

Financing Programme for JCM Model Projects

September 2021

Global Environment Centre Foundation (GEC)



| | |
|--|--|
| Budget | Approx. USD83million in total with Demonstrate Decarbonization Technology for Realizing Co-Innovation Program |
| 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 | <p>Maximum of 50% and reduce the percentage according to the number of already selected project(s) using a similar technology in each partner country.</p> <p>※ 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.</p> |
| Cost-effectiveness | <p>Cost-effectiveness of GHG emission reductions is expected to be JPY4,000/tCO2eq or better.</p> <p>※ If the number of similar technological projects in a partner country is 5 or more, the cost-effectiveness is expected to be JPY3,000 or lower. If it is 10 or more, JPY2,500 or lower.</p> |

Basic policy for JCM Model Projects in FY2021

“Strategy for Overseas Expansion in the Environmental Field”
(decided by MOEJ, June, 2018)

“2025 Strategy for Overseas Expansion of Infrastructure Systems”
(decided by the Economic Cooperation Infrastructure Strategy Council, in December, 2020)

<Project examples>



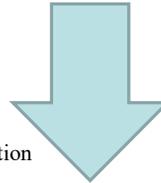
Solar power generation



Carbon capture and storage (CCS)



Wind power generation



Hydrogen



Waste power generation



Geothermal power generation

JCM Model Projects :

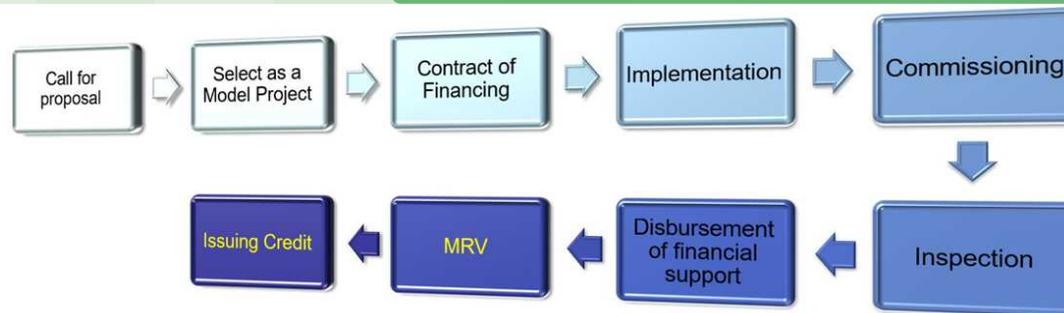
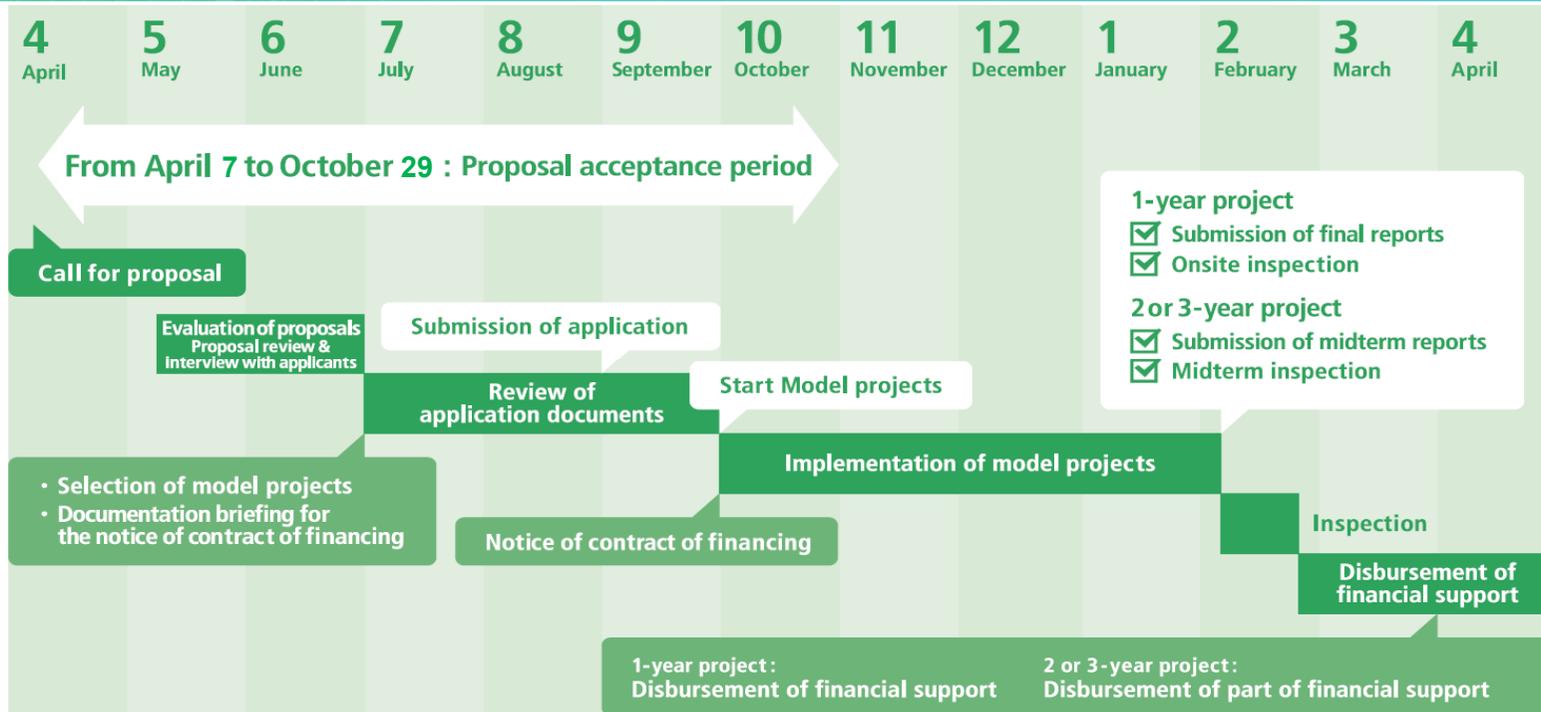
Supporting to facilitate diffusion of advanced decarbonizing technologies ,etc and infrastructure as well as implementation of mitigation actions.

Eligible Projects

- (a) Projects that reduce energy-related CO2 emissions with leading decarbonizing technologies in developing countries, with which Japan has signed or has been consulting to sign a bilateral document on JCM, and that are expected to contribute to achieving Japan’s GHG emission reduction target through the JCM;
- (b) Projects contribute to the sustainable development in partner countries. The installation and operation of the facilities/equipment shall comply with the relevant laws and regulations of the partner country and international practices and guidelines regarding the environmental protection
- (c) Reduction of GHG emissions achieved by the projects can be quantitatively calculated and verified; and
- (d) Facilities/equipment installed by the projects do not receive any other financial support by the Government of Japan.
- (e) If the technology to be adopted is a technology mentioned in Annex 3 “Conditions for Adoption by Technology” in this guideline, the technology shall meet its conditions.

※Call for Proposals for JCM Model Projects in FY2021 Guidelines for Submitting Proposals (Page3)

JCM Model Projects Schedule in FY2021



Guideline for Submitting JCM model project proposal in FY2021

What is the criteria of cost-effectiveness?

JPY4,000/tCO₂equivalent

$$= \frac{\text{Amount of financial support[JPY]}}{\text{Emission reductions of GHG [tCO}_2\text{equivalent/y]} \times \text{legal durable years[y]}}$$

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

JPY3,000/tCO₂equivalent

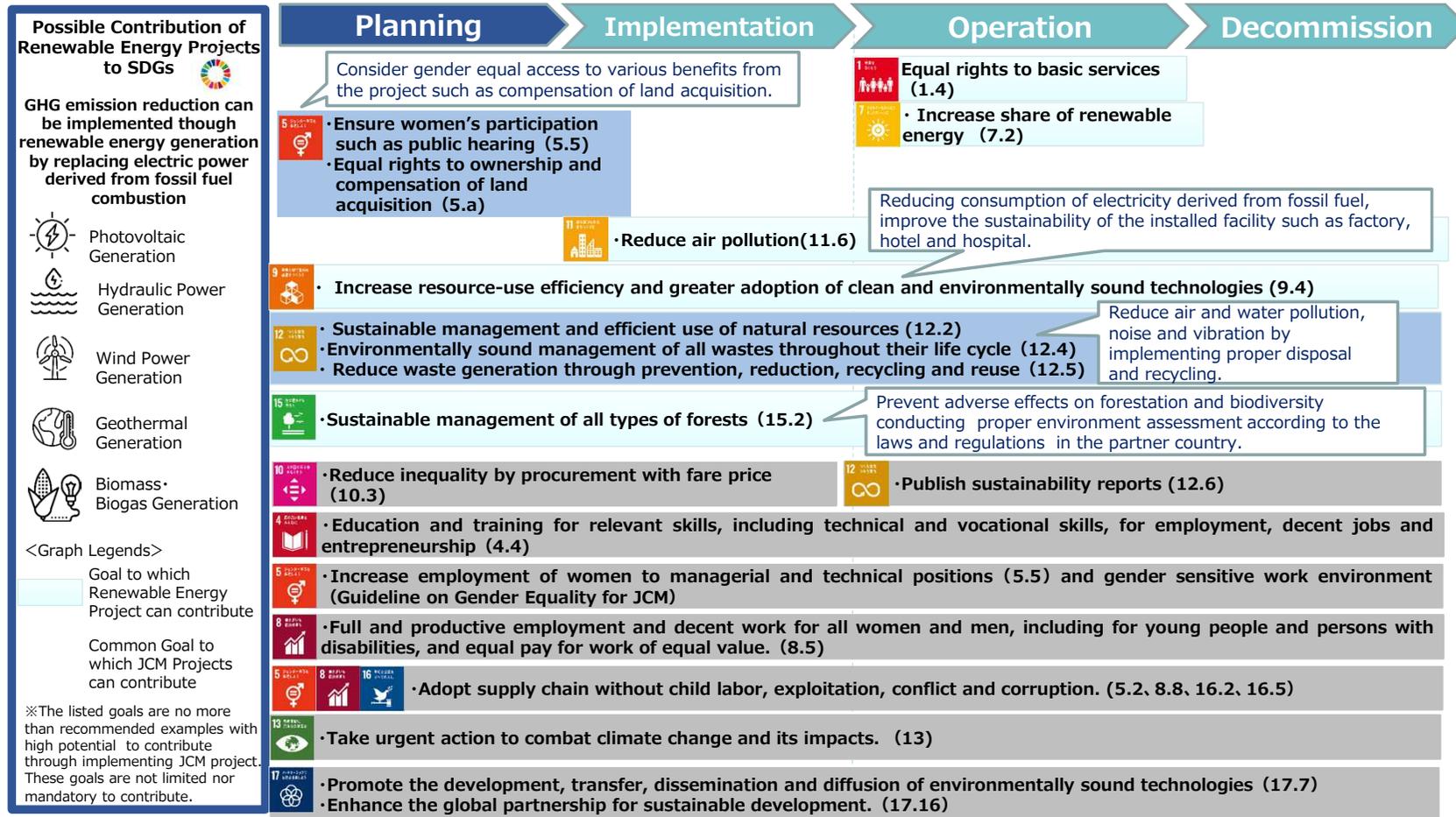
In case the number of similar technological Projects in each country is 5 to 9.

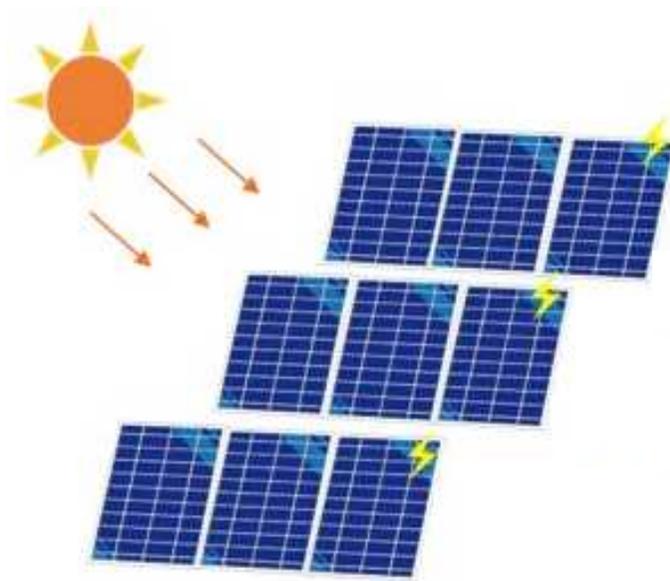
JPY2,500/tCO₂equivalent

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

Solar power projects in Thailand

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





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

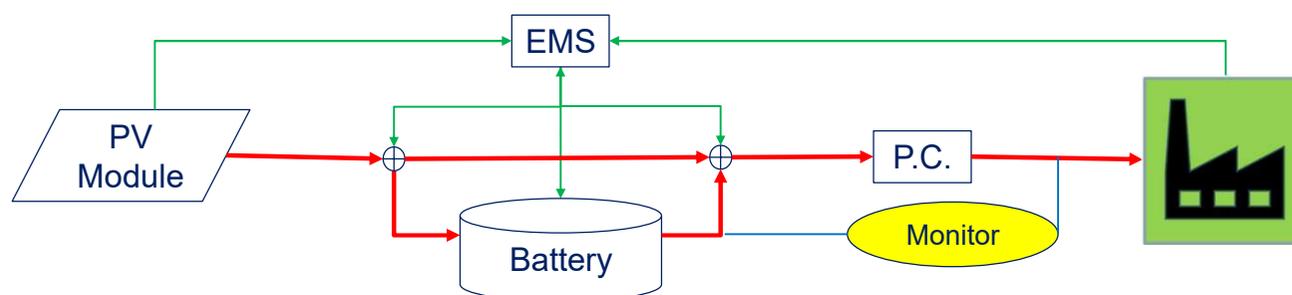
| Technology | Mongolia | Bangladesh | Ethiopia | Kenya | Maldives | Viet Nam | Lao PDR | Indonesia | Costa Rica | Palau | Cambodia | Mexico | Saudi Arabia | Chile | Myanmar | Thailand | Philippines | Total |
|-------------------|----------|------------|----------|-------|----------|----------|---------|-----------|------------|-------|----------|--------|--------------|-------|---------|----------|-------------|-------|
| | 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



1st Selection of Projects in FY2021

| Partner Country | Entity | Project Title | Sector | Expected GHG Emission Reductions (tCO ₂ /y) |
|-----------------|--------------------------------------|---|--|--|
| Vietnam | JFE Engineering Corporation | Waste to Energy project in Bac Ninh Province | Waste handling and disposal | 41,805 |
| Vietnam | Electric Power Development Co., Ltd. | 10MW Rice Husk Power Plant Project in Hau Giang Province | Renewable Energy | 22,315 |
| Vietnam | Sharp Energy Solution Corporation | Introduction of 9MW Rooftop Solar Power System to Factories | Renewable Energy | 3,618 |
| Vietnam | ENDO Lighting Corporation | Introduction of High Efficiency LED Lighting with Dimming and Tunable Function to Office Building in Ho Chi Minh City | Energy Efficiency Improvement | 196 |
| Indonesia | Sumitomo Forestry Co., Ltd. | Introduction of 3.3MW Rooftop Solar Power System in Woodworking Factories | Renewable Energy | 2,396 |
| Indonesia | FUMAKILLA LIMITED | Introduction of High-Efficiency Thermal Oil Heater System in Chemical Factory | Energy Efficiency Improvement | 1,942 |
| Mexico | Sharp Energy Solution Corporation | 20MW Solar Power Project in Guanajuato | Renewable Energy | 20,023 |
| Thailand | Osaka Gas Co., Ltd. | Introduction of High Efficiency Once Through Boiler to Garment Factory | Energy Efficiency Improvement | 2,665 |
| Thailand | NIPPON STEEL ENGINEERING CO., LTD. | Installation of High Efficient Chiller System and PV System for On-Site Energy Supply in Motorcycle Factory | Energy Efficiency Improvement/ Renewable Energy | 1,144 |
| Philippines | MITSUI & CO., LTD. | 60MW Solar Power Project in Cordon, Isabela | Renewable Energy | 44,860 |
| Philippines | Mizuho-Toshiba Leasing Company Ltd. | Tanawon 20MW Flash Geothermal Power Plant Project | Renewable Energy | 38,312 |

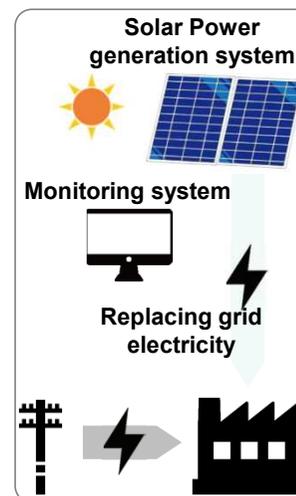
Introduction of 3.3MW Rooftop Solar Power System in Woodworking Factories

PP (Japan): Sumitomo Forestry Co., Ltd., PP (Indonesia): PT. AST INDONESIA

Outline of GHG Mitigation Activity

A total of 3.3MW of roof-mounted captive solar power generation system is installed at two woodworking factories located in an industrial park in the suburbs of Semarang city. The generated electricity replaces a portion of grid electricity to reduce greenhouse gas (GHG) emissions.

The project is being implemented as part of the Sumitomo Forestry Group's efforts to reduce GHG emissions based on SBT (Science Based Targets) and to introduce renewable energy in line with the RE100 target. It also contributes to the achievement of country's renewable energy introduction target of 23% by 2025.



Expected GHG Emission Reductions

2,396 tCO₂/year

= (Reference CO₂ emissions)
- (Project CO₂ emissions)

• Reference CO₂ emissions
= (Quantity of the electricity generated by the project) [MWh/year]

× Emission factor [tCO₂/MWh]

• Project CO₂ emissions
= 0 [tCO₂/year]

Sites of Project



Introduction of High-Efficiency Thermal Oil Heater System in Chemical Factory

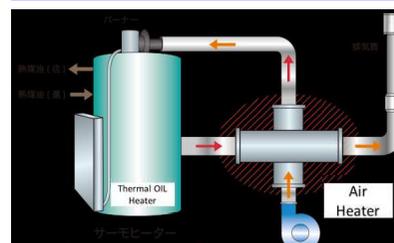
PP (Japan): FUMAKILLA LIMITED, PP (Indonesia): PT FUMAKILLA NOMOS

Outline of GHG Mitigation Activity

For the purpose of the contribution to the global environment, the operation of the existing coal-fired thermal oil heater is stopped, and the amount of greenhouse gas (GHG) emissions can be reduced by installing the new high-efficiency natural gas-fired thermal oil heater.

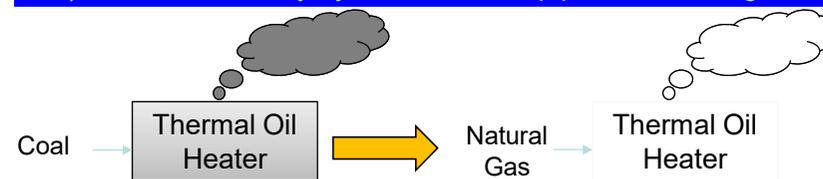
By replacing the coal-fired system with the natural gas-fired system, concerns about the corrosion of pre air heater will be diminished, and the equipment is also expected to be used with high efficiency in the long run.

1) Efficiency improvement by installing pre air heater



Heater efficiency is expected to be improved by 12% by installing pre air heater and to reduce more GHG emissions.

2) More eco-friendly by conversion to pipeline natural gas



Expected GHG Emission Reductions

1,942 tCO₂ /year

$$= [(Reference\ fuel\ consumption) - (Project\ fuel\ consumption)] \times Emission\ factor\ (EF)$$

Sites of Project

Approximately 100km southeast of Soekarno-Hatta International Airport



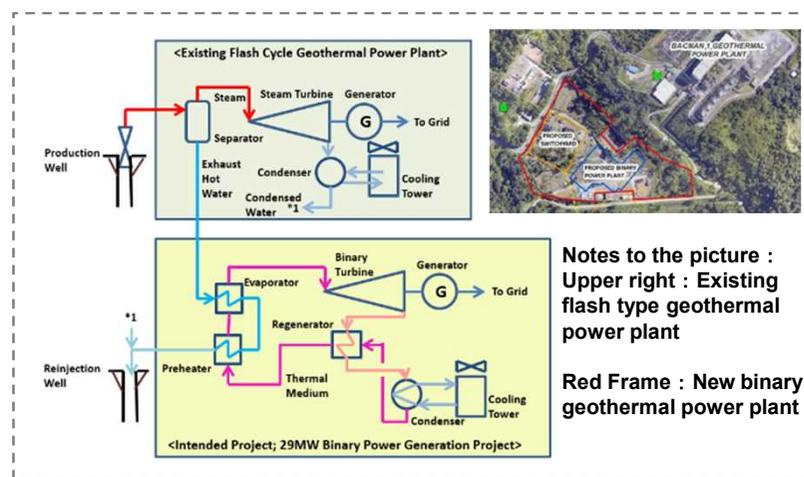
Map data©2021Google

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.



Expected GHG Emission Reductions

72,200 tCO₂/Year

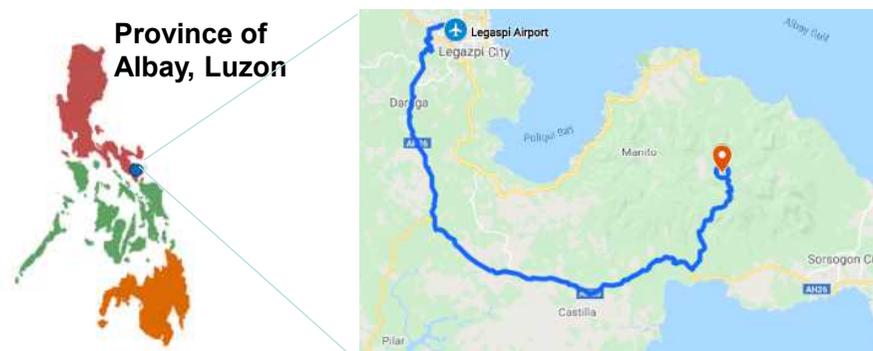
= (Reference CO₂ emissions)
 - (Project CO₂ emissions)

• Reference CO₂ emissions
 = (Quantity of the electricity generated by the project) [MWh/year]

× Emission factor [tCO₂/MWh]

• Project CO₂ emissions
 = 0 [tCO₂/year]

Sites of Project



56km Southwest of the Legazpi City Airport

Map data ©2020 Google

Tanawon 20MW Flash Geothermal Power Plant Project

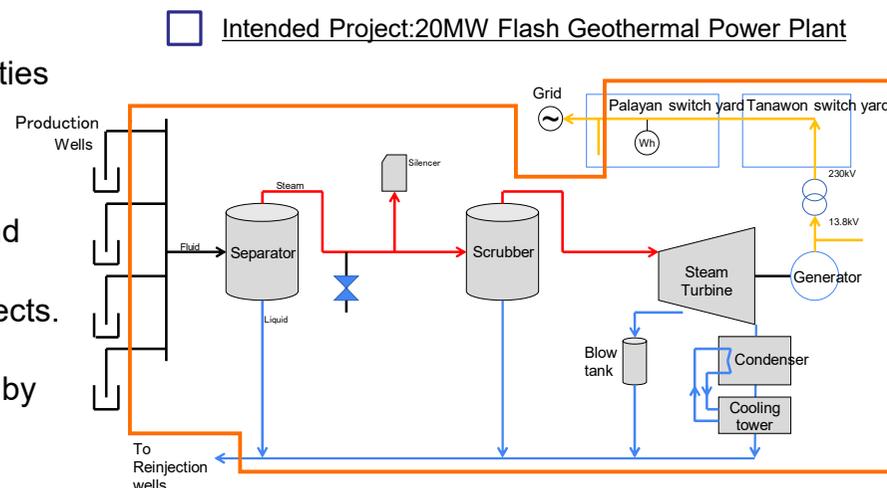
PP (Japan): Mizuho-Toshiba Leasing Company, Limited, PP (Philippines): Bac-Man Geothermal Inc.

Outline of GHG Mitigation Activity

This project introduces a new 20 MW Flash Geothermal power plant system and new facilities for connection to the grid at Tanawon area of southern part of the Luzon island.

This Flash Geothermal power plant is small and easy to install, making it suitable for relatively small-scale geothermal power generation projects.

This project replaces the grid power produced by fossil fuel with renewable energy and reduces greenhouse gas (GHG) emissions.



Expected GHG Emission Reductions

38,312tCO₂/year

= (Reference CO₂ emissions)

– (Project CO₂ emissions)

• Reference CO₂ emissions

= Quantity of the electricity

transmission by the project [MWh/year]

× Emission factor [tCO₂/MWh]

• Project CO₂ emissions

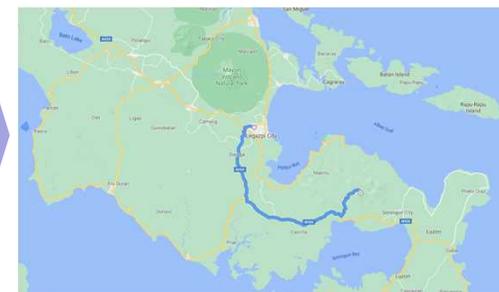
= Quantity of GHG (CO₂, CH₄) in Non

Condensable Gas of Steam from the well.

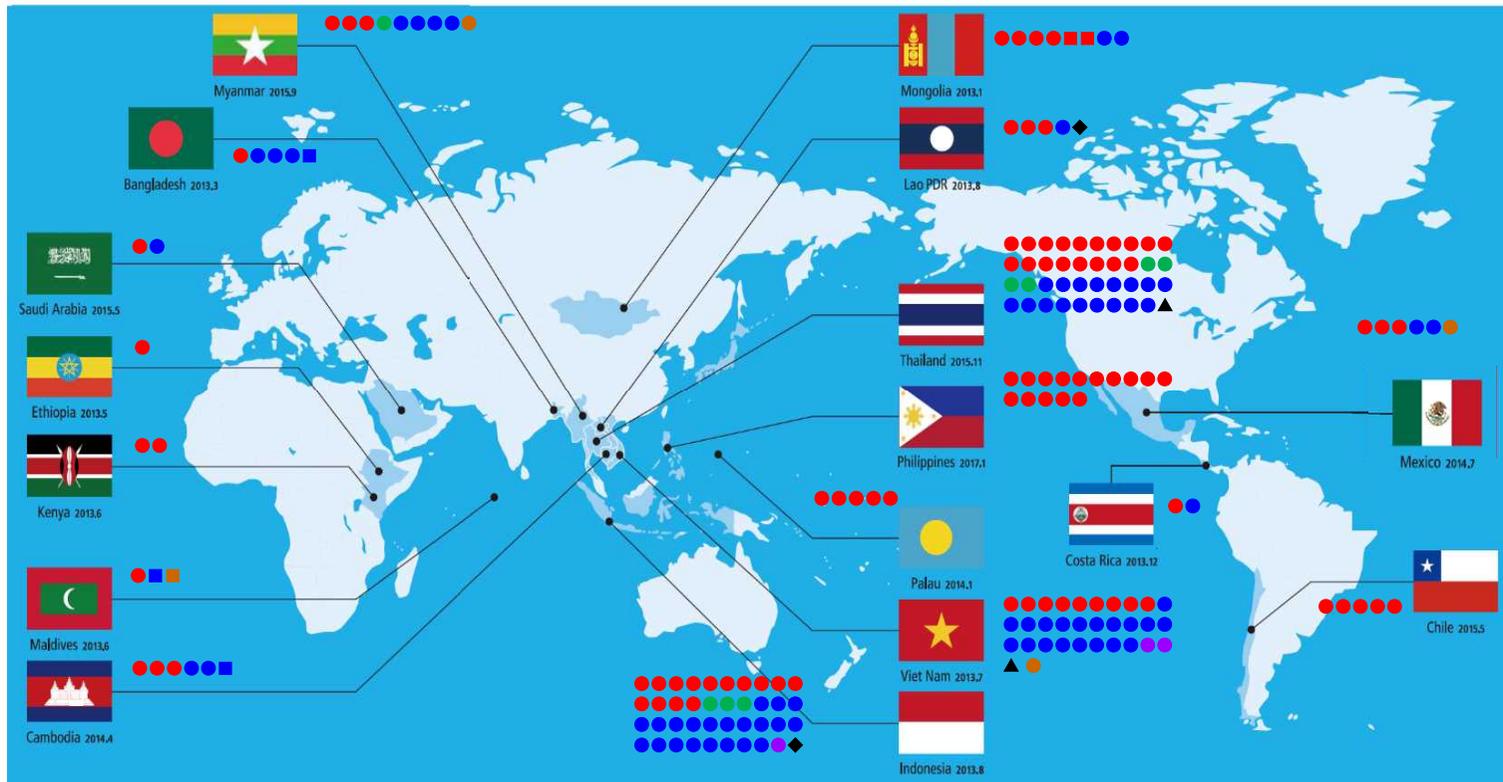
Sites of Project



54km Southeast of the Legazpi City
Domestic Airport



Map data ©2021 Google

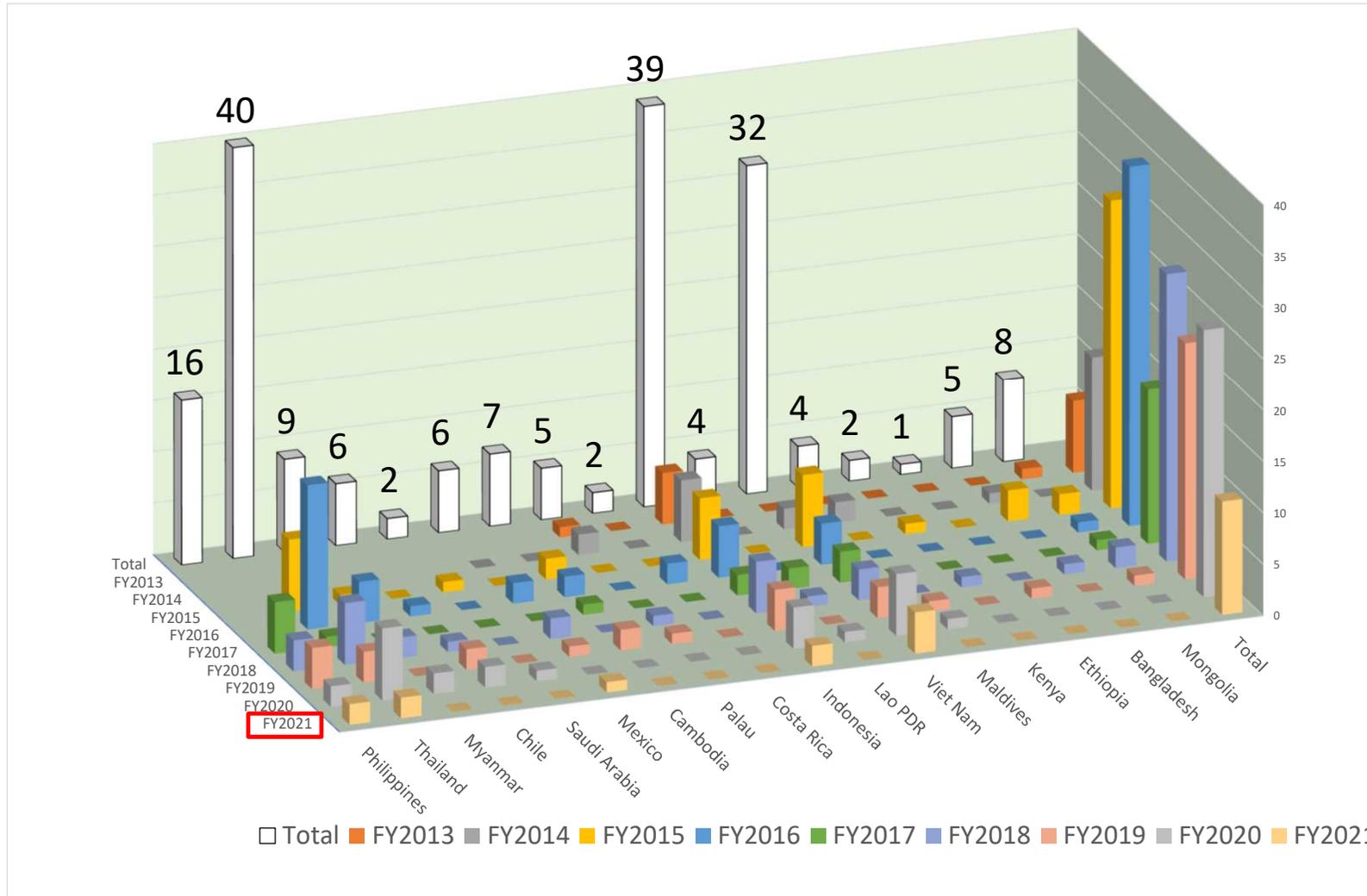


Total 186 projects / 17 countries

(● Model Project:177, ■ ADB:5, ◆ REDD+:2, ▲ F-gas:2)

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

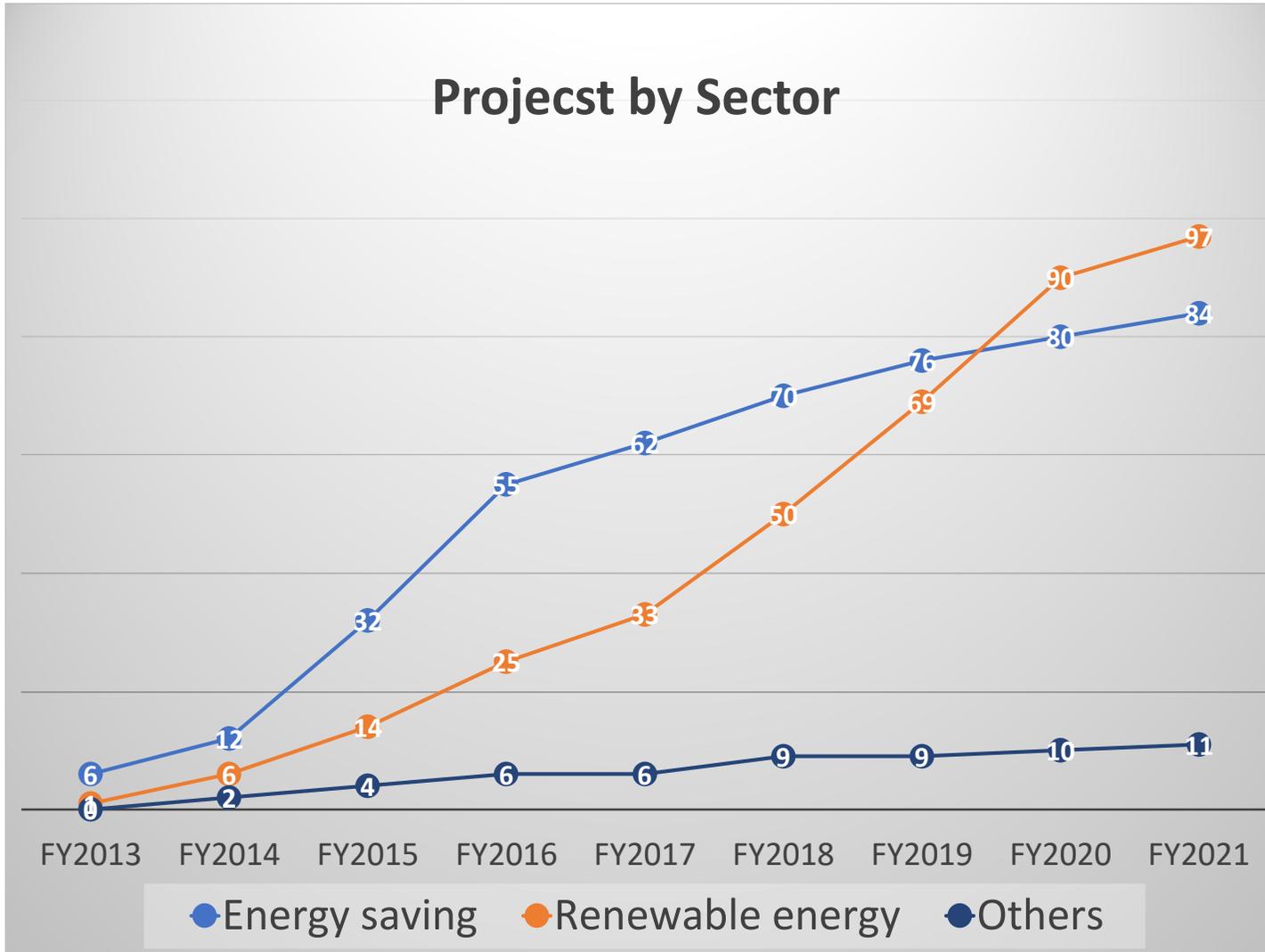
Project by Year and Country

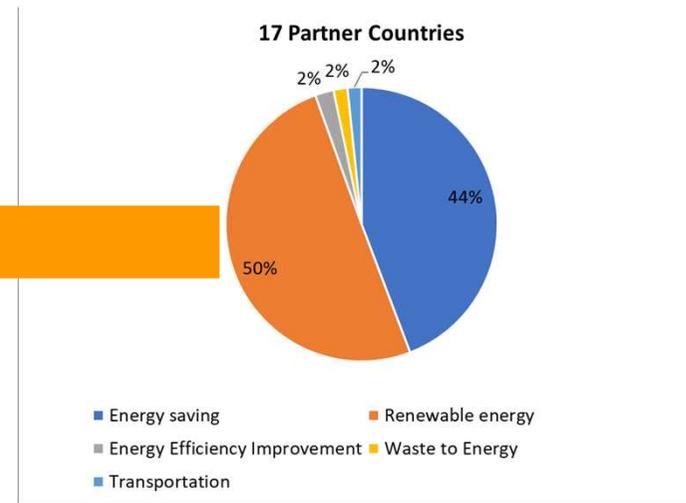
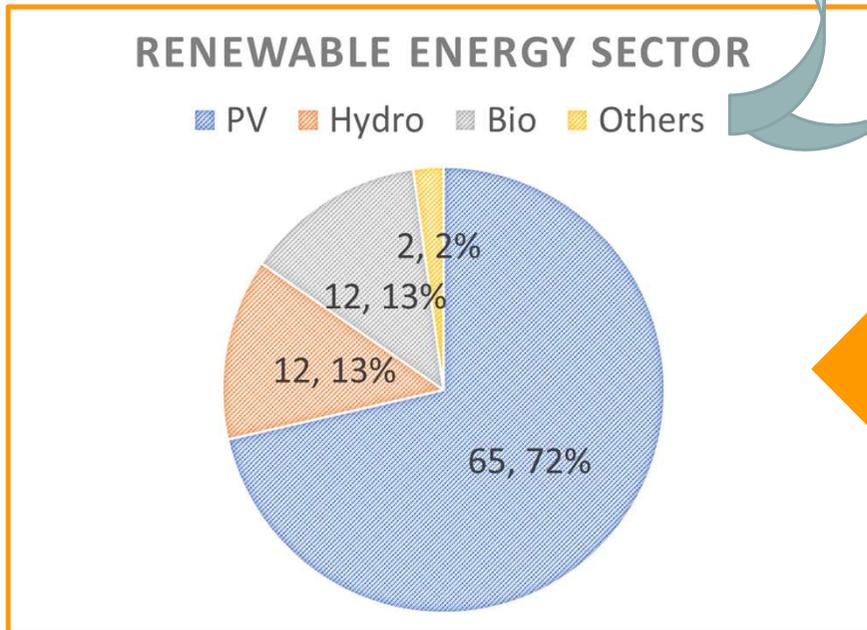
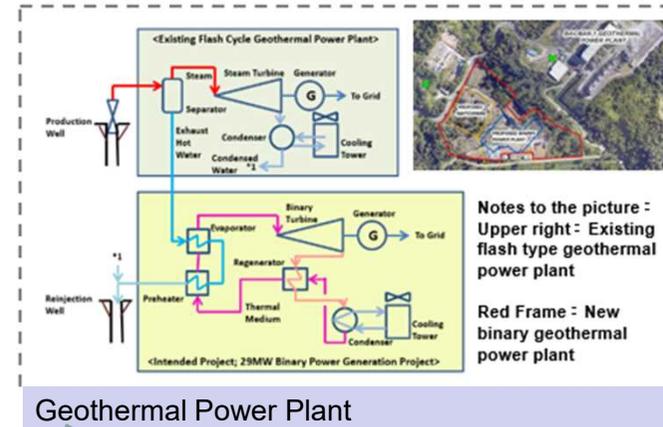
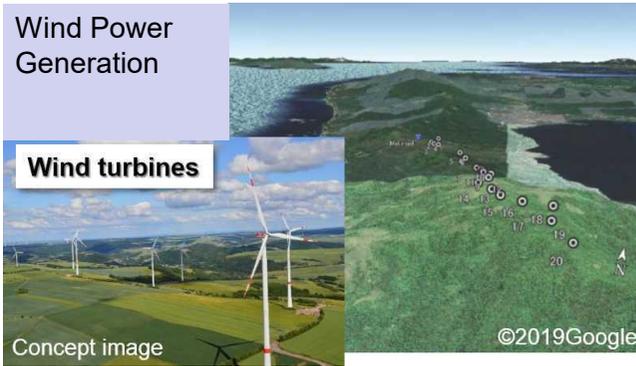


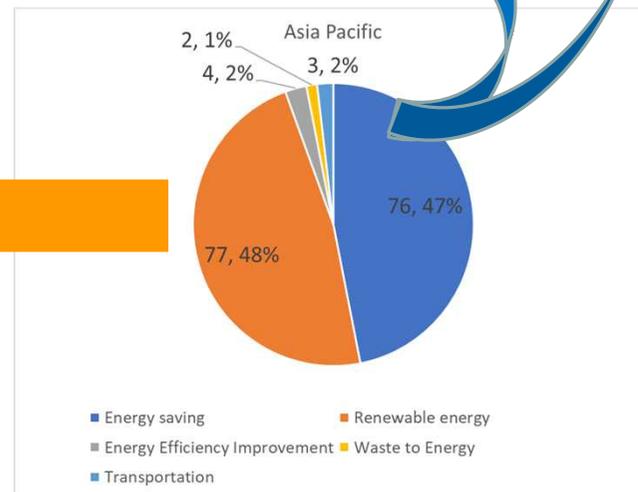
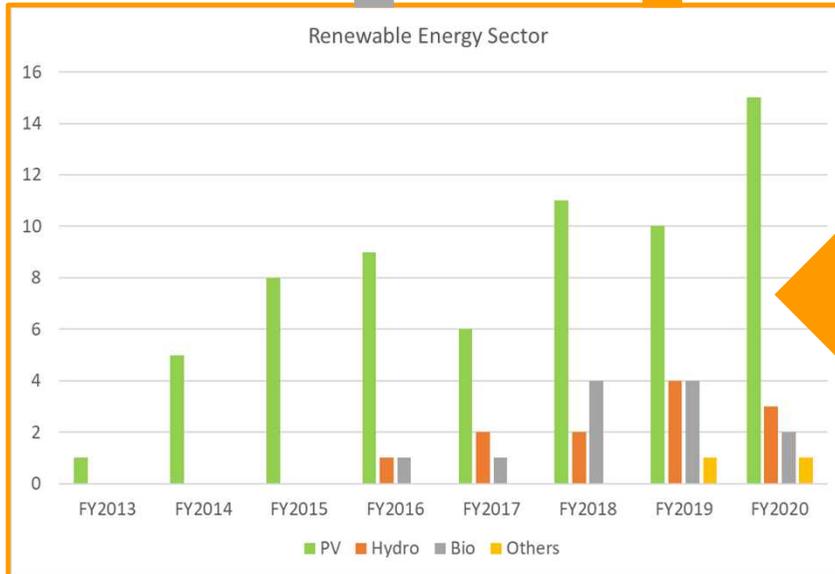
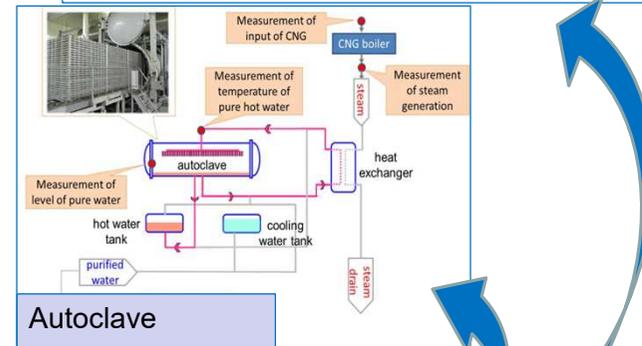
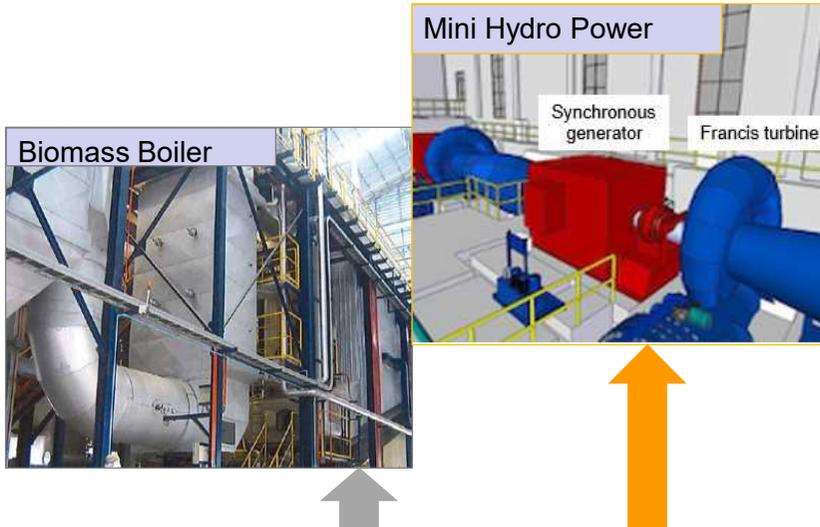
Categorization by applied technology type

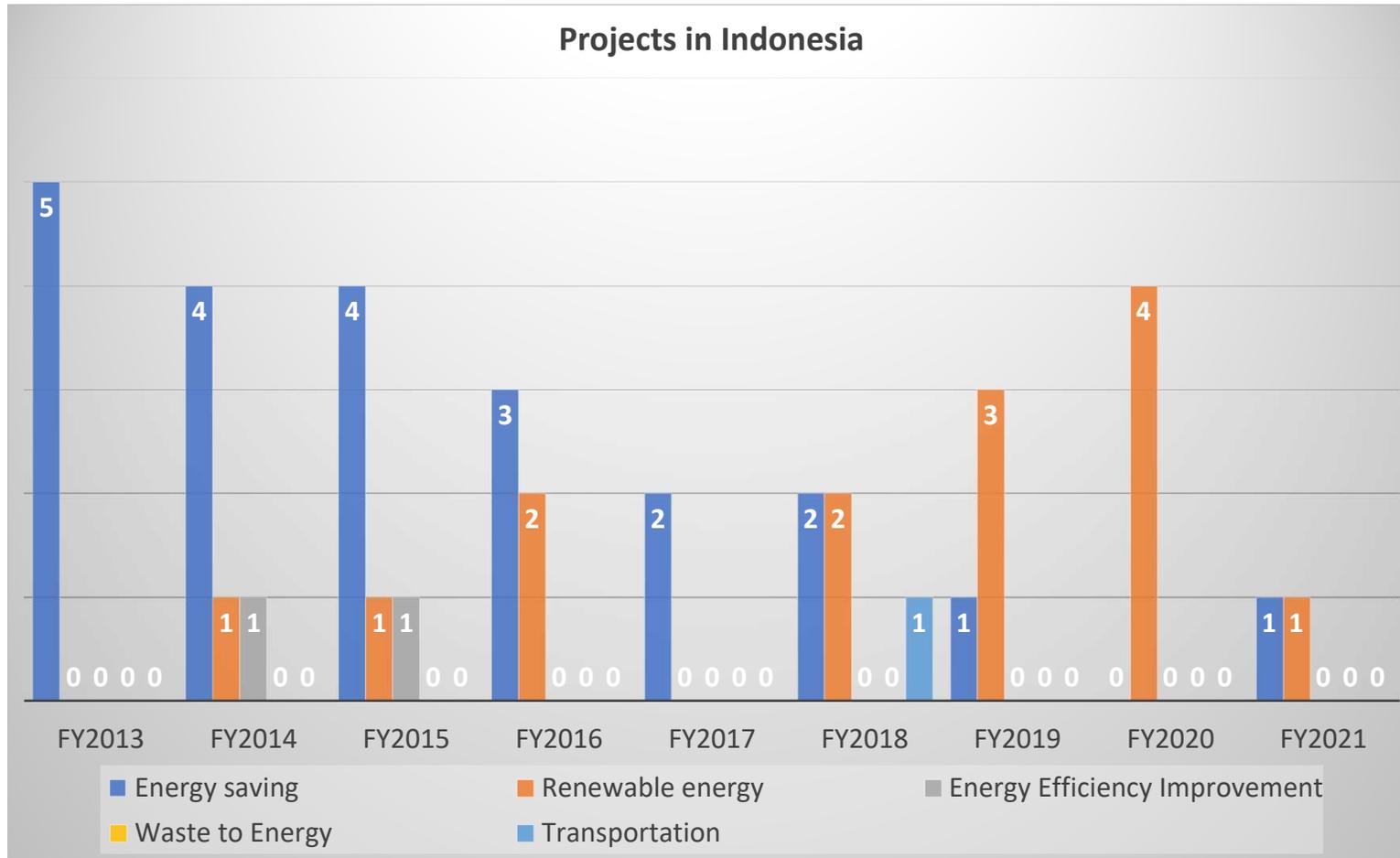
| Sector | Technology | Mongolia | Bangladesh | Ethiopia | Kenya | Maldives | Viet Nam | Lao PDR | Indonesia | Costa Rica | Palau | Cambodia | Mexico | Saudi Arabia | Chile | Myanmar | Thailand | Philippines | |
|---|---|----------|------------|----------|-------|----------|----------|---------|-----------|------------|-------|----------|--------|--------------|-------|---------|----------|-------------|-----|
| | | 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 Exchanger | | | | | | | | | | | | | | | 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 |
| | Frequency Inverter for Pump | | | | | | | 1 | | | | | 1 | | | | | | 2 |
| | Ventilation Control 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 Molding Machine | | | | | | | | 1 | | | | | | | | | | 1 |
| 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 | |
| Biomass boiler | | | | | | | 2 | | | | | | | | | | 1 | 3 | |
| Biogas boiler | | | | | | | | | | | | | | | 1 | | 1 | 2 | |
| Biomass Co-generation | | | | | | 1 | | | | | | | | | | | 1 | 2 | |
| Power Generation by Waste Heat Recovery | | | | | | | | | 1 | | | | | | | 1 | 1 | 3 | |
| Gas Co-generation | | | | | | | | | 2 | | | | | | | | 3 | 5 | |
| Waste-to-Energy Plant | | | | | | | | | | | | | | | | 1 | | 1 | |
| Power Generation by Methane Recovery | | | | | | | | | | | | | 1 | | | | | 1 | |
| 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%









Infrastructure through JCM

- 1 Thailand / EAST RETAILING CO., LTD.
High Efficiency LED Lighting
- 2 Cambodia / AEON MALL Co., Ltd.
Solar Power System and High Efficiency Central Air Conditioning
- 3 Hongkong / Haste Refrigeration Equipment & Systems Co., Ltd.
High Efficiency Centrifugal Chiller
- 4 Mexico / Sanitary Sales Limited
Once-through Roller and Fuel Switching



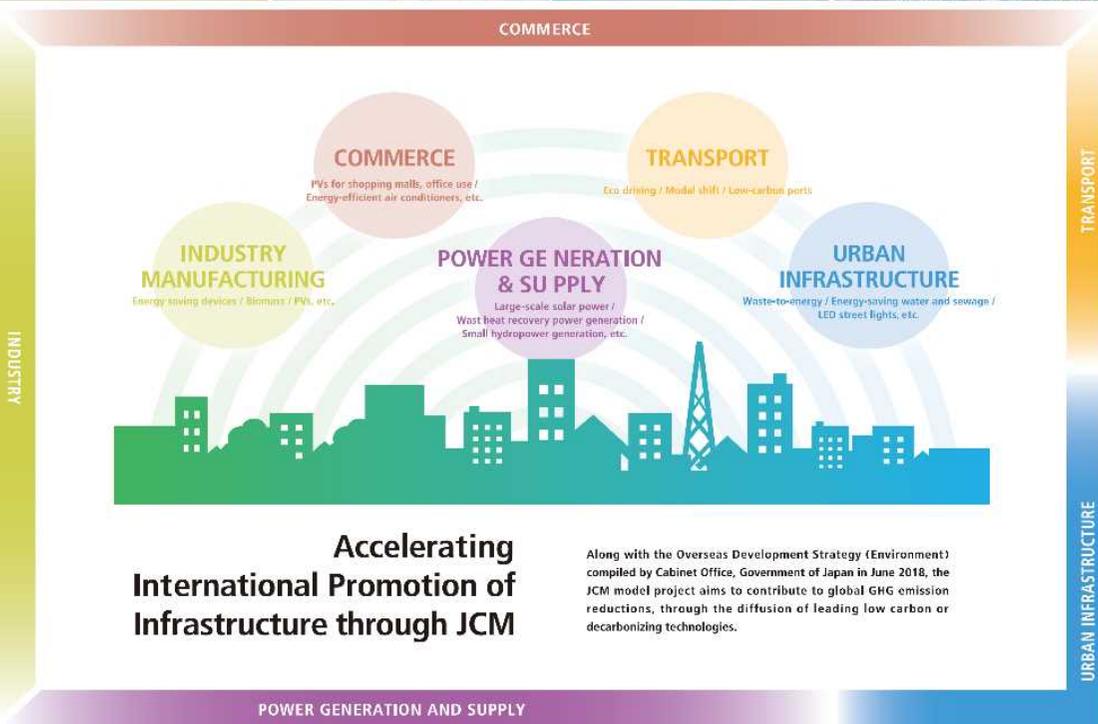
- 1 Palau / Pacific Consultants Co., Ltd.
Solar Power Plants for Commercial Facilities
- 2 Indonesia / Toyota Tsusho Corporation
Double-Bundle type Heat Pump
- 3 Indonesia / Hoshino Co., Ltd.
Choke-chest Equipment for Public Bus
- 4 Thailand / Yokohama Port Corporation
Energy Efficient equipment for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



- 1 Indonesia / Environmental Management and Technology Center
Energy saving in Industrial Wastewater Treatment System
- 2 Myanmar / Kirin Holdings Company, Limited
Energy Saving Steaming System
- 3 Thailand / TESH Co., Ltd.
Floating Solar Power System
- 4 Myanmar / TAI DAIRY INDUSTRY MANAGEMENT CONSULTING, Pte.
Power Generation with Methane Gas Recovery System



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

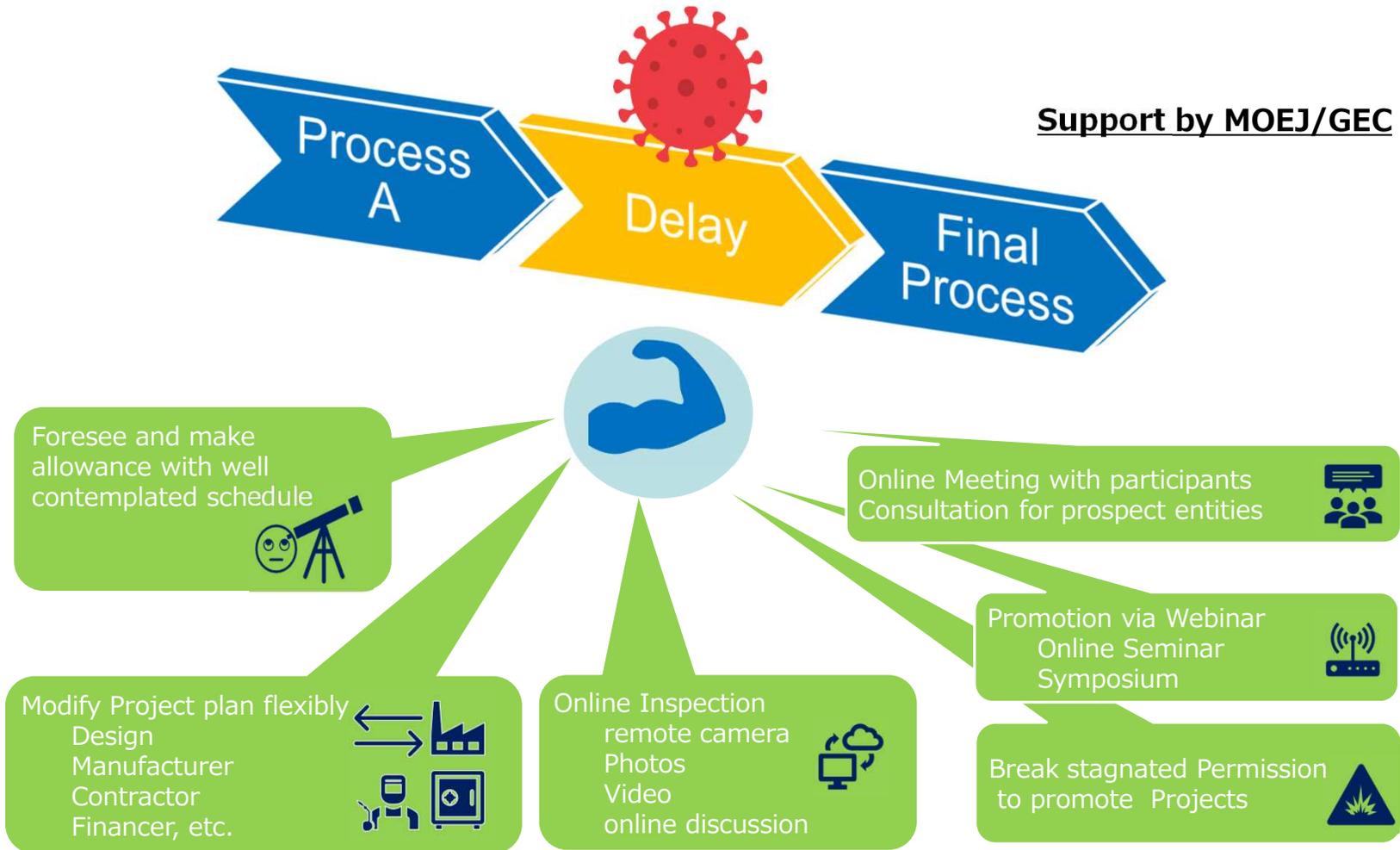


Impact on Projects

- 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



Terima kasih!

ありがとうございました。

Global Environment Centre Foundation(GEC) Tokyo Office

3rd Floor, Hongo Ozeki Bidg 3-19-4, Hongo, Bunkyo-ku,

Tokyo 113-0033, JAPAN

Phone : +81-3-6801-8773 / FAX : +81-3-6801-8861

E-mail : jcm-info@gec.jp

URL : <http://gec.jp/>

