Climate Change
Policies & Measures in Japan

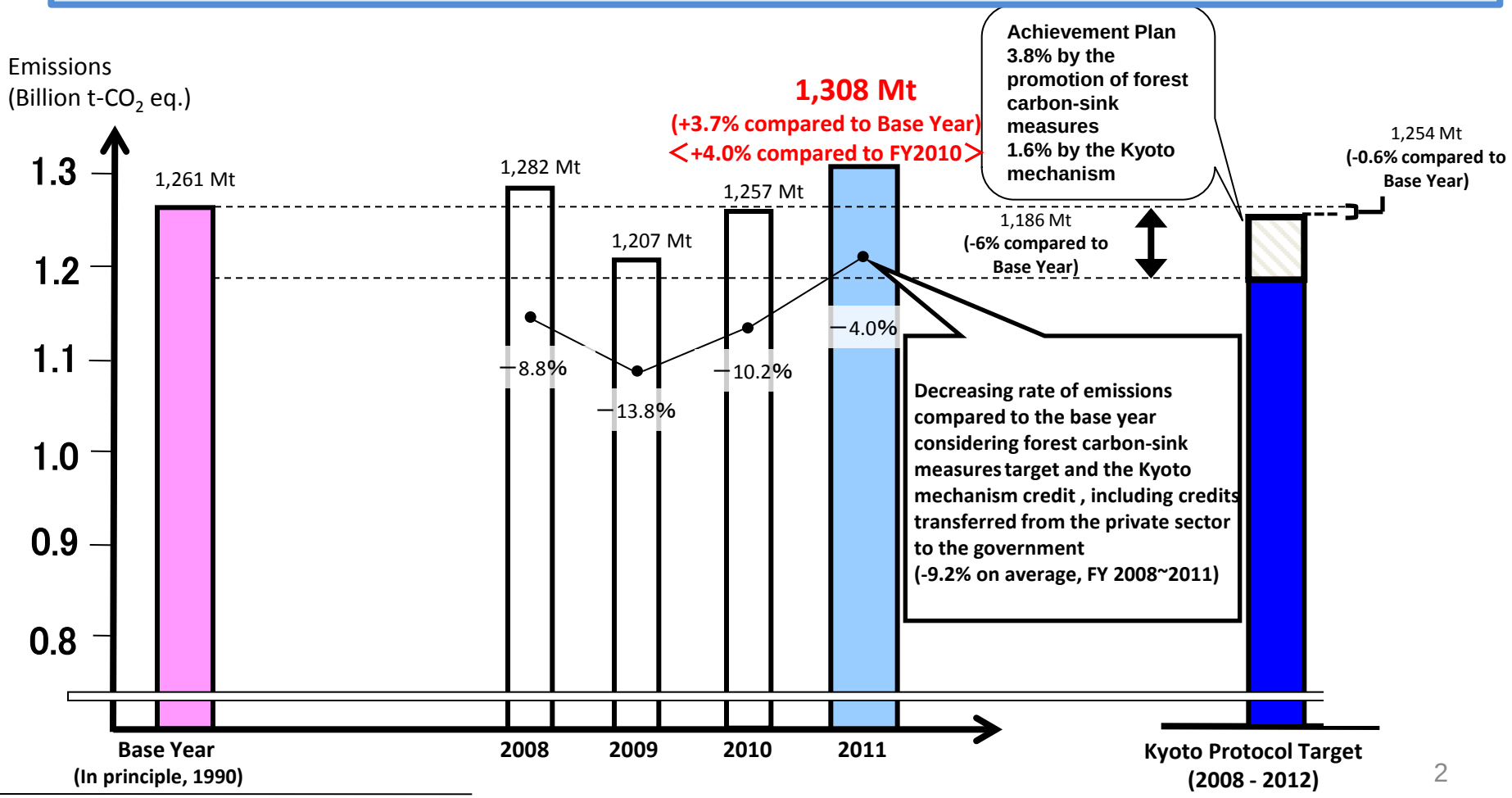
May 2013

Ministry of the Environment Japan

Japan's Greenhouse Gas Emissions

✓ The average GHG emissions from 2008 to 2011 including forest carbon sink and credits from Kyoto mechanism are less than the 1990 level by 9.2%.

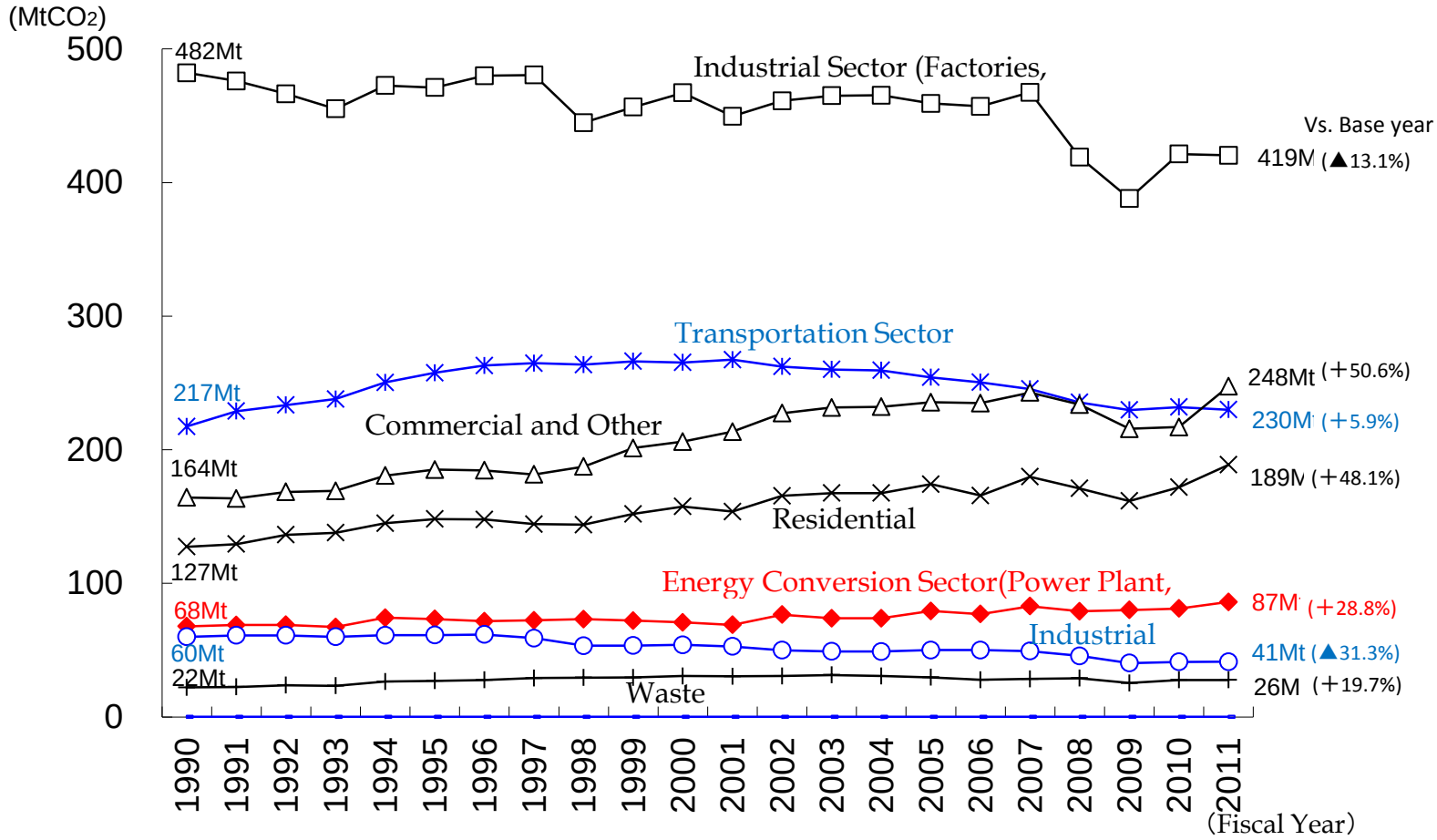
✓ It is likely that Japan achieves its 6% reduction target of the 1st period under the Kyoto Protocol.



Source: Japan's National Greenhouse Gas Emissions in Fiscal Year 2011 <Executive Summary>

CO_2 Emissions by Sector

✓Emissions from the industrial sector, the largest source of CO_2 emissions in Japan, decreased by 13.1% compared to 1990.
✓ CO_2 Emissions from transportation sector peaked out around 2001, and has been decreasing recent years.

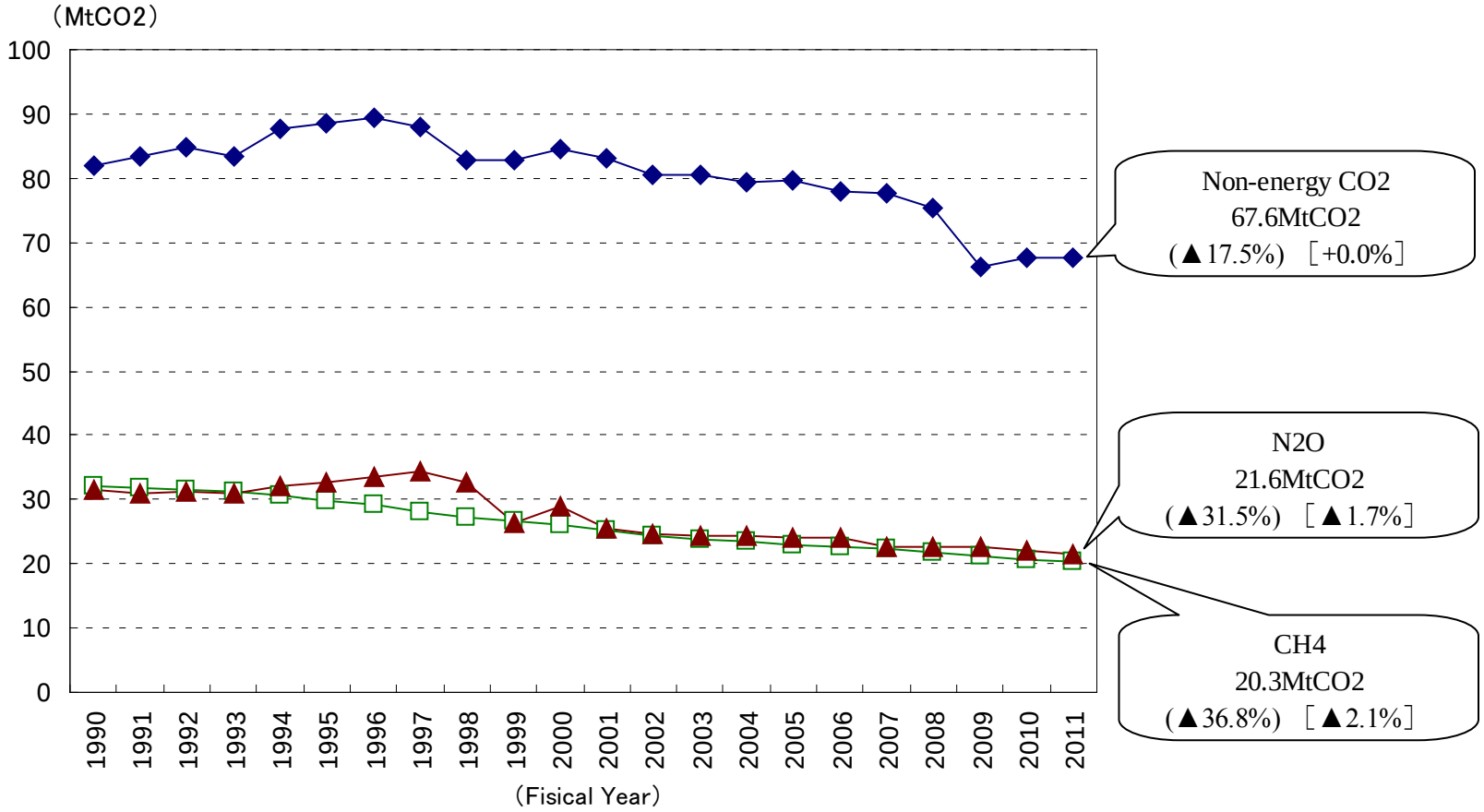


Source: Japan's National Greenhouse Gas Emissions in Fiscal Year 2011

Non-energy CO_2, CH_4 and N_2O emissions

✓**Non-energy related CO_2, CH_4 and N_2O emissions has been decreasing from 1990.**

- CO_2 from non-energy sources: mainly due to a reduction of cement production.
- CH_4: mainly due to a reduction of volume of waste to be landfilled.
- N_2O: mainly due to the installation of N_2O decomposition units in adipic acid production plants.

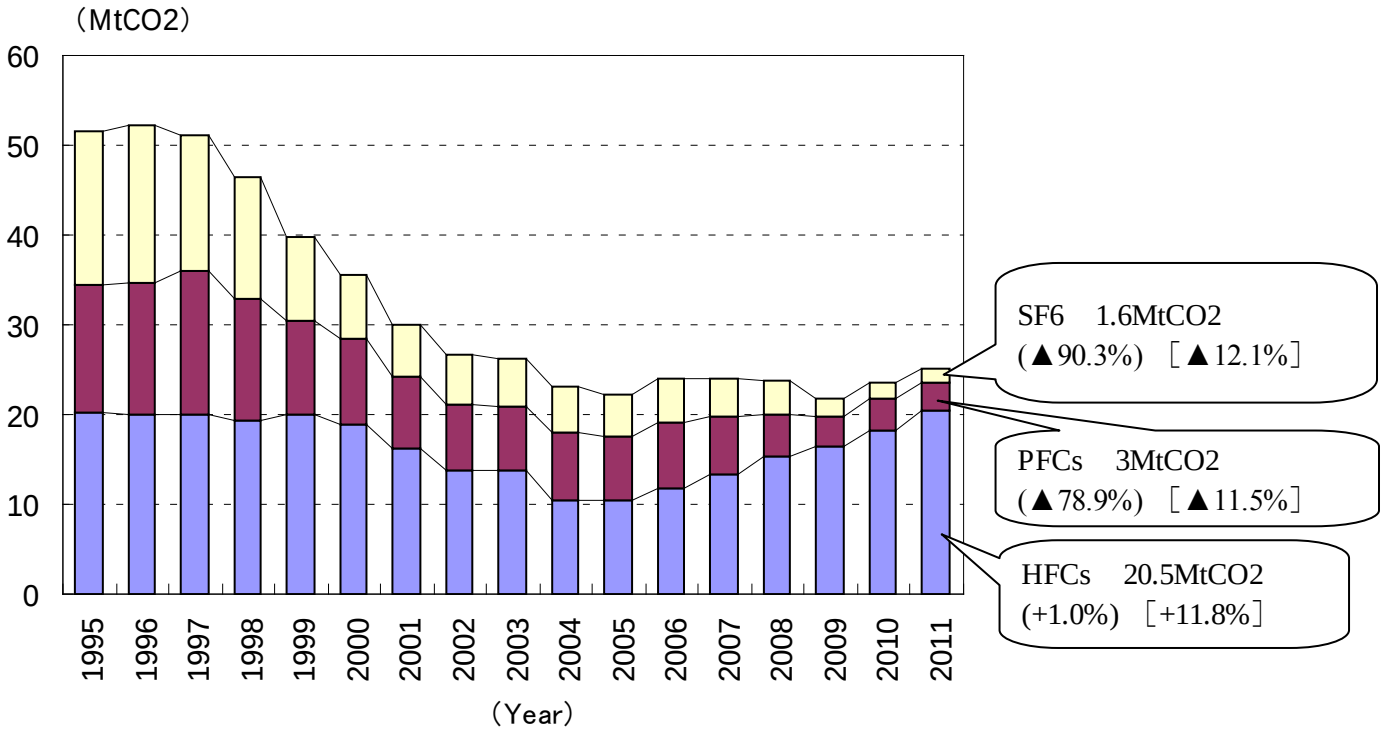


(comparison to 1990) [comparison to 2010]

Source: Japan's National Greenhouse Gas Inventory (2012)

F gas emission Trend

- ✓Emissions of F gases greatly decreased by 2005,but has slightly increased since then. The emissions in 2011 is down 51.2% from 1995 level.
- ✓Only HFCs emissions has increased since 1995. PFCs and SF_6 emissions have greatly decreased from 1995, by 78.9% and 90.3%, respectively.

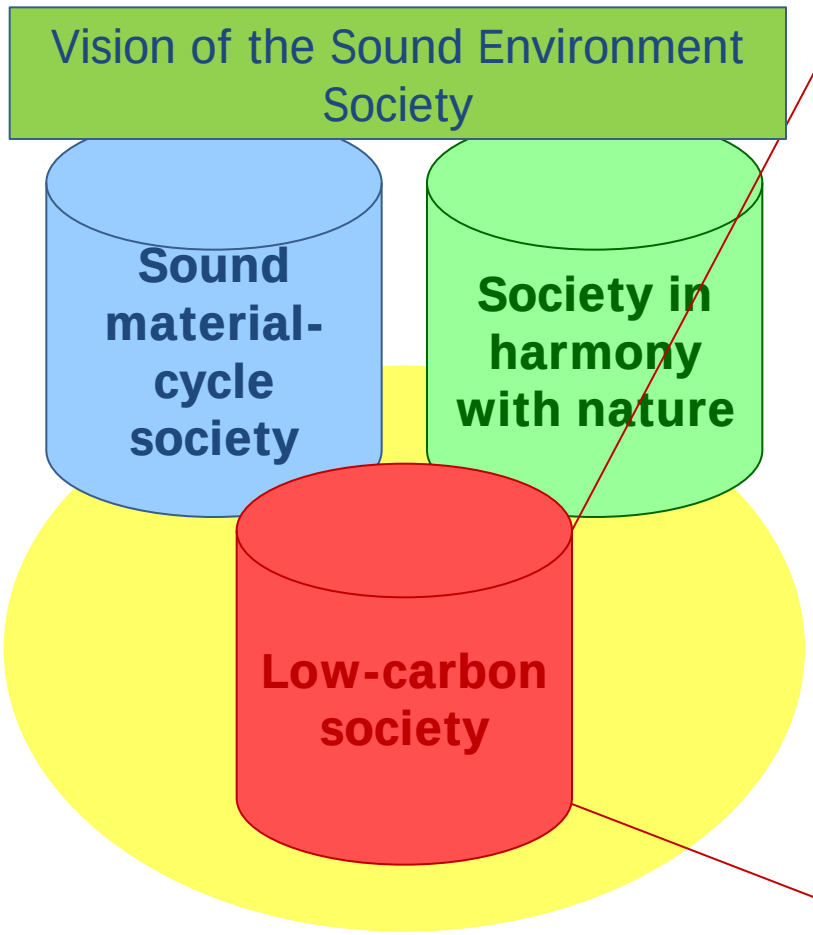


Source: Japan's National Greenhouse Gas Inventory (2012)

(comparison to 1990) [comparison to 2010]

Outline of Japan's Climate Change Policies

4th Basic Environment Plan
(Cabinet Decision in April 2012)



Long Term Target in 2050
80％ reduction from 1990

The Law for Promotion of Global Warming Measures
(Adopted in 1998, revised in 2002, 2005, 2006 and 2008)

KP target achievement plan

National Inventory

Accounting and Reporting

Trading in Kyoto Mechanisms

Center for Climate Change Actions, Promoters

⋮

Kyoto Protocol Target Achievement Plan (FY2008-2012)

✓The KP Target Achievement Plan (decided by the Cabinet in March 2008) sets out detailed emission targets by GHGs and sectors, removals and use of KP credits.

Target of Reduction and Removal of GHGs

	Protocol Base Year	Target Emissions in FY2010*	
		Emissions	**Base-year total emissions ratio**
Energy-originated CO_2	1,059	1,076 – 1,089	**+1.3% – +2.3%**
Industrial sector	482	424 – 428	-4.6% – -4.3%
Commercial and other sector	164	208 – 210	+3.4% – +3.6%
Residential sector	127	138 – 141	+0.9% – +1.1%
Transport sector	217	240 – 243	+1.8% – +2.0%
Energy industries sector	68	66	-0.1%
Non-energy-originated CO_2, CH_4, N_2O	151	132	**-1.5%**
Non-energy-originated CO_2	85	85	0.0%
CH_4	33	23	-0.9%
N_2O	33	25	-0.6%
Three fluorinated gases	51	31	**-1.6%**
HFC	20	22	0.1%
PFC	14	5	-0.7%
SF_6	17	4	-1.0%
Greenhouse Gas Emissions	1,261	1,239 – 1,252	**-1.8% – -0.8%**
CO2 removal by sinks			**-3.8%**
Kyoto Mechanisms			**-1.6%**

* The Law for Promotion of Countermeasures to Global Warming was adopted in 1998, revised 4 times in 2002, 2005, 2006 and 2008.

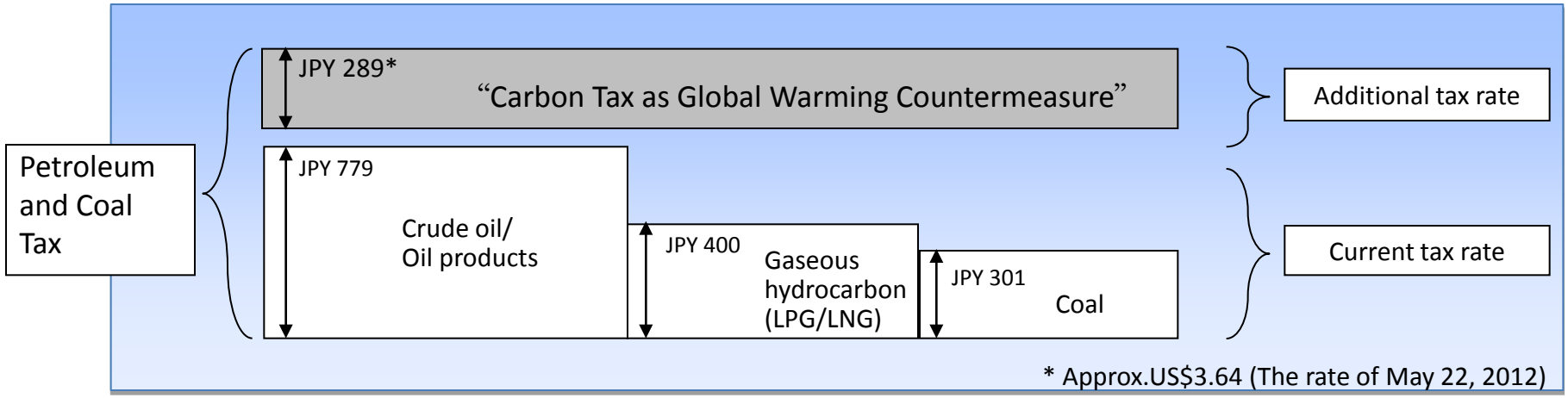
** Estimation of emission shows emissions where countermeasures' effect is maximum and where it is minimum.. While the maximum case should be pursued, the estimation is set to clear the Kyoto Protocol target even in the minimum case.

Carbon Tax

✓Tax rate corresponding to the amount of CO_2 emissions for all fossil fuels (JPY 289/t-CO_2)
✓Enforced from Oct. 2012 and will increase the tax rate over 3 and a half years by Apr. 2016
✓All the tax revenue will be allocated for curbing energy-oriented CO_2 emissions

Tax Rate

Tax Rate per t-CO_2 of "Carbon Tax as Climate Change Countermeasure"



Phase-in Enforcement

Object of Taxation	Current Tax Rate	From Oct. 1, 2012	From Apr. 1, 2014	From Apr. 1, 2016
Crude oil/Oil products [per 1 kl]	(JPY 2,040)	+ JPY 250	+ JPY 250	+ JPY 260
		(JPY 2,290)	(JPY 2,540)	(JPY 2,800)
Gaseous hydrocarbon [per 1 t]	(JPY 1,080)	+ JPY 260	+ JPY 260	+ JPY 260
		(JPY 1,340)	(JPY 1,600)	(JPY 1,860)
Coal [per 1 t]	(JPY 700)	+ JPY 220	+ JPY 220	+ JPY 230
		(JPY 920)	(JPY 1,140)	(JPY 1,370)

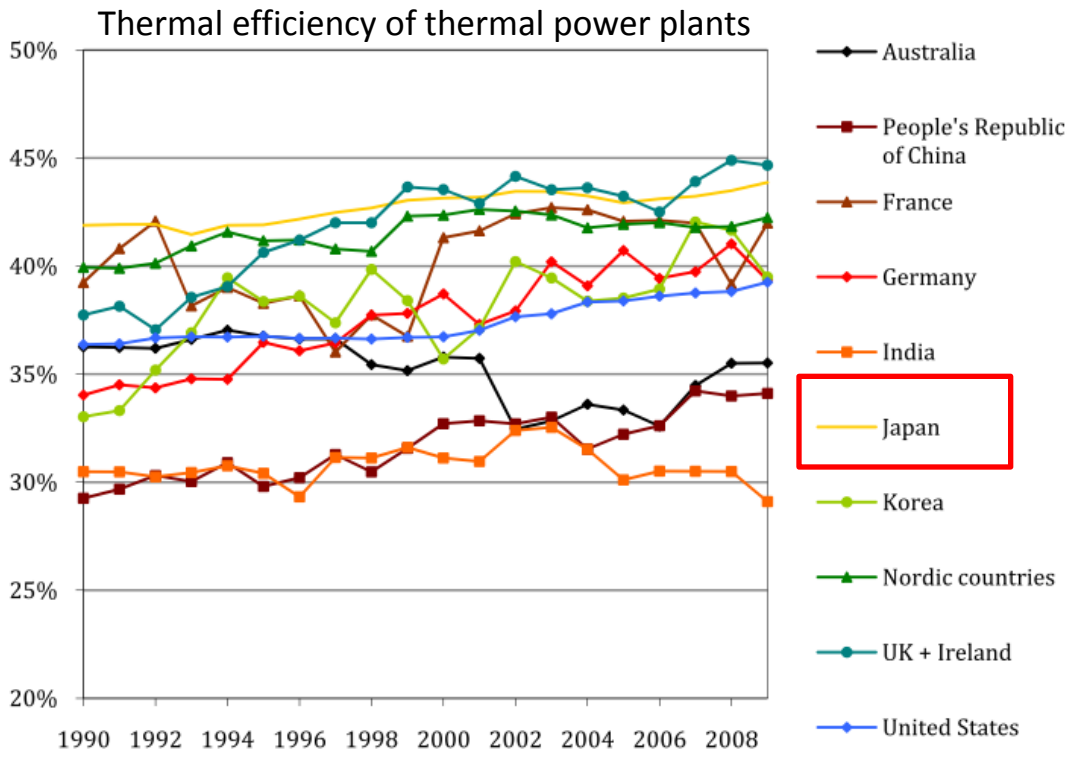
Tax Revenue

[1st year] **JPY 39.1 billion** ; [Normal year] **JPY 262.3 billion** (about US$3.31 billion)

To be used for introduction of renewable energy and enhancement of energy-saving measures, etc.

Thermal efficiency improvements in thermal power plants

- ✓Efficiency of thermal power plants in Japan has gradually improved: 44% in 2009, which is the world top-class.
- ✓This was driven by introduction e.g. LNG combined-cycle electric power generation, an improvement of combustion temperature of gas turbine and high efficiency of boiler-turbines.

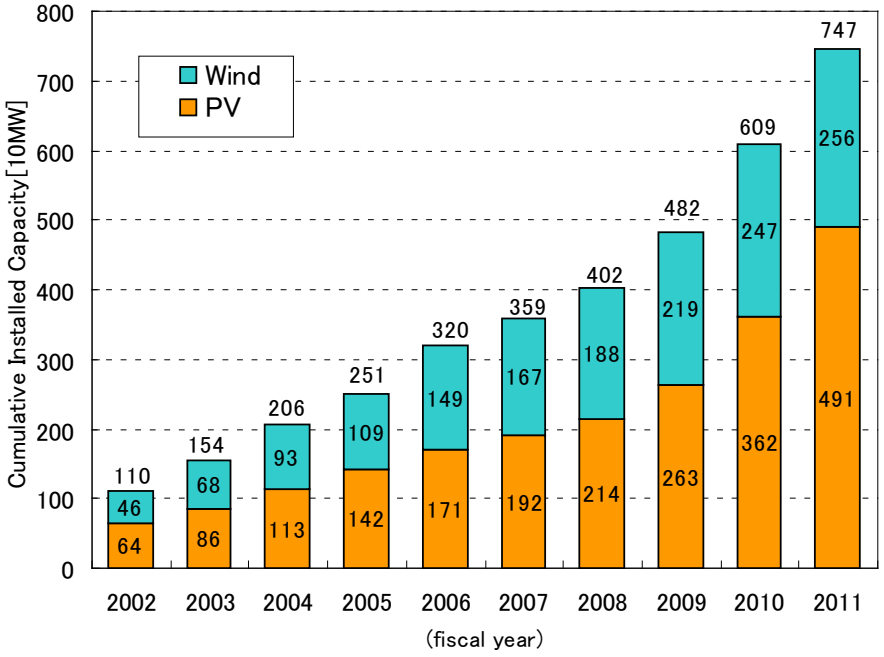


Source: International Comparison of Fossil Power Efficiency and CO2 intensity (2012) (ECOFYS)

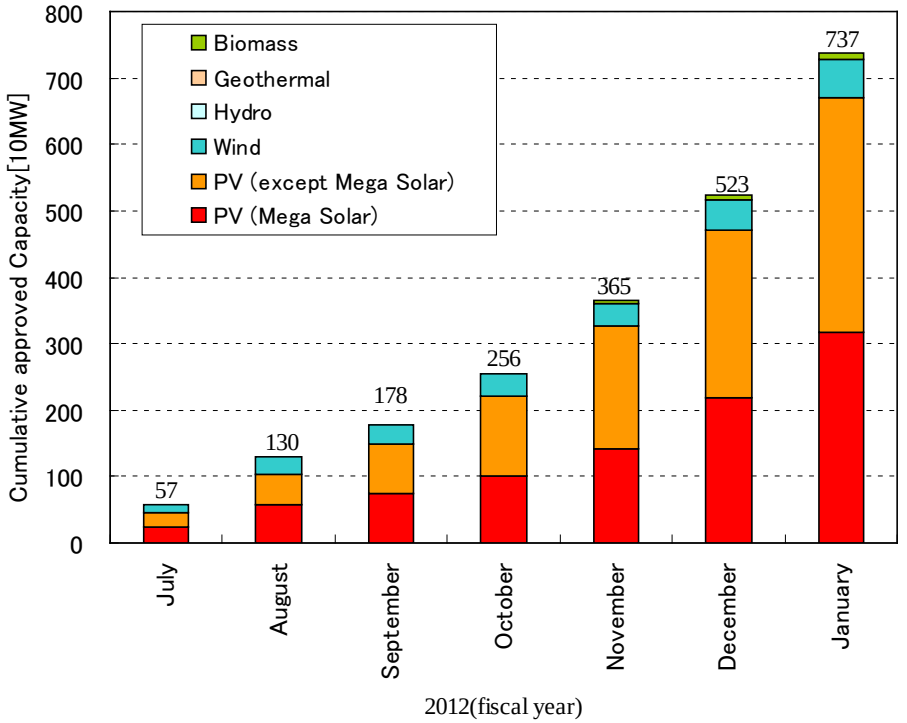
Deployment of Renewable Energy

- ✓The use of RE has been enhanced by the commencement of Feed-in Tariffs(FIT) in July 2012, and the installed-capacity for 7 months from July 2012 to the end of January 2013 increased up to approximately 7,300 MW.
- ✓7,470MW of Wind and Solar PV was installed by 2011, and approximately the same amount has been approved within less than a year after the introduction of FIT.

Cumulative Installed Capacity before FIT



Cumulative Approved Capacity under FIT※



※ Cumulative approved capacity is different from installed capacity". It shows capacity of RE power plants approved by the minister of METI which may not always be installed and operated.

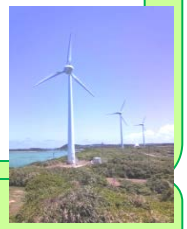
Source: JPEA, JWPA, METI and other organizations

Feed-in Tariffs (FIT) for renewable energy

Business

Those engaged in power generation business using RE

1.Solar PV
2.Hydro (>30,000 kW)
3.Wind
4.Geothermal
5.Biomass



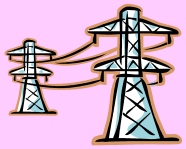
Home

Those who generate power at home
Ex: Solar PV for residences (>10kW)

Sell electricity from RE sources

Purchase electricity at a fixed price for a specified period

Electricity utility



Supply Electricity

Collect surcharge together with the electricity charge

Electricity customers

After open examination at the third party committee, the purchase price and the purchase period shall be decided.

Example of the purchase price and the purchase period — April 2012

Source	Capacity or Category	Rate, tax incl. (JPY per kWh)	Period (year)
PV	≥ 10 kW	42.00 yen	20
	< 10 kW	42.00 yen	10
Wind	≥ 20 kW	23.10 yen	20
	< 20 kW	57.75 yen	

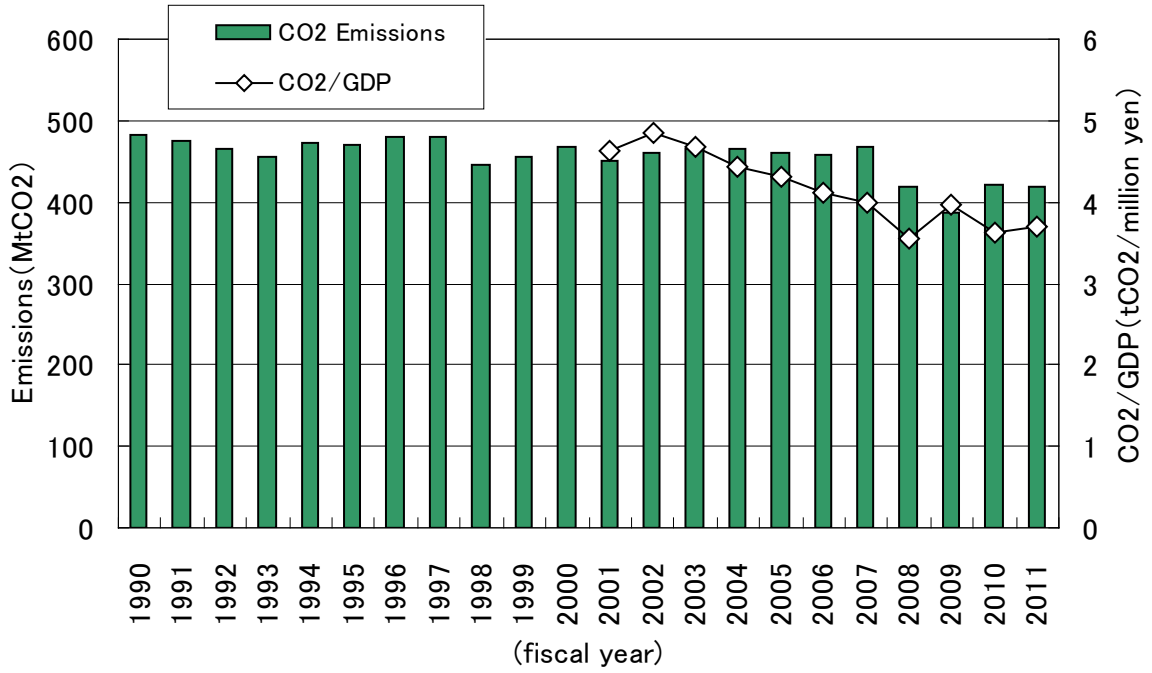
(1 yen ≈ 1 euro cent)

Source: "Feed-in Tariff Scheme for Renewable Energy" (METI, October 2011)

CO_2 Emissions in the Industry sector

- ✓The CO_2 emissions from the industry sector in 2011 has decreased significantly by 13.1% compared to 1990.
- ✓The emissions per unit of GDP has been decreasing significantly: 20.1% reduction from 2001.

Trend in CO_2 Emissions and CO_2/GDP in the Industry sector (after distributing electricity and heat)



Source: Japan's National Greenhouse Gas Inventory (2012)

GHG Emissions Accounting, Reporting and Disclosure Program

✓Large scale emitters are obligated to count and report their GHG emissions, and the government collects the data and publishes them.

① Covered entities calculate their emissions and report the emission information

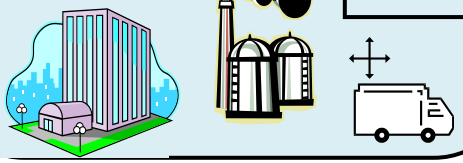
② The competent ministers compile the reported information

③ The notified information is publicly announced/disclosed to the general public.

Specified emitters

Business operators, etc. (including public sector that emit considerably large amounts of GHG are covered.

Calculation



Reporting

Government

Public Announcement
The emission information are made public.

Reading

Disclosure
The emission information on a specific operator is disclosed upon request.

Requests

General public, business operator

※ Emitters may submit relevant information such as the reason of increases or declines in its emissions.

※ If a specified emitter considers that its competitive interests could be harmed by a public announcement of its emissions data, then the emitter may request the protection of its rights and interests.

※Penalty is provided for reporting-obligation violation or false report.

Guidelines for GHG Emission Control

✓Based on the Law on Promotion of Global Warming Countermeasures, the government developed the guidelines for industry, service, waste management sectors respectively which business operators of each sector would follow.

measures

(1)Measures that contribute to GHG control in business activities (Industry, service, waste management sectors)

★Activities for the proper and effective implementation

・Management of the emission amounts, facilities installation and operation status
・Collection and organization of the information
・Implementation of PDCA

★Measures for emission control, etc

・Present measures regarding how to select and use facilities,
Ex) Updating to energy efficient boilers / Improvement of thermal efficiency / Maintenance of heat source facilities etc.

(2)Measures that contribute to GHG control by provision of products used by consumers

★General measures

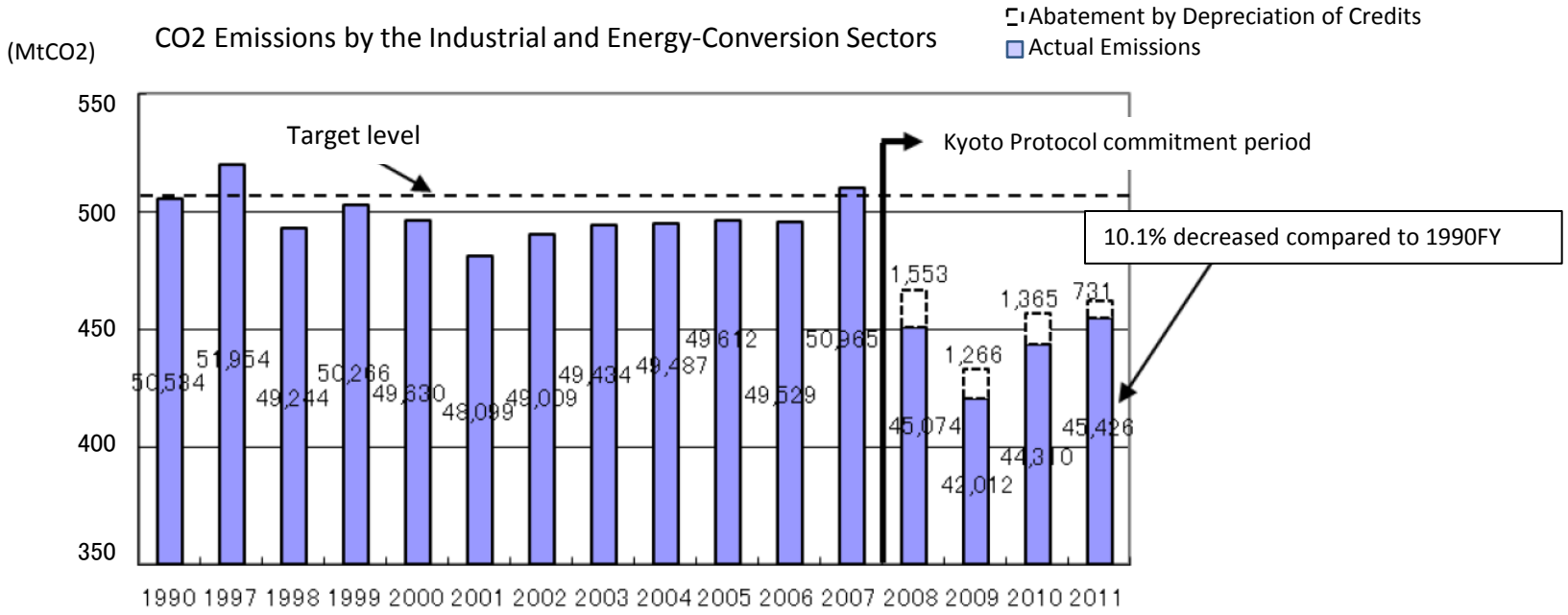
・Manufacture of high energy efficient products
・Provision of the information through the use of "visualization“ such as carbon footprint system, etc.

★Concrete measures

・Present the measures to be taken for the manufacture of apparatus
Ex) Lighting, heating and cooling equipment etc.

Voluntary Action Plan of Japan Business Federation

- ✓ Nippon Keidanren (Japan Business Federation) took the lead in formulating Voluntary Action Plan on the Environment, and established the target of controlling CO_2 emissions in FY2010 below FY1990 levels. In addition to this Voluntary Action Plan, individual businesses in sectors including commercial and other and transport, both affiliated and unaffiliated with Nippon Keidanren, have set up GHG emissions reduction.
- ✓ These voluntary action plans cover approximately 80% of the emissions from the industrial and energy conversion sectors, and around 50% of those from all sectors.
- ✓ The voluntary Action Plan is placed as an important component of Kyoto Protocol Target Achievement Plan and the progress is reviewed deliberately every year. This is an unique example of collaboration between the government and private sectors as the effectiveness of voluntary action is enhanced by being authorized by government.

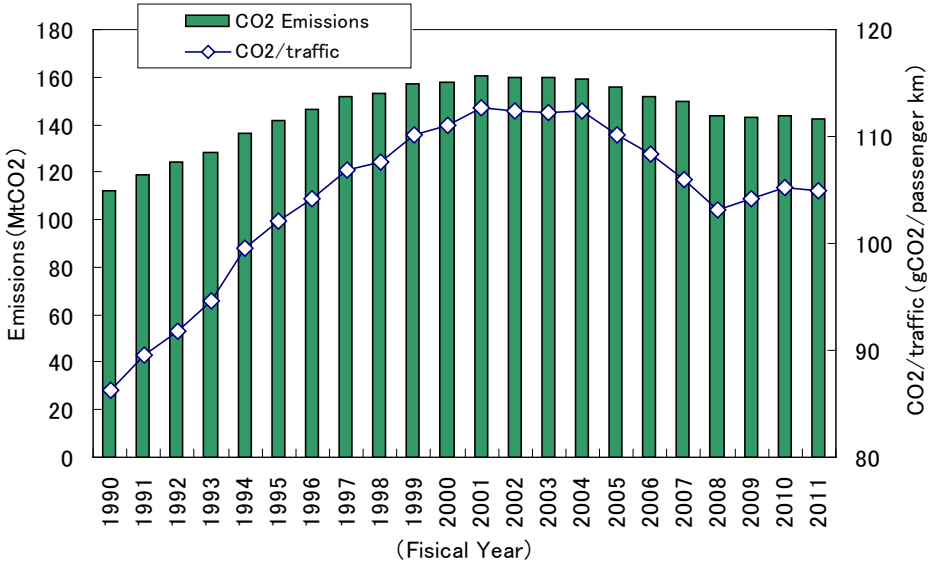


Source: Results of the Fiscal 2012 Follow-up to the Voluntary Action Plan on the Environment (Summary)
—Section on Global Warming Measures— < Performance in Fiscal 2011 > (Keidanren)

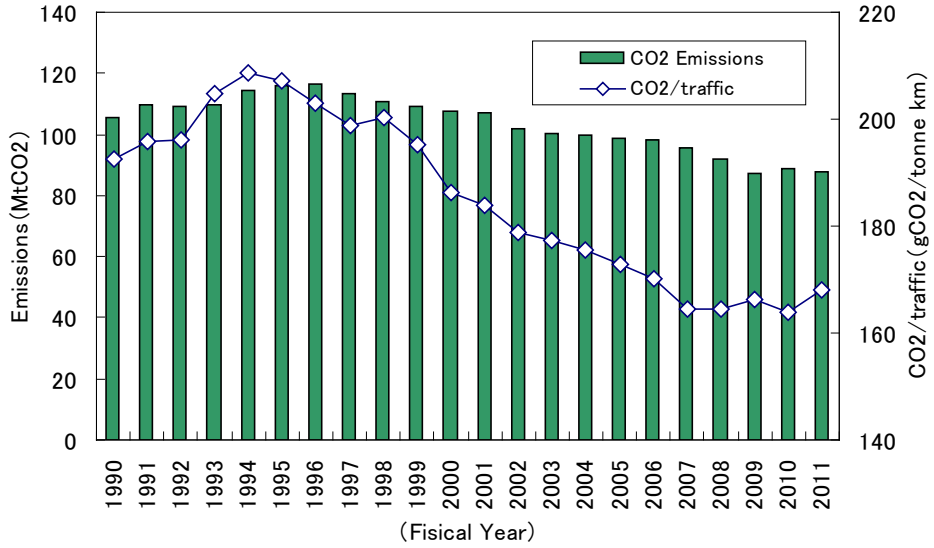
CO_2 emission of the transportation sector

- ✓ CO_2 Emissions from transportation sector has already peaked out, and has had a decreasing trend in recent years.
- ✓ CO_2 Emissions from passenger transport had been increasing since 1990, but has had a decreasing trend since its peak in 2001. The improvement of vehicle fuel efficiency greatly contributes to this.
- ✓ CO_2 Emission from freight transport has had a decreasing trend since its peak in 1996.

Trend in CO_2 Emissions and CO2/traffic from passenger transport



Trend in CO_2 Emissions and CO_2/traffic from freight transport



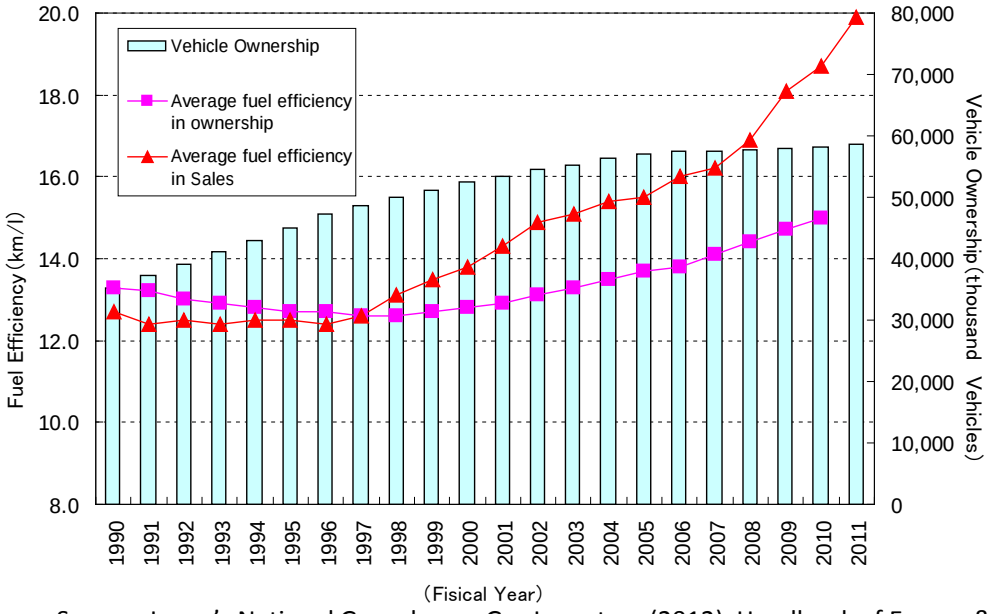
Source: Japan's National Greenhouse Gas Inventory (2012), Handbook of Energy & Economic Statistics in Japan (EDMC), Statistical Report on Motor Vehicle Transport (MLIT)

Measures in the transportation sector

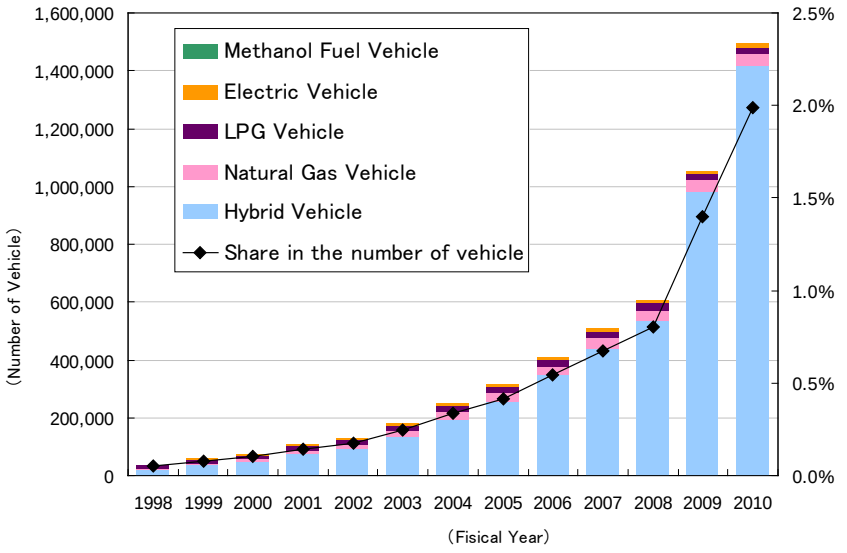
✓The “Top-runner” Fuel efficiency standards based on the most fuel efficient vehicle in keeping with future prospects of the technology development.

✓Green automobile tax, eco-car tax reduction, eco-car subsidy: For the purchase of a fuel efficient vehicle and vehicles with low emissions, a tax reduction and a subsidy for the purchase is granted. It contributed to the expansion of clean energy vehicles.

Trend in average fuel efficiency of vehicle



ownership and ratio of clean energy vehicles



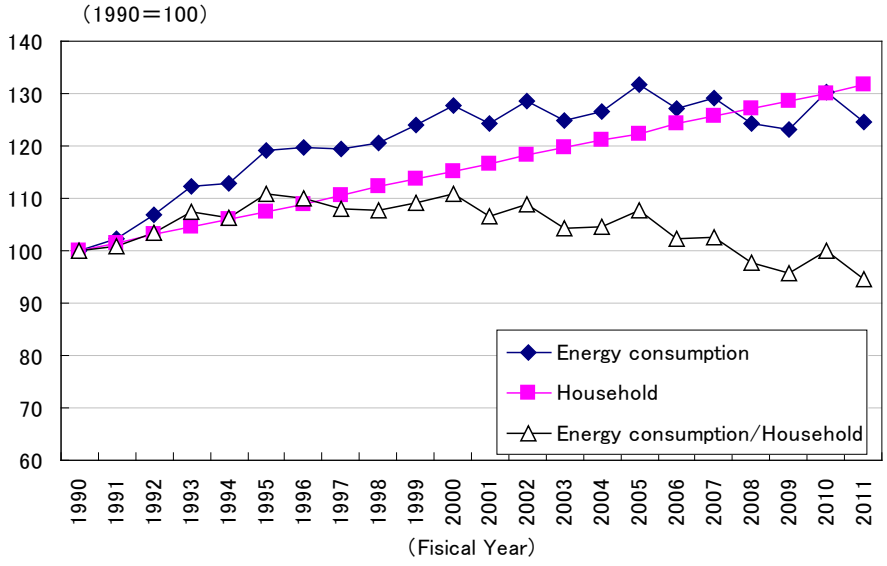
Source: Japan’s National Greenhouse Gas Inventory (2012), Handbook of Energy & Economic Statistics in Japan (EDMC), Statistical Report on Motor Vehicle Transport (MLIT), webpage of Japan Automobile Manufactures Association, webpage of Automobile Inspection & Registration Information Association

Energy consumption of the residential and commercial sectors

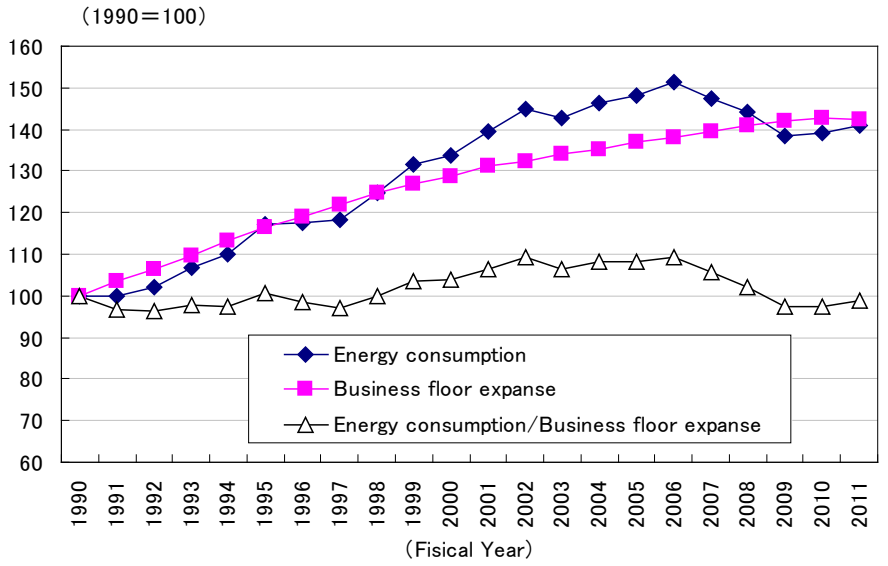
- ✓Increase of the number of households (31.6% increase from 1990) causes of the increase of the energy consumption in residential sector. However, the energy consumption per the household of 2011 is decreased compared to that of 1990.

- ✓Increase of the business floor expanse (42.7% increase from 1990) causes the increase of the energy consumption in commercial sector. However, the energy consumption per the business floor expanse of 2011 is decreased compared to that of 1990.

Trend in Energy consumption, Household and Energy consumption/Household of the residential sector



Trend in Energy consumption, Business floor expanse and Energy consumption/Business floor expanse of the commercial sector



Source: Japan's National Greenhouse Gas Inventory (2012), Population Census (Ministry of Internal Affairs and Communications), Handbook of Energy & Economic Statistics in Japan (EDMC)

Measures in residential and commercial sectors

✓The Top Runner criteria introduced into consumer electronics: Energy consumption efficiency of air conditioning, refrigerator, TV, etc. have improved.

✓Electricity demand control: To respond to the energy crisis after the East Japan Great Earthquake, Japan as a whole tackled to control electricity demand last summer in 2011. As a result, electricity demand was significantly reduced compared with previous years (16% reduction from 2010 on average).

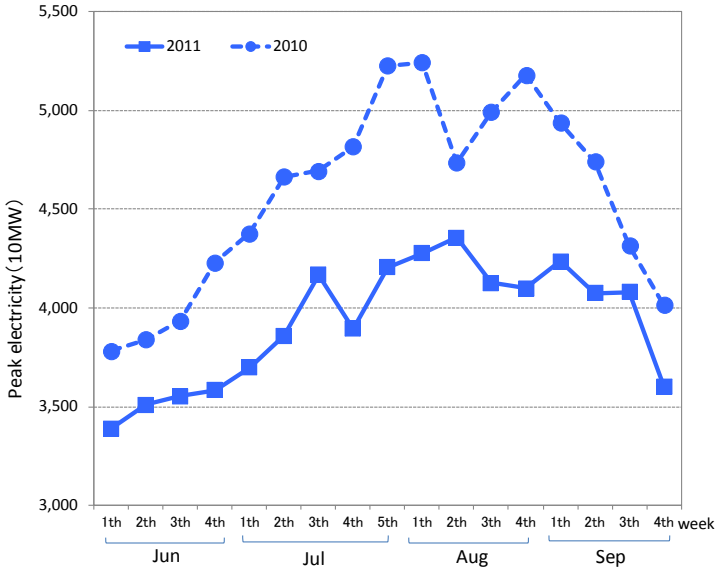
Improvement of average energy efficiency（sales based）

Improvement of energy efficiency	
Equipment	Improvement rate of average energy efficiency
magnetic disk	85.7%(2001→2007)
electronic calculator	80.8%(2001→2007)
air conditioner※	67.8%(1997→2004) 16.3%(2005→2010)
refrigerator	55.2%(1998→2004) 43.0%(2005→2010)
light※	35.7%(1997→2005)
television	29.6%(2004→2008)
freezer	29.6%(1998→2004) 24.9%(2005→2010)
toilet seat	14.6%(2000→2006)

※ criteria based on performance per energy
not ※ criteria based on Consumption

Source: Catalog of energy saving performance of consumer electronics(2012)(METI)

Reduction of electricity demand in East Japan in Jul-Sep. 2011
(in the area where supplied by the Tokyo Electric Power Co.Ltd)

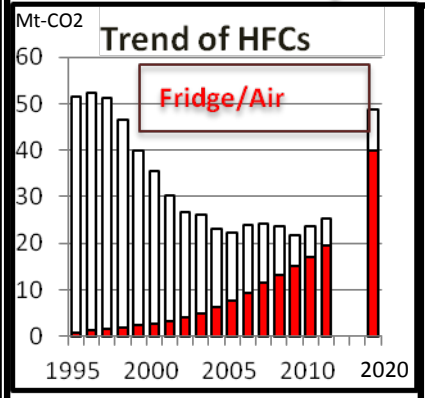


Source: Electric Power System Council of Japan（ESCJ）

Revision of the Law for countermeasures to CFCs, HCFCs and HFCs

Current status

- CFCs emissions reduced significantly.
- On the contrary, emissions of HFCs are increasing rapidly: expected to be doubled in 2020.
- Current scheme obligates to collect and destruct CFCs and HFCs while dumping products which contain CFCs/HFCs only.
- The scheme is not enough due to relatively low collection rate (about 30%) and leakage during the use of products.
- Internationally HFCs countermeasures become more and more important.



Revision planned

Comprehensive measures to cover whole life cycle of CFCs/HFCs

-The government will develop guidelines to reduce emissions at each stage of production and use.

(1)Producers and importers of HFCs: enhance to introduce alternatives (with no or less GWP) and/or reused HFCs

(2) Producers of HFCs containing products: shift to products with HFC alternatives by a target year to be decided for each product

(3) Large-scale Users of the products (e.g. Supermarkets): conduct a periodical check for reducing leakage. measure and report of amount of leakage

(4) Collectors/destructors plus re-users of HFCs: to be designated by local authorities