

JCM Webinar in Republic of Maldives

Financing Programme for JCM Model Projects and JCM Global Match

1st March 2021

Satoru TANGO Global Environment Centre Foundation (GEC)



1. Financing Programme for JCM Model Projects

- > Overview and Recent trend of JCM Model Projects
- > JCM Model Projects in Republic of Maldives

2. Promotion / "JCM Global Match"

Outline of JCM Model Projects



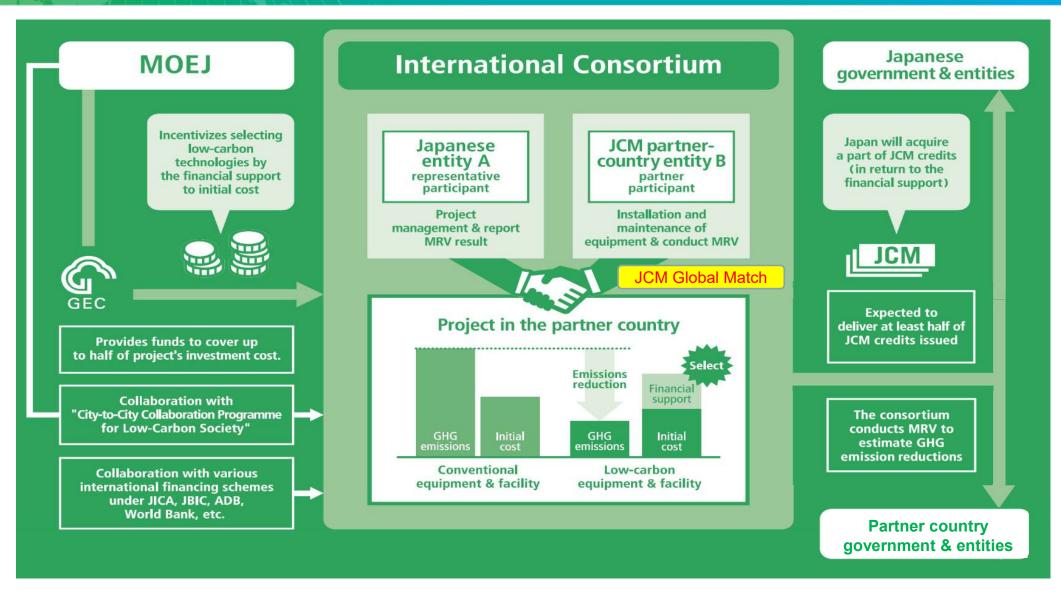
Budget	Approx. USD90million
Executing Entity	International Consortium that consists of a Japanese entity and a JCM partner-country entity (ies)
Scope of Financing	Facilities, equipment, vehicles, etc. which reduce CO2 from fossil fuel combustion as well as construction cost for installing those facilities, 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. **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. ** If the number of PV projects in a partner country is 5 or more, cost-effectiveness is expected to be JPY3,000/tCO2eq or better.

Guideline

for Submitting JCM model project proposal

Basic Concept of JCM Model Projects





What kind of projects are supported by this financing programme?



- Reduce energy-related CO2 emissions with leading low carbon or decarbonizing technologies in partner countries.
- Contribute to the sustainable development in partner countries.
- Reduction of GHG emissions achieved by the projects can be quantitatively calculated and verified.
- Facilities installed by the projects do not receive any other subsidy by the Government of Japan.

Guideline

for Submitting
JCM model project proposal

Cost-effectiveness of emission reductions



What is the criteria of cost-effectiveness?

JPY4,000/tCO2equivalent

Amount of financial support[JPY]

- Emission reductions of GHG [tCO2equivalent/y] × 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.

Guideline

for Submitting JCM model project proposal

Categorization by applied technology type



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			Bangla		Kenya	Maldive	Viet	Lao	Indone		Palau	Cambo	Mexico	Saudi	Chile	Myanm	Thailand	Philippi	
Sector	Technology	a	desh	a	1	S	Nam	PDR	sia	Rica		dia		Arabia		ar		ne	Total
		MN	BD	ET	KE	MV	VN	LA	ID	CR	PW	KH	MX	SA	CL	MM	TH	PH	_
	Air Conditioning System						3		1								1		5
	Chiller		2				4		4	1		1					3		15
	Refrigerator								1							2	4		7
	Absorption Chiller Using Waste Heat								2								2		4
	Swirling Induction Type Air-conditioning																1		1
	System																1		1
	Double Bundle-type Heat Pump						1		1								1		3
	Fridge and Freezer Showcase								1								1		2
	Boiler	2					1		3				1			2	1		10
	Water Heater Using Waste Heat									1									1
	Waste Heat Recovery System															2	1		3
	Heat Exchanger																1		1
	Transformer						4	1									-		5
	LED Lighting						-		2								2		4
	LED Street Lighting with Dimming System								1			1							2
	Pump						1		1		-	1							1
1.Energy																	-		- 1
Efficiency	Air Compressor						1		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
	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
	Gantry crane																1		1
	Electric Forklift																1		1
	Autoclave								1										1
	Multi-effect Distillation System												1						1
	Injection Modling Machine								1										1
	Solar Power Plant	6	1	1	2	2	2	2	2	1	5	4	3		2		10	5	48
	Solar Power Plant with Battery		-		-				1	-					1		10		2
	Small Hydropower Plant								5									4	9
	Wind Power Plant																	1	1
2.Renewable	Biomass Power Plant								1			1			1	1	1	1	6
Energy	Biogas Power Plant								1			1			1	1	1	1	1
	Biomas boiler						-										-	1	2
							1									-	1	- 1	
	Biogas boiler								-							1	- 1	1	2
	Biomass Co-generation		-														1		1
3.Effective Use of Energy	Power Generation by Waste Heat								1							1	1		3
	Recovery																		1
4.Waste	Gas Co-generation								2								3		5
	Waste-to-Energy Plant															1			1
Handling and Disposal	Power Generation by Methane Recovery												1						1
_	Digital Tachograph System						1												1
5.	CNG-Diesel Hybrid Bus								1										1
Transportation	Reefer Container						1												1
Total	Number of technology: 48	8	4	1	2	2	25	3	36	3	5	8	6	1	4	10	42	13	173
				_															2.0

ange more than 4 projects = Up to 30%



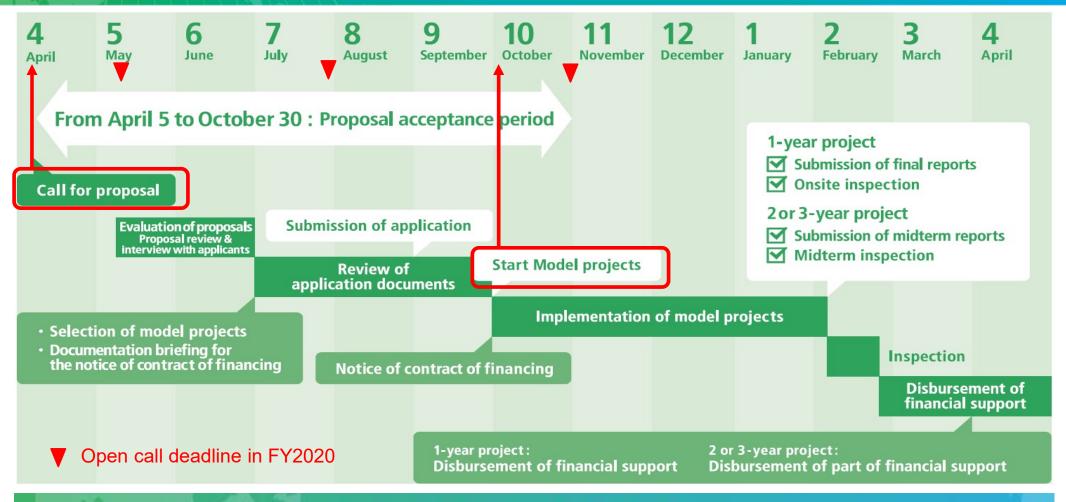
JCM ECO Lease Scheme

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.					

JCM Model Projects Schedule in FY2020





Guideline

for Submitting JCM model project proposal in FY2020

Selection of Projects in FY2020

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

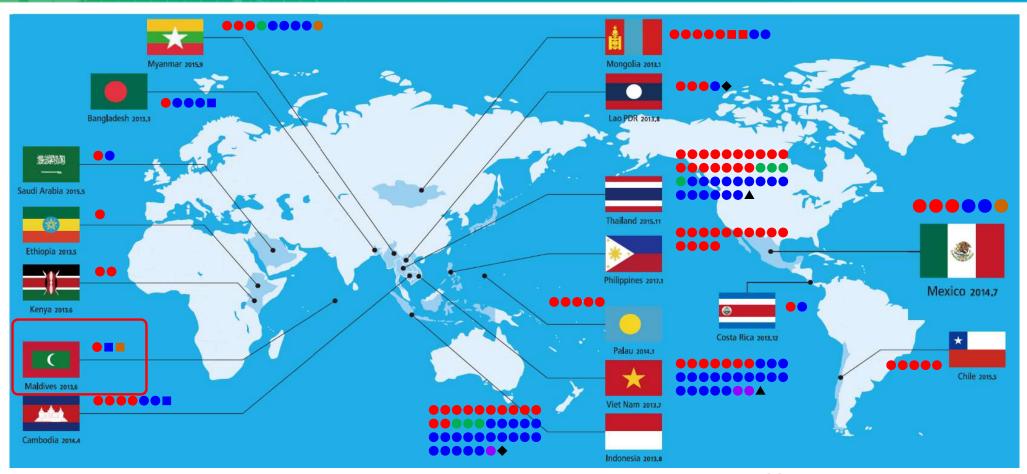


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2. Promotion / "JCM Global Match"

Project Map of JCM Financing Programme, as of Jan. 2021 Global Environment Centre Foundation

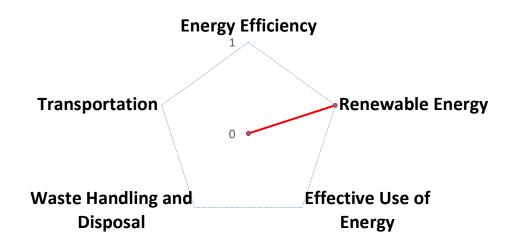


Total 180 projects / 17 countries

(● Model Project:170, ■ ADB:6, ◆ REDD+:2, ▲ F-gas:2)

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





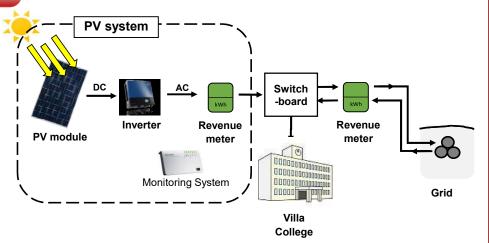
Year	Entity	Project Title	Sector	Expected GHG Emission Reductions (tCO2/y)
2014	Pacific Consultants Co., Ltd.	Solar Power on Rooftop of School Building Project	Renewable Energy	156

Solar Power on Rooftop of School Building Project

PP (Japan): Pacific Consultants Co., Ltd., / InterAct Inc. PP (Maldives): Villa Educational Services Private Limited

Overview of the Project

A 186.72kW grid-connected photovoltaic (PV) system is installed on the rooftops of school buildings. High quality PV modules and general-purpose inverters with easy maintenance, suitable for small-scale applications, is used. The generated electricity is generally consumed in the school. When there is surplus electricity, it is supplied to the grid.



Estimated GHG emissions reductions

156 tCO₂/year

CO₂ emission reduction

- = PV generation (a) × Reference emission factor (b)
- = 293.05 MWh/year \times 0.533 tCO₂/MWh



Following are new Candidate of JCM Model Projects from the Past case studies for Republic of Maldives.

- 1. Introduction of Energy Saving Equipment to Smart Buildings
- 2. Solar Power Project with Blockchain Technology
- 3. farming-type solar power plant that combines agriculture
- 4. Wind Power Generation
- 5. JCM Eco Lease Scheme for small solar systems
- 6. Introduction of CNG-Diesel Hybrid Public Bus

Introduction of Energy Saving Equipment to Complex Buildings of Smart Urban Development Project in Yangon PP(Japan): Yuko-Keiso Co., Ltd., PP(Myanmar): Kajima Yankin PPP Company Limited

Outline of GHG Mitigation Activity

KAJIMA Corporation together with Japan Overseas Infrastructure Investment Corp. is developing (JOIN) "Smart Urban Redevelopment Project" in central Yangon. This mixed-use development (consisting of offices, hotel, long-stay hotel and commercial facilities) aims to contribute to the diffusion of environmental technologies in Myanmar and encourage sustainable urban developments. This project introduces i] high efficiency chillers, ii] air conditioners with total heat exchangers, iii] hot water heat pumps and iv] Ventilation system at parking area.

Equipment	Facilities
High efficiency chillers	Hotel, Commercial facilities, Common-use space
Air conditioners equipped with total heat exchangers	Offices, Hotel
Hot water heat pumps	Long-stay hotel
Ventilation system at parking area	Common-use space



Yankin PPP Redevelopment Project [rendering]

Including Regional Contribution Facilities (Educational Facility, Transportation Square, Disaster Measures, etc.)

Expected GHG Emission Reductions

1,544 t CO₂ /year

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

i] high efficiency chillers: 322t CO2/year ii] air conditioners with total heat exchangers

: 239t CO2/year iii] hot water heat pumps: 738t CO2/year

iv] Ventilation system at parking area: 245t CO₂/year

Sites of Project



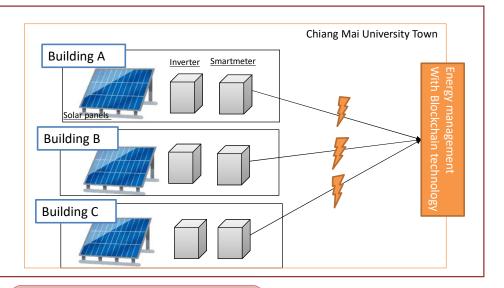
2.5MW Solar Power Project with Blockchain Technology in Chiang Mai University Town Community

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.

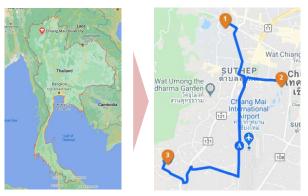


Expected GHG Emission Reductions

1,041 tCO₂/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)

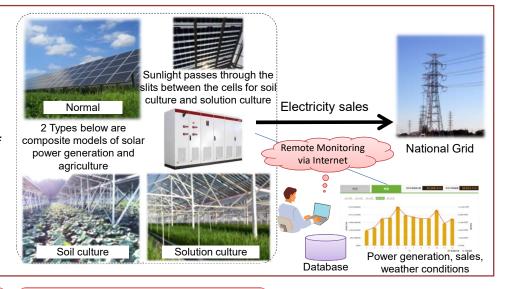
Map data©2020 Google

Installation of 2.1MW Solar Power Plant for Power Supply in Ulaanbaatar Suburb

PP (Japan): Farmdo Co., Ltd. / PP (Mongolia): Everyday Farm LLC, Bridge LLC

Outline of GHG Mitigation Activity

The purpose of this project is to reduce CO₂ emission, mitigate air pollution and stabilize power supply in Mongolia by installing 2.1MW scale solar power plants in the suburbs of Ulaanbaatar. This power plants can replace some part of power generation by coal-fired thermal power. Moreover, lots of achievements in daily life, mitigating air pollution, resolving power shortage, food supplying, etc., can be expected by synergy of agricultural and solar power generation technology.



Expected GHG Emission Reductions

2,424 tCO₂/year

- = Project Electricity Generation(EG) x Emission Factor (EF)
- =Power Generation Capacity[kW] x Annual Operating Rate[%]
 - x 24hours x 365days x EF

Site of JCM Model Project



33MW Wind Power Project in Caraga Region, Mindanao

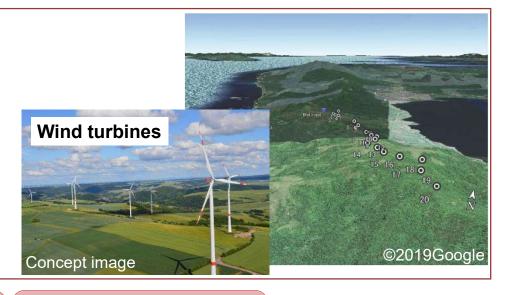
PP (Japan): CHODAI Co., Ltd, Shizen Energy Inc.

PP (Philippines): Equi-Parco Construction Company, Equi-Parco Holdings Corporation, Caraga Wind Energy Corporation

Outline of GHG Mitigation Activity

This project installs wind power generation facilities with a capacity of 33 MW (4.2 MW wind turbine x 8 towers) in Agusan del Norte, Caraga Region, Mindanao.

Generated power is sold to power grid and reduces greenhouse gas (GHG) emissions by replacing grid electricity. Stable supply of wind power from these facilities also helps to develop sustainable economy in Mindanao.



Expected GHG Emission Reductions

35,350 tCO₂/year

- = (Reference CO₂ emissions) [tCO₂/year]
 - (Project CO₂ Emission) [tCO₂/year]
- = ((Reference Power consumption) [MWh/year]
 - 0 [MWh/year])) × Emission Factor [tCO₂/MWh]

Sites of Project



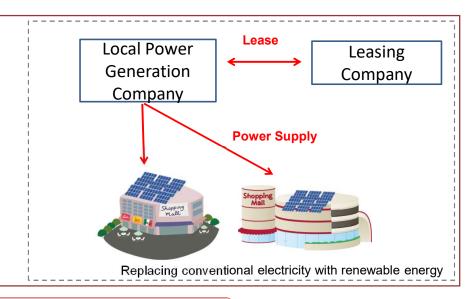
Introduction of 2MW Solar Power System to Shopping Mall(JCM Eco Lease Scheme)

PP (Japan): Tokyo Century Corporation, PP (Philippines): BPI Century Tokyo Rental Corporation (BPICTR)

Outline of GHG Mitigation Activity

This project introduces a total of 2MW Solar System on the roofs of two shopping malls, which are operated by a conglomerate in Philippines, using JCM Eco Lease Scheme.

Reduction of greenhouse gas (GHG) emissions is made by partially replacing conventional fossil fuel electricity to renewable energy.

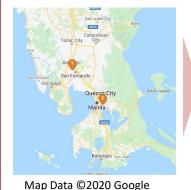


Expected GHG Emission Reductions

1,476 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





Site1:98 km northwest

from Ninoy Aquino International Airport

Outcome of the Control of

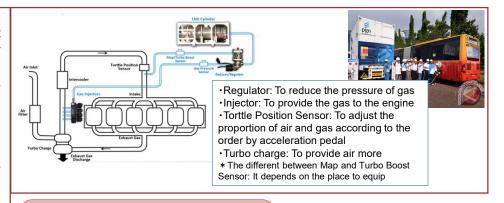
Site2:20 km northeast

Introduction of CNG-Diesel Hybrid Equipment to Public Bus in Semarang

PP from Japan: Hokusan Co., Ltd. / PP from Indonesia: BLU UPTD Trans Semarang

Outline of GHG Mitigation Activity

Toyama City has concluded a cooperation agreement between Semarang City to realize low carbon society under inter-city cooperation. Based on the cooperation agreement, this project aims to reduce GHG emissions through fuel switch from diesel to CNG. In the project, 72 diesel bases owned by Trans Semarang, including 25 large-sized buses and 47 mid-sized buses, are retrofitted from diesel engine to hybrid engine with CNG system available. These buses are considered more cost-effective through fuel switching.



Expected GHG emission reduction

2,667 tCO₂/year

- ← Reference GHG emission Project GHG emission
- = Reference fuel consumption x Fuel-based emission factor Project fuel consumption x Fuel-based emission factor

Reference fuel consumption

= Diesel fuel consumption based for bus operation x emission factor of Diesel fuel

Project fuel consumption

= CNG fuel consumption for bus operation x emission factor of CNG + Diesel fuel consumption for bus operation x emission factor of Diesel fuel

Sites of Project





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2. Promotion / "JCM Global Match"

Website/Publication



■ GEC's Website on JCM

http://gec.jp/jcm/

■ GEC's JCM Twitter

https://twitter.com/GEC_JCM_Info

■JCM Booklet

http://gec.jp/jcm/jp/publications/

■ Business matching site

"JCM Global Match"

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



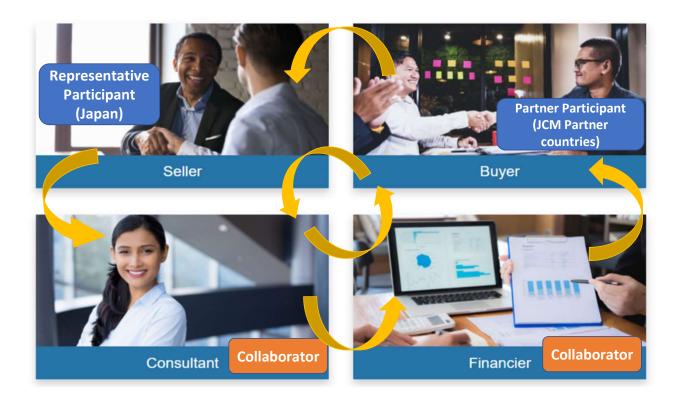




What is the "JCM Global Match"?

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"

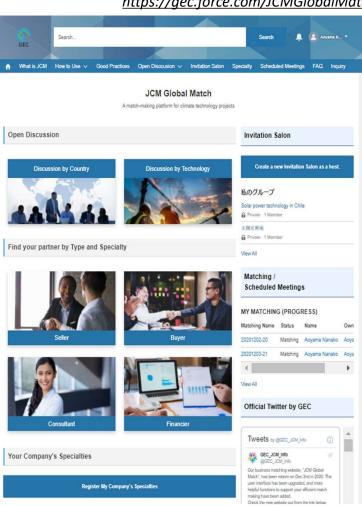
Launched in July 2019

>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. <u>Useful communication among all participants</u> (Open Discussion, Invitation Salon)
- 4. Opportunity to promote your company by Profile and Specialties sections
- 5. <u>1 to 1 Communication</u> by private chat and Email addresses exchange
- 6. Reservation of your Scheduled Meetings

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



^{*}Google Chrome and Firefox are recommended browsers.





Consultation by GEC

Consultation by GEC

GEC provides application consultation in order to assist project formation for entities interested in JCM Model Project. Please feel free to contact us. Please send an e-mail to jcm-info@gec.jp. Subject of e-mail should be "Consultation on application for JCM Model Project (Your company name)".



Suitable for Getting advice on your proposal at various phases.

■ Contact:

Satoru TANGO, Norio TAKEYAMA
Global Environment Centre Foundation (GEC) Tokyo Office

E-mail: jcm-info@gec.jp

****Currently, due to COVID-19, we are partially doing telework, and provide application consultation at web conference. Please send an e-mail to contact us.**

Thank you very mcuh! ありがとうございました。

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URL : http://gec.jp/



Appendix

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



Support by MOEJ/GEC

Final Process

Foresee and make allowance with well contemplated schedule



Online Meeting with participants Consultation for prospect entities



Modify Project plan flexibly Design Manufacturer Contractor

Financer, etc.





Online Inspection remote camera Photos Video online discussion



Promotion via Webinar Online Seminar Symposium



Break stagnated Permission to promote Projects



Infrastructure through JCM



- Theiland / FAST RETAILING CO., LTD.
 High Efficiency IEO Lighting
 Cambodia / AEON MALL Co., Ltd.
 Solar Power System and High Efficiency Centrifugel Oritle
- Bongkelesh / Eharo Reingeration Equipment & Systems Co., Ltd.
 High Efficiency Centrifugal Chiller
- Mexico / Suntory Spirits Limited Once-through Roller and Fuel Switching









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









- Indonesia / Environmental Management and Technology Center Energy Saving in Industrial Wastewater Treatment System
- Energy Soving in Industrial Physics water Treatment
 Myanmar Visin Holdings Company, Limited,
 Floorgy Saving Breving Systems
 Thailand / TSD Cu., Ltd.
 Floating Solar Power System









COMMERCE

PVs for shopping malts, office use / Energy-efficient air conditioners, etc

TRANSPORT

MANUFACTURING

INDUSTRY

POWER GE NERATION & SU PPLY

Large-scale solar power / Wast heat recovery power generation



LED street lights, etc.



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.

















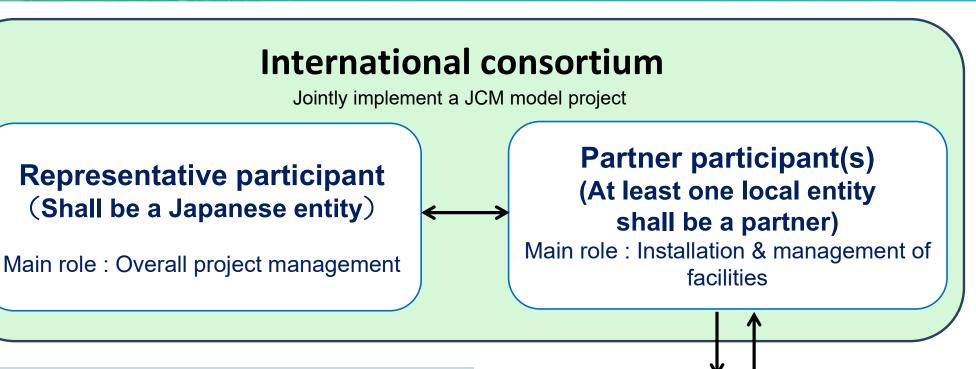


- Viet Nam / Yuka Keiso Co., Ltd.
 Amorphius High Efficercy Transferriers in power grid
 Viet Nam / Yokohama Water Co., Ltd.
 High Efficiency Water Pumps
- Myanmar / JFE Engineering Corporation
 Waste to Energy Plant in Yangon City
- Myanmar / Hujita Corporation Rice Husk Power Generation



International Consortium





➤ Consortium must include both an owner and user of facility installed by the model project.

EPC contractor

Guideline

for Submitting
JCM model project proposal

JCM Model Projects Process



