

# ANNUAL REPORT

ON THE ENVIRONMENT  
IN JAPAN 2017



# TABLE OF CONTENTS

## FOREWORD

— 03

### 1

## ACTION ON THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)

- (1) Actions by the government of Japan
- (2) Actions by the private sector
- (3) Actions by local governments

— 04

— 05

— 07

— 08

### 2

## CLIMATE CHANGE COUNTERMEASURES BUILDING UPON THE PARIS AGREEMENT

- (1) Japan's formal acceptance of the Paris Agreement
- (2) Japan's contribution to COP22
- (3) Japan's global warming countermeasures based on the Paris Agreement

— 09

— 10

— 11

— 12

### 3

## SIMULTANEOUS RESOLUTION OF ENVIRONMENTAL, ECONOMIC AND SOCIAL ISSUES

- (1) Japan's Approaches to the simultaneous resolution of environmental, economic and social issues
- (2) Initiatives aimed at the simultaneous resolution of environmental, economic and social issues

— 16

— 17

— 19

### 4

## RECONSTRUCTION AND RESTORATION OF THE ENVIRONMENT AFTER THE GREAT EAST JAPAN EARTHQUAKE

— 24

## ADDITIONAL MATERIALS

— 26

- Low-carbon society
- Biodiversity
- Sound material-cycle society
- Atmospheric and water environments
- Environmental risks of chemical substances

— 26

— 28

— 30

— 32

— 34

# FOREWORD

About 20 years ago, I was Parliamentary Vice-Minister of the Environment at the time of the Kyoto Conference (COP3) in 1997, engaged in the process of adoption of the Kyoto Protocol. That experience marked the start of my involvement in environmental policy, which has since become my life work. In those days, not everyone appreciated the importance of addressing environmental challenges. I am glad to say that circumstances have changed, and being environmentally-friendly is now discussed more or less as a matter of course.

Nevertheless, over those 20 years, the world's population has increased, and the global economy has continued to grow. The impact of human activities on the environment has increased to such an extent that an existential crisis now faces the global environment that provides the foundation for human survival. Climate change is a particularly urgent challenge. Its effects are already observable around the world, with rising air temperatures, melting snow and ice, and rising sea levels. Year-by-year, the damage caused by storms or typhoons, and the impact on crops and the ecology, are becoming increasingly evident in Japan.

Active cooperation by the international community to take action on such global issues led, in September 2015, to the United Nations General Assembly adopting the Sustainable Development Goals (SDGs) as part of the 2030 Agenda for Sustainable Development. The SDGs show that it is important to find integrated solutions to environmental, economic, and social issues that are increasingly complex and increasingly serious. Japan has made that a basic principle of its environmental policy as it works towards achieving a sustainable society.

In November 2016, the Paris Agreement came into force as the first ever agreement to aim for effectively reducing greenhouse gas emissions to zero by the second half of this century. Under the Paris Agreement, the world has already set out on a path leading to a post-carbon society. When I

attended COP22 in Marrakech the same month to present Japan's commitments for transitioning to a post-carbon society, I sensed a powerful current of opinion in the international community. We now have to make further vigorous efforts to pursue domestic and international initiatives. The keys to a post-carbon society are rigorous energy saving and significant expansion of renewable energy. By enhancing carbon efficiency, raising the level of domestic investment, and expanding the scope of regional economic circulation, they become the motive force that drives new growth.

Based on these circumstances, the Annual Report on the Environment in Japan 2017 has taken "Socioeconomic Innovation through Environmental Measures" as its theme. It first provides an overview of developments in Japan based on the SDGs and the Paris Agreement. Then it examines the environmental, economic and social challenges that Japan faces, introducing the direction of efforts to create socioeconomic innovation and simultaneously solve economic and social issues, at the same time as resolving environmental issues through environmental policy

Each generation aims to pass on a slightly better world to future generations. It is my hope that this report will contribute to that process, with today's environment being slightly better than yesterday's, and the future environment being better still.



Minister of the Environment

Koichi Yamamoto

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# ACTION ON THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)

Economic growth and new technologies have materially enriched our lives and improved convenience, but they have also been detrimental to the global environment that underlies human existence. The adoption of the Sustainable Development Goals (SDGs) at the United Nations Summit in September 2015 was a historic decision in which the international community recognized the urgency of global environment issues, and agreed to collaborate to resolve them. Here we introduce some of the actions that Japan is taking to achieve the SDGs.



1

1. Action on the Sustainable Development Goals (SDGs)

## ACTIONS BY THE GOVERNMENT OF JAPAN

### SDGs Promotion Headquarters

To promote action on the SDGs, in May 2016 Japan established the SDGs Promotion Headquarters, a Cabinet body headed by the Prime Minister with all ministers as its members. The headquarters then organized the SDGs Promotion Roundtable Meeting, where a wide range of stakeholders including local and national government agencies, NGOs/NPOs, academia, the private sector, international organizations, and various other organizations gather and exchange opinions. In December 2016, based on the views that emerged at the Roundtable meetings, the headquarters formulated the SDGs Implementation Guiding Principles.

These principles set out Japan's vision: "Become a leader toward a future where economic, social and environmental improvements are attained in an integrated, sustainable and resilient manner while leaving no one behind." The Principles also identify eight priority areas of focus by reconstructing the SDGs in light of the national context, and give concrete policies to implement. Focusing on these priority areas and utilizing the indicators set out at the same time to assess progress, the government plans to conduct its first follow-up and review process in 2019.

## SUSTAINABLE DEVELOPMENT GOALS

### 17 GOALS TO TRANSFORM OUR WORLD



Correlation of Japan's Priority Areas with SDGs

People	Empowerment of All People	1 NO POVERTY	4 QUALITY EDUCATION	5 GENDER EQUALITY	8 DECENT WORK AND ECONOMIC GROWTH	10 REDUCED INEQUALITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
	Achievement of Good Health and Longevity	3 GOOD HEALTH AND WELL-BEING					
Prosperity	Creating Growth Market, Revitalization of Rural Areas and Promoting Technological Innovation	2 ZERO HUNGER	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	11 SUSTAINABLE CITIES AND COMMUNITIES		
	Sustainable and Resilient Land Use, Promoting Quality Infrastructure	2 ZERO HUNGER	6 CLEAN WATER AND SANITATION	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	11 SUSTAINABLE CITIES AND COMMUNITIES		
Planet	Energy Conservation, Renewable Energy, Climate Change Measures and Sound Material-Cycle Society	7 AFFORDABLE AND CLEAN ENERGY	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION			
	Conservation of Environment, including Biodiversity, Forests and Oceans	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	14 LIFE BELOW WATER	15 LIFE ON LAND		
Peace	Achievement of Peaceful, Safe and Secure Societies	16 PEACE, JUSTICE AND STRONG INSTITUTIONS					
Partnership	Strengthening the Means and Frameworks of the Implementation of the SDGs	17 PARTNERSHIPS FOR THE GOALS					

Source : Ministry of Foreign Affairs of Japan

### Achieving SDGs through Public Private Action for Partnership (PPAP)

In July 2017, Japan reported on its implementation of the SDGs to the United Nations High-level Political Forum on Sustainable Development. In that presentation, Japan declared a clear commitment to take concrete actions domestically and internationally to achieve the vision set out in

the SDGs Implementation Guiding Principles, and to do this through partnership between the public and private sectors, bringing together the country's diversity of knowledge and expertise, and involving civil society and private-sector businesses as well as government.

### Other actions to meet the SDGs

Since the Third Basic Environment Plan of 2006, Japan has stipulated "Integrated improvements of the environment, economy and society" as a direction for future environmental policy. That direction is fundamentally aligned with the SDGs. Consequently, the Basic Environment Plan is being examined by the Central Environment Council to adopt the principles and approaches of the SDGs. The Ministry of the Environment holds

stakeholders' meetings to provide a venue for sharing and recognizing trailblazing actions. In FY2016, there were three such meetings, with a total attendance of about 600. Participants shared case studies of pioneering enterprises that were taking action on the SDGs. Other action by the ministry includes publicizing the latest information from around the world and enhancing networking between stakeholders.

## 2

1. Action on the Sustainable Development Goals (SDGs)

## ACTIONS BY THE PRIVATE SECTOR

Effective use of private sector money and technology to resolve the challenges that our society faces is the key to achieving the SDGs. Japanese businesses are now gaining a deeper understanding of the SDGs and taking action to contribute to the goals. This can be seen in practical actions incorporated into business plans and implemented by operating divisions.

### Sumitomo Chemical's Sustainable Tree project



Sumitomo Chemical Group has a project named "Sustainable Tree" which is open to all group employees worldwide. Staff are invited to think about what they can do in their day-to-day work and daily lives to contribute to the SDGs, posting their ideas on the Sustainable Tree website. This activity enhances understanding of the SDGs, and also boosts employee motivation.

Source : Sumitomo Chemical Company, Limited

### "2030 SDGs" card game

Imacocollabo Association developed the "2030 SDGs" card game as a way for players to discover and experience the path that leads to achieving the 2030 targets by simultaneously achieving goals for environment, economy and society dimensions of the SDGs. The game is being used in government agencies and private sector businesses to promote understanding of the SDGs.



Source : Imacocollabo Association

## ACTIONS BY LOCAL GOVERNMENTS

### SDGs and local governments

Some progressive local governments are already beginning to incorporate aspects of the SDGs into their own policies. For instance, Shiga Prefecture and Nagano Prefecture are actively considering how to factor SDGs into their prefectural basic guidelines. Sapporo City is reviewing its basic environment plan from the viewpoint of how to

contribute to the SDGs. As a model example in towns and villages, the town of Uchiko in Ehime prefecture, whose population is only 18,000, began organizing workshops as soon as the SDGs were adopted. Through these workshops, local residents, public servants, researchers, NPO people, and others are studying actions at the community level.

### “FutureCity” initiative

The Cabinet Office designated 11 cities throughout Japan as “future cities” that would aim to achieve a sustainable economy and society. The FutureCity concept has much in common with SDG11 (Sustainable cities and communities), and it is hoped that knowledge acquired in Japan through this initiative can contribute to achieving that goal.

### SDGs guidelines for local government

In March 2017, the Institute for Building Environment and Energy Conservation (IBEC) gave a boost to the SDG actions of local authorities by publishing guidelines for local government SDGs initiatives.



SDGs Workshop in Uchiko Town, Ehime prefecture

# CLIMATE CHANGE COUNTERMEASURES BUILDING UPON THE PARIS AGREEMENT

The Paris Agreement that took effect in November 2016 represents a turning point in the global climate change countermeasures that have developed out of the United Nations Framework Convention on Climate Change and the Kyoto Protocol. It can be considered a fresh start to the effort to establish decarbonized societies all over the world in the second half of this century.

Here we introduce the main initiatives that Japan has taken based on the Paris Agreement.

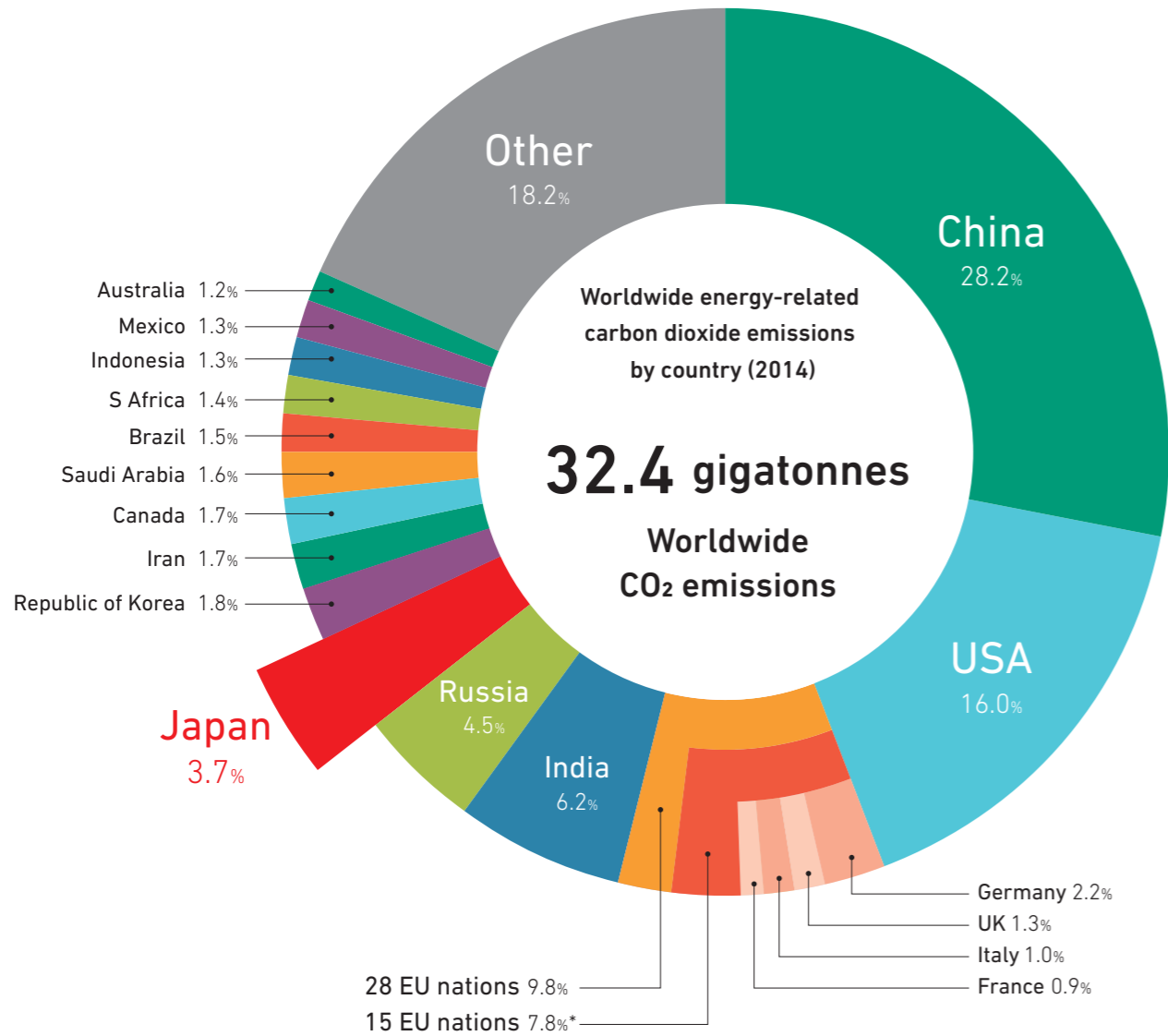
# 2

# JAPAN'S FORMAL ACCEPTANCE OF THE PARIS AGREEMENT

The Paris agreement took effect on November 4, 2016. Japan formally accepted the agreement on November 8 of the same year after obtaining the approval of the national Diet.

In order to achieve the Paris Agreement's 2°C target, we need to keep the cumulative emission amount below a certain level based on the concept of "carbon budgeting." In order to avert potentially

dangerous effects of climate change and to preserve the environment that provides the foundation for human survival, a range of measures aimed at preventing damage to the environment has to be implemented, based on the latest scientific findings. Japan needs to decrease the cumulative emission amount by keeping on making rapid emission cuts based on the best available science.



\*15 EU countries: the number of EU countries that participated in COP3 (Kyoto conference) from the beginning  
Source: IEA "CO<sub>2</sub> Emissions from Fuel Combustion - 2016 Edition"

# JAPAN'S CONTRIBUTION TO COP22

The Government of Japan's main goals at COP22 were (1) to ensure inclusiveness in the decision-making process, (2) to further discussions on the modalities, procedures and guidelines of the Paris Agreement, and (3) to promote Japan's contribution on international cooperation in the field of climate change.

At the ministerial level meeting, Minister of the Environment Koichi Yamamoto welcomed the early entry into force of the Paris Agreement, expressed great respect for the efforts and passion of all countries, and stated that Japan continues to actively contribute to the rule-making process under the Paris Agreement. In addition to reporting the Cabinet's approval of Japan's Plan for Global Warming Countermeasures, he described Japan's stance toward the long-term low-greenhouse gas emission development strategy and initiatives that support developing countries, and emphasized the importance of political leadership in advancing climate change countermeasures.

Furthermore, he announced Japan's Assistance Initiatives to Address Climate Change, a form of international cooperation in the area of climate change.



Statement by Minister Yamamoto at COP22

## Japan's Assistance Initiatives to Address Climate Change

- Diffusion of advanced low-carbon technologies, including diffusion through JCM, etc.**  
Japan provides technological support based on the needs of developing countries by utilizing the Joint Crediting Mechanisms (JCM), etc.
- Enhancement of adaptive capacity through sharing knowledge and experience**  
- We use Japanese knowledge and technology to support policy development and promote understanding of adaptation in developing countries.  
- In particular, we aim to create an Asia-Pacific Adaptation Information Platform by 2020, to help developing countries formulate and implement adaptation plans based on scientific knowledge.
- Improvement of MRV capabilities through human resource development that will lead to a transparency framework**  
We will enhance initiatives aimed at improving monitoring, reporting and verification (MRV) capabilities in developing countries, for example by holding workshops.
- Promotion of building of a system for comprehensive measures for controlling emission of fluorocarbons**  
Japan supports the development of capabilities, including fluorocarbon recovery, destruction and recycling, that make it possible to reduce emissions throughout the lifecycle of fluorocarbons.
- Support for sustainable societies in conjunction with measures addressing climate change**  
Japan will evaluate and promote environmental projects based on multiple environmental aspects addressed by SDGs, and will help developing countries with the transition to decarbonized society and the establishment of sustainable societies.

# JAPAN'S GLOBAL WARMING COUNTERMEASURES BASED ON THE PARIS AGREEMENT

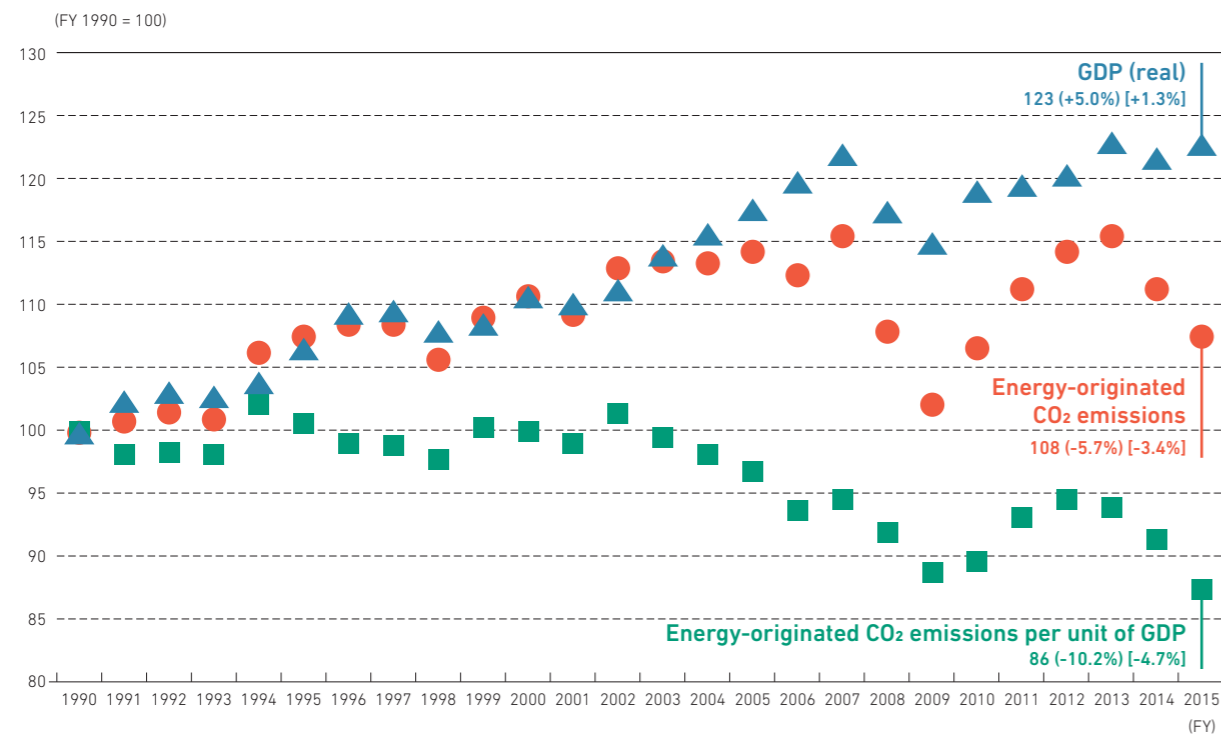
## Greenhouse gas emissions

Japan's total greenhouse gas emissions in FY 2015 declined for the second consecutive year, to 1,325 million tonnes CO<sub>2</sub> eq., representing decreases of 2.9% from the previous year, 6.0% from FY 2013, and 5.3% from FY 2005. The main reason for the decline was a drop in energy-originated CO<sub>2</sub> emissions associated with power generation resulting from the decrease in electricity consumption (due to factors such as energy conservation, a cool summer and a mild winter) and the improvement in emission intensity of electric power

generation (due to factors such as accelerating growth of renewable energy and restarting of nuclear power generation).

When we look at the relationship between greenhouse gas emissions and economic growth, we see that energy-originated CO<sub>2</sub> emissions and real GDP displayed similar upward trends until the early 2000s, but from FY 2013 there was a decoupling whereby greenhouse gas emissions fell while GDP grew.

### Japan's GDP Relative to CO<sub>2</sub> Emissions



Sources: Japanese Cabinet Office "Quarterly Estimates of GDP," the Institute of Energy Economics, Japan/Energy Data and Modeling Center "EDMC Handbook of Japan's & World Energy & Economic Statistics 2016," and the Ministry of the Environment "Greenhouse gas inventories."

## Formulation of Japan's Plan for Global Warming Countermeasures

In May 2016, based on the Act on Promotion of Global Warming Countermeasures, the Cabinet approved Japan's Plan for Global Warming Countermeasures and the Government Action Plan. The Plan for Global Warming Countermeasures is Japan's comprehensive plan for dealing with global warming. Based on the Paris Agreement and Japan's Intended Nationally Determined Contribution submitted to the United

Nations in July 2015, it establishes a medium-term goal (to be achieved by FY 2030) of reducing greenhouse gas emissions by 26% compared to the FY 2013 level, and a long-term goal (by 2050) of reducing them by 80%. It also outlines measures to be taken by business operators, citizens, and other entities, as well as measures to be taken by national and local governments to enable achievement of the Plan's goals.

### The Plan for Global Warming Countermeasures

#### Introduction

- Scientific findings on global warming
- Actions during the 1st commitment period of the Kyoto Protocol, Actions by 2020 under the Cancun Agreement
- Establishment of an international framework after 2020 and communication of Japan's INDC

#### ch.1 Basic direction regarding the promotion of global warming countermeasures

##### - Directions to pursue

1. Actions to achieve mid-term target (26% reduction by 2030)
2. Strategic actions towards long-term goal (80% reduction by 2050)
3. Actions toward global greenhouse gas reduction

##### - Basic concepts

1. Integrated improvements of the environment, economy and society
2. Steady implementation of measures listed in Japan's INDC
3. Response to Paris Agreement
4. Enhancement of R&D and contribution to global greenhouse gases emissions reduction through Japan's leading technologies
5. Transformation in consciousness of all actors, evocation of action and enhancement of collaboration
6. Emphasis on PDCA cycle

#### ch.2 Greenhouse gas reduction target

##### - Japan's greenhouse gas emission reductions target

- Reduction of 26% by FY2030 (25.4% compared to FY2005)
- More than 3.8% reduction by FY2020 compared to FY2005

##### - Planning period

- From date of cabinet decision (May 13, 2016) to FY2030

#### ch.3 Policies and measures for achieving targets

##### - Basic roles of national government, local governments, businesses and citizens

##### - Measures and Policies for Greenhouse Gas Emissions Reduction and Removal

- Energy-originated CO<sub>2</sub>
  - Measures and Policies by Sectors (industrial, commercial and other, residential, transport, energy conversion)
- Non-energy-originated CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O
- Four fluorinated gases: HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>
- Removals by Land Use, Land Use Change and Forestry (LULUCF)
- Cross-sectional strategies
- Foundational measures

##### - Basic matters regarding measures to be taken by Local Governments

##### - Expected Efforts of Business Operators with Large Emissions in Particular

##### - Promotion of nationwide campaign

##### - Promotion of global emission reduction, international collaboration and cooperation

- Response to Paris Agreement
- Global emission reduction due to Japan's contribution
  - Joint Crediting Mechanism (JCM)
  - Actions by industries
  - Support of reduction of emissions from deforestation and degradation (REDD+)
- Cooperation with other countries and international organizations

#### ch.4 Progress Management of the Plan

Yearly progress review, consideration of the plan's revision every 3 years

#### Appendix (Target of each measure)

- Energy-originated CO<sub>2</sub>
- Non-energy-originated CO<sub>2</sub>
- CH<sub>4</sub>, N<sub>2</sub>O
- Four fluorinated gases
- Removals by LULUCF
- Cross-sectional policies

## Long-term low-emission development strategies

Like other countries, Japan has begun considering the formulation of long-term low-emission development strategies based on the Paris Agreement. In March 2017, the Ministry of the Environment formulated its Long-term Low-carbon Vision depicting what a low-carbon society might look like in 2050 and beyond. In April 2017, the Ministry of Economy, Trade and Industry formulated a report on its Long-term Global Warming Countermeasures Platform as a way of reducing greenhouse gas emissions in the

long term, i.e. in 2030 and beyond. Furthermore, in the G7 Ise-Shima Leader's Declaration adopted during the May 2016 Summit, G7 leaders committed to formulating and communicating long-term low-emission development strategies well ahead of the 2020 deadline. Going forward, the Japanese government will continue to consider the formulation of long-term low-emission development strategies based on the documents described above.

## Carbon pricing

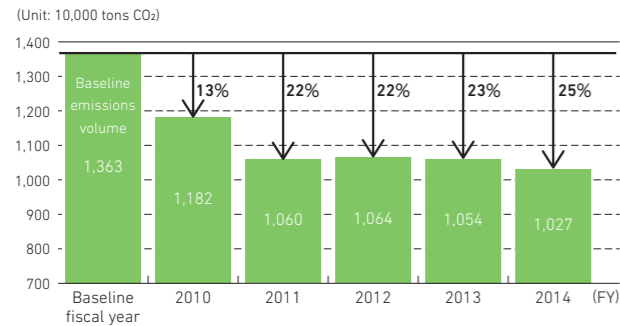
Regarding carbon pricing, Japan's Long-term Low-carbon Vision declares that the time has come to consider, specifically and in depth, "what types of carbon pricing can be suitable for Japan to accelerate domestic initiatives for generating innovations that lead to long-term, substantial emissions reductions."

carbon pricing should work in Japan. While hearing opinions from various quarters, including knowledgeable individuals and businesspeople, the panel is considering how to use carbon pricing in Japan to achieve long-term substantial emissions reductions and simultaneously solve economic and social issues. It also deals with broadly organizing relevant issues and examining those issues from various perspectives.

Accordingly, the Ministry of the Environment established a panel of experts to consider how

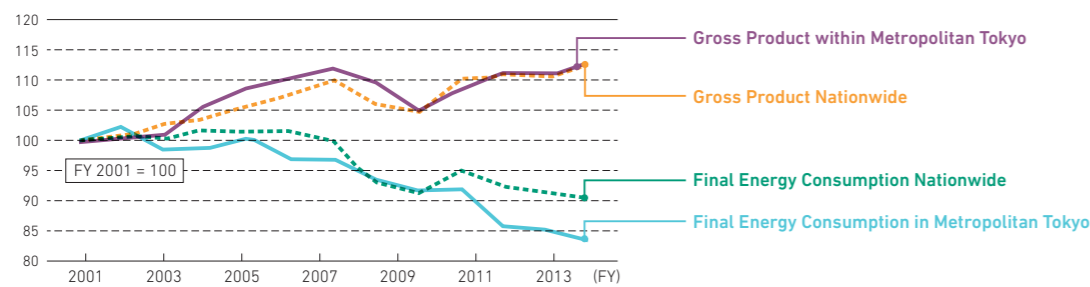
## The Tokyo Metropolitan emissions trading system

Reductions during First Compliance Period (FY 2010-2014)



In 2010, the Tokyo Metropolitan Government imposed an obligation to reduce total greenhouse gas emissions and introduced an emissions reduction trading system. It set the total reduction target at 6% for the period between FY 2010-2014, and obligated targeted business establishments to reduce emissions by 6% or 8%. During the five-year period, the city succeeded in reducing emissions by approximately 14 million tonnes, and all affected business locations complied with their obligation to reduce total emissions. In addition, the metropolis achieved reductions in final energy consumption that exceeded the national average, and also succeeded in decoupling emissions levels from total production within the Tokyo metropolitan area.

Final Energy Consumption and Gross Product in Metropolitan Tokyo



Sources: Tokyo Metropolitan Environment Bureau press releases and "Tokyo Green Building Report 2015"

## Adaptation to the impact of climate change

Japan's Cabinet has approved the National Plan for Adaptation to the Impacts of Climate Change, which establishes five basic strategies: (1) Mainstreaming adaptation into government policy, (2) Enhancement of scientific findings, (3) Promotion of understanding and cooperation of each actor through efforts such as organizing and

sharing climate risk information and other information, (4) Promotion of adaptation in regions, and (5) Promotion of international cooperation and contribution. Based on this plan, the Climate Change Adaptation Platform was established in August 2016 as a basis for adaptation actions of local governments, businesses and citizens.

### Climate Change Impacts and Basic Adaptation Policies and Measures

Sector	Projected Climate Change Impacts	Basic Adaptation Policies and Measures <small>Includes measures for other purposes that also contribute to adaptation</small>	
Agriculture, Forest / Forestry, Fisheries	Agriculture	Declining ratio of first-class rice  Poor coloring of apples and other fruits; northward shift of locations suitable for cultivation  Increasing frequency and severity of mountainous disasters	Development and dissemination of high-temperature-resistant varieties; establish soil and water management  Switch to superior colored varieties of fruit; development of breeding materials adapted to high temperature conditions; and dissemination of cultivation management technologies  Implementation of studies on situations of occurrences of plant pests; disseminate timely and appropriate information; import /domestic quarantine
	Forest / Forestry	Increasing frequency of occurrence and intense of mountainous disasters	Ascertaining more accurately which areas are at high risk of mountain disasters occurring; development of afforestation structures and forests preparing for occurrence of debris flows or wood debris runoff
	Fisheries	Changes in distributed migration range including sardine (e.g., shift northward)	Improvement in the precision of fishing ground projection; provision of real-time monitoring information
Water Environment, Water Resources	Water Environment	Deterioration of water quality	Measures for wastewater from factories and business premises; measures for domestic wastewater
	Water Resources	Increase in droughts due to an increase in the number of rainless days and a decrease in the total amount of snowfall	Optimal use of existing facilities, use of rainwater, reclaimed waste water, and creation of collaborative frameworks among stakeholders for actions including promoting the formulation of timelines (sequenced action plans) in order to mitigate damage as a drought
Natural Ecosystems	Diverse Ecosystems	Expansion of the habitat of sika deer, decreasing area suitable for the growth of reef-building coral	Management of national parks by eliminating plants which are newly distributed accompanied by climate change; creation of networks of ecosystems to allow creatures to migrate and spread to adapt to climate change
Natural Disasters, Coastal Areas	Water Disasters	Increasing frequency of heavy rainfall and short-term intense rainfall; increasing frequency and intense of water disasters accompanied by increases in precipitation from heavy rainfall events	- Disaster prevention measures to address natural hazards that could occur relatively frequently e.g., steady improvements of facilities; improvements of facilities based on disaster risk assessments; design of facilities to avoid rework - Disaster-reduction measures to cope with natural hazards that exceed the capacity of facilities  (1) Improving aspects such as facilities' operations, design, and maintenance/upkeep procedures (e.g., making the most use of existing facilities) (2) Integrating with urban development/local development (e.g., measures to reduce inundation in cooperation with urban development/local development; providing/sharing detailed disaster risk information) (3) Preparations for evacuation, emergency operations, business continuity (e.g., avoid catastrophic damage by preparing timelines)
	Storm Surge, High Waves	Expansion of inundation damage and coastal erosion due to increases in sea-level rise, typhoons and other events	Weather and marine monitoring, and assessment of the results; to promote improvements to make port and coastal structures more robust; support for formulation of port/harbor hazard maps; technology development to enable flexible responses; strengthen coastal erosion prevention
	Sediment-related Disasters	Increased frequency of sediment-related disasters; increases in sediment movement events exceeding design scale	Locating facilities and equipment to be most effective in protecting human life; promotion of baseline surveys and designation of sediment-related disaster hazard areas; implementation of urgent surveys when large scale sediment-related disasters occur
Human Health	Heat Stress	Increasing frequency of heat waves in summer; doubling of the number of heat illness patients transported by ambulance	Information provision relating to topics such as cautionary alerts; awareness raising regarding prevention and treatment, and status of outbreaks
	Infection	Expansion of suitable habitat for arthropods that are vectors for infectious diseases	Measures targeting sources of larvae of mosquito vectors and extermination of adult insects; calling attention to mosquito-prevention measures
Industrial and Economic Activity	Finance and Insurance	Increasing insured losses	Pay attention to efforts of the General Insurance Association of Japan and other organization efforts
Life of Citizenry, Urban Life	Urban Infrastructure, Critical Services	Impacts on infrastructure and critical services due to an increase in short-term intense rainfall events and droughts	Measures to prevent inundation of places such as underground stations; formulation of Business Continuity Plan (BCP) for ports and harbors; enhancing the resilience of water supply and waste disposal facilities
	Heat Island Effect	Further increases in temperature in urban areas	Improving ground cover using vegetation and water; reducing artificial exhaust heat; improving urban design

Source: Ministry of the Environment



# SIMULTANEOUS RESOLUTION OF ENVIRONMENTAL, ECONOMIC AND SOCIAL ISSUES

Japan's population is declining and aging at a pace never before experienced worldwide. We introduce some examples below of approaches and specific initiatives aimed at promoting socioeconomic innovation to resolve economic and social issues while simultaneously resolving environmental issues through environmental policies.

# 3

1

## JAPAN'S APPROACHES TO THE SIMULTANEOUS RESOLUTION OF ENVIRONMENTAL, ECONOMIC AND SOCIAL ISSUES

### Achieving green growth

Achieving the objectives of the Paris Agreement requires sustained long-term investment in reducing global greenhouse gas emissions. Climate change countermeasures may in time help eliminate the shortage of investment opportunities in

Japan, and Japan's outstanding environmental technologies may also generate overseas demand. Linking climate change countermeasures to Japan's further economic growth will become increasingly important.

### Improving carbon productivity

Carbon productivity needs to be greatly improved to ensure continued economic growth under the Paris Agreement. We need to shift to an economic structure in which greenhouse gas emissions are

less likely to increase with economic growth by generating high added value through such means as innovation that leverages brands and other intangible assets.

### Improving resource productivity

Based on the Toyama Framework on Material Cycles adopted at the 2016 G7 Toyama Environment Ministers' Meeting, we need to raise Japan's resource productivity and drive domestic economic growth

while reducing our natural resource consumption by creating services that do not require natural resources, and substituting domestic recycled resources for imported fossil and metal resources.

### Utilizing community energy

Renewable energy is expected to help boost resource-poor Japan's energy self-sufficiency and consequently reduce our dependence on imported fossil fuels. Particularly in rural areas rich in renewable energy resources, community energy

balance could be improved by exploiting such resources, and decentralized and self-reliant energy systems would also help to improve resilience to disasters.

### Urban compaction

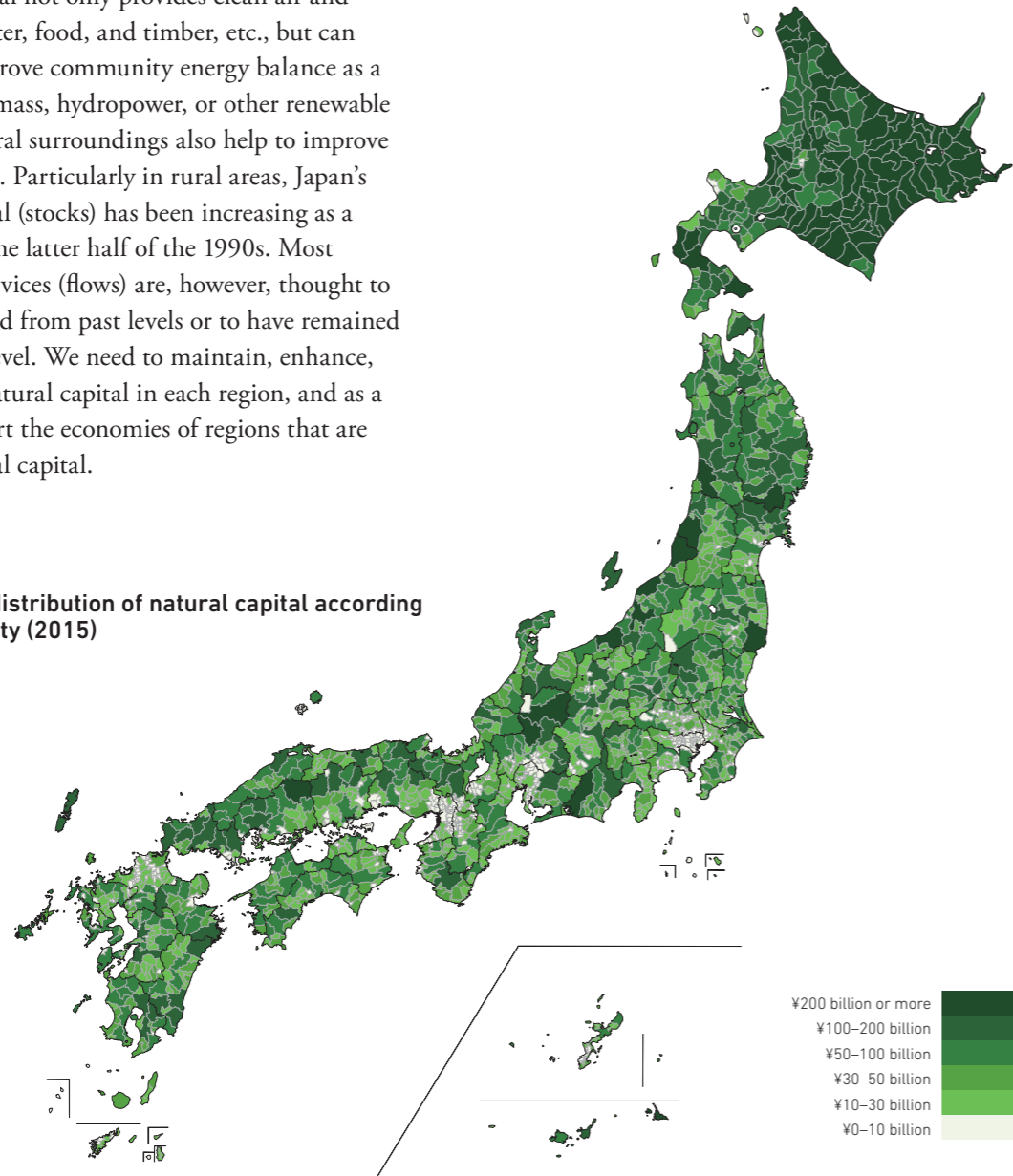
Concentrating services to create more compact cities in tandem with population decline would help cut GHG emissions by reducing fossil fuel-consuming traffic movements. Concentrating services and boosting population density through

urban compaction may also improve labor productivity, revitalize inner cities, reduce government expenditure, extend healthy life, and reduce medical and nursing care costs.

## Maintaining, enhancing, and utilizing natural capital

Natural capital not only provides clean air and abundant water, food, and timber, etc., but can also help improve community energy balance as a source of biomass, hydropower, or other renewable energy. Natural surroundings also help to improve quality of life. Particularly in rural areas, Japan's natural capital (stocks) has been increasing as a whole since the latter half of the 1990s. Most ecosystem services (flows) are, however, thought to have decreased from past levels or to have remained at the same level. We need to maintain, enhance, and utilize natural capital in each region, and as a nation support the economies of regions that are rich in natural capital.

Nationwide distribution of natural capital according to municipality (2015)



¥200 billion or more  
 ¥100-200 billion  
 ¥50-100 billion  
 ¥30-50 billion  
 ¥10-30 billion  
 ¥0-10 billion

Source: Ministry of the Environment

## Climate security

As a major GHG emitter, Japan is aiming to set an example by drastically reducing its GHG emissions, and based on scientific knowledge, to work with other nations to help reduce worldwide GHG emissions and bolster climate security by promoting Japanese technologies, expertise, lifestyles, institutions etc. overseas.

## 2

### 3. Simultaneous resolution of environmental, economic and social issues

## INITIATIVES AIMED AT THE SIMULTANEOUS RESOLUTION OF ENVIRONMENTAL, ECONOMIC AND SOCIAL ISSUES

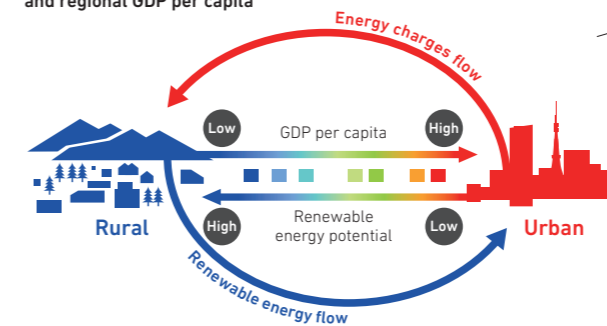
### Renewable energy

Japan's renewable energy deployment potential is estimated to be approximately 2.1 billion tonnes of CO<sub>2</sub> equivalents, which is about 1.8 times the nation's energy-derived CO<sub>2</sub> emissions in fiscal 2015.

Japan aims to achieve a renewable energy capacity of 22-24% in fiscal 2030. Since the introduction of the feed-in tariff (FiT) system in 2012, renewable energy deployment, and particularly solar power generation, has expanded rapidly, with capacity reaching approximately 13% of Japan's energy mix in 2014.

However, about 90% of municipalities throughout Japan are running energy balance deficits, resulting in capital outflows. Since rural areas on the whole have far greater renewable energy deployment potential than urban areas, generating renewable energy in rural areas for consumption in cities would help drive rural revitalization.

Relationship between renewable energy potential and regional GDP per capita



Source: Ministry of the Environment

### Smart Disaster-Resilient Eco-Town

The city of Higashimatsushima, which was inundated by the Great East Japan Earthquake tsunami, has since June 2016 been supplying renewable energy through a microgrid to 85 disaster recovery public housing units as well as surrounding hospitals and public facilities. In the event of a disaster, a combination of emergency generators, solar power generation, and large storage batteries will be able to supply at least three days' worth of power at the normal level. The Higashimatsushima Organization for Progress and Economy, Education, Energy (HOPE) operates the microgrid, creating new jobs within the local community and plowing profits back into the community.



Smart Disaster-resilient Eco-Town

### Utilization of Wood Biomass Resources

In the city of Maniwa, 80% of which is forested, local sawmills, timber industry unions and others joined forces to establish a biomass power generation company running a biomass plant that in 2015 generated 10 MW from locally purchased tree thinnings and sawmill waste timber. The city estimates that the purchase of otherwise unused timber generated approximately ¥1.3 billion in income for local landowners and forestry industries, and has generated approximately 50 jobs. Maniwa is also promoting the use of biomass resources in other ways. For example, it uses biomass to heat its City Hall and other public facilities, and has established a cross-laminated timber production plant and a startup that is developing cellulose nanofiber manufacturing technologies and applications.



Wood biomass power generation plant

## Smart communities

Smart communities are next-generation social systems that make maximum local use of locally generated renewable energy and heat, and minimize energy consumption by leveraging IT networks that connect homes, buildings, and transportation systems. Smart community

initiatives are being pursued in many locations for the way local consumption of locally generated energy and heat creates more disaster-resilient communities as well as making use of local resources and generating jobs.

### Fujisawa Sustainable Smart Town

Fujisawa Sustainable Smart Town in the city of Fujisawa, Kanagawa prefecture, is a public-private joint project to develop a 1,000-household smart community of 600 detached houses and 400 condominium units. All the detached houses are equipped with solar power generation, storage batteries, and home energy management systems as standard fixtures with the aim of reducing CO<sub>2</sub> emissions by 70% and domestic wastewater by 30%, raising use of renewable energy to 30%, and ensuring lifeline services for three days in emergency situations.



Fujisawa Sustainable Smart Town

## Compact cities

In a society with a declining population, consolidating various functions within specific localities and connecting those localities through networks to secure a population of a certain level equipped with the functions required for everyday life also brings environmental benefits. The

Japanese government has established a Compact City Development Support Team made up of representatives of relevant ministries and agencies that is charged with supporting the many compact city initiatives that municipalities throughout Japan have started to formulate.

### Compact urban development focused on public transport

The city of Toyama, Toyama prefecture, is focusing on light rail transit (LRT) and other public transport as a means of implementing compact urban development. In 2006, it launched an inner-city LRT by converting a former heavy rail line. As a result of adding stations and running more frequent trains, the LRT now carries double the pre-conversion number of passengers on weekdays, and 3.5 times on holidays, an increase that, like the city's tram system, also reduces CO<sub>2</sub> emissions that would otherwise be generated by the use of buses and private cars. Although the population of surrounding districts is declining, inner-city residents have been increasing since 2008, and elderly residents appear to be taking advantage of the improved public transport system to get out and about more often.



LRT in Toyama

## Urban mining

Japan's "urban mining" resources (reclaimable precious metals) are estimated to amount to approximately 2–3 years' global consumption of gold, silver, copper, and other precious metals. They are particularly rich in lithium, which is an important battery material, and platinum, which is indispensable as a catalyst and fuel cell electrode

material. Urban mining would not only ensure a stable supply of many resources that are not naturally available in Japan, but would also mitigate global environmental impacts such as mining-related deforestation and water pollution caused by improper heavy metal treatment.

### Tokyo 2020 Medal Project: Toward an Innovative Future For All

Medals to be awarded at the Tokyo 2020 Olympic and Paralympic Games will be cast from recycled metals reclaimed from used mobile phones, PCs, and other small consumer electronic devices. Producing the 5,000-plus medals to be awarded at the Games will require approximately 40 kg of gold, 4,900 kg of silver, and 3,000 kg of copper including material losses generated in the manufacturing process. It is hoped that this initiative will involve people throughout Japan by producing the medals from recycled metals, and contribute to achieving the Sound Material-cycle Society in Japan by leading to continued recycling of consumer electronic devices after the Tokyo 2020 Olympic and Paralympic Games.



Tokyo 2020 Medal Project:  
Toward an Innovative Future For All

## Green infrastructure

Green infrastructure refers to utilization of the diverse functions of nature in both hard and soft aspects of infrastructure development and land use to create sustainable and attractive communities and surroundings. Japan with its proneness to natural disasters has long utilized nature to guard against such disasters. Japanese people have, for example, preserved forests to prevent landslides,

planted coastal forests to mitigate sand- and wind-related damage, and bamboo groves alongside embankments to reduce flood damage, and surrounded their homes with trees to protect them from the elements. Further efforts are now underway to utilize green infrastructure in building communities that are more resilient to torrential downpours and other impacts of climate change.

### Rain garden in Kyoto

Rain gardens that make use of the wisdom contained in traditional Japanese gardens are being developed in Kyoto. Kyoto Gakuen University has installed a rain garden in its campus that incorporates Japanese rock garden concepts. Kyoto Station Building also features a terraced rain garden in which rain falling on the rooftop is fed down gradually through a series of special planters located on lower floors. Scattering small-scale rain gardens such as these throughout an urban landscape will help both to mitigate urban flooding risks, and to preserve biodiversity and enrich urban ecosystems.



Kyoto Gakuen University's rain garden

## Utilizing national parks to promote inbound tourism

The number of foreign tourists visiting Japan has increased sharply in recent years, exceeding 24 million in 2016. The Japanese government is aiming to increase this number to 40 million by 2020, and 60 million by 2030. As one aspect of this endeavor, the government is aiming to boost the number of foreign visitors to national parks in Japan to 10 million—more than double the 2015 total—by 2020, by working also with the private sector to transform the parks into recreational areas providing a rich range of activities and experiences on par with the world’s top national parks. Japan’s 34 national parks cover a total area of over

5% of Japan’s land. In 2016, the Ministry of the Environment selected eight national parks for an initial intensive focus on attracting more foreign tourists, drawing up “Step-Up Program 2020” plans for each national park. Based on this program, which positions nature itself as the parks’ greatest attraction, efforts are underway to offer high quality, high added value tourism by improving scenic assets of the parks themselves and their surroundings to maximize their natural beauty, and by attracting quality accommodation and developing tour programs that best enable visitors to experience the nature of the parks.

## Environmental finance

Developing a long-term investment environment for promoting environmental, social, and governance (ESG) investment is vital to advancing environmental, economic, and social goals in tandem and achieving sustainable economic growth. ESG investment that requires medium- to long-term evaluation of corporate value based on perspectives of environmental, social, and corporate governance concerns is expected to encourage investment in sustainable growth. In January 2017, the Ministry of the Environment’s Working Group on Incorporating Issues Regarding Sustainability into Investment (ESG Working Group) issued its Introduction to ESG Investment report.

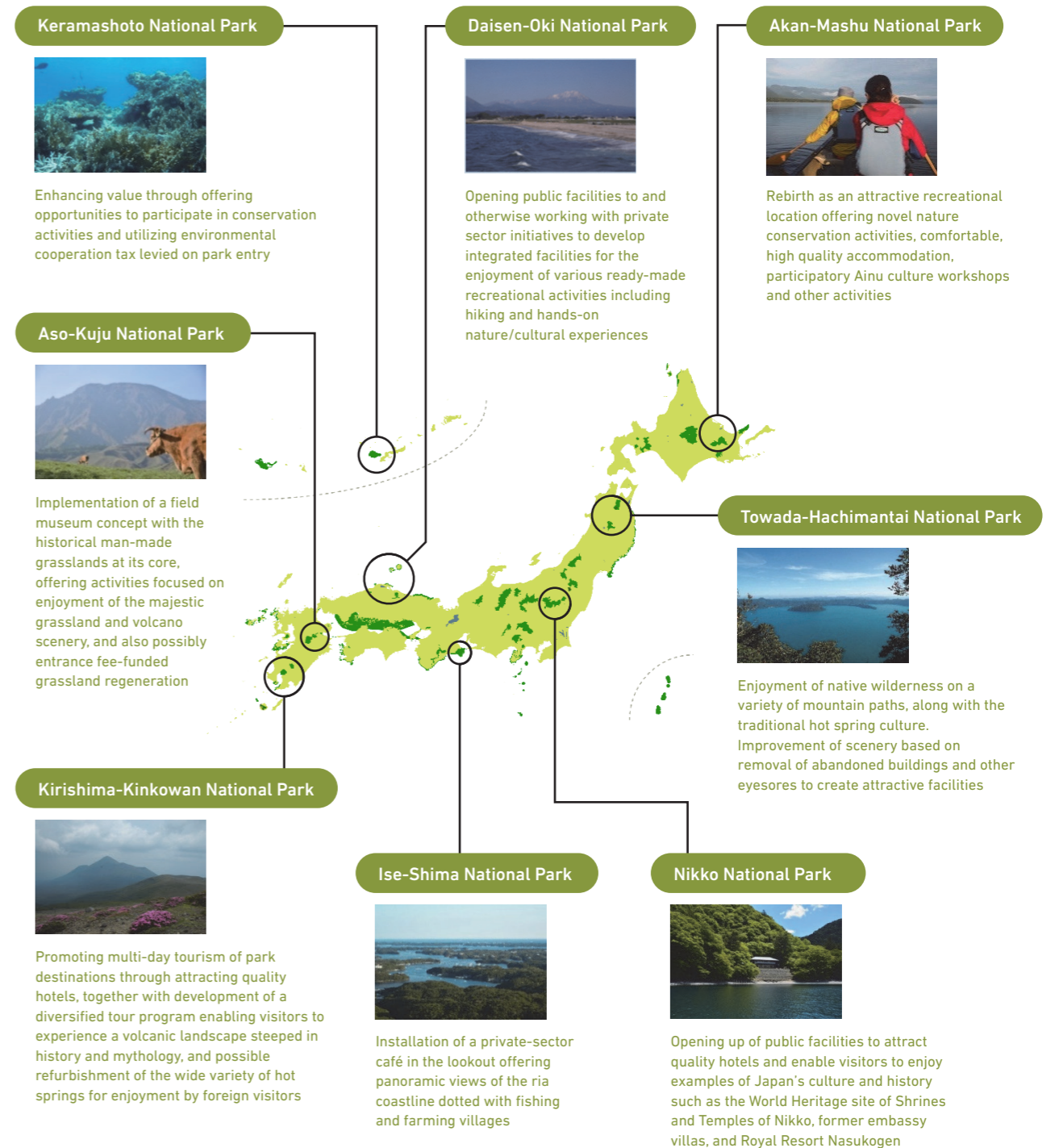
In May 2014, the Government Pension Investment Fund (GPIF), a Japanese government agency that manages the world’s largest pool of retirement savings, accepted the Japanese language edition of the Stewardship Code, and in September 2015, signed the United Nations-backed Principles for Responsible Investment (PRI).

The Japanese Green Bond market is still in its infancy, but the growth of Green Bond issuance and investment can be expected not only to bring various environmental benefits, but also to contribute to the growth of environment-related industries, job creation, regional development, and disaster countermeasures. In March 2017, the Ministry of the Environment issued Green Bond Guidelines, 2017 to promote the issuance of Green Bonds in line with the Green Bond Principles (GBP).

## Tokyo’s Green Bond issue

In December 2016, the Tokyo Metropolitan Government (TMG) issued its Tokyo Environmental Supporter Bonds as a Green Bond trial. The funds raised by these bonds, approximately ¥10 billion, are being used to help resolve climate change and other environmental problems, including fitting TMG facilities with solar power generation systems and LED lighting, and urban greening.

## Overview of the Step-Up Programs of the eight selected national parks



# 4

## RECONSTRUCTION AND RESTORATION OF THE ENVIRONMENT AFTER THE GREAT EAST JAPAN EARTHQUAKE

On March 11, 2011, East Japan was struck by the largest earthquake ever recorded in or around Japan. With magnitude 9.0, it triggered enormous tsunamis that caused immense, widespread damage, primarily along the Pacific coast of the Tohoku region. The tsunami caused accidents at Tokyo Electric Power (TEPCO) Fukushima Daiichi Nuclear Power Plant, which resulted in the release of large amounts of radioactive materials into the environment. Here we introduce our efforts for restoration of the environment, taking action on pollution by the radioactive materials associated with the accidents at the Fukushima Daiichi Nuclear Power Plant.

### Recovery of the environment from radioactive pollution

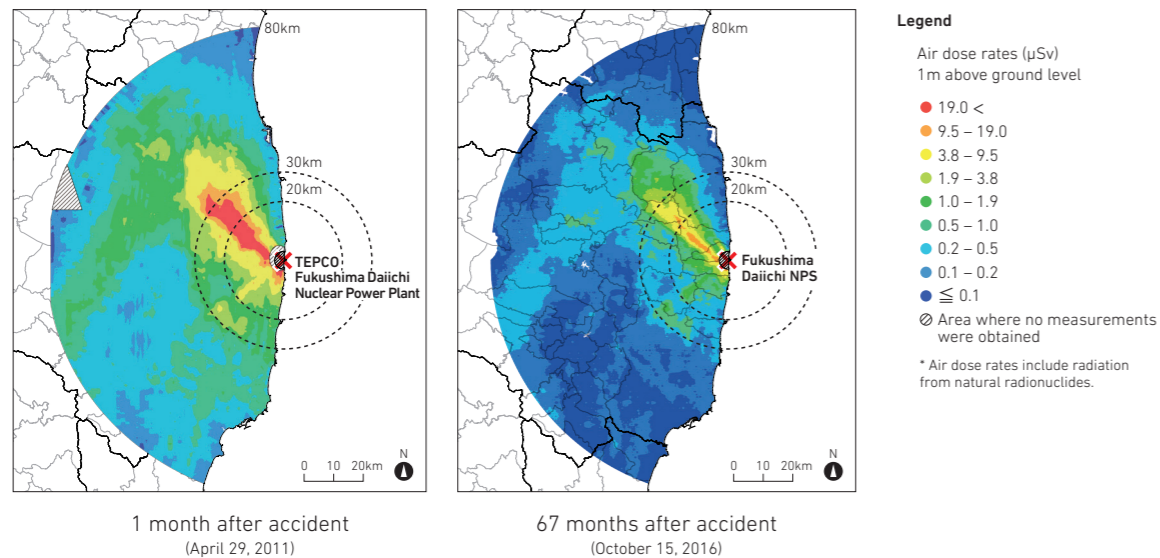
As of October 2016, radiation levels within an 80-kilometer radius of the Fukushima Daiichi Nuclear Power Plant had declined by 71% from November 2011 levels (where comparable data is available). Predictions of the decline of radiation made in August 2011, taking into account estimates of the physical decay of radioactive material and the influence of rainfall, suggested that radiation would decline by about 40% in two years, and by about 50% in 5 years. The actual decline has been preceding at a

greater pace than predicted, probably due to the effect of decontamination work, and to greater than expected effects from natural factors such as rainfall.

The Ministry of the Environment has also been monitoring radioactive materials in water since 2011. Levels of radioactive cesium have been virtually undetectable in ground water and in public water bodies such as rivers, lakes, and coastal areas since 2012.

#### Distribution of air dose rates in 80-km radius

Source: The Secretariat of the Nuclear Regulation Authority



### Decontamination of soil contaminated by radioactive materials

The Ministry of the Environment (MOE) undertook the decontamination of the 11 municipalities designated as the Special Decontamination Areas (SDA). By the end of March 2017, whole area decontamination in the SDA was completed except for the designated Areas where Returning is Difficult. Furthermore, operation of temporary incinerators installed by the MOE in the SDA has enabled good progress to be made in the treatment

of disaster waste contaminated by radioactive materials. This process has already been completed by some municipalities.

In the Intensive Contamination Survey Areas, almost all the decontamination work handled by municipalities has been completed for homes, public facilities, and other places closely connected with daily life.

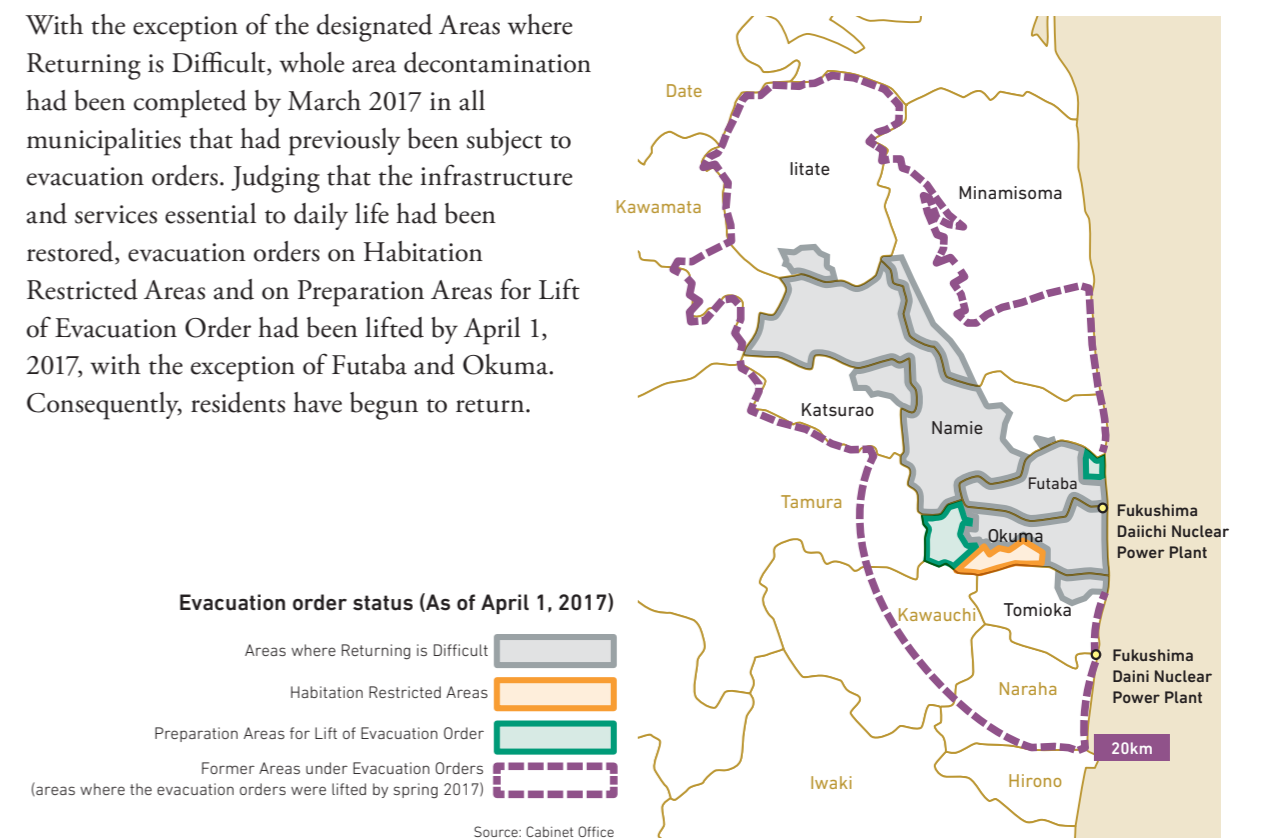
### Interim Storage Facility

The Interim Storage Facility has been established and will eventually provide a centralized facility for safely managing and storing soil containing radioactive materials generated from decontamination work in Fukushima Prefecture, and designated waste exceeding 100,000 bq/kg being stored in Fukushima Prefecture, until final disposal is conducted. Negotiations with landowners in order to secure land needed for the facility are progressing steadily, and construction

work started on the soil storage facilities and some other facilities in November 2016. At the same time as working to gain the further understanding and appreciation of landowners for this project, the construction of facilities and the transportation of soil into the site will continue, using the land already available. Efforts are also being made to develop technology for volume reduction and soil recycling in preparation for future final disposal outside Fukushima prefecture.

### Lifting of evacuation orders

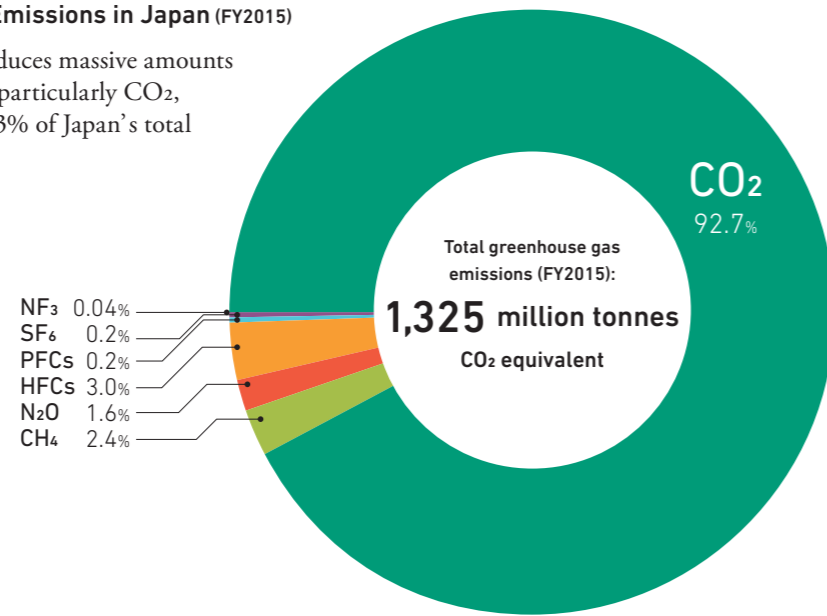
With the exception of the designated Areas where Returning is Difficult, whole area decontamination had been completed by March 2017 in all municipalities that had previously been subject to evacuation orders. Judging that the infrastructure and services essential to daily life had been restored, evacuation orders on Habitation Restricted Areas and on Preparation Areas for Lift of Evacuation Order had been lifted by April 1, 2017, with the exception of Futaba and Okuma. Consequently, residents have begun to return.



Additional materials provide more details about the global warming issue.

### Breakdown of Greenhouse Gas Emissions in Japan (FY2015)

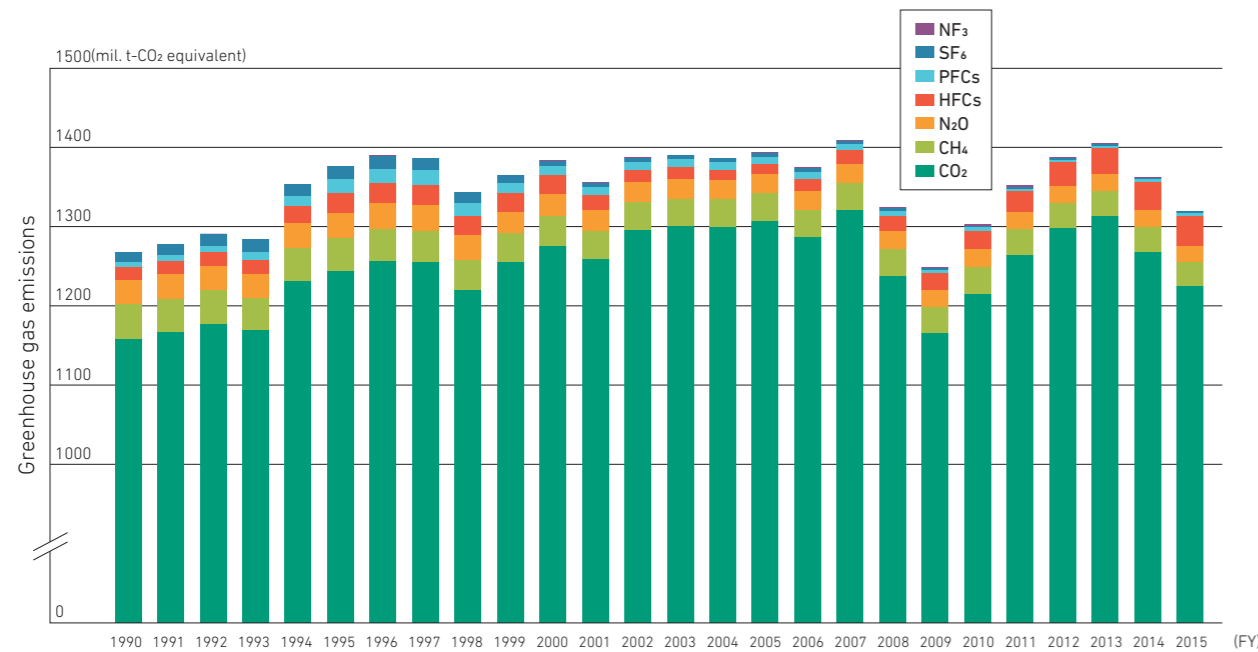
Globally, fossil fuel combustion produces massive amounts of anthropogenic greenhouse gases, particularly CO<sub>2</sub>, which accounts for approximately 93% of Japan's total greenhouse gas emissions.



Source: Ministry of the Environment

### Greenhouse Gas Emissions in Japan

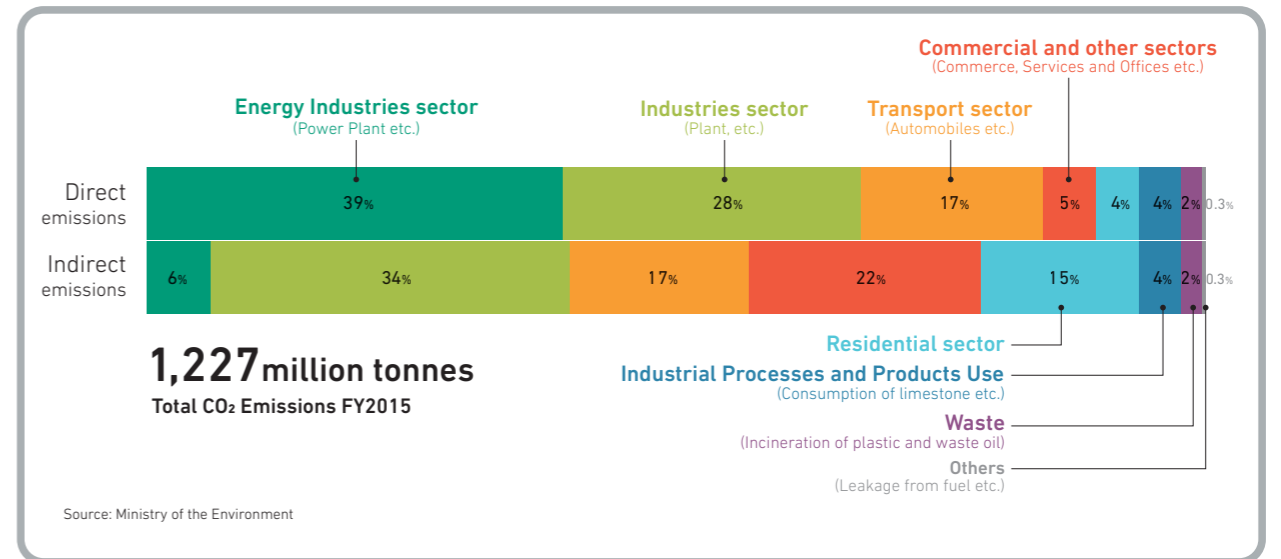
Japan's total greenhouse gas emissions in FY 2015 were equivalent to approximately 1,325 million tonnes of CO<sub>2</sub>, a 2.9% drop from the previous year. This was due to energy originated CO<sub>2</sub> emissions decreasing as lower electricity consumption and the improvement of carbon intensity in power generation resulted in less CO<sub>2</sub> production from power generation.



Source: Ministry of the Environment

### Breakdown of CO<sub>2</sub> Emissions by Sector

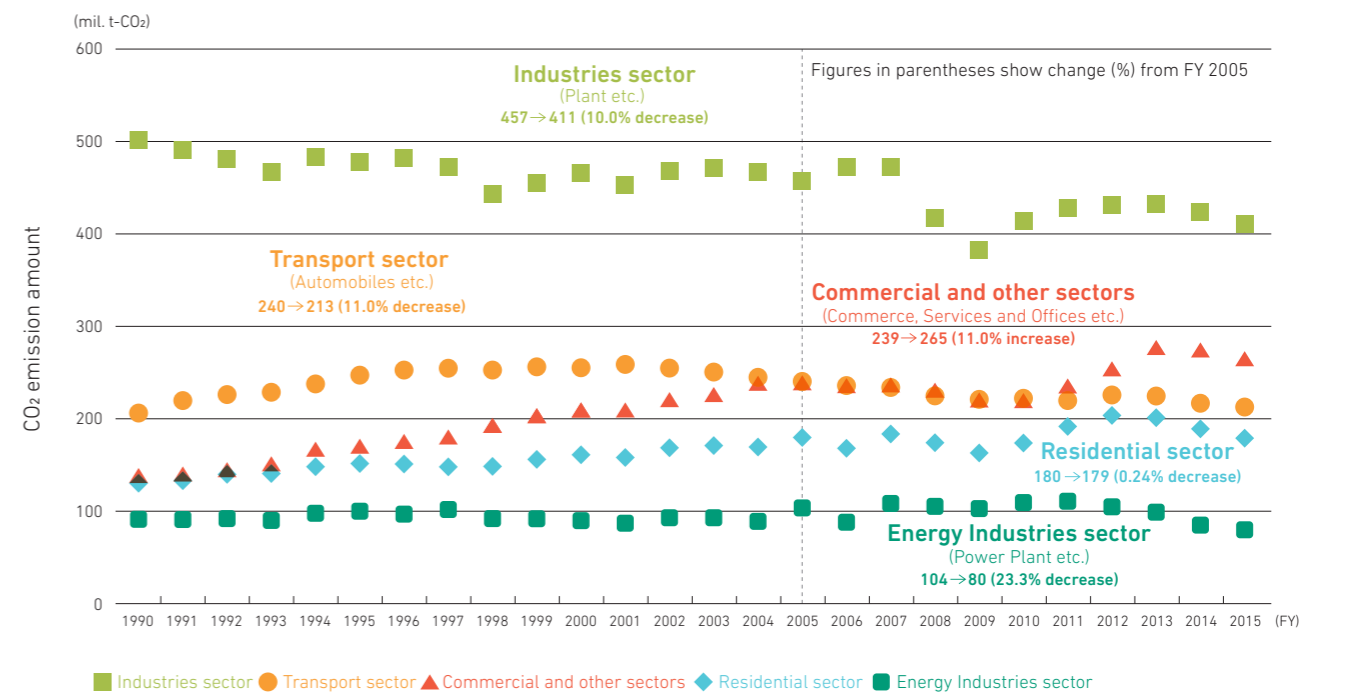
Industries was the sector with the largest CO<sub>2</sub> emissions in FY 2015, accounting for approximately 34% of Japan's total.



Source: Ministry of the Environment

### Energy originated CO<sub>2</sub> Emissions by Sector

Plotting energy originated CO<sub>2</sub> emissions by sector reveals that emissions in most sectors are currently on a downward trend.



Source: Ministry of the Environment

# Biodiversity

Additional materials provide more details about biodiversity in Japan.

## Threatened Wildlife Species in Japan

With an increasing number of species being put on the Red List, which publicizes threatened wildlife species, it is clear that the circumstances of wildlife in Japan continue to be grave.

(Reported in March 2017)

Taxon	Species Targeted for Evaluation	Extinct	Extinct in the Wild	Threatened Species					Near Threatened	Data Deficient	Total of listed species	Endangered Local Population
				Endangered Class I		Endangered Class II	NT	DD				
				Class IA	Class IB							
EX	EW	CR	EN	VU	LP							
<b>Fauna</b>												
Mammals	160 (160)	7 (7)	0 (0)	33(33)		9(9)	18 (18)	5 (5)	63 (63)	23 (23)		
Birds	Approx. 700 (Approx. 700)	13 (14)	1 (1)	97(97)		43(43)	21 (21)	19 (17)	151 (150)	2 (2)		
Reptiles	100 (98)	0 (0)	0 (0)	37(36)		24(23)	17 (17)	4 (3)	58 (56)	5 (5)		
Amphibians	76 (66)	0 (0)	0 (0)	28(22)		13(11)	22 (20)	1 (1)	51 (43)	0 (0)		
Brackish water and freshwater fish	Approx. 400 (Approx. 400)	3 (3)	1 (1)	169(167)		44(44)	34 (34)	35 (33)	242 (238)	15 (15)		
Insects	Approx. 32,000 (Approx. 32,000)	4 (4)	0 (0)	358(358)		185(187)	352 (353)	153 (153)	867 (868)	2 (2)		
Shellfish	Approx. 3,200 (Approx. 3,200)	19 (19)	0 (0)	587(563)		323(319)	446 (451)	89 (93)	1141 (1126)	13 (13)		
Other invertebrates	Approx. 5,300 (Approx. 5,300)	0 (0)	1 (1)	63(61)		42(41)	42 (42)	42 (42)	148 (146)	0 (0)		
<b>Subtotal of Fauna</b>		<b>47 (47)</b>	<b>3 (3)</b>	<b>1372(1337)</b>		<b>683(677)</b>	<b>952 (956)</b>	<b>348 (347)</b>	<b>2721 (2690)</b>	<b>60 (60)</b>		
<b>Flora</b>												
Vascular plants	Approx. 7,000 (Approx. 7,000)	28 (32)	11 (10)	1782(1779)		741(741)	297 (297)	37 (37)	2155 (2155)	0 (0)		
Bryophytes	Approx. 1,800 (Approx. 1,800)	0 (0)	0 (0)	241(241)		103(103)	21 (21)	21 (21)	283 (283)	0 (0)		
Algae	Approx. 3,000 (Approx. 3,000)	4 (4)	1 (1)	116(116)		21(21)	41 (41)	40 (40)	202 (202)	0 (0)		
Lichens	Approx. 1,600 (Approx. 1,600)	4 (4)	0 (0)	61(61)		20(20)	42 (42)	46 (46)	153 (153)	0 (0)		
Fungi	Approx. 3,000 (Approx. 3,000)	26 (26)	1 (1)	62(62)		23(23)	21 (21)	50 (50)	160 (160)	0 (0)		
<b>Subtotal of Flora</b>		<b>62 (66)</b>	<b>13 (12)</b>	<b>2262(2259)</b>		<b>908(908)</b>	<b>422 (422)</b>	<b>194 (194)</b>	<b>2953 (2953)</b>	<b>0 (0)</b>		
<b>Total of thirteen taxonomic groups</b>		<b>108 (113)</b>	<b>16 (15)</b>	<b>3634(3596)</b>		<b>1591(1585)</b>	<b>1374 (1378)</b>	<b>542 (541)</b>	<b>5674 (5643)</b>	<b>60 (60)</b>		

\* Numerals within parentheses indicate the respective numbers of species (including subspecies, variety (only for flora) and form (only for algae and fungi)) from the Red List 2015. The numbers in the LP column are the numbers of local population.

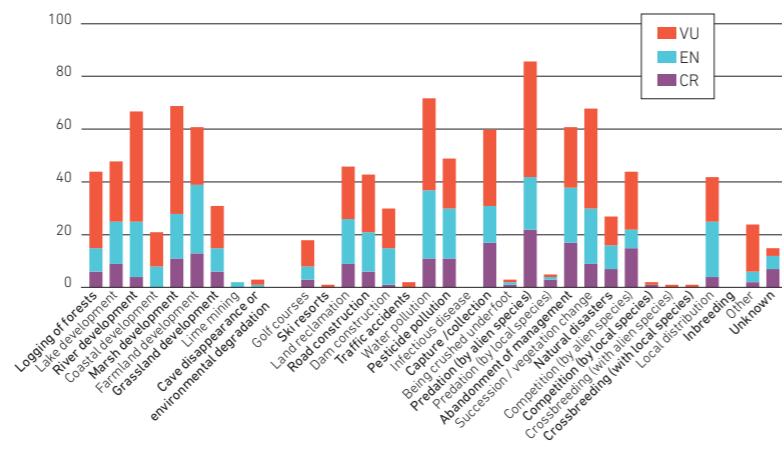
The categories are considered as follows:

- Extinct [EX]: Species that are likely to already be extinct
- Extinct in the Wild [EW]: Species that exist only in captivity or as a naturalized population outside its natural habitat
- Endangered Class I (Critically Endangered + Endangered) [CR+EN]: Species that are threatened to extinction
- Endangered Class I A (Critically Endangered) [CR]: Species that are facing an extremely high risk of extinction in the wild in the near future
- Endangered Class I B (Endangered) [EN]: Species that are facing a high risk of extinction in the wild in the near future
- Endangered Class II (Vulnerable) [VU]: Species with an increasing risk of extinction
- Near Threatened [NT]: Species that are not currently endangered, but may possibly qualify for "endangered" status with changes in their habitat conditions
- Data Deficient [DD]: Species with data insufficient for adequate evaluation
- Endangered Local Population [LP]: Species with a population isolated regionally, and face a high risk of extinction

Source: Red List 2017 by the Ministry of the Environment

## Drivers of Loss of Endangered Species (insects)

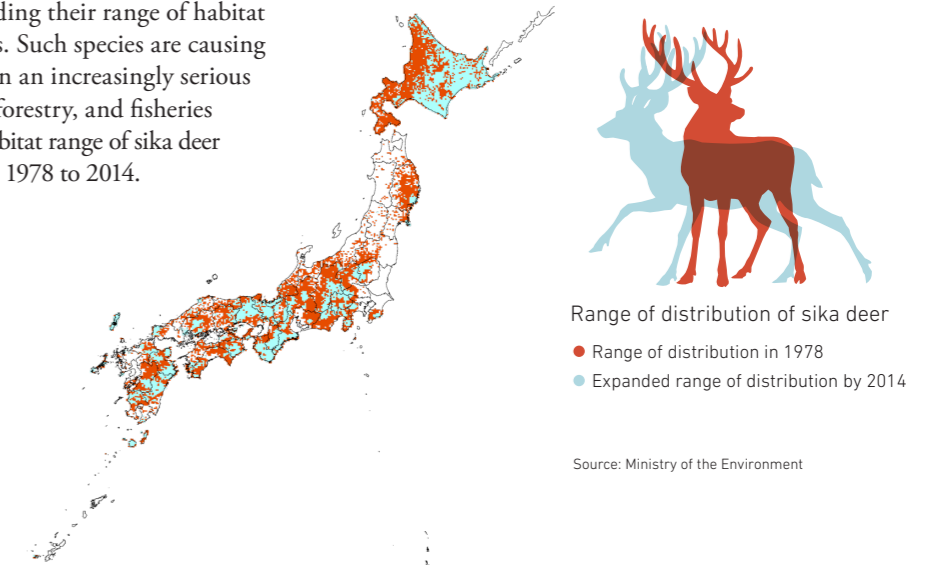
There are various drivers of loss of endangered species, but typical drivers include development, capture/collecting, abandonment of management or succession, overuse, water pollution, and alien species.



Note: CR: Category IA, EN: Category IB, VU: Category II. Source: Ministry of the Environment

## Growing Range of Sika Deer

While certain flora and fauna are endangered, there are also issues with other species, such as sika deer and wild boar, that are suddenly expanding their range of habitat and growing their populations. Such species are causing increasing damage, resulting in an increasingly serious situation for the agricultural, forestry, and fisheries industries. For example, the habitat range of sika deer expanded approx. 2.5 fold from 1978 to 2014.

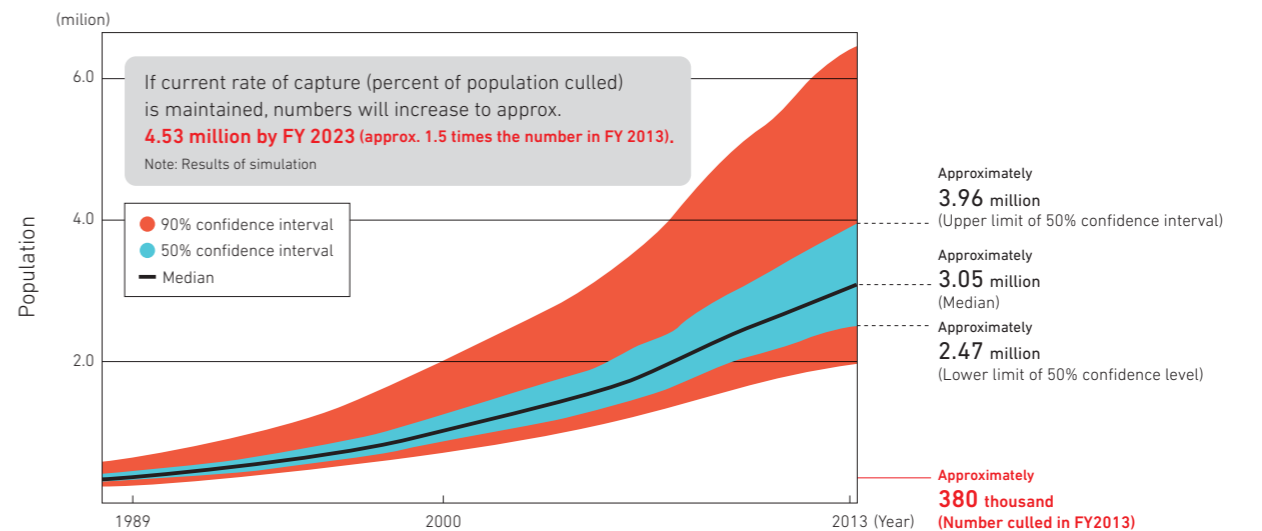


Range of distribution of sika deer  
 ● Range of distribution in 1978  
 ● Expanded range of distribution by 2014

Source: Ministry of the Environment

## Estimated Number of Deer in Japan (excluding Hokkaido prefecture\*)

Furthermore, the number of sika deer on the main Japanese island of Honshu and further south is forecast to increase to 1.7 times its 2011 level by 2023.



\*: In FY 2013, estimated number in Hokkaido was approx. 540,000, and number culled was approx. 130,000 (Hokkaido data). Source: Ministry of the Environment

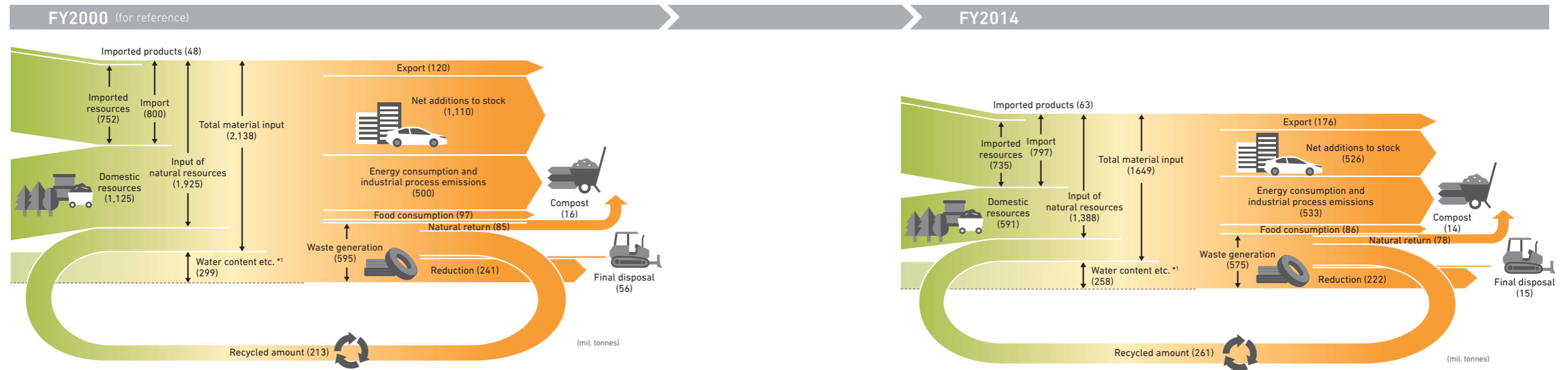
# ADDITIONAL MATERIALS FROM THE 2017 ANNUAL REPORT ON THE ENVIRONMENT

# Sound material-cycle society

Additional materials provide more information about current efforts to form a sound material-cycle society.

## Material Flow in Japan

In order to establish a sound material-cycle society, it is necessary to comprehend material flows (or substance flows) to understand the extent of material extraction, consumption, and disposal in Japan. Japan uses material flows to determine targets for the three indicators of resource productivity, cyclical use rate, and final disposal amount.

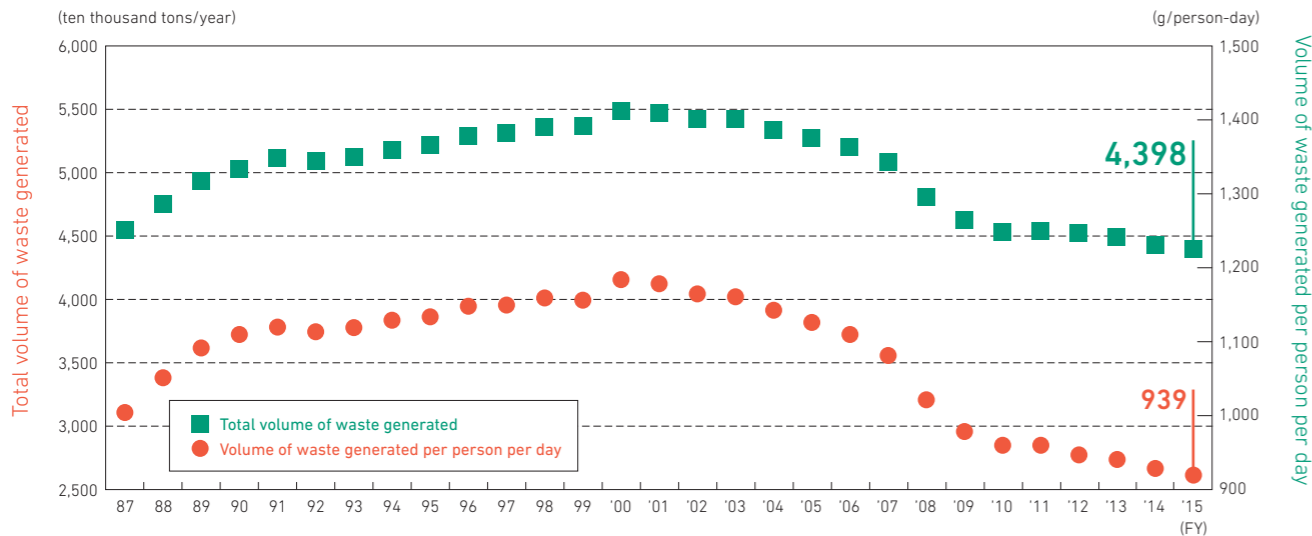


<sup>\*1</sup> Water content: water contents of wastes (sludge, livestock waste, night soil, waste acid, waste alkali) and sediments dumped in association with the process of economic activities (sludge in mining, construction and in waterworks as well as slag)

Source: Ministry of the Environment

## Total Volume of Waste Generation and Waste Volume Per Person Per Day

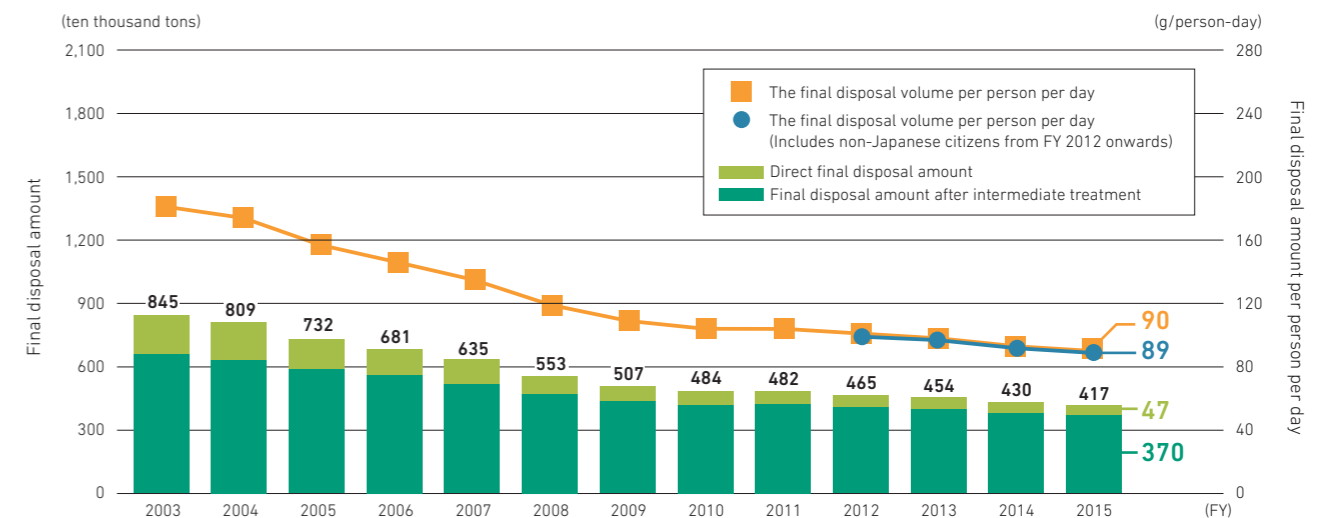
Total generated waste and waste generated per person per day are declining year by year.



Source: Ministry of the Environment

## Final Disposal Amount and Final Disposal Amount Per Person

Final disposal amount of waste and final disposal amount per person per day are trending downwards.

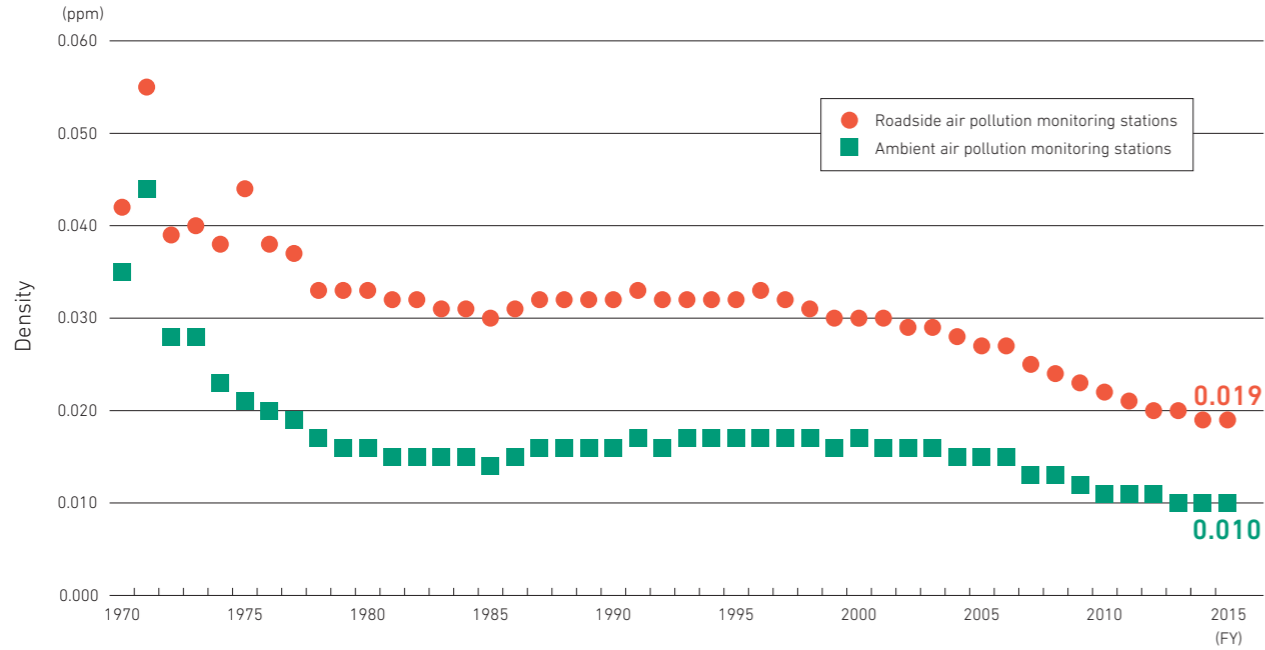


Source: Ministry of the Environment

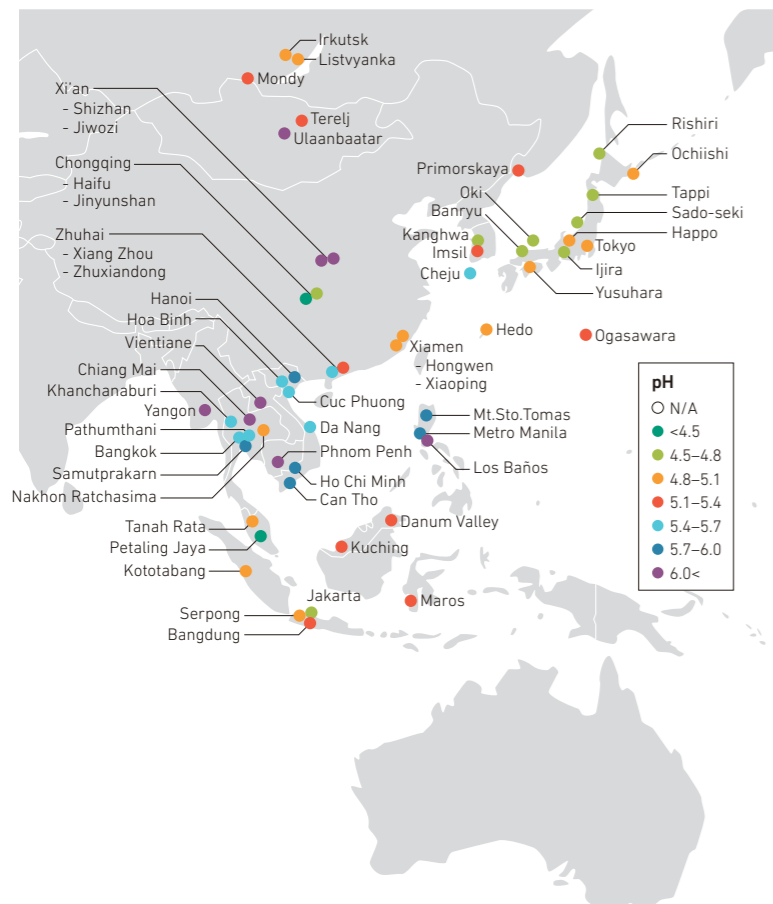


**Annual Average Density of NO<sub>2</sub> (from FY1970 to FY2015)**

A gradual fall in mean nitrogen dioxide levels can be seen recently at both ambient air pollution monitoring stations and roadside air pollution monitoring stations.



Source: Ministry of the Environment



**pH in Precipitation  
in EANET Region  
(Average pH 2012 - 2015)**

The Acid Deposition Monitoring Network in East Asia (EANET) was established with the aim of establishing a regional cooperative framework regarding acid rain, and of making clear the state of the acid deposition issue and its impact in the East Asian region. Currently thirteen East Asia nations participate, collecting reliable data through acid deposition monitoring using the same methodology. The network will expand its range of operations to include PM<sub>2.5</sub> and ozone monitoring.

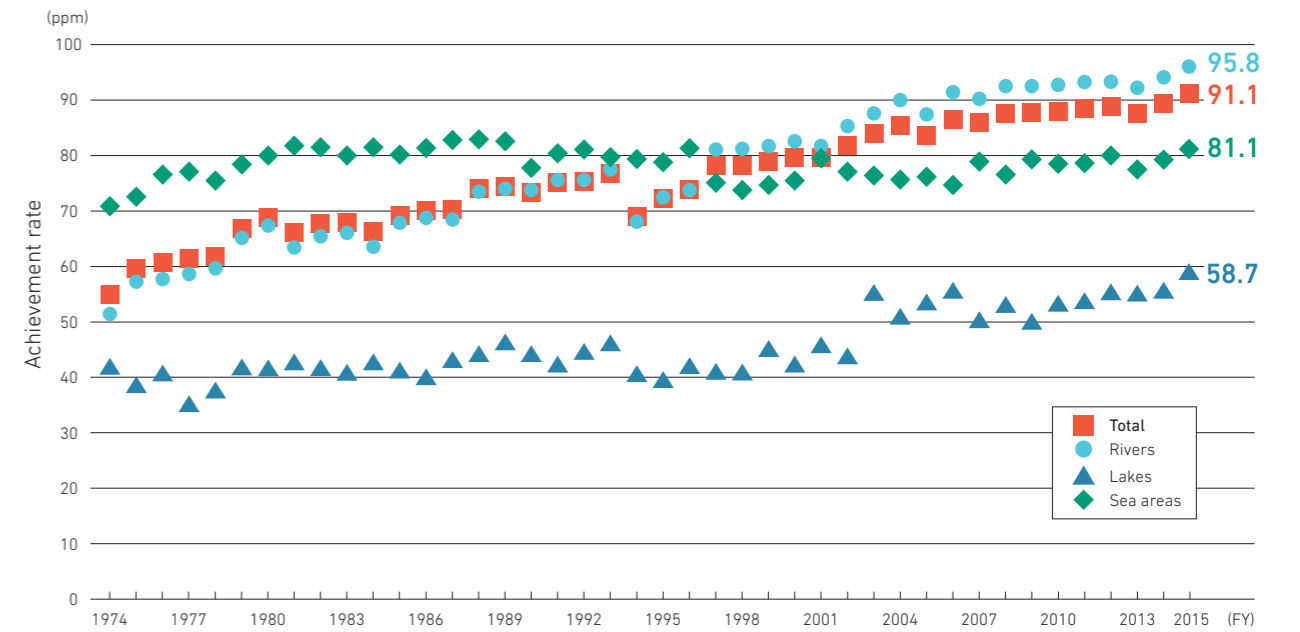
Source: EANET "Data Report on the Acid Deposition in the East Asian Region 2015"

# Atmospheric and water environments

Additional materials provide more information about atmospheric and water environments.

**Achievement of Environmental Standards (BOD or COD)**

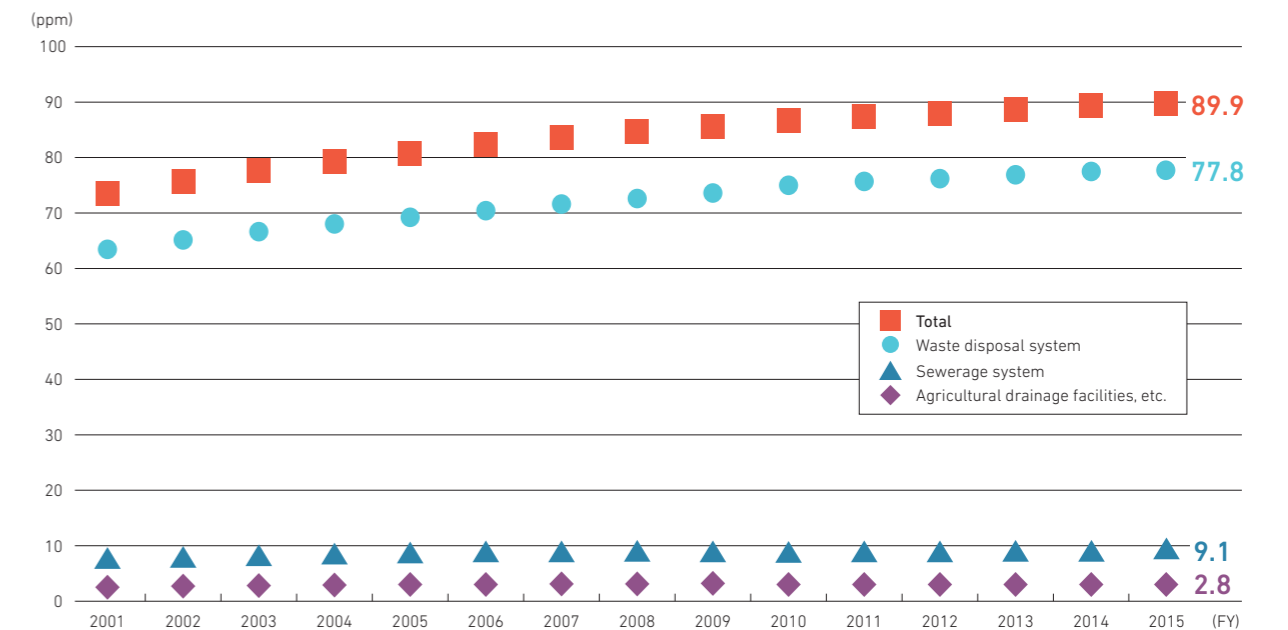
An overall level of 91.1% has been achieved for the biochemical oxygen demand (BOD) and chemical oxygen demand (COD) environmental standards relating to the maintenance of living environments. BOD and COD are leading indicators of water quality in respect of organic pollution.



Source: Ministry of the Environment

**Coverage of Population Served by Waste Disposal System**

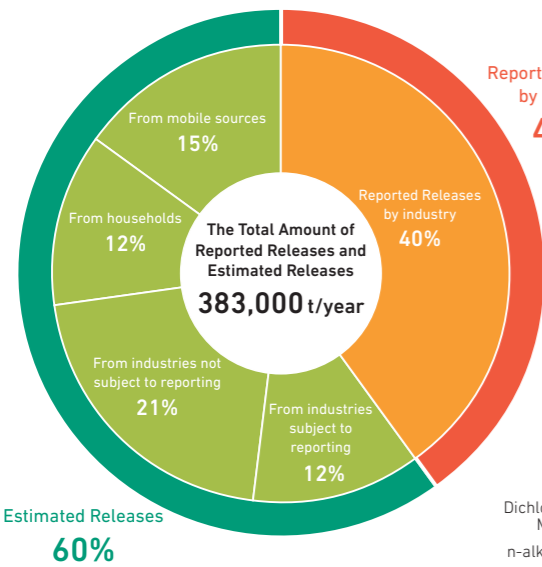
The population coverage of wastewater treatment systems in Japan is 89.9%. Wastewater treatment facilities are being installed to cover the population not yet served by the wastewater treatment systems.



Source: Ministry of the Environment

# ADDITIONAL MATERIALS FROM THE 2017 ANNUAL REPORT ON THE ENVIRONMENT

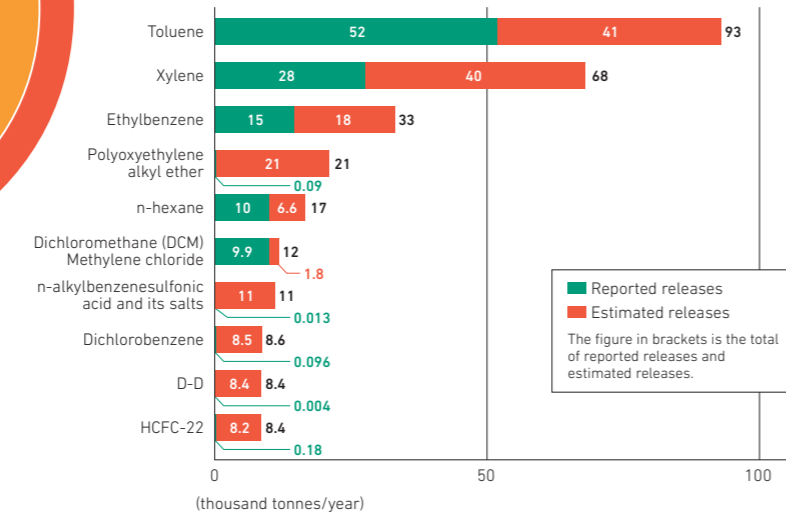
## Breakdown of Reported Releases by Industry and Estimated Releases of Chemical Substances in FY 2015



Notes: The reported releases are from the business entities categorized as subjected to reporting. Releases are estimated for businesses that do not meet the reporting requirements, such as number of employees, annual handling quantity, etc., and are exempted from reporting. Figures in parentheses are the totals of reported and estimated releases.

Source: Ministry of Economy, Trade and Industry and Ministry of the Environment

## Top 10 Chemicals with High-volume of Reported Releases and Estimated Releases (FY 2015)



Source: Ministry of Economy, Trade and Industry and Ministry of the Environment

In March 2017, the government compiled data reported from businesses concerned on release and transfer of chemical substances complying with the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Law). Releases that were not subject to reporting were estimated.

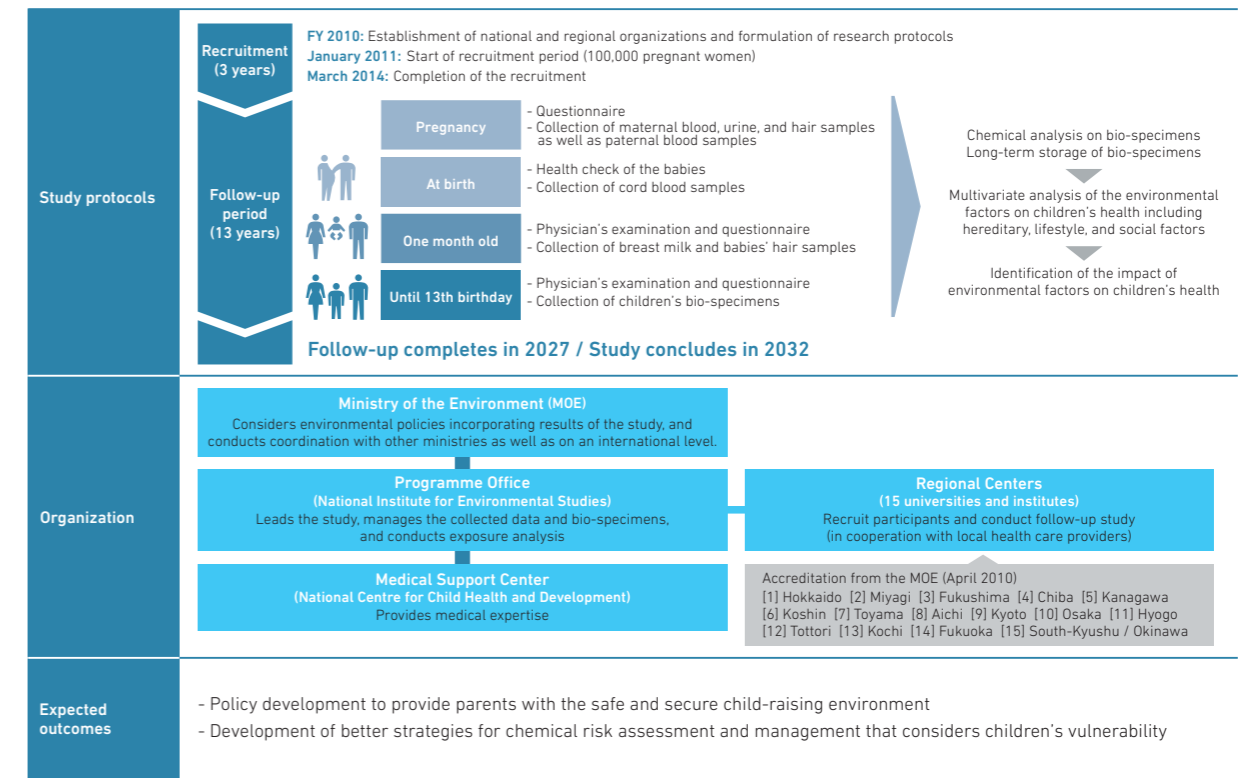
# Environmental risks of chemical substances

The following data provides information on action regarding chemical substance emissions into the environment and initiatives for children's environmental health.

## The Japan Environment and Children's Study (JECS)

The Japan Environment and Children's Study (JECS), a large-scale, long-term national birth cohort study involving 100,000 mother-child pairs, was launched in January 2010. The Sub-cohort study, which includes home visits for environmental measurements, medical examinations and children's bio-specimen collection, began in November 2015, involving 5,000 participants selected from the Main Study.

JECS is a large-scale, long-term prospective cohort study to examine the impact of the exposure to chemical substances during pregnancy and childhood on children's health.



Source: Ministry of the Environment



## Cover: Yambaru National Park

The Yambaru National Park in the northern part of Okinawa Island was designated a national park in September 2016. Reflecting the process that formed the Ryukyu islands, it is home to a large variety of endemic and rare species, including the Okinawa rail, and it has a diversity of ecological niches, such as sea cliffs, karst limestone formations, and mangrove forests. As part of the "Ama-mi-Oshima Island, Tokunoshima Island, the northern part of Okinawa Island and Iriomote Island" site, Yambaru National Park is aiming for inscription on the World Heritage List as a World Natural Heritage site.



Okinawa rail

## Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan 2017

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