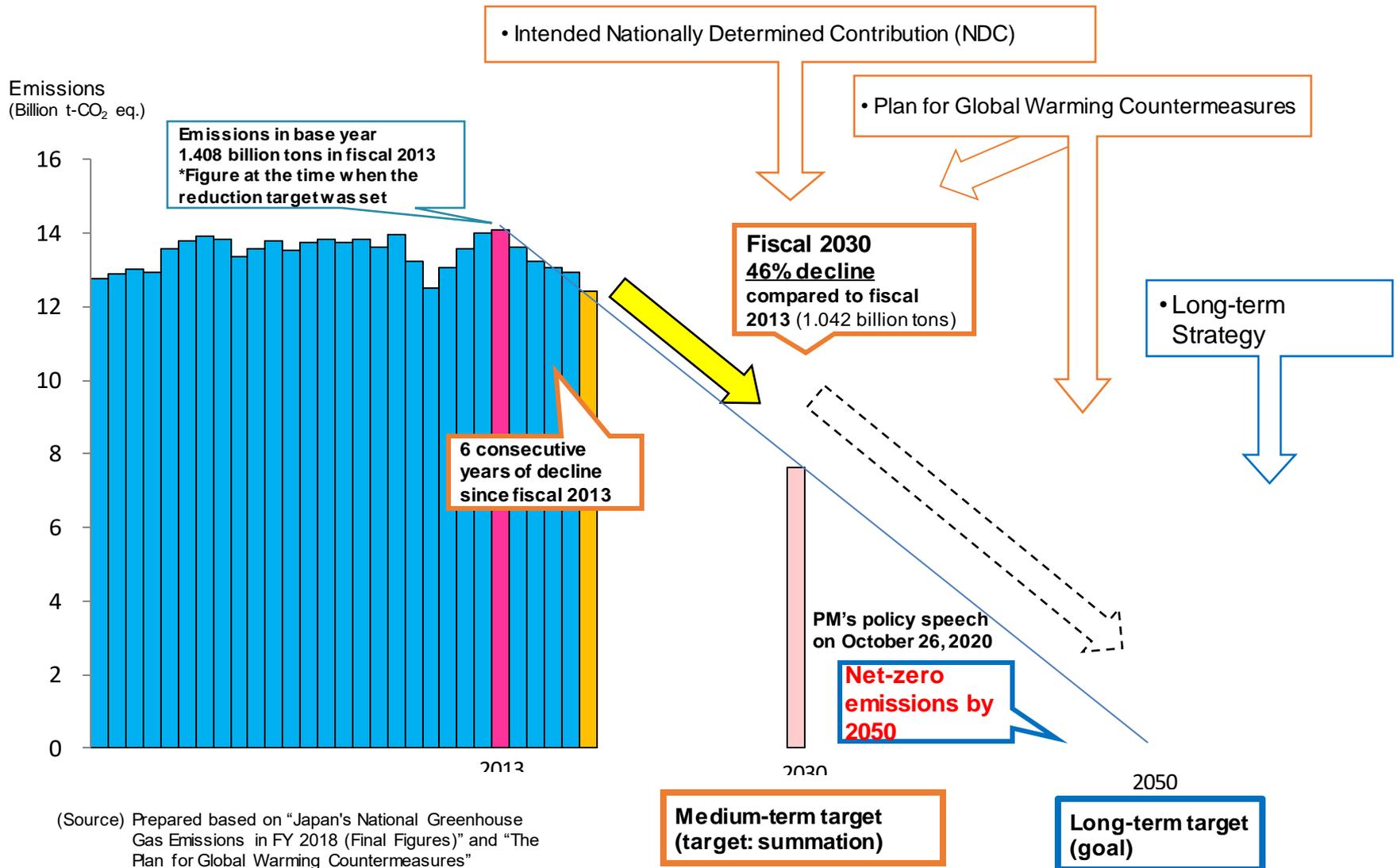


# Japan's Medium- and Long-term Targets for GHG Reduction



(Source) Prepared based on "Japan's National Greenhouse Gas Emissions in FY 2018 (Final Figures)" and "The Plan for Global Warming Countermeasures"

# Emission reduction target on each Sector

Greenhouse Gas Emissions and Removals (million tons-CO <sub>2</sub> )		Actual Data in FY2013	Estimated emissions in FY 2030	Reduction rate	Conventional target
		1408	760	▲46%	▲26%
Energy-related CO <sub>2</sub>		1235	677	▲45%	▲25%
In each sector	Industry sector	463	289	▲38%	▲7%
	Commercial and others sector	238	116	▲51%	▲40%
	Residential sector	208	70	▲66%	▲39%
	Transport sector	224	146	▲35%	▲27%
	Energy conversion sector	106	056	▲47%	▲27%
Non-energy related CO <sub>2</sub> , Methane, N <sub>2</sub> O		134	115	▲14%	▲8%
Fluorinated gases		39	22	▲44%	▲25%
Removals by LULUCF		-	▲48	-	(▲37 million tons-CO <sub>2</sub> )
Joint Crediting System (JCM)		Aiming for a cumulative GHG emission reduction of about 100 million tons of through public-private partnerships (approx. 10 billion USD) as maximum Investment size.			-

## Renewable energy, Energy conservation

- Local governments **set up promotion areas** based on the revised Act.  
→ Expansion of renewable energies that bring benefits to the local community
- Expansion of the obligation to comply with **energy-saving standards** for **houses and buildings**

## Industrial, Transport, etc.

- Support for innovation towards 2050  
→ **2 trillion-yen fund** that supports R&D and implementation in society in priority fields such as **hydrogen and storage batteries**
- R&D and social demonstration support for energy saving of more than 30% in data centers

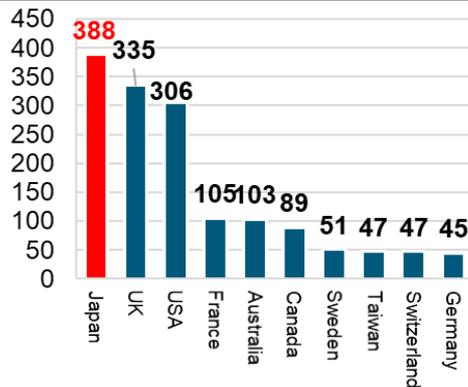
## Cross-sectional Strategies

- Emission reduction in developing countries through the use of advanced decarbonisation technologies  
→ Contributing to global reduction through the "Joint Crediting Mechanism:JCM"
- Creation of **more than 100 "leading decarbonised regions"** by 2030 (Regional Decarbonisation Roadmap)

## TCFD

- 2,091 financial institutions, companies and governments around the world (388 are in Japan.) expressed their support.
- **The largest number in the world**

Number of companies that support TCFD (Top10 countries & regions)

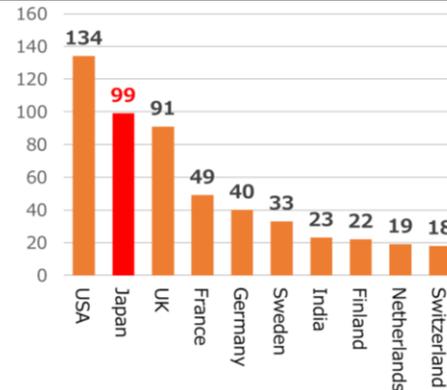


[source] TCFD website TCFD Supporters (<https://www.fsb-tcfd.org/tcfd-supporters/>)

## SBT

- Number of approved companies: 701 (99 are Japanese companies.)
- **The 2nd largest in the world**

Number of approved companies with SBT by country (Top 10 countries)

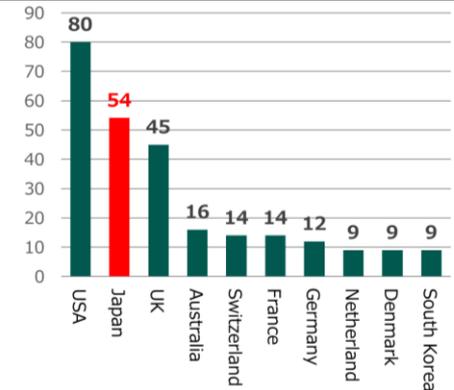


[source] Science Based Targets homepage Compiled from Companies Take Action (<http://sciencebasedtargets.org/companies-taking-action/>). Industry classification is prepared by the secretariat by applying the Japan Standard Industrial Classification, etc.

## RE100

- Number of participating companies: 309 companies worldwide (54 are Japanese companies.)
- **The 2nd largest in the world**

Number of companies participating in RE 100 by country (Top 10 countries)



Compiled from the [source] RE 100 home page (<http://there100.org/>). Industry classification is prepared by the secretariat by applying the Japan Standard Industrial Classification, etc.

### List of companies working on TCFD, SBT and RE100

**Construction** : Sekisui House, Ltd. / Daito Trust Construction Co., Ltd. / Daiwa House Industry Company, Limited / TODA CORPORATION / TOKYU CONSTRUCTION CO., / LTD.LIXIL Group Corporation / Sumitomo Forestry

**Grocery** : Asahi Group Holdings, Ltd. / Ajinomoto Co., Inc. / Kirin Holdings Company, Limited / NISSIN FOODS HOLDINGS CO., LTD.

**Electric Appliances** : KONICA MINOLTA, INC. / SEIKO EPSON CORPORATION Sony Corporation / Panasonic Corporation / Fujitsu Limited / FUJIFILM Holdings Corporation / RICOH Company, Ltd.

**Chemical** : SEKISUI CHEMICAL CO., LTD.

**Pharmacy** : ONO PHARMACEUTICAL CO., LTD.

**Precision equipments** : Shimazu Corporation / NIKON CORPORATION

**Other products** : ASICS Corporation

**Information & Communication** : Nomura Research Institute, Ltd.

**Retail Trade** : ASKUL Corporation / AEON CO., LTD. / J. FRONT RETAILING Co., Ltd. / MARUI GROUP CO., LTD.

**Real estate** : Mitsui Fudosan Co., Ltd. / MITSUBISHI ESTATE CO., LTD.

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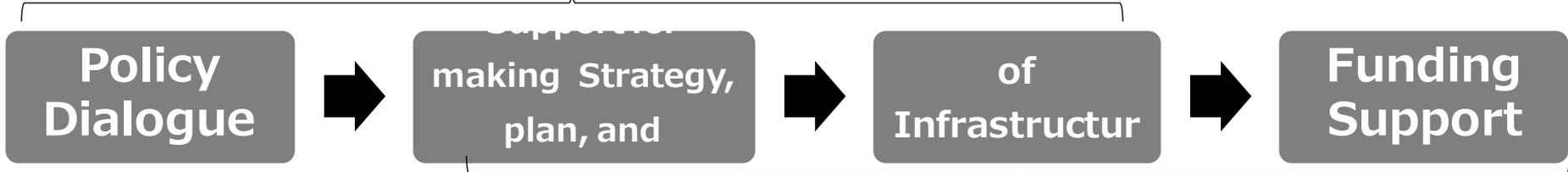
# **International cooperation**

---

# Environmental Infrastructure Promotion Strategy by Ministry of the Environment Japan

- Contribution for Carbon Neutrality and SDGs including environment became a main topic in the Infrastructure System Overseas Promotion Strategy
- **MoEJ promotes their supports for decarbonisation transition in Indo-Pacific by environmental Infrastructure in the public private relationship**

Promoting inter-city cooperation in and out of Japan,  
Transferring experience and know-how to abroad



Developing a business environment in public private platform  
(Japan Platform for Redesign; sustainable Infrastructure )

## Waste to Energy plant

Installed first **WtE plant** in Myanmar (2017)



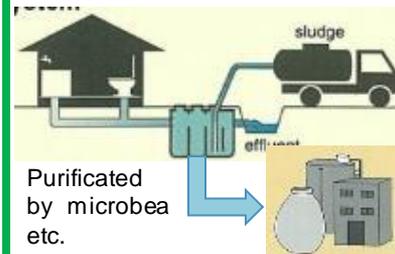
## Saving and Renewable energy (Joint Credit Mechanism)

Installed **Solar power plant** in Mongolia (soccer field 40 site)  
✳Developing in 17 countries



## Jyokaso

Developing in China and Vietnam etc. for **necessity of wastewater treatment**



## Water/Air pollution

Concluded an agreement for **quality improvement of Citarum river** (2018)



# City-to-City Collaboration Program



-Basic concept:

Japanese local governments: Transferring the **knowledge and experience of Japanese cities for creating decarbonized and low-carbon society** to overseas cities in partnership with private sectors.

e.g. Support to design city masterplan and install low-carbon technology etc.

**Company**

**Japanese city**

- Surveying local needs and information
- Identifying suitable technology

**Overseas city**

**Collaboration**

- Transferring the knowledge of designing the local systems
- Providing lectures on city management

- Communication and negotiation with stakeholders in own country
- Supporting low-carbon society creation

- **Creating low-carbon projects** efficiently and effectively
- Designing **local systems** to promote low-carbon society  
e.g. low-carbon action plan and technology evaluation criteria etc.
- **Capacity building** for local staff

**Promotion of private investment**

**Self-sustained development of overseas city**

**Transferring low-carbon technology to other fields**

# Cities joining the city-to-city collaboration program (FY2013~2021)



Participation by **13 countries** **41 cities** · regions  
**Japan 17 local government**

\* Project in FY2021

Overseas city Japanese city Overseas city Japanese city

## Maldives

1 Malé Toyama

## India

2 Bangalore Yokohama

## Myanmar

3 Yangon (region) Kitakyushu

4 Yangon (city) Kawasaki

5 Ayeyarwady Fukushima

6 Sagaing Fukushima

7 Mandalay Kitakyushu

8 Yangon City Fukuoka

9 Sagaing Region, Ayeyarwady Region Fukushima

10 Ulaanbaatar Sapporo · Hokkaido Government

11 Ulaanbaatar city and Tuv aimag Sapporo

## Lao PDR

12 Vieng chan Kyoto

## Vietnam

13 Hai Phong Kitakyushu

14 Da Nang Yokohama

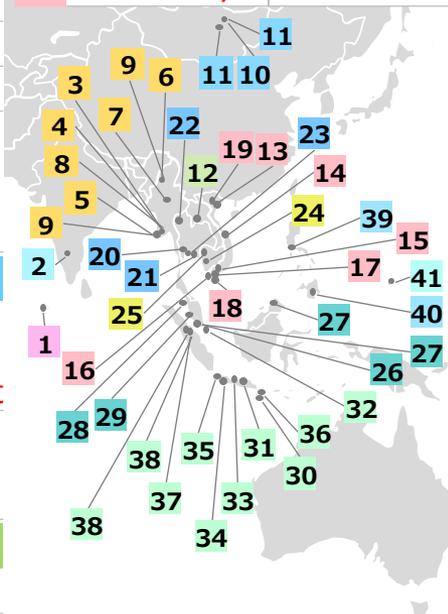
15 Ho Chi Minh Osaka

16 Kiên Giang and others Kobe

17 Can Tho Hiroshima

18 Soc Trang Province Hiroshima

19 Hanoi City Fukuoka



Overseas city Japanese city Overseas city Japanese city

## Thailand

20 Bangkok (Bangkok Port · Laem Chabang Port) Yokohama (Yokohama Port Pier)

21 Rayong Kitakyushu

22 Chiang Mai Kitakyushu

23 Eastern Thailand (EEC) Osaka

## Cambodia

24 Phnom Penh Kitakyushu

25 Siem Reap Kanagawa

## Malaysia

26 Iskandar Development Area Kitakyushu

27 Iskandar Development Area · Kota Kinabalu Toyama

28 Penang and others Kawasaki

29 Kuala Lumpur Tokyo

## Indonesia

30 Denpasar Tokyo Union

31 Surabaya Kitakyushu

32 Batam Yokohama

33 Semarang\* Toyama

34 Bandung Kawasaki

35 Special Capital Territory of Jakarta Kawasaki

36 Bali\* Toyama

37 Rokan Hulu, Riau Kawasaki

38 Rokan Hulu Regency and Pekanbaru City Kawasaki

39 Gorontalo Ehime

\*Joint project for Bali and Semarang

## Philippines

40 Quezon Osaka

41 Davao Kitakyushu

## Palau

42 Koror Kitakyushu

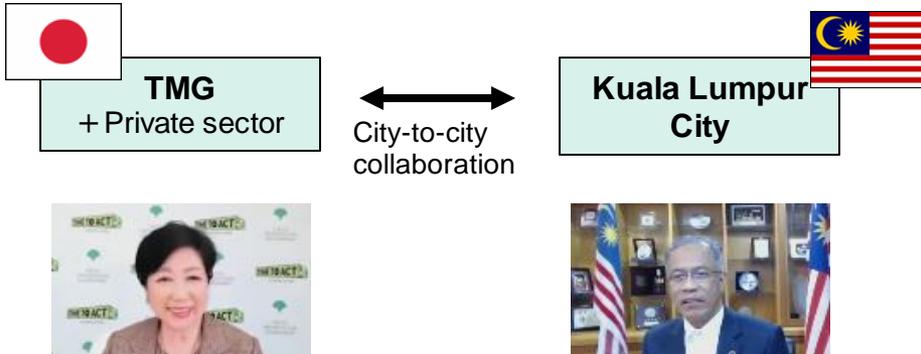
## Chile

43 Renca, Santiago Toyama

# Two Cases of City-to-City Collaboration

- The zero-carbon city initiatives of Japanese frontrunner cities will be rolled out to cities overseas, triggering a "decarbonization domino effect".
- Through city-to-city collaboration projects with other countries, Japanese systems and initiatives will be transferred in a form that meets the needs of these countries, thereby encouraging zero carbon pledges and implementation of specific measures in overseas cities .

## Announcement on zero carbon supported by institutional transfer (Tokyo Metropolitan Government and Kuala Lumpur City)

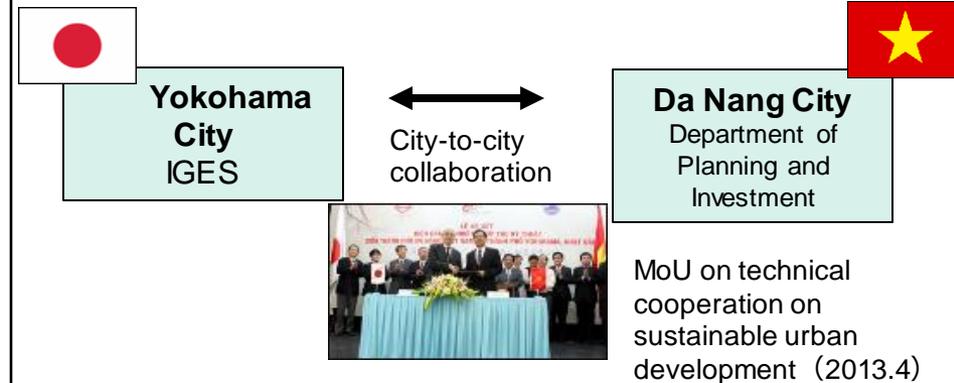


### <Details of collaboration>

- ✓ Transfer of TMG's green building system
- ✓ Development of zero carbon scenario in KL

➔ **KL announced intention to be zero carbon by 2050. (The first case of a "decarbonization domino effect")**

## Introduction of environmental infrastructure through joint study (Yokohama City and Da Nang City)



### <Details of collaboration>

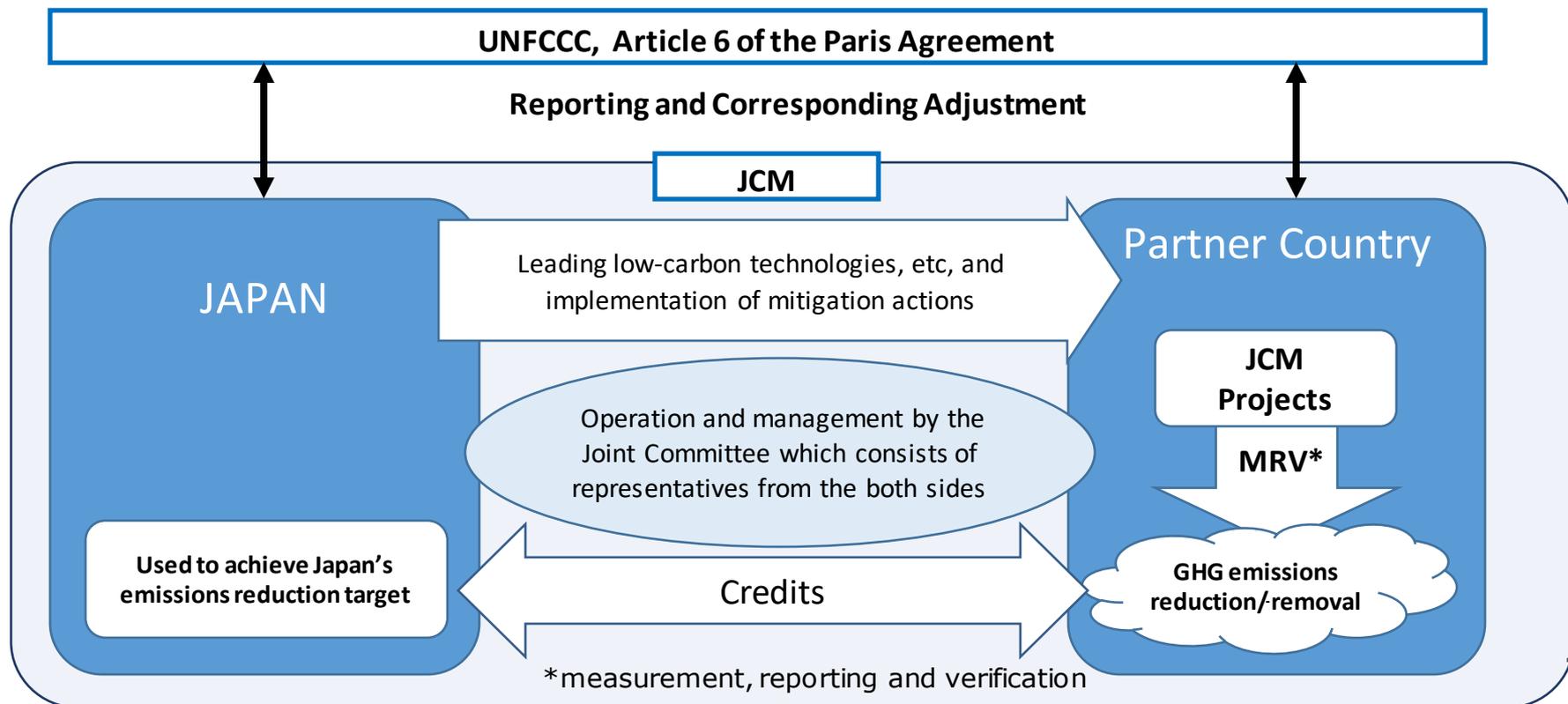
- ✓ Study on introduction of energy-saving equipment into water supply projects

➔ **Installing equipment with JCM subsidies**  
(Installation of energy efficient pumps in Water Supply Joint Stock Company Da Nang)

➔ **Expanding results to other cities** (Energy efficient water intake pumps at the Ho Chi Minh City Water Treatment Plant )

# Basic Concept of the JCM

- Facilitating diffusion of leading decarbonizing technologies ,etc and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions from Japan to GHG emissions reduction or removal in a quantitative manner and use them to achieve Japan's emissions reduction target.
- Contributing to the ultimate objective of the UNFCCC and use of market mechanisms, including the JCM, is articulated under Article 6.





# JCM Financing Programme by MOEJ (FY2013~2021) as of Nov., 2021



**Total 205 projects (17 partner countries)** 118 underlined projects have been started operation. 58 projects with \* have been registered as JCM projects  
 (● Model Project: 194 projects (including Eco Lease: 3 projects), ■ ADB: 5 projects, ◆ REDD+: 2 projects, ▲ F-gas: 4 projects) Other 1 project in Malaysia

## Cambodia: 6 projects

- LED Street Lighting\*
- 200kW Solar PV at International School\*
- Solar PV & Centrifugal Chiller
- Inverters for Distribution Pumps
- Solar PV & Biomass Power Plant
- 0.9MW Solar PV

## Mongolia: 8 projects

- Heat Only Boiler (HOB)\*\*
- 2.1MW Solar PV in Farm\*
- 10MW Solar PV\*
- 8.3MW Solar PV in Farm\*
- 15MW Solar PV
- Upscaling Renewable Energy Sector
- Fuel Conversion by Introduction of LPG Boilers
- Improving Access to Health Services

## Myanmar: 9 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
- 7.3MW Solar PV
- 8.8MW Waste Heat Recovery in Cement Plant
- Brewing Systems and Biogas Boiler to Brewery Factory
- Energy Saving Equipment to Complex Buildings

## Viet Nam: 37 projects

- Digital Tachographs\*
- Amorphous transformers 1\*
- Air-conditioning in Hotel 1\*
- Electricity Kiln
- Air-conditioning in Lens Factory\*
- Container Formation Facility\*
- Amorphous transformers 2\*
- 320kW Solar PV in Shopping Mall\*
- Air-conditioning Control System
- High Efficiency Water Pumps\*
- Energy saving Equipment in Lens Factory\*
- Amorphous transformers 3\*
- Amorphous transformers 4
- Energy Saving Equipment in Wire Production Factory\*
- Energy Saving Equipment in Brewery Factory
- High Efficiency Chiller
- Modal Shift with Reefer Container
- Inverters for Raw Water Intake Pumps
- ▲ Collection Scheme and Dedicated System of F-gas
- Biomass Boiler to Chemical Factory
- 57MW solar PV
- Air-Conditioning System and Air Cooled Chillers
- 49MW solar PV
- Once-through Boiler to Food Factory
- Biomass Boiler
- Biomass Co-generation System
- Air-conditioning in Hotel 2
- 2MW Solar PV
- Waste to Energy
- LED Lighting to Office Building
- 9MW Solar PV
- 10MW Rice Husk Power Plant
- 12MW Solar PV
- 9.8MW Solar PV
- 5.8MW Solar PV
- 2.5MW Solar PV
- Chiller and LED
- ▲ F-gas Recovery and Mixed Combustion Scheme

## Bangladesh: 5 projects

- Centrifugal Chiller
- Loom at Weaving Factory\*
- 315kW PV-diesel Hybrid System\*
- Centrifugal Chiller\*
- High Efficiency Transmission Line

## Maldives: 3 projects

- 186kW Solar Power on School Rooftop\*
- Smart Micro-Grid System
- Greater Male Waste to Energy Project

## Saudi Arabia: 2 projects

- Electrolyzer in Chlorine Production Plant
- 400MW Solar PV

## Ethiopia: 1 project

- 120MW Solar PV

## Kenya: 2 projects

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

## Laos: 6 projects

- ◆ REDD+ through controlling slush-and-burn
- Amorphous transformers
- 14MW Floating Solar PV
- 11MW Solar PV
- 14MW Solar PV
- 19MW Solar PV

## Thailand: 45 projects

- Energy Saving at Convenience Store
- 1MW Solar PV on Factory Rooftop\*
- Upgrading Air-saving Loom\*
- Centrifugal Chiller & Compressor\*
- Centrifugal Chiller in Tire Factory
- Co-generation in Motorcycle Factory
- Air Conditioning System & Chiller\*
- Refrigeration System
- Ion Exchange Membrane Electrolyzer
- Chilled Water Supply System
- LED Lighting to Sales Stores
- 2MW Solar PV 1
- 12MW Waste Heat Recovery in Cement Plant
- Co-generation System PV
- 3.4MW Solar PV\*
- Refrigerator and Evaporator
- Heat Recovery Heat Pump
- 30MW Solar PV\*
- 5MW Floating Solar PV\*
- Boiler System in Rubber Belt Plant
- Air-conditioning Control System
- Biomass Co-generation System
- Co-generation in Fiber Factory
- Biomass Boiler
- 25MW Solar PV in Industrial Park
- 3.4MW Solar PV
- 0.8MW Solar PV and Centrifugal Chiller
- ▲ Introduction of Scheme for F-gas Recovery and Destruction
- 37MW Solar PV and Melting Furnace
- Heat Exchanger in Fiber Factory
- 15MW Biomass Power Plant in Sugar Factory
- 8.1MW Solar PV
- Centrifugal Chiller to Machinery Factory
- 5MW Solar PV
- 2.6MW Solar PV
- 2MW Solar PV 2
- 2.5MW Solar PV with Blockchain Technology
- 30MW Floating Solar PV
- 23MW Solar PV
- Once-through Boiler in Garment Factory
- 35MW Solar PV and Storage Battery
- 2MW Solar PV 3
- Boiler, Chiller and PV
- 1.85MW Solar PV (Eco Lease)
- 0.13MW Solar PV (Eco Lease)

## Philippines: 17 projects

- 15MW Hydro Power Plant
- 1.53MW Rooftop Solar PV
- 1MW Rooftop Solar PV
- 1.2MW Rooftop Solar PV
- 4MW Solar PV
- 2.5MW Rice Husk Power Generation
- 18MW Solar PV
- 0.16MW Micro Hydro Power Plant
- 33MW Wind Power
- 19MW Hydro Power Plant
- 2MW Solar PV (Eco Lease)
- 60MW Solar PV
- Biogas Power Generation and Fuel Conversion
- 29MW Binary Geothermal Power Generation
- 20MW Flash Geothermal Power Plant
- Air Conditioning System
- ▲ F-gas Recovery and Destruction Scheme

## 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

## Indonesia: 43 projects

- Centrifugal Chiller at Textile Factory\*
- Refrigerants to Cold Chain Industry\*\*
- Centrifugal Chiller at Textile Factory 2\*
- 500kW Solar PV and Storage Battery\*
- 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 1
- Looms in Weaving Mill\*
- LED Lighting to Sales Stores
- Industrial Wastewater Treatment System
- 0.5MW Solar PV\*
- Gas Co-generation system
- Absorption Chiller\*
- High Efficiency Autoclave 1
- CNG-Diesel Hybrid Public Bus
- Rehabilitation of Hydro Power Plant
- 12MW Biomass Power Plant
- Injection Molding Machine
- 2MW Mini Hydro Power Plant
- Boiler to Carton Box Factory
- 10MW Hydro Power Plant 2
- 6MW Hydro Power Plant 1
- 6MW Hydro Power Plant 2
- 5MW Hydro Power Plant
- 4.2MW Solar PV
- 8MW Mini Hydro Power Plant
- Thermal Oil Heater System
- 3.3MW Rooftop Solar PV
- 6MW Hydro Power Plant 3
- 2.3MW Hydro Power Plant
- High Efficiency Autoclave 2
- 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

## Mexico: 6 projects

- 1.2MW Power Generation with Methane Gas Recovery System
- Once-through Boiler and Fuel Switching
- 20MW Solar PV
- 30MW Solar PV 1
- Energy Efficient Distillation System
- 30MW Solar PV 2

## Chile: 8 projects

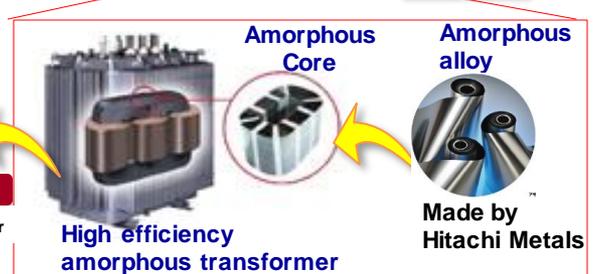
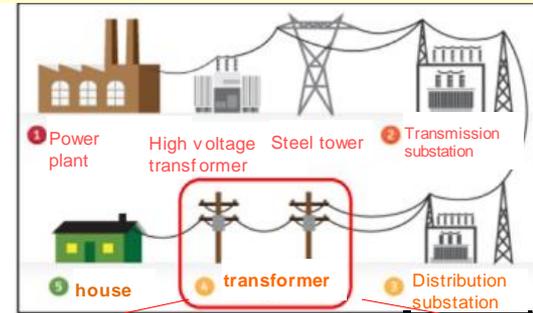
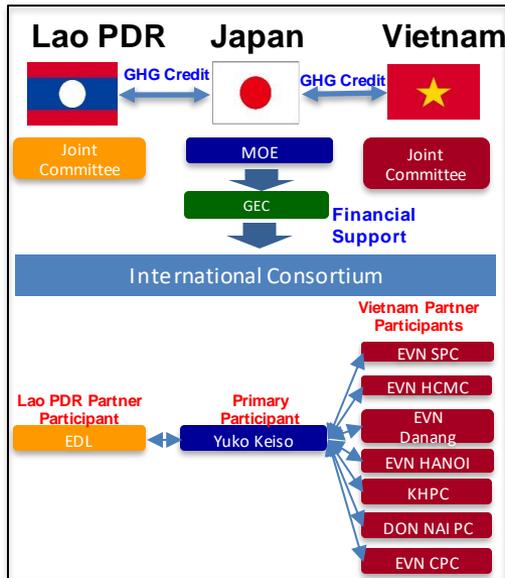
- 1MW Rooftop Solar PV\*
- 3.4MW Rice Husk Power Generation
- 3MW Solar PV 1
- 3MW Solar PV 2
- 34MW Solar PV
- 9MW Solar PV 1
- 9MW Solar PV 2
- 3MW Solar PV 3

## Costa Rica: 2 projects

- 5MW Solar PV\*
- Chiller and Heat Recovery System

# High efficiency amorphous transformers from Vietnam to Lao PDR

- ★ Transformers in Vietnam are being replaced with amorphous high efficiency transformers from 2015 through 2020.
- ★ Succeeded in developing the same product and technology in Lao PDR since 2018. Preparing for expansion to other countries.
- ★ Providing excellent amorphous alloy low carbon technology. A total of 10,000 transformers introduced throughout Vietnam.



TIBIDI (Manufacturers in Vietnam)



**Amount of amorphous transformer introduced (as of JAN2019)**

ベトナム	FY2015	FY2016	FY2017	FY2018	Total
EVN SPC	1,618	2,686	2,507		6,811
EVN HCMC		552	340		892
EVN CPC		981			981
EVN Danang		282			282
EVN HANOI		121	65		186
KHPC		111	305	30	446
DON NAI PC		168	580	207	955
<b>Total</b>	<b>1,618</b>	<b>4,901</b>	<b>3,797</b>	<b>237</b>	<b>10,553</b>

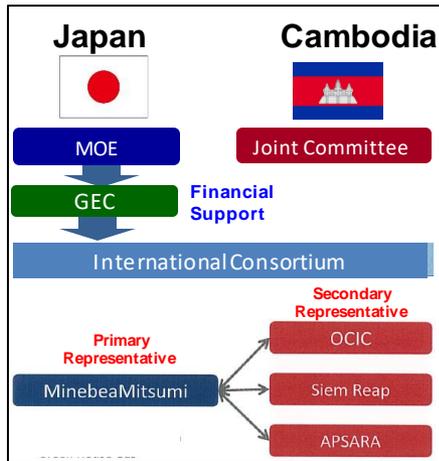
  

ラオス	FY2015	FY2016	FY2017	FY2018	Total
EDL				465	465

## JCM Expansion Example②

# Expansion into smart city environment from LED street light network in Cambodia

- ★70% energy saving is achieved by LED street light in emerging city and world heritage.
- ★Commenced joint study with local partners to build smart city environment by wireless network environment deployment.
- ★5,600 LED street lights installed in Cambodia in areas including Phnom Penh and Angkor Wat (total installation area is 120 km<sup>2</sup>).



APSARA(Angkor Wat)



OCIC Chroy Changvar (Phnom Penh)



Siem Reap

APSARA Site

Siem Reap Site



OCIC Site: Chroy Changvar

Phnom Penh

OCIC Site: Diamond Island

Consortium	No. of Introduction
APSARA	1,670
Siem Reap	1,948

Consortium	No. of Introduction
OCIC	2,054

Actual number installed in Cambodia

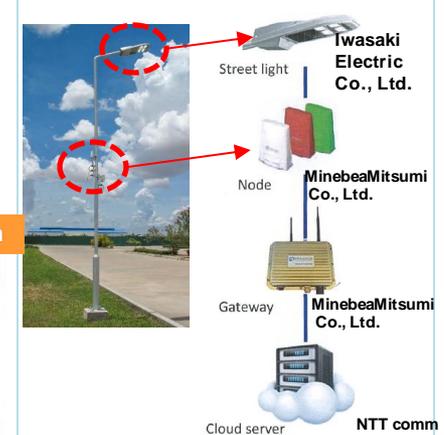


Siem Reap Provincial Hall (SRPH)



OCIC Diamond Island

### LED street light management system



70% energy saving achieved

Deploying various IOT sensors and wireless networking environments will enable the Smart City environmental infrastructure.



The total footprint of the LED street light is 1.5 times that of Manhattan Island (120km<sup>2</sup>)



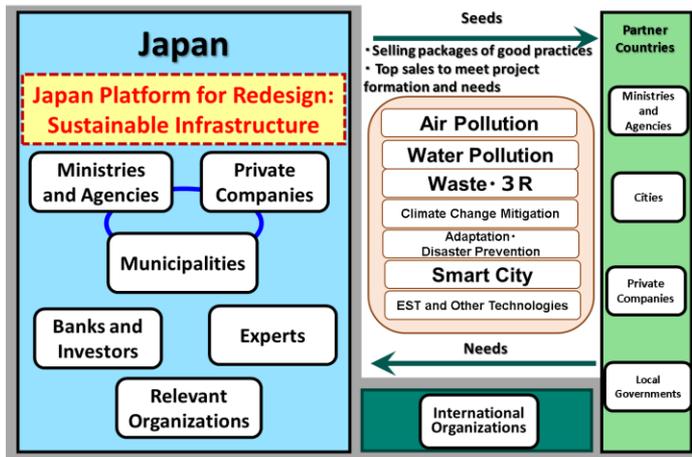
December 2016  
Received Minister of the Environment Award in Cambodia

# Japan Platform for Redesign: Sustainable Infrastructure(JPRSI)

- JPRSI aims to provide a total solution to overall environmental infrastructures using a PPP (Public-Private-Partnership) platform.

## Overview

- Established : September 8, 2020
- Relevant Organizations: JICA, JOIN, JASCA, J-CODE, JAIDA, JBIC, JETRO, and NEXI
- Purpose: Build a network involving joined companies and organizations, and create a self-driven project, which is operated by private companies to meet with cross-sectional needs of a partner country.



## Number of Entities Joined

- 441 entities have joined the platform (as of March 2022).

