

Global Environmental Policy 環境・エネルギー技術政策

<http://sunshine.naoe.t.u-tokyo.ac.jp/jun/kougi/gep/gep.html>

6, October, 2008
Jun TAKAHASHI

- ✓ Outline of this class.
- ✓ How to read statistics data ?
 - ✓ Long-term viewpoint
 - ✓ Suspect an interpretation and the data itself !
- ✓ How to make a policy ?
- ✓ Quiz

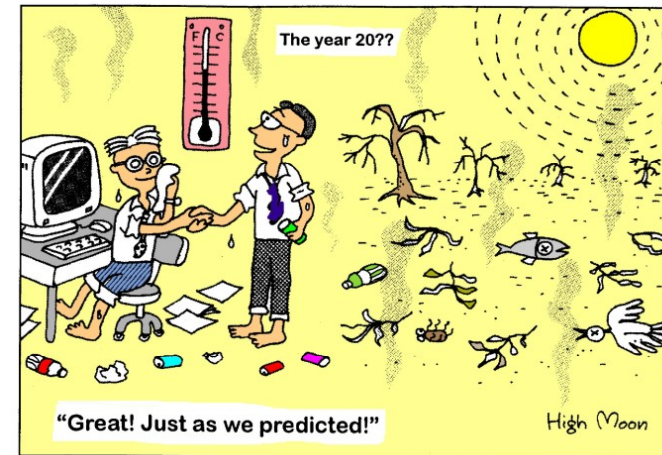
Outline of this class

- ◆ This class will open 8 times, and each lecture will extend till 18:10.
- ◆ To get the credits from this class, you have to attend till 18:10.

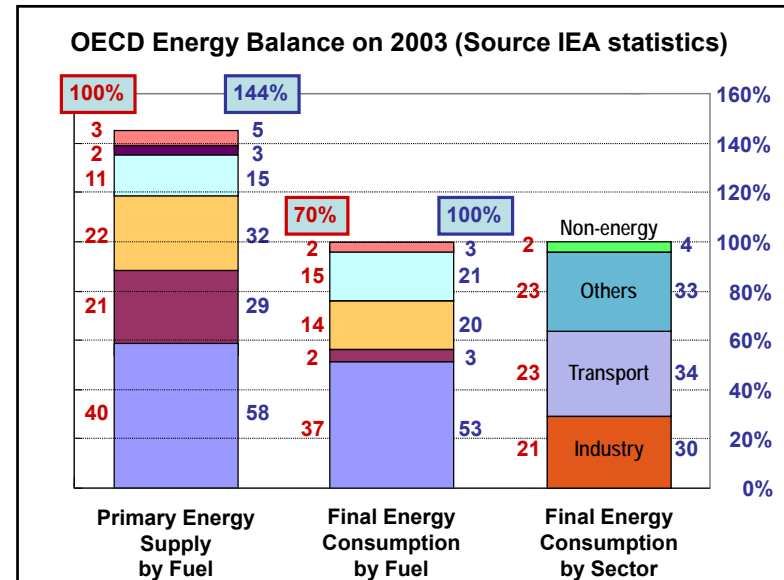
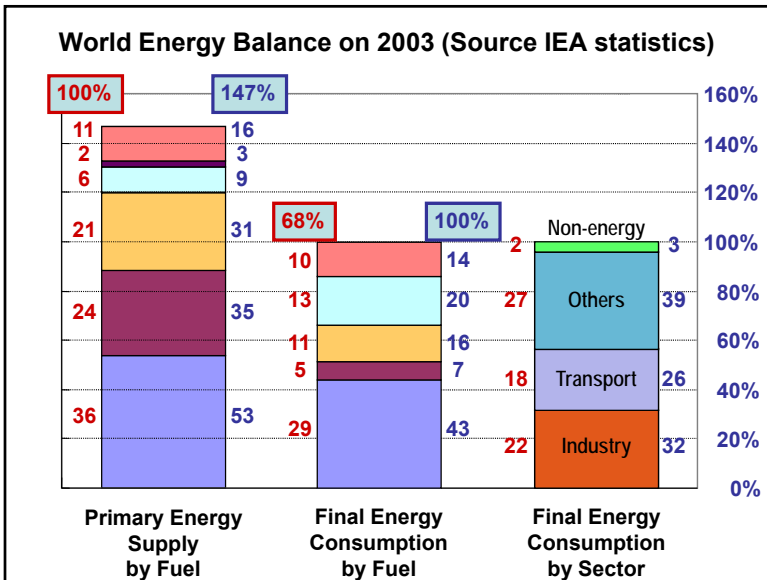
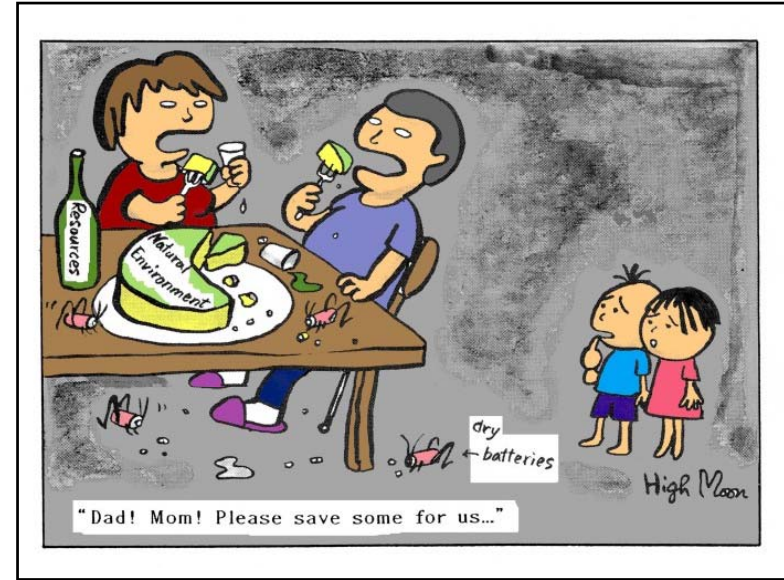
date	Lecturer	Topics
10/06	Jun Takahashi (The University of Tokyo)	Global energy balance
10/20	Kazunori Kobayashi (Japan For Sustainability)	Sustainability
10/27	Kazunori Kobayashi	Student's Presentation and Discussion
11/10	Ryosuke Ugo (NEC)	Management on environment
11/17	Jun Takahashi	Student's Presentation and Discussion
12/01	Ryosuke Ugo	Student's Presentation and Discussion
12/08	Makoto Akai (AIST)	Global technological policy
12/15	Makoto Akai	Student's Presentation and Discussion

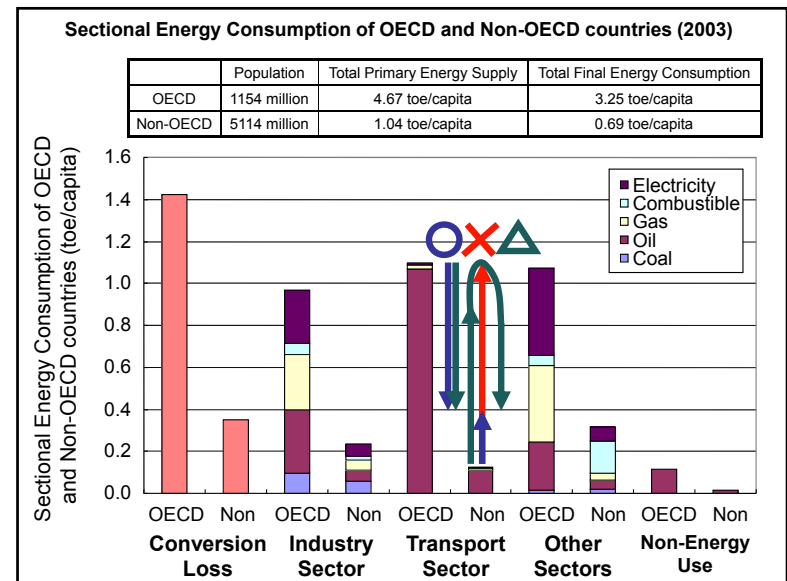
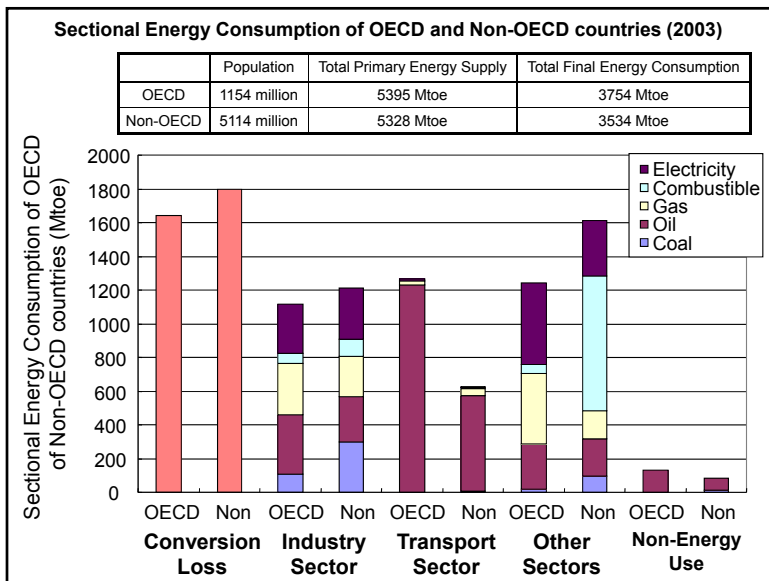
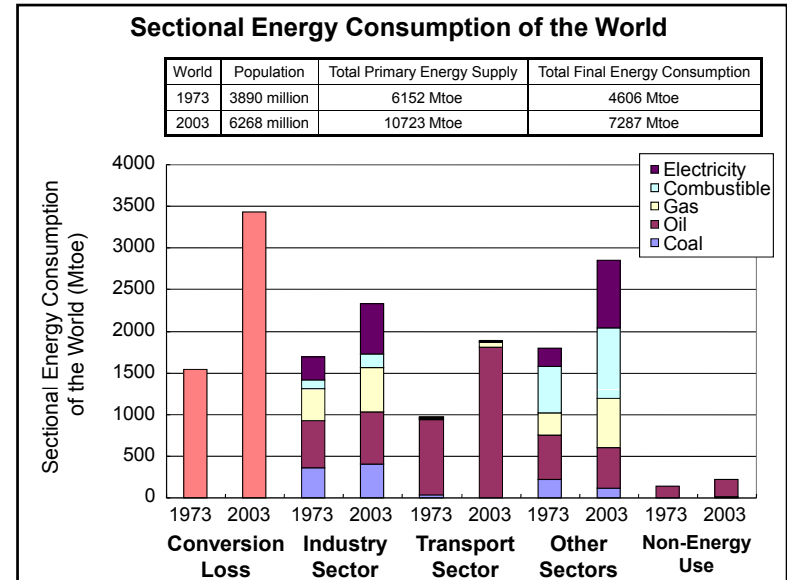
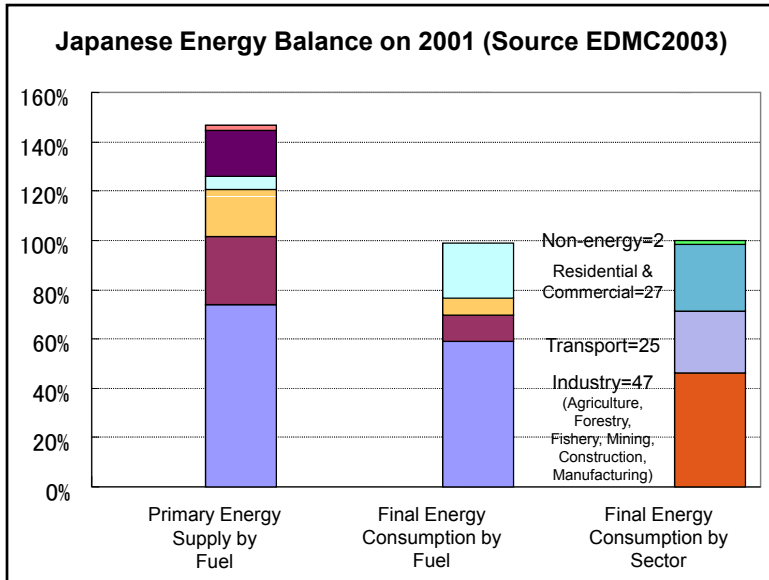
Student's Presentation at 11/17

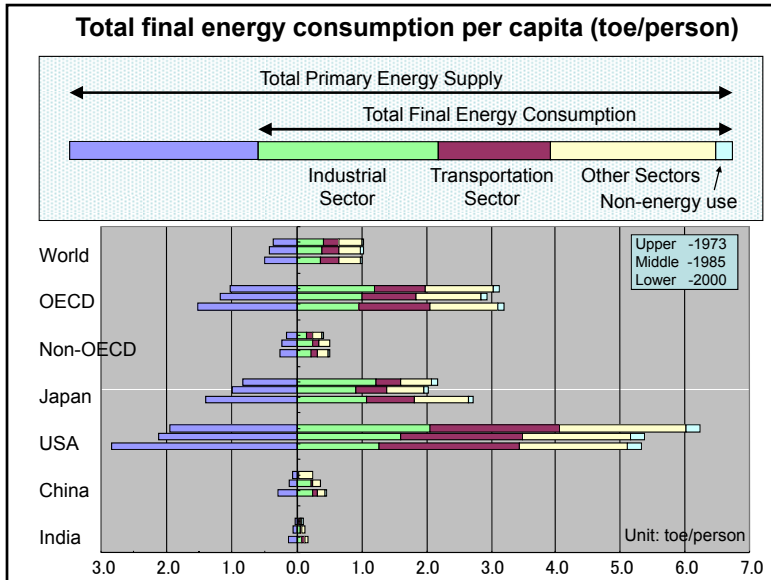
- ◆ Theme
 - ◆ Consider effective policy to reduce world's fossil fuel consumption by using statistics shown in today's lecture first.
 - ◆ Then, show your assumption about technological development, i.e. electric vehicle, and introducing schedule of the technologies to our society.
 - ◆ Evaluate the long term effect of the technologies on the reduction of fossil fuel consumption till 2050 quantitatively based on your assumption.
- ◆ How to get the credits from this class.
 - ◆ You have to make a group which consists of 2 or 3 students.
 - ◆ Discuss well about your presentation in your group.
 - ◆ Every group have to make a 15 minutes presentation by using Microsoft powerpoint.
 - ◆ If you can't make a presentation, you should submit more than 10 pages PPT file by e-mail to jun@sunshine.naoe.t.u-tokyo.ac.jp.



Note: In the case of global warming, countermeasures and implementation are more important than prediction.







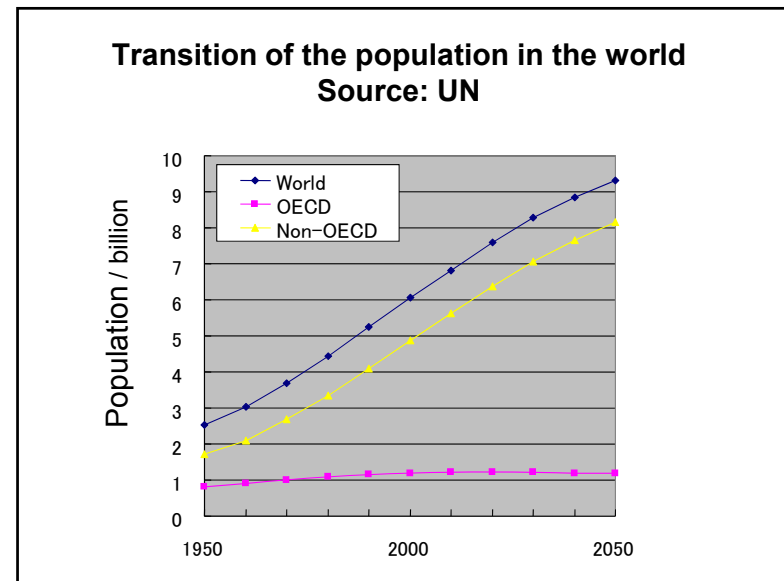
Total Primary Energy Supply and Final Energy Consumption

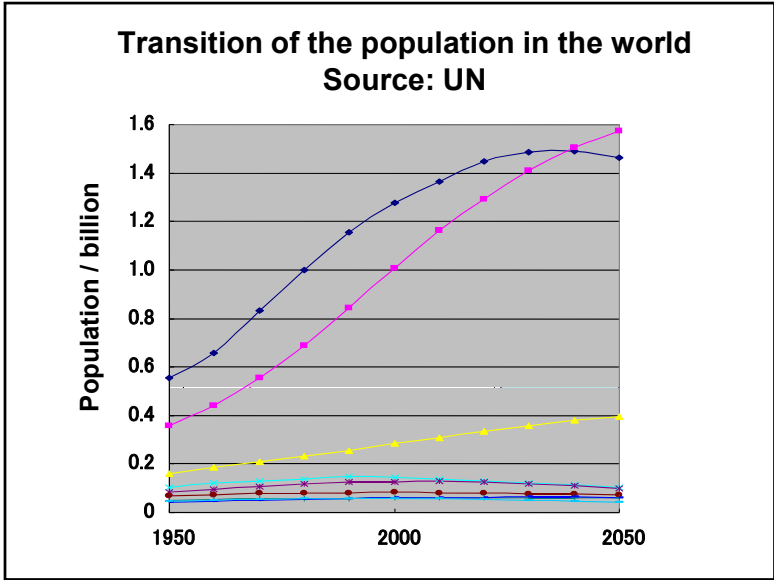
Statistics of 2000 by EDMC2003		World	OECD	Non-OECD	Japan	USA	China	India
Population	Million	6,027	1,125	4,901	127	282	1,262	1,016
GDP	1995 USG\$	34,199	27,675	6,525	5,688	9,009	1,040	482
CO2 Emission	Mt-C	6,422	3,470	2,952	328	1,580	881	266
Total Primary Energy Supply	Mtoe	9,043	5,317	3,726	525	2,300	928	300
	%	149.8	147.2	153.7	151.3	153.4	166.0	181.8
Total Final Energy Consumption	Mtoe	6,035	3,612	2,424	347	1,499	559	165
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Industrial Sector	Mtoe	2,088	1,087	1,004	137	360	311	70
	%	34.6	30.1	41.4	39.6	24.0	55.6	42.6
Transportation Sector	Mtoe	1,780	1,221	560	94	610	74	44
	%	29.5	33.8	23.1	27.1	40.7	13.3	26.8
Other (Residential, Commercial, Agriculture, etc.) Sectors	Mtoe	1,986	1,188	795	106	474	153	46
	%	32.9	32.9	32.8	30.5	31.6	27.4	27.7
Non-energy use	Mtoe	184	117	67	10	56	22	5
	%	3.0	3.2	2.8	2.8	3.7	3.9	3.1

2000's world statistics rearranged by per population

Source: EDMC2003

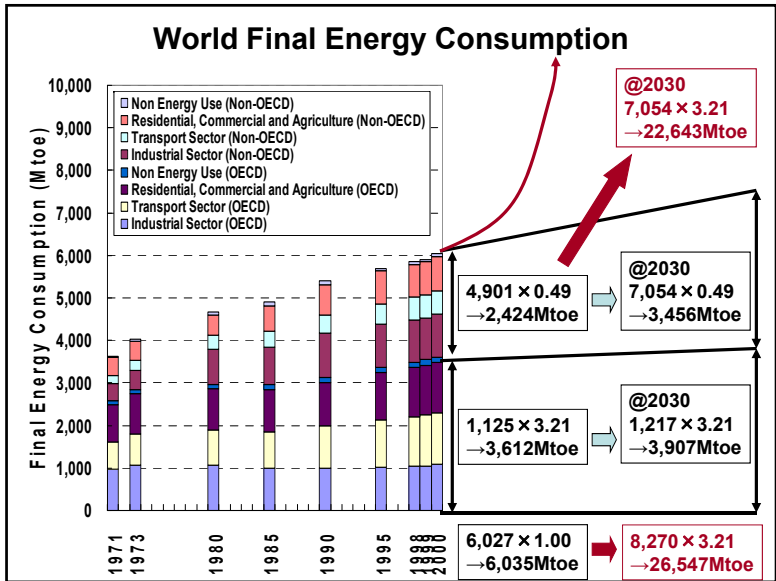
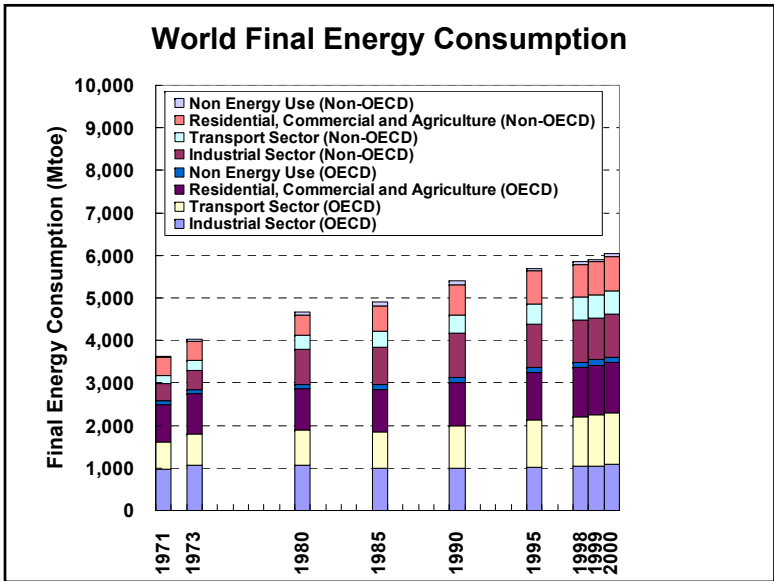
		World	OECD	Non-OECD	Japan	USA	China	India
Population	Million	6,027	1,125	4,901	127	282	1,262	1,016
GDP	1995US\$ /person	5,674	24,600	1,331	44,787	31,947	824	474
CO2 Emission	t-C /person	1.07	3.08	0.60	2.58	5.60	0.70	0.26
Total Primary Energy Supply	toe /parson	1.50	4.73	0.76	4.13	8.16	0.74	0.30
Total Final Energy Consumption	toe /parson	1.00	3.21	0.49	2.73	5.32	0.44	0.16
Industrial Sector	toe /parson	0.35	0.97	0.20	1.08	1.28	0.25	0.07
Transportation Sector	toe /parson	0.30	1.09	0.11	0.74	2.16	0.06	0.04
Other (Residential, Commercial, Agriculture, etc.) Sectors	toe /parson	0.33	1.06	0.16	0.83	1.68	0.12	0.04

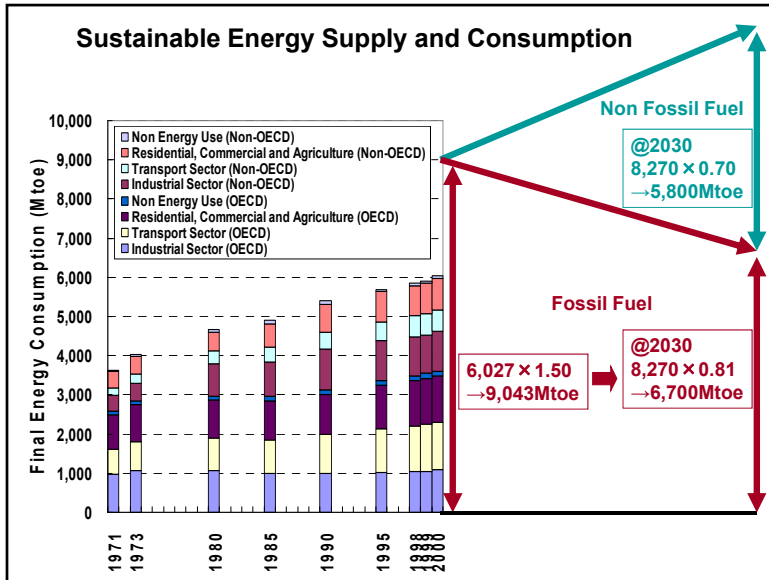




“In terms of the CO₂ issue... we will not do anything that harms our economy. Because, first things first, are the people who live in America.”

“If I had my way, I'd have [tax cuts] in place tomorrow, so that people would have money in their pockets to deal with high energy prices.”





Calculation of the amount of solar energy

Reference

- World primary energy supply is about 1.5 toe/ year par capita
 - 1.5 [toe/ year par capita] = 40000 [kcal/day par capita]
- Human need energy of 2000 [kcal/day par capita] to live.

Solar energy flowing into the earth

$$0.7 \times \pi R^2 [m^2] \times 1367 [J/m^2s]$$

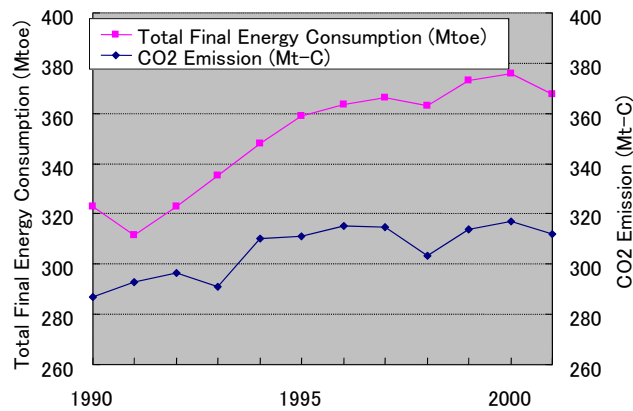
$$= 0.7 \times 1.286 \times 10^{14} [m^2] \times 1367 [J/m^2s]$$

$$= 1.23 \times 10^{17} [J/s]$$

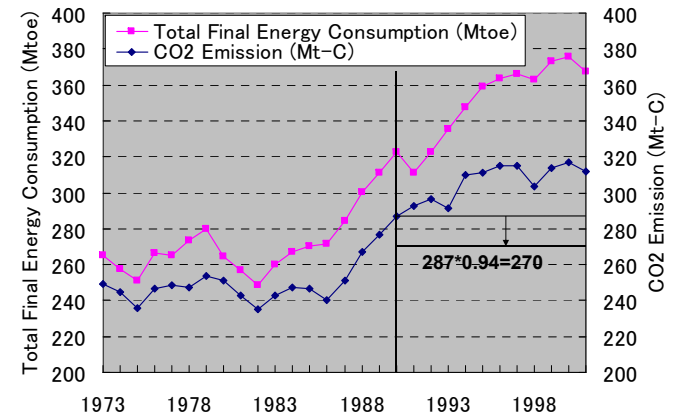
$$= 2.94 \times 10^{13} [kcal/s] \quad (= 40000 \times 10^4 [kcal/day par capita])$$

$$= 2.94 [Mtoe/s] \quad (= 1.5 \times 10^4 [toe/year par capita])$$

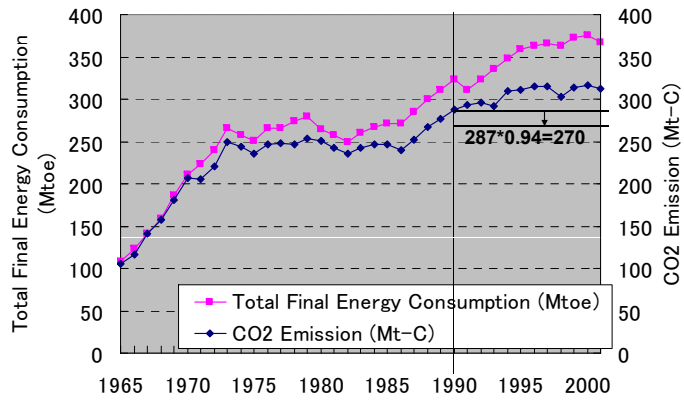
Japanese TFC and CO2 Emission (1990-2001)



Japanese TFC and CO2 Emission (1973-2001)

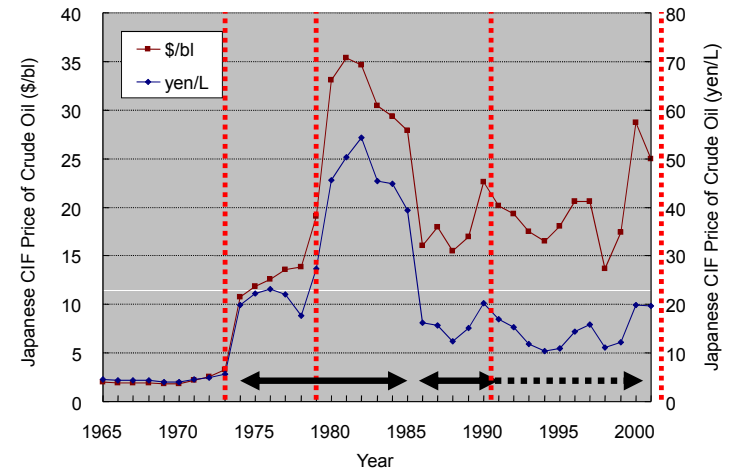


Japanese TFC and CO2 Emission (1965-2001)

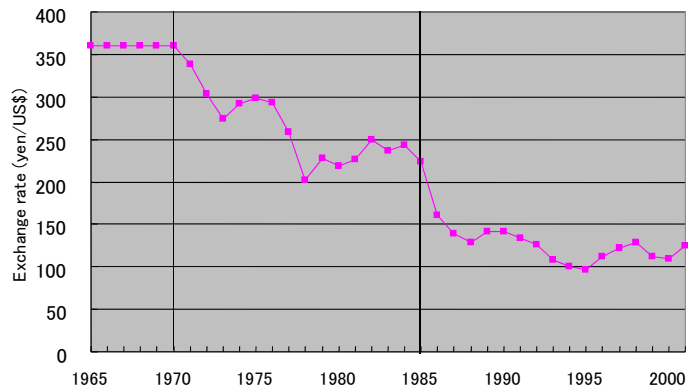


Japanese CIF Price of Crude Oil

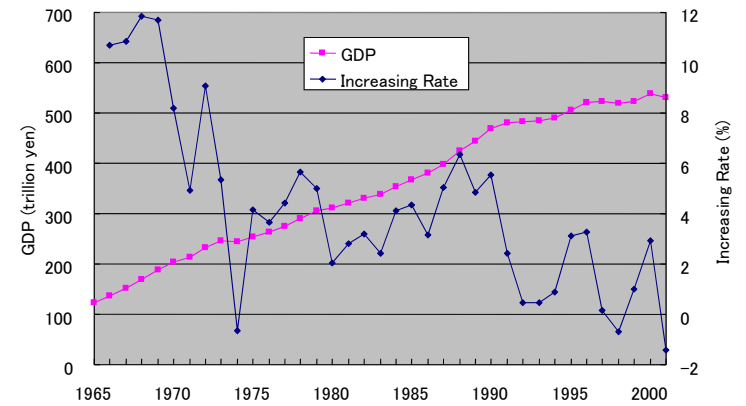
CIF: Cost + Insurance + Freight

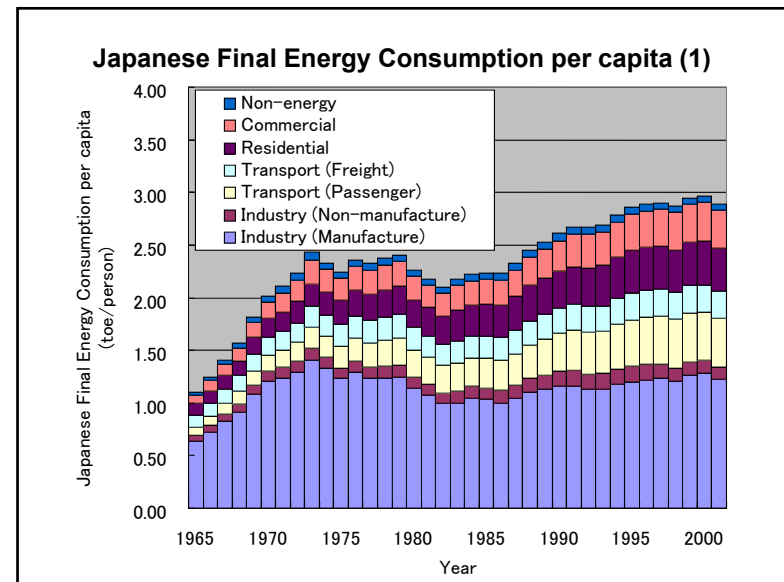
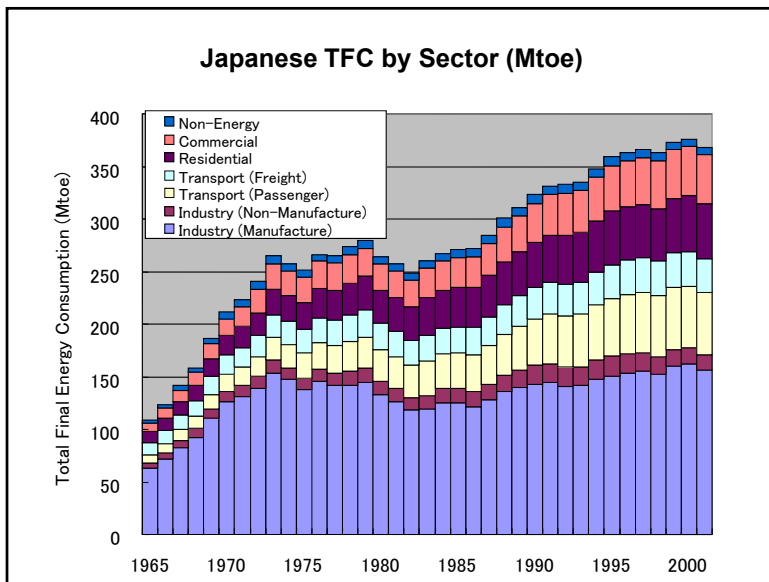
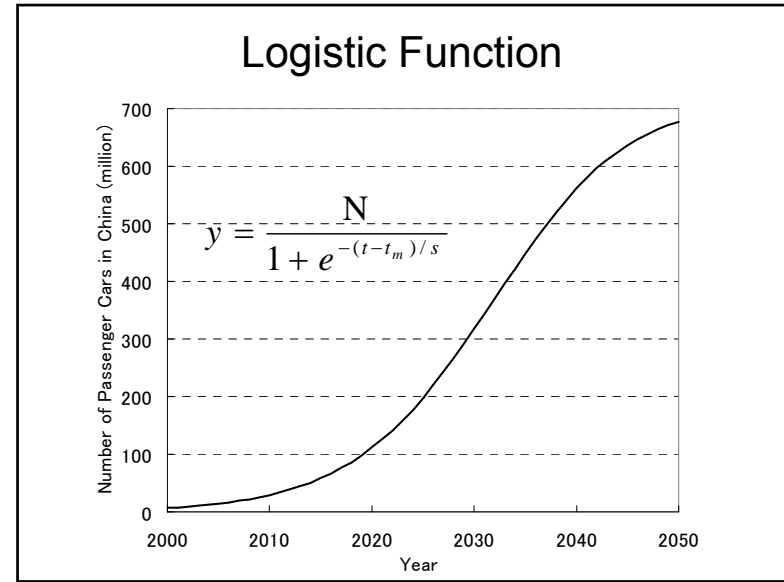
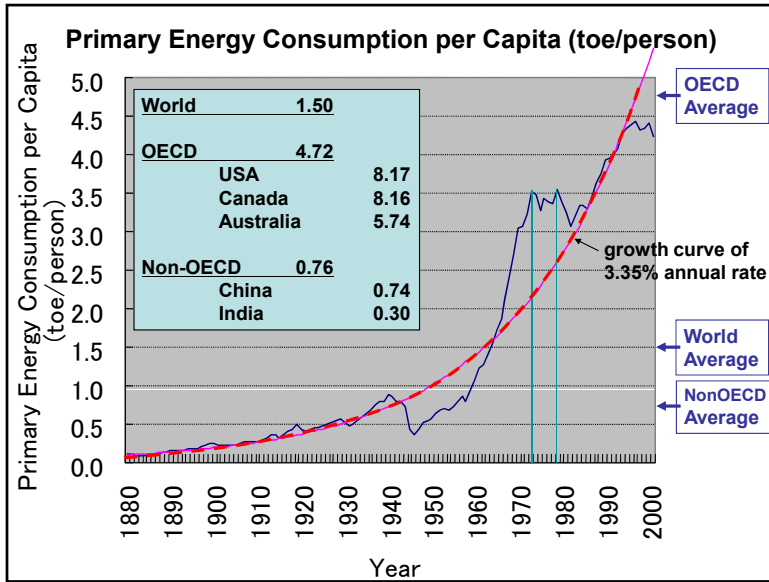


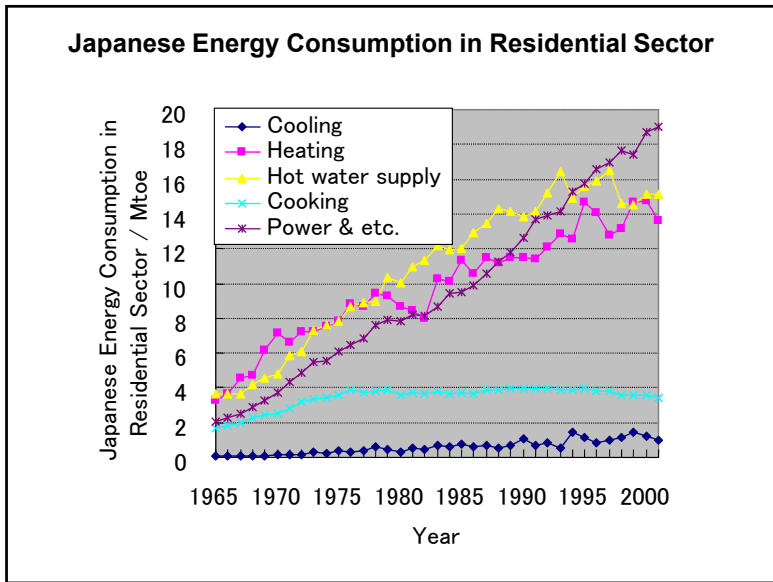
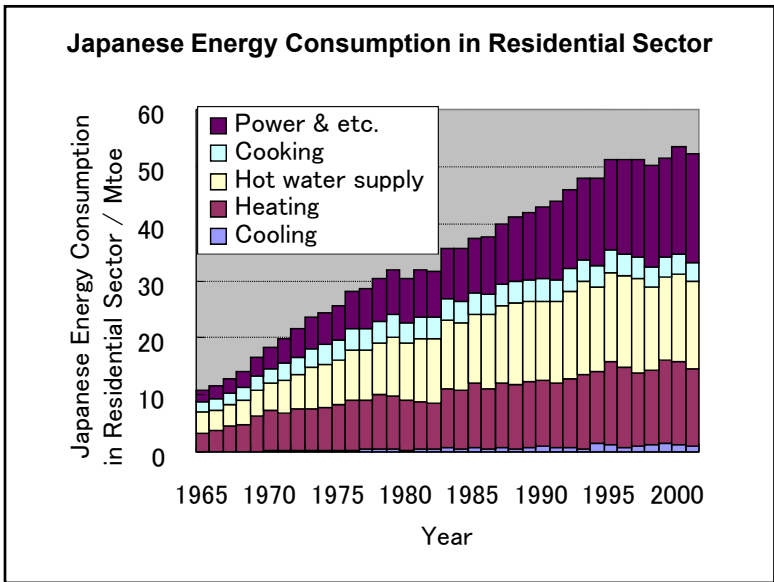
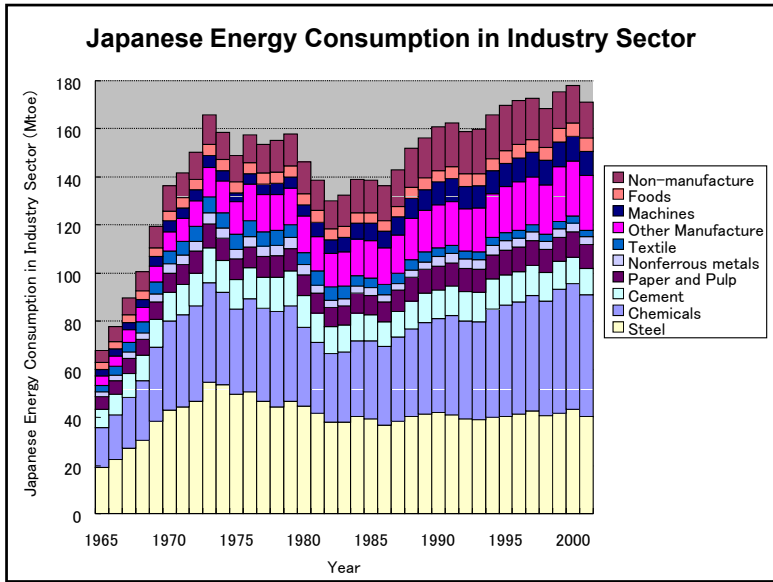
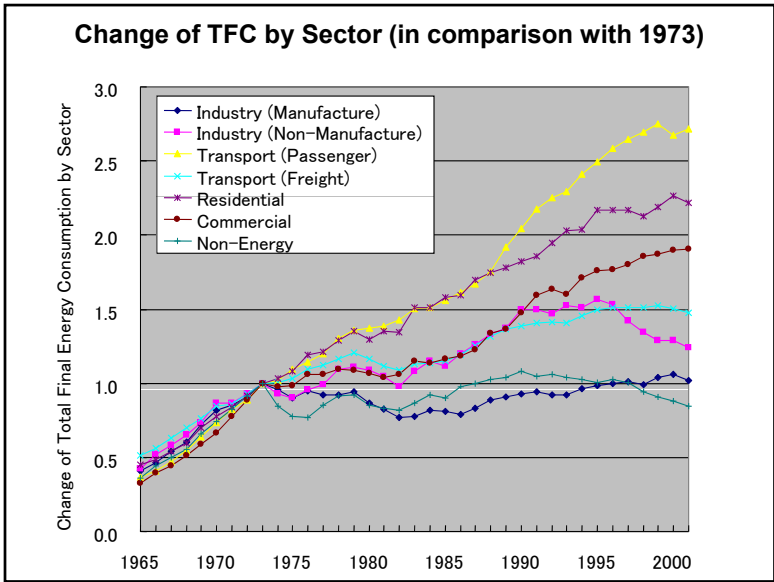
Exchange Rate (yen/US\$)



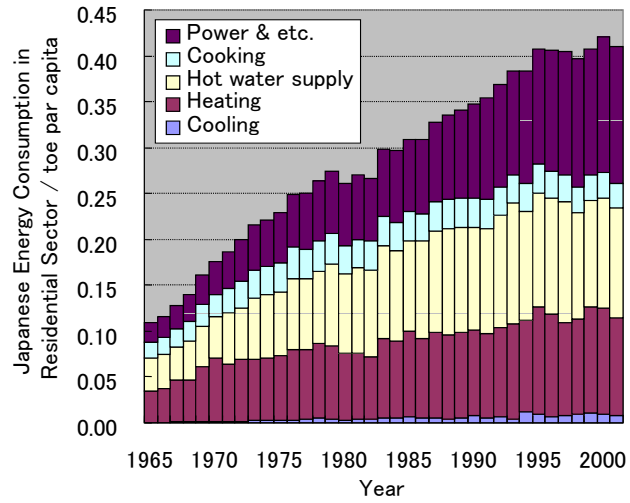
GDP and Increasing Rate



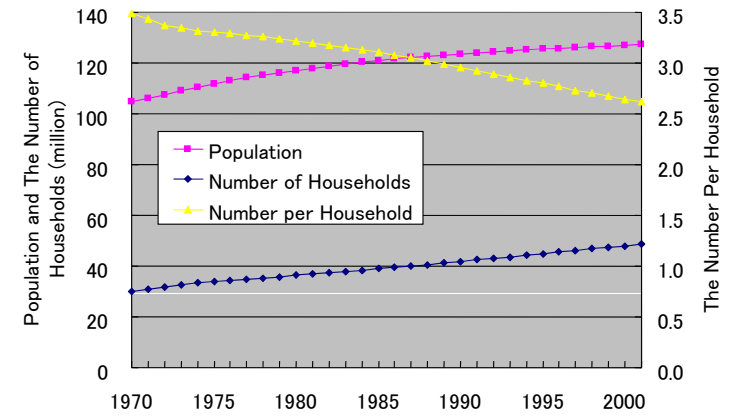




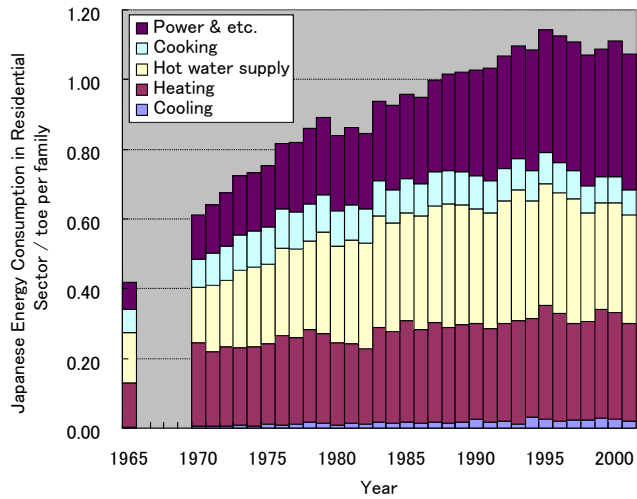
Japanese Energy Consumption in Residential Sector



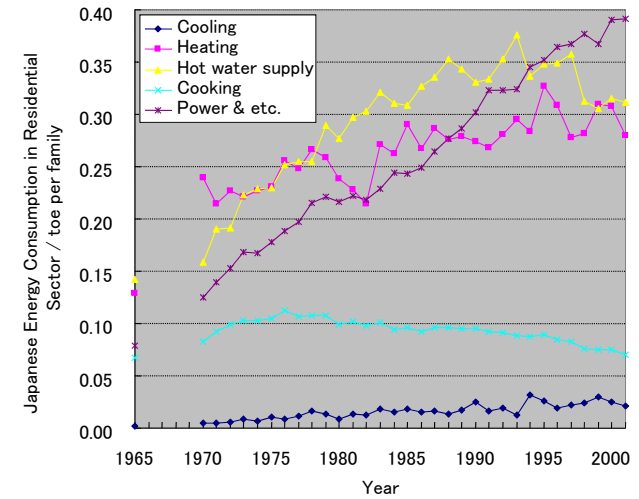
Japanese Population and The Number of Households



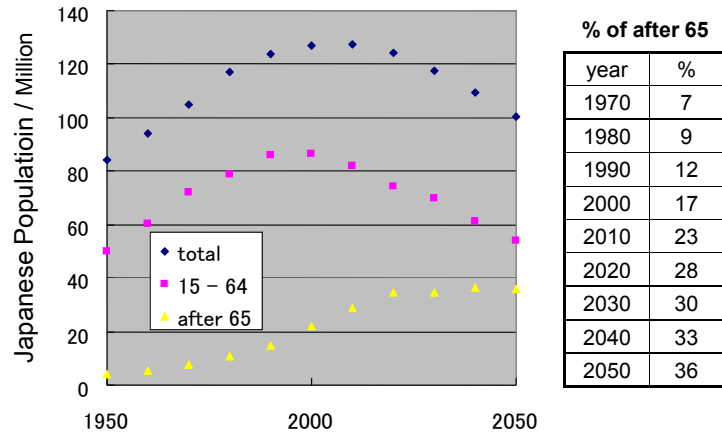
Japanese Energy Consumption in Residential Sector



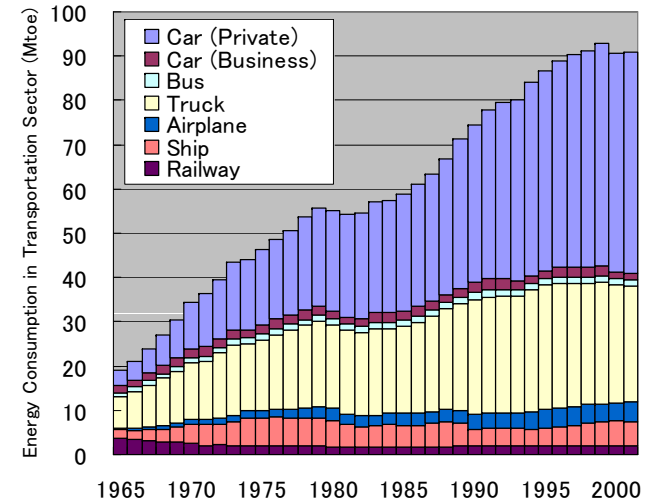
Japanese Energy Consumption in Residential Sector



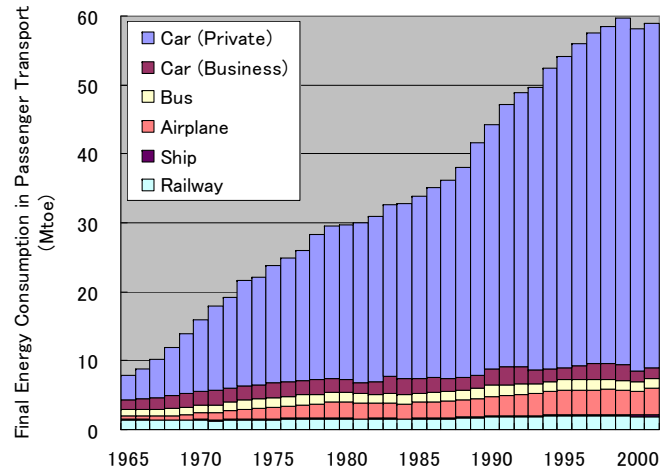
Transition of population composition of Japan



Energy Consumption in Transportation Sector (Mtoe)



Energy Consumption in Passenger Transport (Mtoe)



Passenger Transport Activity (billion passenger-kilometers)

