



Environment Policy for Freight Transportation in Japan

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1. Current situation of environmental issues in the transportation sector

(1) Air quality issues

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(2) Global warming issues

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2. Environmental policies on road freight transportation

(1) Regulation on vehicles

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(2) Promotion of environmentally friendly vehicles

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(3) Development of new technology

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3. Efficiency improvement of freight transportation

(1) Efficiency improvement of trucking

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(2) Efficient combination of transportation modes

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(3) Cooperation with shippers

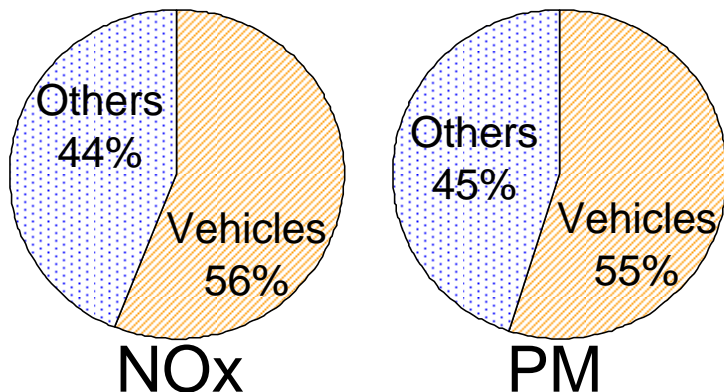
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1.(1) Air quality issues

Japanese Government aims to meet air quality standard at almost all the check points in Japan with regard to NO2 and SPM by 2010, mainly through;

- (1) Strengthened tailpipe emission standard on air pollutant
- (2) Regional and supplementary measures (NOx/PM Reduction Law)
- (3) Promotion of Environmentally Friendly Vehicles

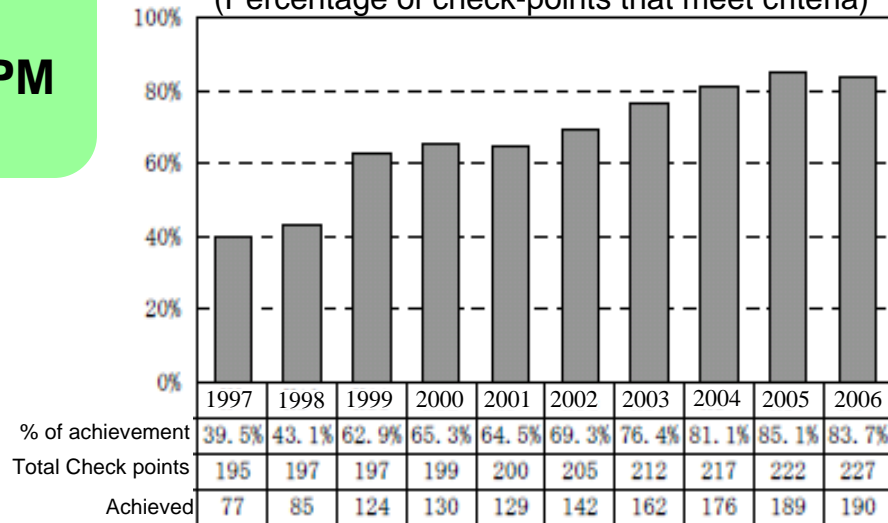
Portion of vehicle emission in the total Emission of NOx and PM



Data: Ministry of Environment (2000)

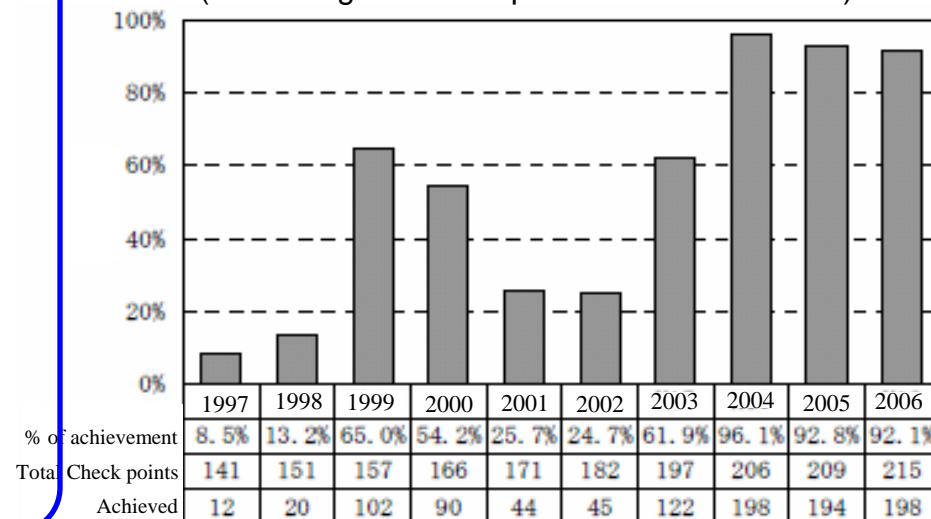
Achievement of NO2 reduction target

(Percentage of check-points that meet criteria)



Achievement of SPM reduction target

(Percentage of check-points that meet criteria)



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1.(2) Global Warming Issues

① Overview of Green House Gas emissions in Japan

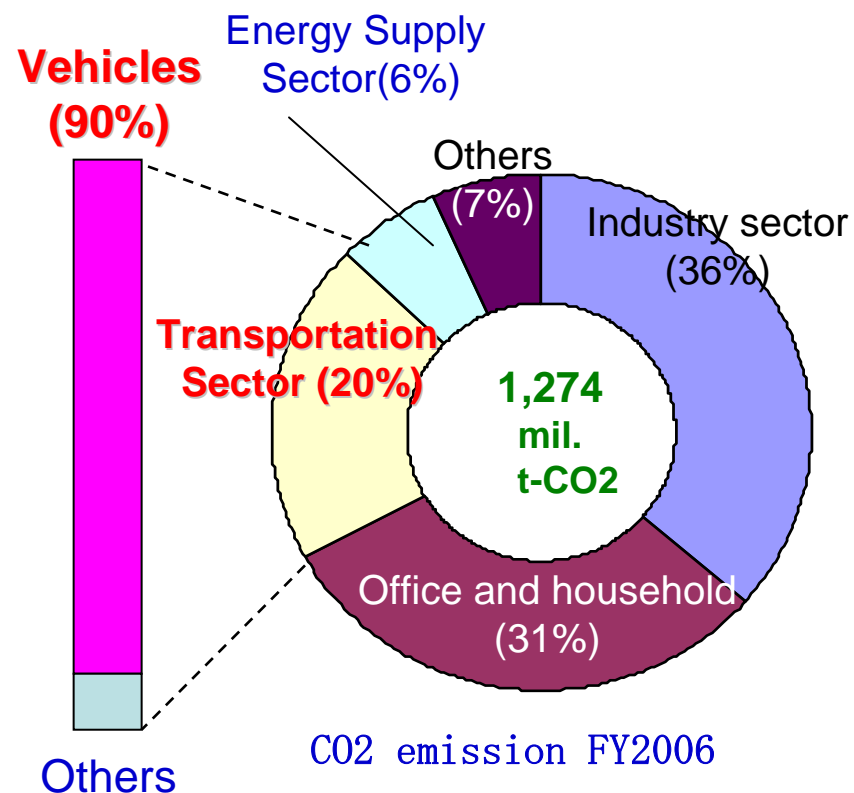
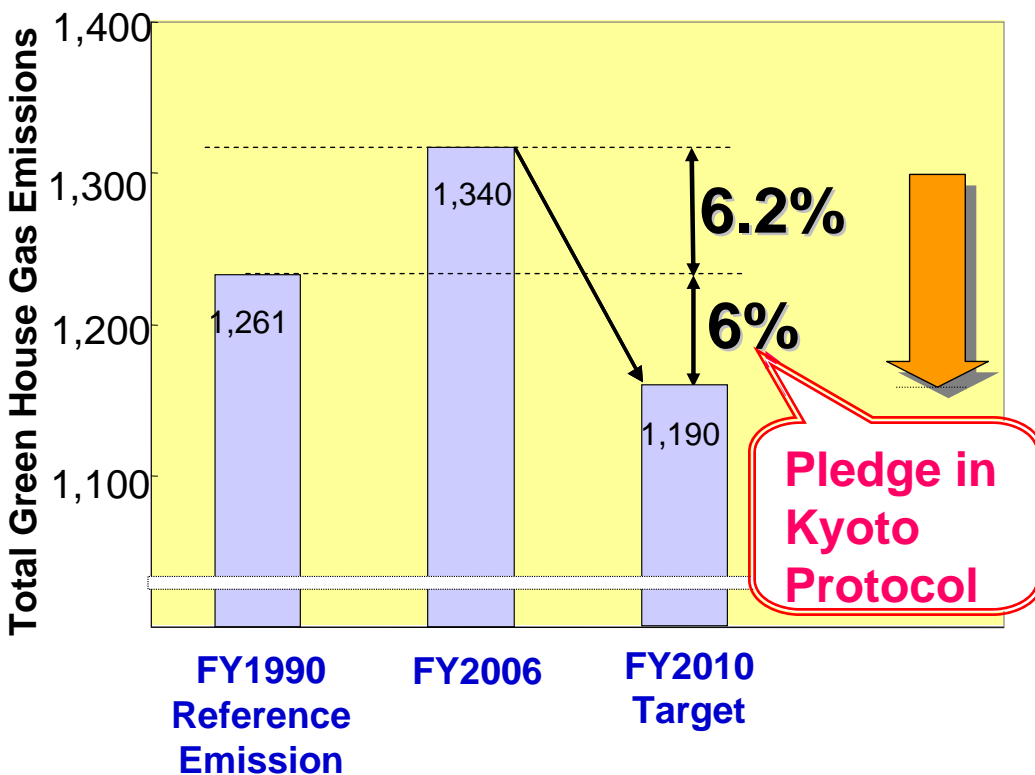
Overview of the national total

To achieve the **6%** reduction committed in Kyoto Protocol, Japan needs to reduce **12.2%** in FY2006-2010.

Overview of the transportation sector

CO2 emissions from the transportation sector account for **20%** of the nation's total, of which **90%** is from vehicles.

(Million t-CO₂e)



(Ministry of Environment)

② CO2 Emission in the Transport Sector

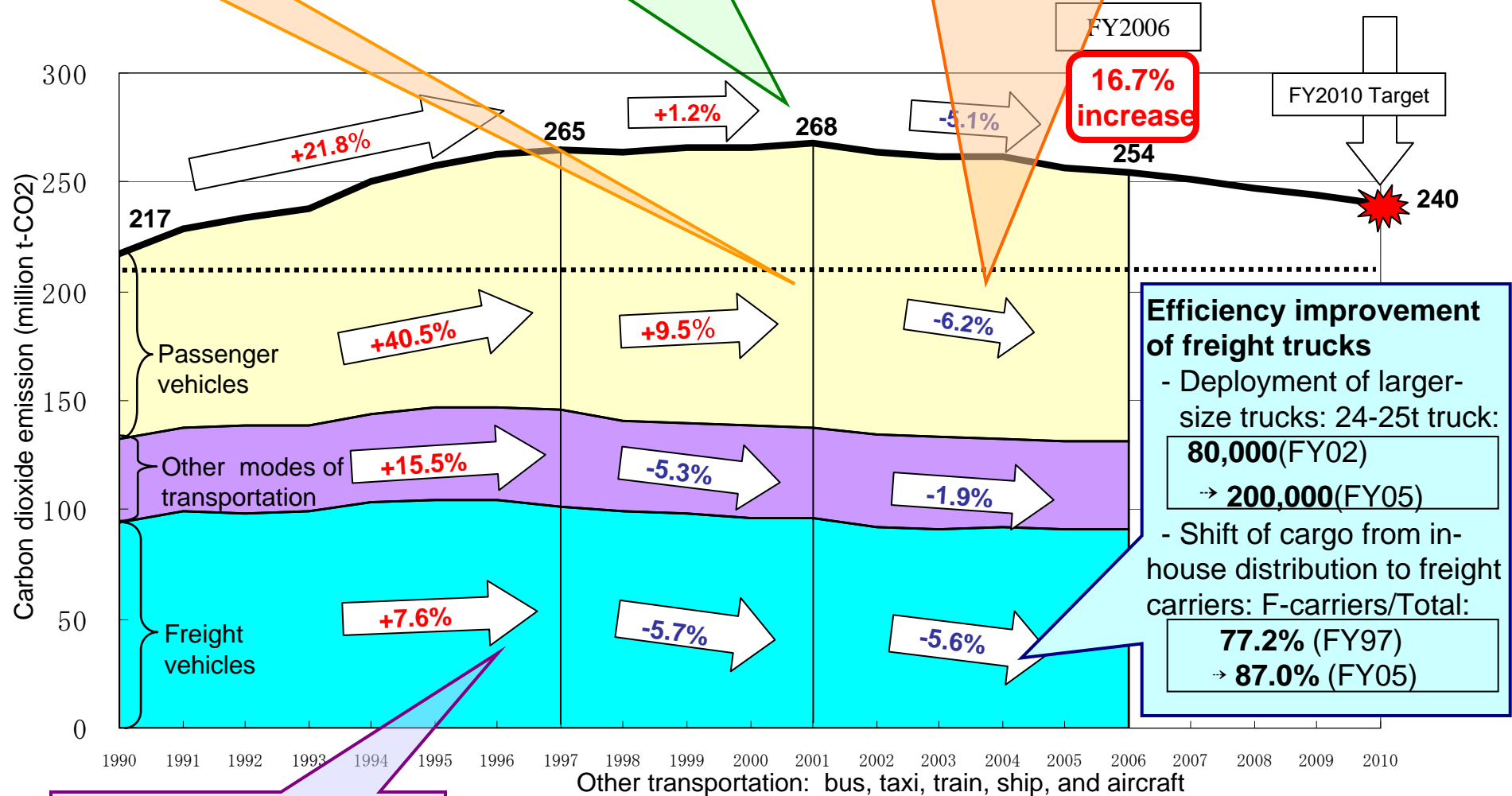
Emissions from passenger vehicles peaked in FY2001.

Since FY2001, emissions from the transportation sector have been on a downward trend.

Improvement of mileage of passenger vehicles

- The Top-runner (Best-in-Class) Standard
- Vehicle Green Tax (Since FY2001)

12.2mil./57.1mil. registered vehicles are GREEN



Efficiency improvement of freight trucks

- Deployment of larger-size trucks: 24-25t truck: **80,000(FY02)** → **200,000(FY05)**
- Shift of cargo from in-house distribution to freight carriers: F-carriers/Total: **77.2% (FY97)** → **87.0% (FY05)**

Emissions from freight vehicles peaked in FY1996

③ Countermeasures against Global Warming in the Transport Sector



Vehicle traffic measures

Measures for vehicles and eco-friendly driving style
(▼27.6 – 29.6 mil. t-CO₂)

- Top-runner fuel efficiency standards
- Promotion of energy-saving vehicles
- Promotion of eco-friendly driving styles
- Introduction of bio-fuel

Improvement of traffic flow
(▼5.5 mil. t-CO₂)

- Improvement of traffic speed by alleviating traffic jams

Road improvement
(already included in calculation of BAU)

- Build highway networks
- Alleviation of bottleneck

Transition to more efficient transportation system

Improvement of cargo transportation efficiency
(▼17.5 – 18.6 mil. t-CO₂)

- Green Distribution Partnership
- Modal shift to railroads and shipping
- Use of efficient vehicles (ex. larger trucks, co-use of a single truck)

Promotion of use of public transportation
(▼2.7 – 3.8 mil. t-CO₂)

- Build new commuter lines, subways, LRTs, etc.
- Promotion through IC cards
- Traffic demand management

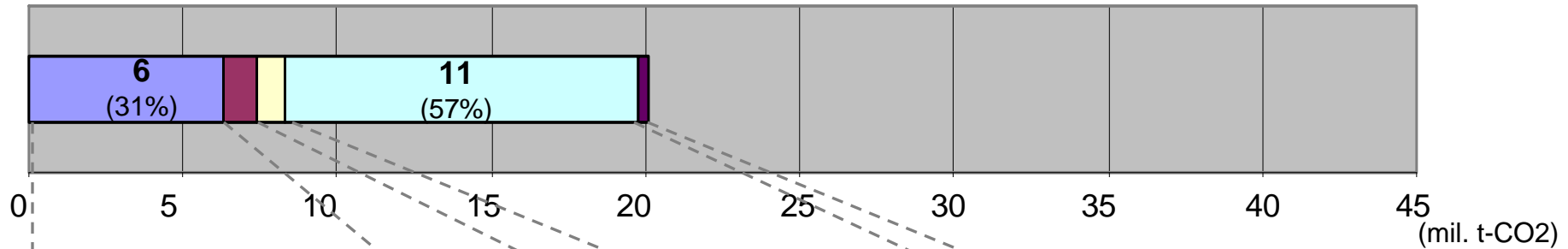
Others

- Technical Innovation of efficiency in railway/aviation sector
- Promotion of teleworking
(▼2.8 mil. t-CO₂)

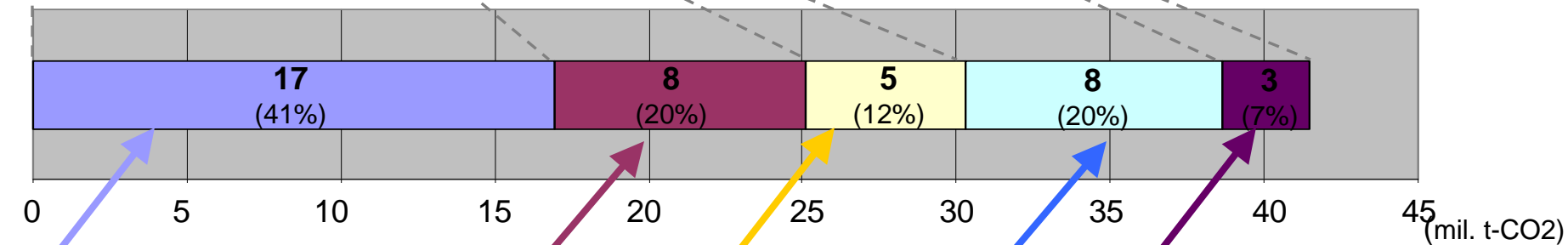
Total: ▼60 mil. t-CO₂

④ Breakdown of the Targeted and Actually Reduced CO2 Emissions in the Transportation Sector

Reduction Already Achieved (2002-2005) [Total reduction: 20 million t-CO2]



Total Targeted Reductions (2002-2010) [Total reduction: 42 million t-CO2]



“Top-runner” fuel efficiency standards

Development/dissemination of low-emission vehicles (Except “top-runner”)

Improvement of traffic flow

Improvement of cargo transportation efficiency (large trucks, modal shift, etc.)

Promotion of use of public transportation

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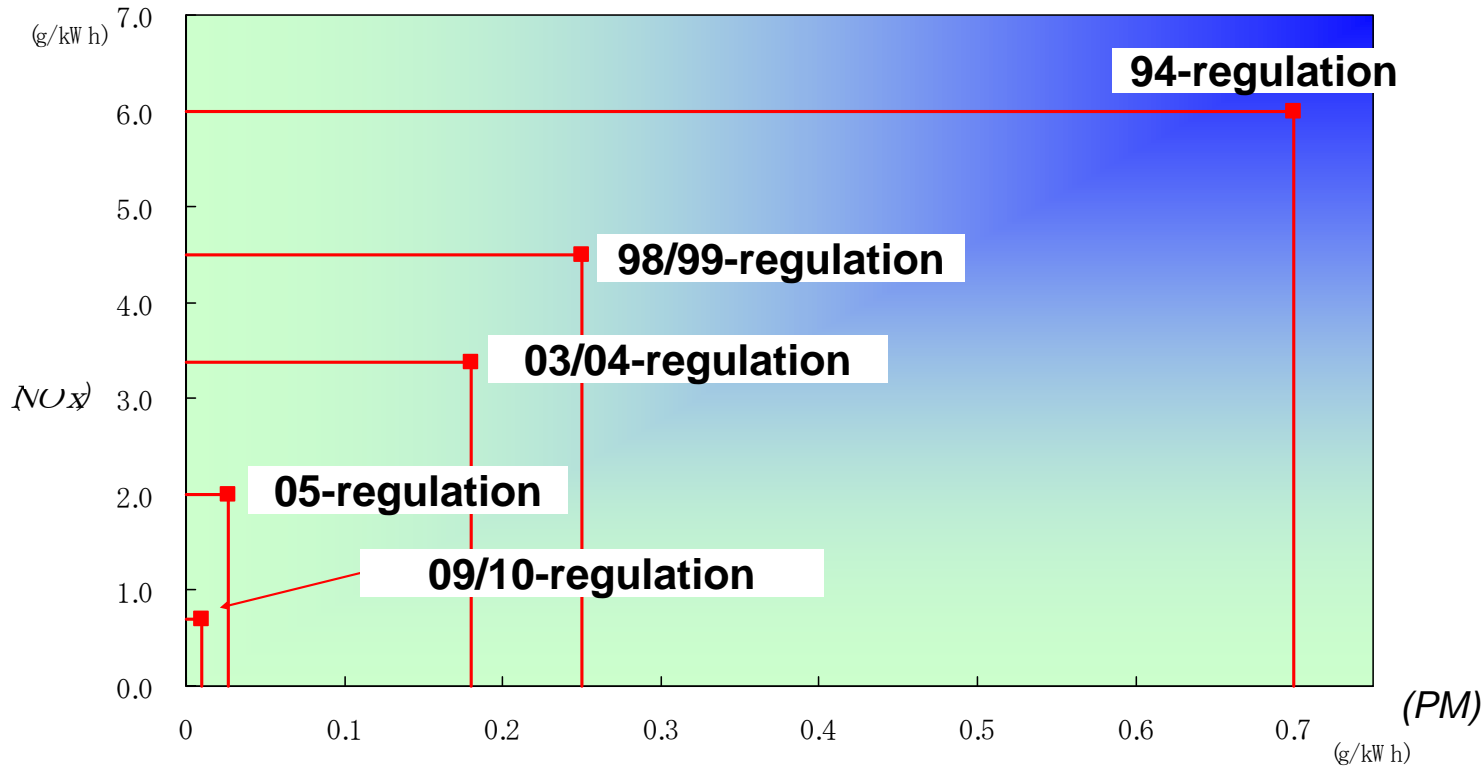
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(3) Cooperation with shippers

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2.(1) Regulation on vehicles -NOx/PM emission

① Gas emission regulations on vehicles over 3.5 tons

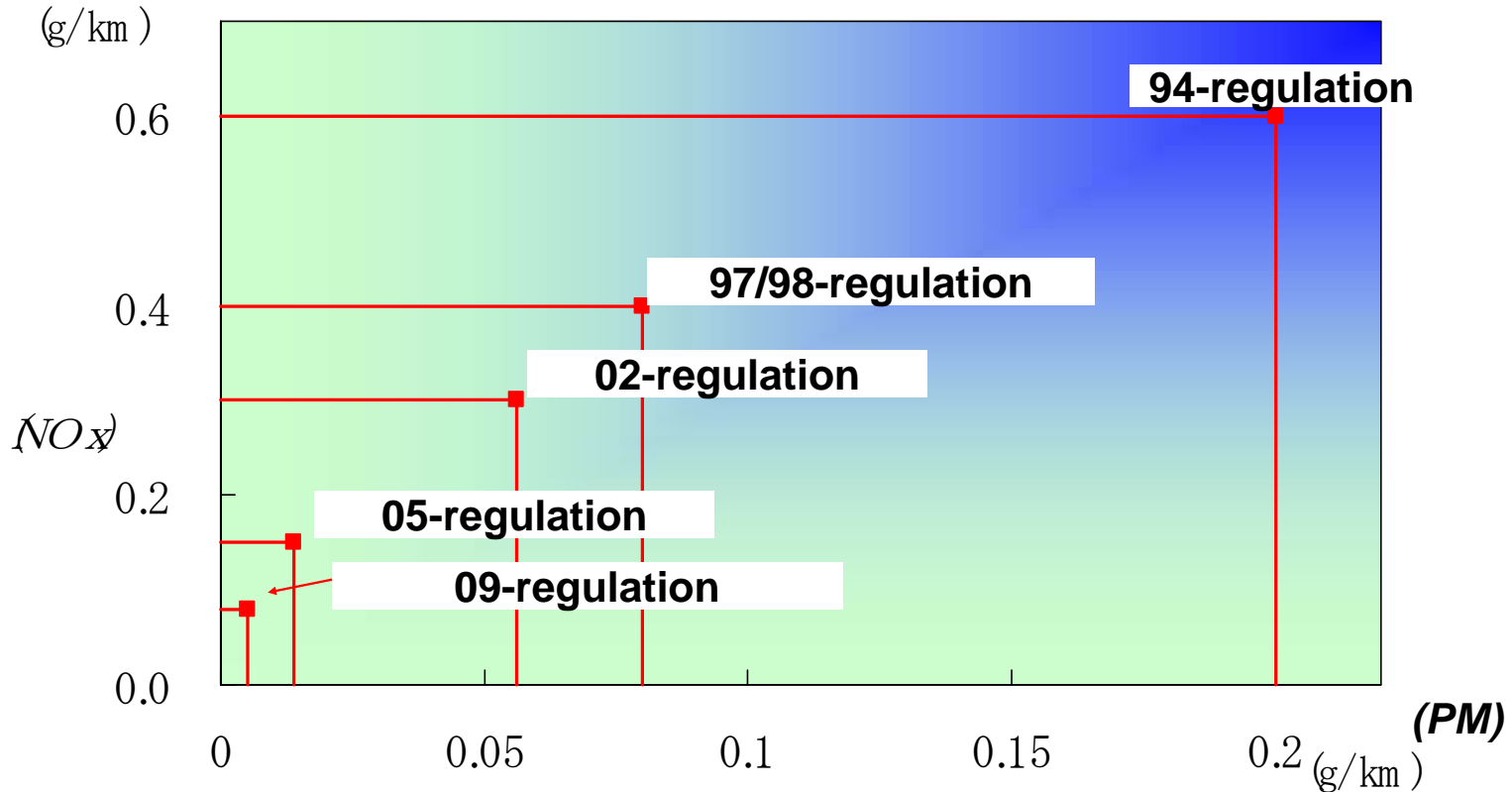


	94-regulation (1994~)	98/99-regulation (Small/Medium size: 1998-) (Large size: 1999-)	03/04-regulation (Small/Medium size: 2003-) (Large size: 2004-)	05-regulation (2005~)	09/10-regulation (Small/Medium size: 2010-) (Large size: 2009-)
NOx	6.0	4.50	3.38	2.0	0.7
PM	0.7	0.25	0.18	0.027	0.010

*Small/Medium size: Gross vehicle weight : 3.5 - 12t (2.5 - 12t by 2005)
 Large size: Gross vehicle weight > 12t



② Gas emission regulations on vehicles under 3.5 tons



	94-regulation (1994~)	97/98-regulation (Small size: 1997- (Medium size: 1998-)	02-regulation (2002~)	05-regulation (2005~)	09-regulation (2009~)
NOx	0.60	0.40	Medium: 0.30 Small: 0.28	Medium: 0.15 Small: 0.14	0.08
PM	0.20	0.08	Medium: 0.056 Small: 0.052	Medium: 0.014 Small: 0.013	0.005

*Small/Medium size: Gross vehicle weight < 1,265kg

Large size: Gross vehicle weight > 1,265kg

③ Regional and supplementary measures

<1> 2001 Vehicles' NOx/PM Reduction Law

1) Basic policy & NOx/PM reduction plan

- **Reduction targets**
 - NO₂: clear the air quality criteria by 2010
 - SPM: considerable reduction
- **NOx/PM reduction plan**
 - drafted by the national and municipal gov.
 - measures taken in “**Watch Areas**”

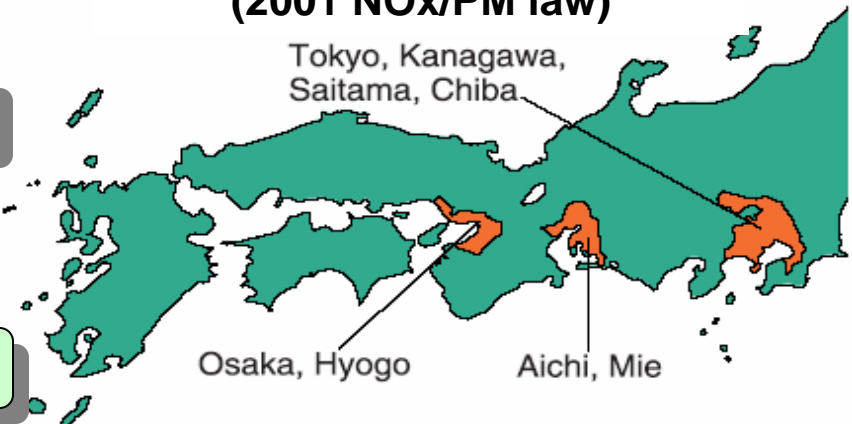
2) Restrictions on types of vehicles

- additional regulations on the vehicles based in Watch Areas.

3) Rules on trucking business

- carriers with ≥ 30 vehicles in the Area have to have an operation plan for emission reduction

NOx/PM Watch Areas (2001 NOx/PM law)



<1> 2001 Vehicles' NOx/PM Reduction Law

It did work, but...

- Some Areas in metropolitan districts have not cleared the air quality criteria yet.
- In these cases, regional air pollution is often caused by vehicles coming from outside of the Watch Areas.

Reinforcement

<2> 2007 Vehicles' NOx/PM Reduction Law

1) Additional measures on designated zones

(a) Setting of the Intensive Improvement Zones

- municipal gov. designates the Intensive Improvement Zones, and carries out the action plan

(b) Report on construction of new buildings

- constructors of new buildings in Zones have to report their design/operation plans

2) Regulation on vehicles coming into the Watch Areas

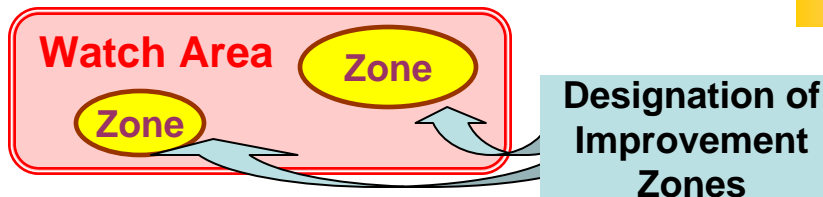
(a) Operation plan by carriers with vehicles coming into the areas

- a carrier with ≥ 30 vehicles in surrounding areas must have an operation plan for emission reduction and submit an annual report

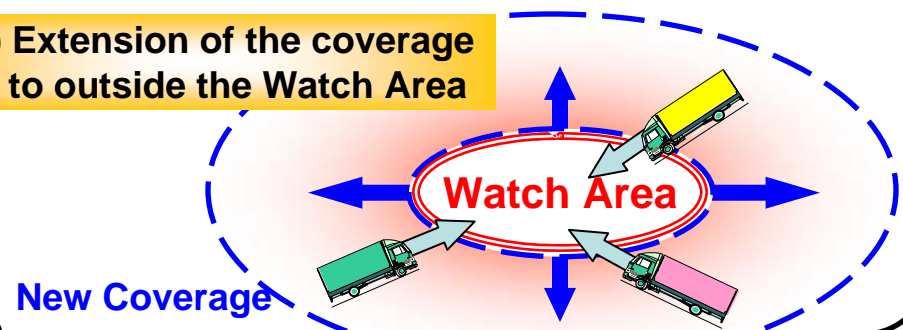
(b) Request for efforts to shippers

- the law requests users (ie. shippers) to make efforts to reduce emission

1)(a) Designation of Zones



2)(a) Extension of the coverage to outside the Watch Area



2.(1) Regulation on vehicles -GHG emission

① Fuel Efficiency Improvement based on the Top-runner Standard

1998 Energy-Saving Law introduced **Top-runner (Best-in-Class) Standard** on energy efficiency for some products including vehicles.

Top-runner Standard of Mileage for Small Vehicles (7/2007-)

- **Target:** passenger cars, small buses, small freight vehicles $\leq 3.5\text{t}$.
- **Target year:** FY2015
- **Improvement:** Mileage in FY2015 will be improved by 23.5% compared to FY2004.
- New standard requests more improvement than that of between FY1995 and FY2004 (22%).

Top-runner Standard of Mileage for Large Vehicles (3/2006-)

- **Target:** freight vehicles $> 3.5\text{ t}$ and passenger cars ≥ 11 people, fueled by light oil.
- **Target Year:** FY2015
- **Improvement:** Mileage in FY2015 will be improved by 12.2% compared to FY2002.
- The world's first mileage standard for large vehicles (trucks and buses).

Vehicle Green Tax System promotes fuel-efficient vehicles, including hybrid vehicles and clean-diesel vehicles

24.5mil. t-CO₂ reduction compared to BAU in 2010

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2.(2) Promotion of eco-friendly vehicles



① Vehicle Green Tax

☆☆☆☆: 75% less emission than 2005-standard for small vehicle

★: cleared 2005-standard for large vehicle 1XX%e: efficiency compared to 2010-standard

Annual Vehicle Tax

Tax based on vehicle size:
(ex. 2t-business truck: \9,000)

Vehicle Acquisition Tax

Full tax on vehicle price: 3 to 5%

(Small: ≤3.5t)
(Large: >3.5t)

Electric Vehicle
Fuel-Cell Vehicle

▼50%

▼2.7%

(Small)

▼50%
(☆☆☆☆)

▼2.7%
(☆☆☆☆)

CNG Vehicle

(Large)

▼50%
(★)

▼2.7%
(★)

(Small)

▼50% / ▼25%
(☆☆☆☆+125%e) / (☆☆☆☆+115%e)

▼1.8%
(☆☆☆☆+120%e)

Hybrid Vehicle

(Large)

—

▼2.7%
(★+100%e-2015)

(Small)

—

▼1.0%
(★-09)

Diesel Vehicle

(Large)

—

▼2.0% / ▼1.2%
(★-09+100%e-2015) (replacement)

Gasoline Vehicle

▼50% / ▼25%
(☆☆☆☆+125%e) / (☆☆☆☆+115%e)

▼\300,000 / ▼\150,000
(☆☆☆☆+125%e) / (☆☆☆☆+115%e)

② Assistance for introduction of low-emission heavy duty vehicles

1) Government Subsidy for introduction of low-emission bus/trucks



Subsidies FOR		Rates
Purchase of new low-emission vehicles	CNG bus/trucks	1/2 of the price gap between normal trucks and low-emission trucks
	Hybrid bus/trucks	
Retrofitting of the existing vehicles		1/3 of the cost

2) Promotion of CNG Vehicles - assistance for regional projects

CNG Vehicles Trial Operation Program

Assistance for regional challenges for designation

• Trial operation of CNG vehicles

National Gov. Subsidy

1/2 of cost
-lease of vehicles
-exhibitions etc.

NEW!
2008-

CNG vehicles Introduction Model Program

Set-up the **Conference** by the Municipal gov.

Designated as a **Model Region**
(FY2005-08: 12 regions)

- **CNG Vehicle Promotion Plan** by the Conference
- Operation of CNG Vehicles

The Regional Conference

Municipal gov.

Gas Supplier

Trucking carrier

Shipper

Branch of national gov.

Assistance by National Gov.

- Assistance for plan making
- Privileges of subsidy for CNG vehicles (priority, eased requirement, etc.)
- Public relations through gov.'s tools

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2.(3) Development of new low-emission vehicles

Now checking the vehicles' quality, durability, operational cost, convenience, etc.

FTD fuel for diesel vehicles



In operation

DME truck



Test run on public roads

LNG truck



Test run on public roads

CNG larger truck



In operation

Hybrid bus

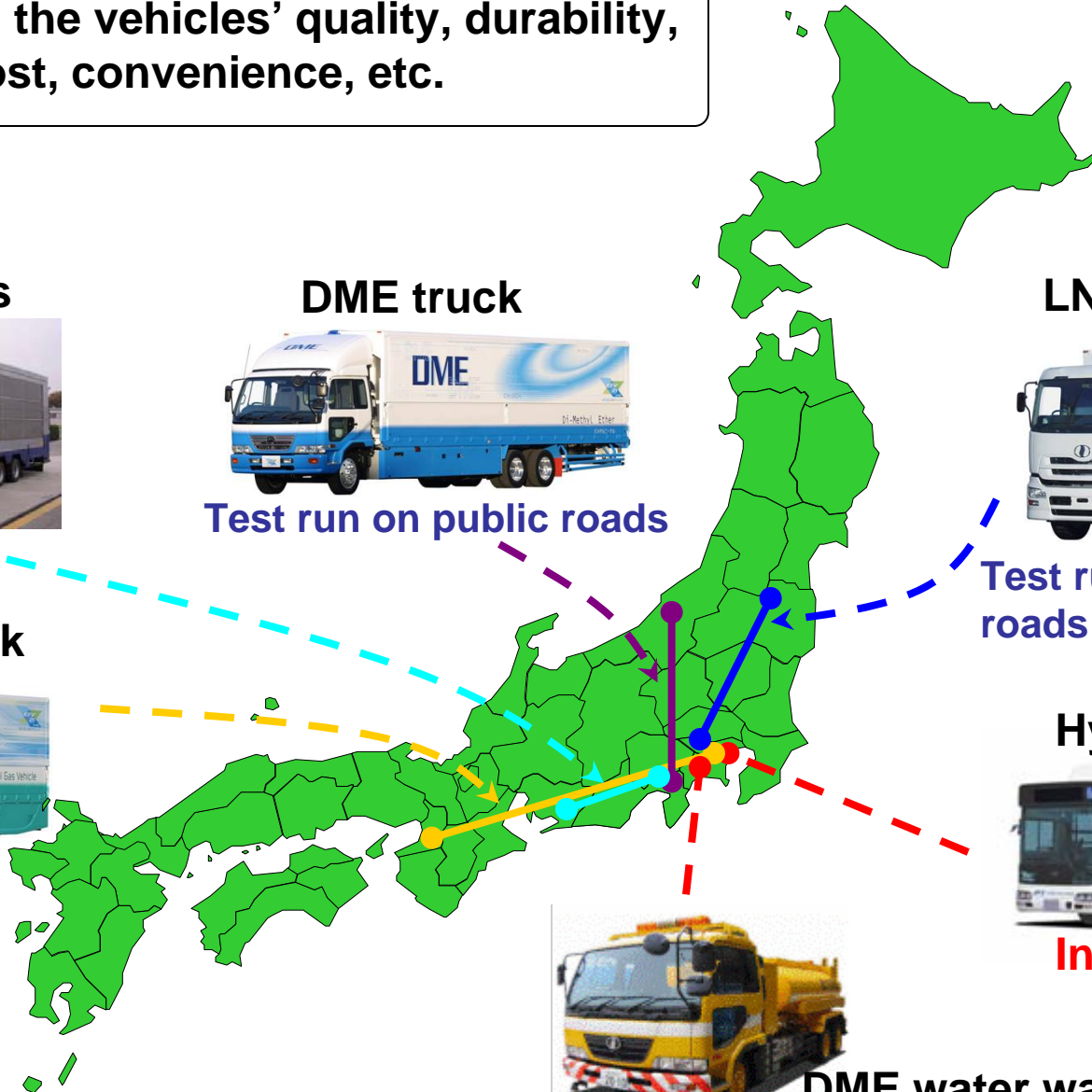


In operation

DME water wagon



In operation



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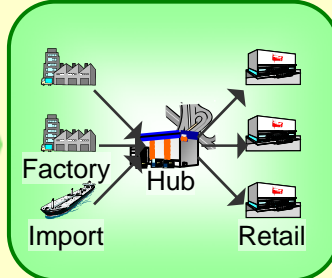
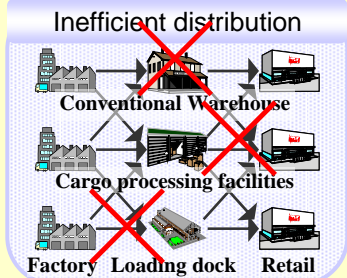
① Improvement in operation

Reduction target FY2010: 13.9 mil. t-CO2

- **Use of Large trucks (target)**
 - trucks (24-25t): increase to **120,800**
 - trailers: increase to **71,100**
- **Shift of cargo from in-house trucks to carrier trucks: business truck 3%up**
- **Improvement of loading efficiency: 2%**



cooperation in distribution through the use of larger trucks and separated rack for individual shippers



Integrated handling of freight at the hub

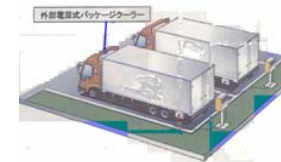
② Use of energy-saving apparatus

- There are apparatus helpful to stop idling during waiting/breaking time such as an air conditioning system by ground power supply
- Government offers subsidy for purchasing these



- **air conditioner with grand power supply**
- ice/heat –pack style air conditioner
- energy-saving freezer
- air curtain
- insulating film

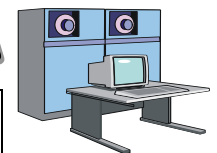
Air conditioner on the trucks



Outlet on the ground



Power supply



Data administration system

③ Promotion of Eco-friendly Driving Management System

- Promotion of **eco-friendly driving** for trucking business
- Centralized management of operation → Introduction of **EMS**
- National subsidy to the trucking business for the purchase of related systems

Outline of Eco-friendly Driving Management System (EMS)

Installation

Onboard terminal



Operation

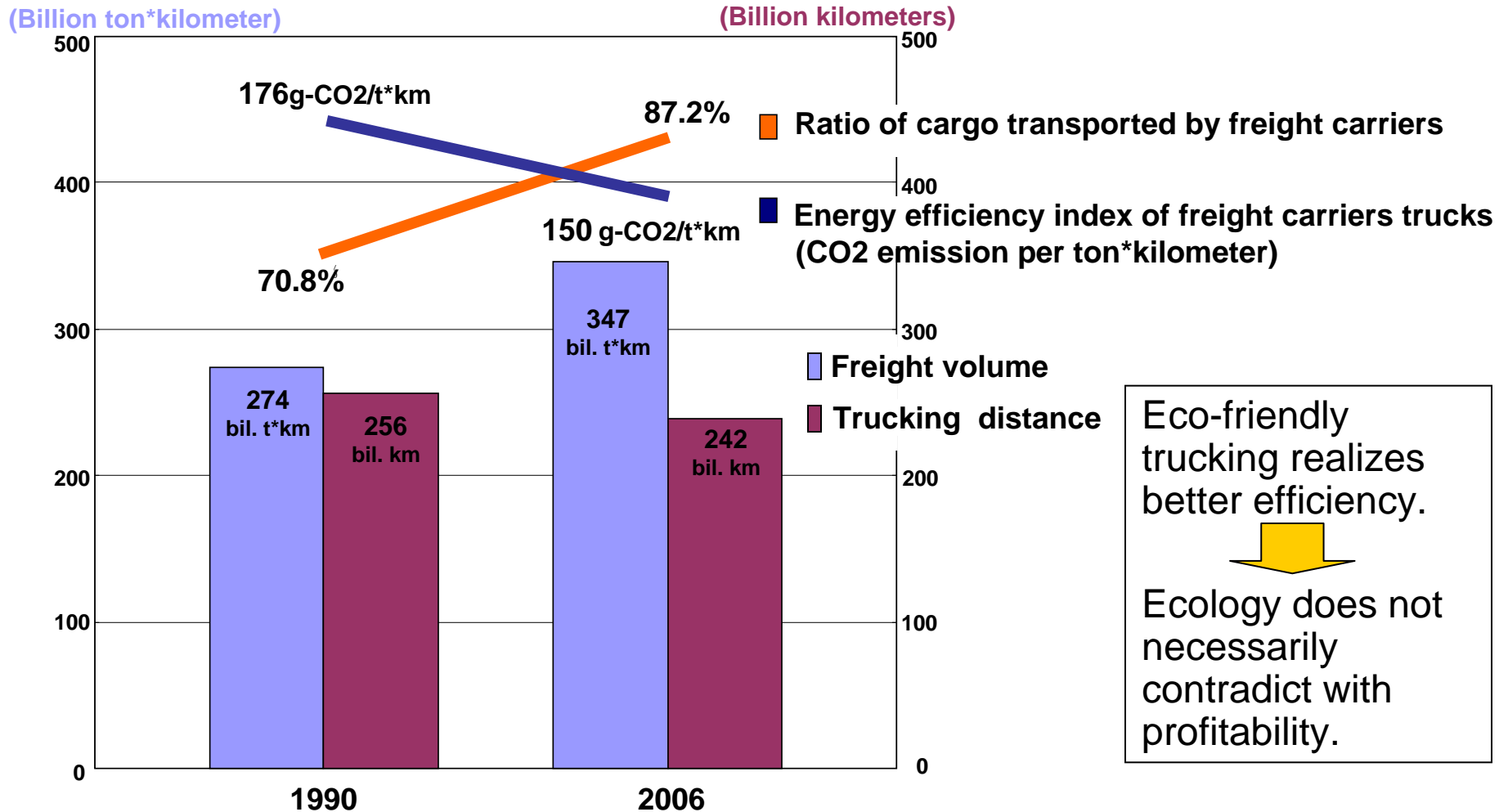


Setting of targets

ex. mild acceleration, idling reduction, etc.

④ Improvement of efficiency of trucking industry in Japan (1990-2006)

- **Freight volume** (ton*kilometer) increased, but **trucking distance** decreased.
- The **ratio of cargo** transported by freight carriers increased.
- **CO2 emission** per ton*kilometer from freight carriers' trucks reduced.



Eco-friendly trucking realizes better efficiency.

↓

Ecology does not necessarily contradict with profitability.

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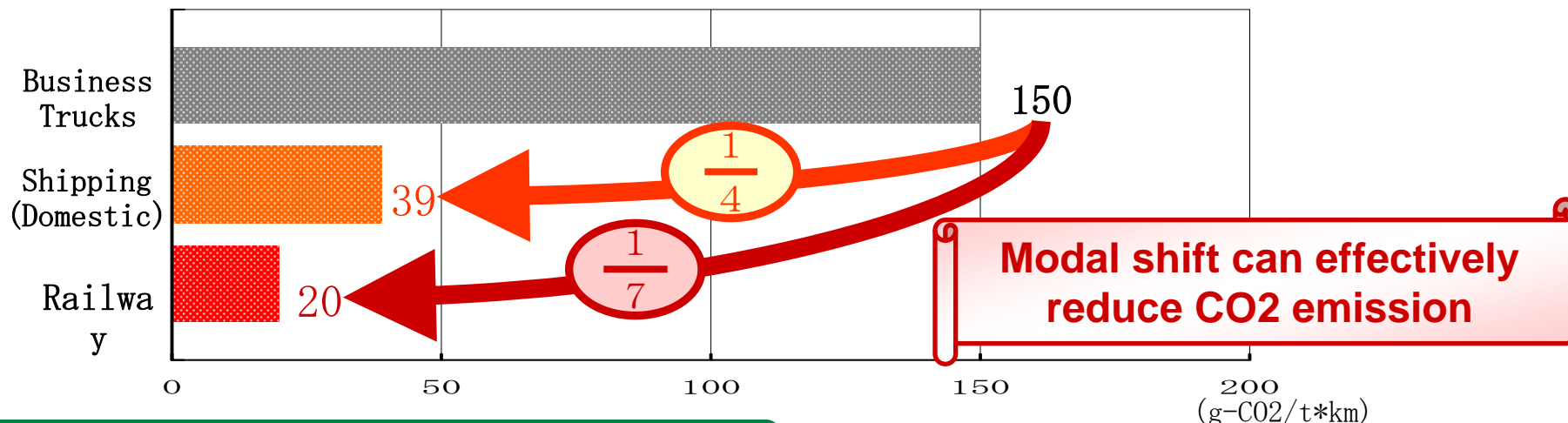
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① Modal shift

The Effect of Modal Shift

(Energy Efficiency Index: emission of CO₂ per ton*kilometer of freight transportation, FY2005)



Modal Shift to Freight Trains

▼ 0.8 million t-CO₂

- Improvement of rail infrastructure and service
- Development of new technology for freight trains
- Campaign for wider recognition of eco-friendly freight trains



Comprehensive measures for greener shipping

- Development and promotion of new technology
 - Promotion of modal shift to coastal shipping
 - Introduction of energy-saving shipping and facilities
- ▼ 1.3 million t-CO₂

Super-eco cargo-ship "Shineimaru"



② Promotion of Third Party Logistics

Third Party Logistics business undertakes the whole process of distribution.

It realizes **optimum arrangement** of cargo transportation, and maximizes efficiency

It contributes to lower costs and reduction of impact on environment.

Promotion of Third Party Logistics

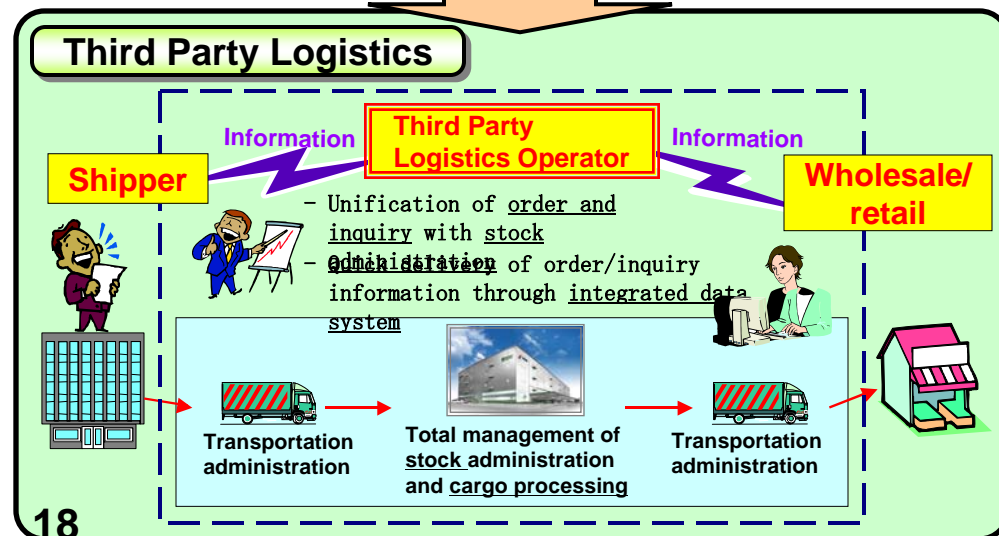
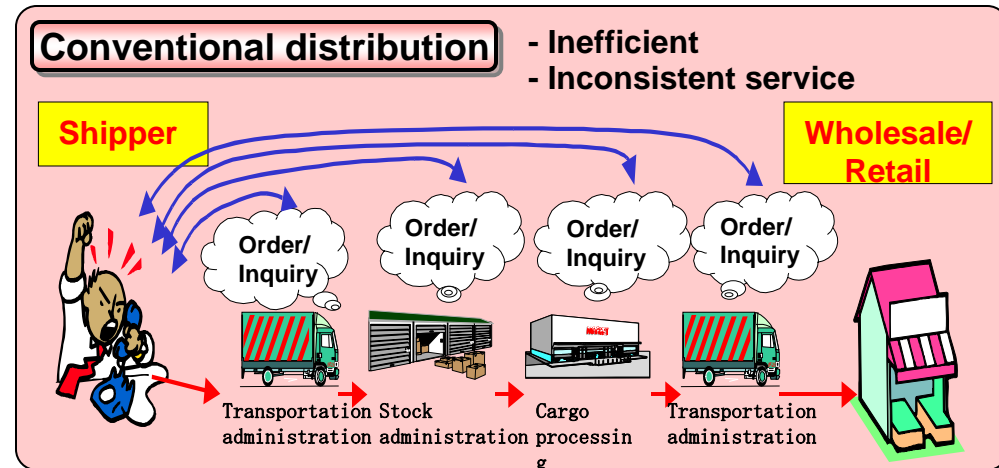
National government's assistance

- Standardization of contracts
- Establishment of Information Security Guidelines
- Research on the third party logistics businesses

Comprehensive Distribution Efficiency Law (2005)

Realization of comprehensive and efficient distribution at the hub facilities, including transportation, storage and cargo-processing

- tax reduction on warehouse facilities
- preferential permission for hub development
- low interest loan etc.



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3. (3) Cooperation with shippers

① Green Distribution Partnership

- To overcome the deference of views between shippers and carriers, the **Green Distribution Partnership** was established (4/2005).
- The Partnership helps cooperation between shippers and trucking carriers through arrangements for Government grants, establishing the calculation method for CO2 emission, introduction of best practices, and recognition of efforts.

Green Distribution Partnership

- **Organizers:** Japan Institute of Logistics Systems, Japan Federation of Freight Industries, METI, MLIT (Cooperation: Nippon Keidanren)
- **Members:** 2,900 members, including carriers, shippers, related associations, think tanks, researchers, branches of national gov., municipal gov. etc.

Assistance for related research
(FY2008 : \$1.5 mil.)

Gov.'s Grants for purchase of facilities (- 1/3 of total costs)
(FY2008 : \$20 mil.)

Establishment of calculation methods for CO2 emission

Recognition by the Ministers of advanced efforts

② 2005 Energy Saving Law

- In addition to carriers, the Law **obliged** large **shippers** to energy-efficient operation
- In mid-long term, it targets 1% improvement of energy efficiency annually

Designated Carriers

(FY2006—)

Large carriers

ex. with trucks ≥ 200 (430 carriers)
 with ships $\geq 20,000$ GWT (33 carriers)
(462 carriers as of 03/2008)

- Submission of **Energy-Saving Plan**
 - Use of Energy efficient vehicles
 - maximum use of space
 - eco-friendly driving etc.
- **Annual report** of energy consumption

Other carriers

Designated Shippers

(FY2007—)

Large Shippers

Freight amount \geq : **30 mil. t*km**

incl. • Food Processing • Chemical
 • Steel • Machinery • Wholesale/retail
(865 shippers as of 06/2008)

- Submission of **Energy-Saving Plan**
 - Modal shift
 - transfer from in-house to business truck
 - cooperation in delivery etc.
- **Annual report** of energy consumption

**Now shippers
 must consider
 environment**

Consignment?
20 (Eco-friendly)

In-house Transport?
(LESS efficient)



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