Recent Development of the JCM and JCM Model Project

Ministry of the Environment

Sep 2018

Overview of the JCM

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

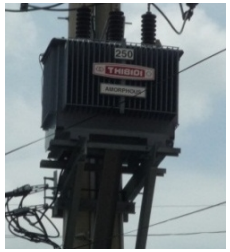
Energy saving at convenience stores, Panasonic, Indonesia

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, Thailand

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

Solar PV System at Salt Factory, PCKK, Kenya

Waste to Energy Plant, JFE engineering, Myanmar

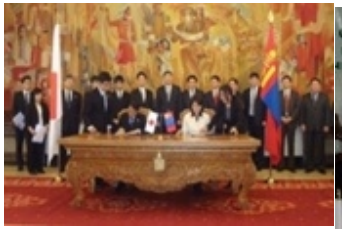
High efficient refrigerator, Mayekawa MFG, Indonesia

Regenerative Burners in industries, Toyotsu Machinery, Indonesia

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

JCM Partner Countries

- Japan has held consultations for the JCM with developing countries since 2011 and has established the JCM with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia, Chile, Myanmar, Thailand and the Philippines.



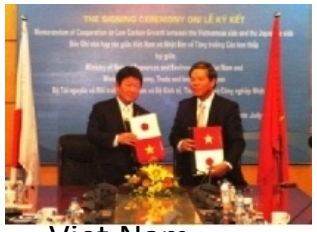
Mongolia
Jan. 8, 2013
（Ulaanbaatar）

Bangladesh
Mar. 19, 2013
(Dhaka)

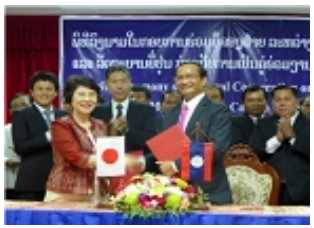
Ethiopia
May 27, 2013
(Addis Ababa)

Kenya
Jun. 12,2013
(Nairobi)

Maldives
Jun. 29, 2013
(Okinawa)

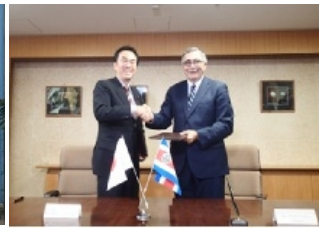


Viet Nam
Jul. 2, 2013
(Hanoi)



Lao PDR
Aug. 7, 2013
(Vientiane)

Indonesia
Aug. 26, 2013
(Jakarta)

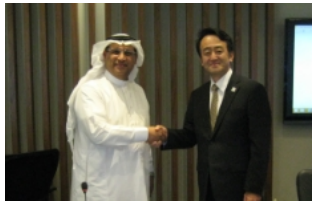


Costa Rica
Dec. 9, 2013
(Tokyo)

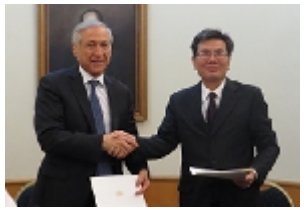
Palau
Jan. 13, 2014
(Ngerulmud)

Cambodia
Apr. 11, 2014
(Phnom Penh)

Mexico
Jul. 25, 2014
(Mexico City)



Saudi Arabia
May 13, 2015



Chile
May 26, 2015
(Santiago)

Myanmar
Sep. 16, 2015
(Nay Pyi Taw)

Thailand
Nov. 19, 2015
(Tokyo)

the Philippines
Jan. 12, 2017
(Manila)

The JCM related Articles in the Paris Agreement

Article 6 of the Agreement

2. Parties shall, where engaging on a voluntary basis in cooperative approaches that involve the use of internationally transferred mitigation outcomes towards nationally determined contributions, promote sustainable development and ensure environmental integrity and transparency, including in governance, and shall apply robust accounting to ensure, inter alia, the avoidance of double counting, consistent with guidance adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement.

3. The use of internationally transferred mitigation outcomes to achieve nationally determined contributions under this Agreement shall be voluntary and authorized by participating Parties.

- Use of market mechanisms, including the JCM, is articulated under Article 6 which prescribes for the use of emission reductions realized oversees towards national emission reduction targets.
- The amount of emission reductions and removals acquired by Japan under the JCM will be appropriately counted as Japan's reduction in accordance with the Paris Agreement.
- Japan is going to contribute to the development of the guidance for robust accounting including for avoidance of double counting to be adopted by the CMA*.

*the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement

Japan's INDC (Excerpt)

Japan's INDC

○ Japan's INDC towards post-2020 GHG emission reductions is at the level of a reduction of **26.0% by fiscal year (FY) 2030 compared to FY 2013** (25.4% reduction compared to FY 2005) (approximately 1.042 billion t-CO_2eq. as 2030 emissions), ensuring consistency with its energy mix, set as a feasible reduction target by bottom-up calculation with concrete policies, measures and individual technologies taking into adequate consideration, *inter alia*, technological and cost constraints, and set based on the amount of domestic emission reductions and removals assumed to be obtained. .

Information to facilitate clarity, transparency and understanding

○ The JCM is not included as a basis of the bottom-up calculation of Japan's emission reduction target, but **the amount of emission reductions and removals acquired by Japan under the JCM will be appropriately counted as Japan's reduction**.

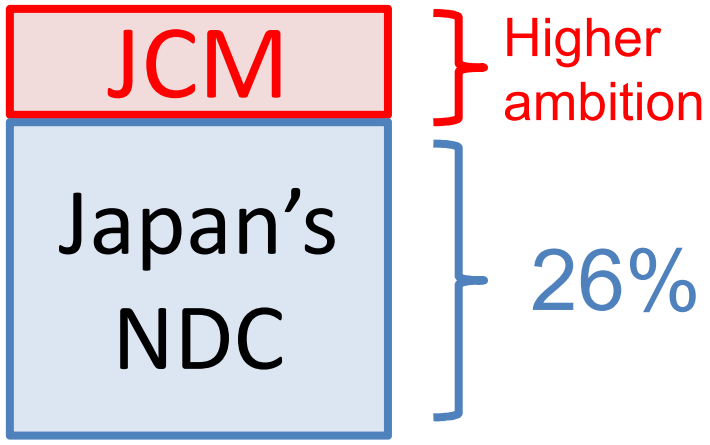
Reference information
GHG emissions and removals
JCM and other international contributions

○ Japan establishes and implements the JCM in order both to appropriately evaluate contributions from Japan to GHG emission reductions or removals in a quantitative manner achieved through the diffusion of low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions in developing countries, and to use them to achieve Japan's emission reduction target.

○ Apart from contributions achieved through private-sector based projects, **accumulated emission reductions or removals by FY 2030 through governmental JCM programs to be undertaken within the government's annual budget are estimated to be ranging from 50 to 100 million t-CO_2.**

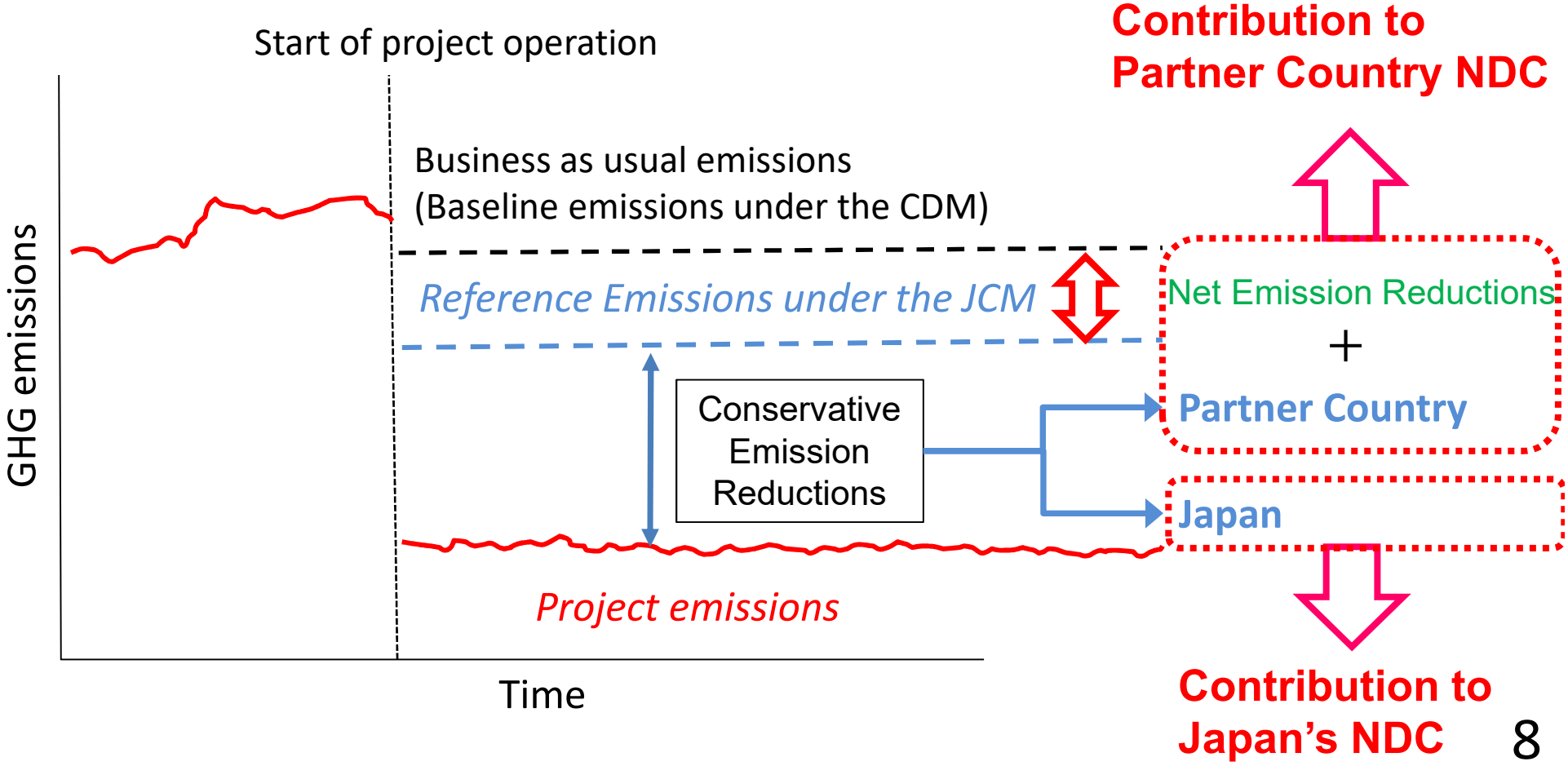
Japan's INDC and JCM

- As stated in Japan's INDC, the 26% reduction target is set based on the amount of domestic emission reductions and removals assumed to be obtained. It is therefore anticipated that Japan will achieve the target through domestic emission reductions and removals without using international reductions and removals (credits).
- The amount of emission reductions and removals acquired by Japan under the JCM will be appropriately counted as Japan's reduction.



JCM's Contribution to NDC

- JCM's conservative emission reduction calculation (reference emissions below BaU emissions) will ensure a net decrease and/or avoidance of GHG emissions.
- This part of emission reductions will automatically contribute to the achievement of NDC.



JCM Support by the Ministry of the Environment, Japan

JCM Model Projects by MOE

The budget for projects starting from FY 2018 is 6.9 billion JPY (approx. USD 69million) in total by FY2020

(1 USD = 100 JPY)

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

Government of Japan

Finance part of an investment cost (**less than half**)

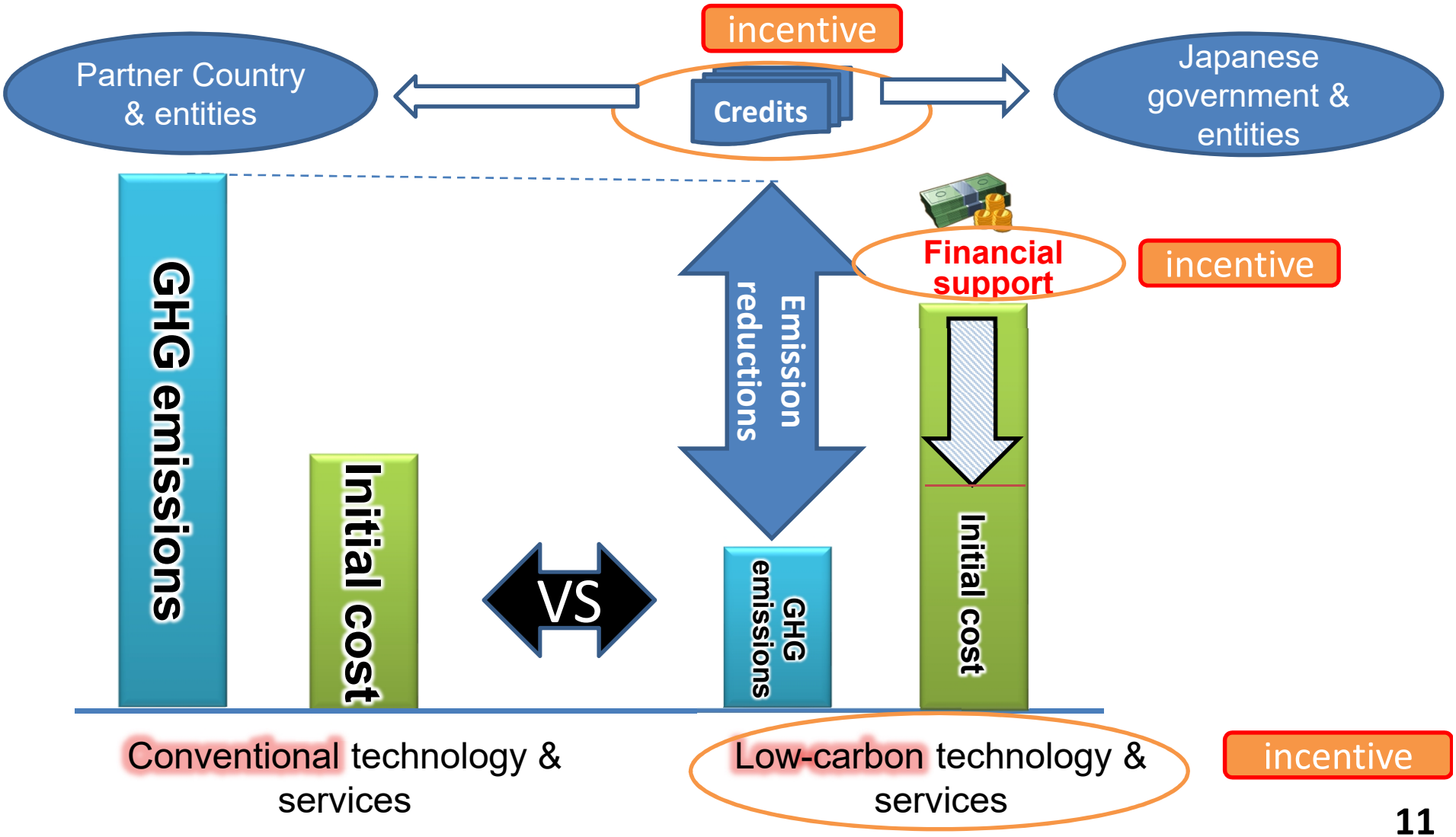
Conduct MRV and expected to deliver at least half of JCM credits issued

International consortiums
(which include Japanese entities)

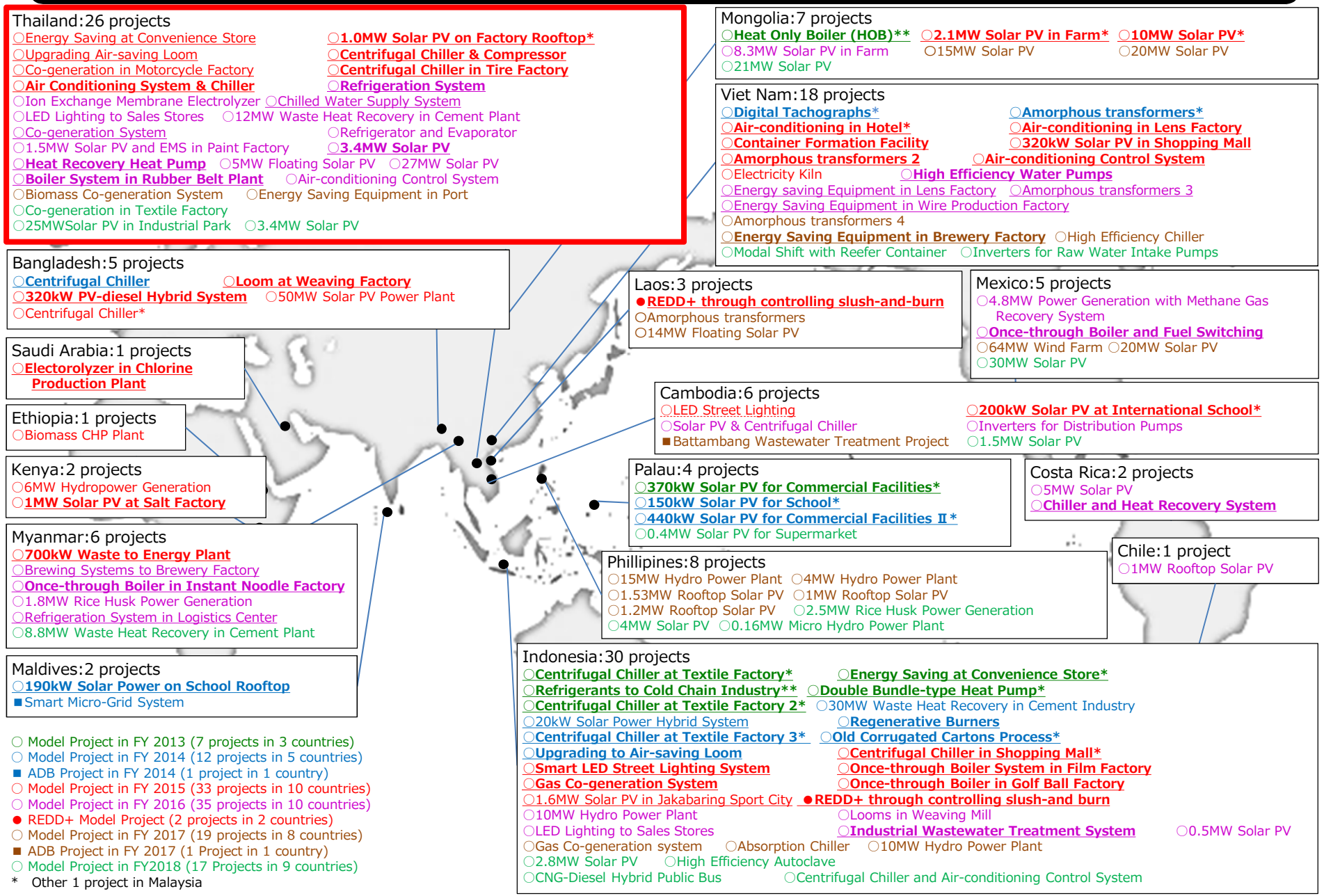
- Scope of the financing: facilities, equipment, vehicles, etc. which reduce CO_2 from fossil fuel combustion as well as construction cost for installing those facilities, etc.
- Eligible Projects : starting installation after the adoption of the financing and finishing installation within three years.

JCM Financial Support Programme

- Japan will address the high initial cost barrier of introducing advanced low-carbon technologies in the Partner countries through the JCM (GoJ implements several supporting schemes)



JCM Financing programme by MOEJ (FY2013～2018) as of June 25, 2018



Thailand:26 projects
- ○Energy Saving at Convenience Store
- ○Upgrading Air-saving Loom
- ○Co-generation in Motorcycle Factory
- **○Air Conditioning System & Chiller**
- ○Ion Exchange Membrane Electrolyzer
- ○LED Lighting to Sales Stores
- ○Co-generation System
- ○1.5MW Solar PV and EMS in Paint Factory
- **○Heat Recovery Heat Pump**
- **○Boiler System in Rubber Belt Plant**
- ○Biomass Co-generation System
- ○Co-generation in Textile Factory
- ○25MWSolar PV in Industrial Park
- **○1.0MW Solar PV on Factory Rooftop***
- **○Centrifugal Chiller & Compressor**
- **○Centrifugal Chiller in Tire 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
- ○27MW Solar PV
- ○Air-conditioning Control System
- ○Energy Saving Equipment in Port
- ○3.4MW Solar PV

Mongolia:7 projects
- **○Heat Only Boiler (HOB)****
- ○8.3MW Solar PV in Farm
- ○21MW Solar PV
- **○2.1MW Solar PV in Farm***
- ○15MW Solar PV
- **○10MW Solar PV***
- ○20MW Solar PV

Viet Nam:18 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
- ○Amorphous transformers 4
- **○Energy Saving Equipment in Brewery Factory**
- ○Modal Shift with Reefer Container
- **○Amorphous transformers***
- **○Air-conditioning in Lens Factory**
- **○320kW Solar PV in Shopping Mall**
- **○Air-conditioning Control System**
- **○High Efficiency Water Pumps**
- ○Amorphous transformers 3
- ○High Efficiency Chiller
- ○Inverters for Raw Water Intake Pumps

Bangladesh:5 projects
- **○Centrifugal Chiller**
- **○320kW PV-diesel Hybrid System**
- ○Centrifugal Chiller*
- **○Loom at Weaving Factory**
- ○50MW Solar PV Power Plant

Laos:3 projects
- **●REDD+ through controlling slush-and-burn**
- ○Amorphous transformers
- ○14MW Floating Solar PV

Mexico:5 projects
- ○4.8MW Power Generation with Methane Gas Recovery System
- **○Once-through Boiler and Fuel Switching**
- ○64MW Wind Farm
- ○20MW Solar PV
- ○30MW Solar PV

Saudi Arabia:1 projects
- **○Electorolyzer in Chlorine Production Plant**

Cambodia:6 projects
- ○LED Street Lighting
- ○Solar PV & Centrifugal Chiller
- ■Battambang Wastewater Treatment Project
- **○200kW Solar PV at International School***
- ○Inverters for Distribution Pumps
- ○1.5MW Solar PV

Ethiopia:1 projects
- ○Biomass CHP Plant

Kenya:2 projects
- ○6MW Hydropower Generation
- **○1MW Solar PV at Salt Factory**

Palau:4 projects
- **○370kW Solar PV for Commercial Facilities***
- **○150kW Solar PV for School***
- **○440kW Solar PV for Commercial Facilities Ⅱ***
- ○0.4MW Solar PV for Supermarket

Costa Rica:2 projects
- ○5MW Solar PV
- **○Chiller and Heat Recovery System**

Myanmar:6 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

Phillipines:8 projects
- ○15MW Hydro Power Plant
- ○1.53MW Rooftop Solar PV
- ○1.2MW Rooftop Solar PV
- ○4MW Solar PV
- ○4MW Hydro Power Plant
- ○1MW Rooftop Solar PV
- ○2.5MW Rice Husk Power Generation
- ○0.16MW Micro Hydro Power Plant

Chile:1 project
- ○1MW Rooftop Solar PV

Maldives:2 projects
- **○190kW Solar Power on School Rooftop**
- ■Smart Micro-Grid System

Indonesia:30 projects
- **○Centrifugal Chiller at Textile Factory***
- **○Refrigerants to Cold Chain Industry****
- **○Centrifugal Chiller at Textile Factory 2***
- ○20kW 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
- ○LED Lighting to Sales Stores
- ○Gas Co-generation system
- ○2.8MW Solar PV
- ○CNG-Diesel Hybrid Public Bus
- **○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
- **○Industrial Wastewater Treatment System**
- ○Absorption Chiller
- ○10MW Hydro Power Plant
- ○High Efficiency Autoclave
- ○Centrifugal Chiller and Air-conditioning Control System
- ○0.5MW Solar PV

○ 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 (33 projects in 10 countries)
○ Model Project in FY 2016 (35 projects in 10 countries)
● REDD+ Model Project (2 projects in 2 countries)
○ Model Project in FY 2017 (19 projects in 8 countries)
■ ADB Project in FY 2017 (1 Project in 1 country)
○ Model Project in FY2018 (17 Projects in 9 countries)
* Other 1 project in Malaysia

Total 127 projects in 17 partner countries

Underlined projects have started operation (68 projects, including 1 partially started projects)
Projects with * have been registered as JCM projects (25 projects)

Technologies Transferred through JCM(FY2013-2018)

- Total of 127 **JCM Model Projects** being developed in 17 partner countries
- 55% are **energy efficiency** and 34% are **renewable energy** while 7% are **co-generation system**
- Transport, waste to energy and REDD+ project shares 4%

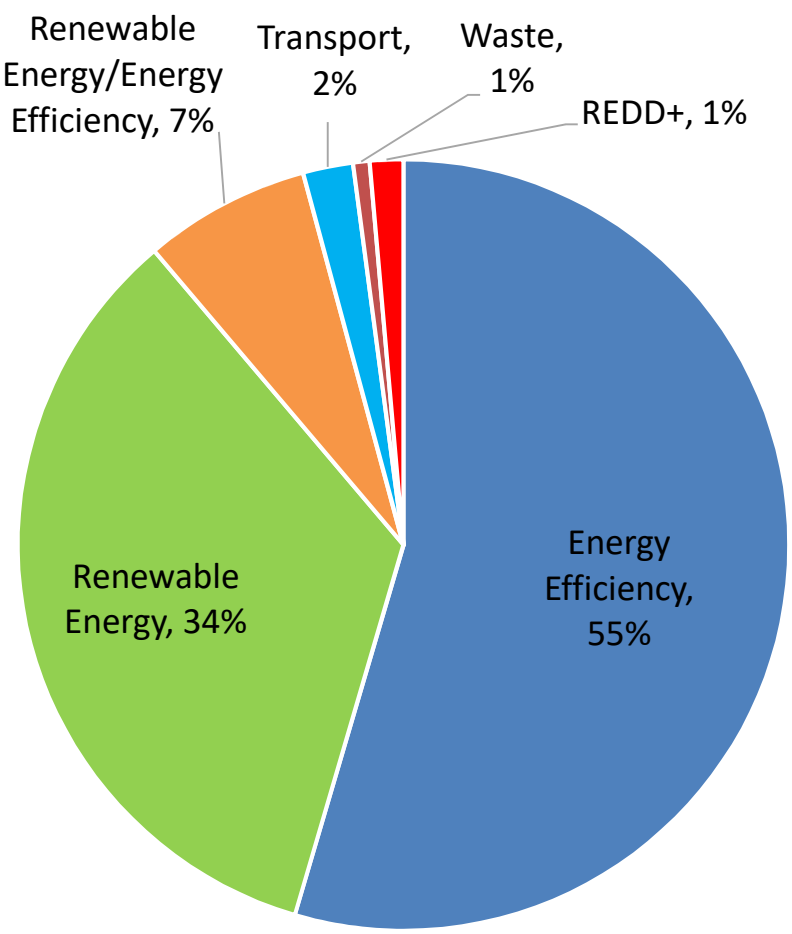
Renewable Energy
Solar
Micro hydro
Biomass
Wind

Renewable Energy/Energy Efficiency
Co-generation System

Transport
Digital Tachographs
Modal Shift
CNG-Diesel Hybrid

Waste
Waste to Energy

REDD+
Controlling Slush and burn



Energy efficiency
Looms
Equipment
Boiler
Burner
Electrolysis tank
LED
Production line
Optimization
Pump
Heat pump/Water heater
Air-conditioning
Refrigerating
Transmission/Transformer
LED Streetlights
Smart Grid

As of June 25, 2018

JCM F-gas Recovery and Destruction Model Project by MOE

【Budget for FY 2018】
40 million JPY (approx. 0.4 million USD) (1 USD = 100 JPY)

Government of Japan

Finance part of the cost in flat-rate (up to 40 million JPY/year)

Conduct MRV to estimate GHG emission reductions.
At least half or ratio of financial support to project cost (larger ratio will be applied) of JCM credits issued are expected to be delivered to the government of Japan

International consortiums (which include Japanese entities)

Manufacturers of equipment which uses F-gas	Users of equipment which uses F-gas	Entities for recovery and transportation of used F-gas (recycling or scrap entities)	Entities for destruction of used F-gas (may use existing facility for destruction)

Purpose

To recover and destroy F-gas (GHG except for energy-related CO2, etc) from used equipment instead of releasing to air, and reduce emissions

Scope of Financing

- Establish scheme for recovery and destruction
- Install facilities/equipment for recovery/destruction
- Implementation of recovery, transportation, destruction and monitoring

Project Period

Three years in maximum (Ex. 1st year for scheme, 2nd year for facilities, 3rd year for recovery/destruction)

Eligible Projects

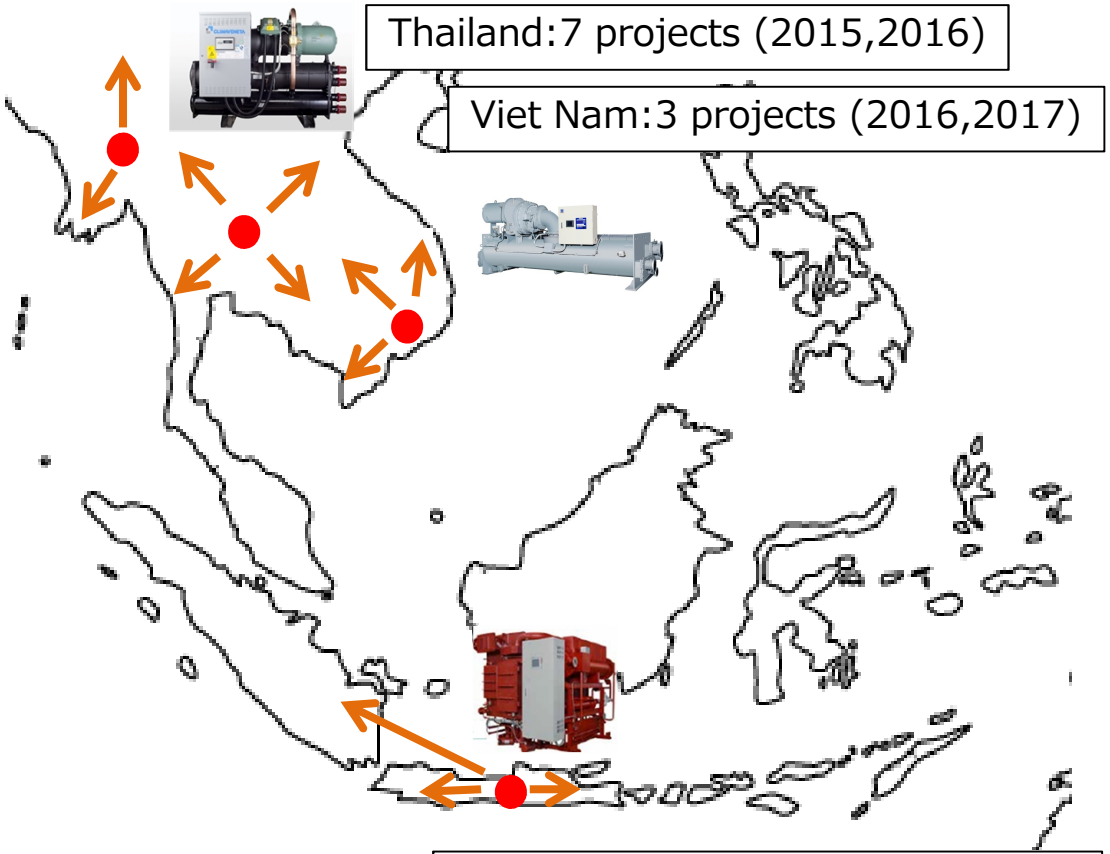
- After the adoption of financing, start implementation of recovery/destruction within three years
- Aim for the registration as JCM project and issuance credits

JCM and Contribution to Thailand

Business Model Case :
Replicating through Standard & Institutional Arrangement

- Company succeeded to implement leading low carbon technologies through the JCM
- Using the project as a showcase, their business was developed in ASEAN countries
- Further business development is expected through the establishment of energy efficiency standard s and relevant institutional arrangements

Myanmar:2 JCM model projects (2016)



Chillers/Refrigerator

JCM model project

↓

Demonstration of energy efficiency effects

↓

Establish standards & institutional arrangements

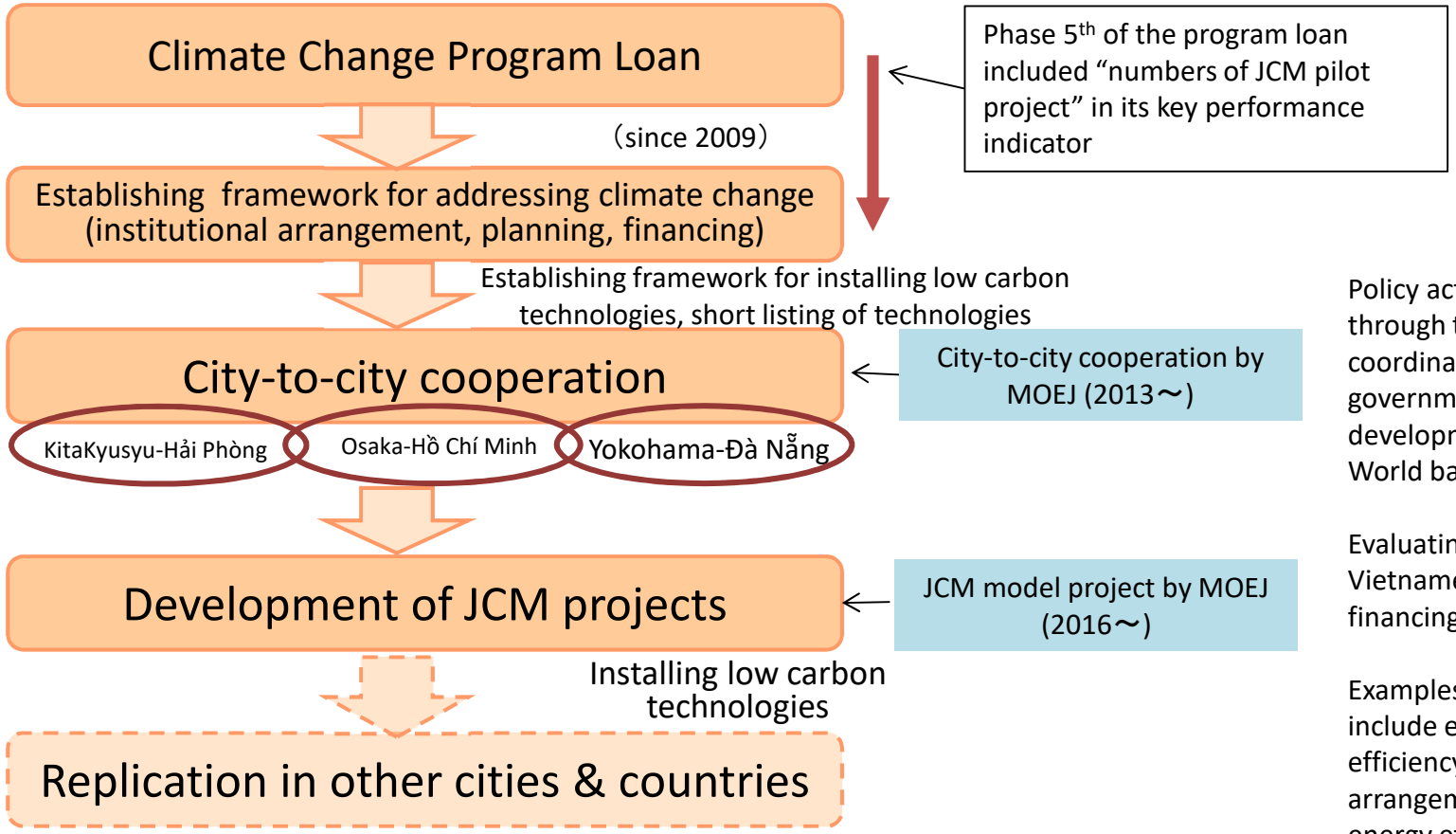
↓

- Regulations
- Standards
- Taxes

Business development in other countries, sectors

Comprehensive & coordinated policy support to JCM project implementations

- Comprehensive policy support on energy efficiency through JICA's climate change program loan in Vietnam
- The program established basis for introducing low carbon technologies where city-to-city cooperation and JCM model projects facilitated uptake of low carbon project implementation which then supported back the climate change mitigation policy in Vietnam



Policy actions are established through the program loan in coordination with Vietnamese government as well as other development partners including World bank & AFD

Evaluating policy action by Vietnamese government and financing through ODA

Examples of policy actions include establishment of energy efficiency law, institutional arrangements for road map on energy efficiency measures and drafting master plan for renewable energy