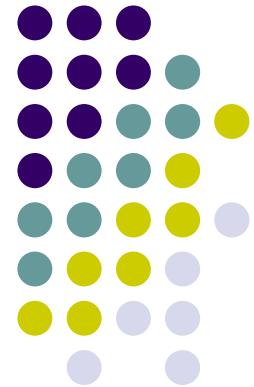# Collection/estimation of energy and activity indicators in the transport sector

30 June 2021

Ryo Eto

Energy Data and Modeling Center (EDMC)
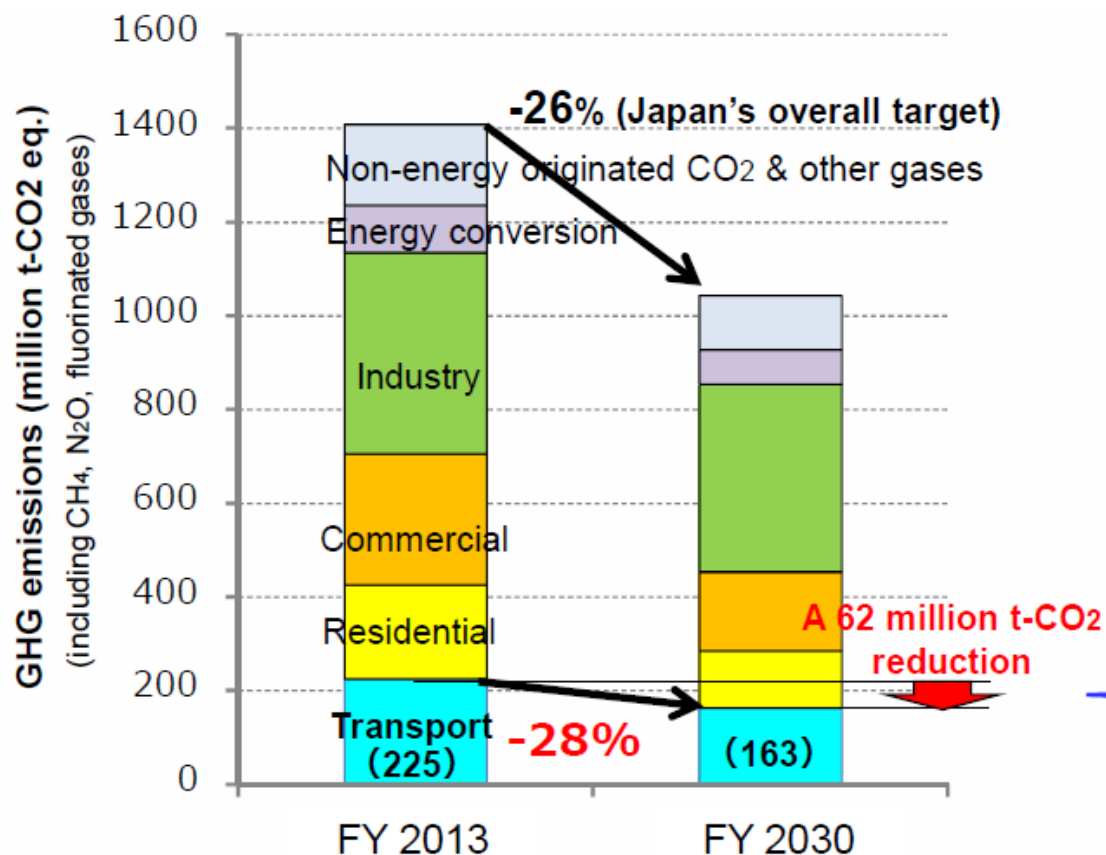The Institute of Energy Economics, Japan (IEEJ)
http://eneken.ieej.or.jp/en/
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Transportation sector in EBT prepared by METI

Display Unit	Coal TJ	Gasoline TJ	Jet Fuel TJ	Gas Oil / TJ	Heavy Fu TJ	Liquefied TJ	City Gas TJ	Electricit TJ	Total TJ
Transportation	37	1600887	153693	980936	134797	31349	1554	62294	3003936
Passenger Transportation	37	1340829	135936	138013	39723	29756	121	59804	1773783
Passenger Vehicle	0	1329193	0	69242	0	29756	3	0	1457585
Bus	0	1000	0	56862	0	0	117	0	57980
Motorcycle	0	10552	0	0	0	0	0	0	10552
Railway Passenger Transport	37	0	0	6001	0	0	0	59804	66016
Water Passenger Transport	0	0	0	5907	39723	0	0	0	45631
Air Passenger Transport	0	83	135936	0	0	0	0	0	136020
Freight	0	260058	17757	842923	95074	1594	1434	2490	1230152
Truck and Lorry	0	260048	0	841838	0	1594	1434	0	1107433
Railway Freight Transport	0	0	0	1085	0	0	0	2490	3594
Water Freight Transport	0	0	0	0	95074	0	0	0	101357
Air Freight Transport	0	11	17757	0	0	0	0	0	17768

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How is it used in energy policies?

GHG emissions (million t-CO2 eq.) (including CH4, N2O, fluorinated gases)

-26% (Japan's overall target)

Non-energy originated CO2 & other gases

Energy conversion

Industry

Commercial

Residential

Transport (225)   -28%   (163)

A 62 million t-CO2 reduction

FY 2013   FY 2030

Reductions will be achieved through:

1. **Vehicle FE improvement, wider use of next-generation vehicles**
2. **Ecodriving**
3. **Improved traffic flow**
4. **Fuel diversity**

Source: Government of Japan

Data sources used for the transportation sector in EBT prepared by METI

	Source	Type of statistics
Passenger Vehicle, Bus, Truck and Lorry	Monthly / Annual Statistical Report on Fuel Consumption by **Motor Vehicle** Transport	General Statistics (Sample survey)
Water Freight Transport	Monthly / Annual Report on **Coastwise Vessel** Transport	Fundamental Statistics (Inventory survey)
Water Passenger Transport	Diesel oil and heavy fuel oil	Collected based on law of admiralty
Air Transport	Monthly / Annual Report on **Air** Transport	General Statistics (Inventory survey)
Railway Transport	Monthly / Annual Report on **Railway** Transport	General Statistics (Inventory survey)
Motorcycle	Estimation combining surveys	Collected by industry organization

Statistical Report on Fuel Consumption by Motor Vehicle Transport

Coverage	Nationwide
Survey unit	Registered vehicle (Sample survey, about 9,600 each month)
Survey period	Two months (7 days for commercial vehicle, 21 days for private vehicle for each month)
Questionnaire distribution	One week before starting period
Questionnaire collection	By 10th in next month
Publication	Two months later

Statistical Report on Fuel Consumption by Motor Vehicle Transport

Feedback (FY2019)

	Number	Rate
Commercial freight vehicle	15,101	about 65%
Commercial passenger vehicle	7,485	about 75%
Small sized passenger private vehicle	28,902	about 50%
Medium and large sized passenger private vehicle	9,039	about 55%

Sample Questionnaire for Statistical Report on Fuel Consumption by Motor Vehicle Transport

Main Purpose

> **1. Passenger**
>
> **2. Fleet**
>
> **3. Others**

Days unused during period for investigation

Fuel Consumption (in Liter)

Travel Distance indicated on Odometer

> **Start**
>
> **End**
>
> **Travel Distance In Investigation Period**

What is not included in Statistical Report on Fuel Consumption by Motor Vehicle Transport

1.Special-purpose vehicle which do not practice general transportation

- Large-sized special-purpose vehicle（bulldozer）
- Small-sized special-purpose vehicle（forklift, tractor）
- Transportation used for a military purpose
- Transportation mainly used for emergency purpose (fire truck, ambulance, police car)

2.Motor cycle
3.Electric vehicle

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Estimation method(Motor cycle)

Travel distance (km)

divided by fuel efficiency (km/l)

for each type of vehicle

multiply calorific value

$$GC = \sum_i \left(\frac{VKT_i}{FE_i} * GCV \right)$$

$$VKT_i = \sum_j \left(NV_{i,j} * TD_i * U_{i,j} \right)$$

GC : Fuel consumption [TJ]
VKT : Travel distance for each type of vehicle [million km]
FE : Fuel efficiency for each type of vehicle [km/l]
GCV : Calorific value [TJ/thousand kl]
i : Type of vehicle

VKT : Travel distance for each type of vehicle [million km]
NV : Number of vehicles owned by type by used years
TD : Travel distance per vehicle by type by used years   [million km per vehicle]
U : Use coefficient of vehicle by type by used years
i : Type of vehicle
j : Used years of vehicle

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Challenge

- Electric vehicle

→Currently energy consumption and travel distance of EV is not surveyed

→In terms of energy balance table, charged electricity for EV is included in other sectors.

- Regional consumption

→How to allocate transportation consumption to region has not been determined