

Recent Development of the JCM and JCM Model Project

Ministry of the Environment
August 2019



The Joint Crediting Mechanism

- ▶ Facilitating diffusion of leading low carbon technologies through contributions from Japan and evaluating realized GHG emission reductions or removals in a quantitative manner to use them for achieving Japan's emission reduction target.
- ▶ Japan will address the high initial cost barrier of introducing advanced low-carbon technologies in the Partner countries (17 countries) through the JCM (GoJ implements several supporting schemes)



Waste heat recovery in Cement Industry, JFE engineering, Indonesia



Eco-driving with Digital Tachographs, NITTSU, Vietnam



Energy saving at convenience stores, Panasonic, Indonesia



High efficiency air-conditioning and process cooling, Ebara refrigeration equipment & systems, Indonesia



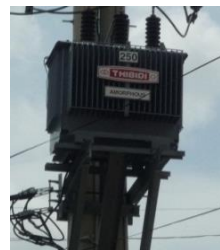
High-efficiency Heat only Boilers, Suuri-Keikaku, Mongolia



Upgrading air-saving loom at textile factory, TORAY etc., Indonesia, Thai, Bangladesh



Installing solar PV system, PCKK, Palau Maldives



Amorphous transformers in power distribution, Hitachi Materials, Vietnam



Co-generation system at factory, Toyota, Nippon Steel & Sumikin Engineering, Indonesia, Thai



High efficiency air-conditioning system, Hitachi, Daikin, Vietnam



Solar PV System at Salt Factory, PCKK, Kenya



Waste to Energy Plant, JFE engineering, Myanmar



High efficient refrigerator, Mayekawa MFG, Indonesia

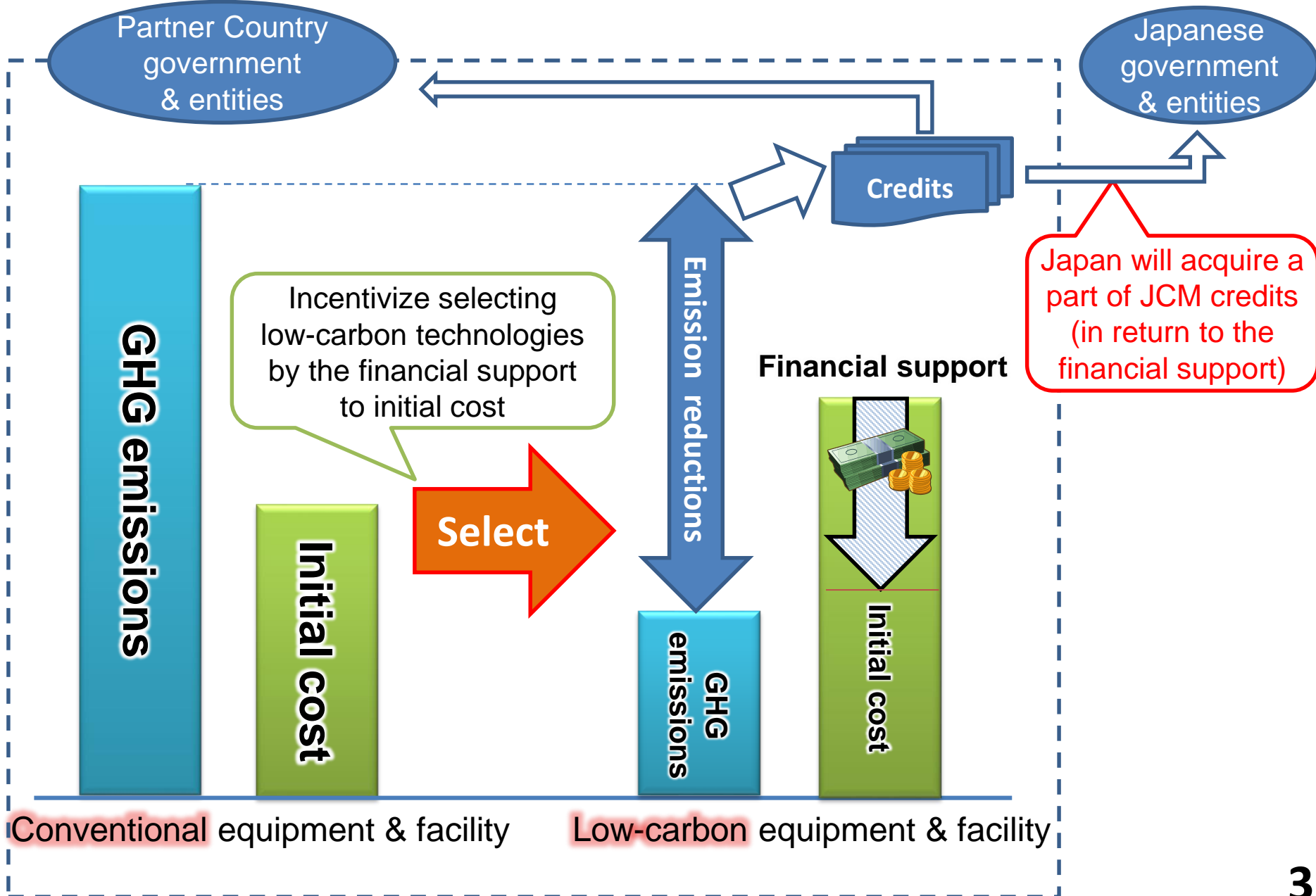


Regenerative Burners in industries, Toyotsu Machinery, Indonesia



LED street lighting system with wireless network control, MinebeaMitsumi, Cambodia

Contributions from Japan



JCM Model Projects by MOEJ

Budget for projects starting from FY 2019 is 9.9 billion JPY (approx. USD 99 million) in total by FY2021

(1 USD = 100 JPY)

✂ Includes collaboration with projects supported by JICA and other governmental-affiliated financial institute.

Finance part of an investment cost (less than half)

Government of Japan

Conduct MRV and expected to deliver at least half of JCM credits issued

International consortiums
(which include Japanese entities)



- Scope of the financing: facilities, equipment, vehicles, etc. which reduce CO₂ from fossil fuel combustion as well as construction cost for installing those facilities, etc.
- Eligible Projects : starting installation after the adoption of the financing and finishing installation within three years.

Expected schedule of JCM financing programme in FY2019

[JCM Model Project]

Items	Date
<ul style="list-style-type: none">▪ Starting date for request▪ Deadline for entities to submit their application	From 2019, Application is open from 5th April through 29th November. (It may close before the deadline due to the availability of remaining budget.)
Announcement of selection	At any time upon selection

Technologies Transferred through JCM by MOEJ(FY2013-2018)

- ◆ Total of 147 **JCM Projects** being developed in 17 partner countries
- ◆ 48% are **energy efficiency** and 43% are **renewable energy**
- ◆ Effective use of Energy, Transport, Waste to energy, F-gas Recovery and Destruction and REDD+ project shares 9%

Waste 2%

- Waste to Energy

Transport 2%

- Digital Tachographs
- Modal Shift
- CNG-Diesel Hybrid

REDD+ 1%

- Controlling slush and burn

F-gas counter measure 1%

- Recovery & Destruction

Effective Use of Energy 3%

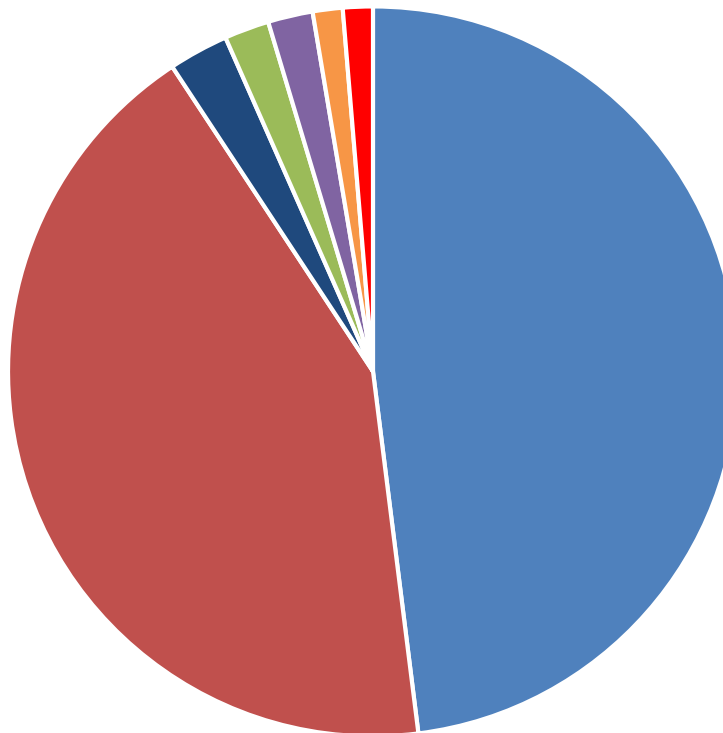
- Waste Heat Recovery
- Gas Co-generation

Renewable energy 43%

- Solar
- Micro hydro
- wind
- Biomass

Energy efficiency 48%

- Boiler
- Air Conditioning
- Refrigerating
- Chiller
- Looms
- Transformer
- LED Lighting



JCM Financing Programme by MOEJ (FY2013~2019) as of Aug 2, 2019

Thailand: 31 projects

- Energy Saving at Convenience Store
- Upgrading Air-saving Loom*
- Centrifugal Chiller in Tire Factory
- Air Conditioning System & Chiller*
- Ion Exchange Membrane Electrolyzer
- LED Lighting to Sales Stores
- Co-generation System
- 2MW Solar PV
- Heat Recovery Heat Pump
- 30MW Solar PV
- Air-conditioning Control System
- Energy Saving Equipment in Port
- 3.4MW Solar PV
- ▲ Introduction of Scheme for F-gas Recovery and Destruction
- 37MW Solar PV and Melting Furnace
- 1MW Solar PV on Factory Rooftop*
- Centrifugal Chiller & Compressor*
- Co-generation in Motorcycle Factory
- Refrigeration System
- Chilled Water Supply System
- 12MW Waste Heat Recovery in Cement Plant
- Refrigerator and Evaporator
- 3.4MW Solar PV*
- 5MW Floating Solar PV
- Boiler System in Rubber Belt Plant
- Biomass Co-generation System
- Co-generation in Fiber Factory
- 25MW Solar PV in Industrial Park
- 0.8MW Solar PV and Centrifugal Chiller
- Heat Exchanger in Fiber Factory

Bangladesh: 6 projects

- Centrifugal Chiller
- 315kW PV-diesel Hybrid System*
- Centrifugal Chiller*
- Loom at Weaving Factory*
- 50MW Solar PV Power Plant
- High Efficiency Transmission Line

Saudi Arabia: 1 project

- Electrolyzer in Chlorine Production Plant

Kenya: 2 projects

- 1MW Solar PV at Salt Factory
- 38MW Solar PV

Myanmar: 7 projects

- 700kW Waste to Energy Plant
- Brewing Systems to Brewery Factory
- Once-through Boiler in Instant Noodle Factory
- 1.8MW Rice Husk Power Generation
- Refrigeration System in Logistics Center
- 8.8MW Waste Heat Recovery in Cement Plant
- Brewing Systems and Biogas Boiler to Brewery Factory

Cambodia: 5 projects

- LED Street Lighting
- Solar PV & Centrifugal Chiller
- Battambang Wastewater Treatment Project
- 200kW Solar PV at International School*
- Inverters for Distribution Pumps

Maldives: 2 projects

- 186kW Solar Power on School Rooftop*
- Smart Micro-Grid System

- Model Project in FY 2013 (7 projects in 3 countries)
- Model Project in FY 2014 (12 projects in 5 countries)
- ADB Project in FY 2014 (1 project in 1 country)
- Model Project in FY 2015 (31 projects in 9 countries)
- Model Project in FY 2016 (35 projects in 9 countries)
- REDD+ Model Project (2 projects in 2 countries)
- Model Project in FY 2017 (19 projects in 7 countries)
- ADB Project in FY 2017 (1 project in 1 country)
- Model Project in FY2018 (24 projects in 11 countries)
- ADB Project in FY 2018 (2 projects in 2 country)
- ▲ F-gas Project in FY 2018 (2 projects in 2 country)
- Model Project in FY 2019 (11 projects in 5 countries)
- Other 1 project in Malaysia

Total 147 projects in 16 partner countries

Mongolia: 9 projects

- Heat Only Boiler (HOB)**
- 8.3MW Solar PV in Farm
- 21MW Solar PV
- Fuel Conversion by Introduction of LPG Boilers
- 2.1MW Solar PV in Farm*
- 15MW Solar PV
- Upscaling Renewable Energy Sector
- 10MW Solar PV*
- 20MW Solar PV

Viet Nam: 22 projects

- Digital Tachographs*
- Air-conditioning in Hotel*
- Container Formation Facility*
- Amorphous transformers 2*
- Electricity Kiln
- Energy saving Equipment in Lens Factory*
- Energy Saving Equipment in Wire Production Factory*
- Energy Saving Equipment in Brewery Factory
- Modal Shift with Reefer Container
- ▲ Collection Scheme and Dedicated System of F-gas
- High Efficiency Water Pumps2
- Amorphous transformers1*
- Air-conditioning in Lens Factory*
- 320kW Solar PV in Shopping Mall*
- Air-conditioning Control System
- High Efficiency Water Pumps1*
- Amorphous transformers 3*
- Amorphous transformers 4
- High Efficiency Chiller
- Inverters for Raw Water Intake Pumps
- Waste to Energy Plant
- Biomass Boiler to Chemical Factory

Mexico: 7 projects

- 2.4MW Power Generation with Methane Gas Recovery System
- Once-through Boiler and Fuel Switching
- 64MW Wind Farm
- 30MW Solar PV1
- 30MW Solar PV2
- 20MW Solar PV
- Energy Efficient Distillation System

Laos: 4 projects

- REDD+ through controlling slush-and-burn
- Amorphous transformers
- 14MW Floating Solar PV
- 11MW Solar PV

Philippines: 11 projects

- 15MW Hydro Power Plant
- 1MW Rooftop Solar PV
- 0.16MW Micro Hydro Power Plant
- 18MW Solar PV
- 4MW Hydro Power Plant
- 1.2MW Rooftop Solar PV
- 4MW Solar PV
- Biogas Power Generation and Fuel Conversion
- 1.53MW Rooftop Solar PV
- 2.5MW Rice Husk Power Generation
- 19MW Hydro Power Plant

Palau: 5 projects

- 370kW Solar PV for Commercial Facilities*
- 155kW Solar PV for School*
- 445kW Solar PV for Commercial Facilities II*
- 0.4MW Solar PV for Supermarket
- 1MW Solar PV for Supermarket

Costa Rica: 2 projects

- 5MW Solar PV
- Chiller and Heat Recovery System

Chile: 2 projects

- 1MW Rooftop Solar PV
- 2MW Solar PV and 4MWh Storage Battery

Indonesia: 31 projects

- Centrifugal Chiller at Textile Factory*
- Refrigerants to Cold Chain Industry**
- Centrifugal Chiller at Textile Factory 2*
- 507kW Solar Power Hybrid System
- Centrifugal Chiller at Textile Factory 3*
- Upgrading to Air-saving Loom*
- Smart LED Street Lighting System
- Gas Co-generation System*
- 1.6MW Solar PV in Jakabaring Sport City*
- 10MW Hydro Power Plant
- Industrial Wastewater Treatment System
- Absorption Chiller
- High Efficiency Autoclave
- 12MW Biomass Power Plant
- Energy Saving at Convenience Store*
- Double Bundle-type Heat Pump*
- 30MW Waste Heat Recovery in Cement Industry*
- Regenerative Burners
- Old Corrugated Cartons Process*
- Centrifugal Chiller in Shopping Mall*
- Once-through Boiler System in Film Factory
- Once-through Boiler in Golf Ball Factory
- REDD+ through controlling slush-and burn
- Looms in Weaving Mill
- 0.5MW Solar PV*
- 10MW Hydro Power Plant
- CNG-Diesel Hybrid Public Bus
- Injection Molding Machine
- LED Lighting to Sales Stores
- Gas Co-generation system
- Rehabilitation of Hydro Power Plant

Underlined projects have started operation (91 projects)
Projects with * have been registered as JCM projects (42 projects)

Introduction of 1MW Rooftop Solar Power System to University

PP (Japan): Waseda Environmental Institute

PP (Chile): MGM Innova Capital Chile SpA

Outline of GHG Mitigation Activity

This project aims to reduce CO2 emissions by introducing a 992kW rooftop solar system at 4 campuses of the Chilean university Universidad Técnica Federico Santa María (San Joaquín, Valparaíso, Viña del Mar, and Vitacura). Solar panels produced by Panasonic Corporation will be used. These feature the industry's top class technology, with each panel having an output of 325W and a module efficiency of 19.7%.

Once the panels are installed on its roofs, the university will consume in-house the electricity generated by the panels. The Chilean partner, MGM Innova Capital, will sell the surplus power to the grid under the PMGD framework (from its acronym in Spanish, meaning Small Means of Distributed Generation).

3,054 solar panels: 992kW

Federico Santa María Technical University
Target: 4 campuses
(Surplus to be partly sold to the grid)

DC

Meter

Measured parameters:
Electricity output, amount of solar radiation

AC

Inverter

PMGD

Grid electricity

Expected GHG Emission Reductions

511tCO2/year

Emission reduction $ER_p = RE_p - PE_p$ * $PE_p = 0$
 $= RE_p$

RE_p = Reference emissions
 $= [\text{Estimated annual energy generation}] \times$
 $[\text{Emission factor of grid electricity}]$
 $= 1,628.854 \text{ MWh/year} \times 0.314 \text{ tCO}_2/\text{MWh}$
 $= 511 \text{ tCO}_2/\text{year}$

PE_p = Project emissions = 0

Sites of JCM Model Project

チリ

コルドバ

Córdoba

Pontificia Universidad Católica de Chile...

アルゼンチン

Viña del Mar

Casa Central Valparaíso

UTFSM Campus

Vitacura

San Joaquín

Map data©2017Google

2MW Solar Power and 4MWh Storage Battery Project in San Pedro de Atacama City

PP (Japan): Liberal Solution Co., Ltd.

PP (Chile): MGM Innova Capital Chile SpA

Outline of GHG Mitigation Activity

This project aims to reduce CO2 emissions by introducing a system combining solar panels and batteries at off-grid San Pedro de Atacama city and sell all of the electricity generated to CESPA:COOPERATIVA DE ABASTECIMIENTO DE ENERGÍA ELÉCTRICA DE SAN PEDRO DE ATACAMA.

The Chilean partner, MGM Innova Capital, will procure and possess the above-mentioned system combining solar panels and batteries. Batteries are introduced to charge surplus electricity which is generated by solar panels but not consumed during the day. The charged electricity is consumed during the peak hours of demand of the residents in the evening.

The diagram illustrates the energy flow and components of the project. At the top left, a grey trapezoid represents 'Solar panels' with the calculation '340w x 6,000 panels= 2,040 kW'. A red arrow labeled 'DC' points down to a meter icon. Below the meter is the text 'Meter, Measured parameters Electricity output amount of solar radiation'. A red arrow labeled 'DC' points right to a box representing 'Inverters'. Above the inverters is a red arrow labeled 'AC'. To the right of the inverters is a cylinder representing 'Batteries' with the text '2,000 kW / 4,000 kWh'. Above the batteries is a red arrow labeled 'AC'. A red arrow labeled 'AC' points from the 'EMS Energy Management System' box to a circled 'X' icon. A red arrow labeled 'AC' points from the batteries to the same circled 'X' icon. Below the circled 'X' is a distribution network icon with the text 'CESPA'.

Expected GHG Emission Reductions

2,352 tCO2/year

Emission reduction $RE_p = RE_p - PE_p * PE_p = 0 = RE_p$

RE_p = Reference emissions
= [Estimated annual energy generation] x [Emission factor of grid electricity]
= 4,413MWh/year x 0.533 tCO2/MWh
=2,352 tCO2/year

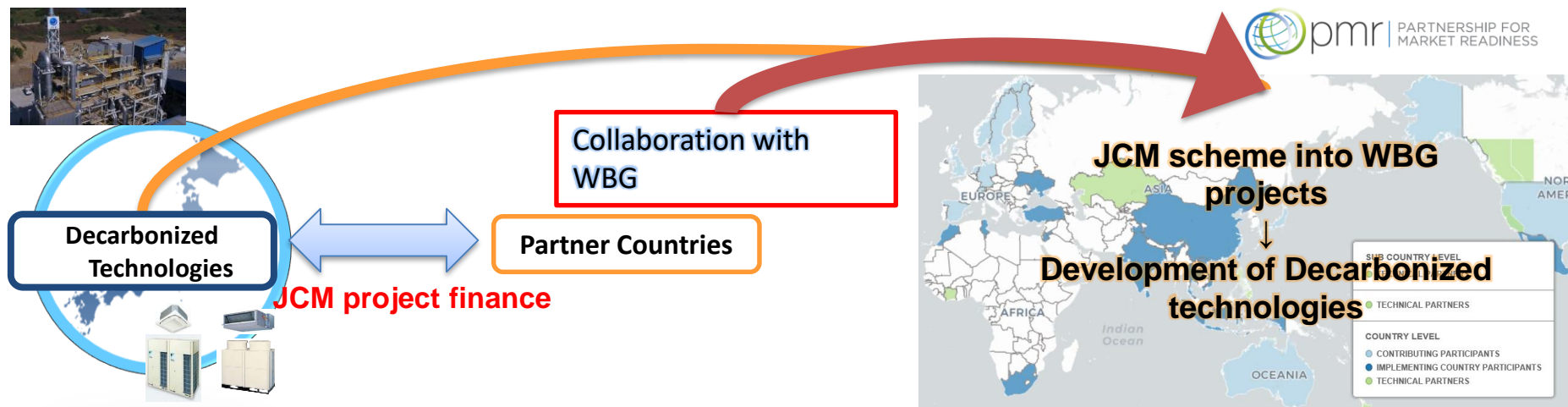
PE_p = Project emissions=0

Sites of JCM Model Project

The map shows the location of the project in Chile. A red box highlights the area around San Pedro de Atacama. A red arrow points from this box to a more detailed map on the right. The detailed map shows the route from 'Airport El Loa' to the project site, with a distance of 109 km and a travel time of 1 h 20 min. The project site is located near 'Ruta 23' and 'Reserva Nacional Los Flamencos'. The map also shows other locations like 'Antofagasta', 'Tocopilla', and 'Villamar Mallico'.

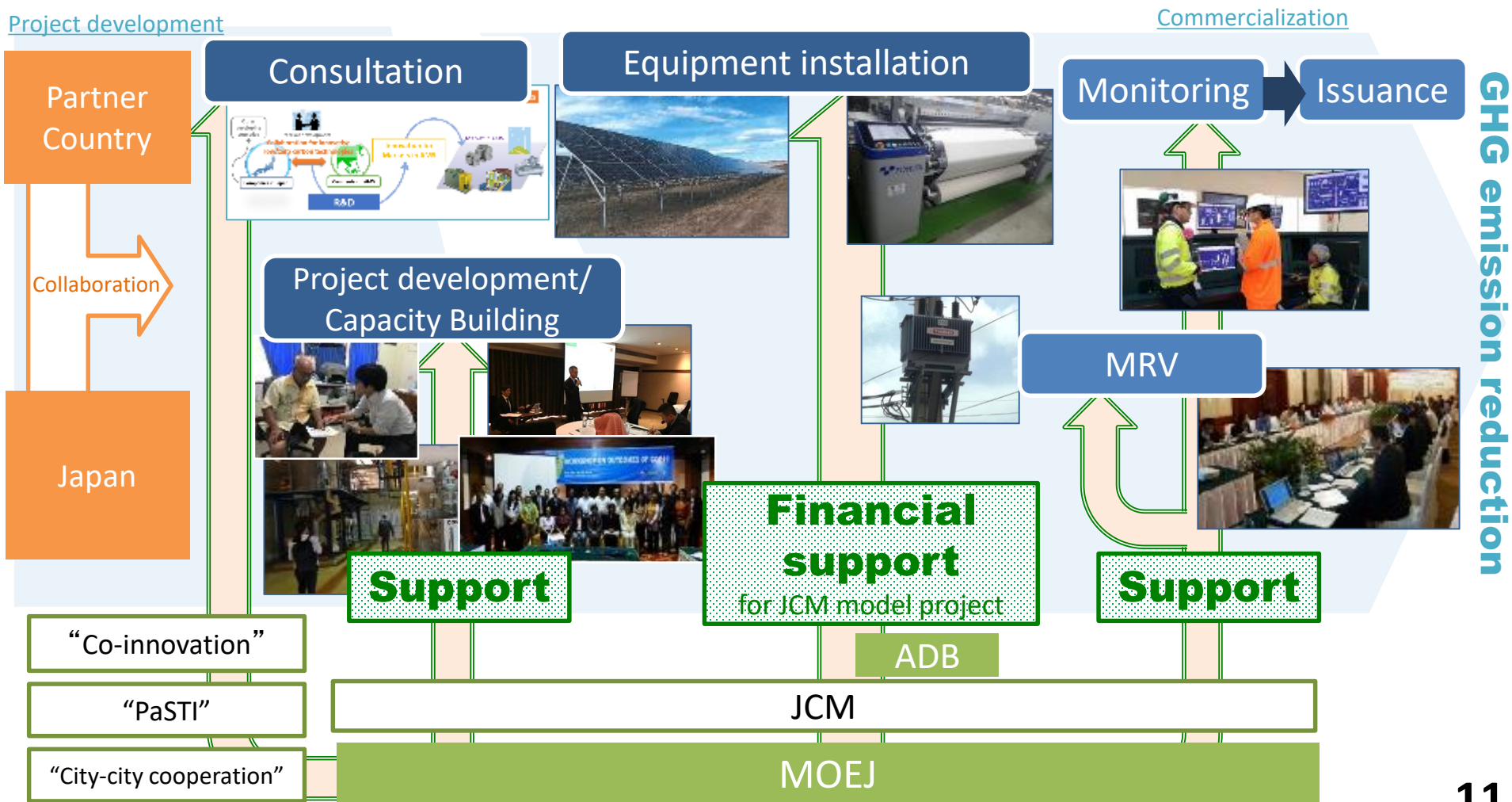
Memorandum of Cooperation between World Bank Group and MOEJ

- Identify suitable WBG programs where the MOEJ could potentially participate through appropriate identified means and jointly develop mitigation outcomes from the projects using the JCM methodology
- Explore the possibility to scale up the JCM projects under the PMR and PMR Successor Program
- Share information on identified candidate programs with the MOEJ to explore and examine potential arrangements of the pilot projects with the JCM including utilization of Measurement, Reporting and Verification (“MRV”) methodologies



Total support for JCM by MOEJ and more

- MOEJ provides total support for the JCM project from idea to action and implementation.



JCM Business Matching Site “JCM Global Match”

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



QR code to see the website

◆Objectives

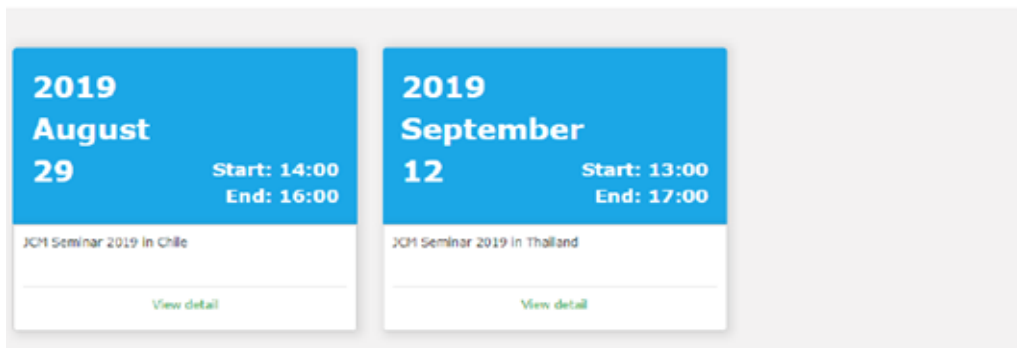
- To facilitate business match making of sellers and buyers of low and zero carbon technology for the JCM project

◆Features

- Automated match-making website based on registered information
- Arrangement of face-to-face meetings
- Financial institutions and consulting firms can also participate for match-making



Events
Browse list of events. You can make an appointment to meet with companies of your interest here.



[JCM Global Match]

