Government services stall, licenses and permits delay
- Design work delay / supply delay due to suspension of factory operation
- Installation work delay due to difficulty in securing labor for construction / engineers unable to enter the project site.
- Deterioration of cash flow of the project partner / reduction of investment budget, difficulty in raising funds
- Suspension of banking operations (delay on loan contracts, remittances)
- Reassessment of the project feasibility / change or reduction of project plan (especially in tourism and transportation)

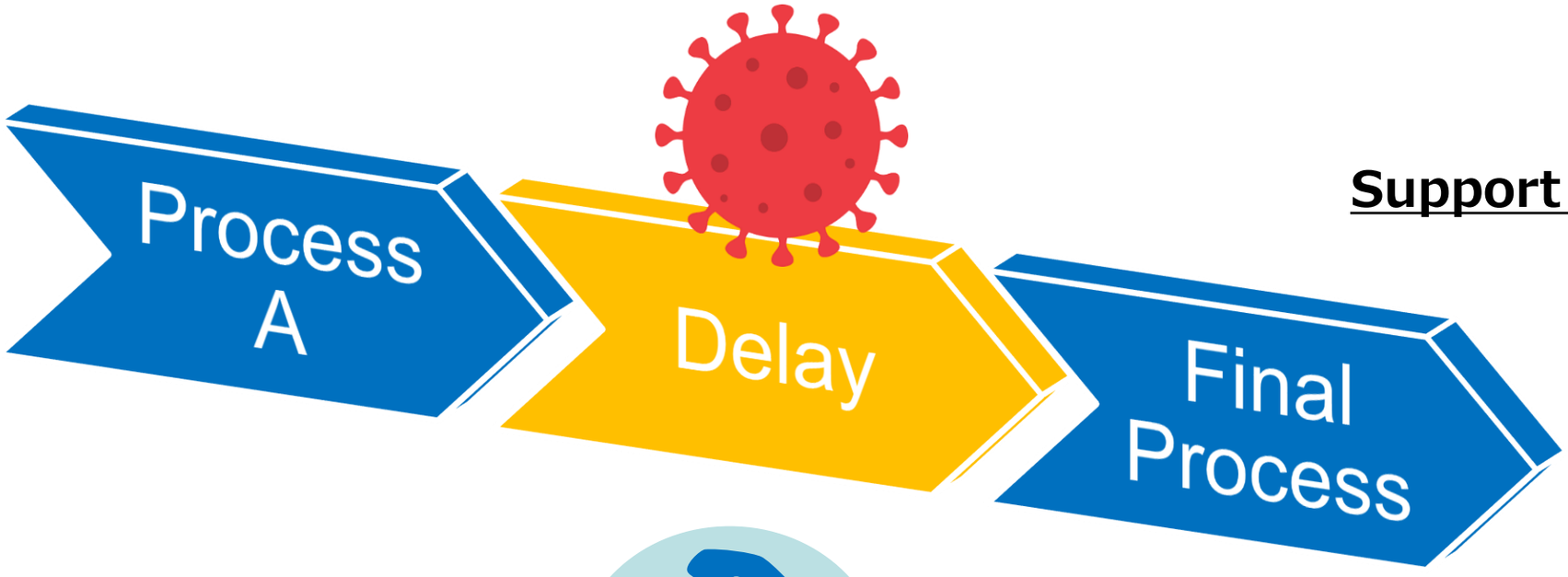
## Impact on Operation for JCM Model Projects

- Restricted face to face meeting:
  - ・Evaluation interviews
  - ・Meeting with participants
  - ・ Consultation for prospect entities

# Countermeasures against Covid-19 Impact



**Support by MOEJ/GEC**




Foresee and make allowance with well contemplated schedule

Modify Project plan flexibly
- Design
- Manufacturer
- Contractor
- Financer, etc.

Online Inspection
- remote camera
- Photos
- Video
- online discussion

Online Meeting with participants
Consultation for prospect entities

Promotion via Webinar
- Online Seminar
- Symposium

Break stagnated Permission to promote Projects

## What is the “JCM Global Match”?

*https://gec.force.com/JCMGlobalMatch/*

A platform to connect the JCM participants for the better and effective project development.

# Features of the "JCM Global Match"

*https://gec.force.com/JCMGlobalMatch/*

**Launched in July 2019**

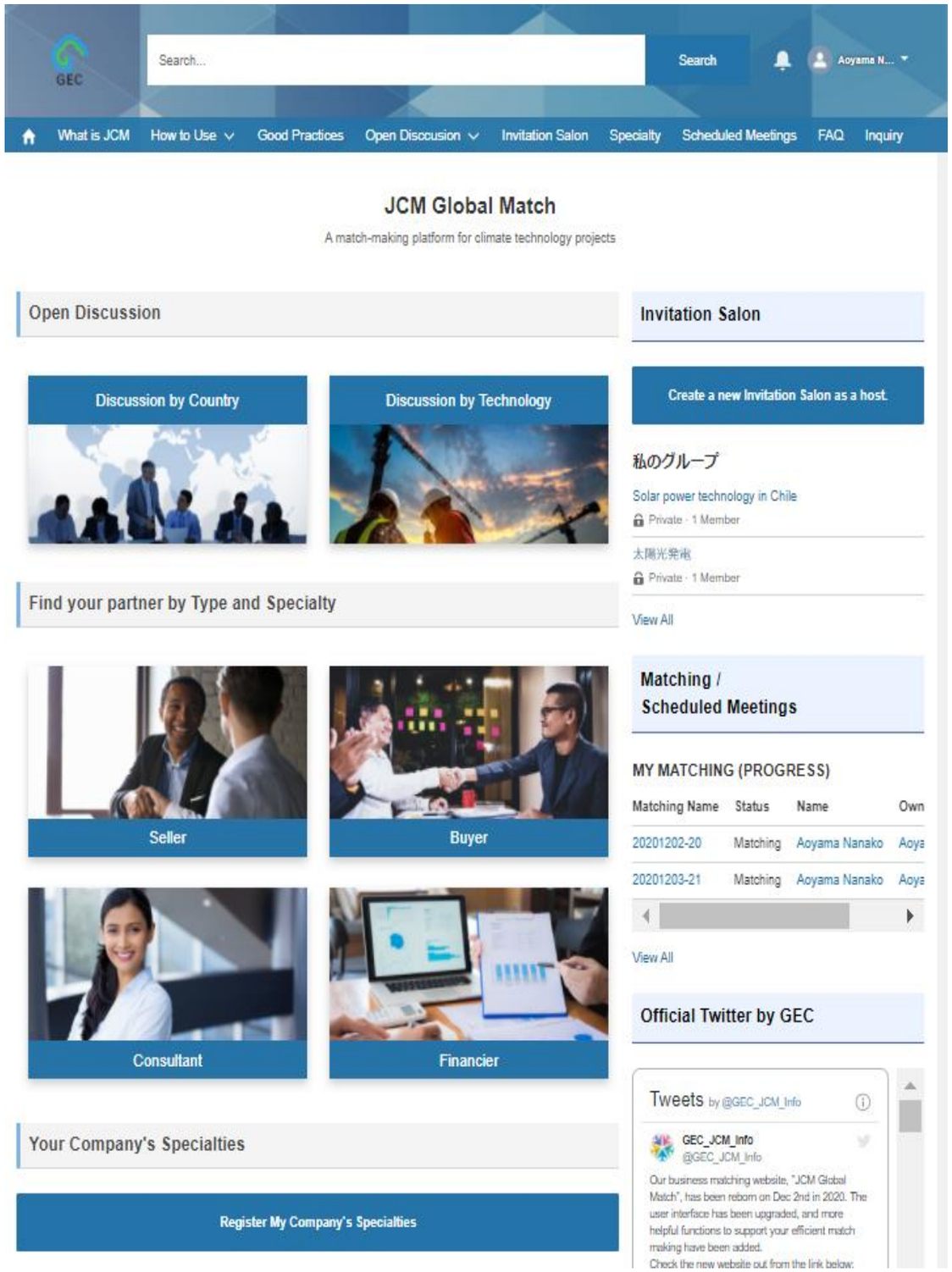
**>Many matchings have already been recognized to realize JCM projects.**

**Reformed on December 2nd 2020!**

1. **Simple registration (only 5 items to start)**
2. **Search of your possible partners by any key word**
3. **Useful communication among all participants (Open Discussion, Invitation Salon)**

   **1 to 1 Communication by private chat and Email addresses exchange**
4. **Opportunity to promote your company by Profile and Specialties sections**
5. **Reservation of your Scheduled Meetings**

*Google Chrome and Firefox are recommended browsers.



# Access Information of the JCM Global Match

Global Environment Centre Foundation

## Access Information

URL: *https://gec.force.com/JCMGlobalMatch/*


Or search with “JCM Global Match”!

***Google Chrome and Firefox are recommended browsers.**

Please register and find your partner now!

Contact：jcm-gm@gec.jp

# Call for Proposals in 2021 Start Today!

Global Environment Centre Foundation

http://gec.jp/jcm/kobo/mp210407/

JCM THE JOINT CREDITING MECHANISM

Global Environment Centre Foundation | Access | Contact | Search | Japanese

Overview | Call for Proposals | Projects | News | JCM Global Match | Publications

The Global Environment Centre Foundation (GEC) as an implementing organization for the Financing Programme for Joint Crediting Mechanism (JCM) Model Projects in FY2021, is soliciting the project proposals for the financing programme.

*We are waiting for your project proposals !*

# ขอบคุณ !

*Thank you!*

ありがとうございました。

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GEC