Ministry of the Environment

IGES
Institute for Global Environmental Strategies

Low-carbon City Profile

Climate Change Actions by Asian Cities in the City-to-City Collaboration Programme

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About this Booklet

Under the Paris Agreement, countries around the world are heading off reductions in greenhouse gas emissions at an early stage, making full use of climate change measures to achieve the creation of a decarbonized society in the latter half of this century. Expectations of actions by non-state actors in particular, such as cities and companies which are major sources of greenhouse gas emissions, are rising in the international community. Non-state actors are also enhancing their international competitiveness as they draw appeal to their efforts on a wider stage, both in their own countries and overseas. With the cooperation of diverse entities, the world is moving towards the creation of a low-carbon, sustainable society with an even greater sense of speed.

The Ministry of the Environment has developed the "City-to-City Collaboration for Low-Carbon Society" (hereinafter "City-to-City Collaboration Programme"), which has aimed to achieve the creation of a low-carbon society through intercity partnerships since fiscal 2013. This programme aims to create low-carbon cities, leapfrogging over conventional development patterns by supporting the formation of low-carbon projects and capacity building in the field, with cities in Japan that have collective experiences in low-carbon development and low-carbon technologies under the Kyoto Protocol cooperating with companies and cities in developing countries that are aiming to achieve economic development in the future. In particular, support for green growth in Asia, home to remarkable economic development, is contributing to the achievement of the goals set out by the United Nations Framework Convention on Climate Change and the Paris Agreement.

This booklet takes a look back on the past five years of the City-to-City Collaboration Programme and introduces the policies being implemented by the cities in Japan and overseas participating in this programme in order to create low-carbon cities. We hope that this booklet will promote an understanding of the initiatives taken by each city and deepen the understanding of support activities and achievements that are unique to intercity cooperation.

March 2018
Ministry of the Environment, Japan

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Chapter 1

Creating Low-Carbon Cities

In the past, climate change measures have mainly been promoted by national governments.
Today, measures are also taken actively by non-state actors, such as cities.

International Trends Related to Climate Change Countermeasures by Cities

International trends and current state of climate change countermeasures

With the adoption of the Paris Agreement at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change in 2015, all countries around the world have become involved in achieving the "2-degree target." To that end, greenhouse gas emissions (GHG) that are increasing worldwide year by year need to shift to a decreasing trend early on, with GHG emissions reached to net zero, that is to say, decarbonization, in the latter half of this century. However, since temperatures are expected to rise by 3 degrees Celsius or more in 2100 just with the efforts to reduce GHG emission targets (Nationally Determined Contributions (NDCs)) declared by national governments, additional efforts to reduce GHG emissions are needed.

What is the 2-degree Target in the Paris Agreement?

The goal of the Paris Agreement is to reduce the average global temperature rise to well below 2 degrees Celsius above pre-industrial levels and to limit that increase even further to 1.5 degrees Celsius to substantially eliminate GHG emissions in the second half of the century.

City's duty to develop low-carbon cities

Cities, home to many people, are the foundations for socioeconomic development. More than 70% of the world's GHG emissions released through various anthropogenic activities are derived from urban areas. This proportion is expected to increase even more, especially with the continued march of urbanization in emerging economies and developing countries. At the other extreme, 90% of cities are located in coastal areas, making it easy to be affected by climate change, with the vulnerability of cities in developing countries where infrastructure is not fully in place of particular note. Development of low-carbon, resilient cities is needed to create a safe and affluent business environment for the region and living environment for residents and is the responsibility of cities as a source of large-scale GHG emissions.

Presence of cities on the rise on the international stage

In the past, climate change countermeasures have mainly been promoted by governments. However, today, the emergence of non-state actors, such as cities and companies, have solidified their presence even on the international stage. More than 1,000 people gathered at the Climate Summit of Local and Regional Leaders held together with COP23 and the participation of heads of state, including 330 municipal heads from about 60 countries, and adopted the "Bonn-Fiji Commitment of Local and Regional Leaders to Deliver the Paris Agreement at All Levels," declaring their resolve to contribute to the achievement of the Paris Agreement by strengthening cooperation with diverse entities, such as governments and cities. There are now 2,500 cities disseminating information externally on urban GHG emissions and policies through carbon registries, a platform for non-state actors.

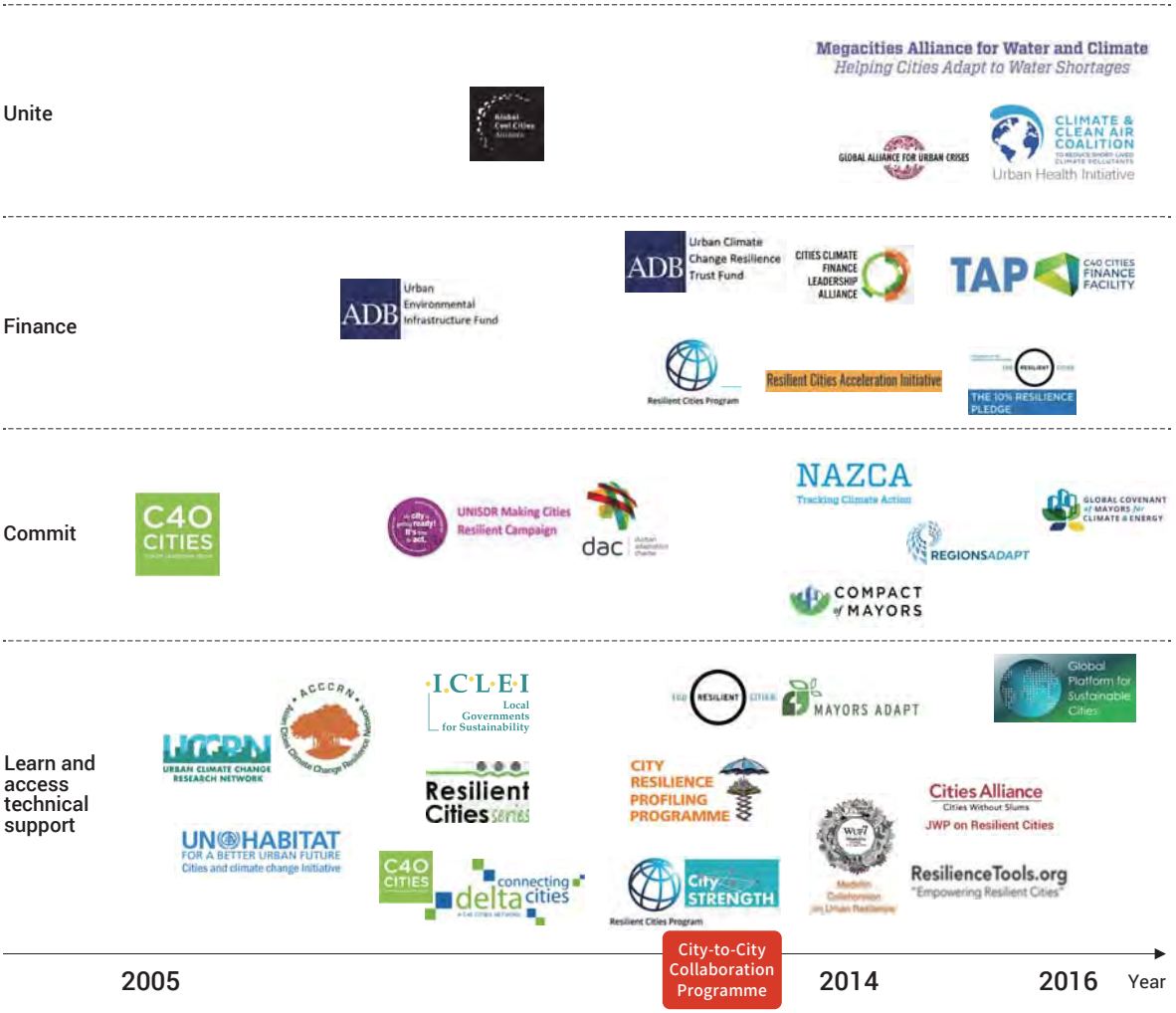
Cities as pioneers for a decarbonized society

Cities, where all resources can be found, are also places that bring about technology and lifestyle innovation. Many cities around the world are implementing climate actions to achieve a decarbonized society by actively forming domestic and overseas partnerships.

Climate Summit of Local and Regional Leaders at COP23 (© ICLEI e.V./2017)

Opportunities Expanded through Intercity Cooperation

Internationally, there are various initiatives and networks in place supporting initiatives to decarbonize urban areas, many of which were launched before and after the adoption of the Paris Agreement. Through the cooperation with a wide range of intercity networks run by international organizations, cities are able to enjoy various benefits, such as the additional development of human resources, formation of low-carbon projects, creation of business opportunities, and improvement of their brand power and reputations to create smart, low-carbon, resilient cities. The "City-to-City Collaboration for Low-Carbon Society" ("City-to-City Collaboration Programme") launched in 2013 by the Ministry of the Environment (see page 4) is also one such initiatives and Japanese cities are contributing to the creation of low-carbon societies by sharing know-how and low-carbon technologies to create low-carbon cities overseas.



Note: The figure illustrates trends only and does not provide an exhaustive list of current global and regional initiatives.
The position of initiatives in the figure roughly indicates the timing of the launch of the initiatives.

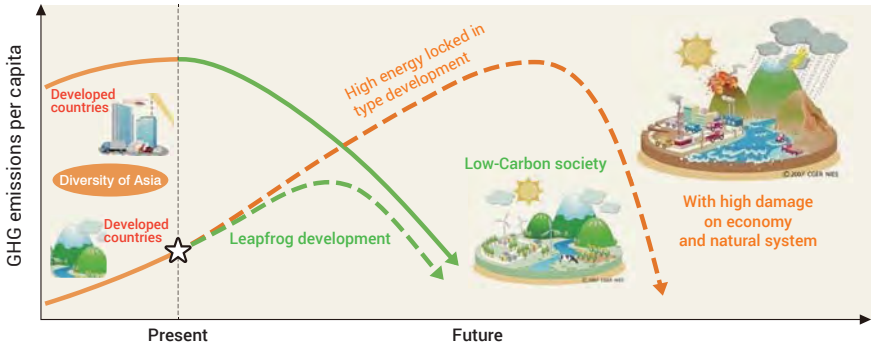
Evolution of the landscape of existing global and regional initiatives on human settlements

Source: Created based on FCCC/SBSTA/2017/INF.3

Overview of City-to-City Collaboration for Low-Carbon Society

Programme background

The concentration of populations in urban areas is on the rise in developing countries where economic development is skyrocketing. To create low-carbon, resilient societies in these countries, low-carbon urban infrastructure and facilities that will be used for long periods of times should be introduced from the outset, and it is necessary to encourage a switch to low-carbon infrastructure and facilities when updating that which is already in place. Under the Kyoto Protocol, the development of superior low-carbon technologies has gained ground and policies and measures have been introduced to expand the use of such technologies in Japan, which is promoting energy conservation looking towards the creation of low-carbon societies, under its obligation to reduce GHG emissions. In order to contribute to the achievement of leapfrog-style development in cities in developing countries through the development and packaging of knowledge and know-how on these technologies and policies, the Ministry of the Environment launched the "City-to-City Collaboration for Low-Carbon Society" ("City-to-City Collaboration Programme") in 2013. Since then, Japan has made contributions to international society towards the achievement of the goals of the Paris Agreement in collaboration with a diverse set of entities both in Japan and abroad.

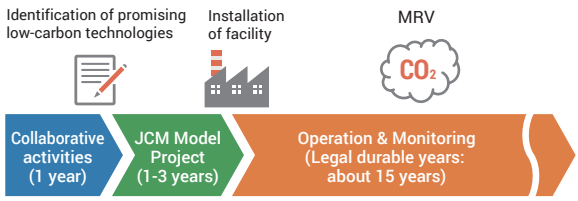


Conceptual diagram of leapfrog development

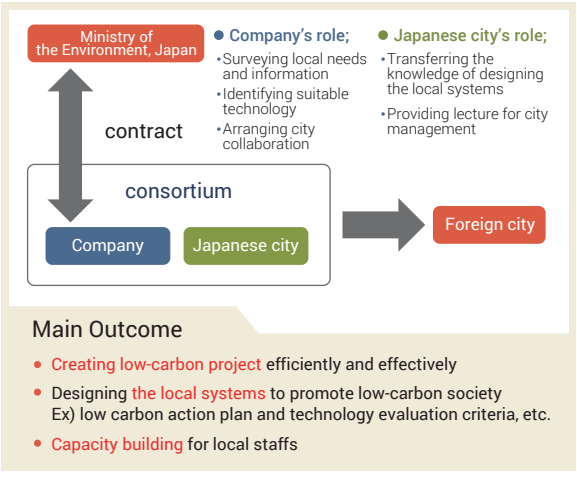
Source: National Institute for Environmental Studies

Programme Overview

Under this framework where cities in developing countries collaborate with cities in Japan, support is provided for human resources development and the creation of institutional foundations in cities in developing countries by considering the development of low-carbon projects in collaboration with private companies and sharing knowledge and know-how on urban management in Japan through intercity collaboration. Due to the concentration of various infrastructure in cities, the introduction and development of superior low-carbon technologies, products, and systems in these facilities will not only help with the low-carbon development of cities, but are also expected to produce various co-benefits, such as improving the environment and energy supply in cities. When introducing low-carbon technologies on the ground, it will also be possible to utilize financial schemes under the Joint Crediting Mechanism promoted by the Government of Japan.



Low-carbon project development under the City-to-City Collaboration Programme (an example)



Outline of City-to-City Collaboration Programme

Benefits for Participating Stakeholders

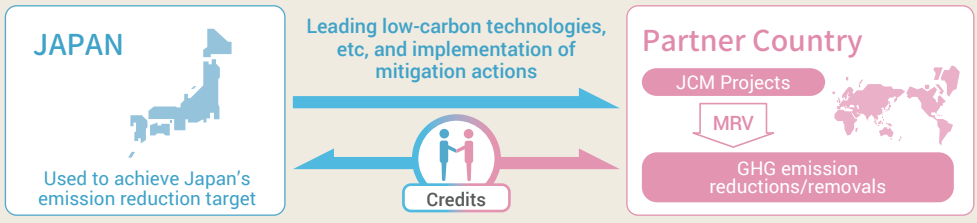
Both Japanese cities and companies as well as partner cities and companies overseas that participate in this programme have the opportunity to gain various benefits.

Many Asian cities participating in this project expect that their involvement will lead to the improvement of their urban environment and capacity of staff.

Benefits for cities overseas	• Strengthen foundation to manage low-carbon cities through the transfer of superior systems, standards, experiences, and know-how • Improve capacity of staff • Construction or implementation of low-carbon city plans • Development of low-carbon cities at lower administrative costs as a result of public-private partnerships (PPP) • Co-benefits, such as environmental improvement and energy supply
Benefits for companies overseas	• Low-cost introduction of superior low-carbon facilities/equipment • Reduced running costs as a result of low-fuel economy performance and fewer failures • Strengthen linkages between cities and Japanese companies • Improve capacity of staff
Benefits for cities in Japan	• Promote overseas deployment of local companies and regional revitalization through these activities • Improve capacity of employees • Improve reputation of city and public awareness
Benefits for companies in Japan	• Build business foundation through the sales of own products and showcases on site • Ease of approaching markets and related institutions and acquisition of local information • Improve capacity of staff

What is the Joint Crediting Mechanism (JCM)?

The Joint Crediting Mechanism (JCM) is a mechanism jointly created and implemented under an agreement between the Government of Japan and a partner country's government to achieve Japan's GHG emissions reduction targets by quantitatively evaluating and understanding Japan's contributions to the reduction/absorption of GHG emissions achieved through the spread of superior low-carbon technologies (technologies/products, systems, services, infrastructure, etc.) and the implementation of policies that can lead to a reduction in GHG emissions in developing countries. The JCM also contributes to the achievement of the ultimate objective of the United Nations Framework Convention on Climate Change by promoting actions to reduce and absorb GHG emissions on a global scale. Japan is implementing the JCM with 17 countries: Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Laos, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia, Chile, Myanmar, Thailand, and the Philippines. (As of February 2018)



JCM outline figure

JCM financial mechanisms: What is the JCM Model Project?

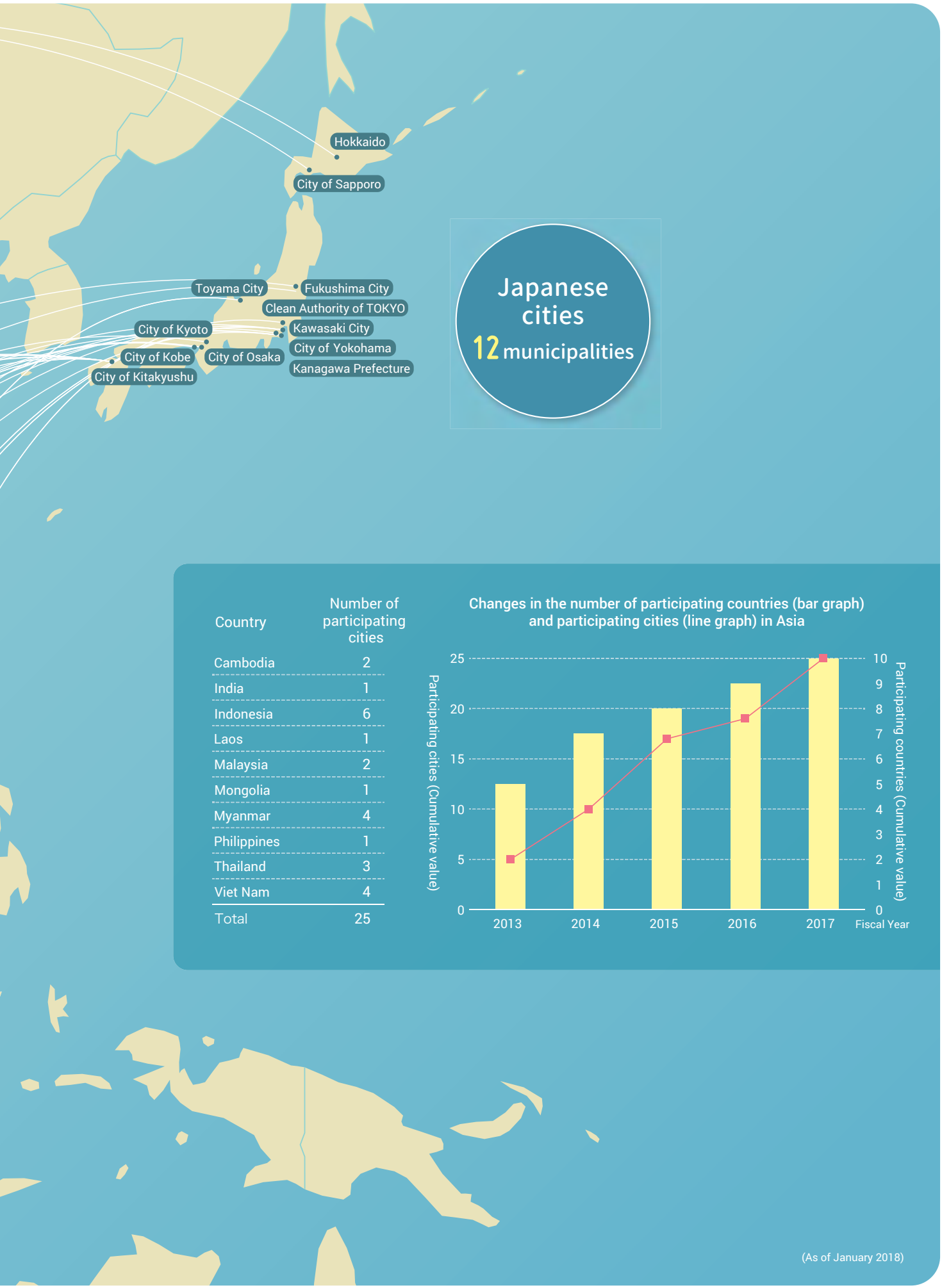
The JCM Model Project is a program to measure, report, and verify (MRV) the implementation of projects to reduce and absorb GHG emissions, as well as Japan's contributions to the emission reduction effects with the use of superior low-carbon technologies in JCM partner countries and developing countries where the JCM is expected to be implemented. JCM credits are issued according to the calculated amount of emissions reduced/absorbed, which are then applied to Japan's emissions reduction target. If adopted, financial support will be provided for the introduction of equipment and machinery that use superior low-carbon technologies. As of December 2017, 112 projects (17 countries) have been adopted and a CO_2 reduction of more than 650,000 tonnes annually is anticipated.

Source: Ministry of the Environment, Japan. List of adopted JCM Model Projects in JCM partner countries (FY2013-2017)

5-Year History of the City-to-City Collaboration Programme

Participating countries and cities

To date, 25 cities from 10 countries in Asia and 12 cities in Japan have taken part in the City-to-City Collaboration Programme



Japanese cities
12 municipalities

Country	Number of participating cities
Cambodia	2
India	1
Indonesia	6
Laos	1
Malaysia	2
Mongolia	1
Myanmar	4
Philippines	1
Thailand	3
Viet Nam	4
Total	25

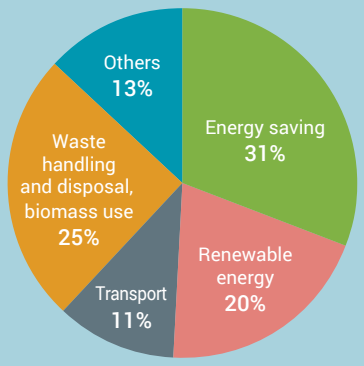
Changes in the number of participating countries (bar graph) and participating cities (line graph) in Asia

(As of January 2018)

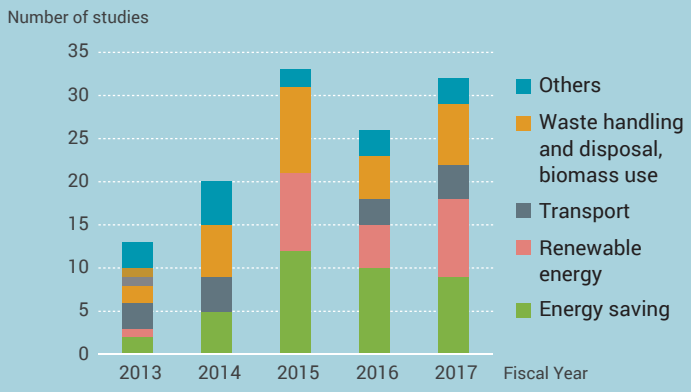
Sectors

67 projects have been adopted and a total of **122** studies have been conducted for target sectors so far in the City-to-City Collaboration Programme

Note: One project may cover some studies for target sectors.



Breakdown of target sectors



Change in the number of studies and breakdown of target sectors

Support for Low-carbon Policies

3 cases contributing to the formation of low-carbon city plans in Asian cities

Green Growth Promotion Plan in Hai Phong City (Cooperation with City of Kitakyushu)

Phnom Penh Climate Change Strategic Plan (Cooperation with City of Kitakyushu)

Climate Change Action Plan of Ho Chi Minh City (Cooperation with City of Osaka)

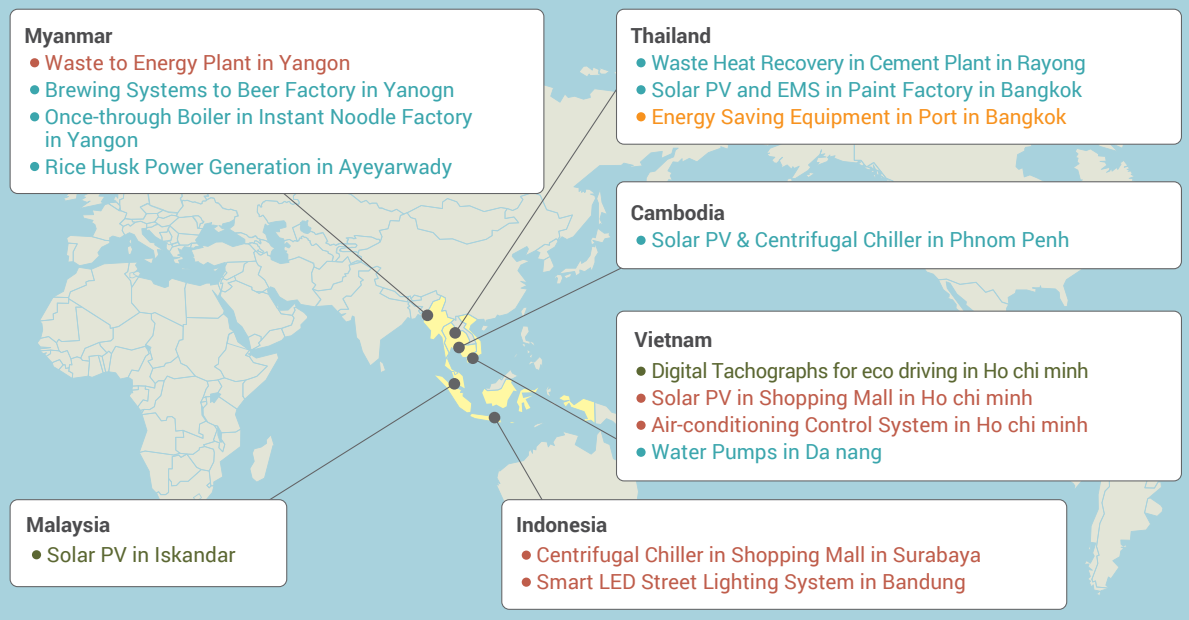
Results

Low-carbon Projects

15 low-carbon projects established

from the City-to-City Collaboration Programme

Estimated CO_2 emissions reduction of 55,000 tonnes/year or more



Support for the Development of Human Resources

8 study sessions were held in Japan by the Ministry of the Environment

with the aim of promoting city-to-city collaboration projects

More than 500 people took part from Japan and overseas

Visits to partner cities in Japan and conduct of individual consultations and inspections of related facilities



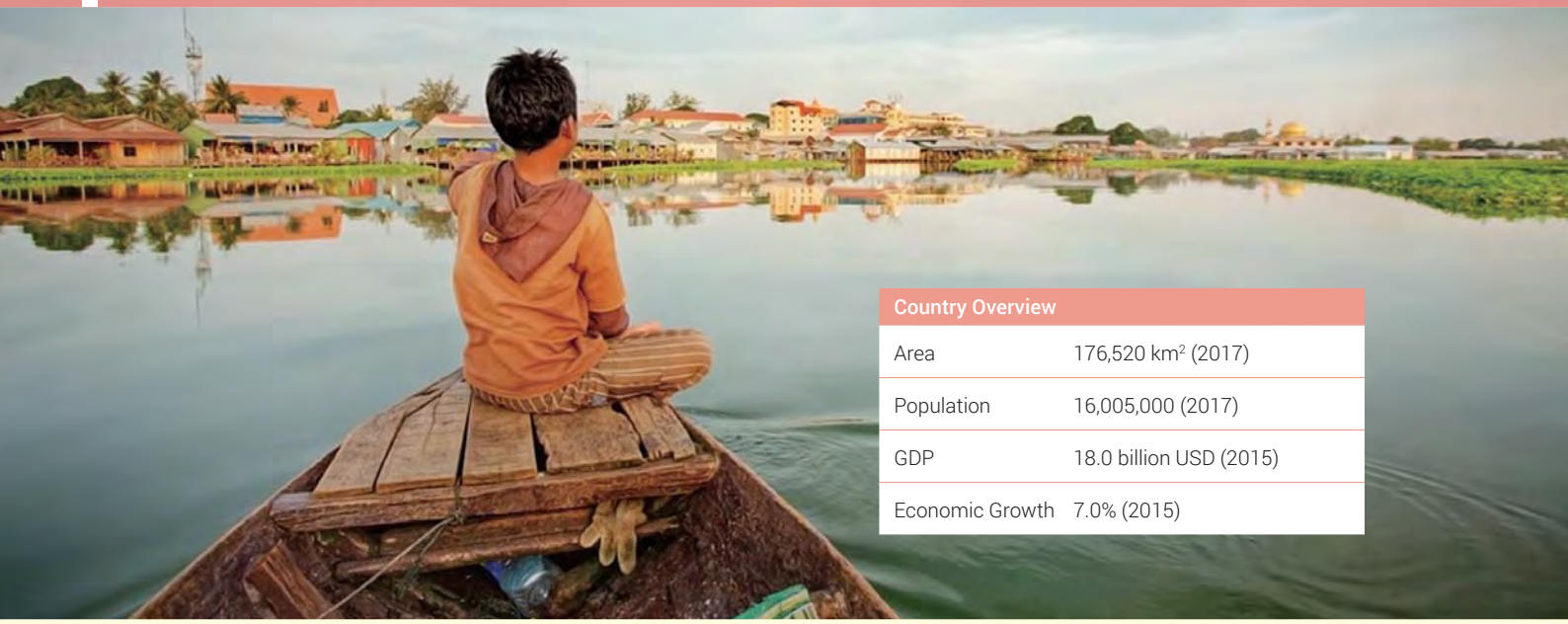
(As of January 2018)

Chapter 2

Efforts to Create Low-Carbon Societies in Asian Cities

Increasingly important in a rapidly-urbanising Asia, environmentally-friendly development is being mainstreamed, for example, the consideration of climate change measures in urban development plans.

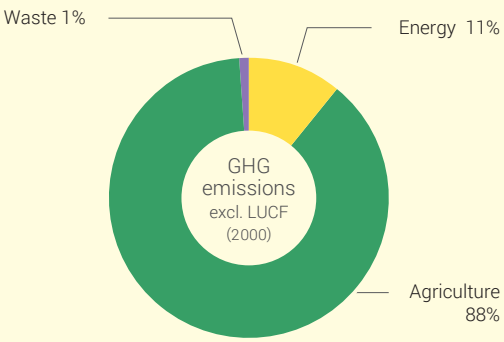
Kingdom of Cambodia



Country Overview	
Area	176,520 km^2 (2017)
Population	16,005,000 (2017)
GDP	18.0 billion USD (2015)
Economic Growth	7.0% (2015)

Climate Change Policy

Cambodia has been making explicit efforts on mainstreaming climate change into national and sub-national planning. The comprehensive national policy documents, i.e., the Climate Change Strategic Plan 2014–2023 (CCCSP) and associated action plans were developed by relevant ministries. The documents illustrate not only the country's priority adaptation needs, but also provide roadmaps for the decarbonization of key economic sectors and the enhancement of carbon sinks. Cambodia has also developed the National Strategic Plan on Green Growth (NGGSP) 2013-2030, in which addressing climate change is one important components. Cambodia pursues nationally determined contributions (NDCs) by implementing all policy and measures placed in those plans.



Greenhouse Gas Emissions by Sector

Nationally Determined Contributions	
Mitigation	Cambodia intends to undertake specific actions as listed in the NDCs, the impact of which is expected to be a maximum reduction of 3,100 Gg CO_2eq compared to baseline emissions of 11,600 Gg CO_2eq by 2030.
Adaptation	• Promoting and improving the adaptive capacity of communities, especially through community-based adaptation actions, and restoring the natural ecology system to respond to climate change • Strengthening early warning systems and climate information dissemination • Developing and rehabilitating the flood protection dikes for agricultural and urban development • Increasing the use of mobile pumping stations and permanent stations in responding to mini-droughts, and promoting groundwater research in response to drought and climate risk • Developing climate-proof agriculture systems for adapting to changes in water variability.

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	-457
Total emissions excl. LUCF	24,109
Emissions/removals from LUCF only	-24,566

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Cambodia's First Nationally Determined Contribution, 2017 / IGES Climate Policy and Market Mechanisms Status Report, 2017.

Siem Reap Province

Province Overview

Siem Reap Province has the fourth biggest city in Cambodia, Siem Reap City, as its capital city. The Province is located about 314 km away from the country's capital, Phnom Penh. Millions of tourists visit Siem Reap Province every year to see the famous temples of Angkor Wat. With rapid urbanisation and an increase in the number of toursts, the environment has been deteriorating as a result of inadequate urban infrastructure, waste management practices and air pollution control. Siem Reap City has set an overall vision for itself as a "Town of Green". Environmental development plans and the introduction of environmental public transport in the Angkor Archeology Park have been promoted under this vision.

Area	10.299 km^2
Population	1,042,286
Main industries	Agriculture, Service and others
City network membership	—

Climate Change Policy

The Siem Reap Provincial Administration supports Siem Reap City to raise public awareness on the environment by using environmental campaign and environmental days, organizing trainings and workshops, and placing banners in public spaces. Prioritized sectors for improving the urban environment are waste management, sewerage, public transportation and air quality. Siem Reap Province concluded an Memorandum of Understanding (MOU) with Kanagawa Prefecture in Japan in November 2015 to address environmental issues, including climate change, and create a Low-carbon Tourism City with the following prioritized sectors: renewable energy, energy savings and electric vehicles.

Partnering Japanese Cities in the City-to-City Collaboration Programme:

Kanagawa Prefecture (Page 66)

Source: Sophean U. "Siem Reap Province Cambodia" at the Seminar of JCM City-to-City Collaboration Projects, January 2017 / JDI, OECC, Asian Gateway Corp., Fiscal Year 2015 JCM Project Formulation Study for Realizing Low Carbon Cities in Asia (Project for Developing Low-carbon Tourism Cities through the Joint Crediting Mechanism in Siem Reap) Final Report, March 2016

Phnom Penh Capital City

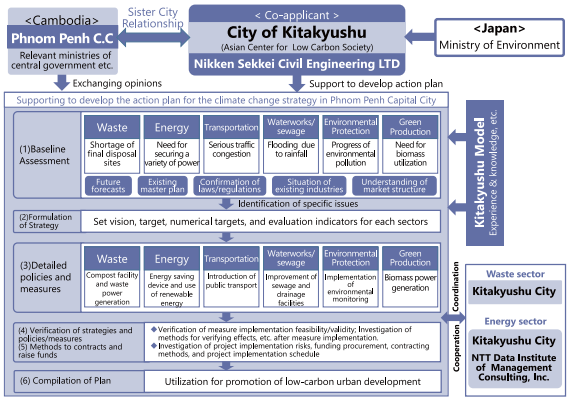
●City Overview

Phnom Penh is the capital city of Cambodia and is located at the point where the Mekong, Tonle Sap, and Bassac rivers meet. It is a center of security, politics, economics, cultural heritage and diplomacy. Aiming to become an environmentally-friendly city, Phnom Penh launched a vision to make the capital "green and clean" through the implementation program of Clean Water, Clean Land and Clean Air. Recently, the city has also developed the Green City Strategic Plan for Phnom Penh 2016-2025, which will provide a road map for Phnom Penh to achieve its eco-vision. Phnom Penh has been recognized internationally for their efforts towards environmental sustainability with the receipt of awards, including the Clean Water, Water for All Award (ADB, 2004), the World Leadership Award (London, 2007) and the ASEAN ESC Award (Bali, 2011).

Area	678 km^2
Population	1,501,724 (2015)
Main industries	Garments, trading, SMEs, property business, tourism
City network membership	Citynet, ASEAN ESC Model Cities Programme

●Climate Change Policy

The national climate change action plans drove the formulation of the Phnom Penh City Climate Change Strategic Action Plan, which also reflects several other environment-related plans created by the city, such as the Phnom Penh Land Use Plan, Urban Transport Plan, Drainage Improvement and Flood Control Plan, Water Supply Master Plan. The development of this comprehensive action plan was supported by Kitakyushu, its sister city in Japan. The action plan was developed to address current needs and challenges in Phnom Penh, such as the need to improve essential infrastructure for water supply, sanitation, waste management, transport, and energy services.



●Partnering Japanese Cities in the City-to-City Collaboration Programme:

City of Kitakyushu (Page 74), Kanagawa Prefecture (Page 66)

JCM Model Projects developed through the City-to-City Collaboration Programme

One low-carbon project has been developed through collaboration between Phnom Penh and Kitakyushu.

Introduction of 1-MW Solar Power System and a High-Efficiency Centrifugal Chiller in a Large Shopping Mall

(Adopted as a JCM Model Project in 2016)

- **Representative Participant:** AEON MALL Co., Ltd.
- **Partner Participant:** AEONMALL (CAMBODIA) CO., LTD.
- **Outline of GHG Mitigation Activity:**
  This project reduces electric power consumption in a new large shopping mall by introducing 1MW-class photovoltaic generation equipment (PV) and a high-efficient chiller.
  The electricity generated by the PV replaces grid power, resulting in the reduction of GHG emissions, along with the energy-saving effect from the chiller.
- **Expected GHG Emission Reductions:** 1,564.3 tCO_2/year

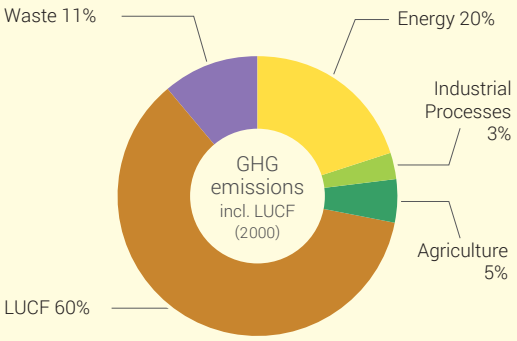
Source: Phnom Penh Capital City website / Angkor Focus "Phnom Penh Economy" / ASEAN ESC Model Cities Programme, "Phnom Penh - Siem Reap." IGES, Phnom Penh & Siem Reap, 2012 / Lord, F. and Sath, S. "From Business-As-Usual future to building a Green and Sustainable City: Future scenarios and actions for Phnom Penh," November, National Council for Sustainable Development - Global Green Growth Institute, Phnom Penh, 2016 / City of Kitakyushu and Nikken Sekkei Civil Engineering, "Phnom Penh City Climate Change Strategic Action Plan: City of Kitakyushu - Phnom Penh City Collaboration Project," 2017 / Global Environment Centre Foundation (http://gec.jp/jcm/projects/16pro_cam_01/)

Republic of Indonesia

Country Overview	
Area	1,811,570 km^2 (2017)
Population	263,991, 000 (2017)
GDP	861.9 billion USD (2015)
Economic Growth	4.8% (2015)

Climate Change Policy

Indonesia has promulgated relevant legal and policy instruments for addressing climate change, including the national action plan on GHG emissions (RAN-GRK) as stipulated in Presidential Regulation (PERPRES) No. 61/2011 and the GHG inventory through Presidential Regulation (PERPRES) No. 71, 2011. Under the Presidential Regulation No. 61/2011, provincial governments are also obligated to develop and implement a Regional Action Plan for GHG Emission Reduction (RAD-GRK). The national government has also made significant efforts towards developing and implementing a National Action Plan on Climate Change Adaptation (RAN-API), which provides a framework for adaptation initiatives that has also been mainstreamed to development plans at the national and city level.



Greenhouse Gas Emissions by Sector

Nationally Determined Contributions	
Mitigation	Indonesia is committed to reducing emissions by 29% compared to the business as usual (BAU) scenario by 2030. Indonesia's target should encourage support from international cooperation, which is expected to help Indonesia to increase its contribution up to 41% reduction in emissions by 2030.
Adaptation	• Study and map regional vulnerabilities as the basis of adaptation information system • Strengthen institutional capacity and promulgation of climate change sensitive policies and regulations by 2020. • Reduce risks on all development sectors (agriculture, water, energy security, forestry, maritime and fisheries, health, public service, infrastructure, and urban system) by 2030 through local capacity strengthening, improved knowledge management, convergent policy on climate change adaptation and disaster risks reduction, and application of adaptive technology.

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	1,375,588
Total emissions excl. LUCF	544,333
Emissions/removals from LUCF only	821,254

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Indonesia's First Nationally Determined Contribution. 2016 / IGES Climate Policy and Market Mechanisms Status Report, 2017.

Special Capital Region of Jakarta

Region Overview

Special Capital Region of Jakarta (DKI Jakarta), Indonesia's political and economic hub, is located on the north-eastern coast of the island of Java in the Indonesian archipelago in Southeast Asia. Jakarta has one of the highest rates of urbanization in the world and possesses one of the highest incomes per capita in Indonesia. In both the long-term development vision (2005-2025) and short-term vision (2018-2022), the word "sustainable" can be easily identified, which shows Jakarta's strong commitment to be an environmentally-friendly city.

Area	662.33 km^2
Population	10,177,924 (2017)
Main industries	Trading, construction, processing industry, information and communication
City network membership	C40, 100 Resilient Cities, Citynet, Compact of Mayors, etc.

Climate Change Policy

Jakarta expressed its intention to reduce GHG emissions by 30% from Business-as-Usual (BAU) scenario by 2030 at COP15 in 2009. In order to achieve the target, the city has released the Governor Regulation No. 38/2012 on Green Buildings and Governor Regulation No. 131/2012: Regional Action Plan for GHG Emission Reduction which was reviewed in 2015. The city also released the Grand Design of Green Building Jakarta, which shows the city's dedication to reducing energy usage, water consumption, and CO_2 emissions from buildings by 30% in 2030. According to Jakarta's GHG emission profile in 2005, 40% was from residential and commercial sectors and 19% was from the transportation sector. The proportions of those sectors are projected to increase respectively to 52% and 25% in 2030. Therefore, the promotion of green building and compact city development with public transportation is crucial for creating a low-carbon city.

Partnering Japanese Cities in the City-to-City Collaboration Programme: Kawasaki City (Page 64)

Source: BAPPEDA Provinsi DKI Jakarta, "RPJMD 2018-2012," RPJMD, 2018 / Badan Pusat Statistik Provinsi DKI Jakarta, "Jakarta Dalam Angka 2016," Jakarta, 2016 / GovLab Singapore, "Jakarta's Smart City vision - A megacity on a mission," Singapore, 2016 / Diyarni, I. P. Low Carbon Development in DKI Jakarta at the Seminar on City-to-City Collaboration for Low Carbon City Development in Asia, January 2018

Surabaya City

City Overview

Surabaya is the second biggest city in Indonesia and is also the capital city of East Java Province, which is also the largest province in Java Island in term of geographic area. The city is committed to sustaining its brand as the best Indonesian city for environmental management. The vision of Surabaya City for 2016-2021 is as a Prosperous, Characteristic, Globally Competitive and Ecologically-Based city. Surabaya receives an award from Adipura almost every year, national recognition of the city's achievements in environmental improvement.

Area	333.063 km^2
Population	3,016,653 (2016)
Main industries	Trading and services
City network membership	ICLEI, Citynet, Global Covenant of Mayors for Climate & Energy, etc.

Climate Change Policy

Based on the Governor Regulation on the Regional Action Plan on GHG Emission Reduction in East Java Province (Peraturan Gubernur Nr. 67/2012), Surabaya city government was instructed to implement a number of action plans from amongst other cities or regencies, as a part of the Regional Action Plan for GHG Emission Reduction (RAD-GRK). As the implementing agency, Mayor Tri Rismaharini has instructed the Environmental Bureau to carry out these action plans, as stated in the Mayor Regulation on the Organizational Structures and Roles of the Environmental Bureau of Surabaya City (Peraturan Walikota Nr. 58/2016). The newest city regulation that is related to climate change mitigation is the Mayor Regulation on the Organization of Car Free Days (Peraturan Walikota Nr. 1/2017). Other regulations related to climate change adaptation include the Regional Regulation on Urban Forest (Peraturan Daerah Nr. 15/2014) and the Regional Regulation on Tree Protection (Peraturan Daerah Nr. 19/2014).

Actions indicated in the RAD-GRK of East Java Province
1. Efficiency on electricity usage
2. Non-motorized transportation
3. Bus Rapid Transit system
4. Development of rail-based mass transportation
5. Development of 3R integrated final waste treatment and management site
6. Development of environmentally-friendly wastewater treatment facility
7. Monitoring of non-forestry activities inside the forest and resource inventory
8. Research and development on climate change policy for forestry

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Kitakyushu (Page 74)

JCM Model Projects developed through the City-to-City Collaboration Programme

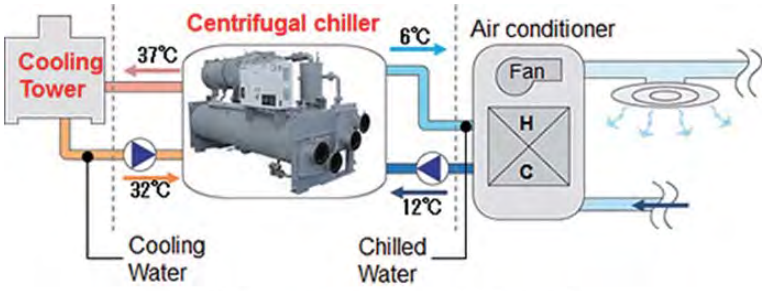
Two low-carbon projects have been developed through collaboration between Surabaya and Kitakyushu.

Energy Savings for Air-Conditioning at a Shopping Mall with the Installation of a High-Efficiency Centrifugal Chiller (Adopted as a JCM Model Project in 2015)

- **Representative Participant:** NTT FACILITIES, INC.
- **Partner Participant:** PT.PAKUWON JATI Tbk
- **Outline of GHG Mitigation Activity:**

  This project aims to reduce electricity consumption in a shopping mall through the introduction of an advanced and efficient Japanese centrifugal chiller system.

  The project will replace the existing central cooling system with a high-efficiency centrifugal chiller with capacity of 966USRT (4 sets) and 569USRT (1 set) in Pakuwon's shopping mall, Tunjungan Plaza, and will replace the existing 8 cooling towers with efficient Japanese models.
- **Expected GHG Emission Reductions:** 996 tCO_2/ yea



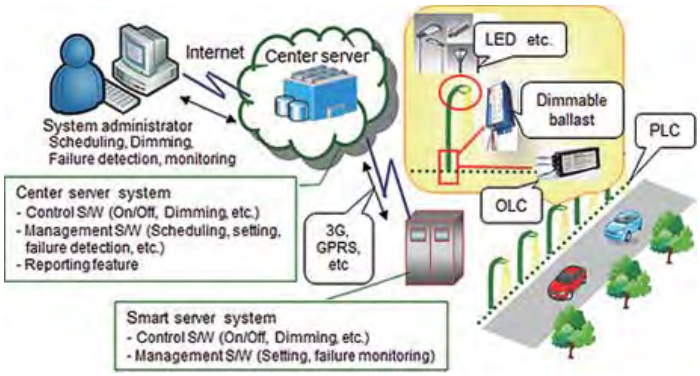
Centrifugal chiller in the A/C system

Energy Savings for Industrial Parks with Smart LED Street Lighting Systems (Adopted as a JCM Model Project in 2015)

- **Representative Participant:** NTT FACILITIES, INC.
- **Partner Participant:** PT. MALIGI PERMATA INDUSTRIAL ESTATE
  PT. HARAPAN ANANG BAKRI & SONS
  PT. KARAWANG TATABINA INDUSTRIAL ESTATE
- **Outline of GHG Mitigation Activity:**

  This project aims to reduce electricity consumption in the industrial park through the introduction of an advanced and efficient Japanese intelligent street lighting system using LED.

  The project reduces GHG emissions by the following measures: Replacement of existing street lights with high-efficiency LED lights and the introduction of intelligent systems to control and modulate light with the luminance of the surrounding environment.
- **Expected GHG Emission Reductions:**
  5,491 tCO_2/year



Source: Surabaya City Government, "Geografi," surabaya.go.id, 2015 / Surabaya City Government, "Statistik Sektoral Kota Surabaya 2016," surabaya.go.id, 2017 / Surabaya City Government, "Surabaya City Profile 2016," Surabaya City Government, Surabaya, 2016 / East Java Province, Governor Regulation on the Regional Action Plan on GHG Emission Reduction in East Java Province. East Java Province, 2012 / Global Environment Centre Foundation (http://gec.jp/jcm/projects/15pro_ina_01/) (http://gec.jp/jcm/projects/15pro_ina_02/)

Bandung City

City Overview

Bandung city is the capital of West Java Province in Indonesia, located approximately 150 km from Jakarta. The city's "Realization of the City of Bandung which is Superior, Comfortable, and Prosperous", is an indication of how Bandung city is committed to forward development, while also preserving its natural resources, in order to provide a good living environment for its citizens. Bandung City has been recognise on the national and international stage for its efforts to become an environmentally-friendly city, including its third win of the nationally-prestigious Adipura Award on the environment in 2017 and the ASEAN Environmentally Sustainable City Award in 2011.

Area	167.297 km^2
Population	2,490,622 (2016)
Main industries	Trading, processing industry
City network membership	Citynet, Global Covenant of Mayors for Climate & Energy

Climate Change Policy

The Regional Action Plan for GHG Emission Reduction (RAD-GRK) of West Java Province was enacted in 2012. Eight actions related to Bandung City are included in the action plan. Bandung was the first city in Indonesia to have a comprehensive mayoral regulation on green buildings (Peraturan Wali Kota Nr. 1023/2016), which was enacted on January 1, 2017. Other newer regulations related to climate change include the mayoral regulation on environmental management guidelines (Peraturan Wali Kota Nr. 844/2013) and the mayoral regulation on funding for the city's waste management (Peraturan Wali Kota Nr. 289/2017). These regulations show Bandung's voluntary commitment to developing their own mitigation and adaption actions.

RAD-GRK actions related to Bandung City
1. Socialization of biogas energy utilization in households
2. Bio-digester installation program from organic waste, animal and human feces in the household
3. Development of biofuels from local resources, such as paddy straw or organic waste rice fields
4. Implementation of smart technology with sensing-technology in electricity use
5. Implementation of eco-building concept in the offices
6. Installation of solar cells in residencies and industries
7. Construction of micro-PLTSA or waste incinerator

Partnering Japanese Cities in the City-to-City Collaboration Programme: Kawasaki City (Page 64)

Source: Bandung City Government, "Kondisi Geografi Kota Bandung," Bandung, 2017 / BPS Kota Bandung, "KOTA BANDUNG DALAM ANGKA Bandung City in Figures 2015," Bandung, 2017 / Bandung City Government, "Struktur Perekonomian Kota Bandung Berdasarkan Sektor - Datasets - Portal Data Kota Bandung," Open Data Kota Bandung, 2017 / Bandung City Government, "Visi dan Misi," Portal Data Kota Bandung, 2005 / W. J. Province, RAD-GRK of West Java Province. West Java Province, 2012

Batam City

City Overview

Geographically, Batam is located strategically along an international shipping route. It is an industry, tourism and MICE* desitnation city and oriented as a FTZ-free trade zone and KEK-special economic zone operated by both the Batam city local government (Pemko) and Batam Indonesia Free Zone Authority (BIFZA). Batam's vision is to be a peaceful, competitive, modern, prosperous and dignified world city. To achieve this vision, six missions have been set up, including a mission to build Batam with environment-friendly designs, modern infrastructure, and comfortably-designed green/smart settlements based on the national culture and local wisdom. Mayor Muhammad Rudi has already targeted these issues during his leadership, thinking about winning back the nationally-prestigious Adipura Award on the environment, which has slowly receded since 2013.

* MICE is the abbreviation of "Meeting, Incentive (Travel), Convention, Exhibition/Event"

Area	3,990 km^2
Population	1,037,187 (2015)
Main industries	Communication, energy, banking, industry, shipping, trading, services
City network membership	UCLG

Climate Change Policy

The mayor assigned the Batam Environmental Services to be the leading institution on environmental issues with the section of Environmental Planning in charge of implementing the city's climate change's mitigation and adaptation action plans (Peraturan Walikota Nr. 51/2016). As part of the city government's tasks for addressing climate change issues, both mitigation and adaptation are clearly stated in the Regulation on Environmental Protection and Management (Peraturan Daerah Nr. 4/2016). Batam City and Yokohama in Japan signed a Letter of Intent (LoI) related to technical cooperation in May 2015. Under this framework, the low-carbon technologies of the private sector as well as environmental management capacity and systems of Yokohama have been shared and promoted.

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Yokohama (Page 61)

Source: Batam City Government homepage / Centre for Liveable Cities & Urban Redevelopment Authority, "Who's Coming - H.E. Muhammad Rudi," World Cities Summit, 2017 / Antaranews, "Batam Raih Sertifikat Adipura," Berita Kepulauan Riau Terkini, 2017

Semarang City

City Overview

Semarang is the capital of the Province of Central Java. The northern part of the city directly borders the Java Sea. Semarang city aims to become a great trading and service hub towards the development of a more prosperous society. The vision is transformed into four missions and emphasises efforts to develop a dynamic and environmentally-friendly city. Semarang is recognized as one of best practices and references from other cities in and outside of Indonesia because of its proactive commitment to climate change-related works.

Area	373.70 km^2
Population	1,602,717 (2016)
Main industries	Processing industry, construction, trading, vehicle maintenance
City network membership	100 Resilient Cities, ICLEI, Citynet

Climate Change Policy

Semarang has been taking concrete mitigation and adaptation actions since 2009. The city government promoted adaptation actions by developing a city resilience strategy, studying and reviewing existing related policies and implementing various innovative programs such as those to address drought problem, build rain water harvesting system, and invest in early warning systems for floods and vector-borne diseases. Semarang is also committed to mitigation actions by developing emission inventory and implementing programs, which facilitates the introduction and expansion of low-carbon products and infrastructure. In 2016, the Semarang city government developed the Semarang City's Resilience Strategy Document as part of the 100 Resilient Cities initiative, with various activities implemented under six pillars.

Six Pillars in Semarang City's Resilience Strategy
1. Sustainable Water and Energy
2. New Economic Opportunities
3. Readiness for Disasters and Diseases
4. Integrated Mobility
5. Transparent Public Information and Governance
6. Competitive Human Resources

Partnering Japanese Cities in the City-to-City Collaboration Programme: Toyama City (Page 58)

Source: Semarang City Government, Revision to the Regional Regulation of Semarang Nr. 6/2016 on Midterm Development Plan 2016-2021, Indonesia: Semarang City Government, 2017 / Semarang City Government, "Visi dan Misi," Profil Kota Semarang, 2015 / 100 Resilient Cities, "Semarang's Resilience Challenge," Semarang - 100 Resilient Cities, 2018 / 100 Resilient Cities, "Resilient Semarang: Moving together towards a resilient Semarang," Semarang, 2016

Bali Province

●Province Overview

The province of Bali is mainly located on Bali Island with several other small islands in the surrounding area. It is internationally famous as Indonesia's major tourist destination. In 2016 alone, the number of visits by foreign tourists reached up to almost 5 million. The province declared the Bali Green Province Program in 2010 with the vision of developing Bali as sustainable (clean, healthy, comfortable, everlasting, and beautiful). This is also documented in the Midterm Development Plan 2013-2018.

This document plan stated the strategies to be applied in Bali Green Province, which covers Green Culture, Green Economy, and Clean and Green programs.

Area	5,636,66 km^2
Population	4,200,100 (2016)
Main industries	Tourism and agriculture
City network membership	-

●Climate Change Policy

Bali Province released the Regional Action Plan for GHG Emission Reduction (RAD-GRK) in December 2012 by enacting the Governor Regulation on the Regional Action Plan on GHG Emission Reduction in Bali Province (Peraturan Gubernur Nr. 49/2012). The top 3 actions based on its emission targets are as follows: efficiency on electricity usage, rehabilitation of land and forest, and use of renewable energy.

Top 3 Actions indicated in the RAD-GRK of Bali Province
1. Efficiency on electricity usage
2. Rehabilitation of land and forest
3. Use of renewable energy

●Partnering Japanese Cities in the City-to-City Collaboration Programme:

Clean Authority of TOKYO (Page 60)

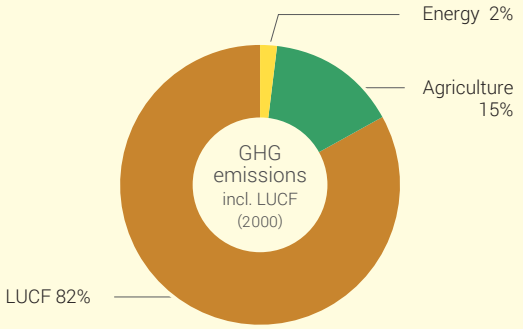
Source: Bali Province, "Bali in Figures 2017," BPS – Statistics of Bali Province, Bali, 2017 / Bali Province, "Regional Profile of Bali Province Year 2016," R&D Regional Development Planning Agency of Bali Province, Denpasar, 2017 / Bali Province, "Report of Regional Environment Status," Bali Province, Bali, 2015

Lao People's Democratic Republic

Country Overview	
Area	230,800 km^2 (2017)
Population	6,858,000 (2017)
GDP	12.3 billion USD (2015)
Economic Growth	7.0% (2015)

Climate Change Policy

Laos set multiple targets as its nationally determined contributions (NDCs). The Lao government aims to achieve these targets by implementing policies and measures set out in the National Climate Change Strategy (NCCS) of the Lao PDR (2010), as well as the climate change action plans for the period 2013-2020. Mitigation and adaptation actions are defined in the sectors of agriculture, forestry, land use change, water resources, energy, transportation, industry and public health. Although there are no specific mandates for local governments, some adaptation and mitigation options are provided in the NCCS for urban development.



Greenhouse Gas Emissions by Sector

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	50,818
Total emissions excl. LUCF	8,898
Emissions/removals from LUCF only	41,920

Note: "LUCF" stands for Land-Use Change and Forestry sector

Nationally Determined Contributions	
Mitigation	• To increase forest cover to 70% of land area (i.e. to 16.58 million hectares) by 2020. Once the target is achieved, emission reductions will carry on beyond 2020. • To increase the share of renewable energy to 30% of energy consumption by 2025. • To make electricity available to 90% of households in rural area by the year 2020. This will offset the combustion of fossil fuels to produce power where there is no access to the electricity grid • Approximately total installed capacity of the hydropower plants will be 5,500 MW by 2020. • In addition, 20,000 MW of additional hydroelectric capacity is planned for construction after 2020
Adaptation	• Climate Resilience in Farming Systems and Agriculture Infrastructure; • Climate Resilience in Forestry Production and Forest Ecosystems; • Water Resource Information Systems; Managing Watersheds and Wetlands; Increasing Water Resource Infrastructure Resilience; • Increasing the Resilience of Urban Development and Infrastructure to Climate Change; • Increasing the Resilience of Public Health Infrastructure and Water Supply System

Source: The World Bank / UN Data / UNFCCC / Lao PDR's First Nationally Determined Contribution. 2016 / IGES Climate Policy and Market Mechanisms Status Report, 2017.

Vientiane Capital City

City Overview

Vientiane, the capital city of Laos, is located on a curve of the Mekong River. The city is called the "Green Capital", as the cities are lined with trees. The city government issued a policy for keeping Vientiane City clean, green, beautiful and livable by launching six So's (in Lao language) slogans namely: peaceful, clean, bright, green, civilized and charming. The "clean" and "green" are related directly to the city's commitment in transforming itself into an environmentally-friendly city. These slogans serve as the basis for all development in the city when it encounters urban problems, most of which are related to its environment. The city realizes that it is important to consider environmental protection along with controlling and regulating urban development.

Area	3,920 km^2
Population	876,838 (2013)
Main industries	Service, agricultural, mining and quarrying activity
City network membership	ASEAN Environmentally Sustainable Cities (ESC)

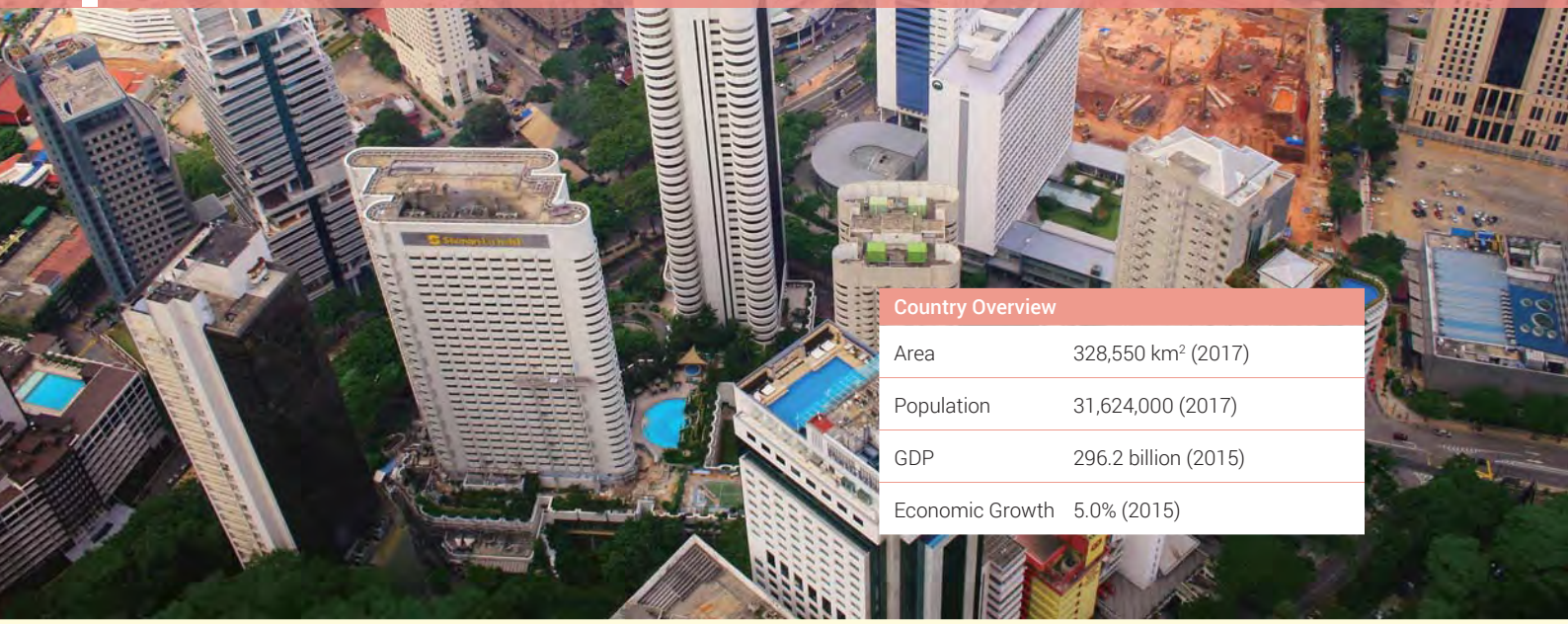
Climate Change Policy

Vientiane aims to become a historic low-carbon city in line with the national climate change policy by implementing the following actions: 1) formulation and dissemination of the Environmentally Sustainable City (ESC) Guidelines, which considers the social economic environment, natural environment and socio-living environment in Vientiane, 2) improvement of solid waste management (SWM) in three pilot cities (Vientiane Capital, Luang Prabang and Xaiyabury) based on the ESC Guidelines, and 3) promotion of community-based urban environmental management for SWM in the pilot cities. Vientiane also puts emphasis on its Master Plan on Comprehensive Urban Transport of Vientiane as one of the city's main guidelines towards sustainable development.

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Kyoto (Page 68)

Source: CCAC Municipal Solid Waste Initiative, "Solid Waste Management City Profile: Vientiane Capital, LAO People's Democratic Republic," 2015 / "Vientiane Capital Urban Development Master Plan," PTI & JICA, Vientiane, 2011 / B. Heuangsavath, "JCM Project based on City-to-City Collaboration: Vientiane Capital City," Vientiane Capital City, Vientiane, 2016 / GIZ, "Master Plan on Comprehensive Urban Transport of Vientiane (Laos) | Transport NAMA Database", 2018 / Phouangmanivang, R. Lao PDR "Implementing Reduce Green House Gas Emissions To Low-Carbon And Sustainable City Development" at the Joint Crediting Mechanism (JCM) Workshop: From Study to Commercialization, October 2014

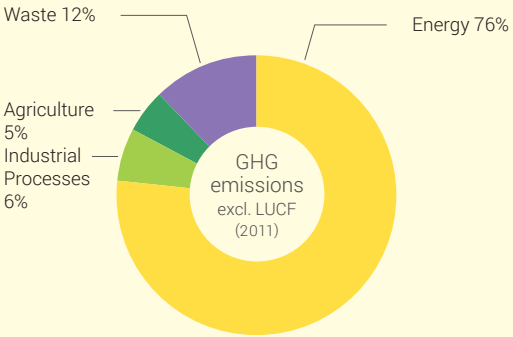
Malaysia



Country Overview	
Area	328,550 km^2 (2017)
Population	31,624,000 (2017)
GDP	296.2 billion (2015)
Economic Growth	5.0% (2015)

Climate Change Policy

Malaysia's National Policy on Climate Change (2009) provides the framework for mobilising and guiding all stakeholders in addressing climate change with five principles: 1) development on a sustainable path, 2) conservation of environment and natural resources, 3) coordinated implementation, 4) effective participation, and 5) common but differentiated responsibilities and respective capabilities. These efforts are further promoted by the Eleventh Malaysia Plan (2016-2020) with a strategic thrust on Pursuing Green Growth for Sustainability and Resilience. The Ministry of Energy, Green Technology and Water (KeTTHA) set the Low Carbon Cities Framework (LCCF) to promote local actions, which guides the implementation of carbon reduction measures in cities and townships. Areas of focus include the urban environment, urban transport, urban infrastructure and buildings.



Greenhouse Gas Emissions by Sector

Nationally Determined Contributions	
Mitigation	45% by 2030 compared to that of year 2005 (Carbon intensity reduction)
Adaptation	• Addressing Flood Risks • Water Security • Food Security • Protecting Coastlines Health

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	26,418
Total emissions excl. LUCF	286,874
Emissions/removals from LUCF only	-260,457

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Malaysia's First Nationally Determined Contribution. 2016. / Tajuk Kertas: Low Carbon Cities Framework and Assessment system, at Mesyuarat Jawatankuasa Perundingan Pihak Berkuasa Tempatan (JPBBT), 2016.

Iskandar Development Region

Region Overview

Iskandar Development Region or Iskandar Malaysia is located just across its neighbor, Singapore, on the southernmost tip of Malaysia Peninsula. It has developed as a metropolis consisting of five local authorities: Johor Bahru, Pontian, Kulai, Pasir Gudang, and its capital, Iskandar Puteri. The metropolis is developed by the Iskandar Regional Development Authority (IRDA) based on the Comprehensive Development Plan II (CDPii) 2014-2025. The CDP elucidates the vision of Iskandar Malaysia to become "A Strong and Sustainable Metropolis of International Standing". Sustainability is certainly the thread that runs through the entire fabric of the Iskandar Malaysia development model. One of the core elements for development is "Resource Optimization and Low Carbon".

Area	2,217 km^2
Population	1,950,400 (2015)
Main industries	Manufacturing, retail/mixed development, residential property segments
City network membership	-

Climate Change Policy

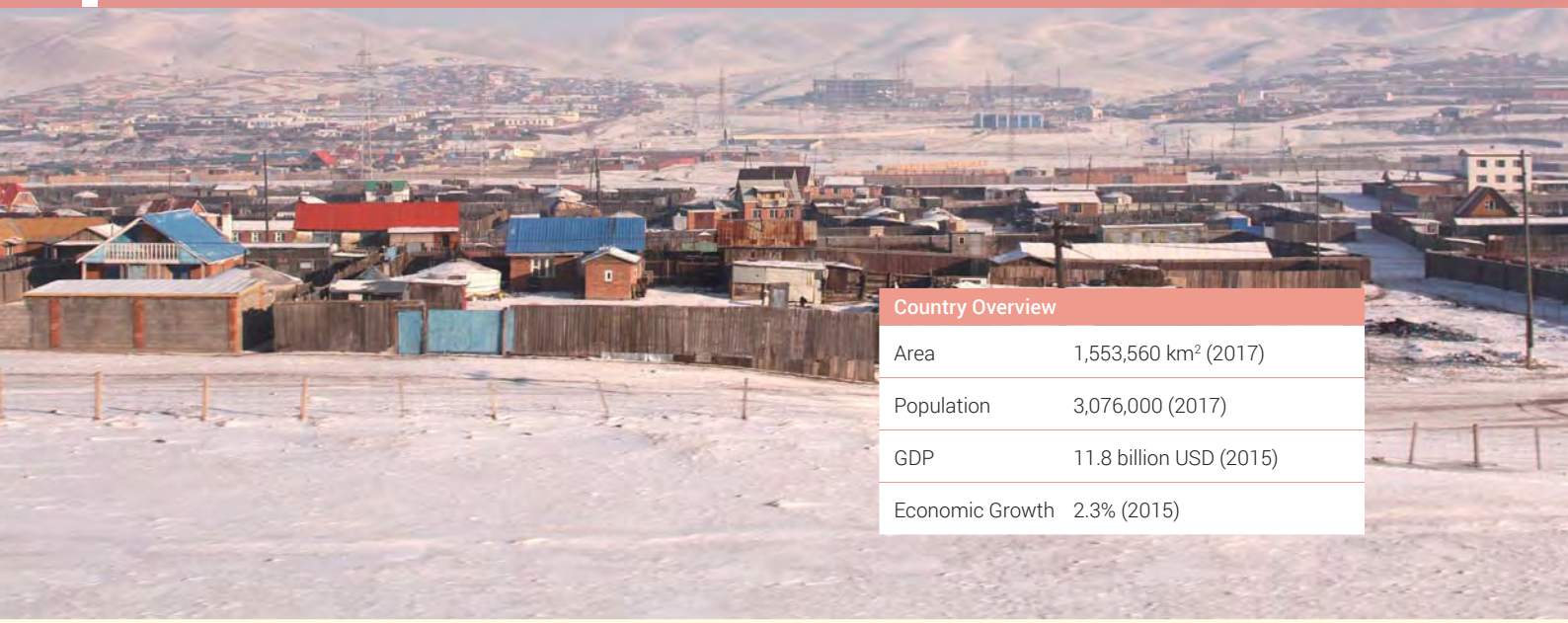
Iskandar Malaysia aims to reduce greenhouse gas emissions by 50% by 2025 by implementing 281 programmes included in the Low Carbon Society Blueprint for Iskandar Malaysia 2025 (LCSBPIM2025). The blueprint serves as a guide for policy-makers, businesses, NGOs and others to go green. The programmes fall under 12 key actions that are grouped in 3 parts: Green Economy, Green Community and Green Environment. The blueprint was launched by IRDA at COP18 and endorsed by the Prime Minister of Malaysia in December 2012. In 2016, Iskandar Malaysia reduced GHG emission intensity by 10.7%.

Action Names	Themes
1. Integrated Green Transportation	GREEN ECONOMY
2. Green Industry	
3. Low Carbon Urban Governance	
4. Green Building & Construction	
5. Green Energy System & Renewable Energy	
6. Low Carbon Lifestyle	GREEN COMMUNITY
7. Community Engagement & Consensus Building	
8. Walkable, Safe, Livable City Design	GREEN ENVIRONMENT
9. Smart Growth	
10. Green and Blue Infrastructure & Rural Resources	
11. Sustainable Waste Management	
12. Clean Air Environment	

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Kitakyushu (Page 74)

Source: IRDA homepage / IRDA, "Annual Report 2015," Johor Bahru, Malaysia / IRDA, "10 Year Progress Report," Johor Bahru, Malaysia, 2016 / Joeman B. D., "Low Carbon Society Blueprint for Iskandar Malaysia: Building Energy Monitoring & Reporting System (BEMRS)" at the City-to-City Collaboration Seminar, January 2018

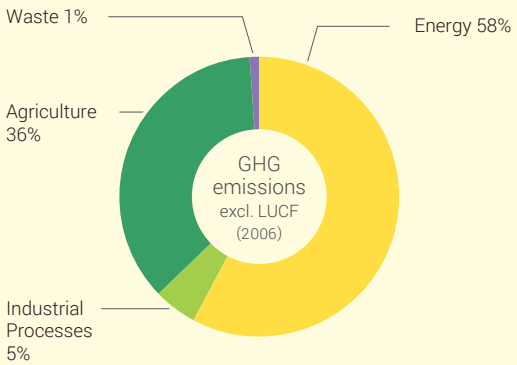
Mongolia



Country Overview	
Area	1,553,560 km^2 (2017)
Population	3,076,000 (2017)
GDP	11.8 billion USD (2015)
Economic Growth	2.3% (2015)

Climate Change Policy

Mongolia's first Green Development Policy was adopted by Parliament in 2014. This policy is the main generator of other important regulations and action plans such as the Nationally Determined Contributions (NDCs) submission by Mongolia. The National Action Programme on Climate Change (NAPCC) endorsed by Parliament 2011 includes concrete measures in response to climate change covering all principal sectors of the economy; and therefore, it serves as the basis for NDC development. The NAPCC suggests local governments facilitate actions and measures related to climate change adaptation and GHG mitigation in local areas.



Greenhouse Gas Emissions by Sector

Nationally Determined Contributions	
Mitigation	A series of policies and measures to implement up to 2030, in the energy, industry, agriculture and waste sectors is expected to achieve 14% reduction in total national GHG emissions excluding LULUCF by 2030, compared to the projected emissions under BAU scenario.
Adaptation	Implement sustainable pasture management, increase irrigated cropland, reduce soil water loss and decrease soil carbon emissions, maintain availability of water resources through protection of runoff formation zones and in river basins, reduce forest degradation rate, improve effectiveness of forest management, enhance and improve early warning and prevention systems for natural disasters, etc.

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	15,628
Total emissions excl. LUCF	17,711
Emissions/removals from LUCF only	-2,083

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Mongolia's First Nationally Determined Contribution. 2016 / IGES Climate Policy and Market Mechanisms Status Report, 2017.

Ulaanbaatar City

City Overview

Ulaanbaatar is the capital city of Mongolia, located in the central area of the country at 1,350 m above sea level. Various environmental issues have appeared in Ulaanbaatar due to the recent rapid increase in population and sharp economic growth. The city has set up a vision in the Ulaanbaatar Master Plan 2030 to become an environmentally-friendly city. One of six priority areas is making Ulaanbaatar a safe, healthy, and green city that is resilient to climate change.

Area	4,700 km^2
Population	1,440,400 (2016)
Main industries	Services, industry and construction, agriculture
City network membership	Citynet

Climate Change Policy

Mongolia's first Green Development Policy adopted by Parliament in 2014 was the main generator of the Ulaanbaatar 2020 Master Plan and Development Approach for 2030 at the city level. To strengthen the implementation of these policy documents, the Capital City Governor and Mayor of Ulaanbaatar in June 2015 developed the Green Development Strategic Action Plan (GDSAP) for Ulaanbaatar through a multi-sectoral consultative process. The GDSAP provides a more convincing vision in aiming at the development of Ulaanbaatar as a green city, environmentally sustainable with inclusive economic growth, active public participation and a safe and healthy living environment for its citizens. Seven priority challenges and green goals have been identified and climate change has also been considered in the GDSAP.

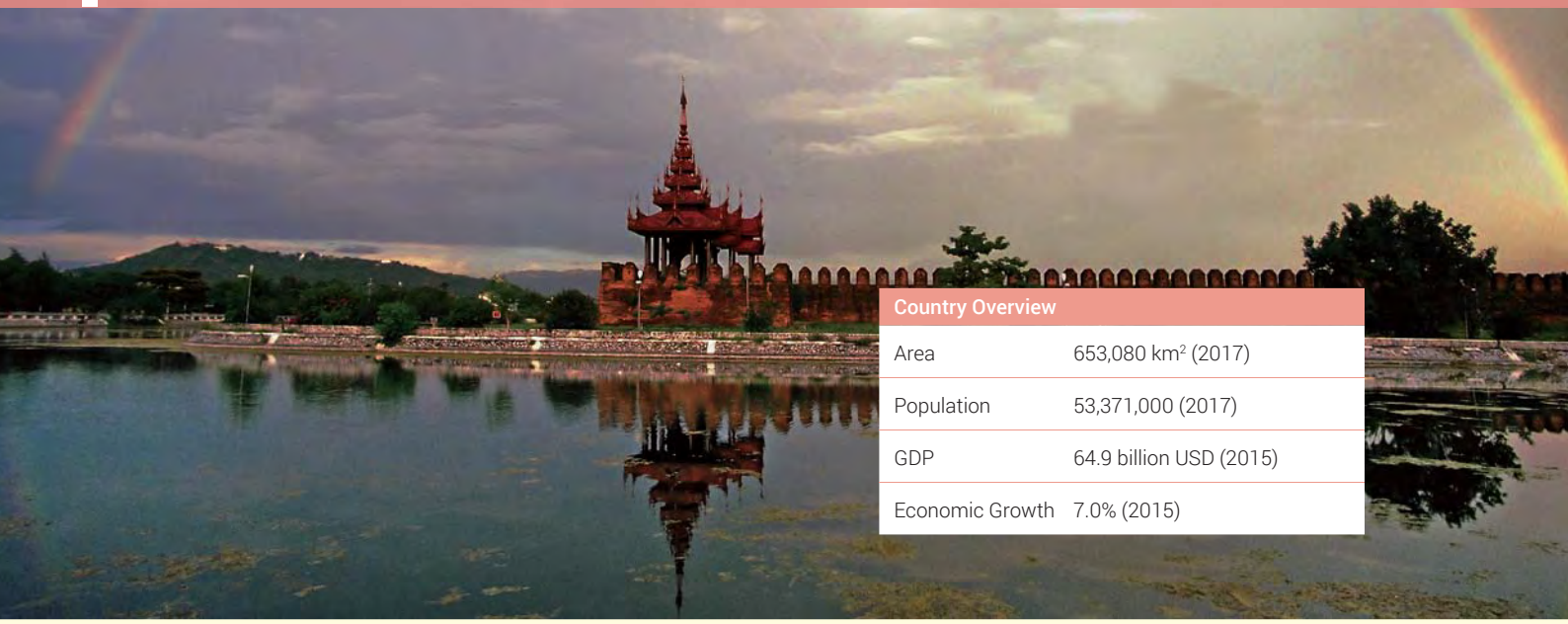
Green goals identified in the GDSAP
1. Cleaner air
2. Sustainable transport
3. Improved solid waste management
4. Water security
5. Cleaner soil
6. Participation in sustaining the environment
7. Climate change resilient

Partnering Japanese Cities in the City-to-City Collaboration Programme:

City of Sapporo & Hokkaido (Page 54)

Source: National Statistics Office of Mongolia, "Mongolian Statistical Yearbook 2016," Ulaanbaatar, Mongolia, 2016 / B. Chilkhaasuren and B. Baasankhuu, "Population and Economic Activities of Ulaanbaatar," Ulaanbaatar, Mongolia, 2012 / Master Planning Agency of the Capital City, "Ulaanbaatar 2020 Master Plan and Development Approaches for 2030," Master Planning Agency of the Capital City, Ulaanbaatar, Mongolia, 2014 / Ulaanbaatar Municipality, "Green Development Strategic Action Plan for Ulaanbaatar 2020," Ulaanbaatar, Mongolia, 2015

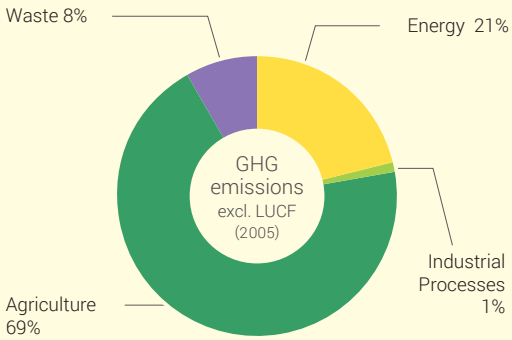
Republic of the Union of Myanmar



Country Overview	
Area	653,080 km^2 (2017)
Population	53,371,000 (2017)
GDP	64.9 billion USD (2015)
Economic Growth	7.0% (2015)

Climate Change Policy

The Environmental Conservation Law (2012) is being implemented in Myanmar and includes provisions to address climate change, as well as provisions for Environmental Impact Assessments in development projects. The recently drafted Myanmar Climate Change Strategy and Action Plan (MCCSAP) provides a roadmap to guide Myanmar's strategic responses and actions to climate-related risks and opportunities as well. The MCCSAP is aligned with Myanmar's development policies—supporting the National Comprehensive Development Plan and National Sustainable Development Strategy—and builds on the country's climate change policies, including its National Adaptation Programme of Action (NAPA) and Nationally Determined Contribution (NDCs). All these regulations are basically binding to the city as well.



Greenhouse Gas Emissions by Sector

Nationally Determined Contributions	
Mitigation	• hydroelectric generation of 9.4 GW by 2030 • Rural electrification through the use of at least 30% renewable sources as to generate electricity supplies • Realise a 20% electricity saving potential by 2030 of the total forecast electricity consumption • Distribute approximately 260,000 cook stoves between 2016 and 2031. (Policy & Actions)
Adaptation	• Resilience in the agriculture sector, developing early warning systems and forest preservation measures • Public health protection and water resource management • Coastal zone protection • Energy and industry sectors, and biodiversity preservation

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	-57,400
Total emissions excl. LUCF	38,375
Emissions/removals from LUCF only	-95,775

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Germanwatch e.V., Global Climate Risk Index 2018. / Myanmar's First Nationally Determined Contribution. 2017 / IGES Climate Policy and Market Mechanisms Status Report, 2017

Mandalay City

City Overview

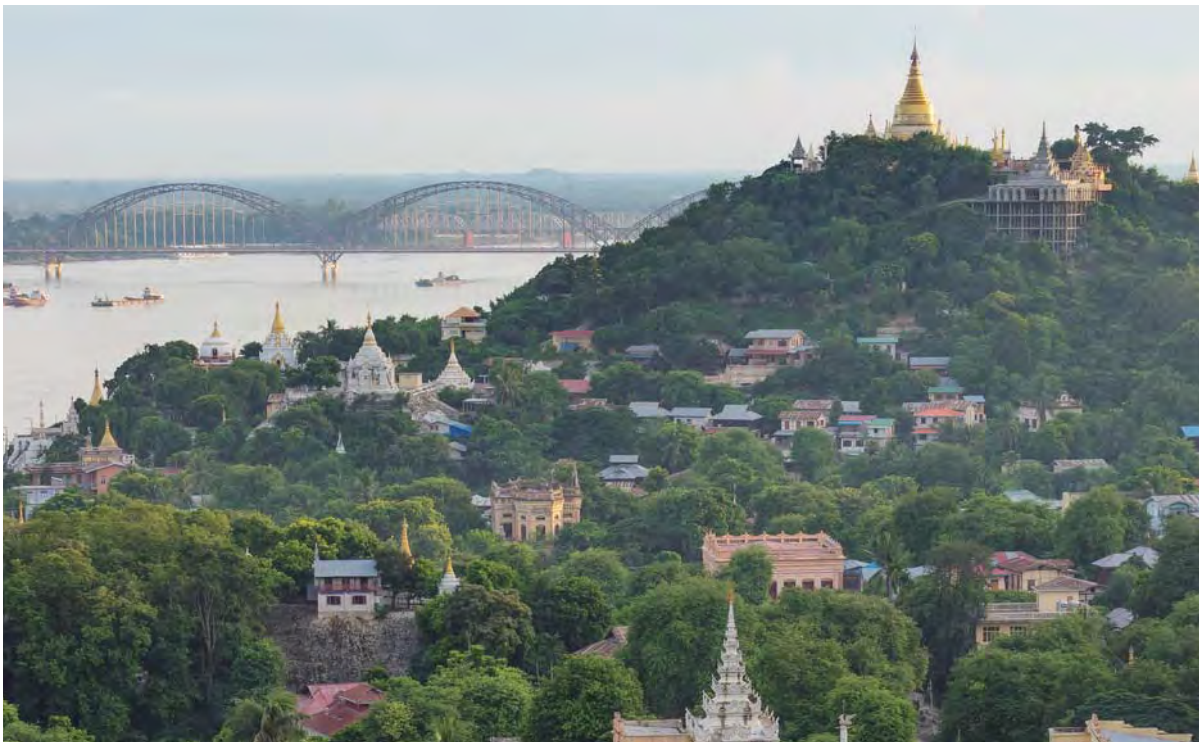
Manadaly City is the last ancient royal capital of Myanmar and is located at the eastern part of Ayeyarwaddy River in the middle part of central Myanmar. With a vision to create a clean and prosperous green city by 2040, the city government developed the first 25-year urban development plan in 2014 with the support of the Asian Development Bank (ADB) and the French Agency for Development (AFD). With a focus on water and waste sectors, the city government implements projects for improving urban services to realise its vision.

Area	44.59 km^2
Population	1,225,000 (2014)
Main industries	Agriculture, trading and logistics, minerals and mining, and wood and forestry
City network membership	-

Climate Change Policy

Mandalay has been contributing to the development of low-carbon society by promoting the use of biogas digesters and reforestation. The biogas project is considered to have multi-benefits such as the prevention of deforestation and air pollution. Currently, about 60% of constructed biogas digesters are located in Mandalay. The projects for improving solid waste management, water supply, and wastewater treatment are also being promoted in cooperation with multiple international donors. Kitakyushu in Japan offers technical cooperation in those areas and environmental education, which is essential for developing the foundation for a smart and green city.

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Kitakyushu (Page 74)



Source: ADB. Toward a Green Mandalay, 2015 / Citynet, City Voices, Vol. 7 No. 2, 2016 / Lin, S. Rural Electrification using Biomass Energy at the workshop on City-to-City Collaboration Projects in July 2017

Yangon City

City Overview

Yangon City is the old capital and the center of economic activity in Myanmar with an economic growth rate up to 7.8% in 2016. In 2013, Yangon City Development Committee (YCDC), in cooperation with Japan International Cooperation Agency (JICA), developed the Strategic Urban Development Plan of Greater Yangon. This master plan shows a substantial environmentally-friendly approach in developing the city in the future. The city's vision stated as a slogan in this master plan is to be "The Peaceful and Beloved Yangon, a City of Green and Gold". One pillar concept for this vision is to be a comfortable city which pays attention to the richness of the green areas, disaster risk reduction, and other environmental aspects.

Area	598.8 km^2
Population	5,200,000 (2014)
Main industries	Processing and manufacturing, trade, service
City network membership	FMDV

Climate Change Policy

In these recent years and the coming future, Yangon has been and will encounter more frequent droughts, intense rains that lead to extreme floods, rise in sea levels, and rising temperatures, all of which are related to climate change. The city government urges all related stakeholders to develop specific mitigation and adaptation action plans together for the city based on the upper regulations mentioned above. The Department of Meteorology and Hydrology (DMH) in Yangon is continuing its monsoon advocacy programmes around the delta region and is also hoping to implement a long-stalled SMS early warning system.

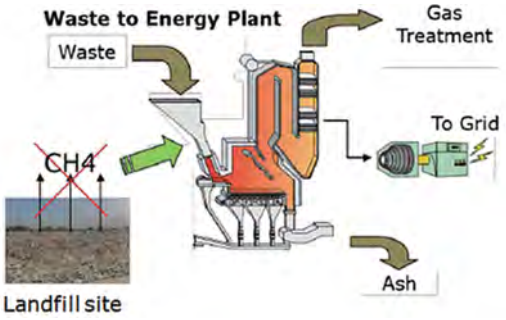
Partnering Japanese Cities in the City-to-City Collaboration Programme: Kawasaki City (Page 64)

JCM Model Projects developed through the City-to-City Collaboration Programme

Three low-carbon projects have been developed through the collaboration between Yangon and Kawasaki.

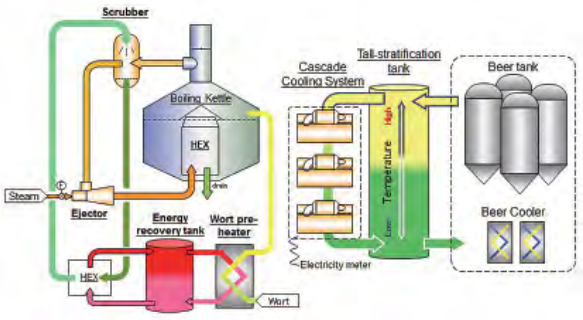
Introduction of Waste-to-Energy Plant in Yangon City (Adopted as a JCM Model Project in 2015)

- **Representative Participant:** JFE Engineering Corporation
- **Partner Participant:** Yangon City Development Committee
- **Outline of GHG Mitigation Activity:**
  The objective of this project is to build and operate a waste-to-energy plant that (1) generates electricity, some of which will be supplied to a power company, resulting in reduction of fossil fuel consumption at the power plant, (2) mitigates electricity shortages, (3) reduces CH_4 emissions from landfill disposal, and (4) improves waste management in Yangon City. This is a pilot project conducted by Yangon City to promote waste-to-energy, with relatively small capacity (60t of waste per day).
- **Expected GHG Emission Reductions:** 4,732 tCO_2/ year



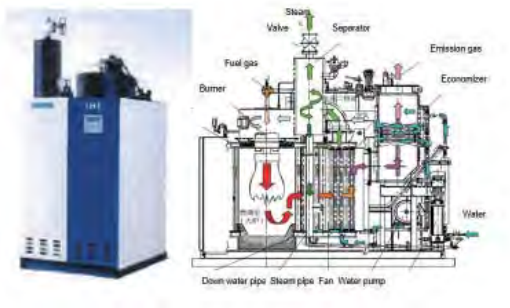
Introduction of Energy-Saving Brewing Systems in Beer Factory (Adopted as a JCM Model Project in 2016)

- **Representative Participant:** Kirin Holdings Company, Limited.
- **Partner Participant:** Myanmar Brewery Ltd.
- **Outline of GHG Mitigation Activity:**
  With a plan to expand the production system at a beer factory in Myanmar, the introduction of high-efficiency equipment to the process for brewing beer will result in additional energy savings and reductions in CO_2 emissions.
  A heat recovery system to recover and reuse steam during the process of boiling wort has been installed and one of the existing furnace smoke tube boilers are replaced with multitubular once-through boilers.
  In the process for cooling, tall-stratification tanks with cascade cooling system (High Efficiency Chiller System) have been installed.
- **Expected GHG Emission Reductions:** 2,841 tCO_2/year



Introduction of Energy-Saving Brewing Systems in Beer Factory (Adopted as a JCM Model Project in 2016)

- **Representative Participant:** Acecook Co.,Ltd.
- **Partner Participant:** Acecook Myanmar Co.,Ltd.
- **Outline of GHG Mitigation Activity:**
  To save energy, a high-efficiency, low-pollutant, once-through boiler is installed to supply steam to an instant noodle factory. Fuel consumption and emissions of CO_2 and air pollutants are reduced by the project boiler.
  The project boiler has high energy-saving characteristics with four-position control (at 100%, 65%, 25%, 0% load) and an economizer.
- **Expected GHG Emission Reductions:** 674 tCO_2/year



Source: Kawasaki City Government, "JCM City-to-City Collaboration between Kawasaki City and Yangon City," Kawasaki City Government, Kawasaki, 2016 / YCDC and JICA, "The Strategic Urban Development Plan of the Greater Yangon," YCDC & JICA, Yangon, 2013 / FMDV, "FMDV Network," FMDV, 2017. / J. Board, "ASIA'S FUTURE CITIES: Yangon lacking resilience to face future disasters -," Channel NewsAsia, 2017 / GEC homepage (http://gec.jp/jcm/projects/15pro_mya_01/) (http://gec.jp/jcm/projects/16pro_mya_01/) (http://gec.jp/jcm/projects/16pro_mya_02/)

Ayeyarwady Region

Region Overview

Ayeyarwady region is located in the southernmost region of the Central Myanmar Delta region of the Ayeyarwady river. The region is known as the "Barn of Myanmar", as it produces about 30% of rice consumed in the country. Pathein City, the region's capital, is envisaged as a logistics hub for the region, a center of local agriculture (agri-green city) and a tourist attraction. Various infrastructure are under construction including for a deep sea port in the southwestern area of Pathein City.

Area	35,000 km^2
Population	6,180,000 (2014)
Main industries	Agriculture, fishery
City network membership	-

Climate Change Policy

There is no specific policy for climate change in place for Ayeyarwady region, however, Pathein City presented environmental policy in the Urban Development Plan for Pathein 2040 developed in cooperation with JICA. The balanced development for economic growth and environment protection will assure low-carbon and sustainable city development. As specific actions related to low-carbon development, the applicability of Japanese low-carbon technologies to the development of a new industrial zone called the Pathein Industrial City are being studied under the framework of public-private-partnership and inter-city collaboration between Ayeyarwady and Fukushima City in Japan.

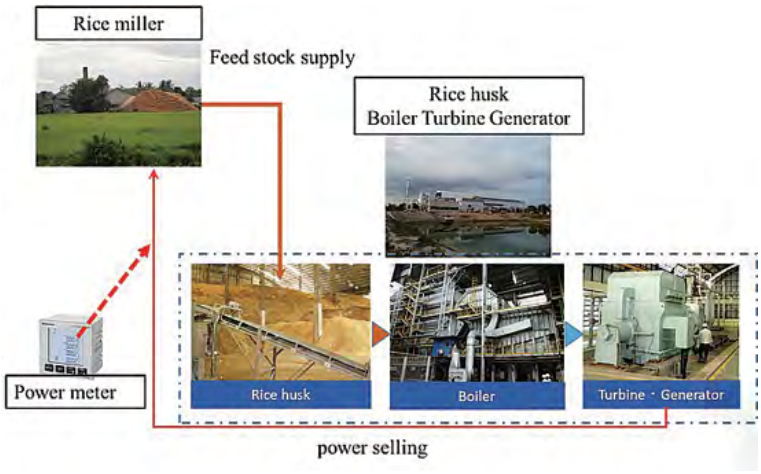
Partnering Japanese Cities in the City-to-City Collaboration Programme: Fukushima City (Page 56)

JCM Model Projects developed through the City-to-City Collaboration Programme

One low-carbon project has been developed through collaboration between Ayeyarwady and Fukushima.

Rice Husk Power Generation in Rice Mill Factory in Ayeyarwady (Adopted as a JCM Model Project in 2016)

- Representative Participant: Fujita Corporation
- Partner Participant: Myaung Mya Power Co., Ltd., Myanmar Agribusiness Public Corporation (MAPCO) Limited
- Outline of GHG Mitigation Activity:
  This project targets biomass power generation using rice husks from a rice mill factory in Myaung Mya, Ayeyarwady region where a large volume of rice is produced.
  The biomass power generation system consists of a direct combustion boiler and 1.8MW turbine.
  Electricity generated from biomass power generation will be sold under power purchace agreements (PPAs) with the rice mill factory. GHG emission reduction will be achieved with the replacement of grid electricity.
- Expected GHG Emission Reductions: 2,750 tCO_2/year



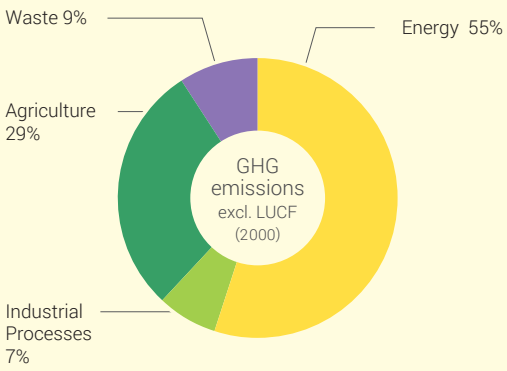
Source: JICA et al., The Republic of the Union of Myanmar Urban Development Plan for Regional Cities: Mandalay, Pathein and Mawlamyine: Final Report, 2016 / MRI & Fujita Corp., FY2016 F/S of JCM Project by City to City Collaboration (JCM Feasibility Study for Low-Carbon City in Ayeyarwady Region (Study of a low-carbon water and sewerage treatment system in Pathein Industrial City)) Report, 2017 / GEC homepage (http://gec.jp/jcm/projects/16pro_mya_03/)

Republic of the Philippines

Country Overview	
Area	298,170 km^2 (2017)
Population	104,918,000 (2017)
GDP	292.0 billions USD (2015)
Economic Growth	5.8% (2015)

Climate Change Policy

As one of the countries with the highest disaster risk in the world, reducing vulnerability is one of the most important challenges for the development of the Philippines. The country has been striving to mainstream and integrate climate change adaptation and disaster risk reduction measures into the country's administrative plans and programs at all levels. The greenhouse gas emission reduction target and adaptation measures presented in the intended nationally determined contributions (INDCs) are to be achieved by implementing measures included in the National Climate Change Action Plan (NCCAP) 2011-2028 under the Climate Change Law (RA9279). Local governments are also required to formulate a Local Climate Change Action Plan as prescribed in the law.



Greenhouse Gas Emissions by Sector

Intended Nationally Determined Contributions	
Mitigation	70% from the BAU scenario by 2030 (conditional) (Relative emission reduction)
Adaptation	• System strengthening for downscaling climate change models, climate scenario-building, climate monitoring and observation • Science-based climate/disaster risk and vulnerability assessment process • Enhancement of climate and disaster-resilience of key sectors – agriculture, water and health • Systematic transition to a climate and disaster-resilient social and economic growth

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	21,767
Total emissions excl. LUCF	126,879
Emissions/removals from LUCF only	-105,111

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Philippines' Intended Nationally Determined Contributions. 2015 / IGES Climate Policy and Market Mechanisms Status Report, 2017

Quezon City

City Overview

Quezon City is the largest city in Metro Manila and one of the largest service economies in the Philippines. The city is a strategic convergence point for the metropolitan road and transportation networks, making the city an ideal distribution hub. Quezon City considers the balance between economic progress and conservation. Climate change, resiliency and disaster risk mitigation are all taken into consideration for sustainable urban development. Quezon City has also been active in sharing their initiatives for a low-carbon city and learning from others through international city networks.

Area	161.12 km^2
Population	3,040,672 (2018)
Main industries	Retail, information technology
City network membership	C40, ICLEI, Citynet, Compat of Mayors, etc.

Climate Change Policy

The city government through the Environmental Protection and Waste Management Department (EPWMD) continuously innovates itself to cope with the fast-changing environmental concerns focusing on a more challenging adversary known as climate change. This global matter has pushed the city to be proactive and outlined various climate change mitigation and adaptation initiatives with a vision of becoming a low carbon and sustainable city. Notable environmental programs and projects of the city include PANGEA biogas emission reduction project, solar power facility project for public schools, updating of the city's greenhouse gas inventory, anti-smoke belching program, streetlighting program, among others. Also, the city recognizes the importance of development plans such as the recently launched Quezon City Local Climate Action Plan (QC LCCAP) which serves as a guideline to address mitigation and adaptation measures in line with the national policies.

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Osaka (Page 70)

Source: Quezon City Public Affairs and Information Services Office

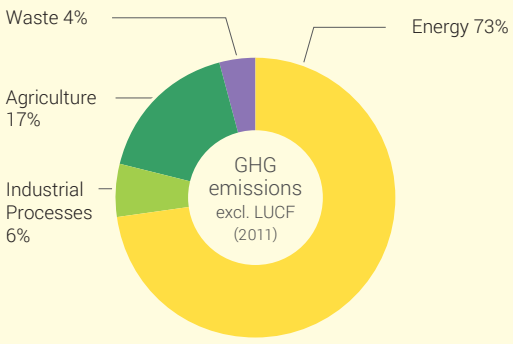
Source: Quezon City homepage / Quezon City Government Annual Report 2015-2016 / Capili, J. V. Quezon City Low Carbon Development Policy and Implementation, at the Seminar of City-to-City Collaboration Projects, January 2018

Kingdom of Thailand

Country Overview	
Area	510,890 km^2 (2017)
Population	69,038,000 (2017)
GDP	395.3 billion USD (2015)
Economic Growth	2.8% (2015)

Climate Change Policy

Thailand has set a development target to achieve "Stability, Prosperity and Sustainability" in the 12th National Economic and Social Development Plan (2017-2021) and responses to climate change have been well mainstreamed. The main focus of polices and plans is adaptation, however, mitigation is considered with a major emphasis on the energy sector. Thailand has formulated the Climate Change Master Plan B.E. 2558-2593 (2015-2050), which provides a continuous framework for measures and actions in the long-term to achieve climate-resilient and low-carbon growth in line with a sustainable development path by 2050. Concrete measures and actions will be developed as sectoral action plans. Local governments are encouraged to develop local-level action plans on climate change adaptation.



Greenhouse Gas Emissions by Sector

Nationally Determined Contributions	
Mitigation	20% from the BAU scenario by 2030; 25% from the BAU scenario by 2030 (conditional) (Relative emission reduction)
Adaptation	• Promote and strengthen Integrated Water Resources Management (IWRM) practices • Safeguard food security through the guidance of Sufficiency Economy Philosophy; • Promote sustainable agriculture and Good Agricultural Practice (GAP); • Increase capacity to manage climate-related health impacts • Increase national forest cover to 40% through local community participation • Safeguard biodiversity and restore ecological integrity in protected areas and important landscapes from the adverse impacts of climate change.

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	234,587
Total emissions excl. LUCF	305,524
Emissions/removals from LUCF only	-70,938

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Thailand's First Nationally Determined Contribution. 2016 / IGES Climate Policy and Market Mechanisms Status Report, 2017

Chiang Mai Province

Province Overview

Chiang Mai Province is the second largest province in Thailand, located about 700 km north of Bangkok. It is one of the most popular tourist destinations in Thailand with an ancient atmosphere. The province vision is outlined in "City of Life and Prosperity" and it is aiming to become an environmentally-friendly province focusing on improving people's quality of life and promoting long-term investment.

Area	20,107 km^2
Population	1,682,382 (2016)
Main industries	Agriculture, manufacture, trade and services, tourism
City network membership	-

Climate Change Policy

Basically, the province takes climate change actions in line with relevant national policies. The promotion of public awareness on climate change is one of the challenges facing the provincial government. Chiang Mai contributes to the achievement of national policies by implementing concrete actions to improve urban environment conditions. For example, the promotion of the Eco Town Project in cooperation with Kitakyushu in Japan will result in improving the urban environment while mitigating greenhouse gas emissions. Another low-carbon initiative called "Sustainable Urban Transport" is also being promoted by Chiang Mai Municipality.

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Kitakyushu (Page 74)

Source: Chiang Mai Province homepage / Sangree, P. Integrated Waste Management in Chiang Mai Province at the Seminar on City-to-City Collaboration Projects in January 2018 / Suwanprik T. The Sustainable Urban Transport at the Low Carbon Mobility Planning Workshop in July 2017 in Chiang Mai

Bangkok

●City Overview

Bangkok is located on the low, flat plains of the Chao Phraya River extending to the Gulf of Thailand and plays a significant role as the country's international port. Bangkok aims to become an environmentally-friendly city as described in the 20-year Development Plan for Bangkok Metropolis (2013-2032). Out of the seven strategies set in the plan, "Bangkok as a green and convenient city" and "Bangkok as a compact city" serve as the basis for low-carbon city development.

Area	1,500 km^2
Population	5,700,000 (2005)
Main industries	commerce, manufacture and service industry
City network membership	C40, ICLEI, Citynet, 100 Resilient Cities, etc.

●Climate Change Policy

In Thailand, the Bangkok Metropolitan Administration (BMA) is the first municipality to develop its own climate change action plan with GHG reduction targets. Building upon the efforts made under the action plan, the BMA formulated the Bangkok Master Plan on Climate Change (BMPCC) 2013-2023 in cooperation with Japan International Cooperation Agency (JICA) and Yokohama in Japan, which became a comprehensive long-term master plan for addressing climate change. Various mitigation measures are implemented under five components. BMA also developed the Bangkok Resilience Strategy (2017) in cooperation with 100 Resilient Cities. Sixty actions will be implemented under three strategic areas: "Increasing quality of life", "Reducing risk and increasing adaptation" and "Driving a strong and competitive economy".

Five components in the BMPCC 2013-2023
1. Environmentally sustainable transport
2. Energy efficiency and alternative energy
3. Efficient solid waste management and wastewater treatment
4. Green urban planning
5. Adaptation planning

●Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Yokohama (Page 61)

JCM Model Projects developed through the City-to-City Collaboration Programme

Two low-carbon projects have been developed through collaboration between Bangkok and Yokohama.

Introduction of 1.5MW Rooftop Solar Power System and Advanced EMS for Power Suppl in a Paint Factory (Adopted as a JCM Model Project in 2016)

- **Representative Participant:** Finetech Co, Ltd.
- **Partner Participant:** Prime Roof Top Co., Ltd.
- **Outline of GHG Mitigation Activity:**

  The objective of this project is to replace grid electricity consumption with solar power generation and reduce greenhouse gas emissions at a major paint factory in Thailand by introducing a 1.5MW roof top solar power system with "Advanced-EMS".

  The system will be operated and maintained by Prime Roof Top Co., Ltd. to supply electricity to the paint factory. Advanced-EMS developed by Finetech Co., Ltd to be mounted to the system will optimize energy demand and supply for various facilities in the factory.
- **Expected GHG Emission Reductions:** 1,240 tCO_2/year

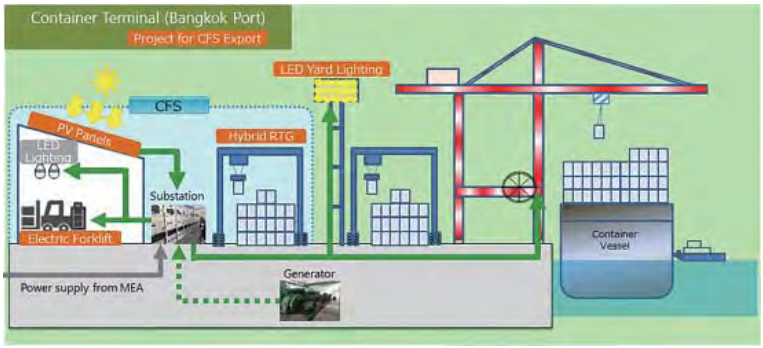
Introduction of Energy-Efficient Equipment to Bangkok Port (Adopted as a JCM Model Project in 2017)

- **Representative Participant:** Yokohama Port Corporation, Green Pacific Co., Ltd.
- **Partner Participant:** Port Authority of Thailand
- **Outline of GHG Mitigation Activity**

  This project introduces the following equipment to a newly-built container freight station (CFS) and container yards at Bangkok Port.

  (1) Electric Forklifts
  (2) Hybrid Rubber Tired Gantry Crane (RTG)
  (3) LED yard lighting
  (4) Photovoltaic power generation equipment

  These low carbon technologies reduce GHG emissions from the port.
- **Expected GHG Emission Reductions:** 5,491 tCO_2/year



Source: Bangkok Metropolitan Administration homepage/ JICA, Project for Bangkok Master Plan on Climate Change 2013-2023 / BMA, 20-year Development Plan for Bangkok Metropolis 2013-2032 / Penggglieng, J., Bangkok: Climate Change Management, at the Urban Regeneration and Climate Change Training Program in September 2017 / GEC homepage (http://gec.jp/jcm/projects/16pro_tha_08/) (http://gec.jp/jcm/jp/projects/17pro_tha_02/)

Rayong Province

Province Overview

Rayong Province is located on the east coast of the Gulf of Thailand with a scenic 100 km-long coast. Located approximately 200 km from Bangkok and 100 km from Laem Chabang Port, it is a popular tourist destination and industrial center. It is a leading industrial province in Thailand as a result of the successive development of large-scale industrial estates since 1990. There are 13 industrial complexes in the province, containing a total of about 350 factories.

Area	3,552 km^2
Population	674,393 (2014)
Main industries	Agriculture, fishery, tourism, manufacturing
City network membership	-

Climate Change Policy

Under the 11th National Economic and Social Development Plan of the Thai Government, the "Eco-Industrial Town" concept was promoted to shift the development paradigm toward an environmentally-sustainable, low-carbon economy and society. Under this plan, two industrial estates in Rayong Province have been designated by the national government: IRPC Industrial Estate by the Department of Industrial Works (DIW) and Map Ta Phut Industrial Estate by the Industrial Estate Authority of Thailand (IEAT). In cooperation with Kitakyushu in Japan, nine polices were developed by IEAT for the Map Ta Phut Eco Industrial Town.

Nine policies for the Map Ta Phut Eco Industrial Town
1. Sustainable management of the industry and communities
2. Green logistics / Developing safe and environmental friendly transportation
3. Water management solutions
4. Enhancing safety management
5. Effective management of environmental information
6. Creating a livable community. strong and sustained
7. Enhancing air quality management
8. Optimizing the management of waste and waste materials
9. Optimizing energy management

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Kitakyushu (Page 74)

JCM Model Projects developed through the City-to-City Collaboration Programme

One low-carbon project has been developed through collaboration between Rayong and Kitakyushu.

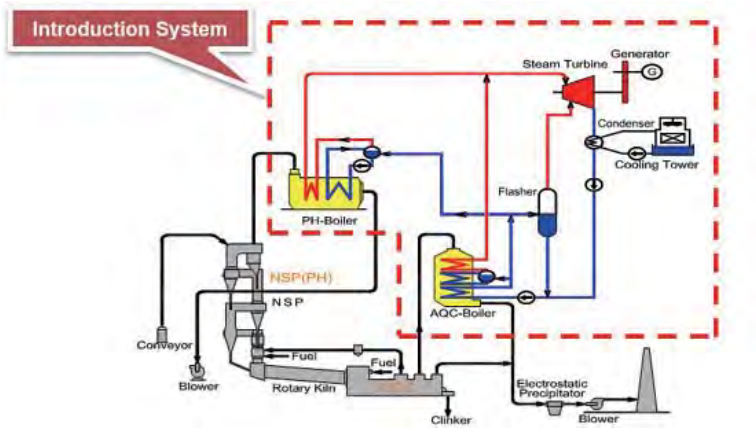
Introduction of 12MW Power Generation System with Waste Heat Recovery for Cement Plant

(Adopted as a JCM Model Project in 2016)

- Representative Participant: NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
- Partner Participant: Siam City Power Company Limited
- Outline of GHG Mitigation Activity:

  This project is planned to introduce a waste heat recovery (WHR) boiler steam turbine generator system to produce power at a cement production plant located in Saraburi Province, Thailand. The generated electricity is used in the cement plant.

  The WHR system contributes to the reduction of GHG emissions as a substitute for electricity from the power grid.
- Expected GHG Emission Reductions: 31,180 tCO_2/year



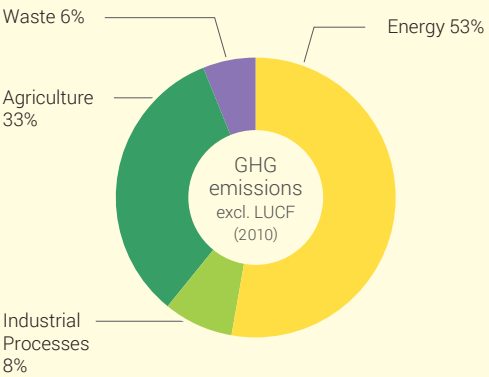
Source: Tourism Authority of Thailand / Presentation by Rayon PAO at the City-to-City Collaboration Seminar in Oct. 2015 / Kitakyushu Asian Center for Low Carbon Society, et al., FY2015 F/S on JCM Project for Realization of a Low-Carbon Society in Asia: Promoting of Decarbonizing of Municipal Waste Management and Ecological Industrial Town in Rayong Province" March 2016. / GEC homepage (http://gec.jp/jcm/projects/16pro_tha_04/)

Socialist Republic of Viet Nam

Country Overview	
Area	310,070 km^2 (2017)
Population	95,541,000 (2017)
GDP	193.6 billion USD (2015)
Economic Growth	6.7% (2015)

Climate Change Policy

Viet Nam has been making efforts to mainstream climate change into the country's socio-economic development under the National Target Program to Respond to Climate Change. Viet Nam launched the National Strategy on Climate Change (NSCC, Decision No.2139/QD-TTg) in 2011 to address climate change, and the National Green Growth Strategy (NGGS, Decision No.1393/QD-TTg) in 2012 to mainstream sustainable economic development and strengthen social economic development. Respective action plans, the Climate Change Action Plan (CCAP 2012-2020, Decision No.1474/QD-TTg) and the Green Growth Action Plan (GGAP 2014-2020, Decision No.403/QD-TTg) were formulated and implemented to pursue the nationally determined contributions (NDCs). Local governments are also required to localize these action plans to create a low-carbon society.



Greenhouse Gas Emissions by Sector

Nationally Determined Contributions	
Mitigation	8% from the BAU scenario by 2030; 25% from the BAU scenario by 2030 (conditional) (Relative emission reduction)
Adaptation	• Respond pro-actively to disasters and improve climate monitoring: Modernise the hydrometeorological observatory and forecasting system; Produce Socio-Economic Development Plans;' Implement disaster prevention plans and measures... • Ensure social security: Review, adjust and develop livelihoods and production processes; Develop mechanisms, policies, and strengthen the insurance system; Improve regulations and technical standards for infrastructure; Implement community-based adaptation... • Responding to sea level rise and urban inundation: Implement integrated coastal zone management; Use sea level rise scenarios in urban and land use planning for infrastructure, industrial parks, coastal and island resettlement areas; Implement anti-inundation measures for large coastal cities...

GHG emissions	Unit: Gg CO_2 eq.
Total emissions	246,831
Total emissions excl. LUCF	266,049
Emissions/removals from LUCF only	-19,219

Note: "LUCF" stands for Land-Use Change and Forestry sector

Source: The World Bank / UN Data / UNFCCC / Viet Nam's First Nationally Determined Contribution. 2016 / IGES Climate Policy and Market Mechanisms Status Report 2017 / IGES Climate Policy and Market Mechanisms Status Report, 2017

Hai Phong City

City Overview

Hai Phong is the third largest city in Viet Nam and a municipality that has special status equal to the province. The city is located about 100 km from Hanoi on the coast and is the largest marine distribution base in northern Viet Nam, with a concentration of large-scale industrial complexes. The city aims to become Viet Nam's first Green Port City by 2020, with a sustainable, environmentally-friendly port driving economic development.

Area	1,562 km^2
Population	1,980,000 (2017)
Main industries	Industry, trade, sercive and tourism
City network membership	Citynet

Climate Change Policy

Hai Phong City has issued legal documents and policies to address climate change in line with national policies, such as the Climate Change Action Plan (Decision No. 65/QD-UBND, 2014), Haiphong Green Growth Strategy Action Plan (Decision No. 1463/QD-UBND, 2014), and Plan for Realizing the Paris Climate Change Agreement in Hai Phong City (Decision No. 3337/QD-UBND, 2017). The Green Growth Promotion Plan (GGPP) was also developed in cooperation with a Japanese sister city, Kitakyushu in May 2015. Policies and measures fall into seven sectors, with priority given to four sectors, as the measures for these sectors are closely related to GHG emission reduction targets. Some measures described in this plan are being implemented.

Seven sectors set in the GGPP	
Main sectors	Waste
	Energy
	Transportation
	Cat Ba Island
Other sectors	Water, sewage and rainwater drainage
	Environmental conservation
	Green production

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Kitakyushu (Page 74)

Source: City of Kitakyushu and City of Hai Phong. Green Growth Promotion Plan of the City of Hai Phong. May 2015 / Kien, C. H. Low Carbon Activities in Hai Phong City based on City-to-City Collaboration at the Seminar on City-to-City Collaboration Project in January 2018

Ho Chi Minh City

City Overview

Ho Chi Minh City (HCMC) is the largest city in Viet Nam and is located in southern part of the country. The city is the center of economy, culture, education, science and technology of the entire southern key economic zone. The Master Plan of HCMC through 2025 that has been implemented since 2016 puts emphasis not only on economic development, but also on environmental protection including responses to climate change.

Area	2,095 km^2
Population	8,297,500 (2016)
Main industries	Mechanical engineering, electronics, chemicals, rubber, plastics and food processing
City network membership	C40, Citynet

Climate Change Policy

HCMC developed the first Climate Change Action Plan (CCAP) towards 2015 with a main focus on adaptation activities. The plan was updated up to 2020 by including both adaptation and mitigation measures a owth Strategy to 2020, and these two administrative plans serve as a basis for low-carbon development in the city. A number of domestic and international actions for addressing climate change have already been implemented in the city.

Ten priority fields in CCAP towards 2020 (Mitigation)	
1. Urban planning	6. Waste management
2. Energy	7. Construction
3. Transportation	8. Healthcare
4. Industry	9. Agriculture and food security
5. Water management	10. Tourism, culture and public awareness

Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Osaka (Page70)

JCM Model Projects developed through the City-to-City Collaboration Programme

Three low-carbon projects have been developed through collaboration between Ho Chi Minh and Osaka.

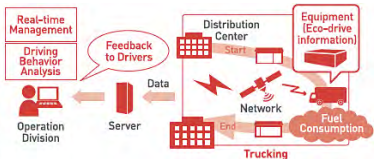
Eco-driving by Utilizing Digital Tachograph System (Adopted as a JCM Model Project in 2014)

- **Representative Participant:** Nippon Express Co., Ltd.
- **Partner Participant:** NIPPON EXPRESS (VIETNAM)
- **Outline of GHG Mitigation Activity:**

  In this project, 130 trucks in use by NIPPON EXPRESS (VIETNAM) are fitted with an eco-drive improvement system using digital tachographs, so that the quantity of fuel consumption, running distance and relevant data on the driving behavior of drivers can be continuously analyzed using a cloud network in Binh Duong and Hanoi City, Vietnam.

  The drivers are given advice in order to improve their driving behavior based on the analyzed data, and feedback linked to training outcomes is provided further improve behavior.

  This project contributes to improvements in transportation quality as well as fuel efficiency, which is directly linked to reductions in CO_2 emissions.
- **Expected GHG Emission Reductions:** 328 t CO_2/year



Introduction of a Solar PV System at a Shopping Mall in Ho Chi Minh (Adopted as a JCM Model Project in 2015)

- **Representative Participant:** AEON RETAIL Co., Ltd.
- **Partner Participant:** AEON VIETNAM Co., Ltd.
- **Outline of GHG Mitigation Activity:**

  This project strengthens measures to save energy at a shopping mall in Ho Chi Minh City by introducing a photovoltaic power generation system on the roof of the car parking area and bicycle parking space for 100% self-production and consumption of energy, which reduces not only the amount of electricity purchased from electricity power system (EPS), but also CO_2 emissions.

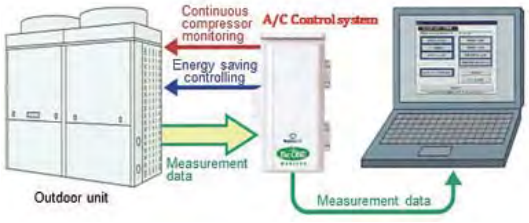
  This shopping mall also introduces high efficiency equipment to strengthen measures to save energy as a "Low-carbon Shopping Mall". This project conforms to the environmental policy of the Vietnamese government and is expected to expand as a model case.
- **Expected GHG Emission Reductions:** 274 tCO_2/ year

Energy Saving in Factories with Air-Conditioning Control System (Adopted as a JCM Model Project in 2015)

- **Representative Participant:** Yuko-Keiso Co., Ltd.
- **Partner Participant:**

  Nidec Vietnam Co., Nidec SERVO Co., Nidec TOSOK Co., Nidec COPAL Co., Nidec SANKYO Co., Nidec SEIMITSU Co.
- **Outline of GHG Mitigation Activity:**

  This project introduces an "air conditioning control system" to air conditioners in six component factories in Viet Nam. The system constantly monitors the operation status of the compressor equipped in the air conditioner outdoor unit by measuring an electric current at the optimum programmed timing. Controlling the compressor once or twice every thirty minutes and the system reduces energy consumption and CO_2 emissions. This system can be introduced to existing facilities and achieve energy savings by preventing excessive cooling without having an effect on comfort.
- **Expected GHG Emission Reductions:** 4,681 tCO_2/ year



Source: General Statistics Office of Viet Nam / Binh, N. D., Ho Chi Ming City developing towards low-carbon city, at the Seminar on City-to-City Collaboration Projects in January 2018 / GEC homepage. (http://gec.jp/jcm/projects/14pro_vie_02/) (http://gec.jp/jcm/projects/15pro_vie_08/) (http://gec.jp/jcm/projects/15pro_vie_04/)

Da Nang City

City Overview

Da Nang City is the fourth largest city and one of five municipalities in Viet Nam. The city is an important port city located on the coast of the South China Sea at the mouth of the Han River with well-developed infrastructure facilities; therefore, the city is considered to be the socio-economic hub of central Viet Nam. Da Nan City aims to become an environmentally-friendly city by 2020 by increasing its green areas and public spaces, ensuring water and air quality standards and addressing issues related to climate change.

Area	1,285 km^2
Population	1,018,900 (2017)
Main industries	Services, industry and agriculture
City network membership	100 Resilient Cities, Citynet

Climate Change Policy

Da Nang City has experienced natural disasters that are considered to be related to climate change, such as droughts, flooding, windstorms, and epidemics. Since the city will be affected more in the future, the city government has formulated the Action Plan in Responding to Climate Change and Sea Level Rise for Da Nang up to 2020. Based on this action plan, the city aims to strengthen their response capacity to climate change by conducting vulnerability assessments and developing and implementing measures responding to climate change.

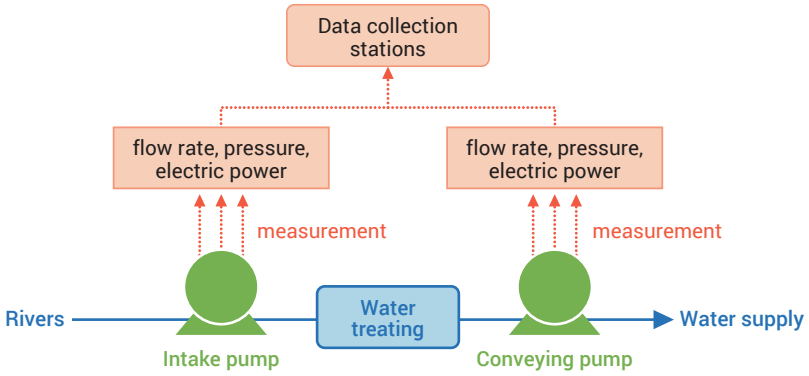
Partnering Japanese Cities in the City-to-City Collaboration Programme: City of Yokohama (Page 61)

JCM Model Projects developed through the City-to-City Collaboration Programme

One low-carbon project has been developed through collaboration between Da Nang and Yokohama.

Introduction of High-Efficiency Water Pumps in Da Nang City (Adopted as a JCM Model Project in 2016)

- **Representative Participant:** Yokohama Water Co., Ltd.
- **Partner Participant:** Danang Water Supply One-member Limited Company (DAWACO)
- **Outline of GHG Mitigation Activity:**
  This project aims to replace existing conventional water pumps with high efficiency pumps in two water pump stations of the treatment plant owned by Danang Water Supply One-member Limited Company (DAWACO).
  Energy savings achieved by the replacement of those pumps contributes to reducing CO_2 emissions. The pumps to be installed perform with high efficiency because they are customized to specific conditions and requirements of the recipient plants.
- **Expected GHG Emission Reductions:** 1,145 t CO_2/year



Source: IPA Danang and KPMG, Invest in Da Nang – Worth Living Worth Investing, 2017 / Anhm N.D. Danang action plan of respond to climate change and sea level rise. / GEC homepage (http://gec.jp/jcm/projects/16pro_vie_01/)

Chapter 3

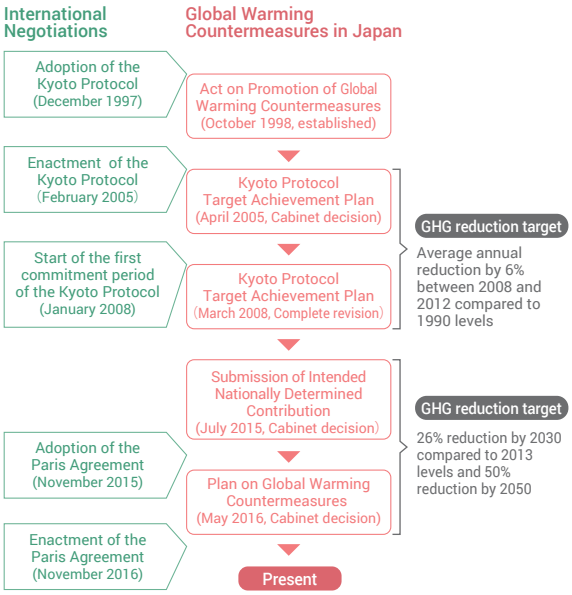
Initiatives to Develop Low-Carbon Societies in Japanese Cities

Japan's climate change measures have been well underway since the adoption of the Kyoto Protocol in 1997.
Even after the adoption of the Paris Agreement, the national government and cities united and worked to low-carbonize cities, country, and on a global scale, based on the "Action Plan for Global Warming Countermeasures."

Climate Change Countermeasures in Japan

Background and Framework of Climate Change Countermeasures in Japan

Japan's framework for climate change countermeasures is stipulated under the "Act on Promotion of Global Warming Countermeasures." Since Japan was obligated to reduce greenhouse gas (GHG) emissions under the Kyoto Protocol, all policies and measures were implemented under the Kyoto Protocol Target Achievement Plan and an implementation system in Japan was developed. With the Great East Japan Earthquake in March 2011, policies on global warming countermeasures could not be determined for the post Kyoto Protocol period. However, the "Action Plan for Global Warming Countermeasures" was set in 2016 based on the adoption of the Paris Agreement, etc. In addition, a Cabinet decision was made on the "National Plan for Adaptation to the Impacts of Climate Change" in 2015. Today, climate change countermeasures are being promoted for both mitigation and adaptation measures in Japan.



Direction of the Aim for Global Warming Countermeasures in Japan

Japan is taking the initiative in global warming countermeasures based on scientific knowledge in coordination with global society.

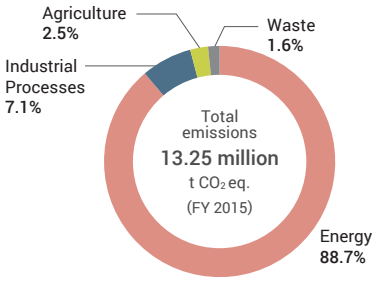
Medium-term target: 26.0% reduction by FY 2030 from FY 2013 level

Long-term target: 80% reduction by 2050

Major measures and policies are positioned for each sector.

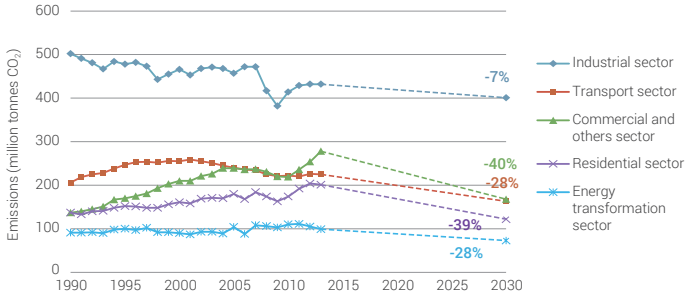
Target sectors:

1 Industrial
2 Commercial and others
3 Residential
4 Transport
5 Energy transformation
6 Cross-sectoral strategies
7 Foundational measures
8 International cooperation



GHG emissions in Japan and breakdown by sector

Source: Created based on the National GHG Inventory Report of JAPAN 2017 (GIO)



Changes and reduction targets for GHG emissions in the energy sector

Source: Created based on the GHG Emission Data of Japan 1990-2013 (GIO) and the Overview of the Plan for Global Warming Countermeasures (MOEJ)

Image of Society to be Reached in Adaptation Plans in Japan

Build a safe and secure sustainable society that can recover quickly by minimizing or avoiding damage to the lives of citizens, property, lifestyles, economy, and the natural environment as a result of impacts from climate change through the promotion of adaptation measures.

Major measures and policies are positioned for each sector.

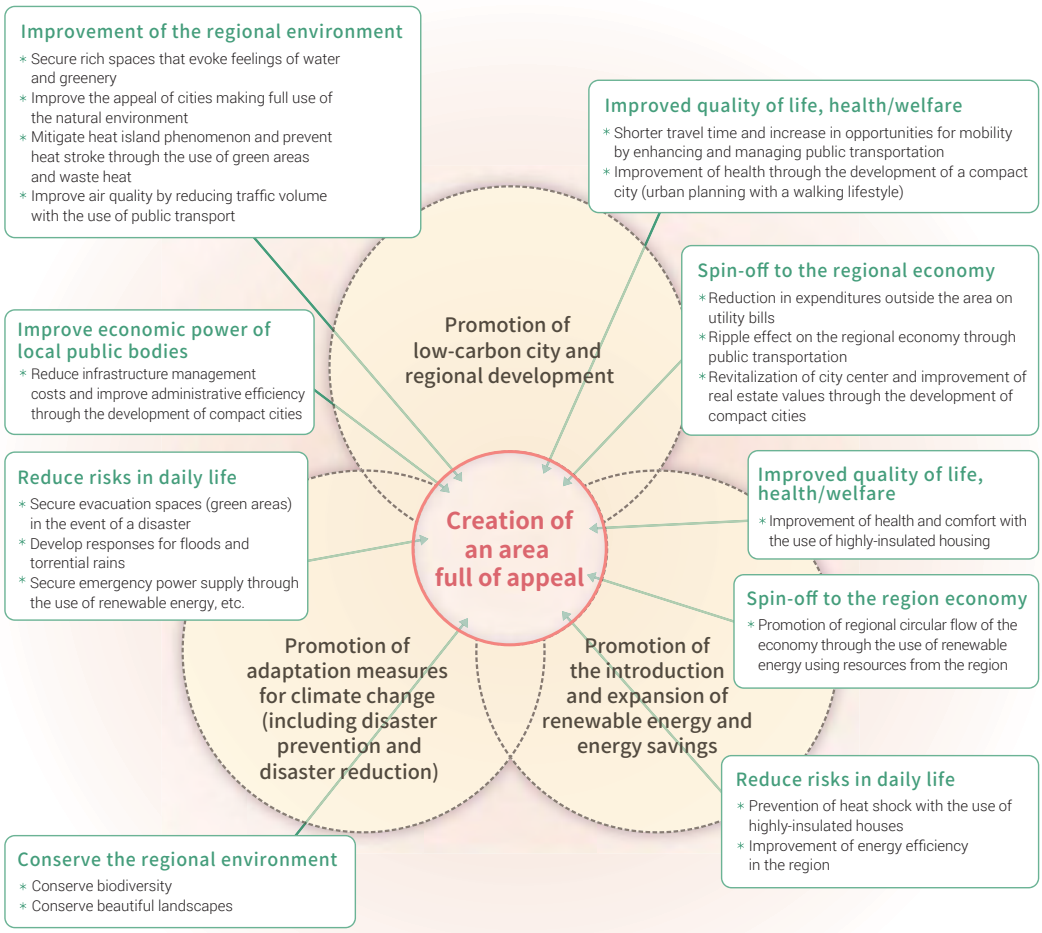
Target sectors:

1 Agriculture, Forest/Forestry, Fisheries,
2 Water Environment, Water Resources,
3 Natural Ecosystems,
4 Natural Disasters, Coastal Areas,
5 Human Health
6 Industrial and Economic Activity
7 Life of Citizenry, Urban Life
8 Observation, Monitoring, Studies and Research
9 Sharing and Providing Information related to Climate Risk
10 Promoting Adaptation in the Region
11 International Measures

Expectations of Cities for the Creation of a Low-carbonized Society

Cities in Japan are required to formulate and implement "Action Plans by Local Governments"* under Article 21 of the Act on Promotion of Global Warming Countermeasures. When creating an area-wide plan, cities are encouraged to set GHG emissions reduction targets based on national policies and the natural and social conditions of the area and to formulate policies and measures, including responses (pursuit of co-benefits) to local socioeconomic issues, such as regional revitalization, population decline, industrial promotion, disaster prevention, and health. Cities are also encouraged to implement PDCA to visualise initiatives and to establish strategic partnerships with diverse entities for the steady promotion of effective measures. These partnerships are not limited to within the region, but can also include cooperation in a wide area, as well as international intercity collaboration based on sister city relationships with cities overseas, etc. These actions are also expected to contribute to reducing GHG emissions throughout the world by sharing information on advanced activities and technologies in Japan and promoting the development of low-carbon cities overseas.

* Measures, such GHG emission reductions generated from local administrative work by local public bodies are all covered by local bodies (administrative operations). In contrast, matters concerning measures to control GHG emissions according to the natural and social conditions of the area are under the jurisdiction of prefectures, government-designated ordinance cities, core cities, and special cities designated at the time of execution. However, other local government bodies are also required to make efforts in development.



Examples of co-benefits of addressing climate change

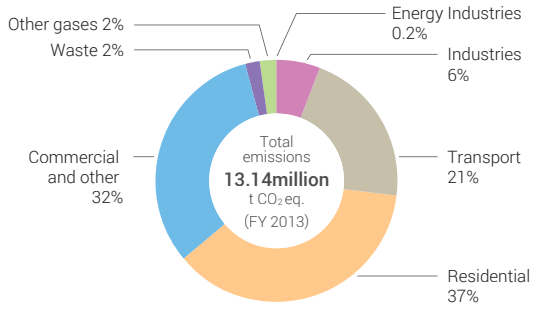
Source: Environmental Strategy Division, Environmental Policy Bureau, MOEJ. Manual for the Development and Implementation of the Action Plans by Local Governments (Local Area Policies) Ver. 1.0. March 2017

Seminar of the City-to-City Collaboration Programme with the participation of local public entities and businesses both in and outside of Japan

City of Sapporo & Hokkaido

Basic Information [Sapporo]

Area	1,121 km² (2017)
Population	1.96 million (2017)
GRP	JPY 6.5478 trillion (2014)
Major industries	Wholesale/retail, service



Greenhouse gas emission profile

Source: Created based on "Progress Report on the Sapporo Energy Vision and the Sapporo Promotion Plan for Global Warming Countermeasures", May 2017, City of Sapporo

Information on Climate Change Countermeasures [Sapporo]

To achieve the greenhouse gas emission reduction targets set out in the "Sapporo City Promotion Plan for Global Warming Countermeasures" (formulated in March 2015), Sapporo has set six visions for society that the city should aim at in accordance with sectors generating greenhouse gases and is developing highly-effective measures based on the regional characteristics of Sapporo and measures in the Sapporo Energy Vision. Sapporo is actively carrying out initiatives by positioning advanced actions as "leading projects" in order to promote more effective global warming countermeasures related to the social vision of "residential," "industries/commercial," and "transportation" that have a high percentage of emissions and "energy" which integrates energy-related measures to strengthen activities.

Mid- and Long-term Emissions Reduction Targets
25% reduction by 2030 (from 1990 levels)
80% reduction by 2050 (from 1990 levels)

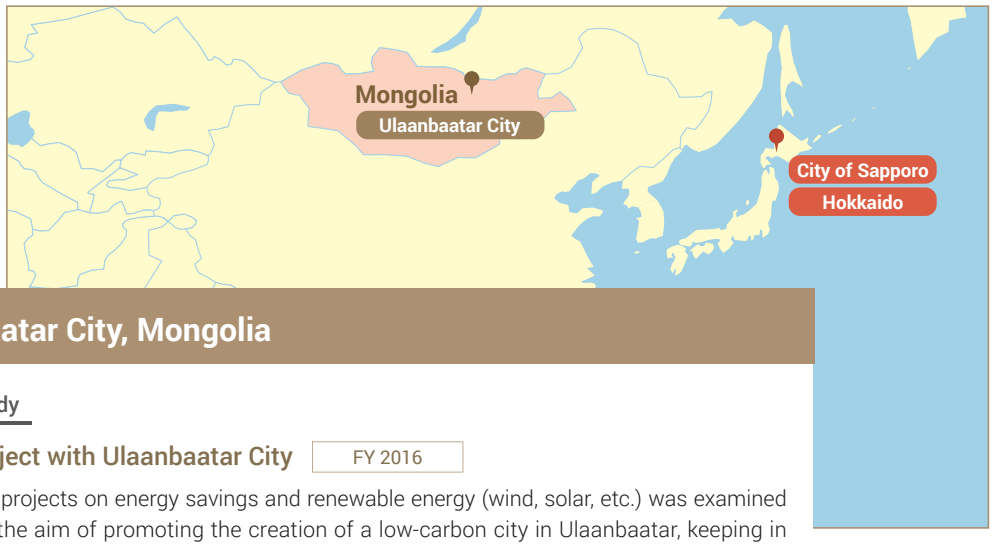
Leading Projects [Sapporo]

Sector	Leading Projects	Sector	Leading Projects
Residential	• Sapporo model project to promote the development of next-generation housing • Project to promote energy savings by residents	Transport	• Project to promote the introduction of next-generation vehicles • Project to promote eco-drive activities
Industrial	• Sapporo Energy Savings Action Program • Project supporting the development of environmental- and energy-related industries	Energy	• Solar Power Generation Promotion Project • Project to promote the development of urban center energy networks

Vision of the Target Future of Sapporo: World-Leading Low-Carbon Society (Eco-Capital Sapporo)

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on three projects in one city/one country in FY 2016



Ulaanbaatar City, Mongolia

Overview of Study

Collaborative project with Ulaanbaatar City FY 2016

The development of projects on energy savings and renewable energy (wind, solar, etc.) was examined in this project, with the aim of promoting the creation of a low-carbon city in Ulaanbaatar, keeping in mind specific support in the Energy Conservation Law in Mongolia and mitigation of serious air pollution in Ulaanbaatar. A feasibility study was also conducted on a waste-to-energy project with the aim of improving waste problems caused by the rapid increase in population in Ulaanbaatar City.

Target sectors: Energy savings, renewable energy, waste disposal/treatment
Implementing agencies: Hokkaido Prefectural Government, City of Sapporo, 2 organizations, 3 companies

Renewable Energy Sector

Solar Power Generation & Power Storage System

Large Capacity Secondary Battery

Energy Saving Sector

Introduction of Heat Pumps or Thermal Storage Heater

Waste Material Sector

Waste-to-Energy

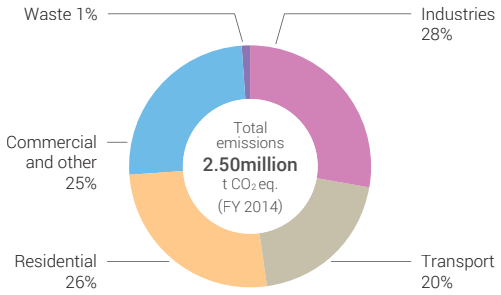
^ Egg plant
< Biogas Plant

Source: Sapporo City website / "Check Data! Changes in Sapporo's Economy (December 2017) / Sapporo City Promotion Plan for Global Warming Countermeasures (March 2015)

Fukushima City

Basic Information

Area	768 km² (2008)
Population	280,000 (2017)
GRP	JPY 1.1576 trillion (2014)
Major industries	Wholesale/retail, medical/ welfare, manufacturing, service



Greenhouse gas emission profile

Source: Created based on "Fukushima City greenhouse gas emissions data for FY 2014 is published", Fukushima City

Information on Climate Change Countermeasures

Fukushima City is promoting countermeasures focused on six priority measures under the "Fukushima City Action Plan on Global Warming Countermeasures" (formulated in March 2011), aiming to achieve the "promotion of a beautiful, environmentally-friendly city", one of the priority measures in the "Fukushima City Comprehensive Plan". In April 2013, two years after the Great East Japan Earthquake, Fukushima City carried out a partial review of the Fukushima City Basic Environment Plan in order to develop a system to promote the introduction of energy savings and renewable energy, as its "contribution to the development of a society free from dependence on nuclear energy," which is included in the Fukushima City Reconstruction Plan.

Mid- and Long-term Emissions Reduction Targets

15% reduction by 2020 (from 2007 levels)
30% reduction by 2030 (from 2007 levels)
60% reduction by 2050 (from 2007 levels)

Leading Projects

Six priority initiatives and measures are being positioned and promoted to prevent global warming.

Priority Initiatives	Measures
I. Promotion of 3Rs to create a material-cycle society	• Reduction in plastic shopping bags and excessive packaging • Promotion of 3Rs
II. Promotion of the introduction of renewable-energy and new-technology housing and facilities	• Expanded use of photovoltaic power generation systems • Promotion of the introduction of new energy • Promotion of the spread of energy-saving housing and new-technology facilities/equipment
III. Promotion of energy savings (Promotion of environmentally-friendly lifestyles)	• Spread and promotion of eco-household account books • Promotion of local production and local consumption
IV. Promotion of low-carbon development of transportation means	• Activation of public transportation • Utilization of bicycles • Spread and promotion of eco-drive activities
V. Countermeasures for CO_2 absorption sources	• Promotion of forest conservation and greening
VI. Support for businesses working to reduce greenhouse gas emissions	• Establishment of eco-business certification systems • Establishment of support system of the Global Warming Countermeasure Promotion Companies

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on five projects in two cities/one country from FY 2015

Ayeyarwady Region, Republic of the Union of Myanmar

Overview of Study

Collaborative Project with Ayeyarwady Region FY 2015 - 2017

The utilization of photovoltaic power generation facilities and decentralised water treatment systems combined with photovoltaic power generation facilities in new industrial parks was examined in this project. A feasibility study was also conducted on the introduction of a low-carbon waste treatment system (power generation projects using rice hulls) in Pathein Industrial City.

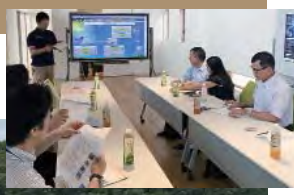
Target sectors: Renewable energy, water supply and sewage, waste treatment, other (development of low-carbon city, understanding needs of partner countries)
Implementing agencies: Fukushima City, 1 organization, 2 companies

Sagaing Region, Republic of the Union of Myanmar

Overview of Study

Collaborative Project with Ayeyarwady Region and Sagaing Region FY 2017

The introduction of low-carbon waste treatment systems (power generation using rice hulls, etc.) and micro-grid systems, as well as support for local waste treatment and community-distributed, autonomous power supply in the area were considered in this project.



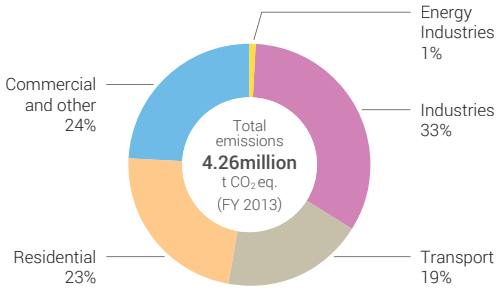
Target sectors: Waste treatment
Implementing agencies: Fukushima City, 1 organization, 2 companies

Source: Fukushima City website / 2014 Economic Census: Results of basic survey / Fukushima Action Plan on Global Warming Countermeasures (March 2011)

Toyama City

Basic Information

Area	1,242 km² (2017)
Population	420,000 (2015)
GRP	JPY 1.8933 trillion (2014)
Major industries	Manufacturing, service, wholesale/retail



Greenhouse gas emission profile

Source: Created based on "Toyama City greenhouse gas emissions in FY 2013", Toyama City

Information on Climate Change Countermeasures

Under the "Toyama City Eco-Model City Action Plan" (revised in March 2014), Toyama City has outlined a basic policy of the "development of a compact city centered on public transportation", in which the government, citizens, and businesses are working together to reduce CO_2 emissions. Sustainable urban management and compact city development in the "FutureCity Toyama" plan have been highly acclaimed both in Japan and abroad. In June 2012, Toyama was selected by Organisation for Economic Co-operation and Development (OECD) as an advanced model city worldwide, together with Melbourne, Vancouver, Paris, and Portland.

Mid- and Long-term Emissions Reduction Targets

14% reduction by 2018 (from 2005 levels)
30% reduction by 2030 (from 2005 levels)
50% reduction by 2050 (from 2005 levels)

Leading Projects

Toyama is promoting the reduction of greenhouse gas emissions with a shift from the use of private vehicles to public transportation, as it aims to become a sustainable city through its compact city strategy with the three pillars of (1) activating public transport (LRT, other), (2) promoting the location of residences in public transportation areas, and (3) activating the city centre. Toyama is also working on the formation of a low-carbon society in various forms, such as the use of renewable energy, including small hydropower and solar power generation, and the Team Toyama project, which promotes voluntary activities by residents and companies.


City train loop line (opened Dec. 2009)


Services extended to below Shinkansen's elevated tracks (opened Mar. 2015)


Toyama Light Rail (opened Apr. 2006)


City train line

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Study on two projects in one city/ one country from FY 2017

Semarang City, Republic of Indonesia

Overview of Study

Collaborative Project with Semarang City FY 2017

This project considered the formation of projects to achieve a compact city and low-carbon public transportation system in Semarang, introduction of renewable energy systems combining small hydropower generation, biomass power generation, and photovoltaic power generation in Diponegoro University, capacity development, such as training for engineers, and implementation of a feasibility study on energy savings in the industrial sector, utilizing the knowledge and technology of Toyama City's plan to develop a compact city around public transportation.

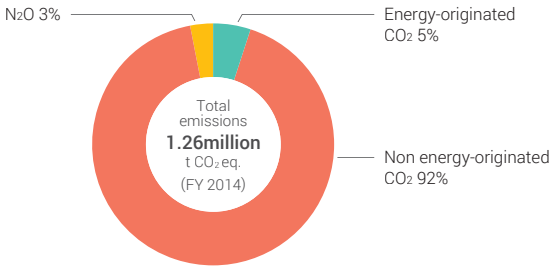
Target sectors: Transportation, renewable energy, energy savings
Implementing agencies: Toyama City, 1 organization, 5 companies

Source: Toyama City website / FY 2014 Toyama City Residents Economic Statistics, July 12, 2017 / Toyama City Eco-Model City Action Plan: Plan to Reduce CO_2 Emissions through Compact City Strategy (Phase 2: 2014-2018), March 2014

Clean Authority of TOKYO

Basic Information

The Clean Authority of TOKYO (Clean Authority) is a special local public body established to jointly carry out incineration and crushing of waste in the 23 wards of Tokyo. The authority manages and operates incineration plants inside the 23 wards and is the largest-scale municipal authority in Japan carrying out cleaning activities. It has 21 incineration plants, two non-burnable waste treatment centers, one bulky waste crushing and disposal facility, and handled 2.75 million tonnes of waste in fiscal 2016.



Greenhouse gas emission profile

Source: Created based on "Calculated and reported figures for emissions based on the Global Warming Law (FY 2014 emissions)", Clean Authority of TOKYO

Information on Climate Change Countermeasures

The Clean Authority promotes the reduction of greenhouse gas emissions through the effective use of waste incineration heat and natural energy in the intermediate treatment of waste. Together with the 23 wards, the authority is developing international cooperation activities that integrate actions in collection and transportation with intermediate treatment to find solutions to environmental issues and waste problems in cities overseas.

Mid- and Long-term Emissions Reduction Targets

The authority strives to reduce the annual average by 1% or more in either energy consumption intensity units or electricity demand leveling evaluation intensity units, as prescribed in the Energy Conservation Law.

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Study on one project in one city/one country in FY 2016

Bali Province, Republic of Indonesia

Overview of Study

Bali Province, Republic of Indonesia

FY 2016

A feasibility study on the introduction of a waste-to-energy plant to solve waste treatment problems in the Sarbagita Region in Bali Province was implemented in this project.

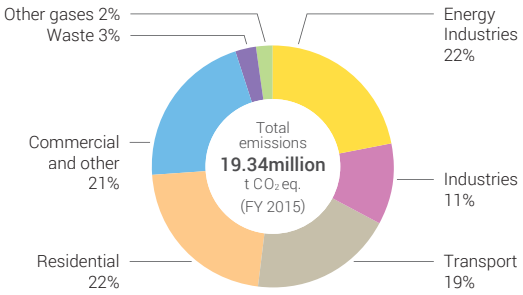
Target sectors: Waste treatment, renewable energy
Implementing agencies: Clean Authority of 23 Wards of Tokyo, 1 company

Source: Clean Authority of 23 Wards of Tokyo website / Calculated and reported figures for emissions based on the Global Warming Law (FY 2014 emissions) / Fundamental policies on global warming prevention countermeasures (January 27, 2016)

City of Yokohama

Basic Information

Area	435 km² (2016)
Population	3.73 million (2016)
GRP	JPY 12.3418 trillion (2014)
Major industries	Service, real estate, wholesale/ retail, manufacturing



Greenhouse gas emission profile

Source: Created based on "Greenhouse gas emissions (confirmed value) in the city in FY 2015", October 27, 2017, City of Yokohama

Information on Climate Change Countermeasures

Yokohama is promoting advanced measures, including the Yokohama Smart City Project (YSCP), and is aiming to create a vibrant, sustainable city through low-carbon development under the "Yokohama City Medium-Term 4-Year Plan, 2014-2017" (formulated in December 2016) and the "Yokohama City Action Plan for Global Warming Countermeasures" (under revision). Yokohama is deepening collaboration with companies, cities, and international organizations both in Japan and overseas and is widely promoting its know-how on urban development. YSCP efforts have been well-received both in Japan and abroad, having received the C40 Cities Award in the Clean Energy division in 2016.

Mid- and Long-term Emissions Reduction Targets
(under revision)

16% reduction by 2020 (from 2005 levels)
24% reduction by 2030 (from 2005 levels)
80% reduction by 2050 (from 2005 levels)

Leading Projects

In 2010, Yokohama was selected as the "Next Generation Energy and Social System Demonstration Region" by the Ministry of Economy, Trade and Industry, and has been promoting the Yokohama Smart City Demonstration Project (YSCP). Since 2015, Yokohama has used the technology and know-how developed through YSCP to establish the Yokohama Smart Business Association (YSBA), a new civil cooperative, in order to shift from "demonstration to implementation", aiming at the creation of an energy efficient circulation city with excellent disaster prevention capabilities, environmental performance, and economic efficiency.

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on 12 projects in four cities/four countries from FY 2014

Batam City, Republic of Indonesia

Overview of Study

Collaborative Project with Batam City FY 2015 - 2017

Promotion of cooperation aiming at smart and clean development of Batam Island.

Target sectors: Waste, sewage treatment, energy savings, renewable energy, transportation, other (green building system)
Implementing agencies: City of Yokohama (Y-PORT Center), 1 organization, 7 companies

Bangkok, Kingdom of Thailand

Overview of Study

Collaborative Project with Bangkok Metropolitan Administration FY 2014 - 2015

Implementation of a study on the promotional scheme for funding to develop a JCM project (energy savings, waste and sewage) and introduce low-carbon technologies based on the Bangkok Climate Change Master Plan 2013-2023

Target sectors: Waste, sewage energy savings
Implementing agencies: City of Yokohama (Y-PORT Center), 1 organization, 3 companies

Collaborative Project with the Port Authority of Thailand FY 2016 - 2017

Implementation of studies on support for the low-carbon development and smart development of ports using the JCM at Bangkok Port and Laem Chabang Port that are managed and operated by the Port Authority of Thailand.

Target sectors: Renewable energy, energy savings, transportation infrastructure
Implementing agencies: City of Yokohama, 1 organization, 2 companies

Da Nang City, Socialist Republic of Viet Nam

Overview of Study

Collaborative Project with Da Nang City FY 2015

Implementation of needs survey for JCM projects, aiming at the formation of a JCM project proposal in the water supply and energy savings sector.

Target sectors: Energy savings, water supply
Implementing agency: City of Yokohama (Y-PORT Center), 1 organization, 2 companies

Bangalore City, India

Overview of Study

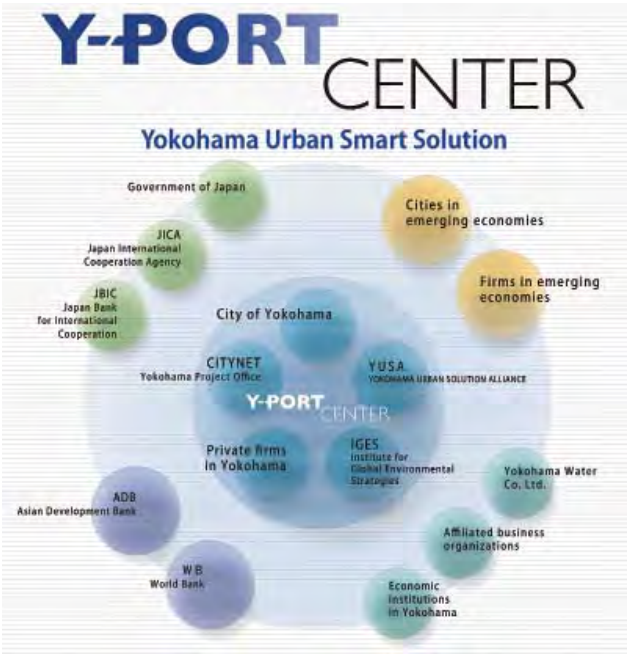
Collaborative Project with Bangalore City FY 2015

Implementation of studies to promote the low-carbon development of the city through resource recycling systems, such as the separation of waste, incineration power generation, and the development of RDF (RPF) for waste, such as plastic.

Target sectors: Waste treatment, water supply and sewage
Implementing agencies: City of Yokohama (Y-PORT Center), 1 organization, 3 companies

Promotion System for International Technical Cooperation through Public-Private Partnerships

In January 2011, Yokohama implemented a project on "International Technical Cooperation through Public-Private Partnerships Using Yokoyama's Resources and Technology (Yokohama Partnership of Resources and Technology, Y-PORT)", with the aim of finding solutions to urban issues in newly emerging economies and the overseas deployment of companies. Yokohama established Y-PORT Center in May 2015 as a platform to promote this project. The Y-PORT Center Public-Private Partnership Office" was opened in July 2017 to strengthen the functions of the Y-PORT Center and staff from the International Affairs Bureau, City of Yokohama, as well as infrastructure business experts were stationed there. The Yokohama Urban Solution Alliance (YUSA) was launched around small- and medium-sized enterprises in the city in order to contribute to expanding opportunities for overseas infrastructure business and finding solutions for urban issues in newly emerging economies in response to these trends to strengthen functions. YUSA also moved to the Y-PORT Center Public-Private Partnership Office, working closely with City of Yokohama in public-private cooperation and business.

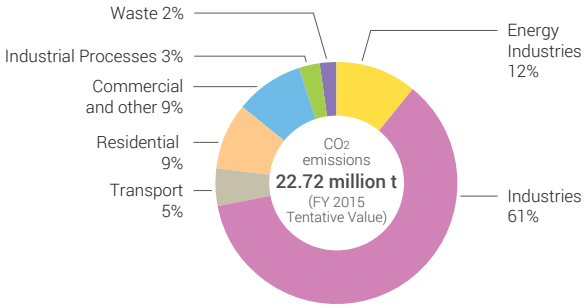


Source: Yokohama City website / FY 2014 Overview of Citizen Economic Calculations in Yokohama City / Yokohama City Action Plan for Global Warming Countermeasures, March 2014 / Creation of FutureCity Yokoyama, Vol. 7, October 2016

Kawasaki City

Basic Information

Area	144 km^2 (2017)
Population	1.5 million (2017)
GRP	JPY 5.369 trillion (2014)
Major industries	Manufacturing, real estate, service



CO_2 emission profile

Source: Created based on the data provided by Kawasaki City

Information on Climate Change Countermeasures

Kawasaki City has formulated the "Basic Plan for Promotion of Global Warming Countermeasures" with the basic philosophy of "Building a low-carbon society through the multi-benefits of countermeasures for global warming" (March 2018), and the citizens, businesses and government are working together to reduce greenhouse gas emissions. Kawasaki City has also formulated an implementation plan (FY 2018 - 2010) based on the basic plan and is developing actions to contribute to measures on a global scale using the excellent environmental technologies that are characteristic of the city.

Mid- and Long-term Emissions Reduction Targets

More than 30% reduction by FY 2030
(from FY 1990 level)

Leading Projects

The main activities of priority projects in the "Kawasaki City Implementation Plan for Global Warming Countermeasures" are as follows.

Priority Projects in Implementation Plan	Main Activities
Eco-life promotion project	• Promotion of eco-life (smart lifestyles) • Promotion of environmental education and environmental learning
Environment and energy project	• Promotion of local production and consumption and autonomous distribution of energy • Promotion of optimal use of energy • Introduction of next-generation energy • Improvement of energy performance of buildings • Promotion of the spread of next-generation vehicles
Green production and environmental technologies project	• Promotion of actions based on the "Kawasaki City Green Innovation Promotion Policy" • Spread of products and technologies that can contribute to global warming countermeasures • International contributions making use of environmental technology • Promotion of reductions in greenhouse gas emissions by large-scale companies • Promotion of smart complexes
City leading action promotion project	• Promotion of the introduction of next-generation vehicles in public facilities • Promotion of the introduction of next-generation vehicles as public vehicles

<Initiatives to disseminate products and technologies that contribute to global warming countermeasure>

The "Low CO_2 Kawasaki Brand" project, which certifies those products and technologies originating in Kawasaki City that have been determined to contribute to the reduction of greenhouse gas emissions throughout their lifecycles, has received high marks, including the Minister of the Environment Award for Global Warming Prevention Activities in FY 2017. To date, the project has certified 76 products and technologies.

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on 11 projects in four cities/three countries from FY 2013

Yangon City, Republic of the Union of Myanmar

Overview of Study

Collaborative Project with Yangon City

FY 2013, FY 2015-2017

Support for the formation of low-carbon development policies in Yangon and implementation of feasibility study on low-carbon projects.

Target sectors: Energy savings, renewable energy, transportation, waste treatment, water supply and sewage, other
Implementing agencies: Kawasaki City, 1 organization, 6 companies

Special Capital Region of Jakarta, Republic of Indonesia

Overview of Study

Collaborative Project Special Capital Region of Jakarta

FY 2017

Implementation of Green Innovation promotion activities in the Special Capital Region of Jakarta feasibility study on low-carbon projects.

Target sectors: Energy savings
Implementing agencies: Kawasaki City, 1 company

Bandung City, Republic of Indonesia

Overview of Study

Collaborative Project with Bandung City

FY 2014-2015

Support for the formation of plans for low-carbon city development in Bandung City and implementation of feasibility study on low-carbon projects. With this project serving as a catalyst, Kawasaki City and Bandung City have concluded a "Memorandum of Understanding on City-to-City Cooperation for the Creation of Low-Carbon, Sustainable Cities."

Target areas: Energy savings, renewable energy, waste treatment, other
Implementing agencies: Kawasaki City, 2 organizations, 2 companies

Penang State, Malaysia

Overview of Study

Collaborative Project with Penang State

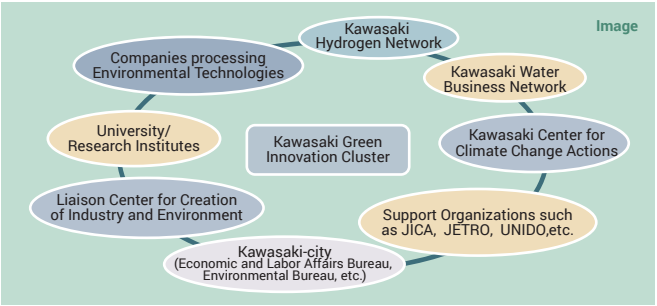
FY 2013

Recommendations of policies for waste management for the formation of a low-carbon city and implementation of a feasibility study on the introduction of waste-to-energy technologies utilizing woody biomass.

Target areas: Waste treatment, transportation, other
Implementing agencies: Kawasaki City, 1 organization, 1 company

Promotion System for International Technical Cooperation through Public-Private Partnerships in Kawasaki City

Kawasaki City will create a sense of energy for the coming generations in Kawasaki by making full use of the city's strong points in environmental technologies and environmental industries and promoting the greening of the economy and society. Kawasaki compiled basic approaches to sustainable urban planning and directions for initiatives, establishing the Kawasaki Green Innovation Cluster in April 2015 as a system to promote this.

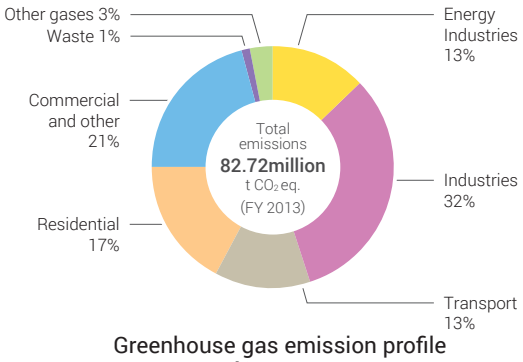


Source: Kawasaki City website / Kawasaki City Promotion Plan for Global Warming Countermeasures (March 2018) / Kawasaki City Implementation Plan for the Promotion of Global Warming Countermeasures (March 2018) / Kawasaki Green Innovation Cluster website

Kanagawa Prefecture

Basic Information

Area	2,416 km² (2016)
Population	9.15 million (2017)
GRP	JPY 30.322 trillion (2014)
Major industries	Wholesale/retail, service



Greenhouse gas emission profile
(Emissions of CO^2 (by sector) and other 6 gases)

Source: Created based on "Estimation results of greenhouse gas emissions in Kanagawa Prefecture in FY 2014", Kanagawa Prefecture

Information on Climate Change Countermeasures

Under the "Kanagawa Prefecture Plan for Global Warming Countermeasures" (revised in October 2016), Kanagawa Prefecture is promoting a shift from an energy-intensive society dependent on fossil fuels to a low-carbon society with lower impacts on the global environment. Each actor, including the prefecture, businesses, residents, and private companies are cooperating and collaborating with one another to implement countermeasures, aiming to pass on a healthy environment to future generations. The promotion of adaptation measures and international environmental cooperation are also positioned in the plan.

Mid- and Long-term Emissions Reduction Targets
27% reduction by 2030 (from 2013 levels)
80% reduction to 2050

Leading Projects

Kanagawa Prefecture regards those actions that they need to put particular emphasis on as "prioritized actions" to achieve the reduction targets set out under the Kanagawa Prefecture Plan for Global Warming Countermeasures.

Sector/Initiative	Prioritized measures (Major Actions)
Industrial sector	• Promotion of voluntary reduction of greenhouse gas emissions by the private sector (Steady implementation of the Business Activity Plan for Global Warming Countermeasures, provision of information and enhanced support system for small and medium-sized enterprises)
Commercial sector	• Energy savings in buildings (Steady implementation of the planning system for global warming countermeasures in buildings, expansion of Net Zero Energy Building (ZEB))
Residential sector	• Promotion of low-carbon lifestyles (Promotion of practical activities for energy savings in residences, etc.) • Energy savings in houses (Expansion of Net Zero Energy House (ZEH), expansion of environmentally-friendly houses)
Transportation sector	• Promotion of the use of environmentally-friendly vehicles (Spread and expansion of next generation vehicles (electric vehicles (EV), fuel cell vehicles (FCV), etc.))
Promotion of the use of diversified power sources, such as renewable energy	• Accelerate the introduction of renewable energy, etc. (Accelerate the introduction of photovoltaic power generation, promote the introduction of small hydropower generation, and solar heat, etc.) • Introduction and expansion of stable distributed power supply (Introduction of gas co-generation, hydrogen energy, and storage batteries)
Measures for fluorocarbons	• Promotion of proper operation of Act on Rational Use and Proper Management of Fluorocarbons (Promotion of proper operation of Act on Rational Use and Proper Management of Fluorocarbons and Act on Recycling, etc. of End-of-life Vehicles)
Education on global warming countermeasures	• Promotion of environmental education in school curriculums (Promotion of environmental education in school curriculums, training for teachers supporting environmental education)

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on four projects in two cities/one country from FY 2015

Siem Reap Province, Cambodia

Overview of Study

Collaborative Project in Siem Reap Province FY 2015 - 2016

Implementation of feasibility study on low-carbon projects for renewable energy facilities and energy saving facilities in Siem Reap City and Angkor area, and support for the "Development of Low-carbon Tourism City" in Siem Reap Province.

Target sectors: Renewable energy, other
Implementing agencies: Kanagawa Prefecture, 1 organization, 3 companies

Phnom Penh Capital City, Cambodia

Overview of Study

Collaborative Project with Phnom Penh Capital City

FY2017

Conduct of co-generation project with dry methane fermentation to help introduce appropriate waste disposal in Phnom Penh, and consideration of the use of renewable energy to be used in the sale of electricity and heat supply to peripheral facilities.

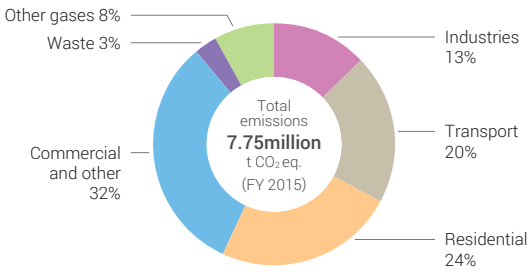
Target sectors: Renewable energy, waste treatment
Implementing agencies: Kanagawa Prefecture, 1 organization, 4 companies

Source: Kanagawa Prefecture website / Our Kanagawa Prefecture FY 2017 edition / Kanagawa Prefecture Citizens Economic Statistics (November 2016) / Kanagawa Prefecture Plan for Global Warming Countermeasures (revised in October 2016)

City of Kyoto

Basic Information

Area	827 km² (2017)
Population	1.47 million (2017)
GRP	JPY 6.1638 trillion (2016)
Major industries	Service, manufacturing, commerce



Greenhouse gas emission profile

Source: Created based on "About the greenhouse gas emissions in FY 2015", City of Kyoto

Information on Climate Change Countermeasures

As the birthplace of the Kyoto Protocol, Kyoto is developing as a city that is changing to an environmentally-friendly lifestyle, using the phrase, "DO YOU KYOTO? (Are you carrying out environmentally-friendly actions?)." The Kyoto City Plan for Global Warming Countermeasures <2011-2020> was revised in March 2017. Based on the changes in social conditions, such as the entry of the Paris Agreement into force, Kyoto City is working on initiatives to further strengthen global warming countermeasures, such as "Project Zero", with an eye on the long-term future.

Mid- and Long-term Emissions Reduction Targets
25% reduction by 2020 (from 1990 levels)
40% reduction by 2030 (from 1990 levels)
80% reduction in the long term (from 1990 levels)

Leading Projects

Kyoto is presenting a vision of a low-carbon society in 2030 from six perspectives in consideration of the features of the area, and has set out 19 promotion policies, 36 specific measures, and 98 specific initiatives to promote action.

Vision 1 Giving priority to pedestrians and public
Transportation in city development to make walking more enjoyable

Vision 2 Regenerating forests and cherishing "tree culture"
Utilizing local timber, appropriate conservation of forests

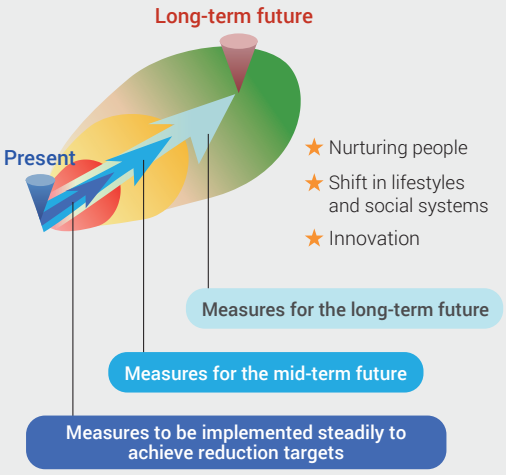
Vision 3 Energy creation and regional circulation city
Introduction and expansion of renewable energy, attractive low-carbon city development

Vision 4 Environmental-friendly lifestyles
Promotion of the spread of eco-living and environmentally-friendly housing

Vision 5 Environmentally-friendly economic activities
Promotion and development of environmental industries, promotion of low-carbon development by companies and others

Vision 6 Reduction of waste
Promotion of 2R, promotion of separation and recycling

Path to Project Zero



Source: Kyoto City website / Kyoto City Plans for Global Warming Countermeasures <2011-2020> (Revised in March 2017) / Kyoto Conference on the Global Environment 2017 (KYOTO+20) website

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on two projects in one city/one country from FY 2014

Vientiane Capital City, Lao People's Democratic Republic

Overview of Study

Collaborative Project with Vientiane Capital City

FY 2014 - 2015

A feasibility study on the creation of operation and management systems and formation of low-carbon projects for the formation of a low-carbon historical city were implemented in this project.

Target sectors: Renewable energy, waste treatment, transportation
Implementing agencies: City of Kyoto, 1 organization, 4 companies

International intercity cooperation activities: Organization of the Kyoto Conference on the Global Environment 2017

In December 2017, City of Kyoto organized the "Kyoto Conference on the Global Environment 2017 (KYOTO+20)" at the Kyoto International Conference Center to commemorate the 20th anniversary of the Kyoto Protocol. Approximately 1,000 people attended from 18 countries and regions around the world. At the conference, the "Kyoto Declaration for Cultivating a Culture of Sustainable Cities" was announced, illustrating the responsibility of cities as major sources of greenhouse gas emissions, in order to achieve net zero emissions of greenhouse gases in the latter half of this century, as stipulated by the Paris Agreement.

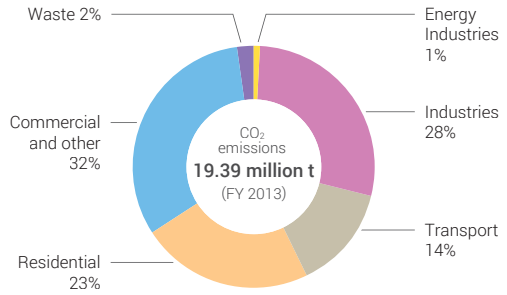
Vision for cities of the world in 2050

- Coexistence with nature is realized, acknowledging its function as a source of life and carbon sink.
- Change in people's values and lifestyle is advanced, by revisiting the culture of daily life that admires the mindful and wise use of goods based on the spirit of "mottainai" (regretting wastefulness) and "shimatsu" (being frugal; making full use of things).
- Leaders for building a sustainable society are nurtured through promotion of environmental education and learning. The leaders are able to perceive various problems as their own and act proactively.
- Strategies for adapting to the impacts of climate change are in place, in parallel with technological innovation for decarbonization.
- Resource-efficient and circular economy is realized, for example by utilizing urban mines, recovering useful metals and other resources contained in waste.
- Energy autonomy of cities is realized, through the promotion of energy savings and the use of renewable energy.
- Urban mobility with low environmental impact is achieved through advancement of urban transport systems.
- Peaceful resolution of social problems, such as poverty and disparity, is well advanced, through efforts to shift to a sustainable society.

City of Osaka

Basic Information

Area	225 km² (2015)
Population	2.71 million (2017)
GRP	JPY 18.7361 trillion (2013)
Major industries	Wholesale/retail, service, information and communications, manufacturing



CO_2 emission profile

Source: Created based on "Osaka City Action Plan on Global Warming Countermeasures (revised plan)", March 2017, City of Osaka

Information on Climate Change Countermeasures

In 2017, Osaka revised the "Osaka City Action Plan on Global Warming Countermeasures" formulated in 2011. Under the positive growth cycle of the environment and economy, Osaka is working on specific mitigation and adaptation measures, with an aim to achieve the development of an environmentally-advanced city where the environment opens up the door to the future. Globally, Osaka is cooperating with international organizations such as United Nations Environment International Environmental Technology Centre (UNEP-IETC) to support the formation of low-carbon cities in Asia through international cooperation.

Mid- and Long-term Emissions Reduction Targets

5% reduction by 2020 (from 2013 levels)
30% reduction by 2030 (from 2013 levels)
80% reduction by 2050 (from 1990 levels)

Leading Projects

As a major city in Japan, Osaka is developing five priority measures with an eye on medium- to long-term priority initiatives, under the basic idea of achieving national GHG emission targets and contributing to global warming countermeasures, while taking advantage of the features of the region.

Promotion energy savings and reduction of CO_2 by citizens and businesses

- Promotion of measures in buildings
- Promotion of the spread of energy-saving and CO_2-saving equipment, such as high-efficiency water heaters
- Introduction of LED lighting in public facilities

Promotion of improvement of local environment

(Transportation/logistics measures, greening, low-carbon type urban development)

- Improvement of public transportation, smooth transit (Osaka Higashi Line, Yodogawa-Sagan Line)
- Creating low-carbon cities

Osaka Outer Ring Road

Promotion of the u se of renewable energy

- Promotion of the introduction of photovoltaic power generation (Expanded targets) (Introduction target in Osaka City area: 150,000 kW → 200,000 kW)
- Utilization of unused energy generated by waste treatment and sewage treatment

Photovoltaic power generation facility

Formation of a Material-Cycle Society

- Promotion of waste measures (expanded target) (Targets for amount of waste handled and disposed in FY 2025: 900,000 tonnes ⇒ 840,000 tonnes)

Participation, coordination, and linkages of residents and businesses

- Promotion of environmental education using Osaka's own supplementary reader, Osaka Environment" and environmental learning from early childhood
- Enhancement of lectures to improve energy literacy of citizens in response to the liberalization of the electricity and gas retail market
- Provision of information to support CO_2 reductions, such as the selection of low-carbon energy

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on five projects in two cities/two countries from FY 2013

Ho Chi Minh City, Socialist Republic of Viet Nam

Overview of Study

Collaborative Project with Ho Chi Minh City FY 2013 - 2015, 2017

Comprehensive support from the formulation of the Ho Chi Minh City Climate Change Action Plan to progress management. Promotion of low-carbon projects in a form linked to this plan.

Target sectors: Renewable energy, energy savings, transportation infrastructure, waste treatment, water supply and sewage, other (support for formulation of plans, etc.)
Implementing agencies: City of Osaka, 2 organizations, 17 companies

Quezon City, Republic of the Philippines

Overview of Study

Collaborative Project with Quezon City FY 2017

Support for the formulation of action plans on photovoltaic power generation and energy savings in factories, under intercity cooperation between Osaka and the Manila metropolitan area, and promotion of low-carbon projects (solar energy, energy savings (factories) sector) in a form linked with this plan.

Target sectors: Renewable energy, energy savings
Implementing agencies: City of Osaka, 1 organization, 7 companies

Promotion System for International Technical Cooperation through Public-Private Partnerships

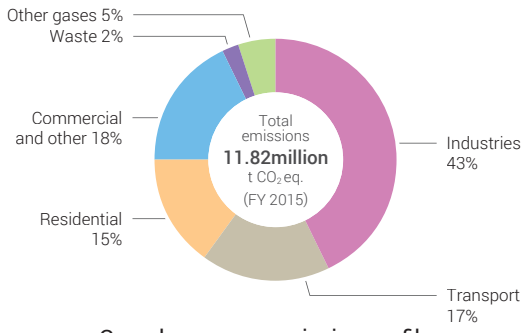
Formation of Team OSAKA Network in June 2016 as a place for businesses in Osaka and Kansai with environmental technologies to collaborate with Osaka, the Global Environment Centre Foundation, and universities in order to create and formulate projects for the development of low-carbon societies in cities in Asia. Through this network, Osaka is promoting the overseas expansion of businesses and revitalization of the economy in Osaka and Kansai, as well as contributing to Japan's role in the international environmental sector.

Source: Osaka City website / FY 2017 Osaka's Economy (January 2017) / Osaka City Action Plan on Global Warming Countermeasures (revised in March 2017)

City of Kobe

Basic Information

Area	557 km² (2017)
Population	1.54 million (2016)
GRP	JPY 6.2 trillion (2014)
Major industries	Service, manufacturing, real estate, wholesale/retail



Greenhouse gas emission profile

Source: Created based on "Status of greenhouse gas emissions in the Kobe area FY 2015 (entire Kobe area)", City of Kobe

Information on Climate Change Countermeasures

One of the basic policies for achieving the desired environmental image of the "Kobe City Environmental Master Plan," the creation of a "Kobe that connects the blessings of nature and the sun to the future" is the "creation of a lifestyle and society with low CO_2 emissions". Kobe is taking climate change countermeasures with the three main pillars of energy savings, renewable energy, and innovative technology development, under the "Kobe City Action Plan for Preventing Global Warming" (revised in September 2015).

Mid- and Long-term Emissions Reduction Targets
34% reduction by 2030 (from 2013 levels)

Leading Projects

The specific measures implemented under the three pillars for Global Warming Countermeasures are as follows.

Countermeasures	Specific Examples of Measures
Promotion of energy savings	Spread and awareness of green curtains, awareness of switching to energy-saving equipment, such as LED lighting, awareness on the use of low-carbon transportation means, such as community cycles
Spread of renewable energy	Support for the installation of photovoltaic power generation for residences, utilization of woody biomass integrated with forest development of the Rokko mountains
Promotion of innovative technology development	Promotion of promising pioneering technologies for hydrogen energy (development of hydrogen supply chains and hydrogen energy utilization systems, etc.), promotion of the development of hydrogen stations and utilization of fuel cells (assistance in the introduction of fuel cell vehicles and fuel cells for households, etc.)

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Study on one project in one city/one country in FY 2014

Kiên Giang Province, Socialist Republic of Viet Nam

Overview of Study

Collaborative Project with Kiên Giang Province FY 2014

This project examined the potential to introduce low-carbon technologies in the water infrastructure sector, conducted a needs survey on waste and other sectors, and identified low-carbon technologies in Japan that could be applicable for Phú Quốc Island in Kiên Giang Province.

Target sectors: Waste treatment, water supply and sewage, transportation infrastructure
Implementing agencies: City of Kobe, 2 organizations, 3 companies

(Reference) Overview of Phú Quốc Island in Kiên Giang Province

Phú Quốc Island is the largest island in Viet Nam (589 km^2), located in Thailand Bay, 40 km west of the mainland of Viet Nam. It is called the Emerald Island and is a popular destination for tourists from Japan and abroad. In recent years, the international airport has been improved and resort island development with a balance between economic development and eco-tourism is expected to move forward. The population and number of tourists are expected to increase, resulting in a rise in electricity demand, increase in waste and sewage treatment, giving concern that greenhouse gas emissions will increase.

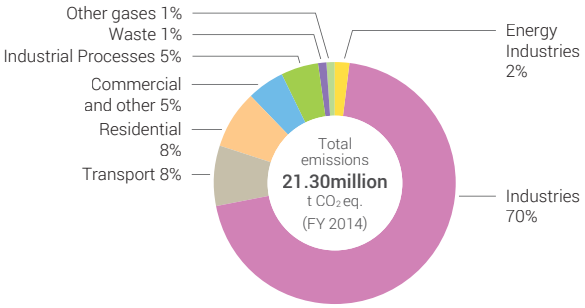
Since it is an island, its own water sources are scarce, leaving as an urgent task the development of sustainable water supply and sewerage systems in light of the future increase in water demand. Electricity is dependent on supply from the mainland. When power is short on the mainland, it is necessary to secure and conserve energy on the island. Final waste disposal sites on the island and proper waste management are issues that need to be solved in situations where waste is being piled up in temporary storage spaces on the island.

Source: Kobe City website / FY 2014 Kobe City Citizens' Economic Statistics / Kobe City Environmental Master Plan (revised March 2016) / Kobe City Plan on the Prevention of Global Warming (revised September 2015) / Report on eco-island feasibility study by the Institute for Global Environmental Strategies, Nikken Sekkei Civil Engineering Ltd., Kiên Giang Province and Kobe City (March 2015)

City of Kitakyushu

Basic Information

Area	492 km² (2016)
Population	960,000 (2016)
GRP	JPY 3.5358 trillion (2014)
Major industries	Service, manufacturing, wholesale/retail



Greenhouse gas emission profile

Source: Created based on "Greenhouse gas emissions in Kitakyushu (FY 2014)", City of Kitakyushu

Information on Climate Change Countermeasures

Kitakyushu positions both mitigation and adaptation measures and is developing various initiatives under the Kitakyushu New Green Frontier Plan (formulated in August 2016). Experiences and technologies developed in the city are being packaged and deployed for Asia through public-private partnerships through the Asian Center for Low Carbon Society (established in June 2010). Such initiatives and activities have been highly acclaimed in both Japan and abroad, with Kitakyushu being selected by OECD in June 2011 as a "Green Growth City" together with Paris, Chicago, and Stockholm.

Mid- and Long-term Emissions Reduction Targets

8% reduction by 2020 (from 2005 levels)
30% reduction by 2030 (from 2005 levels)
50% reduction by 2050 (from 2005 levels)

Leading Projects

Under the Kitakyushu New Green Frontier Plan, Kitakyushu is implementing various measures under five policies in order to "contribute to the development of a sustainable society by taking on the challenge to create a low-carbon society based on the advanced environmental capabilities of its residents, promoting initiatives to prevent global warming and increase urban vitality, and utilizing the results in various countries and cities in Asia."

Action Policies	Major Initiatives
Environment creates an advanced city	• Jono Zero Carbon Advanced Area Project • Improve convenience of public transport • Spread of next-generation vehicles, other
Environment opens up the economy	• Promotion of regional energy base • Environmental energy management • Promotion of the development of a hydrogen energy society, other
Environment develops human resources	• Promotion of "Dokoeco", Kitakyushu environment future learning system • Establishment of the Kitakyushu Environmental Capital examination, other
Environment supports rich lifestyles	• Substantial development of Eco-Life Stage • Promotion of environmental activities using Teitan point system • Eco-Drive Kitakyushu Project, other
Environment deepens ties with Asia	• Promotion of Asian Center for Low Carbon Society • Japan-China joint project on countermeasures for air pollution and energy savings • Kitakyushu Method composting system, other


Jono Zero Carbon Advanced Area Project


Promotion of regional energy base


Promotion of education for sustainable development (ESD)


Substantial development of Eco-Life Stage


Promotion of Asian Center for Low Carbon Society

Cities Cooperating in the City-to-City Collaboration for Low-Carbon Society

Studies on 21 projects in 7 cities/6 countries from FY 2013

Surabaya City, Republic of Indonesia

Overview of Study

Collaborative Project with Surabaya City FY 2013 - 2015

Low-carbon city development project in Surabaya

Target sectors: Energy, waste management, transportation, water resources
Implementing agencies: City of Kitakyushu (Asian Center for Low Carbon Society), 13 companies

Hai Phong City, Socialist Republic of Viet Nam

Overview of Study

Collaborative Project with Hai Phong City FY 2014 - 2017

Support for the formulation of the Green Growth Promotion Plan of the City of Haiphong

Target areas: Low-carbon urban planning, energy, waste management conservation of Cat Ba Island
Implementing agencies: City of Kitakyushu (Asian Center for Low Carbon Society), 10 companies

Iskandar Development Region, Malaysia

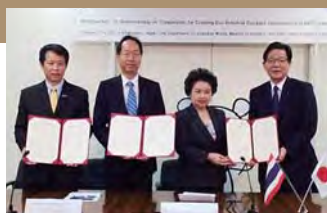
Overview of Study

Collaborative Project with Iskandar Development Region FY 2014 - 2016

Reduction of greenhouse gas emissions in the Iskandar Development Region

Target sectors: Waste-to-energy, energy savings, recycling of industrial waste in industrial estates
Implementing agencies: City of Kitakyushu (Asian Center for Low Carbon Society), 4 companies

Rayong Province, Kingdom of Thailand



Overview of Study

Collaborative Project with Rayong Province FY 2015 - 2016

Reduction of greenhouse gas emissions in Rayong Province

Target sectors: Waste-to-energy projects, energy savings, total recycling in industrial estates
Implementing agencies: City of Kitakyushu (Asian Center for Low Carbon Society), 4 companies

Chiang Mai Province, Kingdom of Thailand

Overview of Study

Collaborative Project with Chiang Mai Province FY 2017

Comprehensive support for the Chiang Mai Province Comprehensive Waste Management Project, support for low-carbon development of the Eco-Industrial Town

Target sectors: Waste treatment, energy savings, renewable energy
Implementing agencies: City of Kitakyushu (Asian Center for Low Carbon Society), 2 companies

Phnom Penh Capital City, Kingdom of Cambodia

Overview of Study

Collaborative Project with Phnom Penh Capital City FY 2016 - 2017

Support for the formulation of the Phnom Penh Climate Change Strategic Action Plan

Target sectors: Low-carbon urban planning, energy
Implementing agencies: City of Kitakyushu (Asian Center for Low Carbon Society), 4 companies

Mandalay City, Republic of the Union of Myanmar

Overview of Study

Collaborative Project with Mandalay City FY 2017

Promotion of low-carbon development in the Mandalay region

Target sectors: Energy savings, renewable energy
Implementing sectors: City of Kitakyushu (Asian Center for Low Carbon Society), 2 companies

Promotion System for International Technical Cooperation through Public-Private Partnerships

Kitakyushu, which has been selected as an Eco-Model City, has set an objective to reduce GHG emissions in the city and reduce GHG emissions in the Asian region by 150% by 2050. To achieve this, Kitakyushu, the Kitakyushu International Techno-cooperative Association, and the Institute for Global Environmental Strategies established the Asian Center for Low Carbon Society in June 2010 and are developing international cooperation and business through public-private partnerships.

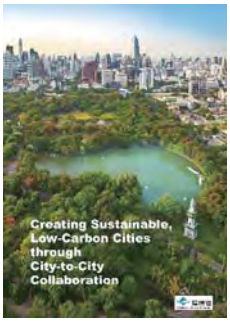
Source: Kitakyushu City website / FY 2014 Kitakyushu City Citizens' Economic Statistics / Kitakyushu City Action Plan on Global Warming Countermeasures and Eco-Model City Action Plan: Kitakyushu New Green Frontier Plan (August 2016) / Asia Green Camp (pamphlet on the Asian Center for Low Carbon Society)

Related Information

Related Information

Guidebook “Creating Sustainable Low-Carbon Cities through City-to-City Collaboration”

The Ministry of the Environment, Japan published the guidebook entitled “Creating Sustainable Low-Carbon Cities through City-to-City Collaboration” to promote the City-to-City Collaboration Programme to city officials and private companies interested in the programme.



Websites Related to International Cooperation for the Creation of Low-Carbon Societies in Japan

Dissemination of information on international cooperation in Japan, including the Joint Crediting Mechanism (JCM)

Joint Crediting Mechanism

https://www.jcm.go.jp/

This website provides information on JCM projects for respective countries. (Managed by the Ministry of Economy, Trade and Industry (METI) and the Ministry of the Environment, Japan (MOEJ))

Sites with information on the development of low-carbon societies in Asia

http://www.env.go.jp/earth/coop/lowcarbon-asia/english/

This website provides consolidated information regarding international negotiations and related policy trends, policies, and support systems. (Managed by the MOEJ)

Carbon Markets Express

https://www.carbon-markets.go.jp/eng/

This website introduces JCM and carbon markets in the world, based on the information released by the government of Japan. (Managed by the Overseas Environmental Cooperation Center, Japan (OECC))

Websites Related to Initiatives to Create Low-Carbon Societies in Japan

A site supporting the development of low-carbon cities by local governments in Japan

Ministry of the Environment: Site with support for the development of local government action plans (Japanese only)

http://www.env.go.jp/policy/local_keikaku/

This website provides manuals, guidelines and tools for supporting local governments to develop "Action Plans by Local Governments". (Managed by the MOEJ)

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