Regional Workshop on Climate Change Mitigation in the Transport Sector
24-25 May 2006, Asian Development Bank Headquarters, Manila, Philippines

Japanese efforts to reduce CO_2 from the transportation

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Global Carbon Project

www.globalcarbonproject.org

Global Carbon Project

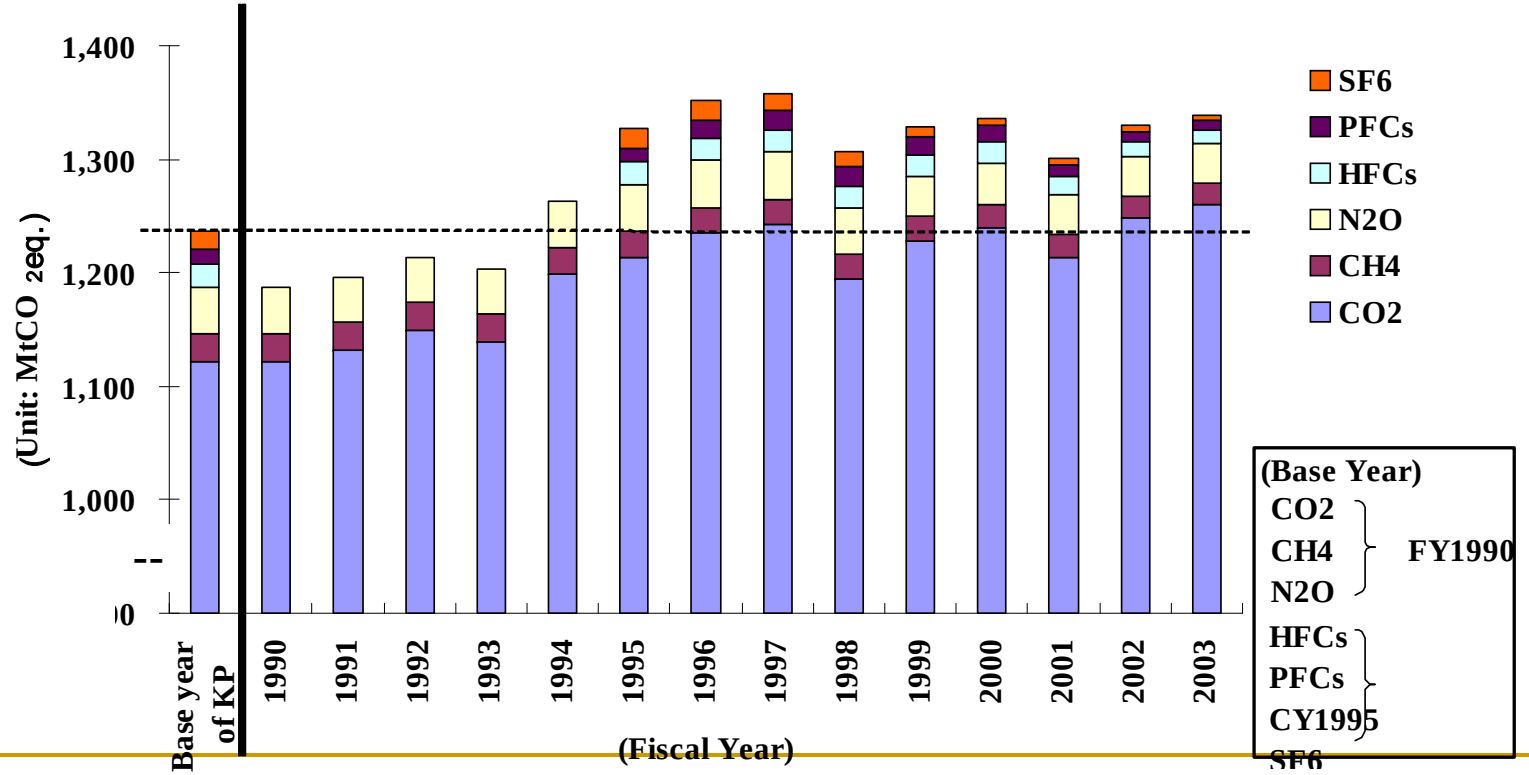
- Cross cutting program of IHDP, IGBP, WCRP, DIVERSITAS
- Guided by International Scientific Steering Committee - Canberra office and Tsukuba Office
- Flagship projects
  - Vulnerability of large scale carbon pools and its management
  - Urban and Regional Carbon Management
- Mexico City Conference "Managing Carbon at Urban and Regional Level: Connecting Development Decisions with Global Issues", September 4-8, 2006
- Series of event including Asia Workshop

Contents

- Trends and structures of GHG emissions including transport sector in Japan
- Overall climate policy of Japanese government
- Kyoto Target Achievement Plan and expectations from transport sector
- Past and expected futures efforts to mitigate GHGs from transport sector
- Discussions of key policy measures
- Future outlook

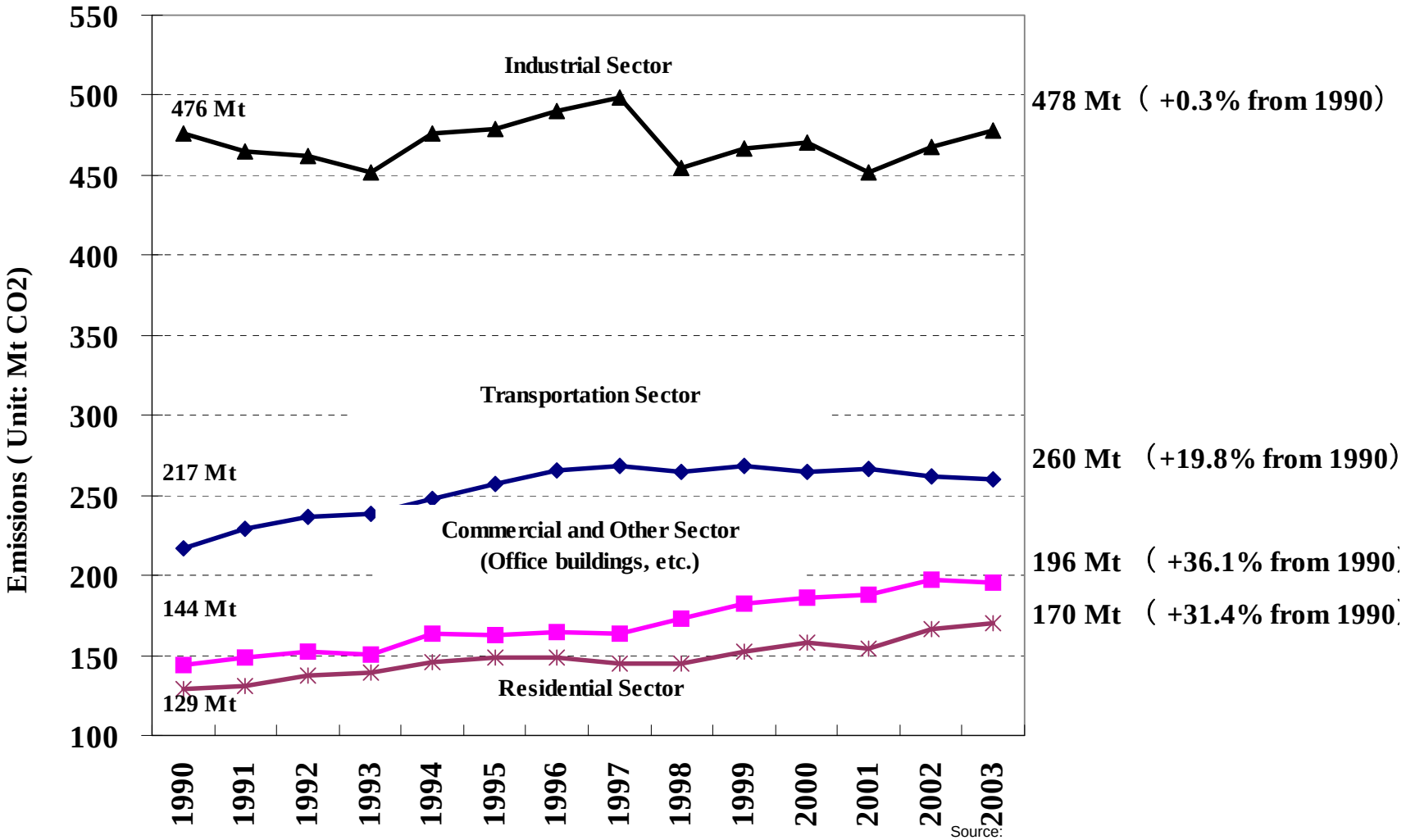
GHG emissions, Japan

- Commitment: 6% reduction from 1990
- Kyoto Protocol ratification: June 2002



Source:
Greenhouse Gas Inventory Office, NIES, Japan
http://www-gio.nies.go.jp/download/6gas_2005E-gioweb.xls

CO_2 emission at a glance: Japan



Source:
Greenhouse Gas Inventory Office, NIES, Japan
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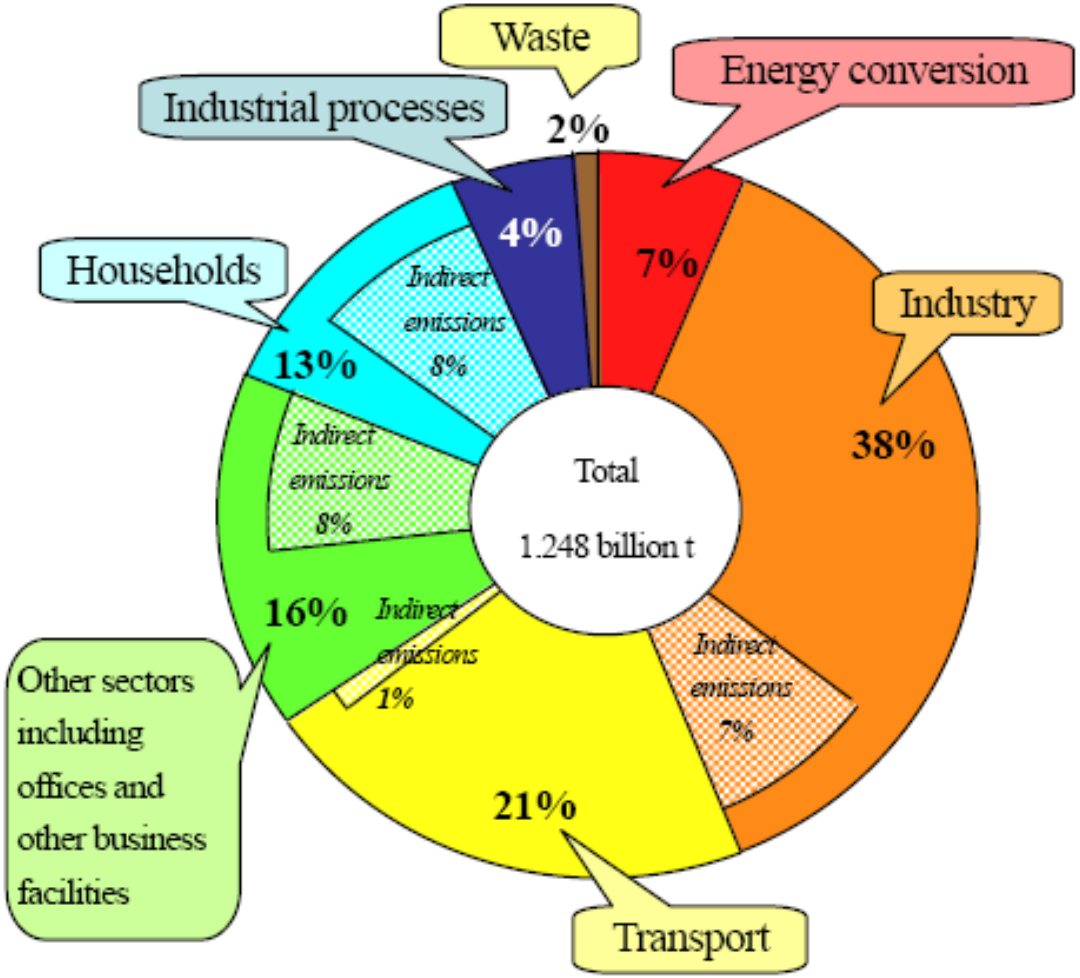
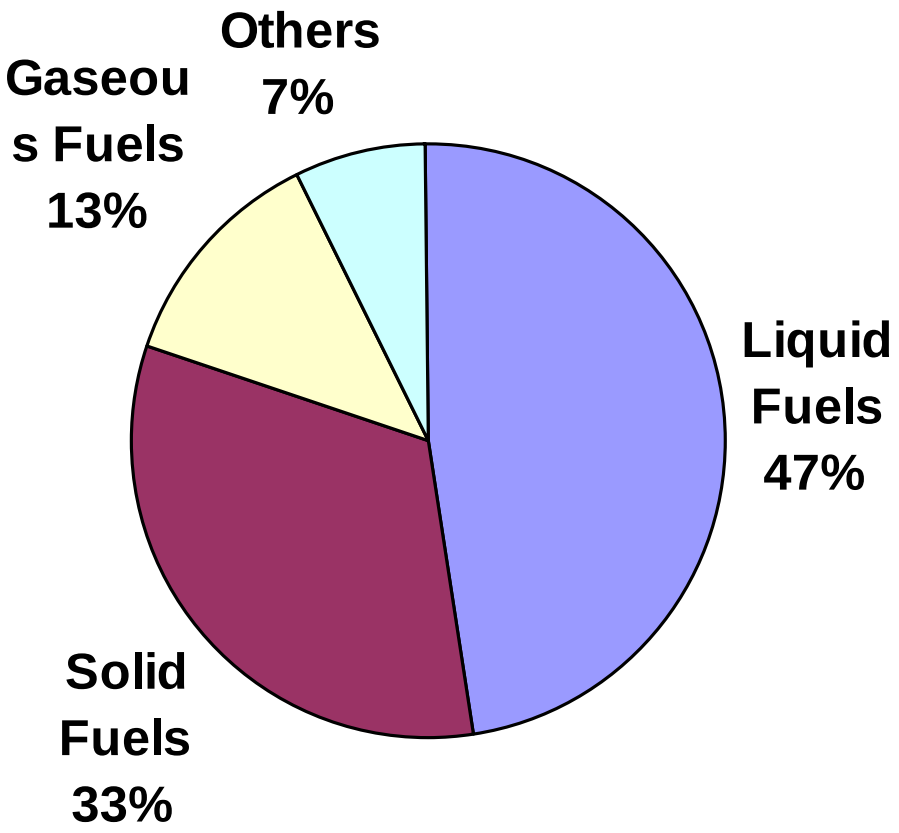
All figures are CO2 only with indirect emission allocated to corresponding sectors

FY 2002 GHG emissions in Japan



Kyoto Protocol Target Achievement Plan, April 28, 2005 MOE, Japan
"Indirect emissions" refers to emissions resulting from power generation by power suppliers, etc.

Share of fuels in CO_2 emissions in Japan (2003)



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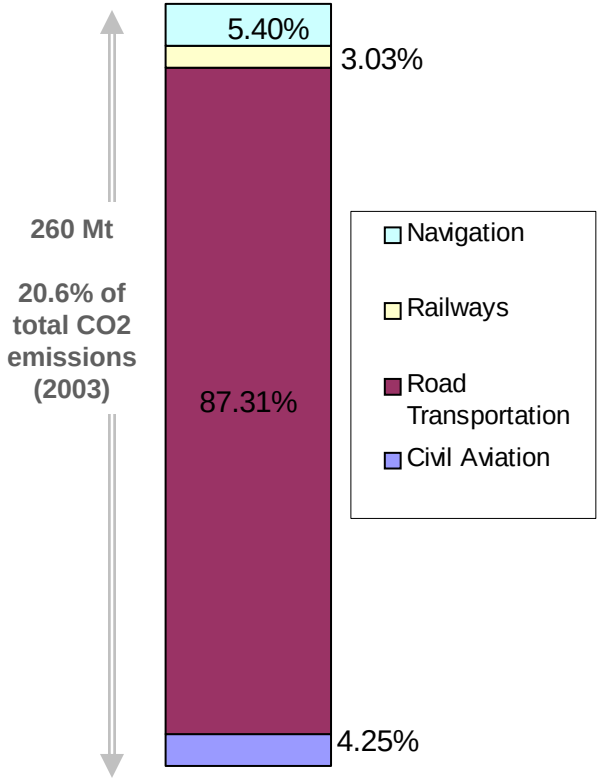
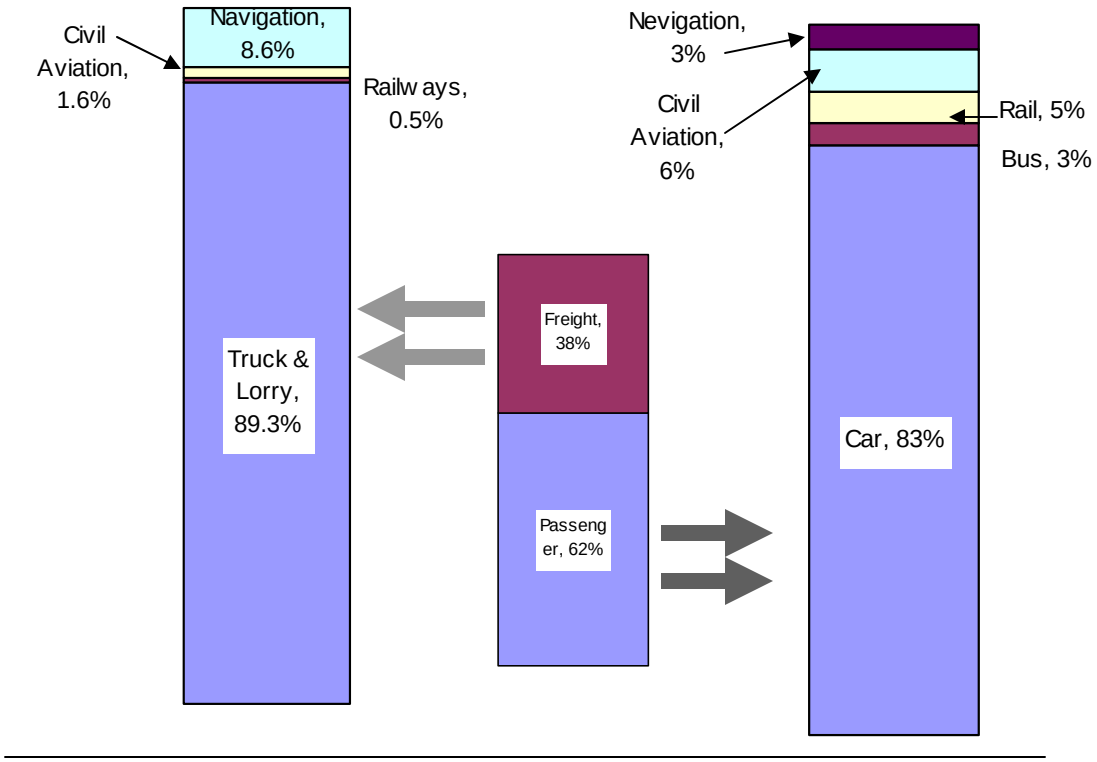
Shares in CO_2 emissions in FY 2003-Transportation





- Passenger cars contribute 51% (133 Mt) of total transport sector (260 Mt) CO2 emissions in 2003 in Japan
- Pass cars + trucks and lorries contribute 86% (222 Mt)

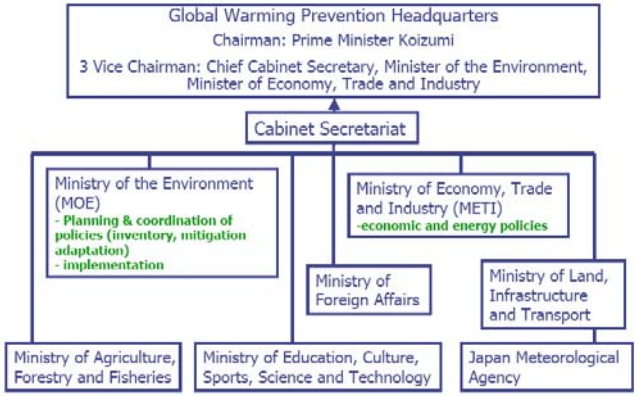
Source:
Prepared by author based on data from Greenhouse Gas Inventory Office, NIES, Japan, http://www-gio.nies.go.jp/download/6gas_2005E-gioweb.xls
All figures are CO2 only with indirect emission allocated to corresponding sectors (i.e. indirect included)

Progress of Climate Policy

- Action Program to Arrest Global Warming (1990)
- Establishment of Global Warming Prevention Headquarters
- Outline for Promotion of Efforts to Prevent Global Warming (1998)
- The Law Concerning the Promotion of Measures to Cope with Global Warming (Law No. 117 of 1998)
- Basic Policy on Measures to Tackle Global Warming (1999)
- Revised Outline for Promotion of Efforts to Prevent Global Warming (2002)
- Kyoto Protocol Target Achievement Plan 2005 (required by 1998 Law)

Climate change efforts at national level

- Global Warming Prevention Headquarters
  - Established immediately after COP3
- Law concerning the Promotion of the Measures to cope with the Global Warming (enacted in October 1998)
  - First country to have enacted a Law with the aim of promoting measures to address climate change
  - Shared responsibility
  - Mandates national and local governments to formulate their "Climate Change Action Plans"
  - Devises information and activity centers for climate change at the level of national and prefectural governments- supported by government but managed by various actors



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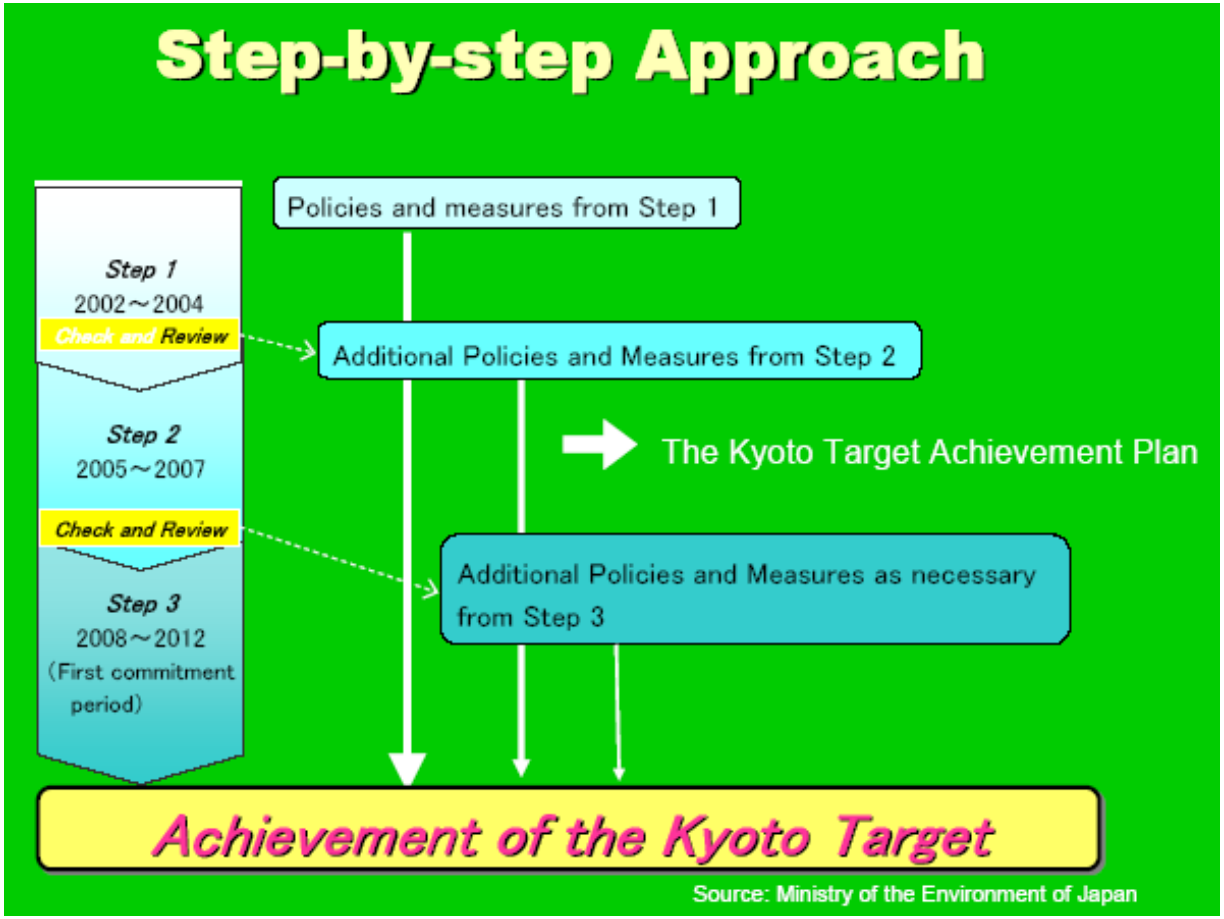
Climate change policy

- Revised general principles and guidelines (2002 March)
  - Contributing to both environment and economy
  - Adopting a step-by-step approach in implementing policies and measures (first review in 2004, second review in 2007)
  - Sharing responsibilities, national government, local governments, businesses and citizens; focusing on commercial, households and transport sectors; promoting volunteering actions among businesses
  - Ensuring international cooperation

Step-by-step approach at glance



General Principle to Promote Measures to Counter Global Warming

1. Comprehensive and deliberate promotion of global warming measures

2. Promotion of measures to reduce CO_2 emissions, centered on measures in both energy demand and supply aspects

[Reduction of the energy derived CO_2 emission]
[Promotion of measures to reduce CO_2 emissions in the energy demand aspect (energy conservation)]
1) Sound implementation and follow-up of the voluntary action plan
2) Drastic energy management
3) Enhancement of energy efficiency in electric appliances
4) Improvement of energy performance in residences and buildings
5) Measures for automobiles and traffics
6) Establishment of traffic system inducing smaller environmental impact (load).
7) Development and dissemination of new energy-conservation technology etc.

[Promotion of measures to reduce CO_2 emissions in the energy supply aspect]
1) Measures for new energy
2) Promotion of nuclear power
3) Promotion of nuclear power

3. Promotion of measures to reduce emissions of non-energy derived CO_2, methane, and dinitrogen monoxide emissions

4. Promotion of measures to reduce the 3 gases, such as promoting CFCs substitute

1) Efforts by now
2) Measures and policies for future

5. Enhancement for research and development of innovative environmental and energy technologies

6. Enhancement for more activities to prevent global warming by the public in different fields

1) Building infrastructure to promote the actions to prevent Electric Heater Evaluation Criteria Subcommittee (Energy Conservation Div.)

7. Promotion of measures for the GHG absorbing source

1) Promotion of forest and forest industry
2) Promotion of afforestation in cities

8. Active utilization of the Kyoto Mechanism

1) Policy, etc. necessary to implement the Kyoto Mechanism
2) Basic concept

9. Other

1) Facilitation to figure out and announce to the public the amount of the GHG emissions, and the unit consumption
2) Facilitation to figure out the amount of the GHG emissions derived from the energy consumption in the household
3) Active utilization of policy mix

Measures for automobile and traffics

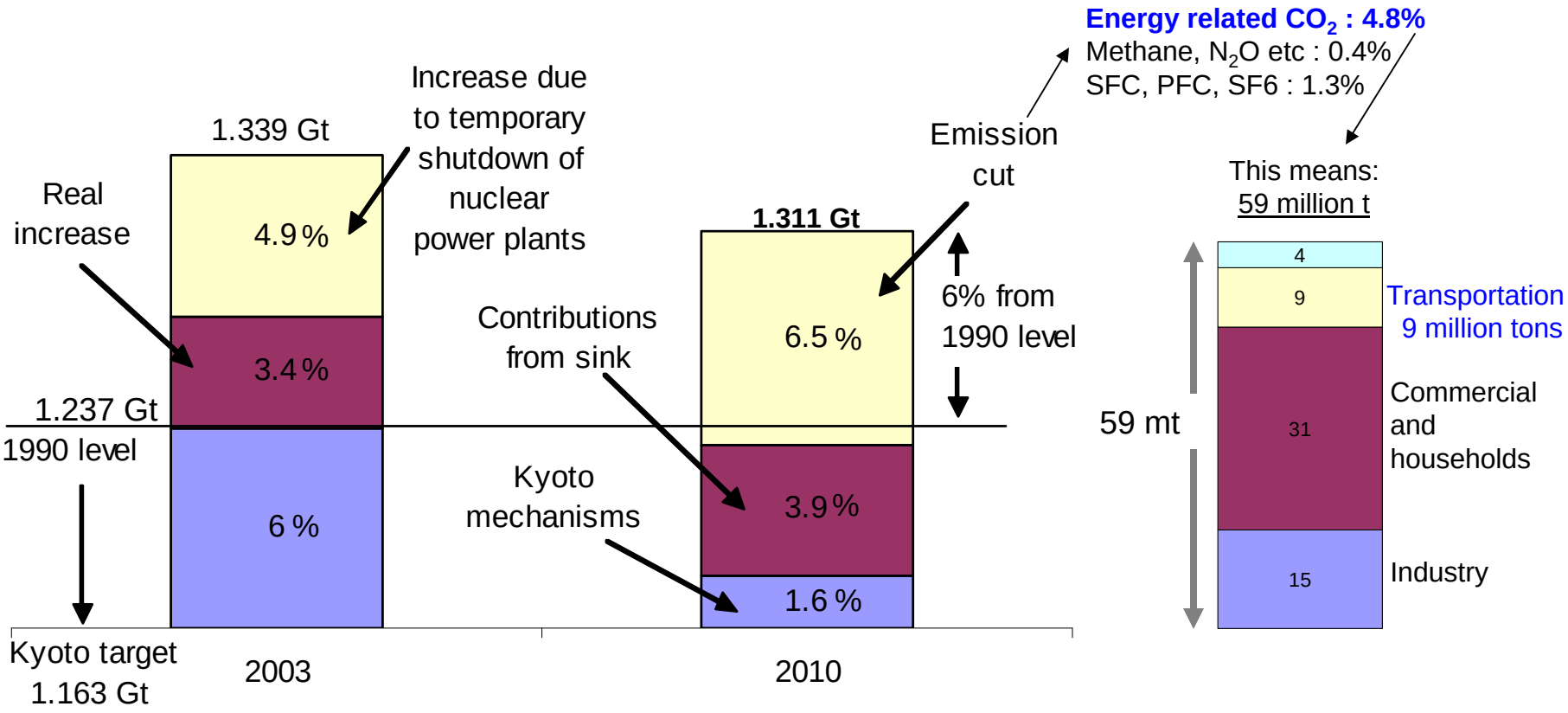
Establishment of traffic system inducing smaller environmental impact

MOE, 2002

Climate change policy

- Promotion of more than 200 measures and action plans
- Promotion of energy efficiency improvements
- Amendment of the Law Concerning the Rational Use of Energy (Law No. 49 of 1979; called “Energy Conservation Law”)

Outline of Japan's Kyoto Achievement Plan 2005 in figure

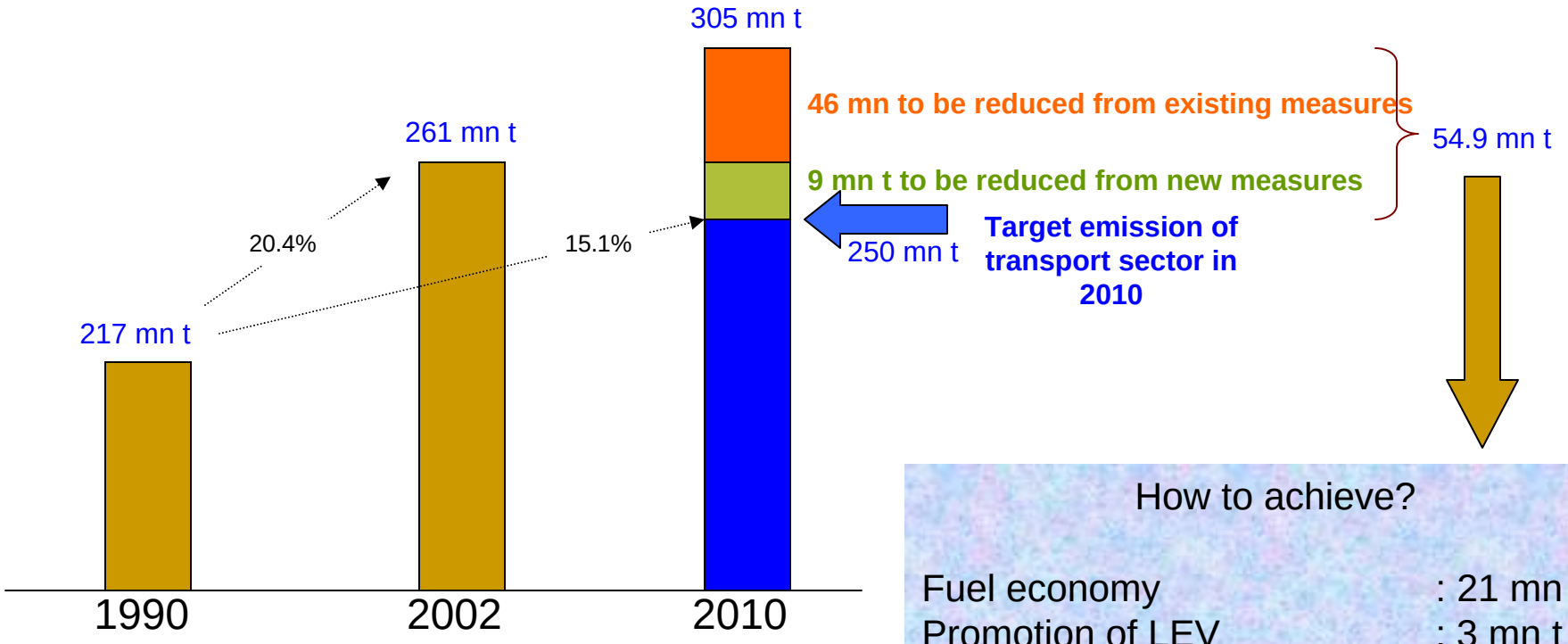


6% emission increase in 2010 from 1990 (12% to be reduced considering Kyoto target) is expected. It includes emission reduction from current counter-measures that are already in place as well as expected rise in emissions from economic growth

All data are on CO_2 equivalent
All years are Fiscal years

Source: Compiled from MOE documents on Kyoto Protocol Achievement Plan by author

CO_2 emissions and target to meet Kyoto target from transportation



How to achieve?

Fuel economy	: 21 mn t
Promotion of LEV	: 3 mn t
Sulfur free fuel	: 1.2 mn t
No vehicle idling	: 0.6 mn t
Heavy duty vehicle speed limit	: 0.8 mn t
Improved traffic flow	: 28.3 mn t

All units are CO2 equivalent
All years are Fiscal Year

Prepared by author from: Kyoto Target Achievement Plan, 2005, MOE Japan and GHG Inventory of Japan

Rounding has been done: the exact no is 304.9 mn t for 2010.

Factors behind GHG emission growth in transportation in 1990-2002

- Trucks and public transport - almost no change but did not reduce emissions
- Passenger cars – greatly increased

Transport sector's policy target in Kyoto Achievement Plan, 2005

- Sound implementation of existing counter-measures
- About 9 million tons additional emission cutback is needed from FY 2010 scenario – this scenario has already considered what can be achieved from existing policies and measures
- Additional measures are necessary
- Key focus:
  - Steadily promoting countermeasures in the trucks and public transport systems
  - Placing priority on formulating effective countermeasures on passenger cars for personal use

Target activities in Kyoto target Achievement Plan, 2005

- Promoting public means of transport including rail
- Promoting eco-driving including anti-idling
- Improving transport infrastructure for smooth traffic flow and promoting ITS
- Realizing EST in few pioneering regions

Key ongoing measures

- “Green” taxation scheme for vehicles and fuels (2001)
- Accelerated introduction of vehicles achieving “Top Runner Standards” (started in 1998)
- Financial support for acceleration of R&D and dissemination of low emission vehicles including clean energy vehicles (2001 action plan)
- Promotion of efficient logistics systems including shift of transport modes from trucking to shipping, modernization of railway infrastructure to allow for freight transport (2000)
- Promotion of public transport utilization; support to the development of railways and other non-road means of transport

Top-runner scheme

- Introduced in FY1999 based on the Energy Conservation Law
- Manufacturers and importers are obliged to meet the target energy efficiency standard set on the basis of the most energy efficient products of the same in the market
- Scope expanded- 18 type of products including passenger vehicles and freight vehicles
- Judging criteria- Weighted average of shipment by product for each product category per manufacturer and importer

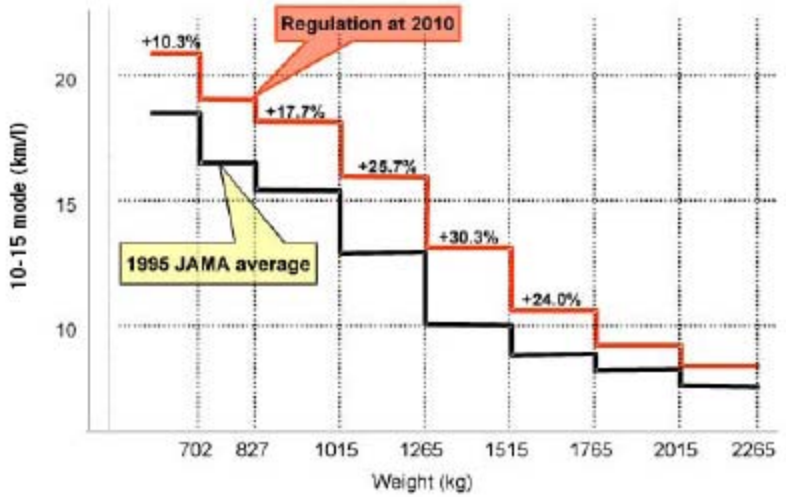
Fuel economy standards under Top Runner Approach

- Fuel economy standards for light-duty passenger and commercial vehicles
  - Gasoline passenger vehicles - 23% improvement in 2010 from 1995
  - Diesel passenger vehicles- 15% improvement in 2005 from 1995
  - 1995 fleet average of passenger vehicle is 14.5 litre/km
  - LPG passenger vehicles- 11% improvement in 2010 from 2001
  - Gasoline freight vehicles- 13% improvement in 2010 from 1995
  - Diesel freight vehicles- 7% improvement in 2005 from 1995

Added in 2003

Vehicle classes by maximum vehicle curb weight		Fuel economy fleet average target by class	
kg	lbs	km/L	mpg (CAFE-equivalent)
<702	<1,548	21.2	49.8
703–827	1,550–1,824	18.8	44.2
828–1,015	1,826–2,238	17.9	42.1
1,016–1,265	2,240–2,789	16.0	37.6
1,266–1,515	2,791–3,341	13.0	30.6
1,516–1,765	3,343–3,892	10.5	24.7
1,766–2,015	3,894–4,443	8.9	20.9
2,016–2,265	4,445–4,994	7.8	18.3
>2,266	>4,997	6.4	15.0

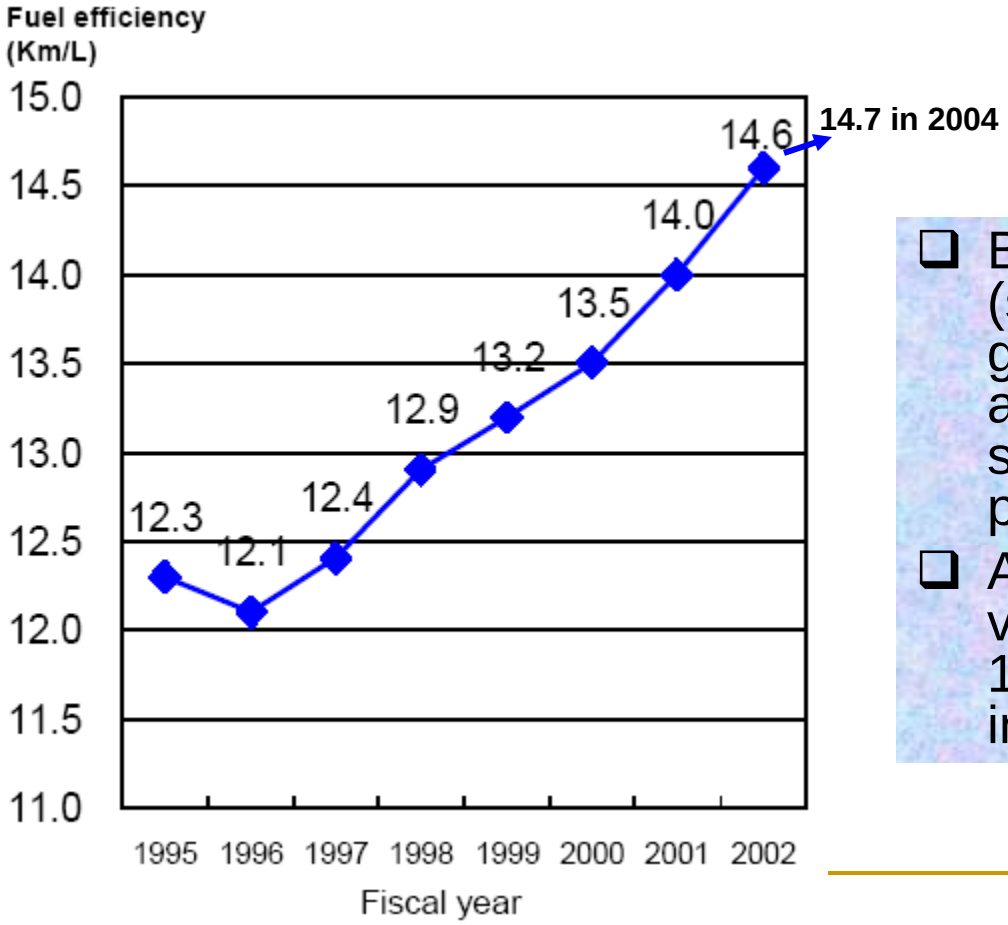
For Gasoline passenger vehicles



For Gasoline passenger vehicles

Compliance rate of Top Runner standards

Trends in average fuel efficiency of gasoline passenger vehicles

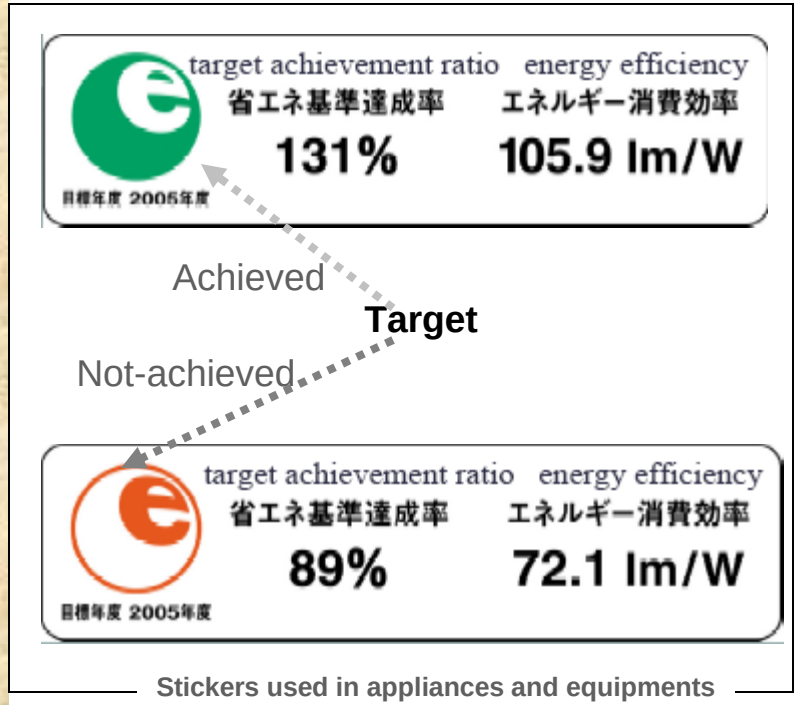


- By FY2003 approximately 80% (shipment basis-new sale) of gasoline passenger vehicles had already achieved the top-runner standards for gasoline passenger vehicles of FY2010
- Average fuel efficiency by vehicles-stock was decreasing till 1997, since then consistently increasing

Source: Energy Conservation center, Tokyo
http://www.enecho.meti.go.jp/english/toprunnner/program.pdf

Fuel economy public disclosure and vehicles labeling system

- Introduced in January 2004 to deepen consumer interests and understanding on fuel economy and promoting efficient cars
- Discloses fuel economy performance publicly for cars of which fuel economy standards are set according to Energy Conservation Law
- Label a sticker on car that conforms to the fuel economy standards



Stickers used in appliances and equipments

FY 2010 fuel economy target achieved car

FY 2010 fuel economy target + 5% achieved car

Use of LEV in government fleets

- LEVs introduced by ministries and agencies
  - FY 2003: 1,676
  - FY 2004: 1,136*
  - All governmental vehicles to be replaced by LEVs by March 31, 2005** (not varified)

http://www.env.go.jp/en/press/2005/0529a.html

* Expected

** Not verified, planned

Minister's car

- Environment Minister's car and its emission performance

Previous official car for the Minister
CNG Century
CO_2 Emissions : 260g/km
NO_2 Emissions : 0.02g/km
PM Emissions : —

Previous official car for private secretary
Prius
CO_2 Emissions : 66g/km
NO_2 Emissions : 0.013g/km
PM Emissions : —

Official car for the Minister in current use

Estima Hybrid

CO_2 Emissions : 127g/km
NO_2 Emissions : 0.02g/km
PM Emissions : —

Source: Minister Koike' Opening Speech at a side event on December 7 at the 11th session of UNFCCC (COP 11) in Montreal, Canada
Ministry of Environment's web-page accesses on 22nd May 2006 from http://www.env.go.jp/en/earth/cc/051208.pdf

Tax incentives for low emission and fuel efficient vehicles – Green tax, 2001

- Tax incentives for fuel efficient and energy efficient vehicles initiated from 2002
- Tax penalties for older vehicles- 10% surcharge to old diesel (11 yr), gasoline and LPG vehicles (13 yr)
- Target: Automobile tax (purchase), Acquisition tax (ownership)
- Hybrid passenger cars
  - 2.2% reduction in acquisition tax
- Electric, CNG, Methanol and hybrid trucks and buses
  - 2.7% reduction in acquisition tax

Source:
Complied by author from METI and MOE documents

What do these incentives mean?

- **Prius - Car price 2.1~2.4 mn yen; Tax incentives 0.2 mn yen**
- **Estima hybrid – About 3.3 mn yen, Tax incentives 0.24 mn yen**
- **Civic hybrid – About 2.1 mn yen, Tax incentives 0.23 mn yen**

☆☆☆☆ Over 75% reduction from 2000 regulation level

☆☆☆ Over 50% reduction from 2000 regulation level

☆☆ Over 25% reduction from 2000 regulation level

Source: Shinsuke Ito, JARI Roundtable, Beijing, October 22, 2005

Promotion of cars with "Idling-Stop" System

- Improve overall fuel economy by about 10%, greater saving is expected in city areas http://www.eccj.or.jp/summary/local0406/eng/02_03_01.html
- Continue to support partial subsidies for purchasing car equipped such system introduced in FY 2003
- PR events for "Idling-Stop"
- Eco-drive Dissemination Liaison Meetings:
  - The National Police Agency, the Ministry of Economy, Trade and Industry, the Ministry of Land, Infrastructure and Transport, and the Ministry of the Environment
- Building and disseminating Eco-drive Management Systems (EMS) for transportation companies

Will Japan meet its CO_2 mitigation target for Kyoto in transport?

- Wait and see…….
- Too much focus on technology and fuel economy – better prospects
- Mode shift and reducing automobile dependency is challenging – focus more on supply side than managing demand
- Role of bio-fuel has not envisioned seriously yet for transport sector for GHG reduction
- Travel activity reduction has received a faint response

Thank you

For suggestions and enquiries, please contact

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Status of CDM in transportation

- Out of 1,192 projects in Point Carbon database , only 206 have reached the PDD stage. (as of Feb 2005 – Browne et al, 2005)
- Out of these 206, only four have been developed for transport sector (as of Feb 2005 – Browne et al, 2005)
- The current CDM projects under pipeline for in transportation are about 10 (as of Feb 2005 – www.cdmwatch.org/)
  - Fuel switch (Bangladesh), ethanol (Brazil, India, Thailand), BRT (Peru, Chile, Colombia), bio-diesel (India), electric mass transit (Peru)

Transport and CDM- Japanese efforts

- Bio-fuel related activities in Indian and Thailand
- Some other projects in Thailand

Category, Target Values

Category	Standard energy consumption efficiency		
	Gasoline	Diesel	LP gas
Vehicles weighing less than 703 kg	21.2	18.9★	15.9
Vehicles weighing 703 or more and up to 828 kg	18.8	18.9★	14.1
Vehicles weighing 828 or more and up to 1,016 kg	17.9	18.9★	13.5
Vehicles weighing 1,016 or more and up to 1,266 kg	16.0	16.2	12.0
Vehicles weighing 1,266 or more and up to 1,516 kg	13.0	13.2	9.8
Vehicles weighing 1,516 or more and up to 1,766 kg	10.5	11.9	7.9
Vehicles weighing 1,766 or more and up to 2,016kg	8.9	10.8	6.7
Vehicles weighing 2,016 or more and up to 2,266 kg	7.8	9.8	5.9
Vehicles weighing 2,266 kg or more	6.4	8.7	4.8

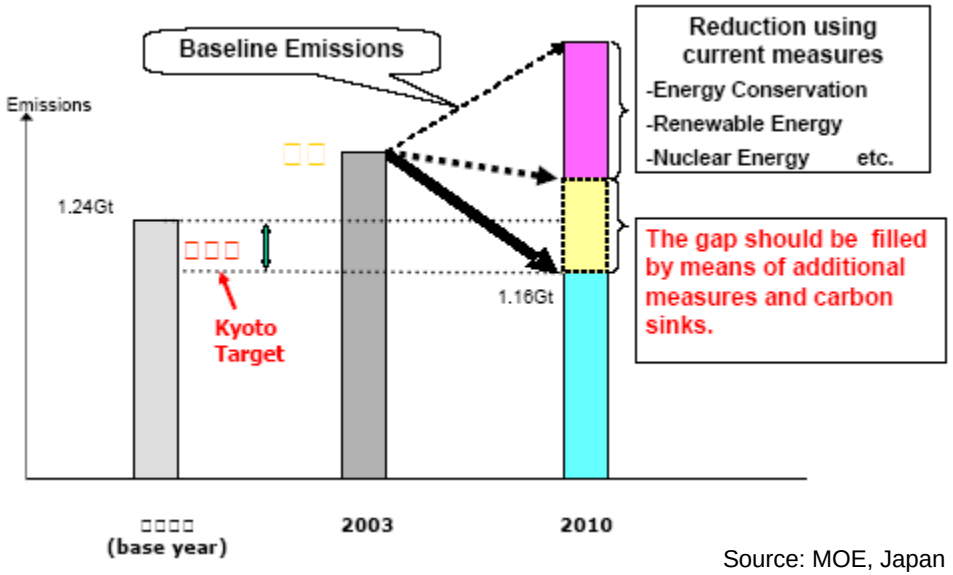
★The vehicle weight is less than 1,016 kg

Efforts at the level of industries

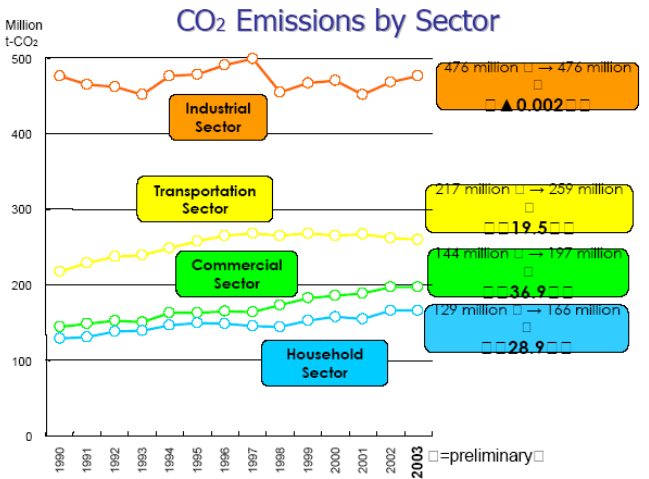
- *1997 Keidanren* Voluntary Action Plan on the Environment
  - Established the target of limiting CO2 emissions in FY2010 to under ±0% of FY1990 levels
  - To date 34 industries have formulated voluntary action plans on the environment establishing quantitative targets
  - These action plans now cover approximately 80% of the industrial and energy conversion sectors.
- Each industrial classification voluntarily decides which of four indicators it will select as targets of the voluntary action plan for their own industrial classification
  - Energy intensity, energy consumption, carbon dioxide emissions intensity, carbon dioxide emissions

Commitments and challenges

- 6% reduction commitment under Kyoto Protocol
- Ratification in June 2002



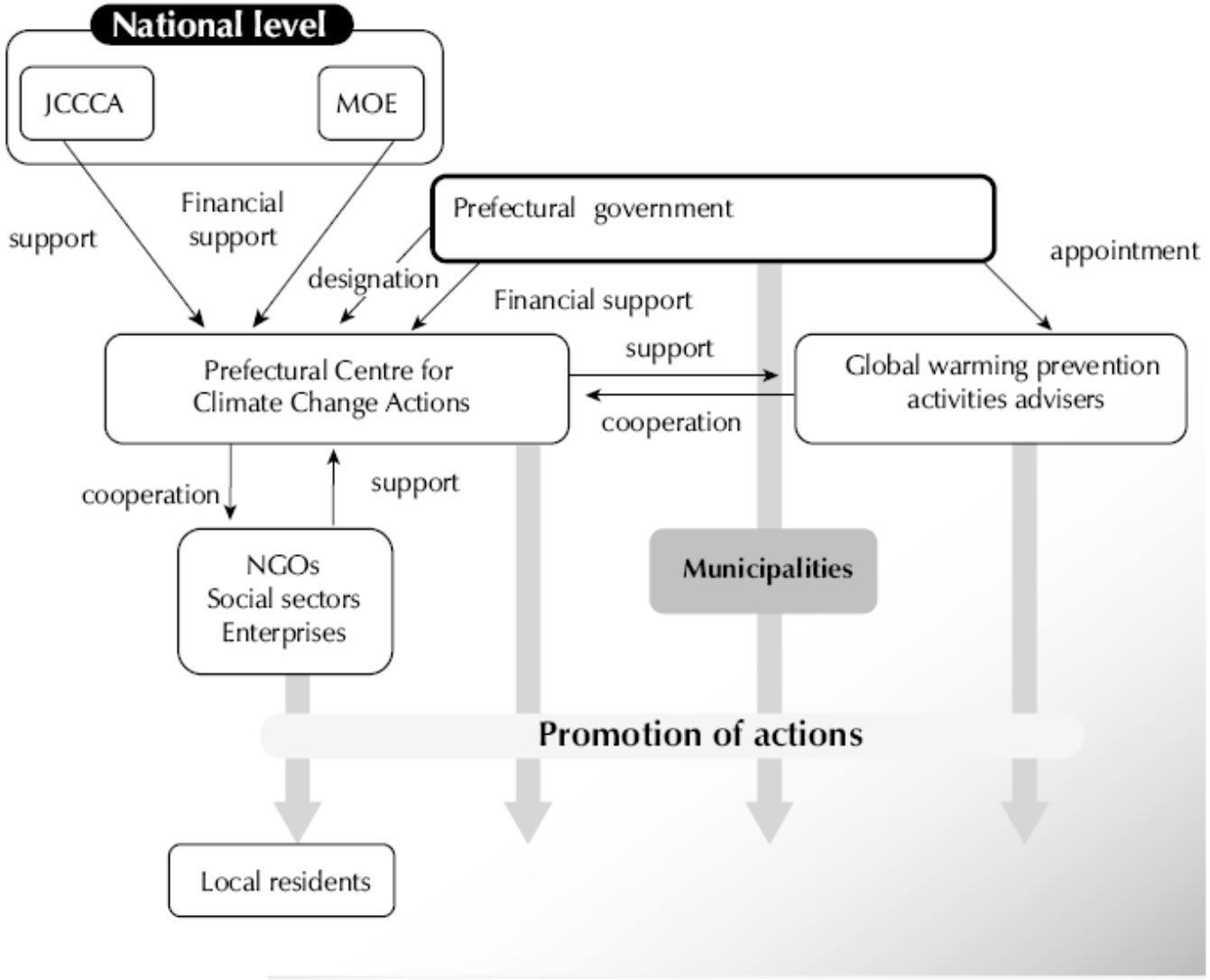
Source: MOE, Japan



Specific actions

- Cool Biz programs (summer of 2005)
  - Encouraged to set air conditioning at offices to around 28 degrees C during summer
  - A survey showed that 95.8% of the respondents knew "Cool Biz" and 32.7% answered that their offices set air conditioner higher than previous years
  - Estimated reduction of CO2 was approximately 460 thousand tons-CO2, which is equivalent to the amount of CO2 emitted from approximately one million households for one month (source, MOE (http://www.env.go.jp/en/press/2005/1028a.html)

Local system in Japan to promote action for GHG mitigation



IGES, 2004