Related document 2

List of Policies and Measures regarding Japan's Emission Reduction Target toward FY 2030

This document is classified as a related document of the Plan for Global Warming Countermeasures (Cabinet decision on February 18, 2025). It provides table-format information, broken down by sector and category, of individual measures aimed at achieving the targets for FY 2030, including specific goals for each greenhouse gas and other classifications, as well as guidelines for sector-specific emissions of energy-related CO_2. The document includes concrete data as the basis for these targets, such as national evaluation indicators for measures, expected emission reduction and absorption volumes, policies implemented by the national government to promote these measures, and examples of policies that local governments are expected to implement.

This table will be reviewed as necessary during the follow-up process conducted by Global Warming Prevention Headquarters, in accordance with Chapter 4, Section 1 of the Plan for Global Warming Countermeasures.

* The figures for fiscal year 2025 serve as benchmarks to assess progress toward the goals for fiscal year 2030.
* The estimated greenhouse gas emission reductions (in CO_2 equivalent) from each measure are calculated by incorporating factors beyond the direct effects of the measures themselves. By clarifying the assumptions used in the calculations, this approach ensures the possibility of subsequent verification.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
01. Steady Implementation, evaluation and verification of Industry's Voluntary Action Plans (Governing agencies: Ministry of Economy, Trade and Industry)							
Steady Implementation, evaluation and verification of Industry's Voluntary Action Plan	● Japan Business Federation, various industries: Contributing to countermeasures against warming by making efforts to reduce emissions, including improving energy intensity, through steady implementation of Industry's Voluntary Action Plans, and through cooperation among actors, international contributions, and technology, including innovative technological development ● Various industries: ・Formulation of new plans by industries that have not yet formulated them ・Continuous improvements to implementation plans through the plan-do-check-act (PDCA) cycle, and formulation of plans for 2030	Encouragement of the following through evaluation and verification by the government: ・Formulation of new plans by industries that have not yet formulated them ・Strict evaluation and verification by the government	-	See the list below regarding target indicators and levels for each industry (Since formulating the Keidanren Voluntary Action Plans in 1997, Keidanren has revised its Industry's Action Plans for a Low-Carbon Society into Carbon Neutrality Action Plan and is promoting the strengthening of autonomous efforts by industry. This information will be updated as autonomous targets are revised in the future.)			

Progress of Steady Implementation, evaluation and verification of Industry's Voluntary Action Plans

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	

Countermeasures by Sector (industrial, commercial and residential, transport, etc.)

A. Industry sector (manufacturing etc.)

(a) Promotion of voluntary effort by industry

○Steady Implementation, evaluation and verification of Industry's Voluntary Action Plans (Industry sector)

Industry under Ministry of Finance				
	Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
Brewers Association of Japan	CO_2 emissions	2013 (FY)	-46%	54.6
Japan Tobacco Inc.	CO_2 emissions	2019 (FY)	-47%	95.0
Industry under Ministry of Health, Labour and Welfare				
	Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
The Federation of Pharmaceutical Manufacturers' Associations of Japan	CO_2 emissions	2013 (FY)	-46%	260.7
Industry under Ministry of Agriculture, Forestry and Fisheries				
	Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
Japan Starch & Sweeteners Industry Association	CO_2 emissions	2013 (FY)	-30.3%	114.8
Japan Dairy Industry Association	CO_2 emissions	2013 (FY)	-38%	119.5

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Japan Soft Drink Association□		CO_2 emissions intensity	2012 (FY)	-18%	122.0
	Japan Baking Industry Association		CO_2 emissions intensity	2013 (FY)	-13.0%	108.5
	Japan Canners Association		Energy intensity	2009 (FY)	-19%	75.5
	Japan Beet Sugar Association		Energy intensity	2010 (FY)	-15%	63.8
	Japan Oilseed Processors Association		CO_2 emissions intensity	2013 (FY)	-6.5%	61.0
			CO_2 emissions	2013 (FY)	-6.5%	
	All Nippon Kashi Association		CO_2 emissions	2013 (FY)	-17%	97.4
			CO_2 emissions intensity	2013 (FY)	-17%	
	Japan Sugar Refiners' Association		CO_2 emissions	2013 (FY)	-22%	39.0
	Japan Frozen Food Association		Energy intensity	2013 (FY)	-15.7%	43.7
	Japan Ham & Sausage Processors Cooperative Association		Energy intensity	2011 (FY)	-17%	56.9
	Flour Millers Association		CO_2 emissions intensity	2013 (FY)	-32.1%	30.5
	All Japan Coffee Association		CO_2 emissions intensity	2005 (FY)	-25%	11.8
	Japan Soy-sauce Association		CO_2 emissions	2013 (FY)	-30%	19.8
	Japan Convenience Foods Industry Association		CO_2 emissions intensity	2013 (FY)	-10%	24.7
	Japan Association of Mayonnaise and Dressings		CO_2 emissions	2012 (FY)	-21.7%	6.2
			CO_2 emissions intensity	2012 (FY)	-17.9%	
	Japan Rice Millers Association		Energy intensity	2005 (FY)	-12%	7.0

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Industry under Ministry of Economy, Trade and Industry					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	The Japan Iron and Steel Federation		CO_2 emissions	2013 (FY)	-30%	19,440.8
	Japan Chemical Industry Association		CO_2 emissions	2013 (FY)	-32%	6,365.1
	Japan Paper Association		CO_2 emissions	2013 (FY)	-38%	1,882.8
	Japan Cement Association		Energy intensity	2013 (FY)	-9.7%	1,806.5
			CO_2 emissions	2013 (FY)	-15%	
	Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention		Energy intensity improvement rate	2020 (FY)	-9.56%	1,296.6
	Japan Auto Parts Industries Association		CO_2 emissions	2013 (FY)	-46%	770.7
	Japan Automobile Manufacturers Association / Japan Auto-Body Industries Association		CO_2 emissions	2013 (FY)	-38%	747.3
	Japan Mining Industry Association		CO_2 emissions	2013 (FY)	-38%	448.9
	Lime Manufacture Association		CO_2 emissions	2013 (FY)	-29%	246.3
	The Japan Rubber Manufacturers Association		CO_2 emissions	2013 (FY)	-46%	210.3
	Japan Textile Finishers' Association		CO_2 emissions	2013 (FY)	-38%	116.5
	Japan Aluminum Association		CO_2 emissions	2013 (FY)	-31%	146.2
	Japan Federation of Printing Industries		CO_2 emissions	2010 (FY)	-29.3%	106.6
			CO_2 emissions	2013 (FY)	-54.2%	142.0
	Flat Glass Manufacturers Association of Japan		CO_2 emissions	2013 (FY)	-25.8%	117.1
	Japan Glass Bottle Association		CO_2 emissions	2013 (FY)	-27.1%	89.4
	The Japanese Electric Wire & Cable Makers' Association		CO_2 emissions	2013 (FY)	-37.4%	96.1

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Japan Bearing Industry Association		CO_2 emissions	2013 (FY)	-38%	84.6
	The Japan Society of Industrial Machinery Manufacturers		CO_2 emissions	2013 (FY)	-38%	62.1
	Japan Copper and Brass Association		CO_2 emissions	2013 (FY)	-33%	47.6
	Japan Construction Equipment Manufacturers Association		Energy intensity	Average 2020-2022 (FY)	-8%	51.1
	Limestone Association of Japan		CO_2 emissions	2013 (FY)	-38%	28.4
	Japan Sanitary Equipment Industry Association		CO_2 emissions	2013 (FY)	-40%	25.7
	Japan Machine Tool Builders' Association		CO_2 emissions	2013 (FY)	-38%	36.3
	Japan Energy Resources Development Association（Japan Petroleum Development Association）		CO_2 emissions	2013 (FY)	-40%	25.4
	Japan Prefabricated Construction Suppliers & Manufacturers Association		CO_2 emissions	2013 (FY)	-65%	16.3
	Japan Industrial Vehicles Association		CO_2 emissions	2013 (FY)	-38%	4.8
	Japan Carbon Association		CO_2 emissions	2013 (FY)	-46%	45.1

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Industry under Ministry of Land, Infrastructure, Transport and Tourism					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	The Shipbuilders' Association of Japan/The Cooperative Association of Japan Shipbuilders		CO_2 emissions	2013 (FY)	-28%	65.0
	Japan Ship Machinery and Equipment Association		Energy intensity	1990 (FY)	-30%	8.5
	Japan Marine Industry Association		CO_2 emissions	2010 (FY)	-14%	2.6
	Japan Association of Rolling Stock Industries		CO_2 emissions	1990 (FY)	-35%	3.6
				2005 (FY)	-19%	
				2010 (FY)	-3%	
	Japan Federation of Construction Contractors		CO_2 emissions intensity	2013 (FY)	-40%	411.3
	Japan Federation of Housing Organizations		Environmental performance of newly constructed residences	–	Achieving ZEH on average for newly built homes	260(22,183)

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	

Countermeasures by Sector (industrial, commercial and residential, transport, etc.)

B. Commercial and others

(a) Promotion of voluntary effort by industry

○Steady Implementation, evaluation and verification of Industry's Voluntary Action Plans (Commercial and other sector)

Industry under Financial Services Agency

	Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
Japanese Bankers Association	CO_2 emissions	2013 (FY)	-51%	163.3
The Life Insurance Association of Japan	CO_2 emissions intensity	2013 (FY)	-51%	110.7
The General Insurance Association of Japan	CO_2 emissions intensity	2013 (FY)	-51%	27.0
The National Association of Shinkin Banks	CO_2 emissions	2013 (FY)	-51%	32.1
Community Bank Shinyo Kumiai	CO_2 emissions	2013 (FY)	-51%	4.7
Japan Securities Dealers Association	CO_2 emissions intensity	2013 (FY)	-51%	19.4

Industry under Ministry of Internal Affairs and Communications

	Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
Telecommunications Carriers Association	Energy intensity	2013 (FY)	- 90%	570.6
Telecom Services Association	Energy intensity	2013 (FY)	-2%	102.1
The Japan Commercial Broadcasters Association	CO_2 emissions intensity	2012 (FY)	-10%	24.5
Japan Broadcasting Corporation	CO_2 emissions	2018 (FY)	-	21.1
Japan Cable and Telecommunications Association	Energy intensity	2020 (FY)	-1%	-

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Japan Satellite Broadcasting Association		Energy intensity	2010 (FY)	-15%	1.0
	Japan Internet Providers Association		Energy intensity	2015 (FY)	-1%	-
	Industry under Ministry of Education, Culture, Sports, Science and Technology					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	The Federation of All Japan Private Schools' Associations		CO_2 emissions intensity	2012 (FY)	-40%	-
	Industry under Ministry of Health, Labour and Welfare					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	Japan Medical Association / Council of 4 Hospitals		CO_2 emissions intensity per total hospital floor area	2013 (FY)	-46%	917.6
	Japanese Consumers' Co-operative Union		CO_2 emissions	2013 (FY)	-40%	102.4
	Industry under Ministry of Agriculture, Forestry and Fisheries					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	Japan Processed Foods Wholesalers Association		Energy intensity	2011 (FY)	-5%	29.1
	Japan Foodservice Association		Energy intensity	2013 (FY)	-15.7%	720.9

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Industry under Ministry of Economy, Trade and Industry					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	Japan Chain Stores Association		Energy intensity	2013 (FY)	-5.1%	540.0
	Japan Franchise Association		CO_2 emissions intensity	2013 (FY)	-46%	437.9
	Japan Council of Shopping Centers		Energy intensity	2013 (FY)	-27%	331.7
	Japan Department Stores Association		Energy intensity	2013 (FY)	-26.5%	190.5
			CO_2 emissions	2013 (FY)	-50%	
	Ote Kaden Ryutsu Kyoukai (home appliances retail)		CO_2 emissions	2013 (FY)	-50.0%	81.1
	Japan DIY・HC Association		Energy intensity	2013 (FY)	-25%	48.7
	Japan Information Technology Services Industry Association		(Office) Energy intensity	2020 (FY)	-9.56%	20.6
			(Data center) Energy intensity	2020 (FY)	-9.56%	64.3
	Japan Association of Chain Drug Stores		Energy intensity	2013 (FY)	-34%	132.5
	Japan Foreign Trade Council, Inc.		CO_2 emissions intensity	2013 (FY)	-60%	5.4
	Japan LP Gas Association		CO_2 emissions	2013 (FY)	-38%	3.1
	Japan Leasing Association		Energy intensity	2013 (FY)	-46%	0.9

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Industry under Ministry of Land, Infrastructure, Transport and Tourism					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	The Japan Warehousing Association Inc.		Energy intensity	1990 (FY)	-20%	119.0
	Japan Association of Refrigerated Warehouses		CO_2 emissions intensity	2013 (FY)	-51%	106.4
	Japan Hotel Association		Energy intensity	2010 (FY)	-15%	69.6
	Japan Ryokan & Hotel Association		Energy intensity	2016 (FY)	-10%	-
	Japan Automobile Service Promotion Association		CO_2 emissions	2007 (FY)	-15%	415.5
	The Real Estate Companies Association of Japan		CO_2 emissions	2013 (FY)	-51%	-
			CO_2 emissions intensity	2013 (FY)	-64%	
	Japan Building Owners and Managers Association		CO_2 emissions intensity	2013 (FY)	-64%	-

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	Industry under Ministry of the Environment					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	Japan Federation of Industrial Waste Management and Recycling Associations		CO_2 emissions	2010 (FY)	-10%	447.5
	The Japan Newspaper Publishers & Editors Association		Energy intensity	2013 (FY)	Annual average -1%	53.7
	Zenkoku Pet Kyoukai (pet retail)		CO_2 emissions intensity	2012 (FY)	0%	0.54
	Industry under National Police Agency					
			Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
	All Japan Pachinko Association		CO_2 emissions	2007 (FY)	-22%	502
	Japan Amusement Industry Association		CO_2 emissions	2012 (FY)	-16.6%	25.3

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	

Countermeasures by Sector (industrial, commercial and residential, transport, etc.)

D. Transport sector initiatives

(a) Promotion of voluntary effort by industry

○Steady Implementation, evaluation and verification of Industry's Voluntary Action Plans (Transport sector)

Industry under Ministry of Land, Infrastructure, Transport and Tourism

	Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
The Japanese Shipowners' Association	CO_2 emissions intensity	1990 (FY)	-30%	5,539
Japan Trucking Association	CO_2 emissions intensity	2005 (FY)	-31%	4,079
The Scheduled Airlines Association of Japan	CO_2 emissions intensity	2013 (FY)	-22%	2,152
		2019 (FY)	-15.4%	
Japan Federation of Coastal Shipping Associations	CO_2 emissions	1990 (FY)	-34%	722.1
Japan Passengerboat Association	CO_2 emissions intensity	2012 (FY)	-	361.3
Japan Federation of Hire-Taxi Associations	CO_2 emissions	2010 (FY)	-25%	338.3
Nihon Bus Association	CO_2 emissions intensity	2015 (FY)	-6%	375.7
Japan Private Railway Association	CO_2 emissions	2013 (FY)	-46%	286.0

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government				
	East Japan Railway Company		CO_2 emissions	2013 (FY)	-50%	215.0
	West Japan Railway Company		CO_2 emissions	2013 (FY)	-50%	185.5
	Central Japan Railway Company		CO_2 emissions	2013 (FY)	-46%	119.2
	Japan Harbor Transportation Association		CO_2 emissions intensity	2005 (FY)	-20%	39.0
	Japan Freight Railway Company		Energy intensity	2013 (FY)	-15%	64.9
	Kyushu Railway Company		CO_2 emissions	2013 (FY)	-50%	44.2
	Hokkaido Railway Company		Energy intensity	2013 (FY)	-7%	32.1
	All Japan Freight Forwarders Association		CO_2 emissions	2009 (FY)	-20%	12.9
	Shikoku Railway Company		CO_2 emissions	2013 (FY)	-30%	8.0

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	

Countermeasures by Sector (industrial, commercial and residential, transport, etc.)

E. Energy-conversion sector initiatives

(a) Promotion of voluntary effort by industry

○Steady Implementation, evaluation and verification of Industry's Voluntary Action Plans (Energy conversion sector)

Industry under Ministry of Economy, Trade and Industry

	Target indicator	Base year/BAU	FY 2030 target level	FY 2013 CO_2 emissions (10,000 t-CO_2)
The Electric Power Council for a Low Carbon Society	CO_2 emissions	BAU	-11,000,000 t-CO_2	49,300.0
	CO_2 emissions intensity	-	Approx. 0.25kg-CO2/kWh	
Petroleum Association of Japan	CO_2 emissions	2013 (FY)	-28%	4,032.6
The Japan Gas Association	CO_2 emissions intensity	2013 (FY)	-28%	45.6

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
02. Promotion of the introduction of facilities and equipment with high energy- saving performance (across industries) (Governing agencies: Ministry of Economy, Trade and Industry)										
Introduction of high-efficiency air conditioning	Manufacturers: Technological development, production, and cost reductions for high-efficiency air conditioning Businesses: Introduction of high-efficiency air conditioning	· Promotion of the spread through the Top Runner Program · Support for introduction of high-efficiency air conditioning	Support for introduction of high-efficiency air conditioning and public awareness-raising	Average APF/COP (electrical system, fuel system)		(10^4 kL)		(10^4 t-CO_2)		· Units sold, efficiency, and operation time of industrial air-conditioning (electric: air-conditioning packages, chilling units, turbo chillers; fuel-powered: gas heat pumps, removals chillers) · Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) · Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) · Fuel (city gas) emission factor: 2.0 t-CO_2/kL · Energy saving from Introduction of high-efficiency air conditioning represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY)	4.8 1.5	2013 (FY)	1	2013 (FY)	5	
				2025 (FY)	6.4 1.8	2025 (FY)	20	2025 (FY)	86	
				2030 (FY)	6.4 1.9	2030 (FY)	29	2030 (FY)	69	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
02. Promotion of the introduction of facilities and equipment with high energy- saving performance (across industries) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Introduction of industrial heat pump	・Manufacturers: Technological development, production, and cost reductions for high-efficiency industrial heat pumps ・Businesses: Introduction of high-efficiency industrial heat pumps	・Regulation under the Act on the Rational Use of Energy ・Support for introduction of high-efficiency industrial heat pumps	Support for introduction of high-efficiency industrial heat pumps and public awareness-raising	Cumulative installed capacity (1000 kW)		(10^4 kL)		(10^4 t-CO_2)		・Full-time usage rate: 94.5% ・Secondary energy conversion coefficient: 3.6 MJ/kWh ・Conversion coefficient to crude oil equivalent: 0.0258 kL/thousand MJ ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・Fuel (city gas) emission factor: 51.4 t-CO_2/million MJ ・Energy saving from Introduction of industrial heat pumps represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY)	11	2013 (FY)	0.2	2013 (FY)	0.2	
				2025 (FY)	824	2025 (FY)	43.0	2025 (FY)	66.0	
				2030 (FY)	1,673	2030 (FY)	87.9	2030 (FY)	161.0	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
02. Promotion of the introduction of facilities and equipment with high energy- saving performance (across industries) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Introduction of industrial lighting	Manufacturers: Technological development related to high-efficiency lighting Vendors: Providing businesses with information about high-efficiency lighting Businesses, consumers: Introduction of high-efficiency lighting	・Technical development and Support for introduction of high-efficiency lighting ・Promotion of the spread through expansion of standards of Top Runner Program	Support for introduction of high-efficiency lighting and public awareness-raising	Cumulative market introductions (100 million units)		(10^4 kL)		(10^4 t-CO_2)		・Energy saving per unit of high-efficiency lighting ・Number of units of high-efficiency lighting promoted ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・Energy saving from Introduction of industrial lighting represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY)	0.16	2013 (FY)	11	2013 (FY)	67.0	
				2025 (FY)	0.80	2025 (FY)	86	2025 (FY)	844.2	
				2030 (FY)	1.05	2030 (FY)	109	2030 (FY)	293.1	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
02. Promotion of the introduction of facilities and equipment with high energy- saving performance (across industries) **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Introduction of low-carbon industrial furnaces	Manufacturers: Technological development, production, and cost reductions for low-carbon industrial furnaces Businesses: Introduction of low-carbon industrial furnaces	・Regulation under the Act on the Rational Use of Energy ・ Support for introduction of low-carbon industrial furnaces	Support for introduction of low-carbon industrial furnaces and public awareness-raising	Cumulative number of introduced units (1000 units)	(10^4 kL)	(10^4 t-CO_2)	・ Number of units adopted in the future and energy use per unit (electricity and fuel) are estimated based on the results of the FY 2014 Project on Infrastructure Improvement for Rationalization of International Energy Use (fact-finding survey on energy saving technologies in industrial furnaces etc.). ・ Numbers of industrial furnaces adopted in the following types: induction heating, metal melting, enhanced insulation, waste heat recovery, raw-material preheating ・ Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・ Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・ Fuel (city gas) emission factor: 51.4 t-CO_2/million MJ ・ Energy saving from Introduction of low-carbon industrial furnaces represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY) 9.4	2013 (FY) 17.0	2013 (FY) 57.5	
				2025 (FY) 16.6	2025 (FY) 281.1	2025 (FY) 692.5	
				2030 (FY) 19.1	2030 (FY) 374.1	2030 (FY) 806.9	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
02. Promotion of the introduction of facilities and equipment with high energy- saving performance (across industries) (Governing agencies: Ministry of Economy, Trade and Industry)							
Introduction of industrial motors and inverters	Manufacturers: Technological development, production, and cost reductions for high-efficiency industrial motors and inverters Businesses: Introduction of high-efficiency industrial motors and inverters	・Promotion of the spread through the Top Runner Program ・Support for introduction of high-efficiency industrial motors and inverters	Support for introduction of high-efficiency industrial motors and inverters and public awareness-raising	Cumulative number of introduced units of highly efficient motors (10^4 units) 2013 (FY): 1.6 2025 (FY): 1,723 2030 (FY): 2,756	(10^4 kL) 2013 (FY): 5.48 2025 (FY): 176.2 2030 (FY): 282.6	(10^4 t-CO_2) 2013 (FY): 33.8 2025 (FY): 1,082.0 2030 (FY): 760.8	・Rate of full-time use of high-efficiency industrial motors: 95.2% ・Rate of inverter installation (FY 2013): 10% ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・Energy saving from Introduction of industrial motors represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				Cumulative number of introduced units of inverters (10^4 units) 2013 (FY): 152.1 2025 (FY): 2,370 2030 (FY): 3,811			

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
02. Promotion of the introduction of facilities and equipment with high energy- saving performance (across industries) (Governing agencies: Ministry of Economy, Trade and Industry)										
Introduction of high-performance boilers	Manufacturers: Technological development, production, and cost reductions related to saving energy of high-performance boilers Vendors: Providing information on high-performance boilers to Introducing businesses Introducing businesses: Choosing high-performance boilers in purchasing	・Regulation under the Act on the Rational Use of Energy ・Support for introduction of high-performance boilers	Support for introduction of high-performance boilers and public awareness-raising	Number of introduced units (100 units)		(10^4 kL)		(10^4 t-CO_2)		・Number of boilers adopted Estimated from various statistics and interviews with business enterprises ・Boiler performance conditions Boiler steam generation: 2,000 kg/h; annual hours in operation: 3,000 hrs.; steam enthalpy: 666.2 kcal/kg Water-supply enthalpy: 20.4 kcal/kg; heavy oil heat generation: 9,250 kcal/L High-performance boilers: thermal efficiency 95%; traditional boilers subject to comparison: thermal efficiency 90% ・Fuel (heavy oil A) emission factor: 2.7 t-CO_2/kL Crude oil equivalent ・Energy saving from Introduction of high-performance boilers represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY)	280.0	2013 (FY)	10.8	2013 (FY)	29.2	
				2025 (FY)	745.4	2025 (FY)	122.5	2025 (FY)	330.7	
				2030 (FY)	957.0	2030 (FY)	173.3	2030 (FY)	467.9	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
02. Promotion of the introduction of facilities and equipment with high energy- saving performance (across industries) (Governing agencies: Ministry of Economy, Trade and Industry)							
Introduction of cogeneration	Manufacturers: Technological and product development toward less costly and more efficient cogeneration Vendors etc.: Providing information for businesses, supporting efficient use of cogeneration Businesses: Proactive introduction and efficient use of cogeneration	・Regulation under the Act on the Rational Use of Energy ・Support for introduction of cogeneration ・Support for efficient use of cogeneration (e.g., promotion of areal use)	Support for introduction of cogeneration and public awareness-raising	Cumulative installed capacity of co-generation (10^4 kW)	(10^4 kL)	(10^4 t-CO_2)	・Expected energy saving (Expected emission reduction) from electric power and heat generated from cogeneration are calculated by subtracting fuel consumption (CO_2 emissions) from cogeneration from fuel consumption (CO_2 emissions) from grid electricity and boilers. ・FY 2030 figures are calculated based on estimates in projections of energy demand and supply for FY 2030. ・Cogeneration adoption volumes in FY 2020 are calculated through linear approximation from the figures from FY 2013 through FY 2030. ・emission intensity for grid electricity assume thermoelectric power sources * *FY 2013 average emission factor for thermoelectric power: 0.65 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) FY 2030 average emission factor for thermoelectric power: 0.60 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・Emission intensity for boilers are based on a weighted average of fuel types used ・Energy saving from Introduction of cogeneration represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY)	1,004	2013 (FY)	12	2013 (FY)	41	
				2025 (FY)	1,230	2025 (FY)	146.7	2025 (FY)	694.2	
				2030 (FY)	1,336	2030 (FY)	212.1	2030 (FY)	1,061	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
03. Promotion of the introduction of facilities and equipment with high energy- saving performance (iron and steel industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Improvement of efficiency of main electricity demand facilities	Businesses: promotion of the spread such as upgrading to high-efficiency electricity demand facilities Businesses: Technological development related to saving energy in electricity demand facilities	・Support for technological development related to saving energy in electricity demand facilities ・Support for introduction of electricity demand facilities with high energy saving performance	–	Rate of widespread use (%)	(10^4 kL)	(10^4 t-CO_2)	・These figures assume electricity savings in FY 2030 of 5% vs. power consumption in FY 2012 for the following three equipment types: oxygen plants, blowers, and compressed-air equipment (The Japan Iron and Steel Federation). ・Crude oil thermal conversion coefficient: 0.0258 kL/GJ (source: Article 4 of the Act on Rationalizing Energy Use [Act No. 74 of 1979]); electricity conversion coefficient (heat generated during consumption): 3.6 MJ/kWh (source: total energy statistics) ・Energy saving from efficiency improvements in main electric-powered equipment represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY) ▲4	2013 (FY) ▲0.2	2013 (FY) ▲0.4	
				2025 (FY) -	2025 (FY) -	2025 (FY) -	
				2030 (FY) 100	2030 (FY) 5.0	2030 (FY) 10.0	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
03. Promotion of the introduction of facilities and equipment with high energy- saving performance (iron and steel industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Expansion of chemical recycle of waste plastics at steel mills	Businesses: Effective use of waste plastics and other materials collected under The Law for Promotion of Sorted Collection and Recycling of Containers and Packaging (No. 112 of 1995) Businesses: Technological development related to chemical recycle of waste plastics etc. at steel mills	・Support for technological development related to chemical recycle of plastic wastes etc. at steel mills ・Smooth operation of The Law for Promotion of Sorted Collection and Recycling of Containers and Packaging	Increasing volumes of container and packaging plastics collected by local governments under The Law for Promotion of Sorted Collection and Recycling of Containers and Packaging	Amount of processed waste plastic (10^4 t)		(10^4 kL)		(10^4 t-CO_2)		・Waste plastics used in FY 2012: 420,000 t (source: The Japan Iron and Steel Federation) ・The volume used is expected to increase to 1 million t in FY 2020 and FY 2030 ・However, this assumes an increase in volumes of plastics processed in the iron and steel industry through means such as revisions to the current collection system for plastic containers and packaging subject to Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging. Evaluation indicators etc. will need to be revised in accordance with the results of joint discussions between the Industrial Structure Council and the Central Environment Council. ・Crude oil thermal conversion coefficient: 0.0258 kL/GJ (source: Article 4 of the Act on Rationalizing Energy Use) ・Energy saving from expanding chemical recycling of plastic wastes at steel mills represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	40	2013 (FY)	▲2	2013 (FY)	▲7	
				2025 (FY)	-	2025 (FY)	-	2025 (FY)	-	
				2030 (FY)	100	2030 (FY)	49	2030 (FY)	212	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
03. Promotion of the introduction of facilities and equipment with high energy- saving performance (iron and steel industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Efficiency improvement of coke oven	Businesses: Technological development related to coke production technologies Businesses: Updating coke oven	Support for introduction of energy conserving equipment	–	Rate of widespread use (%)	(10^4 kL)	(10^4 t-CO_2)	・These figures assume high efficiency through efficiency improvements in coke oven in FY 2030. ・Energy saving from efficiency improvements in coke oven represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY) 93	2013 (FY) ▲4	2013 (FY) ▲4	
				2025 (FY) -	2025 (FY) -	2025 (FY) -	
				2030 (FY) 100	2030 (FY) 17	2030 (FY) 48	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
03. Promotion of the introduction of facilities and equipment with high energy- saving performance (iron and steel industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Improvement of power generation efficiency	Businesses: Technological development related to saving energy in power generation facilities Businesses: Promotion of the spread such as upgrading to power generation facilities with high-efficiency energy saving performance	・Support for technological development related to saving energy in power generation facilities ・Support for introduction of power generation facilities with high-efficiency energy saving performance	–	Rate of widespread use (%)	(10^4 kL)	(10^4 t-CO_2)	・These figures assume that efficiency improvements by FY 2030 for private generators and joint thermal power plants that began operation in FY 1979 or earlier (not including backup equipment and equipment for which decisions have been made on discontinuation of use etc.) ・Power generation through FY 2030 is assumed to be constant ・Energy saving from improving power-generation efficiency represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY) joint thermal power generation 17 private power generation 38	2013 (FY) joint thermal power generation 5 private power generation 4	2013 (FY) joint thermal power generation 16 private power generation 9	
				2025 (FY) -	2025 (FY) -	2025 (FY) -	
				2030 (FY) joint thermal power generation 39 private power generation 92	2030 (FY) joint thermal power generation 14 private power generation 30	2030 (FY) joint thermal power generation 44 private power generation 70	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
03. Promotion of the introduction of facilities and equipment with high energy- saving performance (iron and steel industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Enhancement of energy saving facilities	Businesses: Technological development related to enhancement of energy saving facilities Businesses: Upgrading energy saving facilities	Supporting introduction of energy saving facilities	–	Rate of widespread use (%)	(10^4 kL)	(10^4 t-CO_2)	・It is assumed that pressure recovery power generation at peak blast-furnace pressure (TRT), sensible heat recovery in coke oven (CDQ), equipment for recovery of heat emitted by sintering, and equipment for recovery of heat emitted by converters will achieve FY2005 Top Runner efficiency levels by FY 2030, with the exception of some equipment. ・Conversion coefficient to crude oil equivalent: 0.0258 kL/GJ (Article 4 of the Act on Rationalizing Energy Use) ・Secondary conversion coefficient (heat generated during consumption): 3.6 MJ/kWh (source: total energy statistics) ・Steam thermal conversion coefficient: 3.27 GJ/t (source: total energy statistics) ・Energy saving from enhancement of energy saving equipment represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	TRT 91 CDQ 86 Steam recovery 83	2013 (FY) 0.5	2013 (FY) 0.9
				2025 (FY)	-	2025 (FY) -	2025 (FY) -
				2030 (FY)	TRT 100 CDQ 100 Steam recovery 100	2030 (FY) 34.0	2030 (FY) 65.0

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
03. Promotion of the introduction of facilities and equipment with high energy- saving performance (iron and steel industry) (Governing agencies: Ministry of Economy, Trade and Industry)							
Introduction of innovative pig iron making process (ferro coke)	Businesses: Technological development related to innovative pig iron making process Businesses: Introduction of workflows using innovative pig iron making process	・Suppor for technological development related to innovative pig iron making process ・Support for introduction of workflows using innovative pig iron making process	–	Number of introduced facilities (units)	(10^4 kL)	(10^4 t-CO_2)	・Evaluation indicator: energy saving per unit (Crude oil equivalent) = approx. 39,000 kL/unit * The CO_2 emission reduction at steelworks from development of this technology can be realized through increasing the speed of reduction reactions inside blast furnaces, lowering temperatures, and lowering the reducing-agent ratio, through use of an innovative coke-alternative reducing-agent (ferrocoke). The increase in energy purchased (e.g., electricity) in such a case, since energy recovered also will decrease, is taken into consideration as well. ・Energy saving from Introduction of innovative pig-iron processes (ferrocoke) represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY) 0	2013 (FY) 0	2013 (FY) 0	
				2025 (FY) -	2025 (FY) –	2025 (FY) –	
				2030 (FY) 5	2030 (FY) 19	2030 (FY) 82	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
03. Promotion of the introduction of facilities and equipment with high energy- saving performance (iron and steel industry) (Governing agencies: Ministry of Economy, Trade and Industry)							
Introduction of environmentally harmonious ironmaking processes	Businesses: Technological development related to environmentally harmonious ironmaking processes Businesses: Introduction of workflows using environmentally harmonious ironmaking processes	・Support for technological development related to environmentally harmonious ironmaking processes ・Support for introduction of equipment related to environmentally harmonious ironmaking processes	–	Number of introduced facilities (units)	(10^4 kL)	(10^4 t-CO_2)	・Energy saving per unit of evaluation indicator = 54,000 kL ・CO_2 emission reduction per unit of evaluation indicator = 54,000 (kL) / 0.0258 (kL/GJ) / 1,000 (TJ/GJ) × 51.2 (t-CO_2/TJ) = 107,000 t-CO_2 * The target COT-reduction effects at steel mills from this technological development are approximately 10% from technologies to increase hydrogen included in the high-temperature gas byproducts produced during production of coke and processing iron ore using this hydrogen as a substitute for some coke and approximately 20% from new CO_2 separation and recovery technologies using unused waste heat inside steel mills. * Projected volumes of energy saving are the results of efforts such as efficiency improvements in process reactions inside blast furnaces through use of hydrogen in iron or processing. Accordingly, the projected volumes of energy saving and projected CO_2 emission reduction of this technology do not match. * Expected emission reduction for FY 2030 are 1.78 million t-CO_2 when reductions from sources such as CO_2 separation and recovery technologies are included. ・Conversion coefficient to crude oil equivalent: 0.0258 kL/GJ (Article 4 of the Act on Rationalizing Energy Use) ・Fuel (LNG) emission factor: 51.2 t-CO_2/TJ (List of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・Energy saving from Introduction of eco-friendly steelmaking processes represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	0	2013 (FY)	0	2013 (FY)	0	
				2025 (FY)	-	2025 (FY)	–	2025 (FY)	–	
				2030 (FY)	1	2030 (FY)	5	2030 (FY)	11	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th colspan="2">Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="9">04. Promotion of the introduction of facilities and equipment with high energy- saving performance (chemical industry)
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="4">Introduction of energy saving process technologies in chemistry</td><td rowspan="4">saving energy through recovery of an emitted energy technologies, improved efficiency of facilities and equipment and machinery, rationalization of processes, etc.</td><td rowspan="4">Support for introduction of facilities and equipment by businesses</td><td rowspan="4">–</td><td colspan="2">–</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO_2)</td><td rowspan="4">・Crude oil emission factor: 2.7 t-CO_2/kL
・Energy saving from Introduction of energy saving technologies in chemicals represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.</td></tr>
<tr><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>16.9</td><td>2013 (FY)</td><td>45.6</td></tr>
<tr><td>2025 (FY)</td><td>–</td><td>2025 (FY)</td><td>–</td><td>2025 (FY)</td><td>–</td></tr>
<tr><td>2030 (FY)</td><td>–</td><td>2030 (FY)</td><td>144.1</td><td>2030 (FY)</td><td>389.1</td></tr>
<tr><td rowspan="4">Introduction of carbon dioxide utilization technologies</td><td rowspan="4">Businesses:
Development and introduction of energy saving technologies</td><td rowspan="4">・Support for development of carbon dioxide utilization technologies
・Support for introduction of facilities and equipment by businesses</td><td rowspan="4">–</td><td colspan="2">Introduced amount (10^4 t)</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO_2)</td><td rowspan="4">・Energy saving from Introduction of technologies for converting CO_2 to raw materials represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.</td></tr>
<tr><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>–</td></tr>
<tr><td>2025 (FY)</td><td>0.64</td><td>2025 (FY)</td><td>0.06</td><td>2025 (FY)</td><td>0.16</td></tr>
<tr><td>2030 (FY)</td><td>64.0</td><td>2030 (FY)</td><td>6.4</td><td>2030 (FY)</td><td>17.3</td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
05. Promotion of the introduction of facilities and equipment with high energy- saving performance (cement and ceramic industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Conventional energy saving technology	Businesses: introduction of facilities and equipment capable of efficiently utilizing thermal energy and electrical energy	Support for introduction of facilities and equipment by businesses	–	Energy intensity reduction (MJ/t-cem)	(10^4 kL)	(10^4 t-CO_2)	・Evaluation indicator: Reduction in energy intensity energy saving effect per unit of subject equipment (waste-heat power generation, vertical slag mills, vertical coal mills, high-efficiency coolers) multiplied by the number of units adopted, divided by cement production volume ・Energy saving from traditional energy saving technologies represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY) 2	2013 (FY) 0.2	2013 (FY) 0.5	
				2025 (FY) -	2025 (FY) -	2025 (FY) -	
				2030 (FY) 14	2030 (FY) 2.4	2030 (FY) 6.4	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
05. Promotion of the introduction of facilities and equipment with high energy- saving performance (cement and ceramic industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Technology to use waste as a substitute for thermal energy	Businesses: Use of wastes as a substitute for thermal energy	Support for introduction of facilities and equipment by businesses	–	The co-firing ratio of alternative waste to thermal energy (%)		(10^4 kL)		(10^4 t-CO_2)		・Evaluation indicator: Replacement waste cofiring as a share of thermal energy For waste cofiring rates, the growth rate since 2012 as reported in the FY 2021 Ministry of the Environment report "Report on market size, employment, etc. in environmental industries" is used. ・Energy saving from technology to use waste as a substitute for thermal energy is calculated by multiplying the difference in Energy intensity from previous methods by annual production volume.
				2013 (FY)	▲0.2	2013 (FY)	▲3.1	2013 (FY)	▲8.2	
				2025 (FY)	1.0	2025 (FY)	4.7	2025 (FY)	12.7	
				2030 (FY)	1.5	2030 (FY)	7.2	2030 (FY)	19.2	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
05. Promotion of the introduction of facilities and equipment with high energy- saving performance (cement and ceramic industry) (Governing agencies: Ministry of Economy, Trade and Industry)										
Innovative cement production process	Businesses: R&D etc. toward practical application of technologies related to low-temperature firing in cement production processes	・Support for development of technologies related to low-temperature firing in cement production processes ・Support for practical application and introduction of technologies related to low-temperature firing in cement production processes	–	Low-temperature firing clinker production volume (%)		(10^4 kL)		(10^4 t-CO_2)		・Evaluation indicator: Rate of Introduction of this technology Projected through combination of results of interviews with leading businesses capable of using this technology ・Energy saving from technologies related to low-temperature firing in cement production processes represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	0	2013 (FY)	0	2013 (FY)	0	
				2025 (FY)	28.9	2025 (FY)	4.5	2025 (FY)	12.2	
				2030 (FY)	73.1	2030 (FY)	15.1	2030 (FY)	40.8	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
05. Promotion of the introduction of facilities and equipment with high energy- saving performance (cement and ceramic industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Glass melting process technology	Businesses: R&D etc. toward practical application of glass melting process technology	・Support for development of glass melting process technology ・Support for practical application and introduction of glass melting process technology	–	Technology introduction rate (%)		(10^4 kL)		(10^4 t-CO_2)		・Evaluation indicator: Rate of Introduction of this technology Projected through combination of results of interviews with leading businesses capable of using this technology ・Energy saving from glass melting process technologies represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	0	2013 (FY)	0	2013 (FY)	0	
				2025 (FY)	1.2	2025 (FY)	1.5	2025 (FY)	4.1	
				2030 (FY)	3.7	2030 (FY)	3.0	2030 (FY)	8.1	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
06. Promotion of the introduction of facilities and equipment with high energy- saving performance (pulp, paper, and paper product industry) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Introduction of high-efficiency recovered paper pulping process technology	Businesses: Introduction of facilities and equipment with high energy saving performance	Support for introduction of facilities and equipment by businesses	-	Rate of widespread use (%)		(10^4 kL)		(10^4 t-CO_2)		・Introduction of 35 units is anticipated by FY 2025 (Rate of widespread use = 59 units/172 units = 34%) ・Introduction of 40 units is anticipated by FY 2030 (Rate of widespread use = 64 units/172 units = 37%)
				2013 (FY)	12	2013 (FY)	0.2	2013 (FY)	0.5	
				2025 (FY)	34	2025 (FY)	3.4	2025 (FY)	9.2	・Volumes of energy saving represent energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2030 (FY)	37	2030 (FY)	3.9	2030 (FY)	10.5	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
07. Promotion of the introduction of facilities and equipment with high energy- saving performance (construction work and use of special vehicles) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Introductn of energy saving construction equipment, etc.	Construction contractors etc.: Striving to utilize construction machinery etc. with high energy saving performance in their construction work	Over the short term, aiming to reduce CO_2 through promotion of construction machinery that has outstanding fuel-conservation performance. Over the long term, introducing, and promoting through establishing a certification program for innovative construction machinery based on thorough review of use of diesel as a fuel (e.g., that using electricity, hydrogen, or biomass), to realize carbon neutrality.	Through measures, such as promotion of i-Construction, including increasing use of ICT construction by Small and Midsize Enterprises contractors working on construction projects for local governments, promoting measures in areas such as further efficiency improvements in construction and maintenance management and reductions in staff and labor requirements, to enable adaptation to shortages of skilled labor.	Number of introduced units of hybrid construction machinery (10^4 units)		(10^4 kL)		(10^4 t-CO_2)		・Expected energy saving is estimated based on energy saving per unit and the increase in units since FY 2012 Energy saving per unit: 3.65 kL/unit (Crude oil equivalent) Increase in units in use since FY 2012: 47,000-2,000=45,000 units Expected energy saving: 36,500×4.5=16×10^4 kL ・Expected emission reduction are calculated by multiplying projected energy saving by emission intensity Fuel (diesel) emission factor: 2.7 t-CO_2/kL (Source: Based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy])
				2013 (FY)	Approx. 0.2	2013 (FY)	0.3	2013 (FY)	0.7	
				2025 (FY)	-	2025 (FY)	-	2025 (FY)	-	
				2030 (FY)	Approx. 4.7	2030 (FY)	16.0	2030 (FY)	44.0	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
07. Promotion of the introduction of facilities and equipment with high energy- saving performance (construction work and use of special vehicles) (Governing agencies: Ministry of Economy, Trade and Industry)							
				* Reference: Rate of widespread use of construction machinery that meets fuel efficiency standards	(10^4 kL)	(10^4 t-CO_2)	* Reference: The base year has been set to FY 2017 as a result of revision of evaluation indicators. 1. CO_2 emissions from construction machinery are estimated at 5.71 million t, based on total energy statistics (①). 2. The average composition of CO_2 emissions from construction machinery for 2011-2015 was: 46% for hydraulic shovels, 11% for wheel loaders, and 3% for bulldozers (②). 3. CO_2 emissions will be reduced by 15% in a case of construction machinery that satisfies 2020 fuel-consumption standards (construction machinery satisfying fuel-consumption standards) (③) Projected CO_2 emission reduction from these initiatives are estimated by calculating reductions per unit and multiplying them by the projected number of units in use, as follows: CO_2 reductions (10,000 t-CO_2) =5.71 million t-CO_2 (①) × 46% (②) × rate of adoption (hydraulic shovels) % (③) × 15% +5.71 million t-CO_2 (①) × 11% (②) × rate of adoption (wheel loaders) % (③) × 15% +5.71 million t-CO_2 (①) × 3% (②) × rate of adoption (bulldozers) % (③) × 15% 4. For FCFL, reductions per unit are 4.70 [t-CO_2/unit].
				FY 2017 Hydraulic excavators: 6.7% Wheel loaders: 2.0% Bulldozers: 5.1% FCFL: 77 units	2017 (FY) 1	2017 (FY) 4	
				FY 2025 Hydraulic excavators: 49.4% Wheel loaders: 39.8% Bulldozers: 33.2% FCFL: 500 units	2025 (FY) 11	2025 (FY) 29	
				FY 2030 Hydraulic excavators: 82.3% Wheel loaders: 60.7% Bulldozers: 49.3% FCFL: 2500 units	2030 (FY) 18	2030 (FY) 48	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
08. Promotion of the introduction of facilities and equipment with high energy- saving performance (greenhouse horticulture, agricultural machinery, and fisheries) (Governing agencies: Ministry of Agriculture, Forestry and Fisheries)							
Introduction of energy saving equipment in horticulture facilities, etc.	Manufacturers: Development of equipment, facilities, and materials to contribute to greenhouse gas emission reduction Vendors: Sale of equipment, facilities, and materials to contribute to greenhouse gas emission reduction Nationwide private associations : energy saving rating, and provision of information to farmers, concerning equipment, facilities, and materials to contribute to greenhouse gas emission reduction Growers: Choosing energy saving equipment, facilities, and materials and putting into practice energy saving production management technologies	· Promoting introduction of energy saving equipment in horticulture facilities to contribute to greenhouse gas emission reduction, etc. · Promoting and public awareness-raising of production management through energy saving production-management manuals in horticulture facilities and production-management check sheets in horticulture facilities · Promoting establishment of technologies for energy saving facilities and equipment etc.	· Promoting introduction of energy saving equipment in horticulture facilities to contribute to greenhouse gas emission reduction, etc. · Public awareness-raising	Introduction of energy saving equipment (1,000 units) 2013 (FY): 63 2025 (FY): 143 2030 (FY): 170	(10^4 kL) 2013 (FY) -	(10^4 t-CO_2) 2013 (FY) -	Scale of Introduction of energy saving equipment/machinery (increase in adoption from FY 2013 to FY 2030) ● Number of units of energy saving machinery adopted ・Heat pumps: 26,700 units* ・Heating equipment using woody biomass: 1,000 units* ・Multilayer thermostats: 79,000 units* ● energy saving introduction of equipment sites ・Circulating fans: 143,000 sites* ・Curtain installation: 129,000 sites* * Scale of adoption estimated based on subsidy program results etc. Fuel (heavy oil A) emission factor: 2.7 t-CO_2/kL (prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy])
				Introduction of energy saving facilities (1,000 sites) 2013 (FY): 105 2025 (FY): 304 2030 (FY): 376	2025 (FY) 42.7 2030 (FY) 57.3	2025 (FY) 115 2030 (FY) 155	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
08. Promotion of the introduction of facilities and equipment with high energy- saving performance (greenhouse horticulture, agricultural machinery, and fisheries) (Governing agencies: Ministry of Agriculture, Forestry and Fisheries)							
Introduction of energy saving agricultural machinery	Manufacturers/vendors: Development and promotion of energy saving agricultural machinery, awareness and promotion concerning energy saving in use of agricultural machinery Consumers: Choosing energy saving agricultural machinery at time of purchase, and using it in ways that enable energy saving	・Promotion of introduction of energy saving agricultural machinery ・Awareness promotion concerning saving energy in use of agricultural machinery	Awareness promotion concerning saving energy in use of agricultural machinery	The number of widely-used energy saving agricultural machinery (Units)	(10^4 kL)	(10^4 t-CO_2)	● Estimation of permeation of energy saving agricultural machinery ・Estimation of permeation of energy saving agricultural machinery (automated steering equipment, electrically powered agricultural machinery) ・Calculation of reductions in fuel consumption through permeation of energy saving agricultural machinery (using the energy saving rate of each machine) * Automated steering equipment: 13.3%; electrically powered agricultural machinery: 100% ・CO_2 emission reduction calculated using the conversion coefficient* * Chosen for each type of agricultural machinery, from diesel (2.7 t-CO_2/kL) for automated steering equipment, kerosene (2.7 t-CO_2/kL) and diesel (2.7 t-CO_2/kL) for electrically powered agricultural machinery, etc. (prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy])
				2013 (FY) 0.45	2013 (FY) -	2013 (FY) -	
				2025 (FY) 70	2025 (FY) 0.11	2025 (FY) 0.29	
				2030 (FY) 190	2030 (FY) 0.29	2030 (FY) 0.79	
Energy saving on fishing vessels	Manufacturers/vendors: Development of energy saving fishing vessels, equipment, etc., and providing information to those in the fishing industry Fishers: Choosing energy saving equipment etc. when updating fishing vessels	・Promotion of development and practical application of energy saving technologies of fishing vessels ・Promotion of the spread through replacement of energy saving and power-saving fishing vessels, etc.	Public awareness-raisin	Measure evaluation indicator Shift to energy saving fishing boats (%)	(10^4 kL)	(10^4 t-CO_2)	・Trend in number of fishing boats updated per year: approx. 1.7%/year ・Energy saving effects of updating fishing boats: 10% vs. boat replaced ・Projected improvement in efficiency of fishing boats through Introduction of smart technologies in offshore and open-sea fishing: approx. 5% ・Manifestation of energy saving effects through smart technologies: increasing by approx. 2%/year ・Crude oil emission factor: 2.7 t-CO_2/kL (prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy])
				2013 (FY) 12.4	2013 (FY) -	2013 (FY) -	
				2025 (FY) 32.6	2025 (FY) 4.8	2025 (FY) 13.2	
				2030 (FY) 41.0	2030 (FY) 7.2	2030 (FY) 19.4	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="9">09. Promotion of energy conservation initiatives through inter-industry collaboration
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="3">Promotion of energy conservation initiatives through inter-industry collaboration</td><td rowspan="3">Businesses:
Striving to save energy in cooperation with multiple plants and businesses, through means such as energy accommodation</td><td rowspan="3">・Support for energy saving initiatives through cooperation of multiple businesses

・Evaluation of energy saving initiatives through cooperation of multiple businesses under the Act on the Rational Use of Energy</td><td rowspan="3">Promoting energy saving initiatives through cooperation of multiple businesses</td><td>-</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO_2)</td><td rowspan="3">・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])
・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)

・Fuel (city gas) emission factor: 2.0 t-CO_2/kL
・Fuel (heavy oil A) emission factor: 2.7 t-CO_2/kL
・Fuel (imported thermal coal) emission factor: 3.5 t-CO_2/kL
* For convenience, the average of the emission intensity for coal, heavy oil A, and city gas (2.7t-CO_2/kL) is used in estimating Expected emission reduction from fuel savings.

・Energy saving from energy conservation initiatives through inter-industry collaboration represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.</td></tr>
<tr><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>0</td><td>2013 (FY)</td><td>0</td></tr>
<tr><td>2025 (FY)</td><td>-</td><td>2025 (FY)</td><td>21</td><td>2025 (FY)</td><td>71</td></tr>
<tr><td></td><td></td><td></td><td>2030 (FY)</td><td>-</td><td>2030 (FY)</td><td>29</td><td>2030 (FY)</td><td>78</td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
10. Electrification and fuel conversion (Governing agencies: Ministry of the Environment)										
Promotion of fuel conversion	Manufacturers/vendors: Promoting cost reductions in fuel conversion from coal and heavy oil to natural gas etc., and provision of information Consumers: Choosing fuel conversion from coal and heavy oil to natural gas etc.	· Subsidies for fuel conversion from coal and heavy oil to natural gas etc. · Provision of information on outstanding case studies related to fuel conversion from coal and heavy oil to natural gas etc.	-	The amount of fuel converted to gas (Million Nm^3)		(10^4 kL)		(10^4 t-CO_2)		· Fuel conversion results (most recent four years in industry and commercial sectors) 2016-2019 CO_2 reductions: 500,000 t-CO_2 (125,000 t-CO_2 /year) (2016: 160,000; 2017: 29,000; 2018: 133,000; 2019: 177,000 t-CO_2/year) (Source: The Japan Gas Association) · Average thermoelectric emission intensity are used for FY 2030 emission intensity for grid electricity: 0.60 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)
				2013 (FY)	-	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	-	2025 (FY)	-	2025 (FY)	151	
				2030 (FY)	-	2030 (FY)	-	2030 (FY)	211	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity (in power sector) are estimated based on from FY 2016 to FY 2019, with the exception of figures for FY 2030, which reflect a preferable energy mix.

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<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="9">11. Implementation of thorough energy management using FEMS
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="3">Implementation of thorough energy management using FEMS</td><td rowspan="3">Manufacturers/vendors: Development of low-cost, easy-to-use factory energy management systems (FEMSs) and providing information to businesses introducing

Businesses introducing: Introduction of FEMS</td><td rowspan="3">Supporting FEMS technological development and introduction by businesses</td><td rowspan="3">-</td><td rowspan="3">FEMS coverage rate (%)□</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO₂)</td><td rowspan="3">・FEMS coverage, energy saving rate

・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO₂/kWh (Source: Outlook for energy supply and demand in FY 2030)

・Energy saving from FEMS installation represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.</td></tr>
<tr><td>2013 (FY) 5</td><td>2013 (FY) 4</td><td>2013 (FY) 15</td></tr>
<tr><td>2025 (FY) 18</td><td>2025 (FY) 62</td><td>2025 (FY) 238</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY) 24</td><td>2030 (FY) 74</td><td>2030 (FY) 200</td><td></td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
12. Improvement of the energy efficiency of buildings (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Improvement of the energy efficiency of buildings (new buildings)	Contractors etc.: Building energy saving buildings Owners of buildings etc.: Displaying energy consumption performance of buildings Manufacturers of building materials preventing heat loss etc.: Improving the performance of building materials prevebting heat loss	・Requiring conformity to energy saving standards under the Act on the Improvement of Energy Consumption Performance of Buildings, strengthening guidance standards, and strengthening energy saving standards in stages ・Support through subsidies to promote supply of buildings with improved energy saving performance, such as zero-emissions buildings (ZEB) ・Realizing ZEB in the national government's newly constructed buildings ・Enhancing the Top Runner Program for building materials	・Smooth operation of the Act on the Improvement of Energy Consumption Performance of Buildings ・Public awareness-raising related to energy saving buildings ・Proactive realization of ZEB in public buildings ・Support for promotion and expansion of ZEB etc.	The percentage of medium to large-scale new buildings that meet the energy saving performance* of the ZEB standard (%)		(10^4 kL)		(10^4 t-CO_2)		・FY 2030 energy saving represents energy saving through progress on countermeasures since FY 2013, and volumes of emission reduction are calculated based on these volumes of energy saving. ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) * Primary energy consumption not including renewable energy reduced as follows by use, from current energy saving standards. Hotels, hospitals, department stores, restaurants/bars, meeting places, etc.: 30% reduction (BEI=0.7) Offices, schools, factories, etc.: 40% reduction (BEI=0.6)
				2013 (FY)	0	2013 (FY)	—	2013 (FY)	—	
				2025 (FY)	-	2025 (FY)	—	2025 (FY)	—	
				2030 (FY)	100	2030 (FY)	403	2030 (FY)	1,010	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
12. Improvement of the energy efficiency of buildings (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Improvement of the energy efficiency of buildings (renovation and reconstruction of existing buildings)	Owners etc.: Energy saving renovation and reconstruction of existing buildings Manufacturers of building materials preventing heat loss etc.: Improving the performance of building materials prevebting heat loss	・Support for promotion of energy saving renovation and reconstruction of existing buildings ・Systematic energy saving renovation and reconstruction of public buildings	・Smooth operation of the Act on the Improvement of Energy Consumption Performance of Buildings ・Promotion and awareness raising related to energy saving buildings ・Systematic energy saving renovation and reconstruction of public buildings ・Support for energy saving renovation and reconstruction of buildings	The percentage of building stock that meets energy saving standards (%)		(10^4 kL)		(10^4 t-CO_2)		・FY 2030 energy saving represents energy saving through progress on countermeasures since FY 2013, and volumes of emission reduction are calculated based on these volumes of energy saving. ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)
				2013 (FY)	24	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	–	2025 (FY)	–	2025 (FY)	–	
				2030 (FY)	57	2030 (FY)	143	2030 (FY)	355	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
13. Promotion of high-efficiency energy-saving equipment (commercial and other sectors) **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Installation of energy-efficient commercial water heaters	Manufacturers: Technological development, production, and cost reductions for high-efficiency water heaters Vendors: Providing information to businesses concerning high-efficiency water heaters Businesses: Introduction of high-efficiency water heaters	・ Supporting introduction of high-efficiency water heaters ・ Promoting proactive installation under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities	・ Promotion of the spread of high-efficiency water heaters and provision of information to businesses ・ Promoting proactive installation under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities	Cumulative number of introduced units of HP water heaters (10^4 units) 2013 (FY) 2.9 2025 (FY) 9 2030 (FY) 14	(10^4 kL) 2013 (FY) 2 2025 (FY) 44 2030 (FY) 66	(10^4 t-CO_2) 2013 (FY) 5 2025 (FY) 115 2030 (FY) 141	・ Energy saving per unit of high-efficiency water heaters ・ Units of high-efficiency water heaters adopted ・ Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・ Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (source: Outlook for energy supply and demand in FY 2030) ・ Fuel (city gas) emission factor: 2.0 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) ・ Energy saving from introduction of energy-efficient commercial water heaters represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				Cumulative number of introduced units of latent heat recovery type water heater (10^4 units) 2013 (FY) 15 2025 (FY) 100 2030 (FY) 110			

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator	Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
13. Promotion of high-efficiency energy-saving equipment (commercial and other sectors) **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Introduction of high-efficiency lighting	Manufacturers: Technological development and cost reductions related to high-efficiency lighting Vendors: Providing consumers with information about high-efficiency lighting Businesses: Proactive introduction of high-efficiency lighting	・ Supporting technological development and introduction of high-efficiency lighting ・ Promoting technological development high-efficiency lighting through expansion of the standard of the Top Runner Program ・ Promoting proactive introduction under the Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities	・ Promotion of the spread of high-efficiency lighting and provision of information to businesses ・ Promoting proactive introduction under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities	Cumulative number of introduced units (100 million units)		(10^4 kL)		(10^4 t-CO_2)		・ Energy saving per unit of high-efficiency lighting ・ Number of units of high-efficiency lighting promoted ・ Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・ Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・ Energy saving from introduction of high-efficiency lighting represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY)	0.5	2013 (FY)	16	2013 (FY)	98	
				2025 (FY)	2.7	2025 (FY)	205	2025 (FY)	1,257	
				2030 (FY)	3.2	2030 (FY)	250	2030 (FY)	672	
Introduction of refrigerant management technology	Businesses: ・ Firm establishment of appropriate management methods for refrigeration and air-conditioning equipment ・ Development of technical human resources with appropriate management skills	・ Establishment of decision-making standards related to matters such as appropriate management for users of refrigeration and air-conditioning equipment under Act on Rational Use and Appropriate Management of Fluorocarbons ・ Public awareness-raising for firm establishment of the necessary appropriate and simplified inspection methods for refrigerant management by a wide range of businesses, and training machinery installation engineers	Promotion of the spread of Act on Rational Use and Appropriate Management of Fluorocarbons and providing information to businesses	Rate of widespread use of appropriate management technology (%)		(10^4 kL)		(10^4 t-CO_2)		・ Calculations reflect consideration for the rate of conversion to CFC-free equipment based on a number of 7.5 million units of refrigeration and air-conditioning equipment for business use subject to this measure, based on recent shipments ・ It is assumed that the leak prevention rate can reach 4.5% through implementing appropriate management ・ Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・ Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・ Energy saving from introduction of refrigerant management technologies represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.
				2013 (FY)	51	2013 (FY)	3.8	2013 (FY)	23.5	
				2025 (FY)	100	2025 (FY)	3.5	2025 (FY)	21.6	
				2030 (FY)	100	2030 (FY)	0.6	2030 (FY)	1.6	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
14. Improvement of energy efficiency of equipment through Top Runner Programs (commercial and other sectors) (Governing agencies: Ministry of Economy, Trade and Industry)										
Improvement of energy efficiency of equipment through Top Runner Programs	Manufacturers: Development, production, and introduction of energy-efficient equipment surpassing standards of the Top Runner Program Vendors: Introduction, sales promotion, and provision of information to consumers regarding energy-efficient equipment surpassing standards of the Top Runner Program Consumers: Introduction of energy-efficient equipment surpassing standards of the Top Runner Program	・Expanding the ranks of equipment subject to the Top Runner Program and enhancing standards of the Top Runner Program ・Proactive introduction of energy-efficient equipment surpassing standards of the Top Runner Program under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities	・Public awareness-raising for businesses and consumers ・Proactive introduction of energy-efficient equipment surpassing standards of the Top Runner Program under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities	-		(10^4 kL)		(10^4 t-CO_2)		● Commercial sector ・Improving the energy-consumption efficiency of machinery ・Commercial sector floor area ・Number of units of machinery owned ・Average years of use of machinery
				2013 (FY)	-	2013 (FY)	8	2013 (FY)	52	・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Calculated based on the Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)
				2025 (FY)	-	2025 (FY)	212	2025 (FY)	1,300	・Fuel (city gas) emission factor: 2.0 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) ・Fuel (kerosene) emission factor: 2.7 t-CO_2/kL * For convenience, the weighted average (2.3 t-CO_2/kL) of the emission intensity for city gas, LPG, and kerosene is used in estimating Expected emission reduction from fuel savings.
				2030 (FY)	-	2030 (FY)	342	2030 (FY)	920	・Energy saving from improving the energy saving performance of machinery through the Top Runner Program etc. represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction
15. Implementation of thorough energy management through the use of BEMS, and Energy Conservation diagnosis (Governing agencies: Ministry of Economy, Trade and Industry)							
Implementation of thorough energy management through the use of BEMS and Energy Conservation diagnosis	Manufacturers/vendors: Development of low-cost, easy-to-use building energy management systems (BEMSs) and providing information to businesses adopting BEMS systems Businesses: Thorough energy management using BEMS, energy saving diagnostics, etc.	Support for thorough energy management by businesses using BEMS, energy saving diagnostics, etc.	・Proactive BEMS adoption ・Promotion of the spread of BEMS , and providing information to businesses	Rate of widespread use (%)	(10^4 kL)	(10^4 t-CO_2)	・Energy intensity of non-residential buildings ・FY 2030 business floor area ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・Fuel (city gas) emission factor: 2.0 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) ・Fuel (LPG) emission factor: 2.3 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) ・Fuel (kerosene) emission factor: 2.7 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) * For convenience, the weighted average (2.2 t-CO_2/kL) of the emission intensity for city gas, LPG, and kerosene is used in estimating Expected emission reduction from fuel savings. ・Energy saving from use of BEMS etc. represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	8	2013 (FY) 13	2013 (FY) 56
				2025 (FY)	37	2025 (FY) 137	2025 (FY) 628
				2030 (FY)	48	2030 (FY) 239	2030 (FY) 644

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
16. Promotion of local production for local consumption and areal use of energy **(Governing agencies: Ministry of Economy, Trade and Industry)**										
Promotion of local production for local consumption and areal use of energy	Energy suppliers etc.: Proactive development of systems for local production for local consumption of energy, utilizing distributed energy resources Buyers: Deepening understanding of local production for local consumption of energy, proactive use of local production for local consumption systems	Support for development of systems for local production for local consumption of energy	Support for development of systems for local production for local consumption of energy	Number of regional microgrids constructed (Units)		(10^4 kL)		(10^4 t-CO_2)		The evaluation indicator is the number developed (including those under development) of community micro-grids, which are capable of separation from the wide-area grid to independently supply electricity by using renewable energy and other sources in the event of a large-scale power outage. (The Ministry of Economy, Trade and Industry has provided support for their development since FY 2019.) Since this program is scheduled to be completed by FY 2025, this indicator does not cover years after FY2025.
				2013 (FY)	–	2013 (FY)	–	2013 (FY)	–	
				2024 (FY)	10	2024 (FY)	–	2024 (FY)	–	
				2030 (FY)	–	2030 (FY)	–	2030 (FY)	–	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="9">17. Decarbonization of urban areas through the improvement of the thermal environment by heat island control
(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)</td></tr>
<tr><td rowspan="3">Decarbonization of urban areas through improvement of the thermal environment by heat island control</td><td rowspan="3">Private businesses:
Implementing countermeasures contributing to heat island control and CO_2 emission reduction</td><td rowspan="3">Promotion of heat island control such as rooftop planting</td><td rowspan="3">-</td><td rowspan="3">Area of rooftop greening construction (ha)</td><td rowspan="3">(10^4 kL)</td><td rowspan="3">(10^4 t-CO_2)</td><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>-</td><td rowspan="3">・ While there are multiple countermeasures against the heat island effect, due to a lack of knowledge on CO_2 emissions reduction effects for measures other than rooftop planting, Expected emission reduction have been estimated for promotion of rooftop planting.

・ Average electricity emission factor for all power sources in FY 2019: 0.444 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])
・ Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)</td></tr>
<tr><td>2025 (FY)</td><td>245.4</td><td>2025 (FY)</td><td>-</td><td>2025 (FY)</td><td>0.78～3.64</td></tr>
<tr><td>2030 (FY)</td><td>302.1</td><td>2030 (FY)</td><td>-</td><td>2030 (FY)</td><td>0.71～3.32</td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity (in power sector) are estimated based on FY 2019, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
18. Introduction of energy conservation and renewable energy in water supply and sewage (promotion of energy conservation and renewable energy measures in waterworks) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)							
Promotion of energy conservation and renewable energy measures in waterworks	Waterworks businesses etc.: Implementing energy saving and renewable energy measures	・Implementing subsidized projects toward promoting further introduction of energy saving and renewable energy measures in waterworks ・Ascertaining information such as the state of introduction of energy saving and renewable energy measures in waterworks ・Provision of information concerning energy saving and renewable energy measures Promoting effective introduction of energy saving and renewable energy measures through means such as use of survey results and rolling out of outstanding case studies	Waterworks businesses etc.: Implementing energy saving and renewable energy measures	The amount of renewable energy generated (10^4 kWh) 2013 (FY) 5,496 2025 (FY) 17,004 2030 (FY) 24,852 The amount of energy savings compared to FY2013 (10^4 kWh) 2013 (FY) ― 2025 (FY) 44,911 2030 (FY) 75,054	(10^4 kL) 2013 (FY) ― 2025 (FY) 11.6 2030 (FY) 19.3	(10^4 t-CO_2) 2013 (FY) ― 2025 (FY) 32.0 2030 (FY) 21.6	・Conducting surveys on the state of implementation of energy saving and renewable energy measures among waterworks businesses and related parties nationwide ・Calculating total volumes of energy saving and renewable energy at businesses as a whole ・Adding the results of support by the the national government for Introduction of energy saving and renewable energy measures by waterworks businesses ・It is anticipated that CO_2 emissions will reduce through energy saving resulting from more efficient use of energy and through power generation by equipment using renewable energy ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
19. Introduction of energy conservation and renewable energy in water supply and sewage（promotion of energy conservation and energy creation measures in sewage operations） (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)							
Promotion of energy conservation and energy creation measures in sewage operations	Private businesses: Development of high-efficiency, low-cost technologies for converting sewage sludge to energy, development of energy saving facilities and equipment, introduction of sewage heat at facilities using heat	・Support for development and promotion of technologies for converting sewage sludge to energy ・Provision of information such as energy saving facilities and equipment at final treatment facilities and other facilities and water-treatment technologies with low levels of greenhouse gas (GHG) emissions ・Promoting use of sewage heat ・Support for maintenance to sewage treatment facilities by local governments	・Introduction of energy creation technologies at times such as when renovating sludge treatment facilities ・Introduction of energy saving facilities and equipment at final treatment facilities and other facilities, water-treatment technologies with low levels of GHG emissions, etc. ・Introduction of equipment using sewage heat□	Energy-derived CO_2 emissions per treated water (t-CO_2 /1,000 m^3) 2013 (FY): 0.28 2025 (FY): 0.22 2030 (FY): 0.09	(10^4 kL) 2013 (FY): - 2025 (FY): - 2030 (FY): -	(10^4 t-CO_2) 2013 (FY): - 2025 (FY): - 2030 (FY): -	・The share of energy generation from sewage sludge (calculated by dividing the sewage biomass recycling rate, a target of Priority Plan for Social Infrastructure Development, by green-space and agricultural-land use) will grow to 35% in 2025 and 37% by 2030. ・Promoting energy saving initiatives at sewage treatment facilities ・Continually increasing use of other renewable energy (solar, small-scale hydroelectric, wind power) ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)
				Sewage sludge energy conversion rate (%) 2013 (FY): 15 2025 (FY): 35 2030 (FY): 37	2025 (FY): - 2030 (FY): -	2025 (FY): 138 2030 (FY): 130	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th>Expected energy saving</th><th>Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="10">20. Initiatives in waste treatment
(Governing agencies: Ministry of the Environment)</td></tr>
<tr><td rowspan="3">Promotion of sorted collection and recycling of plastic containers and packaging</td><td rowspan="3">Consumers:
Cooperating in sorted disposal of plastic containers and packaging

Manufacturers and business users of containers and packaging:
Promoting manufacture and use of containers and packaging that are easy to sort, public awareness-raising among consumers, rationalized contribution to local governments</td><td rowspan="3">Promoting sorted collection and recycling of plastic containers and packaging</td><td rowspan="3">・Baling sorted plastic container and packaging wastes collected and improving bale quality

・Public awareness-raising among consumers

・Cooperation in demonstration projects and other policies</td><td>Sorted collection volume of waste from plastic containers and packaging (10^4 t)</td><td>(10^4 kL)</td><td colspan="2">(10^4 t-CO₂)</td><td rowspan="3">● Calculation method
・Projected volumes of sorted collection are estimated from FY 2013 results based on rates of increase in the seventh municipal sorted collection plan
・Reduction effects are calculated based on recycling rates for plastic container and packaging wastes (FY 2013 values)
・There is a possibility that results etc. could be revised in future council meetings etc.

● Notes
・Although estimates are based on the calculation methods from plans for achievement of Kyoto Protocol targets, they could be revised as a result of future studies.
・The evaluation indicator "Volume of sorted collection of plastic container and packaging wastes" refers to volumes delivered to designated businesses</td></tr>
<tr><td>2013 (FY) 66</td><td>2013 (FY) -</td><td colspan="2">2013 (FY) -</td></tr>
<tr><td>2025 (FY) 71
2030 (FY) 73</td><td>2025 (FY) 1.2
2030 (FY) 1.7</td><td colspan="2">2025 (FY) 4.4
2030 (FY) 6.2</td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
20. Initiatives in waste treatment (Governing agencies: Ministry of the Environment)										
Introduction of waste power generation at municipal waste incineration plants	Local governments: Introduction of high-efficiency power generation facilities in accordance with facility size when building new municipal waste incineration plants or renovating or implementing fundamental improvements at existing ones	・Initiatives to achieve targets of the Waste Management Facilities Improvement Plans (June 30, 2023 Cabinet decision) ・Initiatives to achieve targets established in basic plans based on the Act on Waste Management and Public Cleaning ・Initiatives based on guidelines for reducing GHG emissions in the waste-treatment sector ・Certification program for waste heat recovery facility establisher ・Support for improvements to municipal waste incineration plants	Introduction of high-efficiency power generation facilities in accordance with facility size when building new municipal waste incineration plants or renovating or implementing fundamental improvements at existing one	The amount of electricity generated per unit of waste disposed (kWh/t)		(10^4 kL)		(10^4 t-CO_2)		● Projected energy saving volumes: Calculated by estimating increases in power generation per volume of waste (kWh/t) from business-as-usual (BAU) levels in the fiscal year subject to evaluation and multiplying these by the general-waste incineration volume (thousand t), heat from electric power (9.76 GJ/thousand kWh), and Crude oil conversion intensity (0.0258 kL/GJ), assuming that facilities set up 20 years earlier would be subject to fundamental improvements and those set up 35 years earlier to renovation, adopting high-efficiency power generation facilities in accordance with facility size that satisfies the requirements issued for energy-recovery waste-treatment facilities at that time, since the base year (FY 2013) ● Expected emission reduction: Calculated by multiplying the increase from the BAU case in power generation per volume of waste (kWh/t) in the fiscal year subject to evaluation by the general-waste incineration volume in the fiscal year subject to evaluation and the average electricity emission factor for all power sources (kg-CO_2/kWh) ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)
				2013 (FY)	231	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	321 ～ 382	2025 (FY)	65 ～ 112	2025 (FY)	147 ～ 253	
				2030 (FY)	359 ～ 445	2030 (FY)	92 ～ 158	2030 (FY)	91 ～ 157	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
20. Initiatives in waste treatment (Governing agencies: Ministry of the Environment)										
Introduction of waste power generation at industrial waste incineration plants	Treatment businesses: Introduction of high-efficiency power generation facilities at industrial waste incineration plants Generator: Prioritizing entrustment of treatment of industrial wastes to treatment businesses that have industrial waste incineration plants	・Measures to support formulation of business plans such as effective use of power from waste power generation ・Measures to support energy creation and other activities using energy from wastes ・Multifaceted support for promotion of the Action Plans for a Low- Carbon Society by industrial waste treatment businesses	-	The amount of power generated from industrial waste (GWh)		(10^4 kL)		(10^4 t-CO_2)		● Projected energy saving volumes: ・Projections assume setup of about two facilities of industrial waste incineration plants per year through means including use of the project to promote achievement of multiple benefits through effective use of energy from wastes, in FY 2019 and later. ・Calculated based on actual power-generation volumes by industrial-waste treatment businesses in FY 2019 (ascertained from businesses chosen for the low-carbon waste-treatment support program), assuming average annual power generated per facility of 7.4 GWh/year and multiplying this by heat from electric power (9.76 GJ/thousand kWh) and Crude oil conversion intensity (0.0258 kL/GJ) ● Expected emission reduction: ・Expected emission reduction are calculated by multiplying the increase from the BAU case (continuation of 2013 values) in power generation by industrial waste treatment businesses since the base year (thousand kWh/year) by the CO_2 emission factor (kg-CO_2/kWh) in the fiscal year subject to evaluation. ・For the CO_2 emission factor (average for all power sources) in the fiscal year subject to evaluation, the same figures are used as for general wastes.
				2013 (FY)	3,748	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	4,477	2025 (FY)	18	2025 (FY)	42	
				2030 (FY)	4,551	2030 (FY)	20	2030 (FY)	20	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
20. Initiatives in waste treatment (Governing agencies: Ministry of the Environment)										
Promotion of fuel production and energy conservation measures in the waste management industry	Treatment businesses: Use of plastic wastes and other wastes subject to simple incineration as raw materials for fuels. Also, implementing introduction of environmentally conscious equipment and initiatives of saving energy at waste incineration plants Manufacturers etc.: Proactive use of fuels derived from wastes as alternative fuels Waste collection and transport businesses: Introduction of fuel-efficient waste collection and transportation vehicles	・Measures to support formulation of business plans related to such as effective use of power from waste power generation ・Measures to support energy creation and other activities using energy from wastes ・Measures to support introduction of fuel-efficient waste collection and transportation vehicles ・Measures to support introduction of low-carbon waste treatment facilities and equipment ・Multifaceted support for promotion of the Action Plans for a Low- Carbon Society by industrial-waste treatment businesses	-	RPF production volume (1,000 t)		(10^4 kL)		(10^4 t-CO_2)		● Projected energy saving volumes: ・Projections assume production of 1.5 million tons of RPF in FY 2030, through means including use of the project to promote achievement of multiple benefits through effective use of energy from wastes. ・Calculated based on actual RPF production volumes per facility in the base year (from a survey of industrial wastes), multiplied by the RPF solids rate (97.4%) (inventory setting value) heat from RPF (29.3 MJ/kg) (list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]), and Crude oil conversion intensity (0.0258 kL/GJ) ● Expected emission reduction: Calculated by multiplying the increase from the BAU case (continuation of 2013 values) in power generation using RPF (t/year) since the base year by the RPF solids rate, heat generation, and CO_2 emission factor (89.1 kg-CO_2/GJ since 2018) (carbon emission intensity [Agency for Natural Resources and Energy]) of fuel replaced by RPF in the fiscal year subject to evaluation.
				2013 (FY)	914	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	1,293	2025 (FY)	28	2025 (FY)	96	
				2030 (FY)	1,500	2030 (FY)	43	2030 (FY)	149	

<table>
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<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="8">20. Initiatives in waste treatment
(Governing agencies: Ministry of the Environment)</td></tr>
<tr><td rowspan="4">Introduction of electric waste collection vehicles</td><td rowspan="4">Manufacturers: Technological development related to vehicles, loading platform, batteries, etc.</td><td rowspan="4">Subsidies for purchase of electric waste collection vehicles, electricity supply systems, etc.</td><td rowspan="4">CO_2 emission reduction from the waste collection vehicles by replacing the current internal combustion engine waste collection vehicles with EV waste collection vehicle, which is fully electric from driving to loading</td><td>Number of introduced units of EV garbage collection vehicles (Units)</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO_2)</td><td rowspan="4">● Projected energy saving volumes:
・Calculated by ascertaining and totaling numbers of electric waste-collection vehicles adopted per fiscal year, through interviews with manufacturers, local governments, etc.
・emission reduction are estimated by multiplying CO_2 reduction effects per waste-collection vehicle, calculated from the fuel consumption, electricity consumption of diesel-powered waste-collection vehicles and electric waste-collection vehicles, differences in their maximum loads, average distance travelled and days of operation, etc., by the cumulative total number of electric waste-collection vehicles.

・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh
(Source: Outlook for energy supply and demand in FY 2030)
・Years other than FY 2030: 0.57 kg-CO_2/kWh
(Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])</td></tr>
<tr><td>2013 (FY)</td><td>0</td><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>-</td></tr>
<tr><td>2025 (FY)</td><td>10,200</td><td>2025 (FY)</td><td>-</td><td>2025 (FY)</td><td>1.2</td></tr>
<tr><td>2030 (FY)</td><td>26,700</td><td>2030 (FY)</td><td>-</td><td>2030 (FY)</td><td>15</td></tr>
</table>

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Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
21. Improvement of energy efficiency of housing (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Improvement of energy efficiency of housing (new housing)	Contractors etc.: Building energy saving housing Sellers, leasers of residences: Displaying energy consumption performance of housing Designated owners and contractors: Supplying energy-efficient housing Manufacturers of building materials preventing heat loss etc.: Improving the performance of building materials preventing heat loss	・Requiring conformity to energy saving standards under the Act on the Improvement of Energy Consumption Performance of Buildings, strengthening guidance standards, and strengthening energy saving standards in stages ・Promoting supply of energy saving residences through the Top Runner Program for housing ・Support through tax programs, subsidies, and lending to promote supply of residences with improved energy saving performance, such as zero-emissions homes (ZEH) ・Introduction of labeling systems for residential energy saving performance ・Enhancing the Top Runner Program for building materials	・Smooth operation of the Act on the Improvement of Energy Consumption Performance of Buildings ・Public awareness-raising related to energy saving housing ・Promoting ZEH in rental public housing ・Support for promotion and expansion of ZEH etc.	The percentage of new houses that meet the energy saving performance* of the ZEH standard (%)		(10^4 kL)		(10^4 t-CO_2)		・FY 2030 energy saving represents energy saving through progress on countermeasures since FY 2013, and volumes of emission reduction are calculated based on these volumes of energy saving. ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) * Reducing by 20% from current energy saving standards primary energy consumption not including enhanced envelope thermal performance standards and renewable energy
				2013 (FY)	0	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	–	2025 (FY)	–	2025 (FY)	–	
				2030 (FY)	100	2030 (FY)	253	2030 (FY)	620	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
Improvement of energy efficiency of housing (renovation and reconstruction of existing housing)	Owners etc.: Energy saving remodeling to existing housing Manufacturers of building materials preventing heat loss etc.: Improving the performance of building materials prevebting heat loss	・Support through tax programs, subsidies, and lending to promote energy saving remodeling of existing residences ・Development and promotion of building materials, methods, etc. well suited to remodeling with superior energy saving performance	・Smooth operation of the Act on the Improvement of Energy Consumption Performance of Buildings ・Promotion and awareness raising related to energy saving housing ・Implementation of systematic energy saving remodeling of rental public housing ・Support for energy saving remodeling of existing housing	The percentage of housing stock that meets energy saving standards (%)		(10^4 kL)		(10^4 t-CO_2)		・FY 2030 energy saving represents energy saving through progress on countermeasures since FY 2013, and volumes of emission reduction are calculated based on these volumes of energy saving. ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) * Some energy saving effects of energy saving renovation not satisfying energy saving standards also are included in the figures.
				2013 (FY)	6	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	–	2025 (FY)	–	2025 (FY)	–	
				2030 (FY)	30	2030 (FY)	91 *	2030 (FY)	223	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
22. Diffusion of high-efficiency energy-saving equipment (residential sector) (Governing agencies: Ministry of Economy, Trade and Industry)							
Installation of high-efficiency water heaters	Manufacturers: Technological development, production, and cost reductions for high-efficiency water heaters Vendors: Providing information to consumers concerning high-efficiency water heaters Consumers: Proactive introduction of high-efficiency water heaters	・Promotion and expansion of use of high-efficiency water heaters through the Top Runner Program ・Promoting energy saving countermeasures of residential	Promotion and expansion of use of high-efficiency water heaters and provision of information to consumers	Cumulative number of introduced units of heat pump (HP) water heaters (10^4 units) 2013 (FY): 422 2025 (FY): 1,200 2030 (FY): 1,590	(10^4 kL)	(10^4 t-CO_2)	・Energy saving per unit of high-efficiency water heaters ・Units of high-efficiency water heaters adopted ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (source: Outlook for energy supply and demand in FY 2030) ・Fuel (city gas) emission factor: 2.0 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) ・Fuel (LPG) emission factor: 2.3 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) ・Fuel (kerosene) emission factor: 2.7 t-CO_2/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy]) * For convenience, the weighted average (2.2 t-CO_2/kL) of the emission intensity for city gas, LPG, and kerosene is used in estimating Expected emission reduction from fuel savings. ・Energy saving from Introduction of high-efficiency water heaters represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				Cumulative number of introduced units of latent heat recovery type (10^4 units) 2013 (FY): 448 2025 (FY): 2,700 2030 (FY): 3,050	2013 (FY): 11 2025 (FY): 217	2013 (FY): 18 2025 (FY): 640	
				Cumulative number of introduced units of fuel cells (10^4 units) 2013 (FY): 7.2 2025 (FY): 210 2030 (FY): 300	2030 (FY): 332	2030 (FY): 898	

<table>
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<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="8">22. Diffusion of high-efficiency energy-saving equipment (residential sector)
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="3">Introduction of high-efficiency lighting</td><td rowspan="3">Manufacturers:
Technological development and cost reductions related high-efficiency lighting

Vendors:
Providing consumers with information about high-efficiency lighting

Consumers:
Proactive introduction of high-efficiency lighting</td><td rowspan="3">・ Promotion and expansion of high-efficiency lighting through the Top Runner Program</td><td rowspan="3">promotion of the spread of high-efficiency lighting and providing information to consumers</td><td>Cumulative number of introduced units (100 million units)</td><td>(10^4 kL)</td><td colspan="2">(10^4 t-CO₂)</td><td colspan="2">・ Energy saving per unit of high-efficiency lighting
・ Number of units of high-efficiency lighting promoted</td></tr>
<tr><td>2013 (FY)</td><td>0.6</td><td>2013 (FY)</td><td>12</td><td>2013 (FY)</td><td>73</td><td colspan="2">・ Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO₂/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])
・ Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO₂/kWh (Source: Outlook for energy supply and demand in FY 2030)</td></tr>
<tr><td>2025 (FY)</td><td>4.4</td><td>2025 (FY)</td><td>205</td><td>2025 (FY)</td><td>1,257</td><td colspan="2">・ Energy saving from Introduction of high-efficiency lighting represents energy saving from progress on countermeasures since FY 2012, and emission reduction are calculated based on these energy saving values.</td></tr>
<tr><td>2030 (FY)</td><td>4.6</td><td>2030 (FY)</td><td>242</td><td>2030 (FY)</td><td>651</td><td colspan="2"></td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
23. Diffusion of high-efficiency energy- saving equipment (energy saving septic tanks) (residential sector) (Governing agencies: Ministry of the Environment)							
Promotion of energy-efficient septic tank application (replacement of low energy-efficient existing medium-and large-sized septic tanks)	Manufacturers: Technological development related to energy-efficient septic tank application Local governments/vendors: Provision of information to consumers regarding energy-efficient septic tank application Consumers: Choosing energy-efficient septic tank application at time of purchase	・Policy guidance toward energy-efficient septic tank application, through means such as establishment of power-saving standards on installation of septic tank application ・Research on energy-efficient septic tank application and public awareness-raising among manufacturers, local governments, vendors, etc.	・Support for energy-efficient septic tank application ・Provision of information and public awareness-raising among vendors, consumers, etc. regarding energy-efficient septic tank application	Cumulative number of septic tanks with a 26% reduction in power consumption compared to septic tanks for a low-carbon society in FY2013 (10^4 units)	(10^4 kL)	(10^4 t-CO_2)	・While it is anticipated that septic tank application with power consumption 26% lower than that of current septic tank application will be installed through conversion from night-soil reservoirs and single-treatment septic tank application and from traditional compound-treatment septic tank application, since it is expected that installation of new compound-treatment septic tank application will involve installation of existing low-carbon septic tank application in the BAU case, this measure assumes replacement of such septic tank application with septic tank application having 26% lower power consumption, and GHG reductions are estimated based on the difference between the two. ・For representative types of septic tank application, five-, seven-, and 10-person tanks, which have accounted for the majority of units shipped in recent years, have been chosen as targets under this measure. ・A target also has been set regarding replacement of existing medium-sized and large septic tank application, which have low levels of energy efficiency.
				2013 (FY)	3.5	2013 (FY) -	2013 (FY) -
				2025 (FY)	63	2025 (FY) 1.0	2025 (FY) 6.1
				2030 (FY)	93	2030 (FY) 1.5	2030 (FY) 4.9

・Power-consumption base values of FY 2013 low-carbon septic tank application, by number of users (per unit):
Five-person tank: 0.052 kW; seven-person tank: 0.074 kW; 10-person tank: 0.101 kW
(Source: Handling of the water-purification tank improvement project implementation guidelines [2006, Ministry of the Environment])
・Simple average of power consumption per unit among products in the market as of 1990 for medium-sized and large septic tank application
51-100-person tank: 1.125 kW; 101-300-person tank: 2.293 kW; 300-person tank or larger: 6.779 kW

・FY 2013: 0.57 kg-CO_2/kWh
(Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])
・FY 2030: 0.25 kg-CO_2/kWh
(Source: Outlook for energy supply and demand in FY 2030)

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
23. Diffusion of high-efficiency energy- saving equipment (energy saving septic tanks) (residential sector) (Governing agencies: Ministry of the Environment)							
Promotion of energy-efficient septic tank application (replacement of low energy-efficient existing medium-and large-sized septic tanks)	Manufacturers: Technological development related to energy-efficient septic tank application Local governments/vendors: Provision of information to consumers regarding energy-efficient septic tank application Consumers: Choosing energy-efficient septic tank application at time of purchase	・Policy guidance toward energy-efficient septic tank application, through means such as establishment of power-saving standards on installation of septic tank application ・Research on energy-efficient septic tank application and public awareness-raising among manufacturers, local governments, vendors, etc.	・Support for energy-efficient septic tank application ・Provision of information and public awareness-raising among vendors, consumers, etc. regarding energy-efficient septic tank application	Cumulative number of energy saving medium-and large-scale septic tanks (10^4 units)	(10^4 kL)	(10^4 t-CO_2)	・While it is anticipated that septic tank application with power consumption 26% lower than that of current septic tank application will be installed through conversion from night-soil reservoirs and single-treatment septic tank application and from traditional compound-treatment septic tank application, since it is expected that installation of new compound-treatment septic tank application will involve installation of existing low-carbon septic tank application in the BAU case, this measure assumes replacement of such septic tank application with septic tank application having 26% lower power consumption, and GHG reductions are estimated based on the difference between the two. ・For representative types of septic tank application, five-, seven-, and 10-person tanks, which have accounted for the majority of units shipped in recent years, have been chosen as targets under this measure. ・A target also has been set regarding replacement of existing medium-sized and large septic tank application, which have low levels of energy efficiency.
				2013 (FY) 0.1	2013 (FY) -	2013 (FY) -	・Power-consumption base values of FY 2013 low-carbon septic tank application, by number of users (per unit): Five-person tank: 0.052 kW; seven-person tank: 0.074 kW; 10-person tank: 0.101 kW (Source: Handling of the water-purification tank improvement project implementation guidelines [2006, Ministry of the Environment]) ・Simple average of power consumption per unit among products in the market as of 1990 for medium-sized and large septic tank application 51-100-person tank: 1.125 kW; 101-300-person tank: 2.293 kW; 300-person tank or larger: 6.779 kW ・FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)
				2025 (FY) 2.2	2025 (FY) 1.5	2025 (FY) 9.2	
				2030 (FY) 3.4	2030 (FY) 2.3	2030 (FY) 7.4	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th colspan="2">Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="9">24. Improvement of energy efficiency of equipment through Top Runner Programs (residential sector)
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="3">Improvement of energy efficiency of equipment through Top Runner Programs</td><td rowspan="3">Manufacturers:
Development, production, and introduction of energy-efficient equipment surpassing standards of the Top Runner Program

Vendors:
Introduction, sales promotion, and provision of information to consumers regarding energy-efficient equipment surpassing standards of the Top Runner Program

Consumers:
Introduction of energy-efficient equipment surpassing standards of the Top Runner Program</td><td rowspan="3">・ Expanding the ranks of equipment subject to the Top Runner Program and enhancing standards of the Top Runner Program

・ Proactive introduction of energy-efficient equipment surpassing standards of the Top Runner Program under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities</td><td rowspan="3">・ Public awareness-raising among businesses and consumers

・ Proactive introduction of energy-efficient equipment surpassing standards of the Top Runner Program under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities</td><td colspan="2">-</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO₂)</td><td>● Residential sector
・ Energy-consumption efficiency etc. of equipment
・ Number of households
・ Number of units of equipment owned
・ Average years of use of equipment</td></tr>
<tr><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>3.9</td><td>2013 (FY)</td><td>24.3</td><td>・ Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO₂/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])
・ Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO₂/kWh (Source: Outlook for energy supply and demand in FY 2030)</td></tr>
<tr><td>2025 (FY)</td><td>-</td><td>2025 (FY)</td><td>128</td><td>2025 (FY)</td><td>713.4</td><td>・ Fuel (city gas) emission factor: 2.0 t-CO₂/kL (Source: prepared based on the list of carbon emission intensity of total heat [Agency for Natural Resources and Energy])
・ Fuel (kerosene) emission factor: 2.7 t-CO₂/kL
* For convenience, the weighted average (2.3 t-CO₂/kL) of the emission intensity for city gas, LPG, and kerosene is used in estimating Expected emission reduction from fuel savings.</td></tr>
<tr><td>2030 (FY)</td><td>-</td><td>2030 (FY)</td><td>180</td><td>2030 (FY)</td><td>475.7</td><td>・ Energy saving from improving the energy saving performance of equipment through the Top Runner Program etc. represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.</td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th>Expected energy saving</th><th>Expected emission reduction</th><th colspan="3">Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="10">25. Implementation of thorough energy management through the use of HEMS, smart meters, and smart home devices and the provision of energy-saving information
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="8">Implementation of thorough energy management through the use of HEMS and smart meters</td><td rowspan="8">Manufacturers/vendors:
Development of low-cost, easy-to-use home energy management systems (HEMSs, smart home devices) and providing information to consumers

Energy suppliers:
Provision of information on saving energy to consumers

Consumers:
Proactive introduction of HEMS and smart devices, and practicing energy saving activities</td><td rowspan="8">・Promoting introduction of HEMS through support for introduction of ZEH
・Promoting design of standards and architectures by industrial organizations

・Promoting provision of information on saving energy to consumers based on the energy saving guidelines by energy retailers</td><td rowspan="8">・Promotion of HEMSs and smart home devices, and provision of information to consumers</td><td rowspan="2">Number of widely-used HEMS (10^4 households)</td><td>2013 (FY)</td><td>21</td><td rowspan="2">(10^4 kL)</td><td rowspan="2">(10^4 t-CO₂)</td><td rowspan="8">・Rate of energy saving using HEMSs
・Anticipated number of households in 2030
・Annual average power consumption per household
・Rate of energy saving through provision of information
・Energy consumption in the residential sector

・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO₂/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])
・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO₂/kWh (Source: Outlook for energy supply and demand in FY 2030)

・Energy saving from HEMS energy management represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.</td></tr>
<tr><td>2025 (FY)</td><td>1,689</td><td rowspan="2">2013 (FY)</td><td rowspan="2">0.4</td><td rowspan="2">2013 (FY)</td><td rowspan="2">2.4</td></tr>
<tr><td>2030 (FY)</td><td>4,941</td></tr>
<tr><td rowspan="2">Rate of implementation of energy saving information provision (%)</td><td>2013 (FY)</td><td>21</td><td rowspan="2">2025 (FY)</td><td rowspan="2">87.4</td><td rowspan="2">2025 (FY)</td><td rowspan="2">365.8</td></tr>
<tr><td>2025 (FY)</td><td>44</td></tr>
<tr><td>2030 (FY)</td><td>80</td><td>2030 (FY)</td><td>216</td><td>2030 (FY)</td><td>569.1</td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
26. Diffusion of next-generation vehicles, improvement of fuel efficiency, etc. **(Governing agencies: Ministry of Economy, Trade and Industry)**							
Diffusion of next-generation vehicles, improvement of fuel efficiency	Manufacturers, importers, etc.: Development, production, sale, and import of fuel-efficient vehicles Vendors: Proactive sale of fuel-efficient vehicles Consumers: Purchase of fuel-efficient vehicles	· Proactive introduction of next-generation vehicles, and supporting their adoption · Support for introduction of fuel-efficient diesel trucks etc. ·Support for infrastructure development · Preferential tax treatment · Improving fuel efficiency through standards of Top Runner Program · Provision information on fuel efficiency to consumers, through evaluation and publication systems concerning vehicles' fuel efficiency and vehicle labeling ·Supporting technological development and practical application of performance improvements in next-generation vehicles · Preferential treatment under financial, investment, and lending programs · Support for introduction of electric commercial vehicles	· Promotion and awareness raising · Proactive introduction of next-generation vehicles, and supporting their adoption · Infrastructure development · Support for introduction of electric commercial vehicles	The ratio of next-generation vehicles to new car sales(%) 2013 (FY): 23.2 2025 (FY): - 2030 (FY): 50～70	(10^4 kL) 2013 (FY): 19.9 2025 (FY): - 2030 (FY): 990	(10^4 t-CO_2) 2013 (FY): 53.3 2025 (FY): - 2030 (FY): 2,674	· Evaluation indicator (next-generation vehicles as a percentage of new-vehicle sales): FY 2030 figures are based on the Japan Revitalization Strategy (2015): Investing in the future/productivity reforms (June 30, 2015 Cabinet decision). · Energy saving is calculated as the difference between average energy consumption of vehicles owned if measures were implemented and if they were not. · Energy saving from measures of diffusion of next-generation vehicles and improvement of fuel efficiency represent energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				Average fuel consumption (km/L) 2013 (FY): 14.7 2025 (FY): - 2030 (FY): 24.8			

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
27. Road traffic flow measures (promotion of road traffic flow measures) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Implementation of measures for road traffic flow	Road managers: Promotion of measures for road traffic flow	Promotion of measures for road traffic flow	Promotion of measures for road traffic flow	Percentage of highway usage (%)		(10^4 kL)		(10^4 t-CO_2)		・Percentage of roads using these measures and total vehicle-kilometers driven, by road type (expressway, trunk road, neighborhood streets) (FY 2013 figures are based on the 2010 road traffic census and annual report on road transport statistics) ・CO_2 emission intensity by speed ・CO_2 emissions per unit (gasoline, diesel): 2.7 t-CO_2/Crude oil equivalent kL (calculated based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy])
				2013 (FY)	Approx. 16	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	-	2025 (FY)	-	2020 (FY)	-	
				2030 (FY)	Approx. 20	2030 (FY)	Approx. 74	2030 (FY)	Approx. 200	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="8">28. Road traffic flow measures (promotion of the maintenance of LED road lighting)
(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)</td></tr>
<tr><td rowspan="3">Promotion of the installation of LED road lighting</td><td rowspan="3">Manufacturers:
Technological development related to saving energy in road lights</td><td rowspan="3">・Promoting installation of LED road lights

・Further saving energy and advancement in road lighting</td><td rowspan="3">・Promoting installation of LED road lights</td><td>Number of LED road lights on the national roads under the direct control (10^4 units)</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO₂)</td><td rowspan="3">・Hours illuminated of street lights in illuminated areas: 12 hours

・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO₂/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan])

・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO₂/kWh (Source: Outlook for energy supply and demand in FY 2030)

・Emission reduction are calculated as differences from FY 2013</td></tr>
<tr><td>2013 (FY)
Approx. 7</td><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>—</td></tr>
<tr><td>2025 (FY)
Approx. 20</td><td>2025 (FY)
Approx. 0.9</td><td>2025 (FY)
Approx. 5</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)
Approx. 30</td><td>2030 (FY)
Approx. 1.4</td><td>2030 (FY)
Approx. 13</td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
29. Road traffic flow measures (promotion of Intelligent Transport Systems (ITS) (centralized control of traffic lights)) (Governing agencies: National Police Agency)										
Promotion of intelligent transport system (ITS) (centralized control of traffic lights)	–	Promoting centralized control of traffic lights	Centralized control of traffic lights	Centralized control of traffic signals (units)		(10^4 kL)		(10^4 t-CO_2)		・CO_2 improvements per unit of traffic lights under centralized control (FY 2022 standard) ・Evaluation indicator: Planned units of lights installed ・Emission reduction are calculated based on the effects of the cumulative number installed under these measures.
				2013 (FY)	48,800	2013 (FY)	–	2013 (FY)	133	
				2025 (FY)	52,700	2025 (FY)	–	2025 (FY)	144	
				2030 (FY)	–	2030 (FY)	–	2030 (FY)	150	

*1 Figures for FY 2013-2019 are actual results.

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="7">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="8">30. Road traffic flow measures (maintenance of traffic safety facilities (improvement and profile (hybrid) of traffic lights))
(Governing agencies: National Police Agency)</td></tr>
<tr><td rowspan="3">Installation of traffic safety facilities (improvement of traffic lights and profiling [hybrid])</td><td rowspan="3">–</td><td rowspan="3">Promoting networking, responsivity, and other measures of traffic lights</td><td rowspan="3">Networking, responsivity, and other measures of traffic lights</td><td rowspan="2">Improvement of traffic lights (units)</td><td rowspan="2">(10^4 kL)</td><td rowspan="2">(10^4 t-CO_2)</td><td rowspan="3">・CO_2 improvements per traffic lights subject to improvement etc. (FY 2022 standard)
・Evaluation indicator: Planned units of lights improved
・Emission reduction are calculated based on the effects of the cumulative number adopted under these measures.</td></tr>
<tr></tr>
<tr><td>2013 (FY) 42,000</td><td>2013 (FY) –</td><td>2013 (FY) 47</td></tr>
<tr><td>2025 (FY) 49,600</td><td>2025 (FY) –</td><td>2025 (FY) 52</td></tr>
<tr><td>2030 (FY) –</td><td>2030 (FY) –</td><td>2030 (FY) 56</td></tr>
</table>

*1 Figures for FY 2013-2019 are actual results.

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="9">31. Road traffic flow measures (maintenance of traffic safety facilities (promotion of the use of LED lights in signal lights))
(Governing agencies: National Police Agency)</td></tr>
<tr><td rowspan="3">Installation of traffic safety facilities (promotion of the installation of LED traffic lights)</td><td rowspan="3">–</td><td rowspan="3">promotion of the installation of LED traffic lights</td><td rowspan="3">Switching to LED traffic lights</td><td rowspan="3">LED signal lights (Lights)</td><td colspan="2" rowspan="3">(10^4 kL)</td><td colspan="2" rowspan="3">(10^4 t-CO_2)</td><td rowspan="3"></td></tr>
<tr><td>2013 (FY)</td><td>346,800</td><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>6.5</td><td>・CO_2 emission reduction per LED traffic-signal light
・Planned units of lights improved
・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030)
・Emission reduction are calculated based on the effects of the cumulative number adopted under these measures.</td></tr>
<tr><td>2025 (FY)</td><td>806,500</td><td>2025 (FY)</td><td>–</td><td>2025 (FY)</td><td>13</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)</td><td>970,100</td><td>2030 (FY)</td><td>–</td><td>2030 (FY)</td><td>11.9</td><td></td></tr>
</table>

*1 Figures for FY 2013-2019 are actual results.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
32. Road traffic flow measures (promotion of autonomous driving) (Governing agencies: Ministry of Economy, Trade and Industry)										
Promotion of automated driving	Manufacturers: Development, production, and sale of automated driving vehicles Citizens: Use of adaptive cruise control (ACC)	・Technological development ・Business environmental improvements	–	Rate of widespread use of ACC/CACC (%)		(10^4 kL)		(10^4 t-CO_2)		・Assumption: Use of ACC/cooperative adaptive cruise control (CACC) on expressways ・Assumption: Equipment of ACC/CACC with 4-wheel vehicles with autonomous driving level 2 or higher ・Share of driving on expressways, for small and large vehicles (Source: Ministry of Land, Infrastructure, Transport and Tourism Road Traffic Census) ・CO_2 emission intensity by fuel ・Energy saving from promotion of automated driving represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	1.3	2013 (FY)	2.1	2013 (FY)	5.6	
				2025 (FY)	89	2025 (FY)	58.5	2025 (FY)	158.0	
				2030 (FY)	100	2030 (FY)	73.2	2030 (FY)	197.7	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="9">33. Greening of the vehicle transportation business by promoting the use of environmentally friendly vehicles etc.
(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)</td></tr>
<tr><td rowspan="3">Greening of vehicle transportation business by promoting the use of environmentally friendly vehicles etc.</td><td rowspan="3">Manufacturers:
Development and sale of machinery related to eco-driving

Transportation companies:
Introduction of machinery related to eco-driving, undergoing training on eco-driving, and practicing eco-driving</td><td rowspan="3">・Public awareness-raising of eco-driving through implementing eco-driving promotion programs</td><td rowspan="3">Public awareness-raising of eco-driving</td><td>Number of widely-used eco-driving-related equipment (1,000 units)</td><td>(10^4 kL)</td><td></td><td>(10^4 t-CO_2)</td><td></td><td rowspan="3">・CO_2 emissions reduction effect per vehicle equipped with machinery related to eco-driving: approx. 10%

・Fuel-efficiency improvement: approx. 1%/year

・Projected figures for 2020 and beyond will be revised in light of trends in recent years</td></tr>
<tr><td>2013 (FY)
518</td><td>2013 (FY)
-</td><td></td><td>2013 (FY)
-</td><td></td></tr>
<tr><td>2025 (FY)
761</td><td>2025 (FY)
-</td><td></td><td>2025 (FY)
75</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)
860</td><td>2030 (FY)
-</td><td></td><td>2030 (FY)
101</td><td></td><td></td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
34. Promotion of the use of public transportation and bicycles (promotion of the use of public transportation) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Promotion of the use of public transportation	Transportation companies: Development of public transportation and improving services and convenience through provision of MaaS etc. Businesses: Encouraging employees, customers, and others to use public transportation Citizens: Using public transportation	・Promoting formulation of regional public transportation plans ・Promotion of Mobility as a Service (Maas) ・Promoting development of Light-Rail Transit (LRT) and Bus Rapid Transit (BRT) ・Promoting barrier-free railway stations etc. ・Promoting introduction of transit IC card systems and bus location systems ・Promotion of eco-commuting ・Enhancement of modal connections, through bus terminal development	・Formulation of regional public transportation plans ・Promoting use of public transportation through development of public transportation and improving services and convenience through provision of MaaS etc. ・promotion of the spread of eco-commuting	Transfer volume from private traffic (10^8 passenger-kilometers)		(10^4 kL)		(10^4 t-CO_2)		・Passenger-kilometers (Source: 2012 transport economic statistics overview [Institute for Transport Policy Studies]) ・Rate of change in population (Source: Population statistics [January 2012 estimates] [National Institute of Population and Social Security Research]) ・CO_2 emissions intensity (Source: "CO_2 emissions in the transport sector," CO_2 emissions per transport volume [passengers] [Ministry of Land, Infrastructure, Transport and Tourism, FY 2018])
				2013 (FY)	38	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	135	2025 (FY)	–	2025 (FY)	131	
				2030 (FY)	163	2030 (FY)	–	2030 (FY)	162	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th colspan="2">Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td rowspan="4">Improving route efficiency through regional public transportation convenience improvement projects</td><td rowspan="4">Transportation companies:
Improving route efficiency

Local governments:
Formulation plans, coordination with businesses

Citizens:
Using public transportation</td><td rowspan="4">・Support through know-how related to formulation of implementation plans of regional public transportation convenience improvement</td><td rowspan="4">・Formulation of implementation plans of regional public transportation convenience improvement</td><td colspan="2">Number of implementation plans for improving the convenience of local public transportation compiled (Units)</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO_2)</td><td rowspan="4">・Projected number of implementation plans to make regional public transport more convenient authorized per year, and average length of routes made more efficient per authorization (estimated by the Ministry of Land, Infrastructure, Transport and Tourism from existing plans)

・Average number of services (estimated as follows: 1 service/hour × 12 hours × 1 roundtrip)

・Average passenger density (Source: "The bus business in Japan" [FY 2018, Nihon Bus Association])

・CO_2 emissions intensity (Source: "CO_2 emissions in the transport sector," CO_2 emissions per transport volume [passengers] [Ministry of Land, Infrastructure, Transport and Tourism, FY 2018])</td></tr>
<tr><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>–</td></tr>
<tr><td>2025 (FY)</td><td>72</td><td>2025 (FY)</td><td>–</td><td>2025 (FY)</td><td>1.61</td></tr>
<tr><td>2030 (FY)</td><td>102</td><td>2030 (FY)</td><td>–</td><td>2030 (FY)</td><td>2.29</td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
35. Promotion of the use of public transportation and bicycles (promotion of the use of bicycles) **(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)**										
Promotion of the use of bicycles	Businesses: Encouraging employees to use bicycles in commuting, on the job, etc. Citizens: Using bicycles	・Promoting systematic development of spaces for transportation by bicycle ・Promoting bicycle sharing ・Public awareness-raising of health promotion through bicycle use ・Promoting commuting by bicycle	・Promoting systematic development of spaces for transportation by bicycle ・Promoting bicycle sharing ・public awareness-raising of health improvements through bicycle use ・Promoting commuting by bicycle	Bicycle sharing for commuting purposes (%)		(10^4 kL)		(10^4 t-CO_2)		・Aiming for conversion to about 30% use of bicycles for commutes of less than 5 km over the next 10 years ・Annual CO_2 emissions were calculated by multiplying drive kilometer-trip intensity (2015 national urban transport survey) when commuting by car for 5 km or less nationwide by the following indicators and reducing these by 30% (i) Future population in the target year (2017 estimates from the National Institute of Population and Social Security Research) (ii) Round trips (×2) (iii) Number of weekdays (243 days in 2019, after deducting weekends and holidays) (iv) emission intensity, derived by dividing CO_2 emissions by vehicle-kilometers driven (April 22, 2020, Ministry of Land, Infrastructure, Transport and Tourism)
				2013 (FY)	–	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	18.2	2025 (FY)	5	2025 (FY)	14	
				2030 (FY)	20.0	2030 (FY)	10	2030 (FY)	28	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
36. Decarbonization of the railways **(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)**										
Promotion of decarbonization of the railways	Railway companies: ・Voluntary action plans ・Formulation and implementation of medium and long-term plans based on the Act on the Rational Use of Energy ・Introduction of energy saving rolling stock ・Introduction of energy saving equipment in railway facilities	・Support for introduction of new rolling stock ・Support for introduction of energy saving equipment at railway-related facilities ・Application of the Act on the Rational Use of Energy to railway companies	–	Rate of improvement in energy consumption intensity (FY2013 standard)		(10^4 kL)		(10^4 t-CO_2)		・Introduction of energy saving rolling stock ・Introduction of energy saving equipment at railway facilities
				2013 (FY)	100.000	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	88.638	2025 (FY)	52.5	2025 (FY)	183.5	
				2030 (FY)	84.294	2030 (FY)	74.5	2030 (FY)	260.0	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
37. Decarbonization of the shipping sector **(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)**							
Promotion of energy saving and CO_2 emission-saving vessels	Ship operators: Introduction of energy-saving ships and zero-emission ships through alternative construction, introduction of energy-saving equipment through modifications, improvement of operation efficiency Shipbuilding and marine equipment companies: Utilization of energy-saving standard ship types, establishment of a supply system for zero-emission ships, etc.	・Support for the development and introduction of innovative energy-saving and CO_2-reducing technologies ・Visualization of the effects of energy-saving and CO_2-reducing technologies (promotion of obtaining energy-saving ratings for coastal ships) ・Support through tax and interest rate incentives ・Creating an environment for the use of biofuels on ships ・Support for the development and expansion of production facilities required for the construction of zero-emission ships, etc.	—	Number of widely-used ships that contribute to energy conservation (Ships)	(10^4 kL)	(10^4 t-CO_2)	● Assumptions of estimates ・ Annual fuel consumption per vessel: 2,650 kL (heavy oil C) (interviews with operators) ・ Fuel (heavy oil C) emission factor: 3.09 t-CO_2/kL (calculated based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・ Energy saving rate of energy saving vessels: 16% ・ Energy saving rate of intermodal energy saving vessels: 18% (adopted beginning in FY 2023) ・ Number of energy saving vessels/intermodal energy saving vessels adopted: 70 vessels/year ● Grounds and detailed description (e.g., breakdown) of calculation of projected energy saving and Expected emission reduction: (i) <Actual results> CO_2 emissions from domestic marine vesselping in FY 2019 down 458,000 t-CO_2 from FY 2013 (ii) <Construction of energy saving vessels to replace existing vessels> 2,650 kL × 16% × 70 vessels × 3 years × 3.09 t-CO_2/kL = 275,000 t-CO_2 reduction (vs. FY 2019) (iii) <Construction of domestic energy saving vessels to replace existing vessels> 2,650 kL × 18% × 70 vessels × 8 years × 3.09 t-CO_2/kL = 825,000 t-CO_2 reduction (vs. FY 2019) (iv) <Operating improvements> Improvements in vessel operating efficiency to realize approx. 3% reduction in CO_2 emissions: 250,000 t-CO_2 reduction (vs. FY 2019) > (i)+(ii)+(iii)+(iv) = 1,810,000 t-CO_2 reduction (vs. FY 2013)
				2013 (FY)	-	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	730	2025 (FY)	40	2025 (FY)	118	
				2030 (FY)	1,080	2030 (FY)	62	2030 (FY)	181	

*1 It must be noted in evaluation that CO_2 emissions from the modal shift to marine transport contribute to CO_2 emission reduction of transport sector as a whole.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
38. Decarbonization of the aviation sector (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Promotion of decarbonizaion of aviation	–	Promote the introduction of sustainable aviation fuel (SAF), improve flight operation through further sophisticated air traffic control, introduce new technologies into aircraft and equipment, promote energy conservation in airport facilities and airport vehicles, and turn airports into renewable energy hubs, and promote public-private partnerships.	–	CO_2 emissions per unit of transportation (kg-CO_2/ton kilometer)		(10^4 kL)		(10^4 t-CO_2)		Actual results for the evaluation indicator are calculated based on actual shipment figures for each fiscal year, using the following formula: Evaluation indicator (actual results) = CO_2 emissions / t-km charged (Source: Annual Report on Air Transport Statistics [published each fiscal year])
				2013 (FY)	1.3977	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	1.2323	2025 (FY)	-	2025 (FY)	141.0	
				2030 (FY)	1.1693	2030 (FY)	-	2030 (FY)	202.4	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
39. Improvement of efficiency of truck transportation and promotion of joint transportation and delivery (improvement of efficiency of truck transportation) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)							
Efficiency improvement of truck transportation	Transportation companies: Promoting use of larger trucks, trailers, and streamliningt trucking, and formulation and implementing plans based on the Act on the Rational Use of Energy	・Promoting use of larger trucks and trailers ・Application of the Act on the Rational Use of Energy to shippers, trucking companies, etc. ・Promotion of initiatives through the Green Logistics Partnership Conference Conference ・Implementing projects to support businesses streamlining energy use ・Promotion of the spread double-articulated trucks ・Promotion initiatives of using electric trucks such as the electrification of intra-regional transportation and delivery and the development and dissemination of fuel cell trucks for long-distance transportation	・Promoting the spread of adoption ・Road improvements to accommodate larger trucks	Number of vehicles with a gross vehicle weight of more than 24 tons and less than 25 tons owned (units) 2013 (FY): 182,274 2025 (FY): 297,686 2030 (FY): 352,522	(10^4 kL)		(10^4 t-CO_2)		・Fuel savings from Introduction of 25 t trucks: approx. 9,000 L/truck ・Fuel savings from Introduction of trailers: approx. 24,000 L/trailer ・Commercial truck vs. In-house truck intensity: approx. 15% ・Fuel (diesel) emission factor: 2.7 t-CO_2/kL (Source: Prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・Indicator values were revised for FY 2020 and later, in light of trends in recent years and new measures.
				Number of trailers owned (units) 2013 (FY): 98,720 2025 (FY): 160,223 2030 (FY): 189,371	2013 (FY) 2025 (FY) 2030 (FY)	- — —	2013 (FY) 2025 (FY) 2030 (FY)	- 858 1,180	
				Percentage of business/private use (%) 2013 (FY): 86.3 2025 (FY): 87.2 2030 (FY): 87.2					

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
40. Improvement of efficiency of truck transportation and promotion of joint transportation and delivery (promotion of joint transportation and delivery) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Promotion of joint transportation and delivery	Logistics companies: Promotion of joint transportation and delivery through cooperation with shippers, other logistics companies, etc. Shippers: Promotion of joint transportation and delivery through cooperation with other logistics companies, shippers, etc.	・Advancement of initiatives through the Green Logistics Partnership Conference ・Promoting cooperation in shipping at logistics facilities under the Act on Advancement of Integration and Streamlining of Distribution Business ・Promoting reductions in parcel redeliveries through joint transportation and delivery by businesses and others	Public awareness-raising	Rate of increase in the number of joint transportation and delivery initiatives (%)		(10^4 kL)		(10^4 t-CO_2)		・Evaluation indicator: Rate of increase in number of joint-shipping initiatives (vs. 2013) ・Truck CO_2 emissions intensity (FY 2013): approx. 217 g-CO_2/t-km ・Truck CO_2 emissions intensity (FY 2018): approx. 233 g-CO_2/t-km (Reference) CO_2 emission reduction in FY 2025 ・FY 2013 intensity: 18,000 t-CO_2 ・FY 2018 intensity: 27,000 t-CO_2 ・Difference: 27,000-18,000=9000 t-CO_2 increase in Expected emission reduction CO_2 emission reduction in FY 2030 ・FY 2013 intensity: 21,000 t-CO_2 ・FY 2018 intensity: 33,000 t-CO_2 ・Difference: 33,000-21,000=12,000 t-CO_2 increase in Expected emission reduction
				2013 (FY)	–	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	276	2025 (FY)	–	2025 (FY)	2.7	
				2030 (FY)	346	2030 (FY)	–	2030 (FY)	3.3	
				Result of the re-delivery rate of the survey on the actual situation of re-delivery of the courier service (%)		(10^4 kL)		(10^4 t-CO_2)		・Evaluation indicator: Redelivery rate results from parcel redelivery survey ・CO_2 emissions intensity of compact commercial vehicles (FY 2002): approx. 808 g-CO_2/t-km
				2013 (FY)	-	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	6.0%	2025 (FY)	–	2025 (FY)	5.6	
				2030 (FY)	6.0%	2030 (FY)	–	2030 (FY)	5.6	

*1 Figures for FY 2030 on the lower level assume continued achievement of target redelivery rates for FY 2025

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
40. Improvement of efficiency of truck transportation and promotion of joint transportation and delivery (promotion of joint transportation and delivery) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Social implementation of drone logistics	Logistics companies: Promoting initiatives toward social implementation of drone logistics as an alternative means of delivery instead of using trucks or ships Local governments: Promotion of environmental improvements to enable people to continue to reside in rural communities while solving local issues (e.g., support for shopping)	・Support for countermeasures, such as introduction of machinery toward practical application of drone logistics	・Measures to support operation etc.	Number of social implementations by local governments (Units)		(10^4 kL)		(10^4 t-CO_2)		・Since the FY 2020 "Implementation project for logistics using unmanned aircraft in remove areas etc." projected CO_2 reductions from replacement of trucks etc. of 16 t per project, a figure of 16 t/case is used here. ・In some cases multiple projects are implemented in a single region, and these are included under "multiple projects included in a single region," using as units "projects (cases)." ・It is assumed that the number of cases participating will increase based on the market growth rate through 2030 and the number of new drone distribution projects adopted (FY units) through practical application projects.
				2013 (FY)	–	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	174	2025 (FY)	–	2025 (FY)	0.5	
				2030 (FY)	1,496	2030 (FY)	–	2030 (FY)	6.5	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
41. Promotion of a modal shift to marine and rail freight transportation (promotion of a modal shift to marine transportation) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Promotion of a modal shift to marine transportation	Marine shipping companies: Cooperating with shippers to use marine shipping proactively Shippers: Cooperating with marine shipping companies to use coastal shipping proactively	・Promoting building of energy-efficient domestic vessel, using the shared-shipbuilding program ・Supporting promotion of a modal shift to marine transportation under the Act on Advancement of Integration and Streamlining of Distribution Business and other laws and regulations, promotion of Eco-Ship Mark ・Promotion of initiatives through the Green Logistics Partnership Conference	Public awareness-raising	Marine cargo transportation volume (billion ton kilometer)		(10^4 kL)		(10^4 t-CO_2)		● Evaluation indicator: Freight transportation in navigation (t-km) ・FY 2020 figures are based on the "Basic Plan on Transportation Policy" (February 13, 2015 Cabinet decision). ・FY 2030 figures are based on rough drafts of Japan's commitments. ● CO_2 emissions intensity (FY 2013): ・Truck CO_2 emissions intensity: approx. 217 g-CO_2/t-km ・Ship CO_2 emissions intensity: approx. 39 g-CO_2/t-km ● CO_2 emissions intensity (FY 2018): ・Truck CO_2 emissions intensity: approx. 233 g-CO_2/t-km ・Ship CO_2 emissions intensity: approx. 39 g-CO_2/t-km (Reference) CO_2 emission reduction in FY 2025 ・FY 2013 intensity: 1,256,000 t-CO_2 ・FY 2018 intensity: 1,369,000 t-CO_2 ・Difference: 1,369,000-1,256,000=113,000 t-CO_2 increase in Expected emission reduction CO_2 emission reduction in FY 2030 ・FY 2013 intensity: 1,724,000 t-CO_2 ・FY 2018 intensity: 1,879,000 t-CO_2 ・Difference: 1,879,000-1,724,000=155,000 t-CO_2 increase in Expected emission reduction
				2013 (FY)	330.0	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	388.9	2025 (FY)	–	2025 (FY)	136.9	
				2030 (FY)	410.4	2030 (FY)	–	2030 (FY)	187.9	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
42. Promotion of a modal shift to marine and rail freight transportation (promotion of a modal shift to rail freight transportation) (Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)										
Promotion of a modal shift to rail freight transportation	Railway companies: Promoting a modal shift to rail freight transportation through coordination with shippers,transportation companies used, etc. Transportation companies used: Promoting use of rail through enhancement of use of transport equipment such as large-scale containers Shippers: Proactively using eco-friendly rail freight transportation	・ Promotion of initiatives through the Green Logistics Partnership Conference ・ Support for introduction of new high-performance rolling stock to contribute to enhancement of transport capacity ・ Supporting promotion of a modal shift to rail freight under the Act on Advancement of Integration and Streamlining of Distribution Business and other laws and regulations ・ Public awareness-raising of eco-friendly rail freight transportation (publicity and promotion of Eco Rail Mark, etc.) ・ Support for development of models of a modal shift to rail freight using passenger railways ・ Support for new transport services (e.g., block trains, temperature-controlled freight trains)	Public awareness-raising	Rail freight transportation volume (Billion ton kilometer)		(10^4 kL)		(10^4 t-CO_2)		● Evaluation indicator: Freight transportation by rail (t-km) ・ FY 2020 figures are based on the Basic Plan on Transportation Policy. ・ FY 2030 figures are based on rough drafts of Japan's INDC. ● CO_2 emissions intensity (FY 2013): ・ Truck CO_2 emissions intensity: approx. 217 g-CO_2/t-km ・ Rail CO_2 emissions intensity: approx. 25 g-CO_2/t-km ● CO_2 emissions intensity (FY 2018): ・ Truck CO_2 emissions intensity: approx. 233 g-CO_2/t-km ・ Rail CO_2 emissions intensity: approx. 22 g-CO_2/t-km (Reference) CO_2 emission reduction in FY 2025 ・ FY 2013 intensity: 386,000 t-CO_2 ・ FY 2018 intensity: 424,000 t-CO_2 ・ Difference: 424,000-386,000=38,000 t-CO_2 increase in Expected emission reduction CO_2 emission reduction in FY 2030 ・ FY 2013 intensity: 1,334,000 t-CO_2 ・ FY 2018 intensity: 1,466,000 t-CO_2 ・ Difference: 1,466,000-1,334,000=132,000 t-CO_2 increase in Expected emission reduction
				2013 (FY)	193.4	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	208.9	2025 (FY)	-	2025 (FY)	42.4	
				2030 (FY)	256.4	2030 (FY)	–	2030 (FY)	146.6	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="9">43. Promotion of decarbonization of logistics facilities
(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)</td></tr>
<tr><td rowspan="3">Promotion of decarbonization of logistics facilities</td><td rowspan="3">logistics companies:
Introduction of machinery to contribute to decarbonization, such as equipment using renewable energy and energy saving machinery</td><td rowspan="3">・Promotion of adoption and public awareness-raising of equipment using renewable energy and energy saving machinery</td><td rowspan="3">Public awareness-raising</td><td>Number of decarbonized logistics facilities (Facility)</td><td colspan="2">(10^4 kWh)</td><td colspan="2">(10^4 t-CO₂)</td><td rowspan="3">・Evaluation indicator: Number of decarbonized logistics facilities
・Evaluation indicator: Number of decarbonized logistics facilities (FY 2020 and later*)
* Since related subsidy programs began in FY 2020
・Estimated reduction per decarbonized warehouse: 538 t-CO₂
・For FY 2020 and later, CO₂ emission reduction per facility are estimated based on data on projects accepted for related subsidy programs in FY 2020-2021 (including projections).</td></tr>
<tr><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>-</td></tr>
<tr><td>2024 (FY)</td><td>35</td><td>2024 (FY)</td><td>3.7</td><td>2024 (FY)</td><td>1.9</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)</td><td>200</td><td>2030 (FY)</td><td>44.0</td><td>2030 (FY)</td><td>11.0</td><td></td></tr>
</table>

*1 CO_2 emission intensity in power sector are estimated based on FY 2018 emission intensity for FY 2024 and based on FY 2030 average emission intensity for all power sources for FY 2030.

*2 Figures for FY 2024 are estimates for confirming progress toward FY 2030.

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator (100 million t-km)</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="9">44. Efforts at ports and harbors (reduction of the distance of land transportation of cargo through optimal selection of ports and harbors)
(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)</td></tr>
<tr><td rowspan="3">Reduction of the distance of land transportation of cargo through optimal selection of ports and harbors</td><td rowspan="3">–</td><td rowspan="3">・Improving logistics terminals etc.
・Improving harbor roads</td><td rowspan="3">・Improving logistics terminals etc.
・Improving harbor roads</td><td>Amount of reduction in land transportation of cargo (Billion ton kilometer)</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO₂)</td><td rowspan="3">CO₂-reduction intensity: 271 g-CO₂/t-km (calculated by the Ministry of Land, Infrastructure, Transport and Tourism Ports and Harbors Bureau from data on actual results)</td></tr>
<tr><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>–</td><td>2013 (FY)</td><td>–</td></tr>
<tr><td>2025 (FY)</td><td>35</td><td>2025 (FY)</td><td>–</td><td>2025 (FY)</td><td>96</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)</td><td>35</td><td>2030 (FY)</td><td>–</td><td>2030 (FY)</td><td>96</td><td></td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
45. Efforts at ports and harbors (comprehensive decarbonization of ports and harbors) **(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)**										
Comprehensive decarbonization of ports and harbors [promotion of introduction of energy-efficient cargo handling machinery, etc.]	Manufacturers: Technological development related to energy-efficient cargo handling machinery etc.	Supporting introduction of energy-efficient cargo handling machinery etc.	–	Number of introduced units of energy saving cargo handling machineries, etc. (Units)		(10,000 kL)		(10,000 t-CO_2)		● Promotion of introduction of energy-efficient cargo handling machinery etc. ・Calculations for FY 2020 and later assume progress in introduction of 19 units/year, based on past results ・Cargo handling machinery is assumed to be in operation for 3000 hours/year (from interviews with businesses) ・Fuel use used in calculations: 21.7 L/unit-hour (from interviews with businesses) ・Emission factor used in calculations (diesel): 2.7 kg-CO_2/kL (Based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・Fuel savings rate used in calculations: 0.378 (from interviews with businesses) * Reference: more ambitous case Calculations for FY 2020 and later assume progress in introduction of 24 units/year, based on past results (maximum)
				2013 (FY)	–	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	225 *Reference (255)	2025 (FY)	–	2025 (FY)	2.02 *Reference (2.22)	
				2030 (FY)	320 *Reference (375)	2030 (FY)	–	2030 (FY)	2.65 *Reference (3.01)	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
46. Reform of regulations contributing to global warming countermeasures (Governing agencies: Ministry of the Environment)										
Reform of regulations contributing to global warming countermeasures	(Case of structural-reform special zones) Local governments: Proposals related to special exception measures, applying for approval of special zone plans, project development using to special exception measures Private businesses etc.: Making proposals related to special exception measures, business development using special exception measures	(Case of structural-reform special zones) Proposals related to special exception measures: Recruiting continuously Application for approval of special zone plans: Applications to be accepted roughly in May, September, and January of each fiscal year	(Case of structural-reform special zones) ・Opportunities will be provided for discussions with related agencies and other parties in preparation for project development using special exception measures ・Developing an environment for informing local residents for project development using special exception measures and other matters	Number of cases of special regulatory (Cases)		(10^4 kL)		(10^4 t-CO_2)		・The estimated amount of emission reductions will be calculated by taking advantage of structural-reform special zones to provide special regulatory measures, and compiling the estimates for the "Special Project for the Use of Pipelines for the Transportation of Specially Controlled Industrial Waste," which was rolled out nationwide in FY2023, and using the total estimated amount of reductions from each measure.
				2013 (FY)	1	2013 (FY)	-	2013 (FY)	5.3	
				2025 (FY)	1	2025 (FY)	-	2025 (FY)	5.3	
				2030 (FY)	1	2030 (FY)	-	2030 (FY)	5.3	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures							
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
47. Reduction of CO2 emission intensity in power sectors (Governing agencies: Ministry of Economy, Trade and Industry)										
Improving efficiency of thermal power generation	Autonomous framework of the electric power industry: ・Projecting the maximum potential emission reduction through means that include the use of the best available technology (BAT) that is economically feasible, in light of the size of the power plant, when establishing a new thermal power plant ・Striving toward efficiency improvements in thermal power generation, etc., and running through the plan-do-check-act (PDCA), including plans of initiatives of individual companies, to ensure efficacy	・Demanding the following from power generators through the Act on the Rational Use of Energy: ・For newly installed generating equipment: satisfaction of generating efficiency standards per unit of generating equipment ・For existing generating equipment: satisfaction of efficiency standards in generation results, per power generators		CO_2 reduction by utilizing BAT (10^4 t-CO_2)		(10^4 kL)		(10^4 t-CO_2)		Maximum reduction potential indicating results of comparison of introduction of BAT in main power development since FY 2013 with use of previous technologies
				2013 (FY)	—	2013 (FY)	—	2013 (FY)	—	
				2025 (FY)	—	2025 (FY)	—	2025 (FY)	—	
				2030 (FY)	1,100	2030 (FY)	—	2030 (FY)	1,100	

<table>
<tr><th rowspan="3">Name of mitigation action</th><th rowspan="3">Countermeasures of each actor</th><th rowspan="3">Countermeasures of the national government</th><th rowspan="3">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th colspan="2">Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th rowspan="2">Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="2">CO_2 emission factor of the electric power industry (kg-CO_2/kWh)</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO_2)</td></tr>
<tr><td rowspan="3">Improving efficiency of thermal power generation, utilization of nuclear power generation on the major assumption of ensuring safety, maximum introduction of renewable energy</td><td rowspan="3">Autonomous framework of the electric power industry: Striving toward use of nuclear power and renewable energy, efficiency improvements in thermal power generation, etc., and running through the plan-do-check-act (PDCA), including plans of initiatives of individual companies, to ensure efficacy</td><td rowspan="3">● Regarding the autonomous framework of the electric power industry, promoting initiatives toward achievement of targets through measures under the Act on the Rational Use of Energy, the Act on the Promotion of the Use of Non-fossil Energy Sources and the Effective Use of Fossil Energy Raw Materials by Energy Suppliers, and other laws and regulations, and securing both efficacy and transparency. Also, through the Act on the Promotion of the Use of Non-fossil Energy Sources and the Effective Use of Fossil Energy Raw Materials by Energy Suppliers, demanding the following from retail electric utilities:
● Identifying the description of CO_2-adjusted emission intensity in guidelines on retail sale of electricity as a desirable practice.
● Based on the enforcement ordinance and enforcement regulations to the Act on Promotion of Global Warming Countermeasures, asking all retail electric utilities to report their actual CO_2 emission intensity for the greenhouse gas emissions calculation, reporting, and publication system, and publishing these.
● Evaluating the progress of the above initiatives every fiscal year, to make sure that their efficacy is improving continuously</td><td rowspan="3"></td><td>2013 (FY)</td><td>0.57</td><td>2013 (FY)</td><td>—</td><td>2013 (FY)</td><td>—</td><td rowspan="3">Energy-derived CO_2 emission reduction from electricity, calculated for Outlook for energy supply and demand in FY 2030
・FY 2013 emissions: 572 million t-CO_2
・FY 2030 emissions: 219 million t-CO_2</td></tr>
<tr><td>2025 (FY)</td><td>—</td><td>2025 (FY)</td><td>—</td><td>2025 (FY)</td><td>—</td></tr>
<tr><td>2030 (FY)</td><td>0.25</td><td>2030 (FY)</td><td>—</td><td>2030 (FY)</td><td>35,300</td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.
CO_2 emission intensity in electric power industry of FY 2030 represent CO_2 emission intensity consistent with the national energy mix and greenhouse gas reduction targets.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
48. Maximum introduction of renewable energy (Governing agencies: Ministry of Economy, Trade and Industry)										
Expansion of use of renewable electricity	Power generators etc.: Long-term, stable operation of renewable-energy power generation facilities Retail electric utilities etc.: Carrying out procurement based on the Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities General electricity transmission and distribution utilities: Stable power grid operation Local governments etc.: Proactive introduction of renewable-energy power generation equipment Consumers: Proactive use of electricity from renewable energy	・Appropriate operation and revision of the feed-in-tariff program ・Technological development toward goals, such as improving efficiency and cutting costs of power generation equipment and more advanced grid operation ・Improvements to power grids and grid operation rules ・Streamlining of regulations as necessary ・Coordination among related government agencies through the council of ministers on renewable energy etc.	・Support for introduction of renewable energy by businesses and other users in their districts ・Proactive adoption in public facilities and other facilities of local governments	Amount of electricity generated (Billion kWh)		(10^4 kL)		(10^4 t-CO_2)		・Renewable energy (electricity): Solar, wind, geothermal, hydroelectric, biomass ・Average thermoelectric electricity emission factor in FY 2013: 0.65 kg-CO_2 /kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average thermoelectric electricity emission factor in FY 2030: 0.60 kg-CO_2 /kWh (Source: Outlook for energy supply and demand in FY 2030) * Promoting maximum expansion of Introduction of renewable energy with consideration for the energy mix identified in The 6th Strategic Energy Plan and other considerations
				2013 (FY)	1,179	2013 (FY)	-	2013 (FY)	7,662	
				2025 (FY)	*	2025 (FY)	-	2025 (FY)	*	
				2030 (FY)	3,360 - Approx. 3,530	2030 (FY)	-	2030 (FY)	20,160 - Approx. 21,180	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="6">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Expected emission reduction</th><th>Assumptions of expected energy saving and expected emission reduction□</th></tr>
<tr><td colspan="8">48. Maximum introduction of renewable energy
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="4">Expansion of use of renewable heat</td><td rowspan="4">Private businesses, local governments, etc.:
Proactive introduction of equipment using renewable heat</td><td rowspan="4">・Support for introduction of equipment for supplying renewable heat

・Testing, development, etc. of models for effective use of various thermal energies in the region</td><td rowspan="4">・Support for introduction of renewable energy by businesses and other users in their districts

・Proactive adoption in public facilities and other facilities of local governments</td><td>Amount of heat supply (crude oil equivalent) (10^4 kL)</td><td>(10^4 kL)</td><td colspan="2">(10^4 kL)</td><td colspan="2">(10^4 t-CO₂)</td><td rowspan="4">・Renewable energy (heat): Solar heat, biomass, unused heat, etc.

・Crude oil emission factor: 2.7 t-CO₂/kL

・Figures for FY 2030 are based on Outlook for energy supply and demand in FY 2030

* Progress will be made on expanding Introduction of heat from renewable energy while taking into consideration matters such as biofuel supply targets under the Advancement Act of Non-fossil Energy Sources and the Effective Use of Fossil Energy Raw Materials by Energy Suppliers</td></tr>
<tr><td>2013 (FY)</td><td>1,104</td><td>2013 (FY)</td><td>-</td><td>2013 (FY)</td><td>2,980</td></tr>
<tr><td>2025 (FY)</td><td>*</td><td>2025 (FY)</td><td>-</td><td>2025 (FY)</td><td>*</td></tr>
<tr><td>2030 (FY)</td><td>1,341</td><td>2030 (FY)</td><td>-</td><td>2030 (FY)</td><td>3,618</td></tr>
</table>

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
49. Promotion of the introduction of facilities and equipment with high energy-saving performance (petroleum product manufacturing sector) (Governing agencies: Ministry of Economy, Trade and Industry)							
Effective use of heat, introduction of advanced control and high-efficiency equipment, improvement of power system operations, and large-scale improvements and upgrades of processes	Businesses: Steady realization of a low-carbon society in the petroleum industry	Promoting steady realization of a low-carbon society in the petroleum industry	—	Prospect of introduction and widespread use (%)	(10^4 kL)	(10^4 t-CO_2)	・Petroleum Industry's Action Plans for a Low-Carbon Society: Through energy saving measures since FY 2010, striving to achieve energy saving equivalent to 1 million kL when converted to Crude oil equivalent vs. BAU (the absence of additional measures) in FY 2030 ・Industry-wide energy saving: Ascertaining and totaling industry-wide the energy saving vs. BAU from the individual conservation measures adopted by the oil-refining industry at its refineries and plants since FY 2010, for each fiscal year ・Evaluation indicator: Rate of achievement of FY 2030 target energy saving (Crude oil equivalent kL) (Crude oil equivalent million kL) ・Expected energy saving, Expected emission reduction: Expected energy saving are the industry-wide energy saving vs. BAU from the individual conservation measures adopted by the oil-refining industry at its refineries and plants since FY 2010, ascertained and totaled for each fiscal year. Expected emission reduction are the projected energy saving (Crude oil equivalent) multiplied by the carbon emission factor (2.7 t-CO_2/Crude oil equivalent kL). ・Other matters Reconsideration of targets will be considered in the event of major changes to the industry situation, such as a reduction in the number of refineries due to falling domestic demand and other factors or large-scale changes in production processes. Target levels will be evaluated roughly every five years after 2015.
				2013 (FY)	29.9	2013 (FY)	2.9	2013 (FY)	7.7
				2025 (FY)	76.5	2025 (FY)	59.7	2025 (FY)	161.2
				2030 (FY)	100.0	2030 (FY)	76.0	2030 (FY)	208.0

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="5">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th colspan="2">Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="8">50. Expansion of the use of blended cement
(Governing agencies: Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="4">Expansion of the use of blended cement</td><td rowspan="4">The national government, local governments, businesses, etc.:
Proactive use of blended cement in various opportunities, public awareness-raising, playing active roles, etc.</td><td rowspan="4">・ Promotion of use under the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities, by the the national government and others
(In the part that blended cement is specified as a material which should be promoted to use in public-works projects.)

・ Promotion of use under the Low Carbon City Act (Act No. 84 of 2012)
(Use of blended cement or fly-ash cement is specified as one selection criterion in the certification standards for low-carbon buildings.)

・ Addition to the J-Credit methodology

・ Implementing studies on policies for promotion and expansion of blended cement</td><td rowspan="4">・ Expanding use of blended cement through means such as recycled-product certification systems

・ Incorporation of blended cement into systems such as those for evaluation of the environmental performance of buildings
And other infrastructure improvements to help promote and expand use of blended cement</td><td>Mixed cement production/total cement production (%)</td><td colspan="2">(10^4 t-CO_2)</td><td colspan="2" rowspan="4">● Evaluation indicator: Blended cement production as a percentage of total cement production (%)
Blended cement production
= Blast-furnace cement production volume
+ fly-ash cement production volume under the Cement Handbook
Total cement production
= Cement production volume
+ clinker exports under the Cement Handbook

● Expected emission reduction
Expected emission reduction
= (CO_2 emissions in the absence of any measures)-(CO_2 emissions with measures taken) in the subject fiscal year
CO_2 emissions
= Portland cement production volume × CO_2 emission factor from Portland cement limestone decarboxylation + blended cement production volume × CO_2 emission factor from blended cement

・Absence of any measures:
Blended cement production volume as a percentage of total cement production volume remains unchanged from the base year FY 2013
・ With measures:
Blended cement production volume as a percentage of total cement production volume trends as projected under the evaluation indicator
・ Projected production volumes:
Figures from the Cement industry’s Action Plans for a Low-Carbon Society and Outlook for energy supply and demand in FY 2030 are cited.

● CO_2 emission intensity from limestone decarboxylation
LCI data (September 2015, Japan Cement Association) are cited.</td></tr>
<tr><td>2013 (FY)</td><td>22.1</td><td>2013 (FY)</td><td>-</td></tr>
<tr><td>2025 (FY)</td><td>-</td><td>2025 (FY)</td><td>-</td></tr>
<tr><td>2030 (FY)</td><td>25.7</td><td>2030 (FY)</td><td>38.8</td></tr>
</table>

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="5">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th>Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th>Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="9">51. Diffusion of biomass plastics
(Governing agencies: Ministry of the Environment)</td></tr>
<tr><td rowspan="3">Diffusion of biomass plastics</td><td rowspan="3">Private businesses:
Adopting biomass plastics in the plastics used in products, packaging, etc.

Consumers:
Choosing products (certified products) using biomass plastics preferentially at the time of purchasing products

Local governments:
Promoting policies to promote biomass plastics in their regions</td><td rowspan="3">Studying countermeasures to promote introduction of biomass plastics for plastic products that need to be incinerated, due to reasons such as difficulties in material recycling, and promoting and supporting their adoption</td><td rowspan="3">· Promoting policies to advance biomass plastics in their regions

· Also, choosing products using biomass plastics preferentially at the time of procuring products themselves</td><td>Domestic shipments of biomass plastics (10^4 t)</td><td colspan="2">(10^4 t-CO_2)</td><td rowspan="3">Evaluation indicator:
Domestic shipments of biomass plastics by raw-material resin and by use, for each fiscal year, are ascertained from sources such as the National Inventory Survey (Japan Organics Recycling Association)</td></tr>
<tr><td>2013 (FY)
7</td><td>2013 (FY)</td><td>-</td></tr>
<tr><td>2025 (FY)
138

2030 (FY)
197</td><td>2025 (FY)

2030 (FY)</td><td>141

209</td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected energy saving		Assumptions of expected energy saving and expected emission reduction
52. Reduction of waste incineration (Governing agencies: Ministry of the Environment)								
Promotion of recycling of waste plastics	Private businesses: Reducing volumes of incinerated waste through promoting reductions in use of plastic containers and packaging and recycling of plastic wastes Local governments: Reducing volumes of incinerated wastes through controlling their emission and promoting their recycling and reuse	・ Initiatives toward achievement of the targets established in the Waste Management Facilities Improvement Plans ・ Promoting three-R initiatives toward achievement of the targets established in basic policies based on the Act on Waste Management and Public Cleaning ・ Implementing measures based on individual recycling acts ・ Initiatives based on guidelines for reducing GHG emissions in the waste sector ・ Supporting improvements to municipal waste incineration plants ・ Promoting charging fees for municipal waste incineration and guidelines on sorted collection and other matters at municipalities and others ・ Proactive introduction of products etc. to contribute to reducing waste generation based on the Act on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities ・ Multifaceted support for promotion of Action Plans for a Low- Carbon Society by industrial-waste treatment operators ・ Support for introduction of recycling equipment by waste processors ・ Implementation of measures based on the Act on the Promotion of Resource Circulation related to Plastics	・ Reducing volumes of incinerated wastes through controlling emissions of plastic waste and other wastes and promoting recycling and reuse through means such as sorted collection and recycling of plastic containers and packaging based on the The Law for Promotion of Sorted Collection and Recycling of Containers and Packaging ・ Implementation of measures based on the Act on the Promotion of Resource Circulation related to Plastics	Amount of plastic waste incinerated (dry base) (10^4 t)		(10^4 t-CO_2)		Based on Resource Circulation Strategy for Plastic and other measures, reductions are projected in incineration volumes of plastic resources in general waste under the following assumptions ・ Reductions are projected of 140,000 t/year based on results of charging fees for shopping bags, and the difference of 4.4%, or 78,000 t, between current levels of wastes and reduction rates and the levels projected for PET bottles and other plastic container wastes based on the reduction target of 22% by FY 2025 identified in the 3R Promotion Council's 2025 Voluntary Action Plan for Three R's for Containers and Packaging (vs. 17.6% in FY 2019)*, is used as projected reductions. * From Document 2 of the Ministry of Economy, Trade and Industry's 26th Industrial Structure Council Industrial Technology Environmental Subcommittee Wastes and Recycling Group ・ It is expected that the volume of plastic resources recovered per person will rise to 9.64 kg/year with expansion of segregated collection efforts for plastic resources by municipalities and others and implementation of segregated collection in all municipalities For plastic resources from industrial wastes, it is anticipated that chemical recycling will be conducted for 1.5 million t (up 1.27 million t from FY 2018) by 2030, based on the Japan Chemical Industry Association's The Chemical Industry's Future Vision on the Chemical Recycling of Plastic Waste. The volume of incinerated waste is projected to decrease by 490,000 t based on the portion of this figure treated in FY 2019. These figures are multiplied by the CO_2 emission factor during incineration of plastics (2.71 t-CO_2/t) in calculations.
				2013 (FY)	515	2013 (FY)	0	
				2025 (FY)	331	2025 (FY)	498	
				2030 (FY)	278	2030 (FY)	640	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected energy saving		Assumptions of expected energy saving and expected emission reduction
52. Reduction of waste incineration (Governing agencies: Ministry of the Environment)								
Promotion of recycling of waste oil	Businesses using oil and emitting waste oil: Sorted emission of waste oil and using recycled oil Waste-oil recyclers: Reducing incineration volumes through promoting recycling	・Supporting promotion of recycling of waste oil	-	Amount of material recycled from waste solvents (kt)		(10^4 t-CO_2)		It is anticipated that material recycling of solvents will advance in FY 2021 and later, through means including projects to promote waste-oil recycling, resulting in 2030 in material recycling of 30% of solvents previously incinerated. This is multiplied by the average yield-to-weight ratio of CO_2 emissions from incineration to organic solvents (3.1) in calculations.
				2013 (FY)	490	2013 (FY)	0	
				2025 (FY)	619	2025 (FY)	40	
				2030 (FY)	716	2030 (FY)	70	

<table>
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<tr><th>Measure evaluation indicator</th><th>Expected energy saving</th><th colspan="2">Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="8">53. Measures to reduce greenhouse gas emissions related to agricultural soil (reduction of methane emissions in paddy fields)
(Governing agencies: Ministry of Agriculture, Forestry and Fisheries)</td></tr>
<tr><td rowspan="4">Measure to reduce GHG emissions in agricultural soils [CH_4 emission reduction from rice cultivation]</td><td rowspan="4">Farmers:
Implementing prolonging mid-season drainage period as water management for rice cultivation</td><td rowspan="4">・Promoting countermeasures contributing to emission reduction of methane generated from rice cultivation

・ Verification of the effectiveness of new technologies for methane reduction</td><td rowspan="4">Prefectures:
・Promoting countermeasures contributing to emission reduction of methane generated from rice cultivation

・ Verification of the effectiveness of new technologies for methane reduction</td><td>Area ratio of paddy fields conducted prolonging midseason drainage (%)</td><td>(10^4 t-CO_2)
* Total emissions in FY 2013 (actual figures) = BAU</td><td colspan="2" rowspan="4">・ Nationwide methane emissions from paddy fields were estimated for each fiscal year using the DNDC-Rice Model developed by the National Agriculture and Food Research Organization. The difference from FY 2013 emissions is used as the reduction volume.

・ These measures are based on the concept of deployment of agricultural management to reduce greenhouse gas emissions while improving the soil in agricultural production activities. In addition, projected volumes of emission reduction assume achievement of projections of land area under paddy rice cultivation and other figures identified in the Basic Plan for Food, Agriculture and Rural Areas.</td></tr>
<tr><td>2013 (FY) -</td><td>2013 (FY) -</td></tr>
<tr><td>2025 (FY) -</td><td>2025 (FY) -</td></tr>
<tr><td>2030 (FY) 30%</td><td>2030 (FY) 117</td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected energy saving		Assumptions of expected energy saving and expected emission reduction
54. Reduction of final waste disposal (Governing agencies: Ministry of the Environment)								
Reduction of final waste disposal	Local governments: Promoting reductions in volumes of organic waste directly placed in landfills	・Initiatives toward achievement of the targets established in Waste Management Facilities Improvement Plans ・Promoting three-R initiatives toward achievement of the targets established in basic policies based on the Act on Waste Management and Public Cleaning ・Implementing measures based on individual recycling laws ・Supporting improvements to municipal waste incineration plants ・Promoting charging fees municipal waste incineration and guidelines on sorted collection and other matters at municipalities and others ・Multifaceted support for promotion of Action Plans for a Low- Carbon Society by industrial-waste treatment operators	Promoting reductions in volumes of organic waste directly placed in landfills	Final disposal amount of organic municipal waste (based on dry weight) (1,000 t)		(10^4 t-CO_2)		Expected emission reduction are calculated by multiplying the difference from the BAU case in waste decomposition volume in the fiscal year under evaluation and calculated based on the final disposal volume of organic general waste by the methane emission factor of each type of waste and the various parameters identified in inventories, assuming that progress has been made on reducing the final disposal volume of organic general wastes since the base year (FY 2013).
				2013 (FY)	325	2013 (FY)	-	
				2025 (FY)	20	2025 (FY)	39	
				2030 (FY)	10	2030 (FY)	52	

<table>
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<tr><th colspan="2">Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th>Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="7">55. Adoption of semi-aerobic landfill structures in final waste disposal sites
(Governing agencies: Ministry of the Environment)</td></tr>
<tr><td rowspan="3">Adoption of semi-aerobic landfill structures in municipal waste disposal sites</td><td rowspan="3">Local governments:
Reducing methane generation from biodegradation of organic general waste in comparison to anaerobic landfills, through use of semi-aerobic landfill structures when setting up new landfills as well as managing collection and drain pipe terminals in an open state</td><td rowspan="3">Promoting use of semi-aerobic landfills through thorough facility installation and maintenance based on technical standards related to final disposal locations for general waste (which cover collection and drainage facilities for water load etc. and ventilation equipment)</td><td rowspan="3">Controlling methane generation from biodegradation of organic general waste in comparison to anaerobic landfills, through use of semi-aerobic landfill structures when setting up new landfills as well as managing collection and drain pipe terminals in an open state</td><td>Percentage of quasi-aerobic landfill disposal volume (%)</td><td></td><td>(10^4 t-CO₂)</td><td></td><td rowspan="3">Expected emission reduction are calculated by multiplying waste decomposition volume in the fiscal year under evaluation for each type of final disposal structure and calculated based on the final disposal volume of organic general waste by the methane emission factor of each type of waste and the various parameters identified in inventories, assuming that progress has been made on installation of semi-aerobic landfill structures since the base year (FY 2013).</td></tr>
<tr><td>2013 (FY)</td><td>60</td><td>2013 (FY)</td><td>-</td></tr>
<tr><td>2025 (FY)</td><td>75</td><td>2025 (FY)</td><td>3.9</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)</td><td>77</td><td>2030 (FY)</td><td>5.4</td><td></td></tr>
<tr><td rowspan="3">Adoption of semi-aerobic landfill structures in industrial waste disposal sites</td><td rowspan="3">Businesses:
Reducing methane generation from biodegradation of organic industrial waste in comparison to anaerobic landfills, through use of semi-aerobic landfill structures when setting up new final disposal locations as well as managing collection and drain pipe terminals in an open state</td><td rowspan="3">・Promoting use of semi-aerobic landfills through thorough facility installation and maintenance based on technical standards related to final disposal locations for industrial waste (which cover collection and drainage facilities for water load etc. and ventilation equipment)

・Multifaceted support for promotion of Action Plans for a Low- Carbon Society by industrial-waste treatment operators</td><td rowspan="3">Providing appropriate guidance to businesses to enable maintenance of semi-aerobic properties at the managed final disposal locations they set up</td><td>Percentage of quasi-aerobic landfill disposal volume at final industrial waste disposal sites (%)</td><td></td><td>(10^4 t-CO₂)</td><td></td><td rowspan="3">Figures from Japan's Greenhouse Gas Inventory Report (April 2015, National Institute for Environmental Studies) are used as FY 2013 figures for the evaluation indicator of the share of disposal in semi-aerobic landfills.</td></tr>
<tr><td>2013 (FY)</td><td>70</td><td>2013 (FY)</td><td>-</td></tr>
<tr><td>2025 (FY)</td><td>74</td><td>2025 (FY)</td><td>2</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)</td><td>76</td><td>2030 (FY)</td><td>3</td><td></td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected energy saving		Assumptions of expected energy saving and expected emission reduction
56. Measures to reduce greenhouse gas emissions related to agricultural soil (reduction of nitrous oxide associated with fertilization) (Governing agencies: Ministry of Agriculture, Forestry and Fisheries)								
N_2O emission reduction associated with fertilizer application	・Reducing fertilizer volumes, through means such as reviewing fertilizer designs ・Practicing environmentally friendly agriculture	・Promoting proper fertilizing based on soil diagnostics ・Promoting environmentally friendly agriculture	・Promoting proper fertilizing based on soil diagnostics ・Promoting environmentally friendly agriculture	Demand for chemical fertilizers (1,000 tons N)		(10^4 t-CO_2) * Total emissions (actual figures) = BAU		・The demand for chemical fertilizers in 2030 is calculated by multiplying the amount of chemical fertilizer used in 2030 (720,000 tons) in the Green Food System Strategy by the proportion of N components. Demand for 2025 is calculated based on the assumption that usage will decrease at a constant rate from the most recent actual amount (2022) until 2030. ・Actual figures are calculated based on production volume reports from fertilizer manufacturers, etc
				2013 (FY)	410	2013 (FY)	-	
				2025 (FY)	366	2025 (FY)	18	
				2030 (FY)	349	2030 (FY)	24	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures		
				Measure evaluation indicator	Expected energy saving	Assumptions of expected energy saving and expected emission reduction
57. Advancement of incineration at sewage sludge incineration facilities **(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)**						
Advancement of incineration at sewage sludge incineration facilities	Private businesses: Development of high-efficiency, low-cost high-temperature incineration technologies and technologies for sewage sludge solid fuel conversion	・Support for development, promotion, and deployment of high-temperature incineration technologies and technologies for sewage sludge solid fuel conversion ・Support for improvements to sewage-treatment facilities by local governments	・Use of higher temperatures in sludge incineration ・Introduction of technologies such as high-temperature incineration technologies and technologies for sewage sludge solid fuel conversion when renovating sludge incineration facilities	High temperature incineration rate (%) 2013 (FY): 63% 2025 (FY): 90% 2030 (FY): 100% Number of new type furnaces and solid fuel conversion furnaces installed (Units/year) 2013 (FY): - 2025 (FY): 2 2030 (FY): 2	(10^4 t-CO_2) 2013 (FY): - 2025 (FY): 63 2030 (FY): 78	・100% high-temperature incineration rate in 2030 ・Perspective of adopting facilities for sewage sludge solid fuel conversion and turbo furnaces

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator		Expected energy saving	Assumptions of expected energy saving and expected emission reduction
58. Policies and measures for Fluorinated Gases: (HFCs, PFCs, SF6, NF3) **(Governing agencies: Ministry of the Environment, Ministry of Economy, Trade and Industry)**							
Reduction of production and import volumes of HFCs, conversion of refrigerants	· Manufacturers: Technological development related to use of CFC-free and low-GWP technologies in designated products · Vendors: Providing information to consumers concerning designated CFCfree and low-GWP products · Consumers: Choosing CFC-free and low-GWP products when purchasing	· To promote introduction of CFCfree and low-GWP technologies in products using CFCs, setting targets for greenhouse gas emission reduction for manufacturers and others and establishing systems for achieving targets on a weightedaverage basis for each product category shipped by manufacturers · Supporting introduction of devices using energy saving natural coolants	Promoting introduction of designated CFC-free and low-GWP products and providing information to consumers	Achievement rate of the target GWP value of the designated product system (based on number of product categories) (%)		(10^4 t-CO_2)	It is assumed that conversion of each coolant will be achieved by the target fiscal year identified under the designated-product system, while reflecting the reduction effects of the Kigali Amendment
				2013 (FY)	7		
				2025 (FY)	95	2013 (FY)	-
				2030 (FY)	100		
				Cumulative number of natural refrigerant devices installed (10,000 units)		2025 (FY)	891
				2013 (FY)	-		The cumulative number of natural refrigerant equipment installed will be 200,000 units in 2025 and 330,000 units in 2030
				2025 (FY)	20	2030 (FY)	1,463
				2030 (FY)	33		

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="5">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th colspan="2">Measure evaluation indicator</th><th colspan="2">Expected energy saving</th><th>Assumptions of expected energy saving and expected emission reduction</th></tr>
<tr><td colspan="8">58. Policies and measures for Fluorinated Gases: (HFCs, PFCs, SF6, NF3)
(Governing agencies: Ministry of the Environment, Ministry of Economy, Trade and Industry)</td></tr>
<tr><td rowspan="3">Reduction of fluorinated gases at time of product manufacture</td><td rowspan="3">Manufacturers, etc.:
To promote systematic efforts by the industry to reduce emissions of alternative fluorocarbons, etc., the relevant industries will implement initiatives based on voluntary action plans formulated by the industry</td><td rowspan="3">・Report on the progress of voluntary action plans formulated by relevant industry groups to the Working Group on Fluorocarbons and Other Substances Policy, Subcommittee on Chemical Substances Policy, Manufacturing Industry Division, Industrial Structure Council</td><td rowspan="3">–</td><td>Achievement rate of voluntary action plan goals (based on number of organizations) (%)</td><td></td><td>(10^4 t-CO_2)</td><td></td><td rowspan="3">The emission reductions for the four gases will be accumulated based on the assumption that all industries will achieve their annual targets for the voluntary action plans created by each industry.</td></tr>
<tr><td>2013 (FY)</td><td>100</td><td>2013 (FY)</td><td>-</td></tr>
<tr><td>2025 (FY)</td><td>100</td><td>2025 (FY)</td><td>88</td></tr>
<tr><td></td><td></td><td></td><td></td><td>2030 (FY)</td><td>100</td><td>2030 (FY)</td><td>122</td></tr>
</table>

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected energy saving		Assumptions of expected energy saving and expected emission reduction
58. Policies and measures for Fluorinated Gases: (HFCs, PFCs, SF6, NF3) (Governing agencies: Ministry of the Environment, Ministry of Economy, Trade and Industry)								
Reduction of volume of HFC leaks at time of product use	Manager of commercial refrigeration and air conditioning equipment: Compliance with the Fluorocarbons Emissions Reduction Act (conducting inspections, etc.)	・Effective operation of the reporting and disclosure system for calculated leakage amounts of fluorocarbons based on the Fluorocarbons Emissions and Proper Management Act ・Appropriate implementation and operation of the law (support for guidance and supervision by prefectures, public awareness, etc.) ・Support for the introduction and dissemination of IoT remote monitoring systems, etc.	・Instruction and supervision of managers by prefectures based on the Fluorocarbons Emissions and Proper Management Act ・Public awareness raising	Rate of adoption of continuous monitoring systems when selling new commercial air conditioners and commercial refrigeration/freezing equipment (4 major items) (%))		(10^4 t-CO_2)		Regarding the four main items with high leakage during use (package air conditioners for stores, buildings, and facilities, and condensing units for separate showcases), the adoption rate of continuous monitoring systems at the time of new sales will be set at 5% by 2025 and 10% by 2030.
				2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	5			
				2030 (FY)	10			
				Total amount of HFCs reported by businesses that leaked 1,000 tons or more per year (CO_2 equivalent) (10,000 tons)		2025 (FY)	1,330	The total amount of HFCs leaked (CO_2 equivalent) reported by businesses leaking 1,000 tons or more per year will be increased to 2.2 million tons in fiscal 2025 and 2 million tons in fiscal 2030.
				2013 (FY)	-			
				2025 (FY)	220			
				2030 (FY)	200			

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected energy saving		Assumptions of expected energy saving and expected emission reduction
58. Policies and measures for Fluorinated Gases: (HFCs, PFCs, SF6, NF3) (Governing agencies: Ministry of the Environment, Ministry of Economy, Trade and Industry)								
Reduction of volume of HFC releases at time of product disposal	Disposers of commercial refrigeration and air conditioning equipment: Obligation to request proper collection at the time of disposal, obligation to provide and preserve documents Building demolition companies: Obligation to confirm whether equipment is installed in the building to be demolished, obligation to explain to the client Waste and recycling companies that take back equipment: Prohibition on taking back equipment that has not had fluorocarbons removed Refill and recovery companies: Obligation to ensure collection, obligation to provide and preserve documents	・Appropriate enforcement and operation of the law (support for guidance and supervision by prefectures, public awareness, etc.) ・Identifying and demonstrating issues to improve the refrigerant recovery rate per device	・Instruction and supervision by prefectures to waste disposal operators, specific demolition contractors, collection operators, refill and recovery operators, etc., based on the Fluorocarbons Emissions and Proper Management Act ・Publicity and awareness raising	HFCs recovery rate when disposing of commercial air conditioners and commercial refrigeration/freezing equipment (unit basis) (%)		(10^4 t-CO_2)		Achieve a recovery rate of HFCs (unit basis) when commercial air conditioners and commercial refrigeration and freezing equipment are disposed of at 70% by 2025 and 85% by 2030
				2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	70			
				2030 (FY)	85	2025 (FY)	1,350	
				HFC recovery rate when commercial air conditioners and commercial refrigeration and freezing equipment are disposed of (based on refrigerant volume) (%)				
				2013 (FY)	31	2030 (FY)	1,690	Raise the HFC recovery rate (based on refrigerant volume) from commercial refrigeration and air conditioning equipment at the time of disposal, etc., based on the Fluorocarbons Emissions Control Act from approximately 31% in 2013 to 60% in 2025 and 75% in 2030.
				2025 (FY)	60			
				2030 (FY)	75			

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected energy saving		Assumptions of expected energy saving and expected emission reduction
58. Policies and measures for Fluorinated Gases: (HFCs, PFCs, SF6, NF3) (Governing agencies: Ministry of the Environment, Ministry of Economy, Trade and Industry)								
	Disposer: When disposing of a household air conditioner, dispose of it properly. Retailer: Collect used household air conditioners from the disposer and hand them over to manufacturers, etc. at a designated collection point. Manufacturers, etc.: Collect used air conditioners at a designated collection point and re-manufacture them.	・Implement measures to improve the collection rate of discarded household air conditioners through proper implementation and operation of the Home Appliance Recycling Law and public awareness raising.	・Steady enforcement of crackdowns on illegal collectors based on the Waste Management and Cleansing Law ・Establishment of collection routes for non-mandatory items ・Publication and awareness-raising of the Home Appliance Recycling Law	Reduction in the number of discarded home air conditioners that are not properly disposed of (10,000 units)		(10^4 t-CO_2)		By disposing of 3.12 million discarded household air conditioners that were collected by scrap dealers and yard operators in 2019 and are assumed not to have been properly disposed of through proper routes, the number of discarded household air conditioners that are not properly disposed of will be reduced by 1.56 million in 2030. *Please note that measures, policies, countermeasure evaluation indicators, and expected emission reduction amounts may be further reviewed based on discussions at the joint meeting of the Industrial Structure Council's Industrial Technology Environment Subcommittee, Waste and Recycling Subcommittee, Electrical and Electronic Equipment Recycling Working Group, Central Environment Council's Recycling Society Division, and the Home Appliance Recycling System Evaluation and Review Subcommittee.
				2019 (FY)	0	2019 (FY)	0	
				2025 (FY)	84	2025 (FY)	62	
				2030 (FY)	156	2030 (FY)	113	

<table>
<tr><th rowspan="2">Name of mitigation action</th><th rowspan="2">Countermeasures of each actor</th><th rowspan="2">Countermeasures of the national government</th><th rowspan="2">Examples of countermeasures expected to be implemented by local governments</th><th colspan="4">Measure evaluation indicator, and results of countermeasures</th></tr>
<tr><th colspan="2">Measure evaluation indicator</th><th colspan="2">Expected removals</th><th>Assumptions of expected removals</th></tr>
<tr><td colspan="8">59. Policies and measures for forest carbon sinks
(Governing agencies: Ministry of Agriculture, Forestry and Fisheries)</td></tr>
<tr><td rowspan="4">Policies and measures for forest carbon sink</td><td colspan="3" rowspan="4">・To achieve 38 million t-CO_2 of removals through forest sinks (corresponding to 2.7% of total emissions in FY 2013) in FY 2030, as a contribution by the forestry sector to achievement of greenhouse gas reduction targets, promoting policies and measures for forest carbon sinks, such as sound forest management through appropriate thinning and planting, appropriate management and conservation of protected forests and other sites, efforts to develop efficient and stable forest management system, People’s Participation in Forest Management, and use of wood and woody biomass.

・To achieve removals through forest removals, it will be necessary to implement forest management for 700,000 ha on average per year during FY 2021-2030, in accordance with the Basic Plan for Forests and Forestry (June 15, 2021 Cabinet decision).</td><td>Area of forest management practices (10^4 ha)</td><td colspan="2">(10^4 t-CO_2)</td><td rowspan="4">● Forests included in calculation of removals through forest removals
・Planted forests: Forests subject to forestation (e.g., renewal [e.g., land clearance, surface improvements, planting], preservation [shrub cutting and weeding], thinning, final cutting) since 1990 to maintain appropriate forest conditions
・Natural forests: Forests subject to protection and conservation measures, such as thinning and restriction on reuse, under laws, regulations, etc.

○ FY 2030
● Expected removals by forest removals if the necessary funding is secured and forest removals measures, including forest management, are conducted in accordance with targets: 31.2 million t-CO_2
● Projected effects from harvested wood products (HWP) if the necessary funding is secured and efforts are made to expand supply and use of forestry products: 6.8 million t-CO_2
● 31.2 million + 6.8 million = 38 million t-CO_2

* The Expected removals of CO_2 removal in FY2030 when the new calculation method described in Chapter 3, Section 2, 3 (1) is applied is 90 million t-CO_2.</td></tr>
<tr><td>2013 (FY)</td><td>83</td><td>2013 (FY)</td><td>5,172</td></tr>
<tr><td>2025 (FY)</td><td>—</td><td>2025 (FY)</td><td>—</td></tr>
<tr><td>2030 (FY)</td><td>2021-2030 (FY) Average: 70</td><td>2030 (FY)</td><td>Approx. 3,800</td></tr>
</table>

	[Sound forest management] The national government, local governments, etc.: Promoting necessary forest management to achieve the targets of the Basic Plan for Forests and Forestry Local governments, parties involved in forestry, nonprofits, etc.: Reliably and efficiently implementing improvement of forests not managed adequately	・Promotion of diverse forest management, including through appropriate thinning, reforestation after harvesting, development of multi-layered forests, and long rotation forest management ・Promotion of additional thinning and reforestation, including through further promotion of municipal efforts based on the Act on Special Measures concerning Promotion of Forest Thinning ・Promotion of forest management by public entities, utilizing the private forest management entrustment system and the Forest Environment Transfer Tax based on the Private Forest Management Entrustment Act ・Development of forestry road systems by appropriately combining forest roads and forestry operation roads while also taking into consideration the preservation of the natural environment ・Promotion of the development of mixed conifer-broadleaf forests through harvesting and introducing broadleaf trees depending on natural conditions ・Promotion of reforestation through labor-saving and low-cost silviculture practices, including by using drones and forestry machinery to transport saplings, leveraging integrated harvesting and reforestation operations, low-density planting, and the use of elite trees and large saplings to reduce the frequency of weeding ・Efficient development and expansion of seed and seedling production of elite trees with excellent growth, and promotion of countermeasures against damage by wild birds and animals ・Securing reforestation through proper implementation of regulations such as the logging and reforestation notification system ・Restocking of unforestered and unplanted areas in upstream watersheds. and rehabilitation of devastated satoyama forests	In accordance with the basic philosophies of the Forest and Forestry Basic Act (Act No. 161 of 1964) (Basic Plan for Forests and Forestry based on the Forest and Forestry Basic Act), the Act on Promotion of Global Warming Countermeasures, and other laws and regulations, promoting measures in accordance with the natural, economic, and social conditions of their districts, through appropriate division of responsibilities with the national government in forests and forestry				

[Promoting appropriate management, conservation, etc. of protected woodlands, natural parks, and other areas] The national government, local governments, etc.: Appropriate implementation of measures, such as improving forest-conservation facilities and conserving protected woodlands	・Appropriate operation of regulations under the protection forest system, planned designation of Protected Forest, appropriate conservation and management under the forest protection system in national forest, and promotion of measures to conserve and restore natural vegetation collaboratively including with NPOs ・Systematic implementation of forest conservation projects in areas vulnerable to mountain disasters and in devastated forests ・Prevention of forest pests and diseases, as well as the damage caused by animals and implementation of forest fire prevention measures ・Expansion of nature parks and nature conservation areas and proper operation of regulations and strengthening of conservation management within these areas	In accordance with the basic philosophies of the Forest and Forestry Basic Act (Basic Plan for Forests and Forestry based on the Forest and Forestry Basic Act), the Act on Promotion of Global Warming Countermeasures, and other laws and regulations, promoting measures in accordance with the natural, economic, and social conditions of their districts, through appropriate division of responsibilities with the national government in forests and forestry					

[Development of efficient and stable forest management] The national government, local governments, parties involved in forestry, etc.: Promoting measures as necessary for the sound, sustained	・Securing long-term sustainable forestry management by clarifying forest ownership and boundaries, consolidating forest operations, promoting long-term outsourcing of operations, establishing management rights under the private forest management entrustment system, promotion of forest management projects by forest owners' cooperatives, and formulation of forest management plans ・Promotion of "new forestry" initiatives through the reduction of silviculture cost as well as the labor saving and lightening of forestry work through the development and diffusion of remotely and automatically operated machinery ・Development of forest resource information using laser scanning surveys, sharing and advanced use of forest-related information, including those on forest owners, and streamlining of timber production, distribution, and management using ICT ・Introduction and efficient use of operation systems that properly combines forest road network development and high-performance forestry machinery, and implementation of initiatives based on the Forestry Innovation Program for On-site Implementation (formulated by the Ministry of Agriculture, Forestry and Fisheries in December 2019, amended in 2022) ・Promotion of initiatives to train and secure forestry workers	In accordance with the basic philosophies of the Forest and Forestry Basic Act (Basic Plan for Forests and Forestry based on the Forest and Forestry Basic Act), the Act on Promotion of Global Warming Countermeasures, and other laws and regulations, promoting measures in accordance with the natural, economic, and social conditions of their districts, through appropriate division of responsibilities with the national government in forests and forestry					

	[People's Participation in Forest Management] The national government, local governments, businesses, nonprofits, etc.: Promoting adoption and awareness raising, forestry volunteer activities, forestry and environmental education, diverse use of forests, etc.	・Promotion of public participation in forest management activities through nationwide greening events such as the National Tree-Planting Festival ・Support for forest management and conservation activities, such as tree planting by a wide range of entities, including companies and NPOs, and support for forest creation activities by companies etc., and promotion of green fundraising activities ・ Improvement of skills of and safety systems for forest volunteers and others ・Promotion of forest environment education ・Promotion of forest conservation and management and use of forest resources through cooperation among local residents, forest owners, and others ・Creation and promotion of forest service industries that comprehensively utilize forest spaces ・Promotion of ecosystem maintenance and restoration projects related to deer and other animals and green worker projects, for the conservation of forest ecosystems in national parks and other areas ・Cultivation of public awareness of the fact that people's lives are supported by the rich forests, countryside, rivers, and oceans	In accordance with the basic philosophies of the Forest and Forestry Basic Act (Basic Plan for Forests and Forestry based on the Forest and Forestry Basic Act), the Act on Promotion of Global Warming Countermeasures, and other laws and regulations, promoting measures in accordance with the natural, economic, and social conditions of their districts, through appropriate division of responsibilities with the national government in forests and forestry				

	[Promoting use of wood and wood biomass] The national government, local governments, businesses, nonprofits, etc.: Promoting measures necessary to secure supply and use of forestry products	・Promotion of the use of local timber for housing and construction ・Further promotion of wood use in urban areas through the construction of wooden public buildings and medium- and large-scale buildings as well as the development and dissemination of products and technologies, such as cross-laminated timber (CLT) and fire-resistant wood materials under the Wood Use Promotion Act. ・Promotion of new technologies for forest product, utilization as well as, materials derived from woody biomass such as cellulose nanofibers and modified lignin, research, development and practical application of new wood-based materials. that can replace plastics ・Establishment of a stable supply system for domestic wood to meet demand, including the development of efficient wood processing and distribution facilities ・Promotion of power generation and heat utilization through the establishment of efficient and low-cost collection and transportation systems for woody biomass in a manner that guarantees the sustainable use of forest resources ・Promotion of the use of wood by disseminating the significance and effects of wood use, the "Kizukai Undo“ (attention to wood use) initiative and “Mokuiku” (wood use education) activities and promote efforts such as networking among companies, in order to foster public understanding of wood use and also lead to ESG investment in companies that use wood sustainably	In accordance with the basic philosophies of the Forest and Forestry Basic Act (Basic Plan for Forests and Forestry based on the Forest and Forestry Basic Act), the Act on Promotion of Global Warming Countermeasures, and other laws and regulations, promoting measures in accordance with the natural, economic, and social conditions of their districts, through appropriate division of responsibilities with the national government in forests and forestry				

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected removals		Assumptions of expected removals
60. Policies and measures to increase carbon removals in agricultural soils (Governing agencies: Ministry of Agriculture, Forestry and Fisheries)								
Policies and measures to increase carbon removals in agricultural soils	Farmers: Promoting soil preparation through means such as application of organic matter like compost and green manure	・Promoting the continuous application of organic matter such as compost and green manure to the soil as part of soil preparation ・Promoting the application of biochar, etc.	Prefectures: ・Promoting the continuous application of organic matter, such as compost and green manure to the soil as part of soil preparation ・Promoting the application of biochar, etc.	Soil carbon storage amount (mineral soil) (10^4 t-CO_2)		(10^4 t-CO_2)		・Using the calculation model (improved Roth-C model) developed by the National Agriculture and Food Research Organization, the change per year in soil carbon of mineral soil included in cropland and grassland nationwide (stock change) and the stock change that would occur if no organic matter was applied in the same year is estimated. The latter is used as the base value, and the difference was calculated to estimate soil carbon storage (absorption). ・These countermeasures are based on the concept that activities such as soil preparation through agricultural production activities contribute to greenhouse gas emission reduction. Projected removal volumes assume achievement of targets such as the projected land under cultivation under the Basic Plan on Food, Agriculture and Rural Areas. They also assume establishment of necessary cultivation systems, technologies, etc. and implementation of financial assistance and other countermeasures.
				2013 (FY)	700	2013 (FY)	700	
				2025 (FY)	-	2025 (FY)	-	
				2030 (FY)	850	2030 (FY)	850	

<table>
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<tr><th>Measure evaluation indicator</th><th>Expected removals</th><th colspan="3">Assumptions of expected removals</th></tr>
<tr><td colspan="9">61. Promotion of urban greening
(Governing agencies: Ministry of Land, Infrastructure, Transport and Tourism)</td></tr>
<tr><td rowspan="4">Promotion of urban greening</td><td rowspan="4">The national government, local governments, etc.:
Promoting revegetation of public facilities, public awareness-raising of revegetation, and promoting revegetation by a wide range of parties

Citizens, businesses, nonprofits, etc.:
Active participation in revegetation and other activities across a wide range of land, facilities, etc.</td><td rowspan="4">・Promoting development of urban parks, revegetation along roads, rivers (including erosion control structures), ports and harbors, sewage treatment facilities, public rental housing, facilities of public agencies, etc., and creation of new green spaces in sites such as on rooftops, based on the Green Basic Policy formulated by the national government and other plans
・Close examination and study of methods of calculating sink effects of revegetation of urban communities etc., and development of reporting and verification systems
・Promoting adoption and public awareness-raising of revegetation, and promoting revegetation by a wide range or parties including members of the public, businesses, and nonprofits</td><td rowspan="4">・Promoting development of urban parks, revegetation along roads, rivers (including erosion control structures), ports and harbors, sewage treatment facilities, public rental housing, facilities of public agencies, etc., and creation of new green spaces in sites such as on rooftops, based on the Green Regional Plans formulated by the prefectures, the Green Basic Plans formulated by the municipalities and other plans
・Calculating removals effects of revegetation of urban communities etc., and providing information for reporting, verification, etc.
・Promoting adoption and public awareness-raising of revegetation, and promoting revegetation by a wide range of parties including members of the public, businesses, and nonprofits</td><td>Maintenance area (1,000 ha)</td><td>(10^4 t-CO_2)</td><td colspan="3" rowspan="4">CO_2 sink effects are calculated and totaled for each carbon pool (biomass [trees], litter [fallen leaves], soil, etc.) by collecting statistical data on land area subject to development of urban parks, and land areas subject to revegetation along roads, rivers (including erosion control structures), ports and harbors, sewage treatment facilities, public rental housing, facilities of public agencies, etc., which are subject to reporting under the United Nations Framework Convention on Climate Change, etc, and using calculation formulas, coefficients, etc., indicated in international guidelines on removal calculation methods.</td></tr>
<tr><td>2013 (FY) 77</td><td>2013 (FY) 115</td></tr>
<tr><td>2025 (FY) 83</td><td>2025 (FY) 122</td></tr>
<tr><td>2030 (FY) 85</td><td>2030 (FY) 124</td></tr>
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Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Expected removals		Assumptions of expected removals
62. Activation of the J- Credit Scheme (Governing agencies: Ministry of the Environment)								
Revitalization of the J-Credit Scheme	private businesses etc. (creators of credits): Implementation of greenhouse gas emission reduction and sink measures and recovery of funds through sale of credits private businesses etc. (users of credits): Implementation of measures, such as adjustment of emissions and emission intensity and carbon offsetting, using the credits	Operation and management of the J-Credit Scheme	・Implementation of greenhouse gas emission reduction and removals measures by creators of credits ・Implementation of the greenhouse gas emission reduction and removals measures of creators of credits through use of credits ・Operation and management of local J- Credit Scheme	J-Credit certified amount (10^4 t-CO_2)		(10^4 t-CO_2)		-
				2013 (FY)	3	2013 (FY)	3	
				2025 (FY)	1,100	2025 (FY)	1,100	
				2030 (FY)	1,500	2030 (FY)	1,500	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures				
				Measure evaluation indicator		Cumulative Expected emission reduction by 2030		Assumptions of expected energy saving and expected emission reduction
63. Contributions to reducing global greenhouse gas emissions (Governing agencies: Ministry of the Environment)								
Promotion of the Joint Crediting Mechanism (JCM)	Partner countries: Holding joint committee meetings to approve methodologies and discuss allocation of credits and other matters with the Japanese government, and calculating volumes of emission reduction (credits) Japanese firms: Accelerating measures to promote outstanding decarbonization technologies, products, systems, services, and infrastructure as well as the implementation of countermeasure activities Partner-country firms: Adoption, management, and monitoring at local facilities	・Support through means such as subsidies for up to one-half of the costs of initial investment, field testing, etc. ・Holding joint committee meetings with partner countries to approve methodologies and discuss allocation of credits and other matters	–	Estimated cumulative emissions reductions and absorption through JCM financial support projects, etc. (10^4 t-CO_2)		(10^4 t-CO_2)		・Estimating cumulative emission reduction by FY 2030, based on results such as the number of 184 projects using the JCM funding support program in the past (as of April 7, 2021) ・Deciding on allocation of credits through discussions with partner countries
				2013 (FY)	1.5	2013 (FY)	1.5	
				2025 (FY)	-	2025 (FY)	-	
				2030 (FY)	10,000	2030 (FY)	10,000	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
64. Decarbonization initiatives in national parks (Governing agencies: Ministry of the Environment)										
Promotion of decarbonization efforts in national parks [Zero Carbon Park]	Formulization of plans and visions related to carbon-zero parks, and efforts toward their realization Hotel industry, tourism industry: Introduction of energy saving equipment, renewable-energy private generators, and equipment using hot-spring heat in facilities for lodging and other uses inside national parks, developing decarbonization tour options, etc. Transportation companies: Realizing decarbonized mobility in areas such as access to national parks Consumers: Choosing decarbonized tours, lodging facilities, and other facilities	・Cooperation with regional environmental offices to develop plans and visions related to carbon-zero parks ・Decarbonization of visitor centers and other facilities inside national parks ・Support for introduction of equipment using renewable energy, such as equipment using hot-spring heat, and energy saving equipment	・Formulization of plans and visions related to carbon-zero parks in cooperation with the regional environmental offices of the Ministry of the Environment ・introduction of equipment using renewable energy and energy saving equipment at facilities owned by local governments inside national park	Number of areas where Zero Carbon Parks are registered (Location)		(10^4 kL)		(10^4 t-CO_2)		After launching the carbon-zero parks program in March 2020, aiming to achieve 10 registered sites by 2025 and 20 sites by 2030
				2013 (FY)	–	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	10	2025 (FY)	–	2025 (FY)	–	
				2030 (FY)	20	2030 (FY)	–	2030 (FY)	–	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
65. Proactive actions by the national government (Governing agencies: Ministry of the Environment)										
Proactive actions by the national government	–	· Implementation and inspection of government action plans · Implementation and inspection of action plans of individual related agencies	–	Emissions reduction rate (%)		(10^4 kL)		(10^4 t-CO_2)		· Greenhouse gas reduction targets for 2030 under National Government Action Plan (October 22, 2021 Cabinet decision) (50% reduction vs. FY 2013) · FY 2013 emissions: 2.393 million t-CO_2 (total greenhouse gas emissions from government administration and operations in FY 2013: 3.009 million t-CO_2 [the figure fromNational Government Action Plan under the Act on Promotion of Global Warming Countermeasures in FY 2019 {March 2021, Global Warming Prevention Headquarters Executive Committee} minus emissions from use of government sea and air craft and emissions from government incineration of waste related to the Great East Japan Earthquake in Fukushima Prefecture]) * Base-year emissions may change in the future due to close examination of measures in the subject scope
				2013 (FY)	-	2013 (FY)	-	2013 (FY)	239.3	
				2030 (FY)	50	2030 (FY)	-	2030 (FY)	119.7	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction
66. Proactive actions by local governments and promotion by the national government (Governing agencies: Ministry of the Environment)										
Initiatives led by local governments and promotion by the national government	Local governments: Formulation and review of local government's action plans for operations, and promoting initiatives to carry out measures based on the action plans for these	Provision of technical advice etc. to staff of local governments, through means such as development of manuals on formulation of local government's action plans for operations	Establishing measures for reducing the amount of greenhouse gas emissions and maintaining and intensifying the absorption of greenhouse gas sinks in connection with their own operations in local government's action plans for operations	Rate of formulation of action plans of local governments, the formulation and review, etc. of which are carried out by prefectures and municipalities (%)		(10^4 kL)		(10^4 t-CO_2)		Aiming to increase the percentage of prefectures and municipalities that have formulated action plans of local government, through formulation, review, etc., to 95% by FY 2025 and 100% by FY 2030
				2013 (FY)	-	2013 (FY)	-	2013 (FY)	-	
				2025 (FY)	95	2025 (FY)	-	2025 (FY)	-	
				2030 (FY)	100	2030 (FY)	-	2030 (FY)	-	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
67. Promotion of initiatives based on the local government's action plan for entire municipal jurisdictions (Governing agencies: Ministry of the Environment)										
Promotion of efforts local government's action plans for entire municipal jurisdictions	Local governments[*1]: Formulation of local government's action plans for entire municipal jurisdictions, and promoting initiatives to carry out measures based on these	Provision of technical advice etc. to staff of local governments, through means such as development of manuals on formulation of local government's action plans for entire municipal jurisdictions	Local governments[*1]: Establishing measures for purposes, such as reducing greenhouse gas emissions in local government's action plans for entire municipal jurisdictions in accordance with natural and social conditions in their districts	Rate of formulation of action plans of local governments[*2](%)		(10^4 kL)		(10^4 t-CO_2)[*2]		–
				2013 (FY)	–	2013 (FY)	–	2013 (FY)	–	
				2025 (FY)	100	2025 (FY)	–	2025 (FY)	–	
				2030 (FY)	100	2030 (FY)	–	2030 (FY)	–	

*1 Prefectures, ordinance-designated major cities, and central cities obligated to formulate these plans by law (including those subject to special exceptions on the timing of implementation)

*2 This countermeasure provide backing support for all of other coutermeasures shown on the Annex.

68. Promotion of “Decokatsu” (a national campaign for a new, enriched decarbonized way of lifestyles)
(Governing agencies: Ministry of the Environment)

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures						
				Measure evaluation indicator		Expected energy saving		Expected emission reduction		Assumptions of expected energy saving and expected emission reduction□
Promotion of thorough implementation of Cool Biz and Warm Biz	Businesses, ordinary households, individuals: Promoting Cool Biz and Warm Biz seasonal lifestyles to enable comfortable living at indoor temperatures of 28° C (target) when using air-conditioning and 20° C (target) when using heating	・Promoting a sense of urgency regarding climate change, adoption and awareness raising of global-warming countermeasures, and changes in behavior ・Fostering a mood under which businesses proactive about global warming countermeasures are recognized in society and supported by consumers and others ・Promotion and awareness-raising activities in cooperation with local governments ・Enhancing cooperation among the Japan Center for Climate Change Actions, Prefectural Centers for Climate Change Actions, the global warming prevention activities advisors, regional councils for global warming countermeasures, and others promoting action	Promoting an understanding of the urgency of global warming and its negative impact on society, and advancing effective initiatives that are easy for people to participate in, in accordance with community and individual lifestyles, to raise awareness among residents and lead to growth of autonomous initiatives and to their taking root	Rate of implementation of Cool Biz (commercial) (%)		(10^4 kL)		(10^4 t-CO_2)		○ Evaluation indicators ・Cool Biz/Warm Biz implementation rate ・Actual figures (FY 2013): Cool Biz (28° C) or Warm Biz (20° C) implementation rate from annual surveys ・Projected future implementation rates: Assuming linear growth from current trends toward 100% implementation rates in FY 2030 ○ Reductions in electricity use and emissions from these measures ● Commercial sector ・Cool Biz Reduction from increasing temperature setting by 2° C: 2.9% ・Warm Biz Reduction from decreasing temperature setting by 3° C: 4.0% ● Residential sector ・Cool Biz Reduction from increasing temperature setting by 1° C: 7.0% ・Warm Biz Reduction from decreasing temperature setting by 1° C: 8.0% (air-conditioning) Reduction from decreasing temperature setting by 1° C: 5.6% (oil and gas fan heaters) ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・Average thermoelectric electricity emission factor in FY 2030: 0.60 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・Fuel emission factor: 2.26 t-CO_2/kL (Prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・Energy saving from thorough implementation of Cool Biz and "Warm Biz" seasonal lifestyles represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY)	71.3	2013 (FY)	▲0.5	2013 (FY)	▲2.9	
				2025 (FY)	91.6	2025 (FY)	2.2	2025 (FY)	13.2	
				2030 (FY)	100	2030 (FY)	3.2	2030 (FY)	8.7	
				Rate of implementation of Cool Biz (household) (%)		(10^4 kL)		(10^4 t-CO_2)		
				2013 (FY)	77.0	2013 (FY)	▲0.3	2013 (FY)	▲1.8	
				2025 (FY)	93.2	2025 (FY)	1.4	2025 (FY)	8.9	
				2030 (FY)	100	2030 (FY)	2.2	2030 (FY)	5.8	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
68. Promotion of “Decokatsu” (a national campaign for a new, enriched decarbonized way of lifestyles) (Governing agencies: Ministry of the Environment)							
				Rate of implementation of Warm Biz (commercial) (%)		(10^4 kL)		(10^4 t-CO_2)	
				2013 (FY)	71.0	2013 (FY)	0.1	2013 (FY)	0.3
				2025 (FY)	91.5	2025 (FY)	1.3	2025 (FY)	7.9
				2030 (FY)	100	2030 (FY)	1.8	2030 (FY)	4.9
				Rate of implementation of Warm Biz (household) (%)		(10^4 kL)		(10^4 t-CO_2)	
				2013 (FY)	81.2	2013 (FY)	0.2	2013 (FY)	0.7
				2025 (FY)	94.5	2025 (FY)	10.2	2025 (FY)	44.2
				2030 (FY)	100	2030 (FY)	14.4	2030 (FY)	35.9

68. Promotion of “Decokatsu” (a national campaign for a new, enriched decarbonized way of lifestyles)
(Governing agencies: Ministry of the Environment)

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
Home Eco-Diagnosis	Ordinary households and individuals: Switching to energy saving products, using related services, and choosing decarbonized lifestyles through the household eco-diagnostics program, which provides energy saving diagnostics for households	Use of online diagnostics and other services of the household eco-diagnostics program	Promoting an understanding of the urgency of global warming and its negative impact on society, and advancing effective initiatives that are easy for people to participate in, in accordance with community and individual lifestyles, to raise awareness among residents and lead to growth of autonomous initiatives and to their taking root	Cumulative number of households diagnosed (1000 households) 2013 (FY): 31 2025 (FY): 830 2030 (FY): 1555	(10^4 kL) 2013 (FY): 0 2025 (FY): 1.1 2030 (FY): 2.2	(10^4 t-CO_2) 2013 (FY): 0.1 2025 (FY): 2.6 2030 (FY): 4.9	● Evaluation indicators ・Cumulative number of households for which diagnostics were conducted (source: results of the household eco-diagnostics program [Ministry of the Environment]) and implementation rate (cumulative number of households for which diagnostics were conducted/total households) ・Actual figures (FY 2013): The cumulative number of households for which diagnostics were conducted was 31,000 households, for an implementation rate of 0.1% ・Projected future number of household eco-diagnostics: Expected to be implemented for 1.555 million households in FY 2030 (for an implementation rate of 2.9% [1.555 million households/53.48 million households]) ● Reductions in electricity consumption through this measure: Resulting reductions in electricity consumption are considered to overlap with HEMS figures, and for other fuels consumption is assumed to decrease by 5% after various energy saving measures. ・Fuel emission factor: 2.26 t-CO_2/kL (Prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・Energy saving from household eco-diagnostics represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				Implementation rate (%) 2013 (FY): 0.1 2025 (FY): 1.5 2030 (FY): 2.9			

68. Promotion of “Decokatsu” (a national campaign for a new, enriched decarbonized way of lifestyles)
(Governing agencies: Ministry of the Environment)

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
Eco-driving	Drivers of ordinary vehicles: Implementing "eco-driving" to lessen the environmental impact of driving and reduce both fuel consumption and CO_2 emissions, for example by not idling the engine while the vehicle is parked and driving safety at lower speeds in accordance with traffic conditions	Public awareness-raising of global warming countermeasures among drivers of passenger vehicles and personal trucks, and adopting eco-driving support systems using the latest ICT technologies, to promote and raise awareness of eco-driving and encourage changes in behavior	Advancing effective initiatives that are easy for people to participate in, in accordance with community and individual lifestyles, to raise awareness among residents and lead to growth of autonomous initiatives and to their taking root	Implementation rate of eco-driving (passenger cars) (%) 2013 (FY) 6% 2025 (FY) 60% 2030 (FY) 67%	(10^4 kL) 2013 (FY) 10.6 2025 (FY) 219 2030 (FY) 249	(10^4 t-CO_2) 2013 (FY) 28 2025 (FY) 582 2030 (FY) 659	● Evaluation indicators ・ Eco-driving implementation rates ・ Actual figures (FY 2013): Assumed to be 6% for passenger vehicles and 9% for personal trucks ・ Future projected implementation rates: Implementation rates are assumed to be 67% for passenger vehicles and 60% for personal trucks in FY 2030 ● energy saving effects of eco-driving: 10% reduction ・ emission factor of gasoline etc. for passenger vehicles: 2.65 t-CO_2/kL ・ emission factor of gasoline etc. for personal trucks: 2.66 t-CO_2/kL (Prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・ Energy saving from eco-driving represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				Implementation rate of eco-driving (private freight cars) (%) 2013 (FY) 9% 2025 (FY) 53% 2030 (FY) 60%			

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
68. Promotion of “Decokatsu” (a national campaign for a new, enriched decarbonized way of lifestyles) (Governing agencies: Ministry of the Environment)							
Car sharing	Businesses: Technological development to contribute to promotion of car sharing Ordinary households and individuals, and businesses: Accelerated Introduction of electric vehicles that contribute to promotion of car sharing, and growing the Car sharing market	Together with encouraging global warming countermeasures by drivers of passenger vehicles and personal trucks, public awareness-raising of car sharing, promoting changes in behavior, etc.	Advancing effective initiatives that are easy for people to participate in, in accordance with community and individual lifestyles, to raise awareness among residents and lead to growth of autonomous initiatives and to their taking root	Implementation rate of car sharing (%)	(10^4 kL)	(10^4 t-CO_2)	● Evaluation indicators ・Car sharing implementation rate ・Actual figures (FY 2013): Assumed to be 0.23% for both light vehicles and ordinary passenger vehicles, based on Car sharing members as a percentage of the population (source for number of members: Foundation for Promoting Personal Mobility and Ecological Transportation, "Trends in Car sharing vehicle numbers and membership in Japan") ・Future projected implementation rate: The implementation rate for FY 2030 is estimated based on linear approximation from Car sharing implementation results in FY 2013-2020 (estimated at 3.42%) (Source: Estimated based on Foundation for Promoting Personal Mobility and Ecological Transportation, "Trends in Car sharing vehicle numbers and membership in Japan," June 2020) ・Average electricity emission factor for all power sources in FY 2013: 0.57 kg-CO_2/kWh (Source: Environmental Action Plan by the Japanese Electric Utility Industry [Federation of Electric Power Companies of Japan]) ・Average electricity emission factor for all power sources in FY 2030: 0.25 kg-CO_2/kWh (Source: Outlook for energy supply and demand in FY 2030) ・emission factor of gasoline etc. for passenger vehicles: 2.65 t-CO_2/kL (Prepared based on the list of carbon emission intensity of total heat by energy source [Agency for Natural Resources and Energy]) ・Energy saving from Car sharing represents energy saving through progress on countermeasures since FY 2012, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY) 0.23%	2013 (FY) 2.8	2013 (FY) 7	
				2025 (FY) 2.46%	2025 (FY) 51	2025 (FY) 117	
				2030 (FY) 3.42%	2030 (FY) 73	2030 (FY) 192	

Name of mitigation action	Countermeasures of each actor	Countermeasures of the national government	Examples of countermeasures expected to be implemented by local governments	Measure evaluation indicator, and results of countermeasures			
				Measure evaluation indicator	Expected energy saving	Expected emission reduction	Assumptions of expected energy saving and expected emission reduction□
68. Promotion of “Decokatsu” (a national campaign for a new, enriched decarbonized way of lifestyles) (Governing agencies: Ministry of the Environment)							
Reduction of food loss and waste in households	General households: Implementing measures to counter food loss and waste, such as checking the content of the refrigerator before going shopping to avoid buying too much and preparing suitable volume meals that eating up	Public awareness-raising that reducing food loss and waste in the household helps to global warming countermeasures, encouraging changes in behavior, etc.	Promoting an understanding of the urgency of global warming and its negative impact on society, and advancing effective initiatives that are easy for people to participate in, in accordance with community and individual lifestyles, to raise awareness among residents and lead to growth of autonomous initiatives and to their taking root	Amount of food loss and waste generated from households (10^4 tons)	(10^4 kL)	(10^4 t-CO_2)	● Evaluation indicator ・Food loss and waste from household Measured based on Ministry of the Environment, "Status of wasted food etc." ・Actual figure (FY 2013): 3.02 million t (Source: "Status of wasted food etc." [FY 2013 estimate]) ・Projected future food loss and waste: Assumed to be 2.16 million t in FY 2030 (Based on the target of halving household food loss and waste by FY 2030 vs. the FY 2000 level in the Basic Policy on Promotion of Food Loss and Waste Reduction [March 2020 Cabinet decision] and the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society [June 2018 Cabinet decision]) ・Food loss and waste in FY 2025 is estimated based on the target halved level of food loss and waste in FY 2030 (2.16 million t) and the actual figure in FY 2018 (2.76 million t). ・CO_2 emissions intensity related to food loss: 0.46 t-CO_2/t (CO_2 emissions intensity of procurement and production of 1 t of food raw materials for each food category, multiplied by the food self-sufficiency rate, as a weighted average for the share of food loss form households) ・Energy saving from addressing food loss and waste represents energy saving through progress on countermeasures since FY 2013, and volumes of emission reduction are calculated based on these volumes of energy saving.
				2013 (FY) 302	2013 (FY) 0	2013 (FY) 0	
				2025 (FY) 241	2025 (FY) 10.6	2025 (FY) 28.1	
				2030 (FY) 216	2030 (FY) 14.9	2030 (FY) 39.6	

*1 Because of the difficulty of projecting expected energy mix, CO_2 emission intensity in power sector are estimated based on FY 2013, with the exception of figures for FY 2030, which reflect a preferable energy mix.