



GHG emissions, statistics and mitigation for transport sector in Japan

Kohei Sakai

***Greenhouse Gas Inventory Office in Japan (GIO),
Center for Global Environmental Research (CGER),
National Institute for Environmental Studies (NIES)***

WGIA9 Transport WG

14 July 2011

Emission and Trend



Kyushu Shinkansen (super express) opened on March 2011

Japan's Background Information

- Japan consists of 400 inhabited islands based in main 4 islands.
- Although population increased slightly in the 90s, it stagnates after that.
- 79 million automobiles are registered, which means two-thirds persons have (including for business).
- Gasoline automobiles are dominant than Diesel automobiles.
- There are multiple automobile companies.
- Networks of railway are developed in the whole country. Main lines are electrified.
- Shinkansen (super express train, top speed: 300 km/h) was connected in one lines in this year from Aomori (Honshu northern end)- Tokyo - Osaka - Kagoshima (Kyushu southern end).
- In especially, around big cities such as Tokyo, Osaka and Nagoya, networks of railway are developed, and the share rate of railway for movement is high.
- The railway rate of freight transportation is low.
- There are about 100 airports and about 40 places are airports other than 4 main islands.

Japan's Background Information

Four main islands

Big city

Shinkansen (super express) lines ———

JR lines (Railway) ———

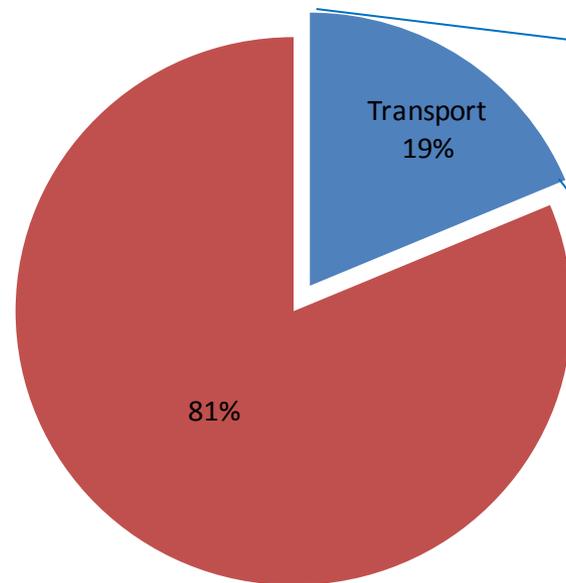
Key airport 

Other airport 

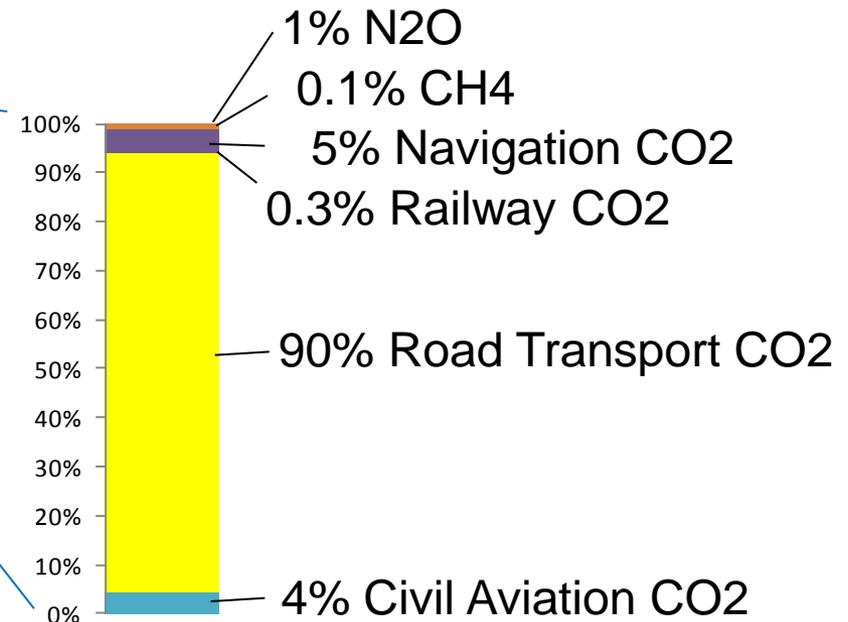


Summary of Emissions from Transport

- Japan estimates GHG Emissions from Civil Aviation, Road Transportation, Railways and Navigation.
- Japan estimates CO₂, CH₄ and N₂O from transportation.
- 19% of national total emissions is from Transport section
- 89% of transport emissions is form Road Transport CO₂



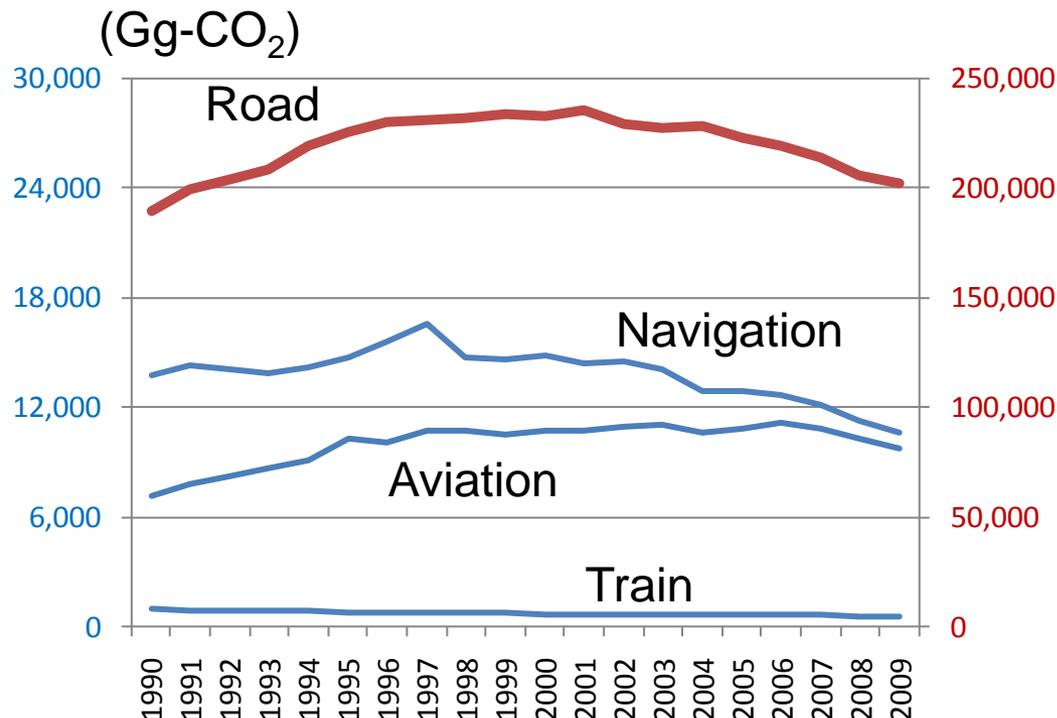
Japan's Total emissions (2009)



Japan's transport emissions (2009)

CO2 Emission Trend

- In the '90s, emissions from road transport increased by the increase of the number of automobiles.
- However, emissions in the '2000s have decreased by the improvement of gasoline mileage owing to Top Runner Approach regulated by the *Act on the Rational Use of Energy*.



Statistics for transport



Electric Power Generation by bicycle
In NIES booth (Eco Life Fair, Tokyo, June 2011)

Statistics to estimate CO2 emissions

GHG Inventory

**Inport
Export
production Data**

**General energy statistics
(Energy Balance Table)**

By Natural Resource
and Energy Agency

*Secondary statistics
(Energy Balance)*

Primary statistics (Fuel Consumption)

Road

Aviation

Navigation

Train

**Statistical
Yearbook of
Motor Vehicle
Transport**

**Statistical
Yearbook of
Air Transport**

**Statistical
Yearbook of
Coastwise
Vessel
Transport**

**Statistical
Yearbook of
Railway
Transport**

Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

Statistical Yearbook of Motor Vehicle Transport

- Data are collected by sample survey of questionnaire.
- Questionnaire is distributed to 30,000 automobiles at random.
(79,000,000 automobiles are registered in Japan)
- Frequency: Monthly.
- Survey period: 7 days each month

- Objectives of this statistics are
 - 1) to promote policy and measure as a base material for transport,
 - 2) to estimate GHG emissions and energy consumption,
 - 3) to be a base material to promote 'modal shift'

Website (Introduction of investigation methods of this statistics)

<http://www.stat.go.jp/english/index/official/209.htm>

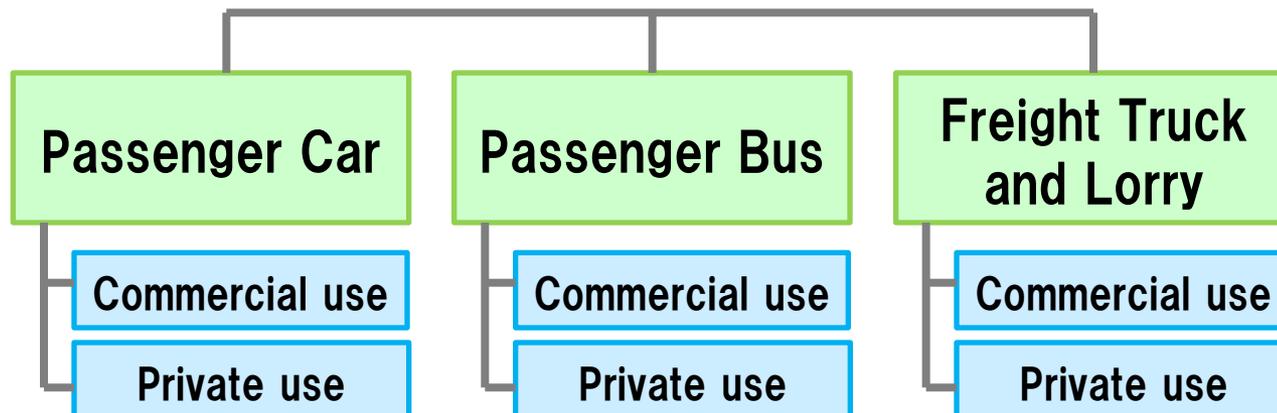
Statistical Yearbook of Motor Vehicle Transport

Common items

- 'Fuel consumption'
- 'Travel distance' based on travel distance meter.
- 'Transport frequency'

Variable by type

- 'Passenger transport volume' (passengers-km)
- 'Cargo transport volume' (tons-km)



Motor vehicles owned

Motor vehicles owned data

- Published by Automobile Inspection and Registration Information Association supervised by MLIT.
- Used to estimate 'Fuel consumption', 'Travel distance' and etc...
- Since motor vehicle owners have duties of Automobile Inspection, mandatory automobile liability insurance, and automobile weight tax, data is taken exactly.



Estimation Method

<CO₂>

➤ Tier 1 Sectoral Approach

General Energy Statistics

$$\text{Emissions} = \sum (\text{Energy Consumption [t,l,m}^3\text{]}) \times (\text{GCV [MJ/t,l,m}^3\text{]}) \times (\text{EF [tC/MJ]}) \times 44/12$$

CS data

<CH₄ & N₂O>

➤ Tier 3 Method

$$\text{Emissions} = \sum (\text{distance traveled [km]}) \times (\text{EF [kg-CH}_4\text{ or N}_2\text{O/km]})$$

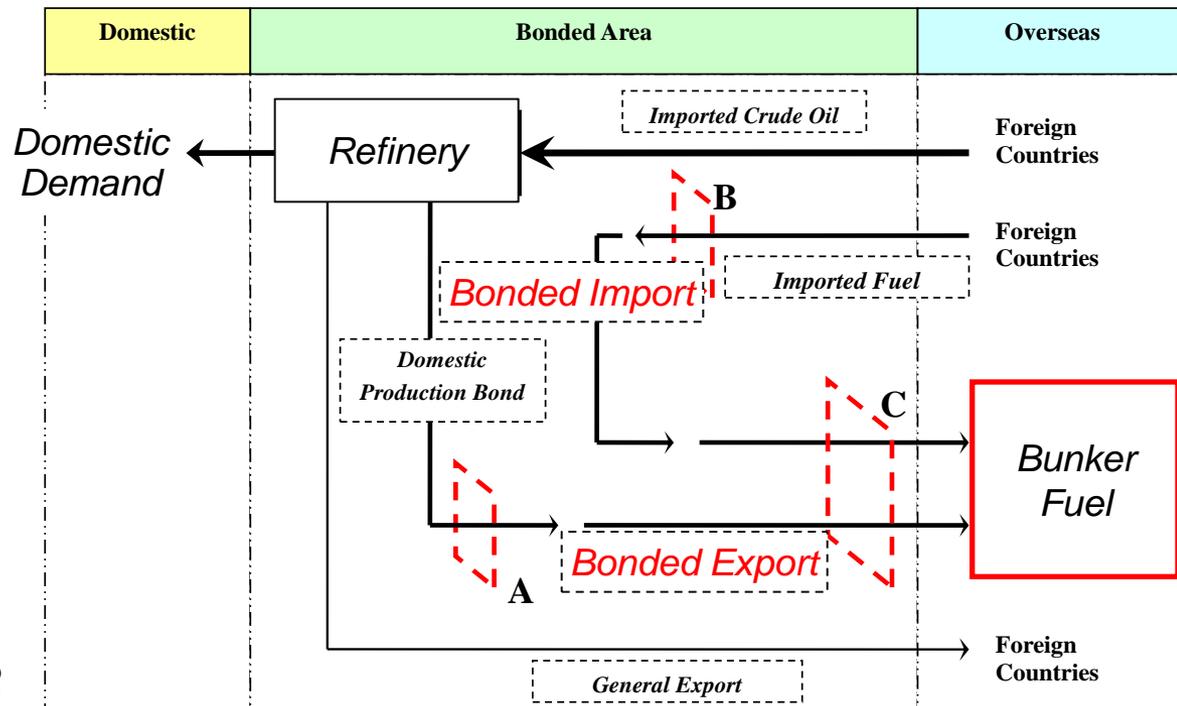
By vehicle type

Calculated by using driving mode test data (actual measurement data)

Statistical Yearbook of Motor Vehicle Transport

Bunker Fuel

- **Bonded Import** and **Bonded Export**, which is described in *Yearbook of Mineral Resources and Petroleum Products Statistics* by Ministry of Economy, Trade and Industry (METI), represent Bunker Fuel.
- *Statistical Yearbook of Coastwise Vessel Transport* includes only domestic vessel.



NIR 2011 Fig. 3-3

Mitigation Action



Electric Vehicle and electric power station

Mitigation Action

<Key Ministry>

MLIT(Land, Transport), METI (Industry), MOE(Environment)

<Relevant Law>

- *Act on Promotion of Global Warming Countermeasure
(Revised Kyoto Protocol Target Achievement Plan)*
- *Act on the Rational Use of Energy
(Top Runner Approach)*

Revised Kyoto Protocol Target Achievement Plan

by Act on Promotion of Global Warming Countermeasure

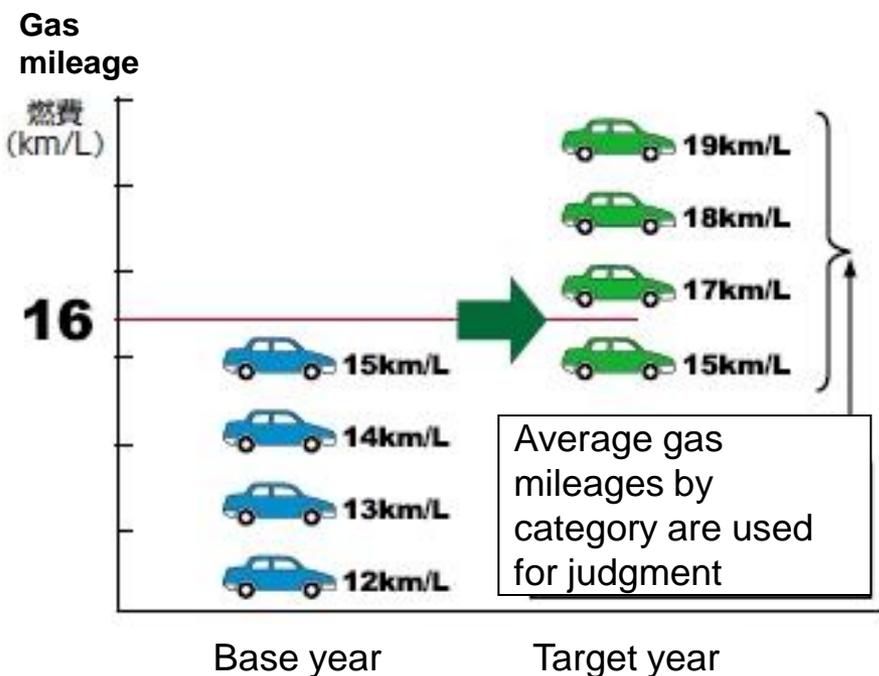
<Action Plan for transport>

- Improvement of automobile,
- Countermeasure of traffic stream (reduction of traffic jam),
- Promotion of public transport utilization,
- Promotion for development and introduction of high energy efficient railway, vessel and airplane,
- Transportation Demand Management (TDM),
- Introduction of Intelligent Transport Systems (ITS),
- Eco-Drive promotion activities
- Modal Shift and efficiency improvement of track transport

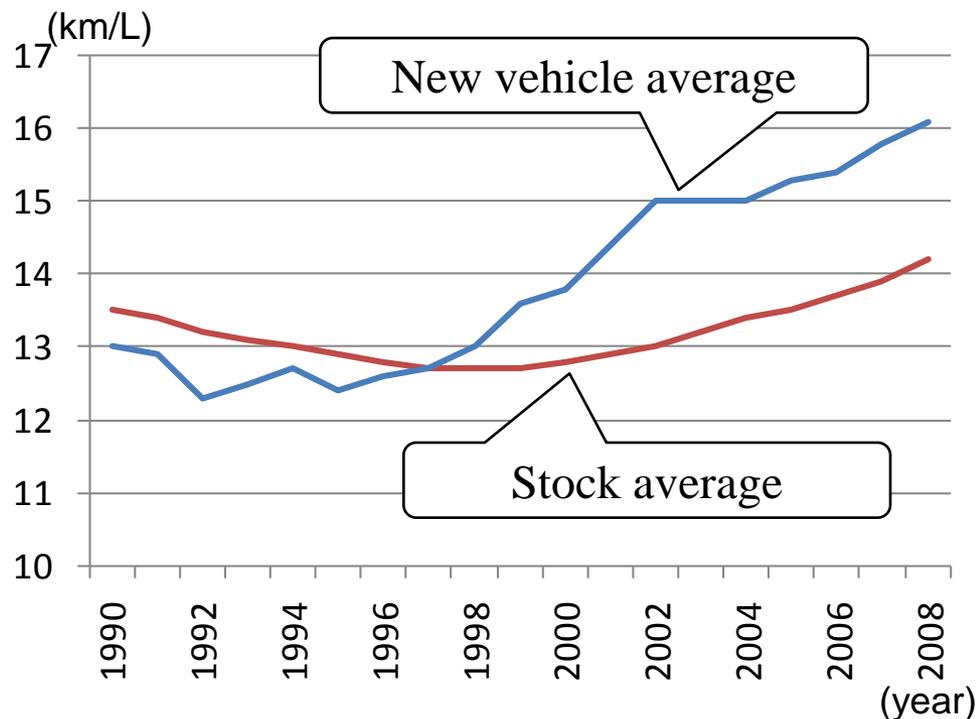
Top Runner Approach

by Act on the Rational Use of Energy

- **Top Runner Approach** is enforced for motor vehicles by **the Act on the Rational Use of Energy**.
- In the '2000s, this approach improved gas mileage and decreased fuel combustion and CO₂ emissions.



Top Runner Approach



Gasoline mileage for passenger vehicle (10.15 mode)

Japanese | Contact us | Site Map



Greenhouse Gas Inventory Office of Japan
温室効果ガスインベントリオフィス

Updated: 10/06/2008

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GHG Inventories

What We Do

Activity History

FAQ

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Glossary

Welcome to the Website of the Greenhouse Gas Inventory Office of Japan (GIO)

To promote the prevention of global warming, GIO is engaged in the development of annual greenhouse gas inventories and the national inventory report, which involves the necessary tasks such as international response, and conducts research that is needed for inventory preparation and utilizes developed inventories.

Under the Kyoto Protocol that Japan ratified in June of 2002, the greenhouse gases subject to the quantified reduction commitments are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). These quantified reduction commitments have been established for each country. During the first commitment period, from 2008 to 2012, Japan has committed to reducing these greenhouse gases by 6% from the base year's emissions (1990 for CO₂, CH₄, and N₂O, while 1995 for HFCs, PFCs, and SF₆). Therefore, accurate emissions inventories are more essential than ever. All developed countries have been responsible for the development of the national inventory on emissions and removals of greenhouse gases mentioned above by one year prior to the first commitment period (2007). The greenhouse gas inventories are crucial databases to report the achievement on the reduction commitments under the Kyoto Protocol.

National Institute for Environmental Studies
Center for Global Environmental Research

Search

Greenhouse Gas Inventory Office of Japan
What's New!

October 6, 2007	Proceedings of the 5th Workshop on Greenhouse Gas Inventories in Asia
May 16, 2008	The GHGs Emissions Data of Japan (2006)
May 16, 2008	National GHGs Inventory Report of JAPAN (2008)
December 25, 2007	Renewal "National GHGs Inventory Report of JAPAN (2007)" Ver.5.0
December 18, 2007	Agenda of the 5th Workshop on Greenhouse Gas Inventories in Asia

Greenhouse Gas Inventory Office of Japan
Focus

- Workshops on Greenhouse Gas (GHG) Inventories in Asia Region
- National GHGs Inventory Report of JAPAN



ありがとう

Thank you
ありがとうございます

GIO JAPAN

Search



GIO Website: <http://www-gio.nies.go.jp/index.html>

