Financing Programme for JCM Model Projects

February 2022

Global Environment Centre Foundation (GEC)

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 (Main Points)

(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.

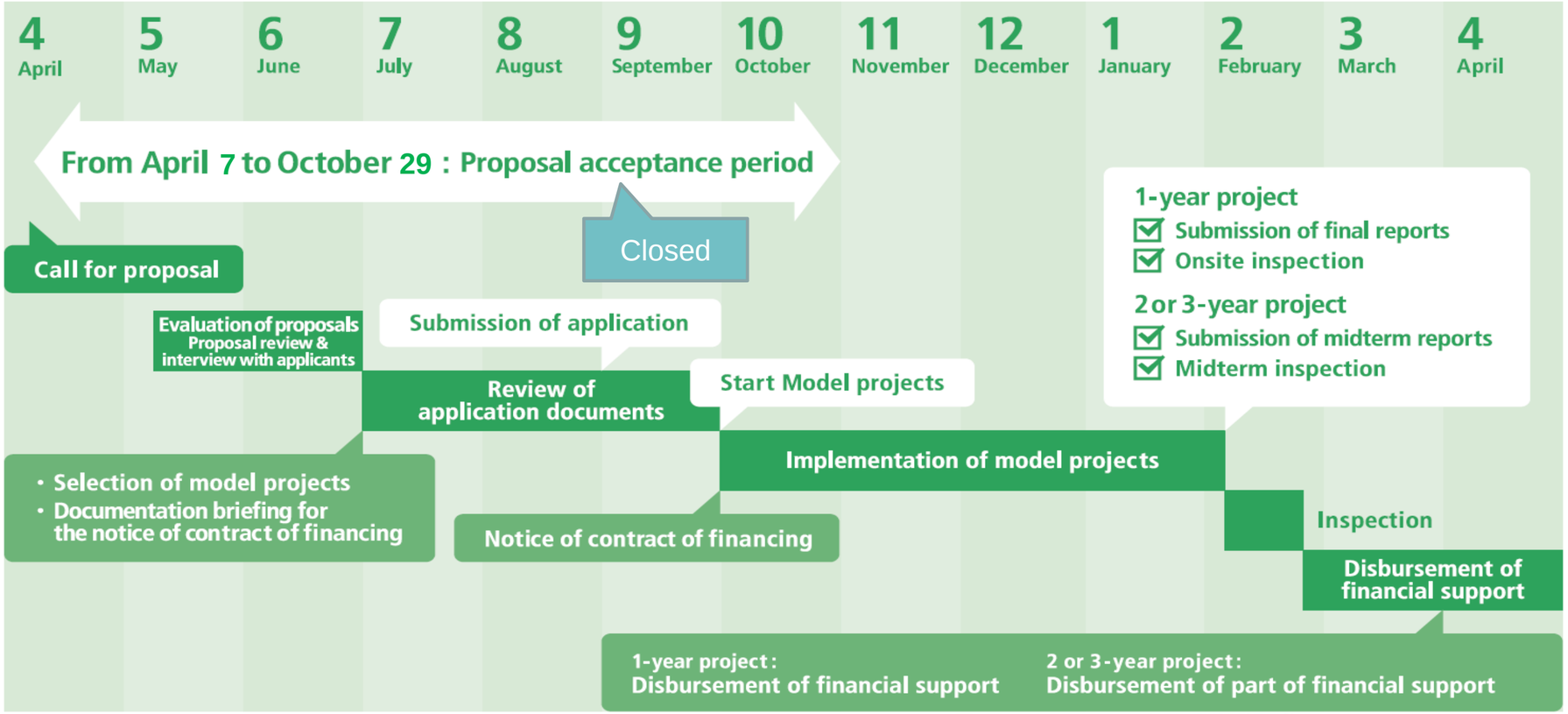
(b) Projects contribute to the sustainable development in partner countries.
The installation and operation of the facilities/equipment shall comply with the relevant laws and regulations of the partner country and international practices and guidelines regarding the environmental protection.

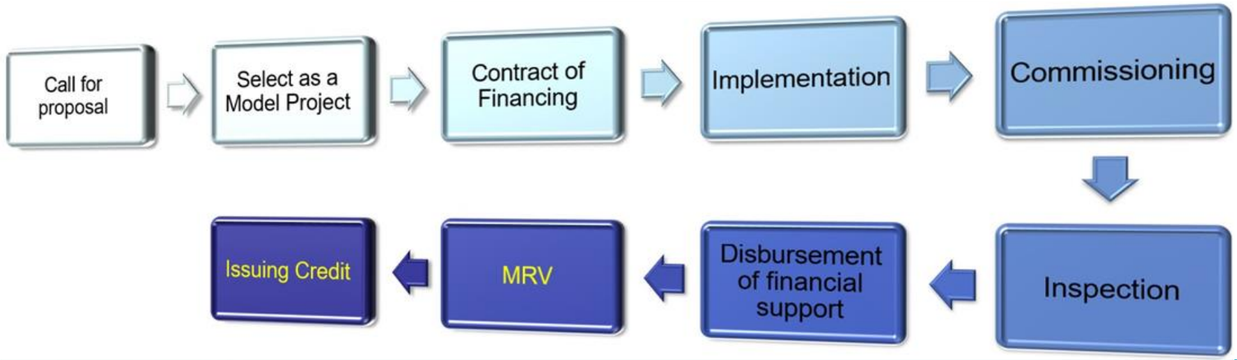
(c) Reduction of GHG emissions achieved by the projects can be quantitatively calculated and verified.

※Call for Proposals for JCM Model Projects in FY2021Guidelines for Submitting Proposals（Page3）

JCM Model Projects Schedule in FY2021

Global Environment Centre Foundation





Guideline for Submitting JCM model project proposal in FY2021

Cost-effectiveness of emission reductions

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 Mongolia, Palau and Philippine and hydropower projects in Indonesia

Guideline for Submitting JCM model project proposal

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%

JCM for SDGs

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）**

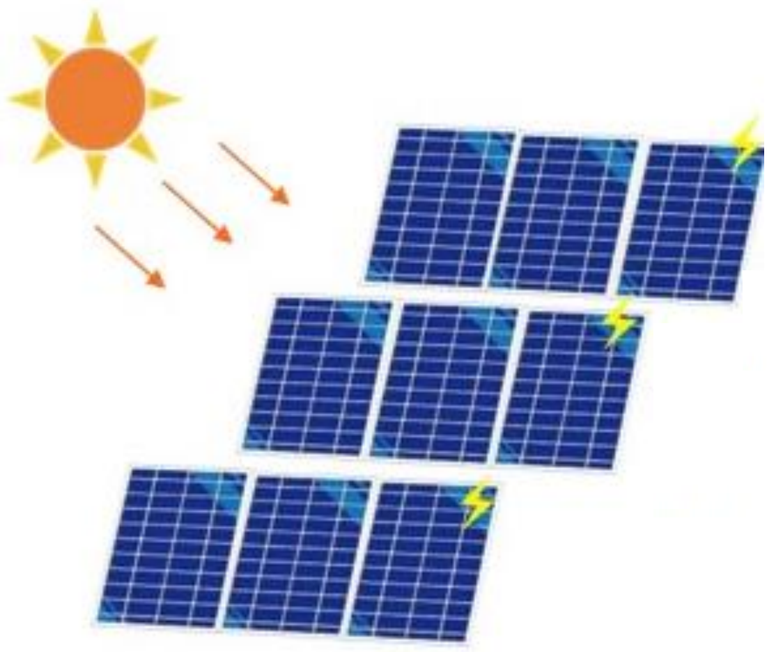
1st Selection of Projects in FY2021

Partner Country	Entity	Project Title	Sector	Expected GHG Emission Reductions (tCO2/y)
Vietnam	JFE Engineering Corporation	Waste to Energy project in Bac Ninh Province	Waste handling and disposal	41,805
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
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

2nd Selection of Projects in FY2021

Partner Country	Entity	Project Title	Sector	GHG Emission Reductions（tCO2/y）
Vietnam	Marubeni Corporation	Introduction of 12MW Rooftop Solar Power System to Commercial and Industrial Customers	Renewable Energy	5,815
Vietnam	Osaka Gas Co., Ltd.	Introduction of 9.8MW Rooftop Solar Power System in Industrial Park	Renewable Energy	4,254
Vietnam	Asian Gateway Corporation	Introduction of 5.8MW Rooftop Solar Power System to Beverage Factory	Renewable Energy	2,531
Vietnam	The Kansai Electric Power Company, Incorporated	Introduction of 2.5MW Rooftop Solar Power System to Food Factory and Garment Factory	Renewable Energy	982
Vietnam	Tokyu Corporation	Introduction of High Efficiency Chiller and High Efficiency LED Lighting with Dimming Function to Shopping Center	Energy Efficiency Improvement	726
Lao PDR	Liberal Solution Co., Ltd.	19MW Solar Power Project in Xiangkhouang Province	Renewable Energy	7,861
Indonesia	WWS-JAPAN Co.	6MW Mini Hydro Power Plant Project in Besay River, Lampung Province	Renewable Energy	20,307
Indonesia	WWS-JAPAN Co.	2.3 MW Mini Hydro Power Plant Project in Melesom River, Lampung Province	Renewable Energy	6,787
Indonesia	Otsuka Pharmaceutical Factory, Inc.	Energy Saving by Introducing High Efficiency Autoclave to Infusion Manufacturing Factory 2	Energy Efficiency Improvement	8,796
Chile	Eurus Energy Holdings Corporation	9MW Solar Power Project in Casablanca, Valparaiso Region	Renewable Energy	8,527
Chile	Eurus Energy Holdings Corporation	9MW Solar Power Project in Yungay, Biobio Region	Renewable Energy	8,476
Chile	FARMLAND Co., Ltd.	3MW Solar Power Project Utilizing Farmland in Maule Region	Renewable Energy	2,489
Thailand	Kanematsu KGK Corp.	35MW Solar Power and Storage Battery Project in Suphanburi Province	Renewable Energy	13,197
Thailand	Sharp Energy Solution Corporation	Introduction of 23MW Rooftop Solar Power System to Tire Factories	Renewable Energy	8,928
Thailand	The Kansai Electric Power Company, Incorporated	Introduction of High Efficiency Boiler, High Efficiency Chiller, and Solar PV System to Textile Factory and Food Factory	Energy Efficiency Improvement/ Renewable Energy	1,885
Thailand	The Kansai Electric Power Company, Incorporated	Introduction of 2MW Rooftop Solar Power System to Non-ferrous Metal Factory	Renewable Energy	945
Thailand	Tokyo Century Corporation	Introduction of 1.85MW Solar Power System to Food Factories (JCM Eco Lease Scheme)	Renewable Energy	858
Thailand	Tokyo Century Corporation	Introduction of 0.13MW Solar Power System to Auto Parts Factory (JCM Eco Lease Scheme)	Renewable Energy	52
Philippines	Oriental Consultants Co., Ltd.	Introduction of Energy Saving Air Conditioning System to Quezon City Hall Compound	Energy Efficiency Improvement	780

Solar Power Module



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

Solar Power Plant with Battery

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

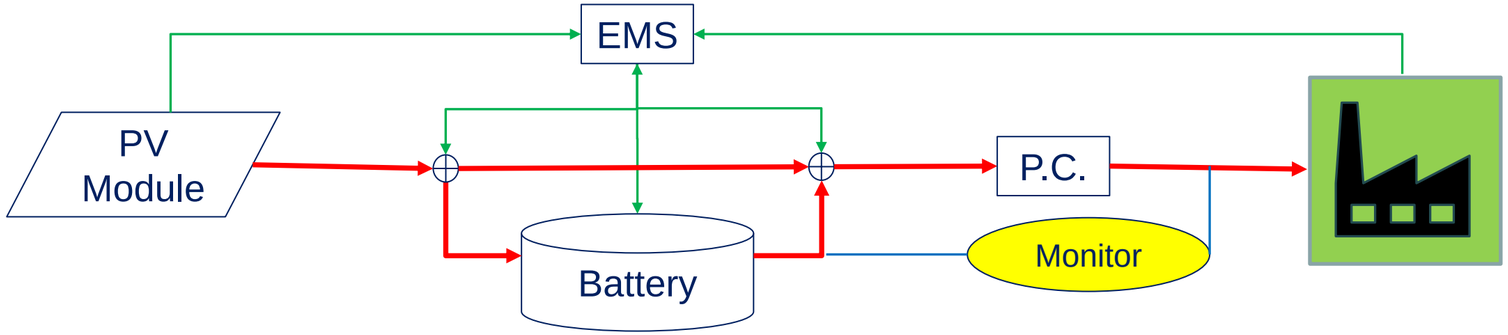
1) Introduction to off-the-grid areas

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



JCM Model Project（FY2021）in Thailand

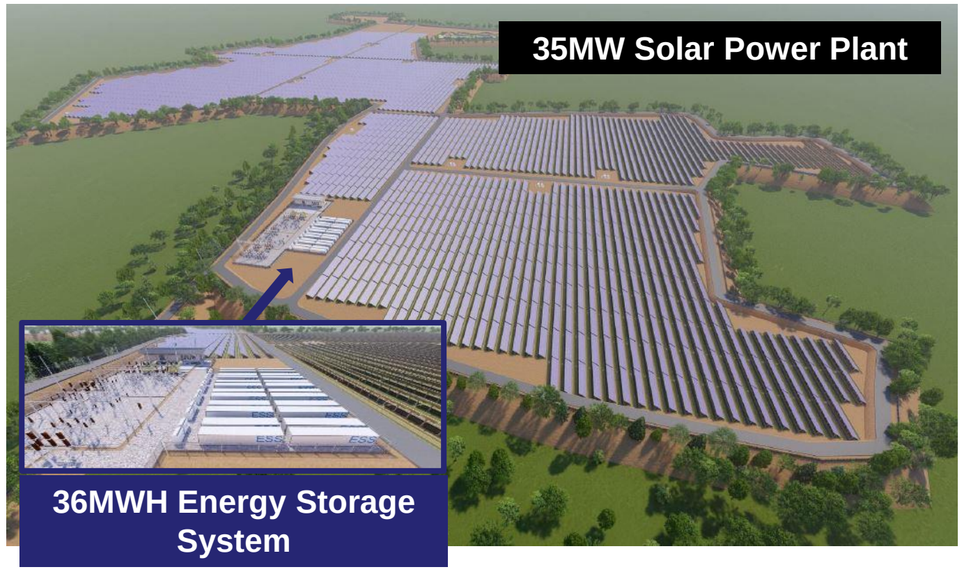
Global Environment Centre Foundation

35MW Solar Power and Storage Battery Project in Suphanburi Province

PP (Japan): Kanematsu KGK Corp.　PP (Thailand): Blue Solar Co., Ltd., Blue Solar Farm 2 Co., Ltd.

Outline of GHG Mitigation Activity

This project installs 35MW solar power system and 36MWH energy storage system in Suphanburi province. The electricity generated by solar power plant is supplied to the grid. In daytime, surplus power is charged into the energy storage system, and charged power is supplied to the grid during evening time. The project contributes to Thailand's target to reduce greenhouse gas (GHG) emissions by shifting power resource to renewable energy from fossil fuel.



Expected GHG Emission Reductions

13,197tCO_2/year

= (Reference CO_2 emissions)

- (Project CO_2 emissions)

・Reference CO_2 emissions

= (Quantity of the electricity generated by the project) [MWh/year]

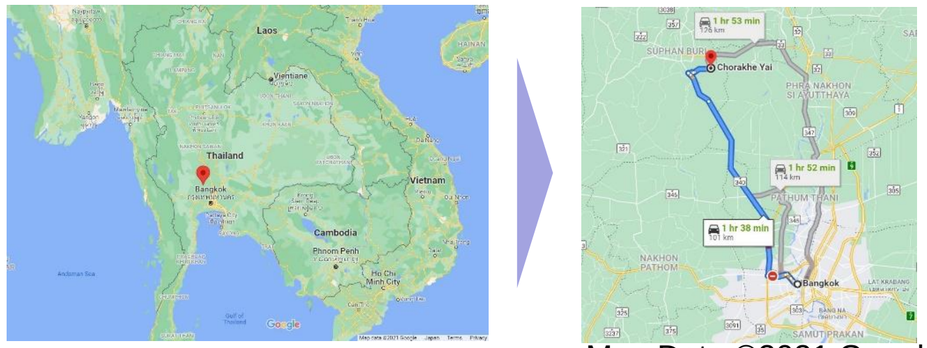
×Emission factor [tCO_2/MWh]

・Project CO_2 emissions

= 0 [tCO_2/year])

Sites of Project

Approx. 100km northwest from Bangkok city



Map Data ©2021 Google

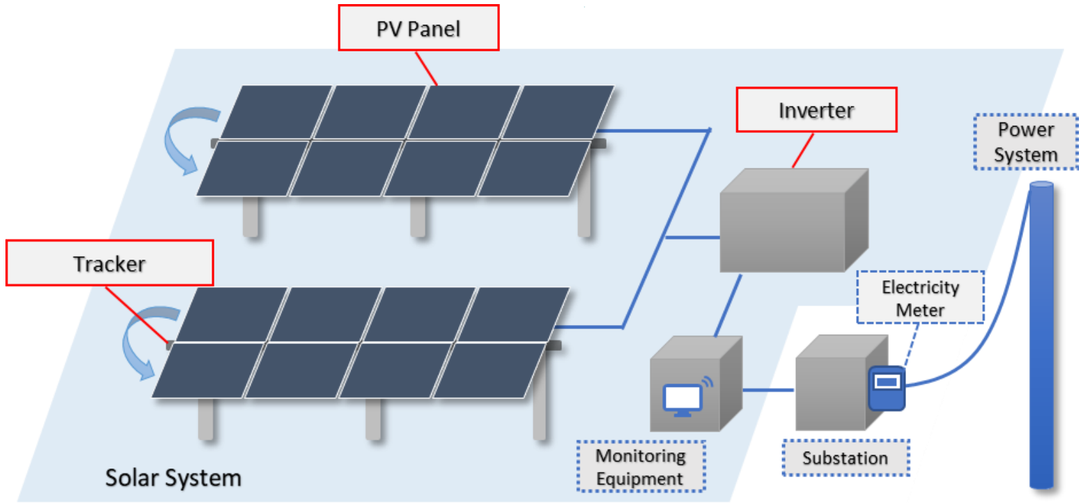
9MW Solar Power Project in Casablanca, Valparaiso Region

PP (Japan): Eurus Energy Holdings Corporation, PP (Chile): Eurus Energy Chile SpA, Solar Ti Veintiséis SpA

Outline of GHG Mitigation Activity

9 MW solar power system (using single-axis trackers) is installed in Casablanca, Valparaiso. The generated electricity replaces a portion of grid electricity with renewable energy and reduces greenhouse gas (GHG) emissions.

This project contributes to the achievement of Chile's policy for a renewable energy ratio target of 70% in 2050.



Expected GHG Emission Reductions

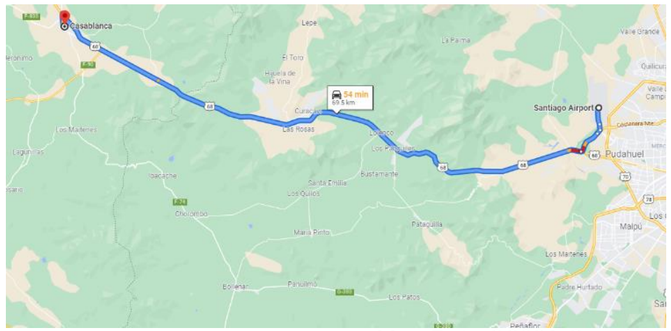
8,527 tCO_2 /year

= (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



Map Data ©2021 Google

Approx. 70km West of Santiago International airport

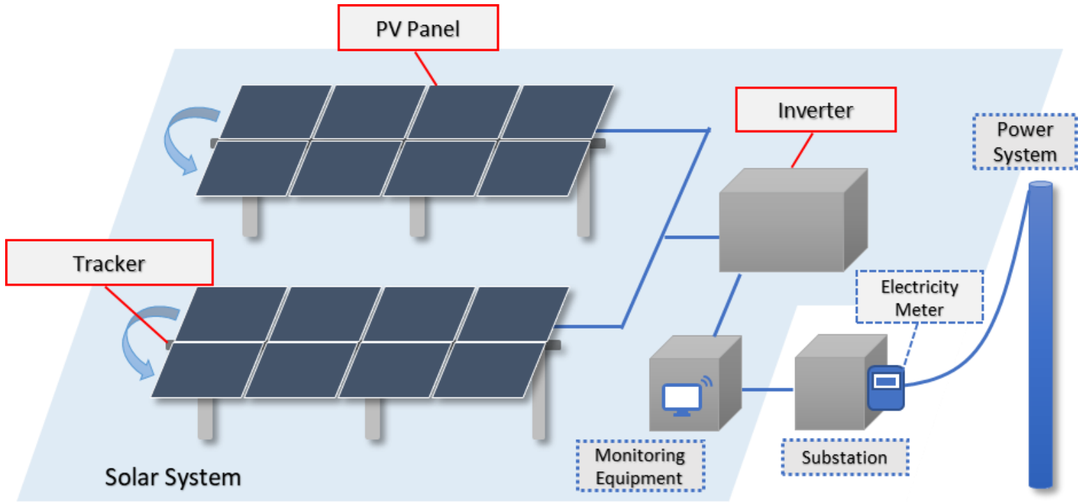
9MW Solar Power Project in Yungay, Biobio Region

PP (Japan): Eurus Energy Holdings Corporation, PP (Chile): Eurus Energy Chile SpA, Solar Ti Quince SpA

Outline of GHG Mitigation Activity

9 MW solar power system (using single-axis trackers) is installed in Yungay, Biobio. The generated electricity replaces a portion of grid electricity with renewable energy and reduces greenhouse gas (GHG) emissions.

This project contributes to the achievement of Chile's policy for a renewable energy ratio target of 70% in 2050.



Expected GHG Emission Reductions

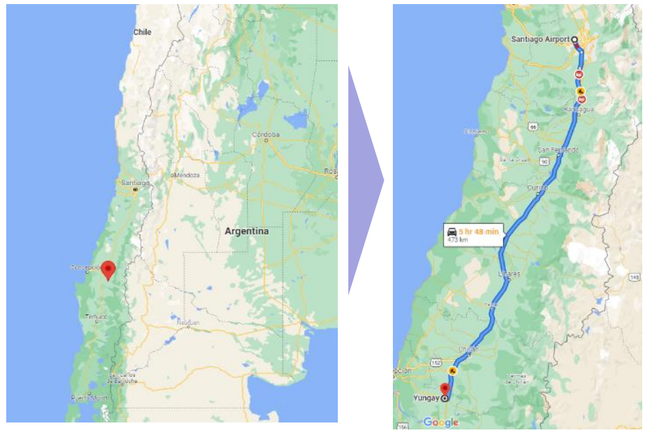
8,476 tCO_2 /year

= (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. 500km
South of Santiago
International airport

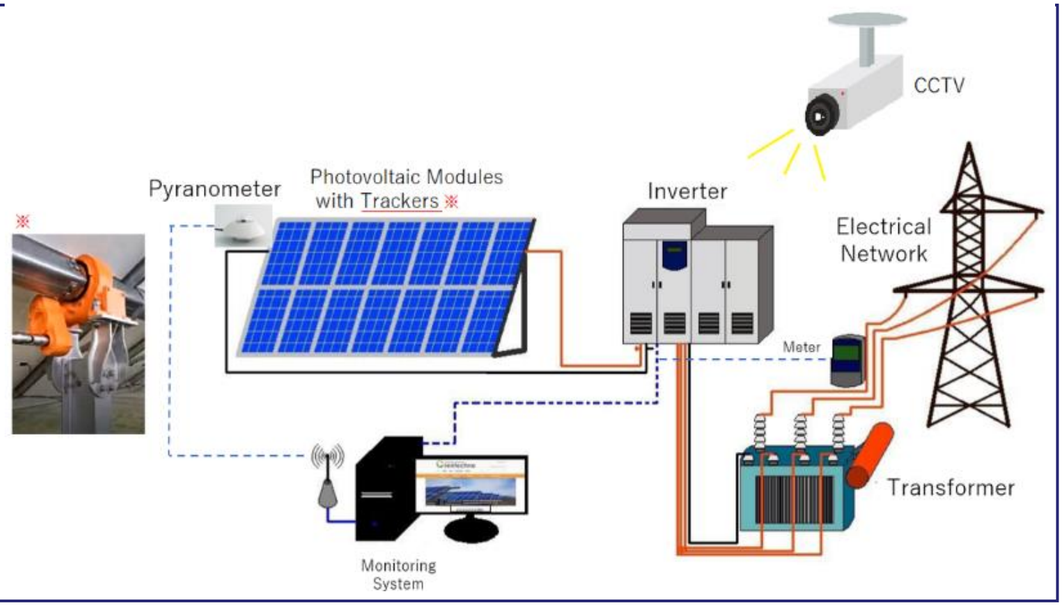
Map Data ©2021 Google

3MW Solar Power Project Utilizing Farmland in Maule Region

PP (Japan): Farmland Co., Ltd, Farmdo Co., Ltd., PP (Chile): Land and Sea SpA, Farmdo Energy Chile SpA

Outline of GHG Mitigation Activity

This project aims to reduce greenhouse gas (GHG) emissions and supply clean energy by utilizing farmland for a 3MW photovoltaic power generation facility (using single axis trackers) in Maule Region. A CCTV monitoring system is deployed, and the facility is monitored in real-time through a remote management system.
This project contributes to the achievement of Chile's policy for a renewable energy ratio target of 70% in 2050.



Expected GHG Emission Reductions

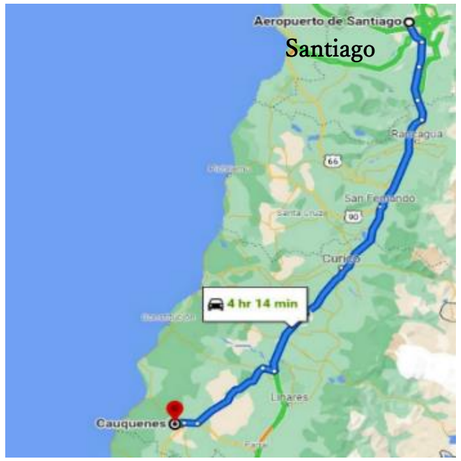
2,489 tCO_2/year
= (Reference CO_2 emissions)
- (Project CO_2 emissions)

・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. 400km south of Santiago Airport



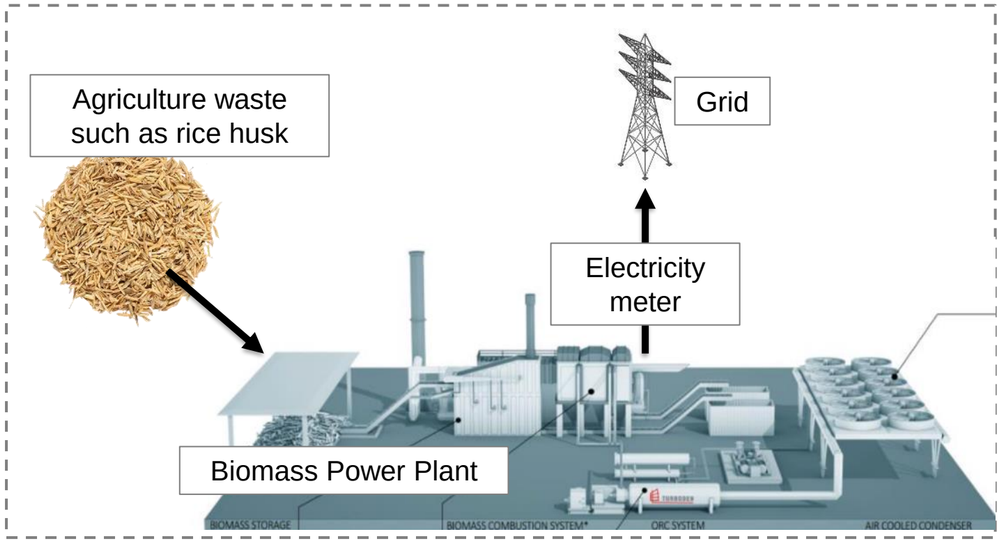
Map data ©2021Google

3.4MW Rice Husk Power Generation Project in Maule

PP (Japan): Asian Gateway Corporation, PP (Chile): La Gloria S.A

Outline of GHG Mitigation Activity

3.4 MW biomass power plant is installed in the region of Maule in Chile, which utilizes the agricultural residue such as rice husk.
The generated power is supplied to an electric company and reduces greenhouse gas (GHG) emissions by replacing the grid power.
In addition, this project prevents air pollution caused by open burning of agricultural residue.
By adopting Organic Rankin Cycle technology, which requires less water consumption, it also contributes to the climate change adaptation regarding low rainfall expected in Chile.



Expected GHG Emission Reductions

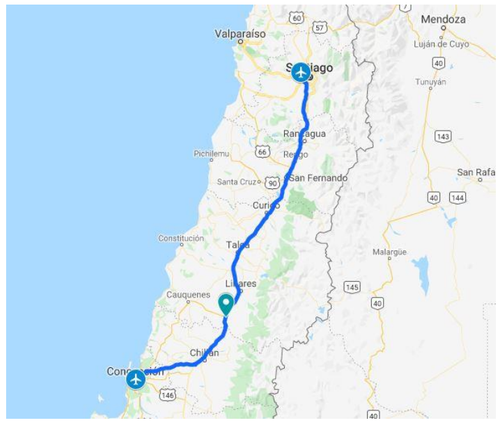
8,567tCO$_2$/year

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

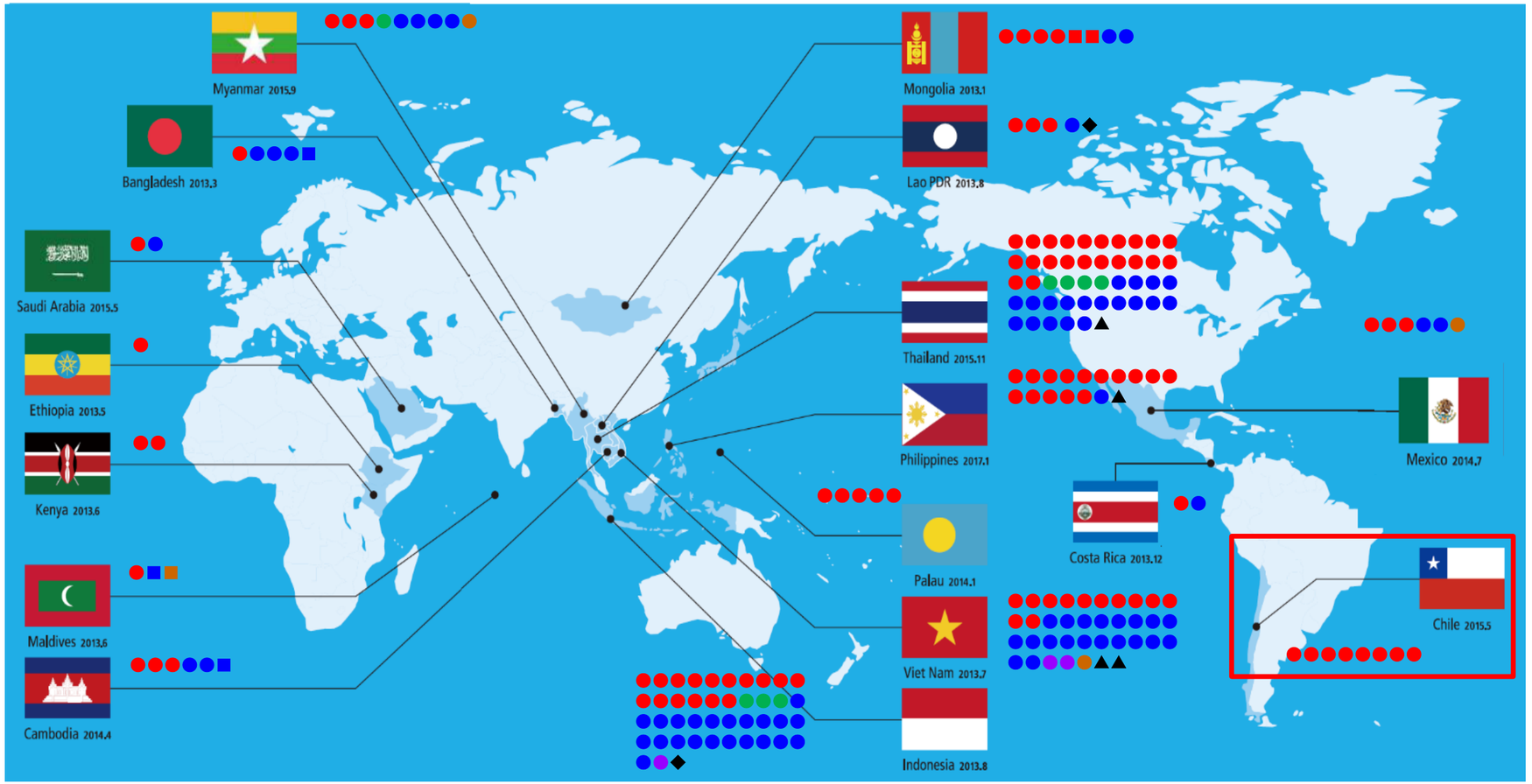
Ry = (Electricity generation) [MWh/year]
　　×(CO_2 emission factor) [tCO_2/MWh]
　= 27,286[MWh/year]×0.314[tCO_2/ MWh]
Py = 0

Sites of Project

The project site is located at 347km southwest from Santiago international airport, or 127km northeast from Concepcion international airport.



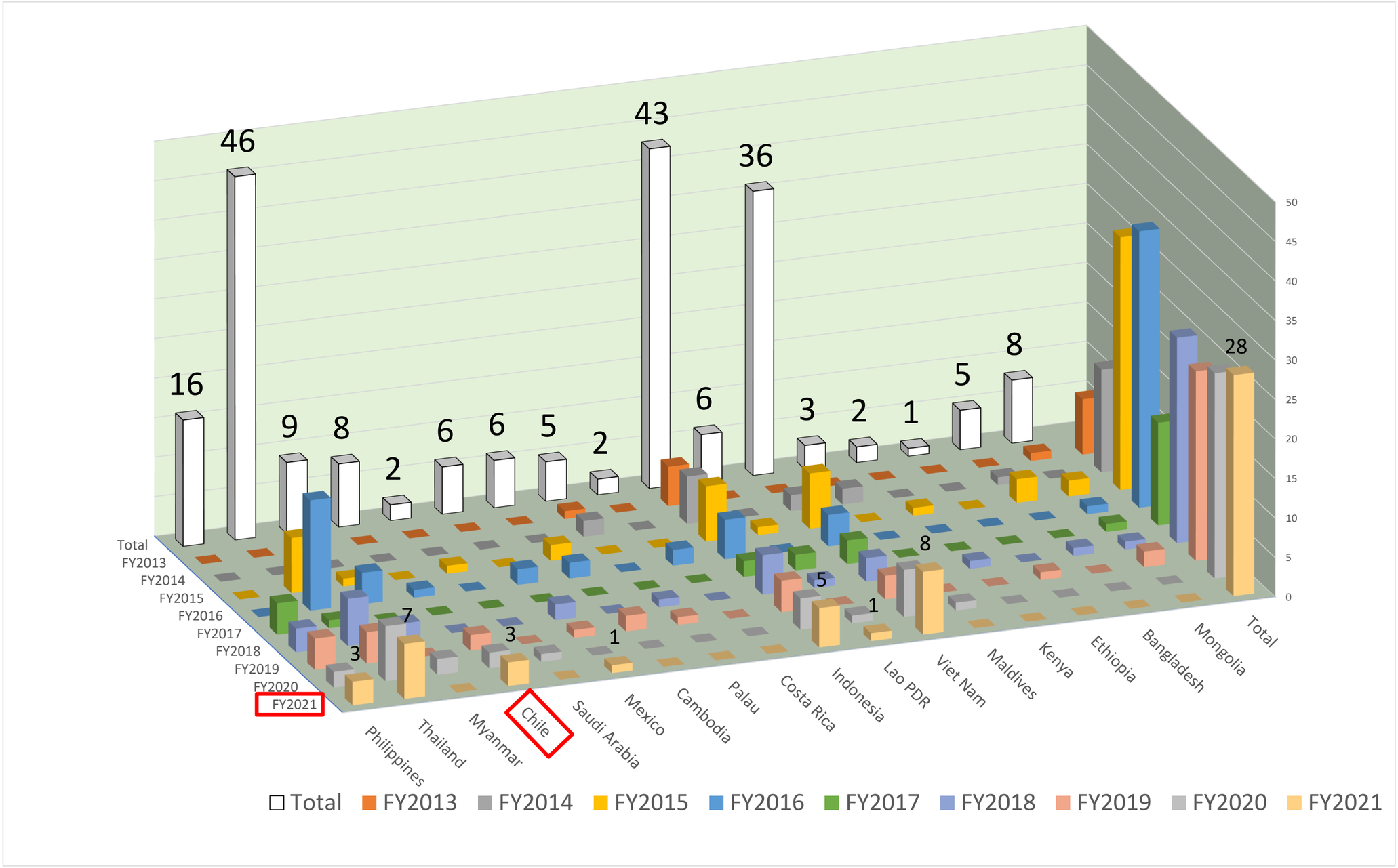
Project Map of JCM Financing Programme : as of September 27, 2021



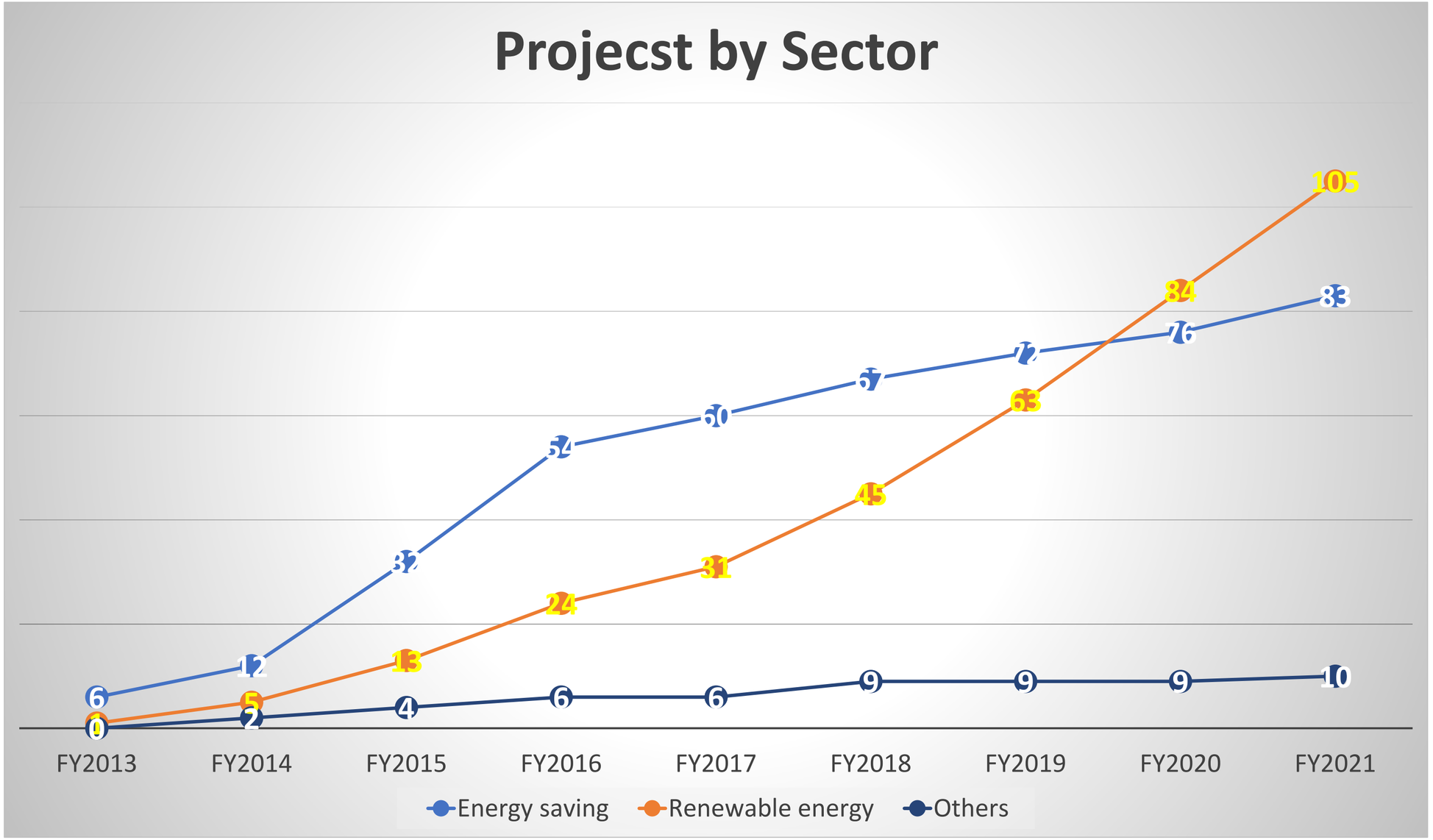
Total 205 projects / 17 countries
(● Model Project:194, ■ ADB:5, ◆ REDD+:2, ▲ F-gas:4)

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

Project by Year and Country

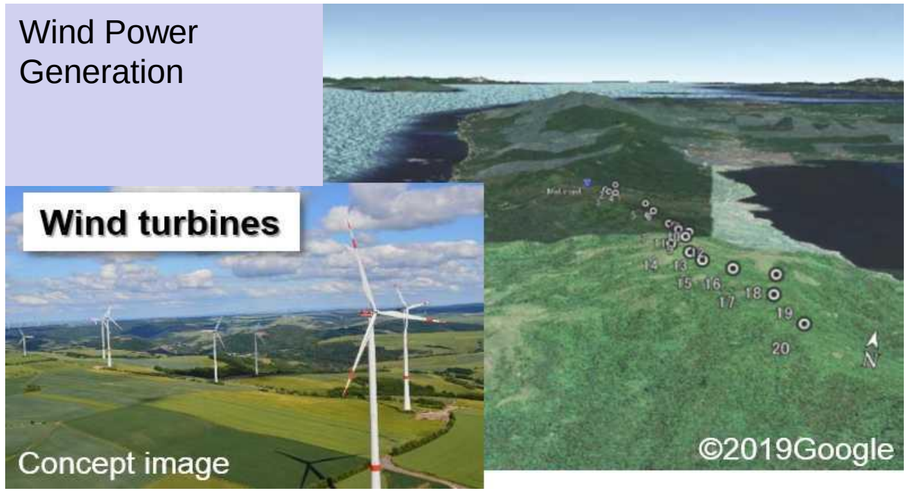


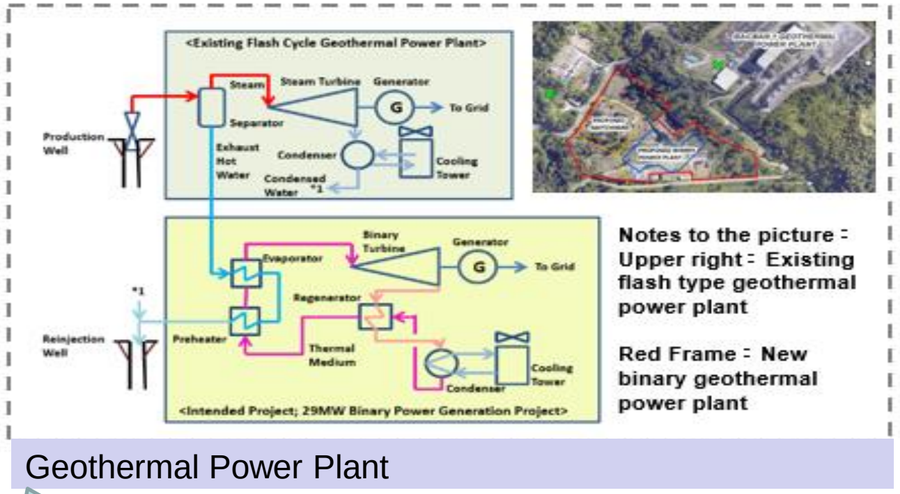
Project by Sector



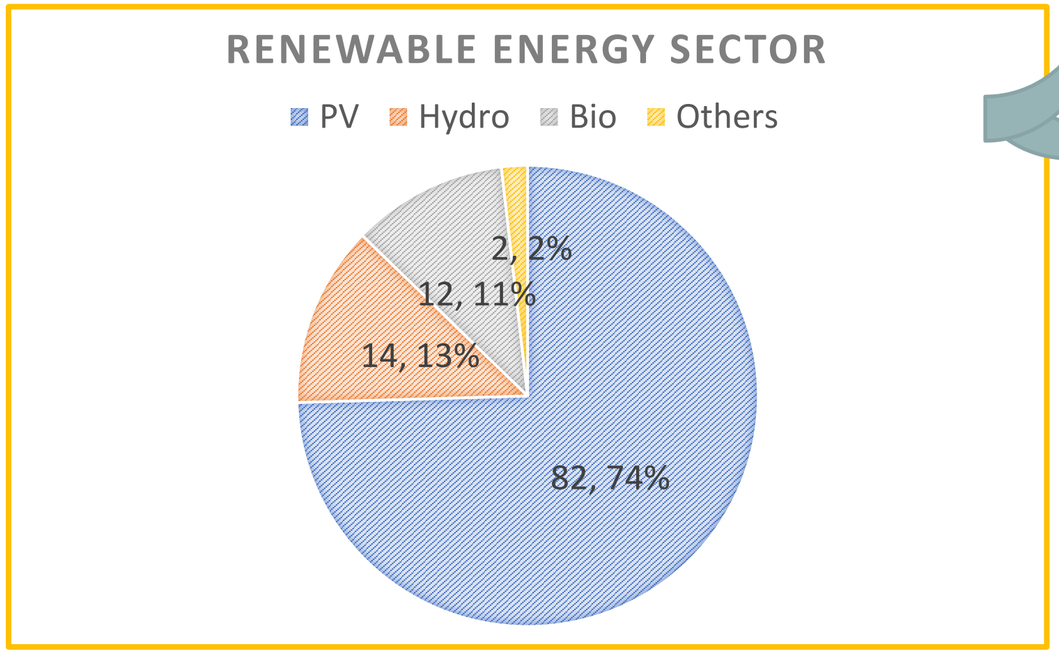
Renewable Energy

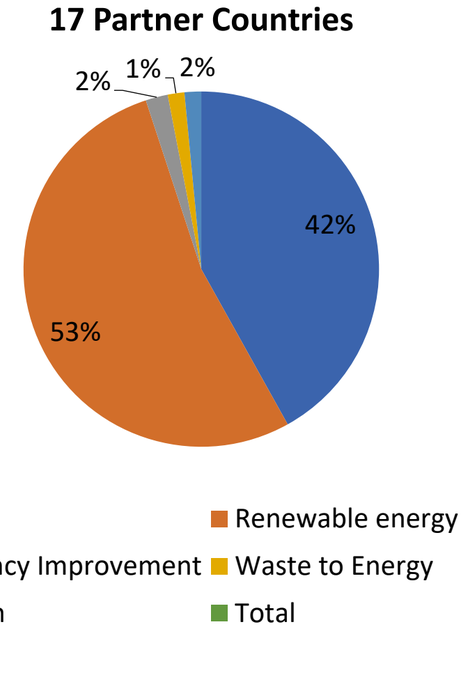
Wind Power Generation





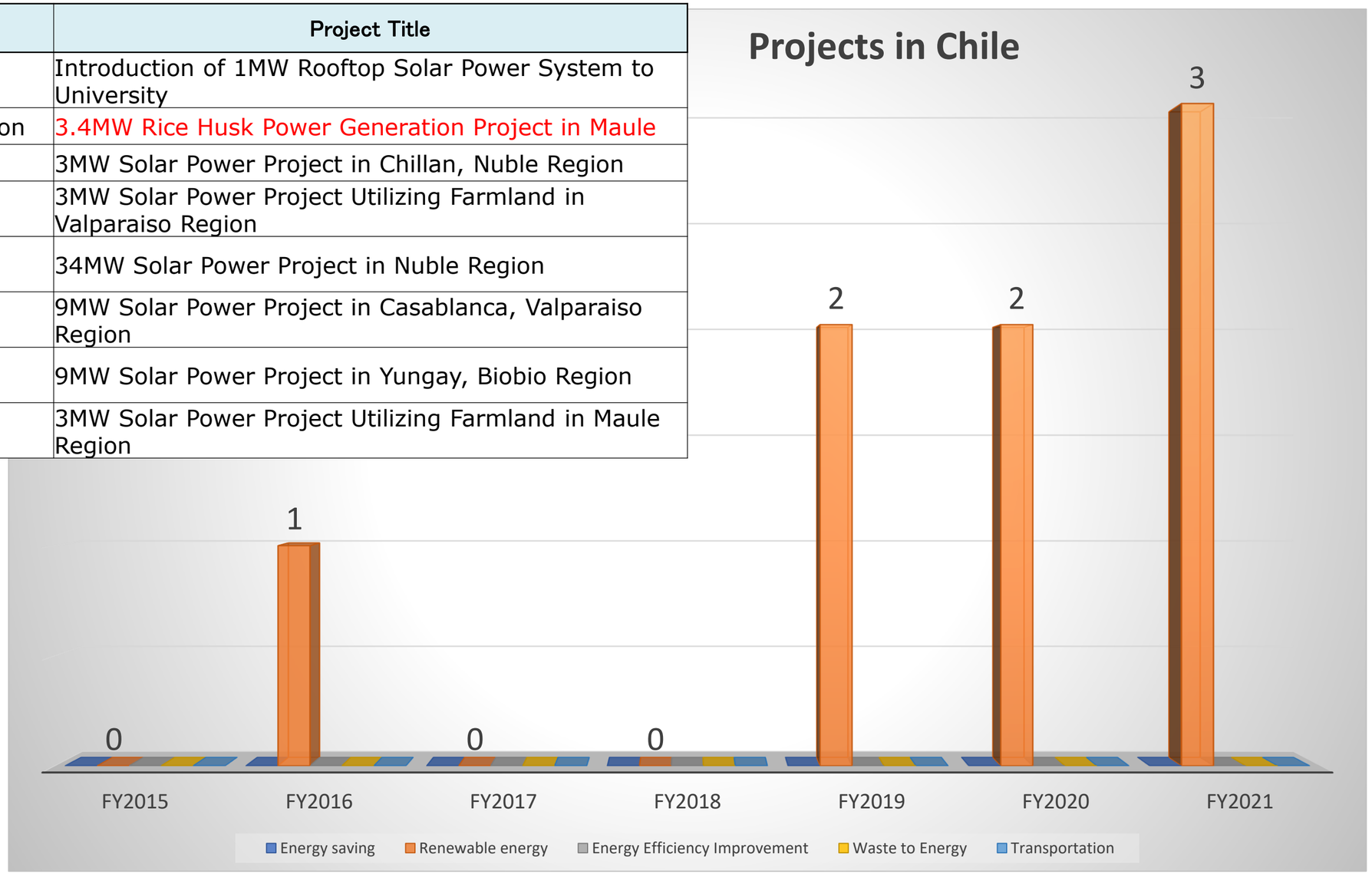
Geothermal Power Plant





Projects in Chile

Year	Entity	Project Title
2016	Waseda Environmental Institute Co., Ltd.	Introduction of 1MW Rooftop Solar Power System to University
2019	Asian Gateway Corporation	3.4MW Rice Husk Power Generation Project in Maule
2019	FARMLAND Co., Ltd.	3MW Solar Power Project in Chillan, Nuble Region
2020	FARMLAND Co., Ltd.	3MW Solar Power Project Utilizing Farmland in Valparaiso Region
2020	Sharp Energy Solutions Corporation	34MW Solar Power Project in Nuble Region
2021	Eurus Energy Holdings Corporation	9MW Solar Power Project in Casablanca, Valparaiso Region
2021	Eurus Energy Holdings Corporation	9MW Solar Power Project in Yungay, Biobio Region
2021	FARMLAND Co., Ltd.	3MW Solar Power Project Utilizing Farmland in Maule Region



Infrastructure through JCM

Energy Efficiency

LPG Boilers (Mongolia) /
Saisan Co.,Ltd.

Raw Water Intake Pumps (Viet Nam) /
Yokohama Water Co., Ltd.

Amorphous Transformers (Viet Nam) /
Yuko Keiso Co., Ltd.

Chiller and Heat Recovery System (Costa Rica) /
NTT Data Institute Consulting Inc.

Energy Efficiency

Energy Efficient Distillation System (Mexico) /
Suntory Spirits Ltd.

Once-through Boiler (Myanmar) /
Acecook Co., Ltd.

Effective Use of Energy

Co-generation Plant (Thailand) /
Nippon Steel Engineering Co., Ltd.

Gas Co-generation system (Indonesia) /
Toyota Tsusho Corporation

Renewable Energy

Wind Power Generation (Philippines) /
Chodai Co., Ltd.

Binary Geothermal Power Generation (Philippines) /
Mitsubishi Heavy Industries Ltd.

Solar Power (Viet Nam) /
Kanematsu KGK Corp.

Solar Power (Lao PDR) /
Sharp Energy Solutions Corporation

Renewable Energy

Biomass Boiler (Thailand) /
Fuji Foods Corporation

Waste Handling and Disposal

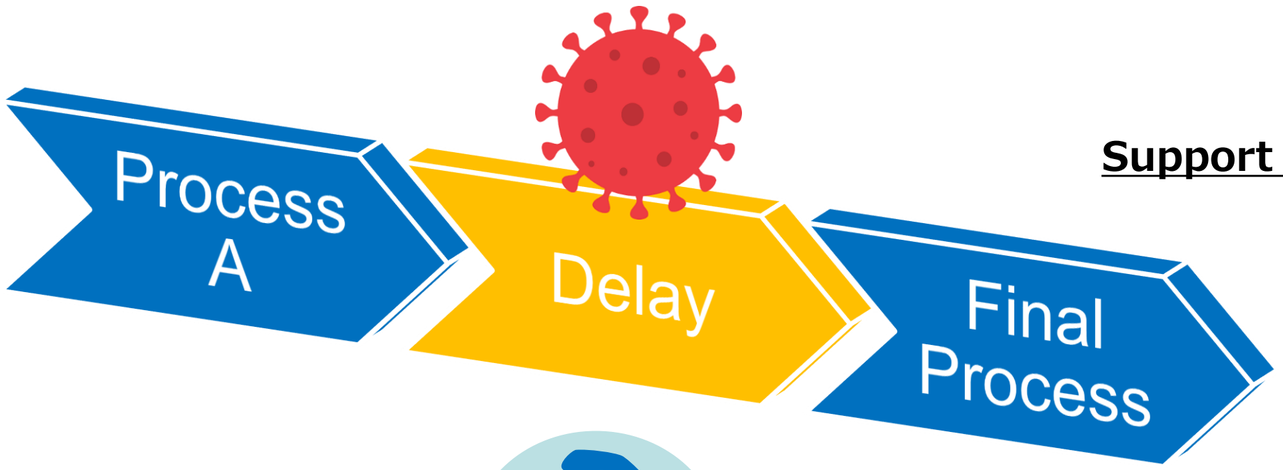
Power Generation with Methane Gas Recovery System (Mexico) /
NTT Data Institute Consulting Inc.

Waste to Energy Plant (Myanmar) /
JFE Engineering Corporation

Transportation

CNG-Diesel Hybrid Public Bus (Indonesia) /
Hokusan Co., Ltd.

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

Muchas gracias
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/