

Chapter 1

National Circumstances Relevant to Greenhouse Gas Emissions and Removals

1.1 National Land Use

Japan, located on the east side of Eurasia, is a long and thin archipelago stretching approximately between latitudes 24 and 46 north, and consists of four major islands—(from north to south) Hokkaido, Honshu, Shikoku, and Kyushu—as well as more than 6,800 other islands.

As of FY2007 Japan's land area equaled 37.79 million hectares, or 0.3% of the total global land area, of which nearly 80% is accounted for by 24.98 million hectares (66.1%) of forests and 4.03 million hectares (10.7%) of agricultural land. Current land use statistics indicate that forests, agricultural land, and marshes are declining, while grasslands and developing areas are increasing.

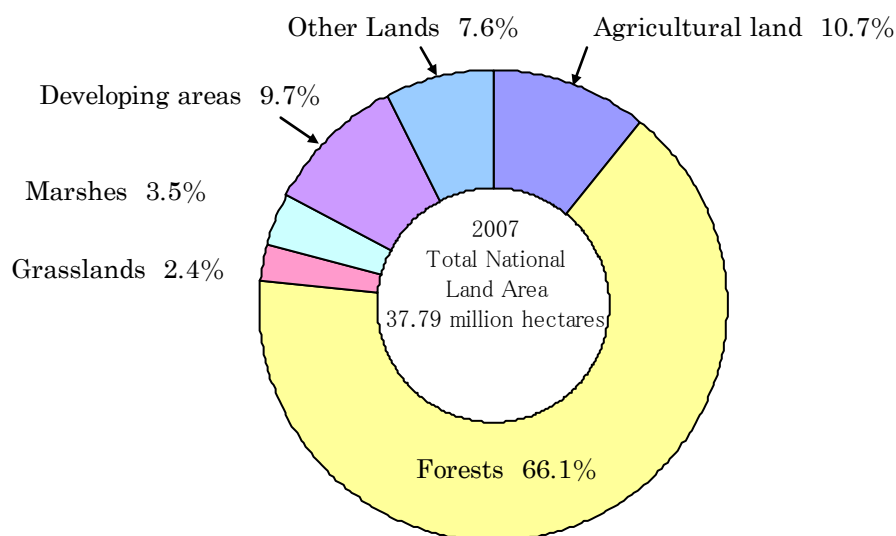


Figure 1.1 Current Land Use in Japan¹

Source: National Greenhouse Gas Inventory Report of Japan (NIR) (April 2009)

¹ Developing areas are urban regions that do not correspond to forests, agricultural land, grasslands, or marshes. Figures are from the National Institute for Environmental Studies and consist of those directly assessed using existing statistics and those estimated for a portion of lands that could not be directly assessed.

1.2 Climate

Japan stretches over a great distance from north to south with subtropical zones in the south and subarctic zones in north. In addition, Japan has rich seasonal changes. Topographically, mountain ranges stretching from the south to north also serve to produce significant climatic change between different regions of Japan. In winter, seasonal cold winds from Siberia bring a large amount of snowfall to the coastal areas facing the Japan Sea, while seasonal warm winds from the south make summer hot and humid.

With such a varied natural environment, Japan is home to a wide variety of species. With regard to fauna, about 1,400 vertebrates and about 35,000 invertebrates have been identified, while amongst the flora, some 7,000 vascular plants and approximately 25,300 other plants have been found.

The major climate statistic averages (30-year average for the period 1971-2000)² are shown in Table 1.1 for several meteorological stations, which are considered affected only slightly by urbanization.

Table 1.1 Major Climate Components of Japan

		Latitude	Longitude	Elevation (meters)	Annual Mean Temperature (°C)	Annual Mean of Daily Maximum Temperature (°C)	Annual Mean of Daily Minimum Temperature (°C)	Annual Precipitation (mm)
Northern Japan	Abashiri	44°01.0'	144°16.7'	37.6	6.2	10.0	2.6	801.9
	Nemuro	43°19.8'	145°35.1'	25.2	6.1	9.4	3.0	1,030.0
	Yamagata	38°15.3'	140°20.7'	152.5	11.5	16.4	7.2	1,125.0
	Ishinomaki	38°25.6'	141°17.9'	42.5	11.4	15.3	7.9	1,064.5
Eastern Japan	Fushiki	36°47.5'	137°03.3'	11.6	13.7	17.7	10.3	2,196.4
	Mito	36°22.8'	140°28.0'	29.3	13.4	18.5	8.9	1,326.0
	Choshi	35°44.3'	140°51.4'	20.1	15.3	18.3	12.3	1,580.1
	Iida	35°31.4'	137°49.3'	516.4	12.4	18.3	7.6	1,606.7
Western Japan	Sakai	35°32.6'	133°14.1'	2.0	14.9	19.0	11.1	1,894.9
	Hamada	34°53.8'	132°04.2'	19.0	15.2	19.1	11.5	1,705.7
	Hikone	35°16.5'	136°14.6'	87.3	14.4	18.5	10.8	1,617.9
	Miyazaki	31°56.3'	131°24.8'	9.2	17.2	21.8	13.0	2,457.0
	Tadotsu	34°16.5'	133°45.1'	3.7	16.0	20.0	12.2	1,090.7
Nansei Islands	Naze	28°22.7'	129°29.7'	2.8	21.5	24.7	18.6	2,913.5
	Ishigakijima	24°20.2'	124°09.8'	5.7	24.0	26.6	21.9	2,061.0

Source: Japan Meteorological Agency—'Climate Table of Japan' (CD-ROM (Eighth Edition))

In order to examine the long-term changes in temperature and precipitation in Japan, the average of the

² Average mean temperatures, annual means of daily maximum, and minimum temperatures are obtained by calculating monthly mean normals over a 30-year period and then calculating a 12-month average from that figure.

anomalies difference from the normal for annual mean surface temperature and annual precipitation ratios to the normal in the observation stations of the Japan Meteorological Agency in the period 1898-2008 were taken and the results³ of the analysis of the data are presented here.

The annual mean surface temperature in Japan has repeatedly fluctuated, but is on a long-term increasing trend and is currently increasing at a rate of about 1.11°C per century (Figure 1.2). In particular, preeminently high temperatures have been frequently recorded since the 1990s. The temperature anomaly in Japan for 2008 was +0.46°C, the eleventh highest figure since statistics began in 1898. The cause of recent frequent high temperature years in Japan, as well as the rest of the world, coincides with the impact of global warming, which accompanies increases in greenhouse gasses (such as CO₂) with the cycles in nature that repeat every decade or so. In addition, one cause for 2008 displaying a lower average temperature in comparison to recent years is thought to be the impact of the La Nina phenomenon that occurred between spring 2007 and spring 2008.

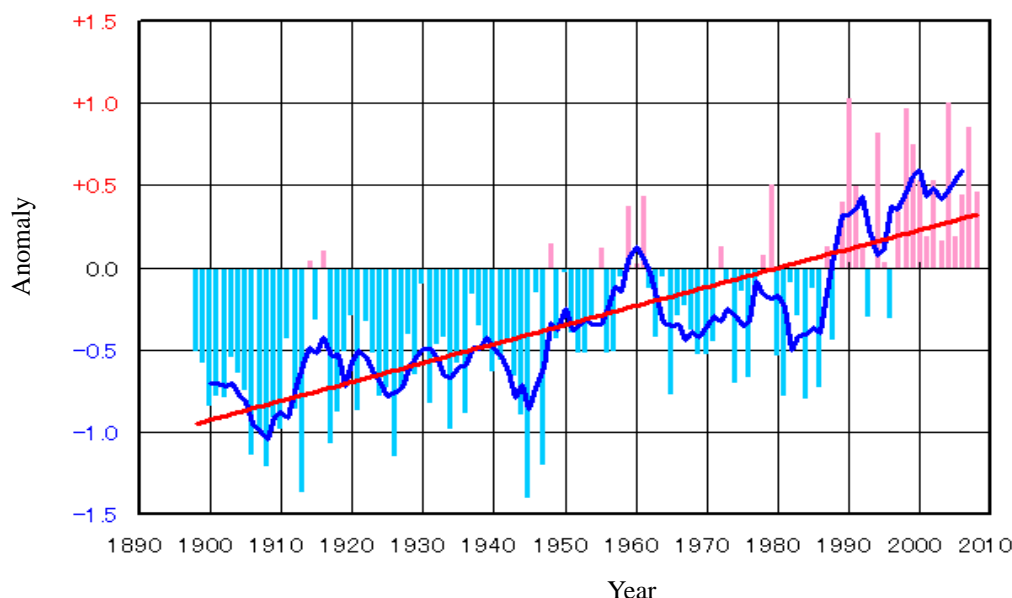


Figure 1.2 Variations in Annual Mean Surface Temperature in Japan (1898-2008)

The bar graph shows anomalies from the normal, the thick line (blue) indicates the five-year running mean, and the straight line (red) represents the long-term trend. The normal is derived from the average of 30 years between 1971 and 2000.

³ For the analysis of surface temperature we used 17 stations for which the observed data maintained its homogeneity in the long term and for which changes in the environment due to urbanization, etc. were relatively minor. For the calculation of precipitation, we used 51 stations for which the observed data maintained its homogeneity in the long term. It should be noted that although for this analysis 17 stations were selected that are only impacted by urbanization to a minor degree when calculating surface temperature, the impact of urbanization is not completely eliminated from the analysis.

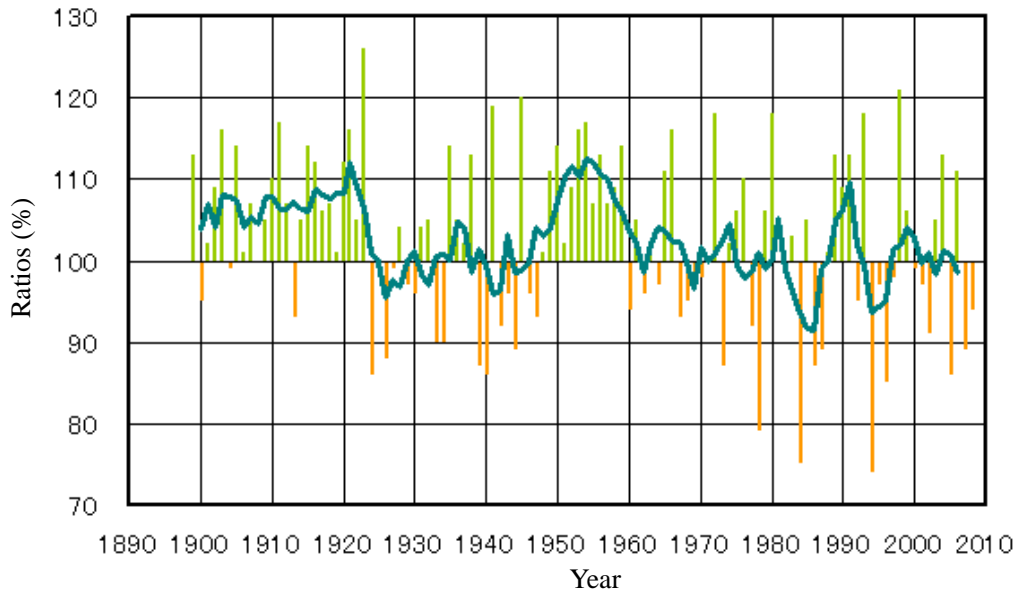


Figure 1.3 Variations of Annual Precipitation Ratios in Japan from 1898-2008

The bar graph shows averages of annual precipitation ratios to the normal for 51 stations in Japan (expressed in percentages compared to annual means), and the thick line (green) represents the five-year running mean. The normal is derived from the average of 30 years between 1971 and 2000.

Source: Japan Meteorological Agency

The annual precipitation of Japan (Figure 1.3) does not provide any clear long-term trend. On the other hand, the variations between years have widened in recent years. There are noticeably both more years with a lot of rain as well as those with little rain.

1.3 Population and Households

According to the population census, as of October 1, 2005, Japan's population was 127,285,653, representing a 0.3 percent increase over the October 2000 census. The population density was 343 inhabitants per square kilometer. In line with the falling birthrate and increased average longevity, the ratio of the elderly amongst the population is rapidly increasing at a higher rate than ever, and the population segment aged 65 or older as of 2005 reached 20 percent. This rate is among the highest of all the developed countries.

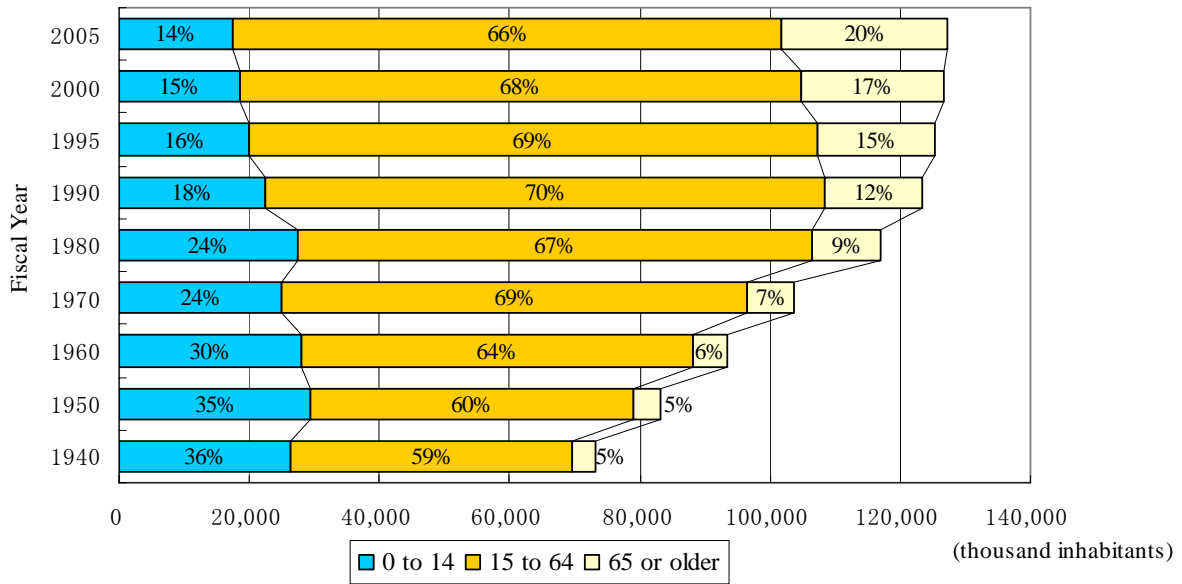


Figure 1.4 Population for Three Age Segments

Source: Ministry of Internal Affairs and Communications—‘Population Census’

One of the major factors behind the aging of the population is the decline in the number of births. During the 1960s the number of births generally increased but peaked in 1973, and have continued to gradually decline ever since. In 2005, birth numbers reached their lowest in history, and the number of deaths exceeded the number of births, creating a natural decline of 18,516 people. 2007 displayed yet another negative figure, indicating that Japan is facing an era of a declining population.

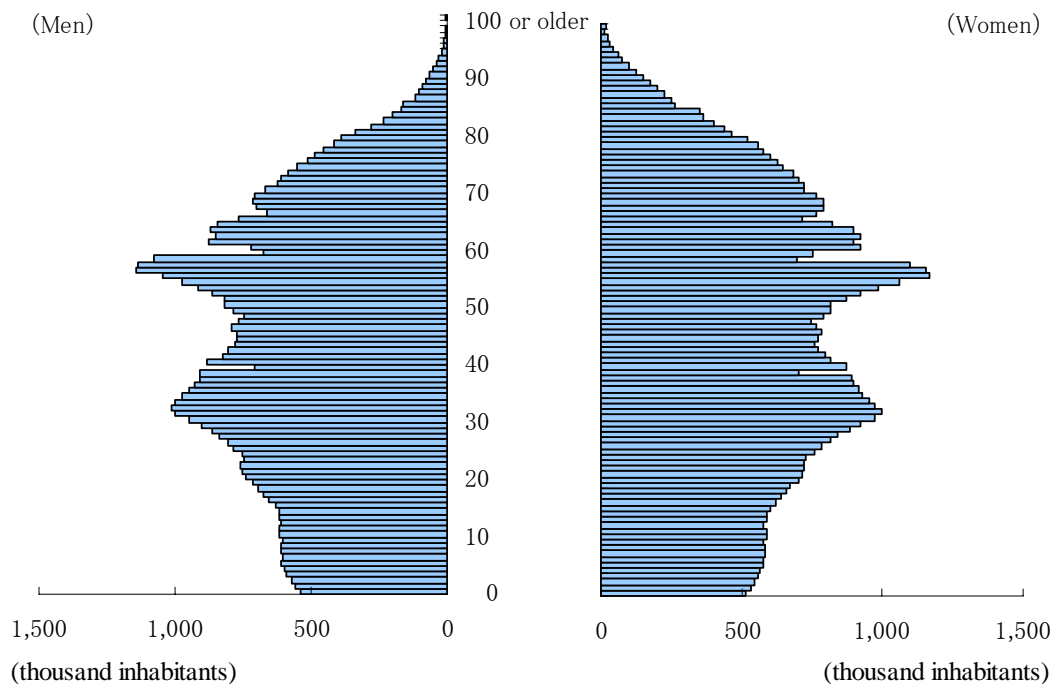


Figure 1.5 Japanese Population Pyramid in 2005

Source: Ministry of Internal Affairs and Communications—‘Population Census’

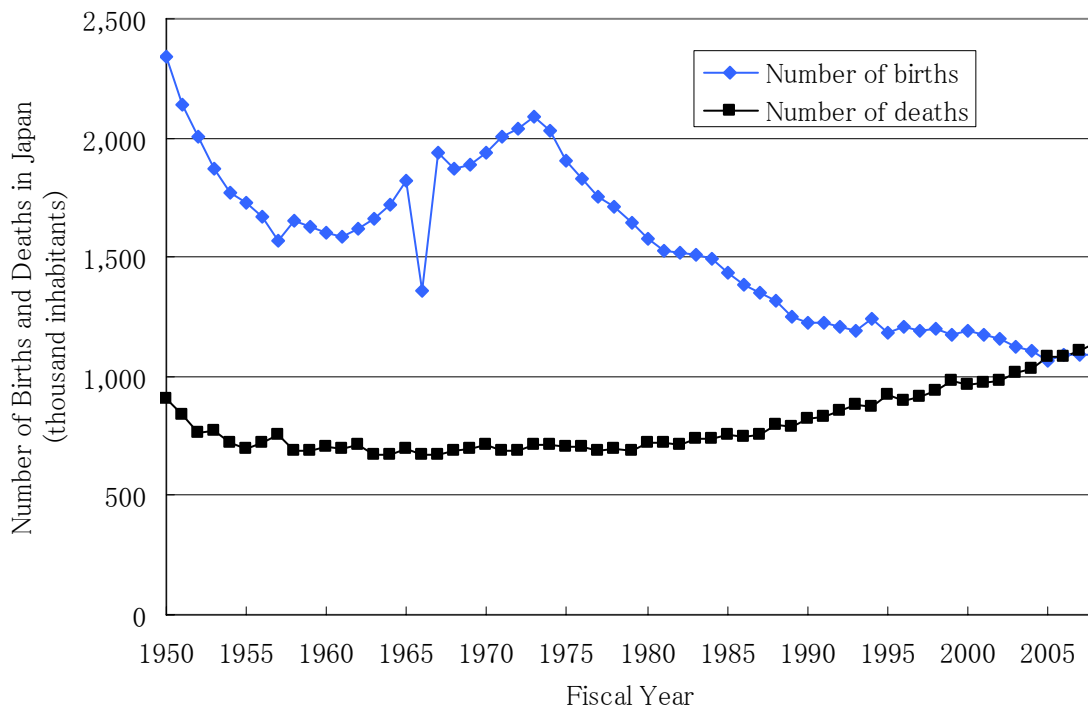


Figure 1.6 Changes in the Number of Births and Deaths in Japan

Source: Ministry of Health, Labour and Welfare – ‘Annual Estimate of Vital Statistics 2008’

During the 1960s, when the economy grew very rapidly, the number of people migrating into Japan’s three metropolitan areas substantially exceeded the number leaving, with a net excess immigration into such areas of approximately 500,000 people per year. Further excess numbers of immigration have been seen again since 1996, and since 2004 that excess has been markedly increasing. In addition to the three metropolitan areas, as of October 2005 66.3% of Japan’s total population was concentrated in densely inhabited districts⁴, indicating that the concentration of Japan’s population in urban regions is advancing.

⁴ Regions within a city, town, or village and adjacent to basic unit districts with a high population density (a population density of at least 4,000 people per square kilometer in principle), and with a population of at least 5,000 people.

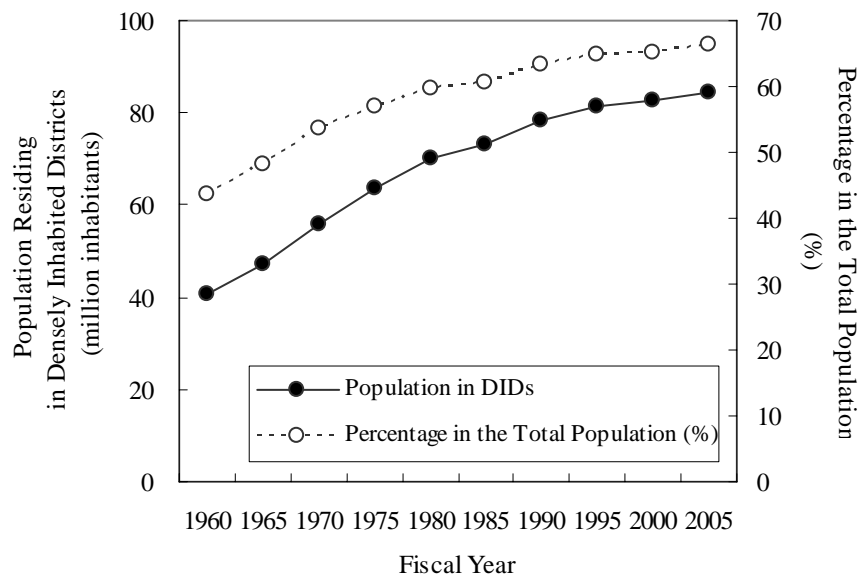


Figure 1.7 Population Residing in Densely Inhabited Districts

Source: Ministry of Internal Affairs and Communications—‘Population Census’

In 2005, there were 490.63 million households in Japan, 4.9 percent more than recorded in the 2000 census. In 2005, the average household size was 2.55 persons. Since 1970, the number of households has continued to increase and the average size of households has continued to decline, reflecting changes in household formation patterns, such as a shift from extended families to nuclear families, an increased number of solitary-person households, and a reduction in the number of children reflected the falling birthrate.

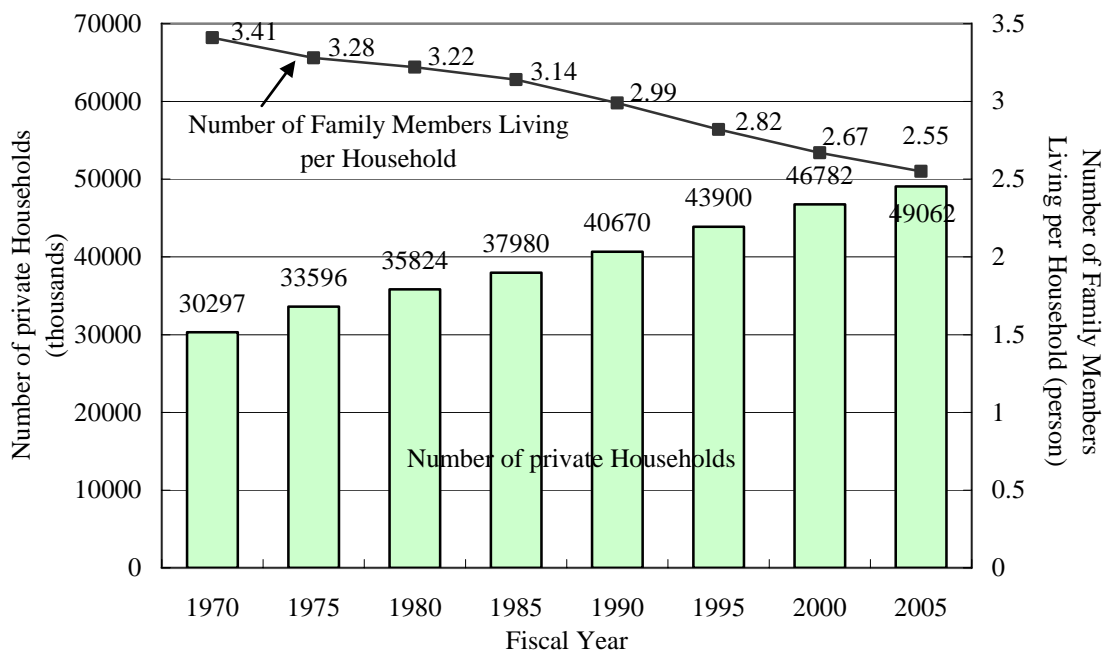


Figure 1.8 The Number and Average Size of Japanese Households

Source: Ministry of Internal Affairs and Communications—‘Population Census’

1.4 Houses and Commercial Facilities

According to the ‘Housing and Land Survey of Japan’ in 2008, the total number of houses has reached 57.59 million for a total of 49.99 million households. As a result, the number of houses per household has reached 1.15, representing a continued improvement.

Meanwhile, in terms of the quality of such accommodations, the average area of floor space per home has risen to 92.71 square meters, demonstrating a steady improvement overall, but when the details are analyzed, a stark contrast can be seen between owned houses (120.89 square meters) and rented houses (45.93 square meters), illustrating the prominence of small rented houses.

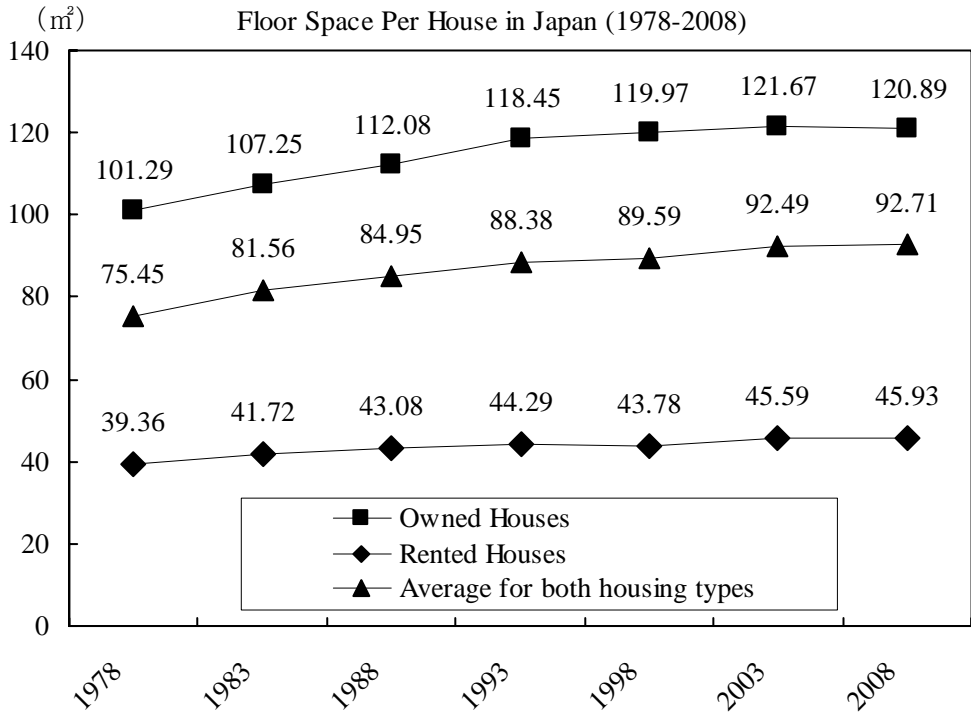


Figure 1.9 Floor Space Area per House in Japan

Source: Ministry of Internal Affairs and Communications – ‘2008 Housing and Land Survey of Japan’ (preliminary totals)

In Japan, since the period of rapid economic growth, the ratio of tertiary industries has increased in terms of the industrial structure and particularly in regards to employment. The importance of “soft-type” works, including technology, information, planning, and design, has also increased for each industry, and the weight of indirect sectors has increased. In line with this shift towards service and other tertiary industries as indicated above, the amount of floor space devoted to the commercial sector has steadily increased. Since 1965, it has increased at an average of 4.1 percent annually. However,

since 2000 the annual rate of increase has been in decline, with an annual average at 1.2 percent.

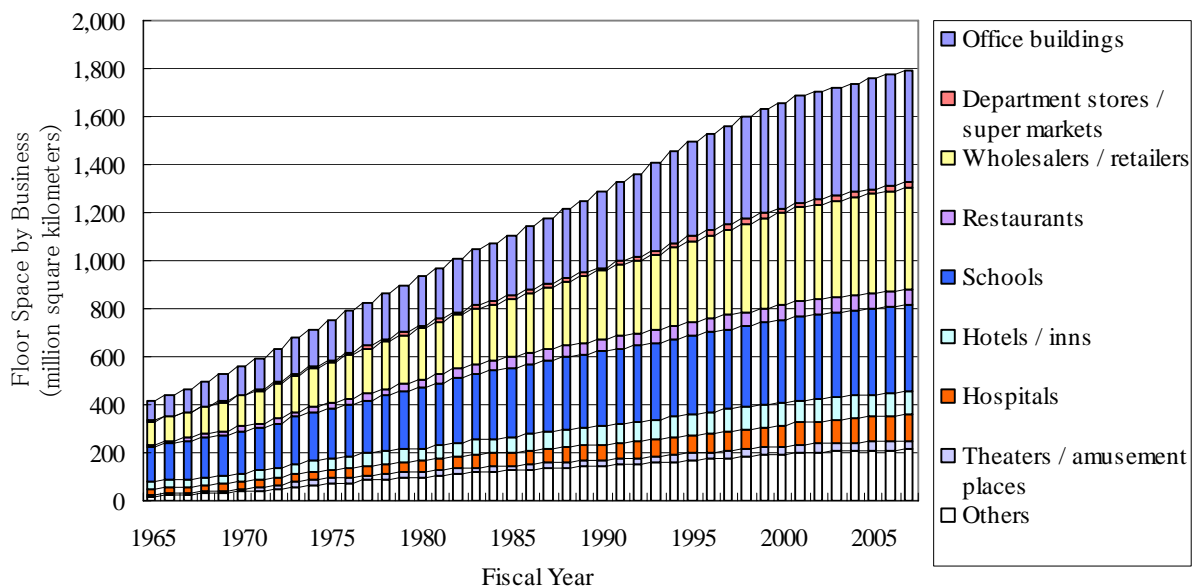


Figure 1.10 Change in the Amount of Floor Space in the Commercial Sector by Business Type

Source: The Institute of Energy Economics, Japan – ‘Handbook of Energy & Economic Statistics in Japan’

1.5 Japan’s Industry and Economy

Compared to FY1980 Japan’s real gross domestic product (GDP)⁵ increased 1.8 times to 585 trillion yen in 2007. During the same period, per capita real GDP increased about 1.7 times from 2.70 million to 4.50 million yen. The growth process of the Japanese economy up until the present day is explained below.

Japan’s economy grew extremely rapidly in the 1960s resulting in the significant development of heavy industry, producing such essentials as steel and petrochemical materials. As a result, the Japanese economy increased consumption of resources and energy. During the same period, the workforce shifted from primary to secondary and tertiary industries. Agricultural production increased despite a reduction in the number of agricultural laborers. Nevertheless, because of the growing income gap compared with other industries, along with depopulation, and other factors, the number of younger laborers working in agriculture decreased while the average age of the nation’s farmers increased. Japanese forestry was primarily practiced by dispersed, extremely small businesses operating in steep mountainous areas. It was therefore difficult to improve labor productivity, so forestry faced various problems including a price differential versus imported lumber and an income disparity with other domestic industries. As a result, depopulation of mountain villages continued, the average age of forestry workers increased, and production stagnated.

In the 1970s, following the first oil shock (1973), in 1974 Japan’s real economic growth rate recorded

⁵ Real GDP according to fixed based year method (base calendar year 2000).

its first contraction since the Second World War. Economic growth remained sluggish for some time thereafter. At the same time, impact from the oil shock caused energy-intensive basic industries, such as the steel and petrochemical industries, to lose speed while high value-added processing and assembly industries, such as electrical appliances and machinery, developed further. As income levels rose, the economy’s services and software components expanded. Tertiary industry came to account for over 50 percent of gross domestic product and total employment. In agriculture, the ratio of vegetables and dairy products increased as Japanese dietary habits changed and the nation ended up with a surplus of rice.

Following the Plaza Accord of 1985, the yen began to grow ever stronger, severely impacting the Japanese export industry in particular. The subsequent structural adjustment of the Japanese economy, however, expanded domestic demand, which in turn enlarged the economy, increased the sector shares of the financial, wholesale, and retail industries, and made the prices of land, securities, and other assets skyrocket.

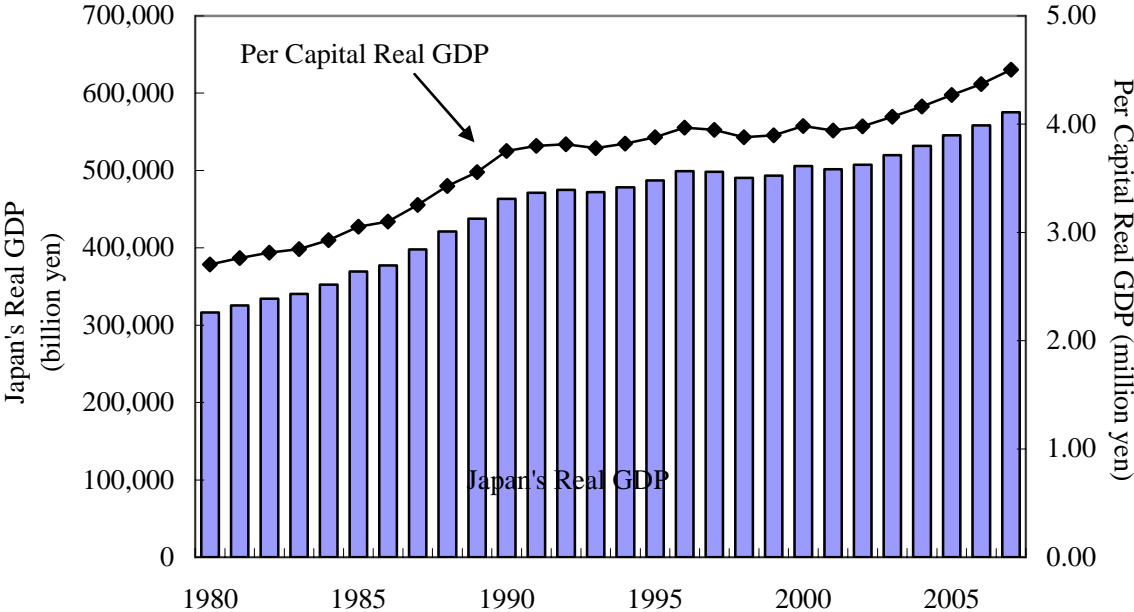
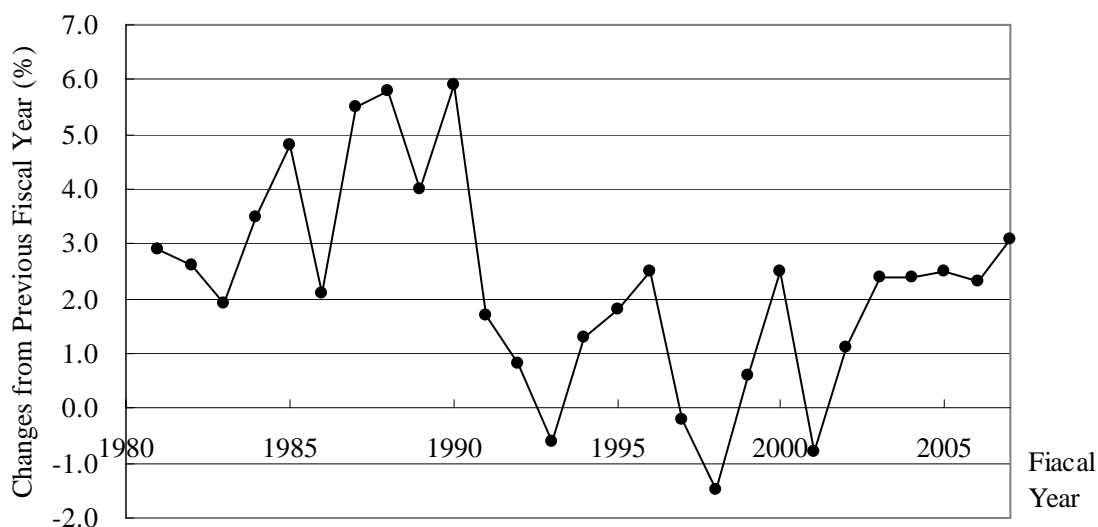


Figure 1.11 Change in Real Gross Domestic Product (Fixed Based Year Method, Base Calendar Year 2000)

Source: Economic and Social Research Institute, Cabinet Office, Government of Japan – ‘Annual Report on National Accounts of 2007’



**Figure 1.12 Change in Year-on-Year Real Gross Domestic Product Growth Rate
(Fixed Based Year Method, Base Calendar Year 2000)**

Source: Economic and Social Research Institute, Cabinet Office, Government of Japan – ‘Annual Report on National Accounts of 2007’

Then, in the early 1990s, the prices of land, securities, and other assets nose-dived due to monetary tightening, among other factors. The collapse in asset prices led to a reduction in expenditure on consumables as well as to adjustments in consumer durables and capital stock. These in turn led to the stagnation of economic activities and to irrecoverable debts among the nation’s financial institutions. The Asian economic and currency crises also had an impact and the economy continued to be marked by low growth. For example, in 1998 Japan recorded negative growth. This difficult period for the economy lasted approximately ten years. However, the three excesses – excessive employment, excessive capital stock, and excessive debt – were largely eliminated and as the financial position of companies has strengthened, investment and consumption also began to rise. In addition, at the beginning of 2002 an increase in exports served to revive production, leading to the greatest period of economic recovery since the Second World War, longer than the expansion period of the ‘Izanagi boom’ (57 months between October 1965 and July 1970). During this period, the annual mean real growth rate surpassed the 2 percent level. However, in 2007, during the sixth year of economic recovery, changes in the financial and capital markets originating from the United States subprime housing loan crisis as well as skyrocketing crude oil and material prices, put pressure on corporate earnings and business confidence thereby making corporate and household spending behavior more cautious. The direct impact of the United States economic downturn became real, and began to impact even exports from Japan. The anticipated wave of economic recovery transmitted from corporations to households has not been realized as the corporate sector is losing its strength.

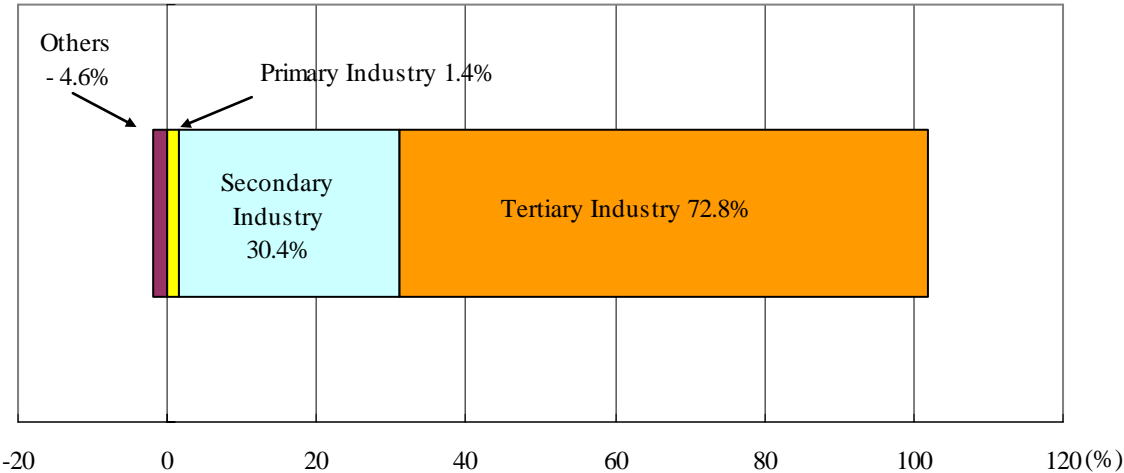


Figure 1.13 Gross Domestic Product by Economic Activity in 2007
 (Real Base, Base Calendar Year 2000)

Source: Economic and Social Research Institute, Cabinet Office, Government of Japan – ‘Annual Report on National Accounts of 2008’

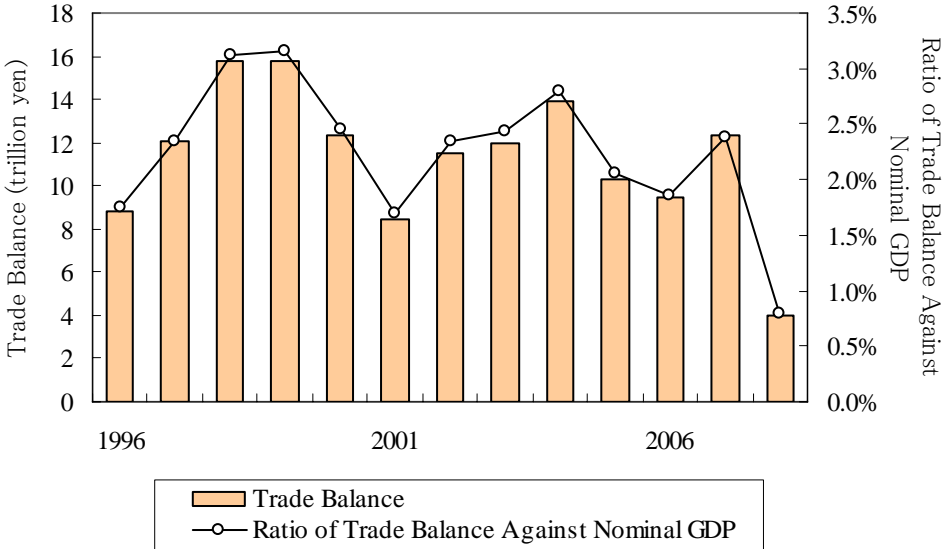


Figure 1.14 Changes in Trade Balance

Sources: Bank of Japan - ‘Balance of Payments Monthly’; Economic and Social Research Institute, Cabinet Office, Government of Japan – ‘National Accounts of FY2004’

In terms of the industrial sector, the yen continued to appreciate from the spring of 1990 through the spring of 1995, impacting the processing and assembly industries and spurring on a structural shift among Japanese firms towards greater overseas production. On the other hand, the information, telecommunications, and other industries are recording large growth. In agriculture, competition with foreign producers has intensified as the volume of imports has been increasing sharply. In response, Japanese farmers have been strengthening their operations by moving towards larger-scale production

and pursuing other rationalization measures.

Looking at the trade balance, a surplus of between 10 and 15 trillion yen has been recorded each year since the 1980s but the ratio of the surplus to nominal GDP has been declining since its peak year of 1986.

1.6 Transport

1.6.1 Passenger Transport

Domestic passenger traffic grew significantly throughout the period of rapid economic growth as a result of the popularization of automobiles, improvements to the transport system, and the reduction of travelling time accompanying network expansion. Private automobile ownership began to grow from around 1960 in line with the growth of income level. As a result, rail traffic's share decreased significantly throughout the 1960s as road traffic's share increased significantly. Air traffic represented a small fraction of all traffic, but its transport volume grew significantly due to its timesaving features and the introduction of jet aircraft in domestic airlines, which resulted in an increase in the size and speed of air transport services.

Following the oil shock, the growth in domestic passenger traffic slowed as a whole, but the rise in the standard of living and the increase of recreational time pushed up passenger travel by automobile. The introduction of jumbo jet services, relatively low airfares, and a growing preference for faster modes of transportation caused an increase in the volume of air traffic and its share. On the other hand, the share of railways decreased, sinking to barely above 40 percent in the end of the 1970s, down from 75 percent in 1960.

The growth rate of passenger traffic during the early 1980s lowered, but suddenly increased in the latter 1980s along with the economic boom due to the bubble economy. From the 1990s, however, passenger traffic volume, along with the share of each transportation mode, has remained almost constant.

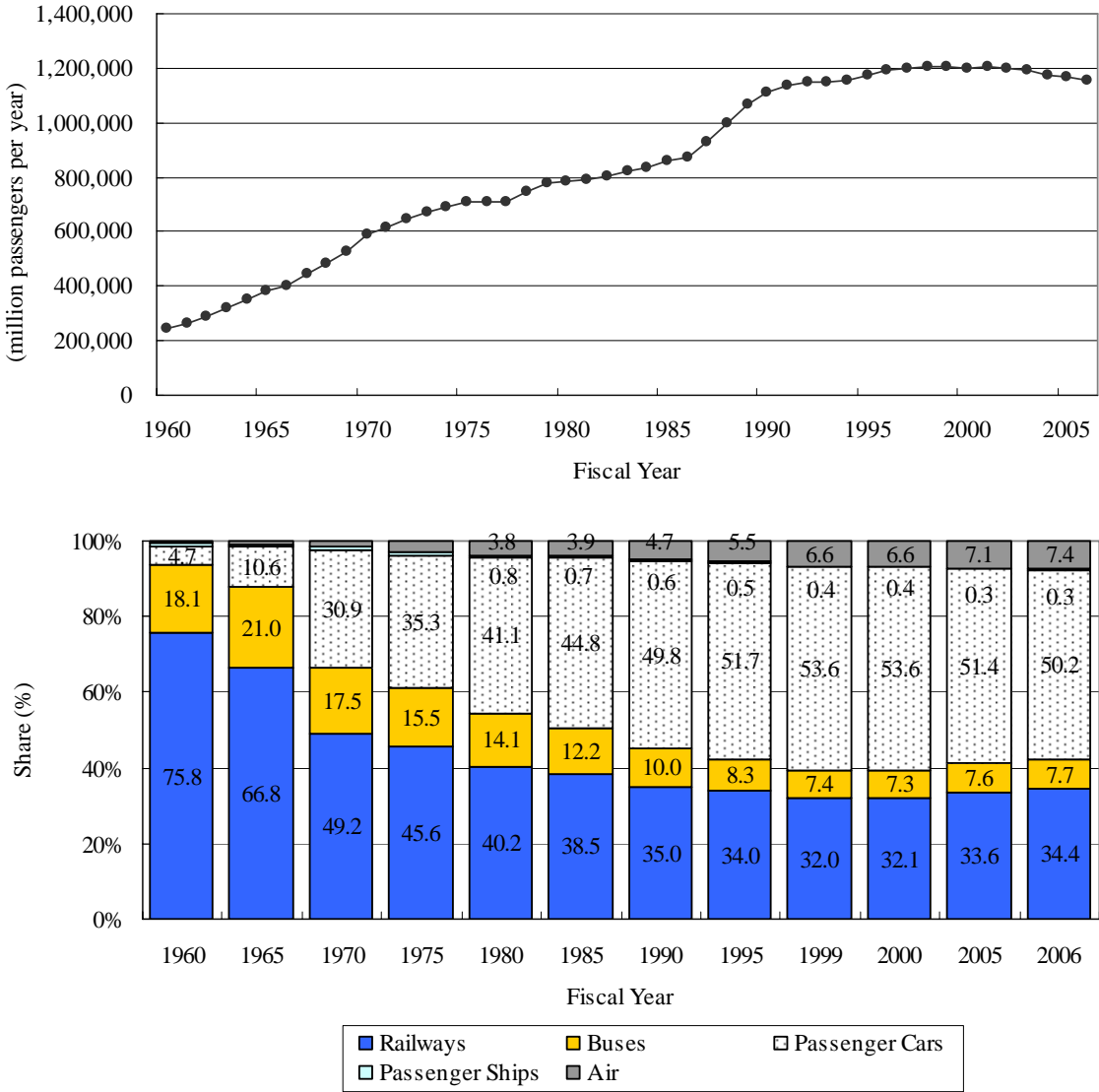


Figure 1.15 Volume of Domestic Passenger Traffic (above) and Modal Shares (below) in Passenger-Kilometers⁶

Source: Ministry of Land, Infrastructure and Transport – ‘Domestic Transportation Statistics Handbook’

1.6.2 Freight Transport

Domestic freight traffic followed the same upward path as the economy during the period of rapid economic growth. Freight road transport showed especially rapid growth, because of an increased demand for transportation of relatively light processing components and shortened transport distances as industries moved their offices to coastal complexes near major cities. With the shift of the energy source from coal to oil and the development of heavy industry in coastal areas, domestic sea freight traffic grew, mainly carrying

⁶ Passenger cars do not include light motor vehicles or household freight vehicles. Numeric data on passenger cars for fiscal 1994 does not include figures for Hyogo prefecture between January and March 1995 due to the Great Hanshin-Awaji Earthquake.

raw materials for the petrochemical, steel, cement, and other key heavy industries. In contrast, the growth of freight traffic by rail barely increased.

The first oil shock in 1973 sharply decreased domestic freight traffic in FY1974 and 1975. Freight traffic then gradually increased until FY1979 as the transport of civil engineering-related cargos grew due to robust expenditures for public works resulting from policies to stimulate the economy. When the second oil shock struck in 1979, however, domestic demand and shipments of basic and material industries again stagnated and freight traffic shrank as oil consumption decreased with the conversion from oil to other forms of energy.

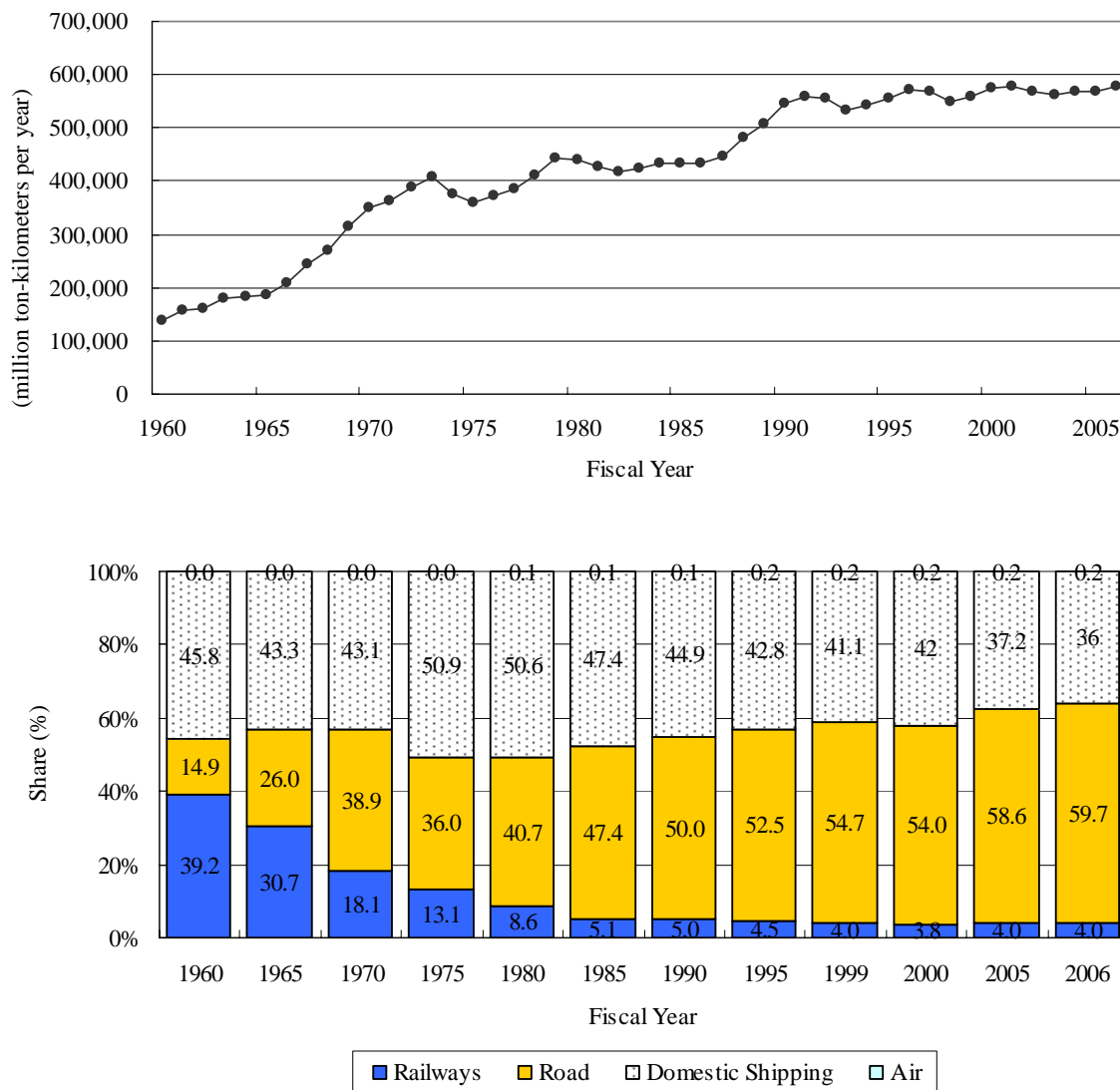


Figure 1.16 Domestic Freight Traffic (above) and Modal Shares (below) in Ton-Kilometers⁷

Source: Ministry of Land, Infrastructure and Transport – ‘Domestic Transportation Statistics Handbook’

⁷ Passenger cars do not include light motor vehicles. Numeric data on passenger cars for fiscal 1994 does not include figures for Hyogo prefecture between January and March 1995 due to the Great Hanshin-Awaji Earthquake.

From the 1980s, Japan experienced industrial restructuring, including a shift from basic materials to processing and assembly, the growth of knowledge-intensive industries, and the transformation of the industrial structure towards tertiary industries. Transport demand generated through industrial activities has been reduced in line with the shift to a service-oriented economy. As a result, freight traffic remained generally flat during this period, decoupled from the economic growth. In the latter half of 1980s, freight traffic increased due to a major, domestic demand-led economic expansion. The modal share of road freight traffic recorded over 50 percent in 1987, as the characteristics of truck transport met the need for small-lot, high-frequency transportation brought on by the advance of the small-volume production of a wide variety of products, even as small packet delivery services were upgraded. As a result of the decline in the basic material industries, growth of domestic sea transportation remained rather slack overall, but it showed some growth with the economic expansion in the late 1980s. Domestic sea shipments exceeded their second oil shock freight traffic level in FY1990. Although the share of airfreight was small, it has been growing to meet the demand for shipping relatively small, light items including machine parts, fresh foods, and books. The share of rail freight transportation has steadily declined, but the advance of containerized transport in recent years has slowed down this decline.

The total freight volume (tonne-kilometers) has remained generally flat since FY1991 due to the impact streamlined distribution and changes in the industrial sector following the collapse of the bubble economy at the beginning of the 1990s. However, in a tonne base, volumes have been slightly decreasing since their peak in FY1991.

1.6.3 Motor Vehicle Traffic

Road transport accounts for a large portion of both passenger traffic and freight traffic. In this section, both trends in the number of motor vehicles owned and vehicle mileage are explained. Changes in the number of motor vehicles owned show that total motor vehicle ownership has increased consistently since the 1960s, but has decreased in comparison to the previous year during 2006 and 2007.

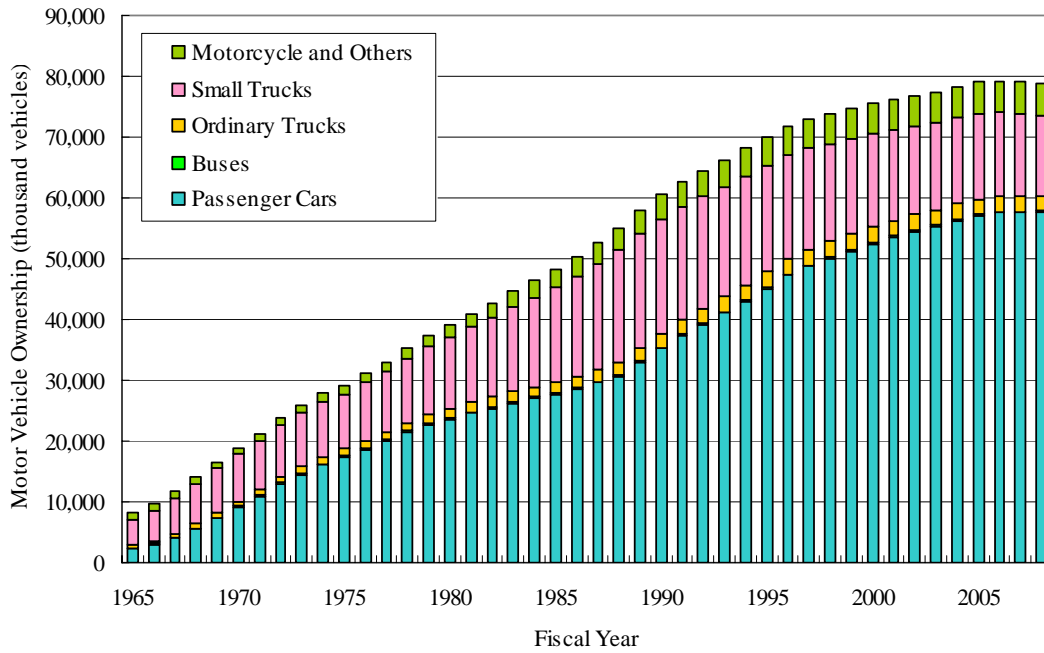


Figure 1.17 Motor Vehicle Ownership⁸

Source: Ministry of Land, Infrastructure and Transport

Motor vehicle mileage was on an upward trend until 2003, and began to decline in 2004. This is due to a decrease in the number of freight vehicles and business-use passenger cars in addition to the decline of household-use passenger cars, which had been increasing until 2003. The decrease in mileage for household-use passenger cars can be attributed to a change in people’s perception of cars, such as a decrease in the number of people who enjoy leisure-time driving.

⁸ “Passenger cars” includes light weight cars. “Small trucks” includes light weight trucks. Small special categories of vehicle, scooters (type I) and scooters (type II) are not included.

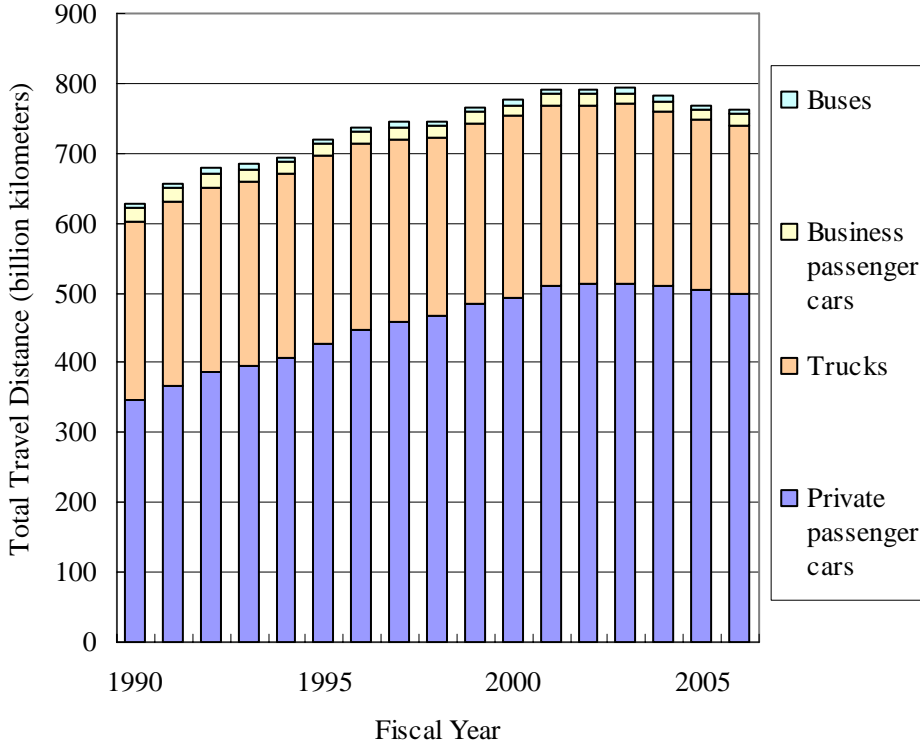


Figure 1.18 Change in Vehicle Total Travel Distance

Source: Ministry of Land, Infrastructure and Transportation – ‘Annual Statistical Report for Car Transportation’

With regard to passenger cars, which account for a large proportion of the total number of owned vehicles, preferences have shifted to luxury vehicles and RVs since 1980. The ratio of heavier vehicles has increased due in part to safety measures. In particular, there is a marked trend for increased size of ordinary passenger cars and compact passenger cars, excluding light-weight cars, and the ratio of passenger cars 1,000 kilograms or lighter in FY2007 was approximately 41.7% fewer than that in FY1980. Meanwhile, during the same period the number of passenger cars between 1,001 kilograms and 1,500 kilograms increased by nearly three-fold, while the number of passenger cars 1,501 or heavier increased 71.6 times.

However, the rise in ownership of ordinary and compact passenger cars recently reached its peak, and the share of light weight cars is increasing overall. The average weight of light weight cars has also been increasing following legislation to improve their safety implemented in 1994. Nevertheless, as they are still relatively lighter than ordinary and compact passenger cars, the increase in average weight of all passenger cars has reached its peak.

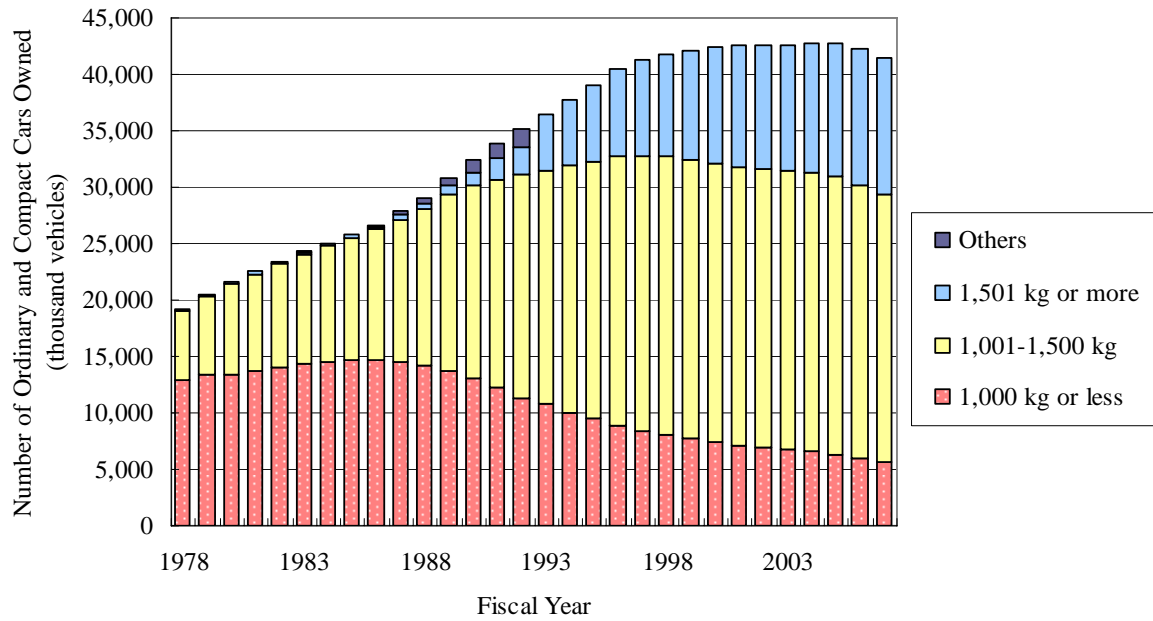


Figure 1.19 Increase in Size (Weight) of Ordinary and Compact Passenger Cars^{9,10}

Source: Automobile Inspection and Registration Association - 'Car ownership by category'

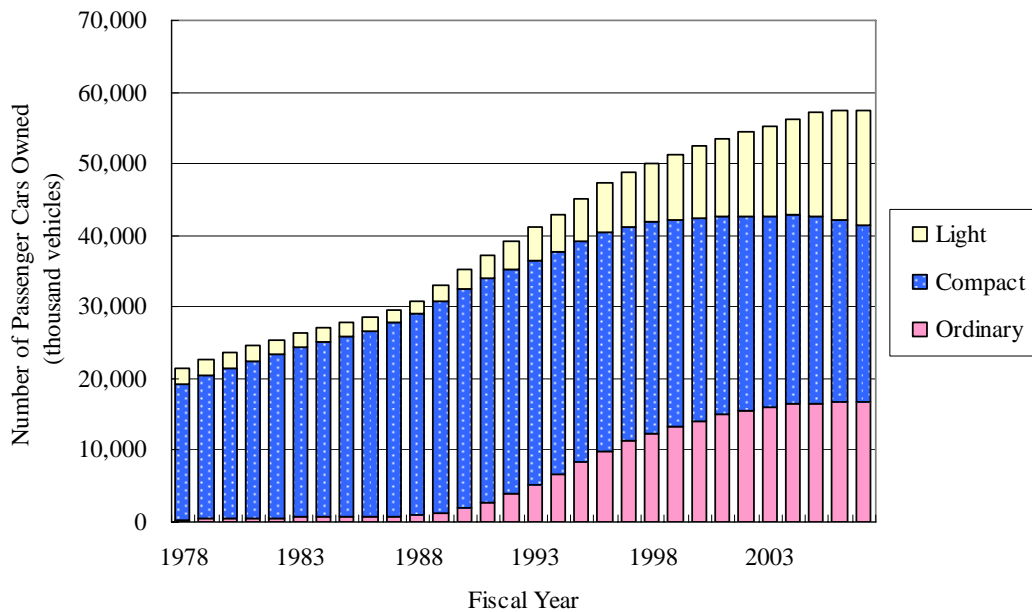


Figure 1.20 Ownership of Passenger Cars (ordinary, compact, and light weight)

Source: Automobile Inspection and Registration Association - 'Car ownership by category,' 'Car Ownership'

⁹ Lightweight cars are not included. Minivans, etc. that weigh 1,501 kg or more were included under 'Others' until 1992, but they are categorized by weight from 1993 onwards.

¹⁰ 'Other' includes vehicles for which a categorical assignment is unclear.

1.7 Energy

1.7.1 Consumption

Final energy consumption continued to increase significantly with the Japanese economy's rapid growth until the 1970s (Phase I). It then leveled off following the two oil shocks of the 1970s, followed by a period represented by a downward trend (Phase II). A strong economy and relatively lower crude oil prices in the late 1980s, however, pushed consumption to increase again (Phase III), where after it has nearly leveled off since 2000 (Phase IV). Energy consumption in FY2007 was $15,794 \times 10^{15}$ J.

These trends can be summarized for different consumption sectors as follows. Until the first oil shock in 1973 (Phase I), the industrial, commercial and residential, and transport sectors energy consumption grew rapidly. From FY1973 until FY1986 (Phase II), the commercial and residential, and transport sectors energy consumption continued to grow, but industrial energy consumption began to decrease. From FY1986 until FY2000 (Phase III), the strong economy and drop in crude oil prices in the latter half of 1980s boosted energy consumption in all four sectors. From 2001 onward (Phase IV), energy consumption in the industrial and transport sectors has decreased overall, but energy consumption in the commercial and residential sector continued to increase. The share of final energy consumption for Japan in FY2007 was 45 percent for the industrial sector (including non-energy uses), 31 percent for the commercial and residential sectors, and 23 percent for the transport sector.

Energy consumption trends differ according to the type of energy in question. Electricity and gas consumption have grown uninterrupted; in FY2007, they were 2.5 times and 4.3 times their FY1973 levels, respectively. The commercial and residential demand for electricity, which includes the total consumption for electric lights and commercial power, accounted for 70% of the overall demand, and the growth in demand was led by commercial and residential consumption. In the residential sector, this increase was spawned by the rapid spread of electrical equipment due to a higher standard of living, while in the business sector the increase was supported by a larger number of office buildings and the swift diffusion of office automation equipment in response to economic informatization and the advancement of the services industry. The electrification ratio¹¹ was 12.7 percent in FY1970 and reached 23 percent by FY2007. Gas consumption was once centered on the residential sector, but the share for residential consumption has fallen below 50 percent since the 1990s, while the shares for industrial and commercial gas consumption are increasing. Reasons for this jump can be attributed to such factors as the implementation of a payment system that elicits large-scale and heavy-load industrial demand (with minimal fluctuation in usage amounts between seasons) for major gas companies that have introduced LNG, the advancement of technological innovation related to gas systems, and the demand for a response to global environmental problems. Coal consumption has gradually increased at a rather steady pace, while oil increased during Phase I and Phase II, but then gradually decreased during Phase III and Phase IV.

¹¹ The electrification ratio is the ratio of consumed electricity within 'Final Consumer Energy Consumption stipulated in General Energy Statistics.

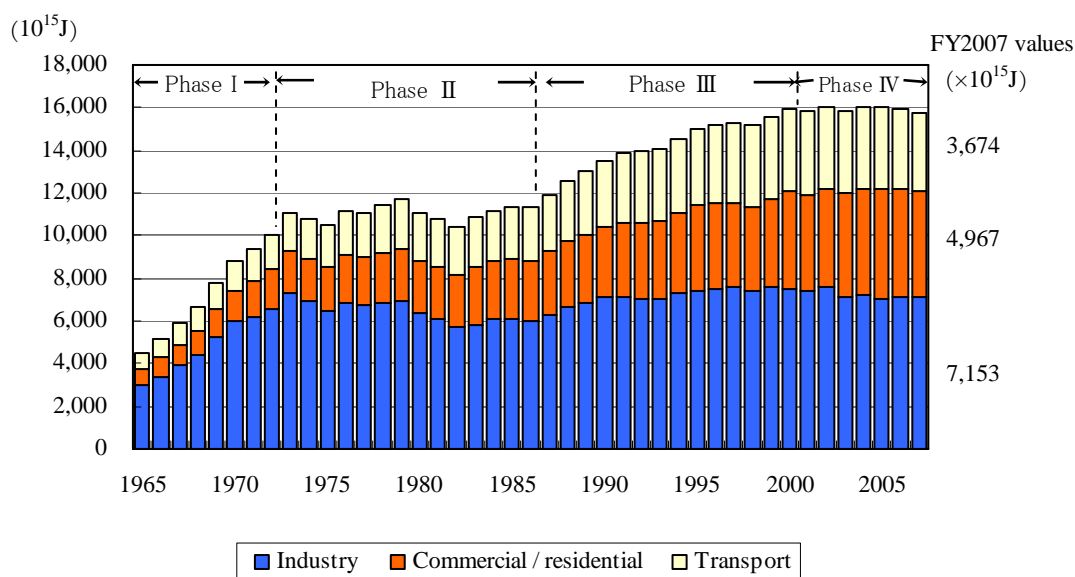


Figure 1.21 Final Consumer Energy Consumption¹²

Source: Agency of Natural Resources and Energy – ‘General Energy Statistics’

1.7.2 Supplies

Japan has almost no domestic fossil fuel resources. The ratio of domestic production volumes for the total fossil fuel supply volume is 0.4 percent for crude oil and 4.3 percent for natural gas (all data as of FY2007). Japan’s dependence on foreign energy sources peaked in FY1973 at 89.4 percent of its energy supply. Although this dependence has been reduced by efforts to find substitutes for oil since then, in recent years foreign dependence has remained at about 80 percent, putting the nation in a vulnerable energy-supply situation.

Japan’s total primary energy supplies reflect increases in final energy consumption; supplies continued to grow at a substantial rate until FY1973 but leveled off after the first oil shock. After FY1986 there was again a surge of growth, but supply has leveled off again in recent years. In FY2007, Japan’s total primary energy supply was $23,861 \times 10^{15}$ J.

Oil supplies grew continually during Phase I, and shrank in Phase II due to the promotion of oil substitution policies and energy conservation policies implemented in response to the oil shock. In Phase III, oil supplies overall increased due to Japan’s strong economy and a drop in crude oil prices. However, they have been decreasing since FY1995 due to such reasons as the promotion of substitute energy sources, as one example. Coal supplies increased steadily, while natural gas and nuclear energy

¹² Figures for the industrial and transport sectors include non-energy use. Furthermore, the compilation methods of the “General Energy Statistics” for FY2001 and before and for FY2002 onwards are different, and attention shall also be given to the fact that there are points where data for FY1989 and before differs from those for FY1990 onwards.

supplies have increased significantly.

Different energy sources contribute different shares of the total primary energy supply: during Phase I, oil increased its share while coal and hydroelectric power decreased. As a result, oil’s share of total primary energy (the “oil dependency” rate) rose to its peak at 77 percent in FY1973. The oil dependency ratio then began to decrease with the promotion of substitute energy sources including nuclear energy, natural gas, the introduction of coal, and development of new energies. This result was a significant decrease in the share of oil supplies during Phase II, and its share was 47 percent in FY2007. At the same time, natural gas and nuclear energy rapidly increased their shares, reaching 16 percent (2 percent in FY1972) and 10 percent (1 percent in FY1972) in FY2007, respectively. The share of coal also increased to reach 21 percent (15 percent in FY1972) in FY2007.

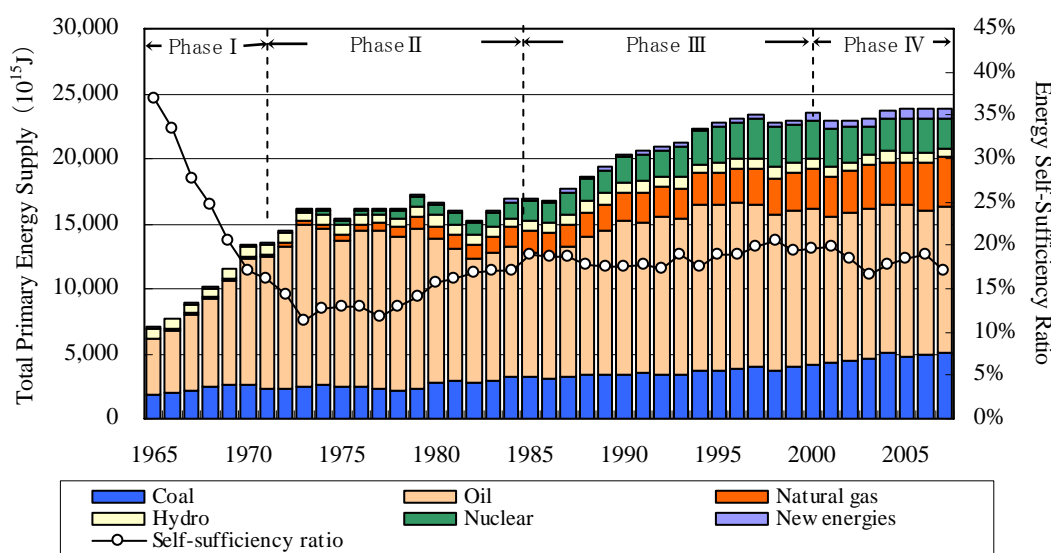


Figure 1.22 Total Primary Energy Supply and Self-Sufficiency Ratio¹³

Source: Agency of Natural Resources and Energy – ‘General Energy Statistics’

The total electric power generation increased 2.5 times in FY2007 from FY1973. Sources for electrical power generation was 25.6 percent for nuclear power, 25.3 percent for coal-fired thermal power, 27.4 percent for LNG thermal power, 13.1 percent for oil and other thermal power, and 7.6 percent for hydroelectric power.

The amount of power generation from nuclear power in FY2007 was 263.8 billion kWh, about 27 times higher than amounts in 1973. Coal power generation in FY2007 amounted to 260.5 billion kWh, approximately 15 times more than levels in 1973. LNG power generation reached 282.1 billion kWh in FY2007, which was a level nearly 32 times that of those in 1973. Oil power generation amounts have

¹³ New energies, etc. include geothermal heat.

dropped dramatically, amounting to 77.9 billion kWh in FY2006, which is approximately 30 percent of levels in 1973. The drop in oil usage is due to a shift to peak power optimization from base and middle power resources by such means as beginning new nuclear power operations and increasing their operations efficiency. The development of hydroelectric power commenced before the Second World War. Large-scale hydroelectric power plants have been almost completely developed and their power generation amounts generally continue to remain flat. The amount of hydroelectric power generation in FY2006 was 78.4 billion kWh, a level 1.2 times those in FY1973.

1.7.3 Per Capita Total Primary Energy Supply and Total Primary Energy Supply per Unit of GDP

Japan's total primary energy supply per capita as of 2007 is 187×10^9 J, and has been declining in recent years.

Japan's total primary energy supply per unit of GDP (total primary energy supply per gross domestic product) increased during Phase I, but has improved significantly since Phase II. This is a result of the introduction of world-leading energy-saving facilities and technologies brought about by the oil shock. Levels remained generally static during Phase III. This is due to the significant contribution of the industrial sector's extensive investments in energy-saving reductions, which have already shown marked decrease in energy input per unit of output, as well as increased energy consumption in the commercial, residential and transport sectors, in accordance to the public's pursuit of a more comfortable and affluent standard of living. In Phase IV, amounts declined overall in response to changes in the industrial sector's structure and a shift to reductions in the transport sector.

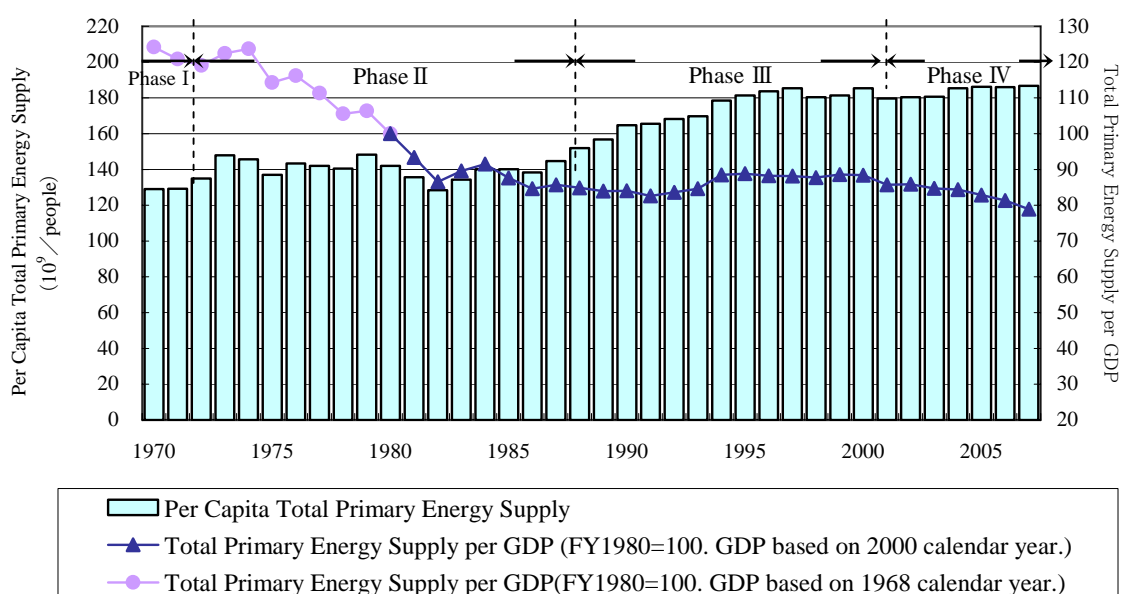


Figure 1.23 Per Capita Total Primary Energy Supply and Total Primary Energy Supply per GDP

Sources: Agency of Natural Resources and Energy – 'General Energy Statistics'; Economic and Social

Research Institute, Cabinet Office, Government of Japan – ‘Annual Report on National Accounts’;
Ministry of Internal Affairs and Communications – ‘Population Census’ and ‘The Annual Report on
Current Population Estimates’

1.7.4 Prices

Imported energy was cheap and supplies stable during Phase I; prices skyrocketed as a result of the two oil shocks, peaking in FY1981 then beginning to fall, and have been steady since FY1986. The FY1990 yen-denominated real price of crude oil¹⁴ (partially due to the substantial appreciation of the yen) is only slightly higher than it was prior to the oil shock.

Crude oil prices shot up temporarily at the outbreak of the 1990 Gulf War, but soon returned to the prior prevailing levels. In 1996, however, the price of crude oil topped US\$20 a barrel, due to the strong growth of worldwide oil demand, the low inventory system for crude oil, oil products adopted by Western petroleum companies in an effort to reduce costs, and the unstable political situation in the Persian Gulf region.

As stated above, in the first half of the 1990s, the price per barrel changed to around US\$20, but the crude oil price fell to US\$10 per barrel when global oil stocks increased in line with a slowdown in the rate of demand, mainly in Asia. This was a result of the faltering Asian economy during the financial and currency crises from 1997 to 1998. Soon after, crude oil prices increased to the lower US\$30s per barrel level as production was repeatedly reduced by the OPEC countries and Asian economy began to recover, among other factors. The September 11, 2001 terrorist attacks on the United States led to a slowdown in the world economy and, as a result, crude oil prices fell to low levels.

However, after the price of crude oil per barrel bottomed out at US\$17 (OPEC basket) in January 2002, it began to rise dramatically. Even though it briefly declined in December 2004, it once again began to rise and in 2005 remained permanently above US\$40 per barrel.

Crude oil prices continued to skyrocket and surpassed the price levels of the second oil shock, even recording a CIF import price of US\$136 per barrel in August 2008. Nevertheless, CIF prices began to drop and the price after 2009 declined to US\$40 per barrel. This was due not only to the fall in global crude oil prices from mid-July 2008, but also the appreciation of the yen (Figure 1.24).

There are various reasons for skyrocketing crude oil prices, including (1) a marked growth in demand for oil in the Asia-Pacific region, particularly in China and India, due to their high level of growth, (2) the reduction in oil production in non-OPEC oil-producing countries, specifically the significant decline in the United States’ oil production in response to Hurricane Katrina in August 2005, and (3) the influx of funds to the oil market by speculators.

¹⁴ Crude oil prices are adjusted using an indicator (deflator) to correct for price fluctuations after converting dollar-based crude oil prices to yen using exchange rate during the period concerned.

Crude oil prices dropped drastically following the financial crisis in September 2008, which can be owed to reasons such as (1) a significant reduction in OECD demand, as well as a quick deceleration in the growth of non-OECD demand, due to the impact from a rapidly worsening real economy, and (2) the increase in the withdrawal of funds from the crude oil futures market in order to evade risk following the financial crisis-induced credit crunch, as well as the accelerating concern over the future of the United States and global economies.

In Japan, the ratio of fossil fuels to all imports is falling (at a rate of 10% to 20%) due to policies in oil substitution and energy-saving, both implemented after the oil shock, as well as the effects of yen appreciation on crude oil transactions conducted in US dollars. In addition, due to the transformation of the industrial sector, the Japanese economic structure is changing into one that is resilient against the impact of rising crude oil prices. Thus the impact on the Japanese economy from these skyrocketing crude oil prices is relatively low compared with the first and second oil shocks.

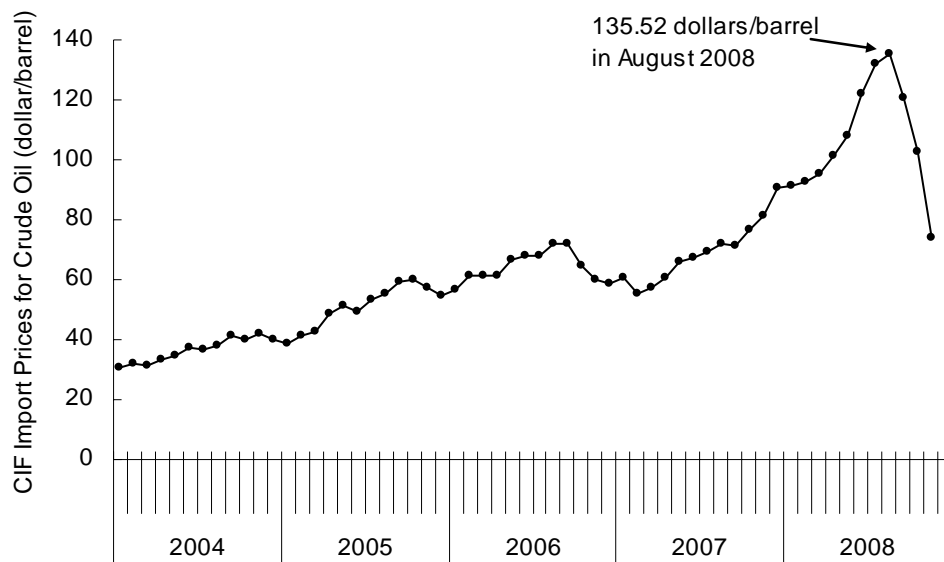


Figure 1.24 CIF Import Prices for Crude Oil (dollar/barrel)

Source: Ministry of Finance — ‘Trade of Japan’

1.7.5 National Energy Budget and Taxation System

Today, Japan finds it necessary to reform its energy supply and demand structure in order to increase national energy security and positively address global environmental problems.

On the demand side, the government is trying to promote efficient energy usage, beginning with energy conservation measures. In terms of supply, efforts are being made to promote the introduction of non-fossil energy, including new energy resources, and to strengthen measures to secure a stable supply

of oil. In order to further advance these policies, the funds for energy-related measures in the national budget are secured via special accounts. Until FY2006 the Special Accounts for Petroleum and Sophisticated Structure of Energy of Supply and Demand and the Special Accounts for Electric Power Development Acceleration Measures were responsible for this role. However, from FY2007, the two were integrated to form the Special Accounts for Measures for Energy. The Special Accounts for Measures for Energy is composed of the Accounts for Supply and Demand of Energy (formerly the Special Accounts for Petroleum and Sophisticated Structure of Energy of Supply and Demand) and the Accounts for Promotion of Power Development (formerly the Special Accounts for Electric Power Development Acceleration Measures).

Accounts for Supply and Demand of Energy focuses on measures for both a stable fuel supply and for advancing the supply and demand structure for energy. Measures for a stable fuel supply include increasing stockpiles of oil and promoting the development of oil, combustible natural gas, and coal resources, as well as measures for streamlining the production and distribution of those resources. Measures for advancing the supply and demand structure for energy include developing technology related to non-fossil energy (including energy conservation), and promoting the introduction of facilities using alternative energy as well as high-capacity energy-saving facilities. The accounts for supply and demand of energy in FY2009 amounted to 282.5 billion yen, an increase of 4.1 percent, as measures to upgrade the energy supply and demand structure.

Table 1.2 Accounts for the Supply and Demand of Energy and Accounts for the Promotion of Power Development

(Unit: hundred million yen)

Special Accounts for Measures for Energy	FY2009	FY2009	+/-	Year-on-Year Growth
Accounts for Supply and Demand of Energy	5,241	5,377	-137	-2,5%
Measures for stable fuel supply	2,415	2,663	-247	-9,3%
Measures for advancing the supply and demand structure for energy	2,825	2,715	+111	+4,1%
Accounts for Promotion of Power Development	3,679	3,715	-36	-1,0%
Measures for electrical power plant location	1,955	1,986	-31	-1,6%
Measures for electrical power generation diversification	1,724	1,729	-5	-0,3%

Japan has a system of energy-related taxes that include the Petroleum And Coal Tax, imposed on crude oil, imported oil products, coal, etc., and the Promotion of Power-Resources Development Tax, which is levied on the electricity sold by general electrical power suppliers. The FY2003 Tax Reform was adopted that revised the former Petroleum Tax and reduced the Promotion of Power-Resources Development Tax in order to more fairly allocate the public costs of ensuring a stable supply of energy

and stronger policies to combat global warming. Regarding the Petroleum Tax, the government increased the tax rate on LPG and LNG and, at the same time, created a new tax on coal and renamed the tax the Petroleum And Coal Tax. Tax rates on LPG, LNG, and coal were raised in three stages; FY2003, FY2005, and FY2007.

In addition, an investment-promoting taxation system was implemented from FY1981 that relates to Japanese energy infrastructure. The Energy Demand Structure Reform investment promotion tax system was established in FY1992 aimed to promote reforms to the supply and demand structure for energy. This overall system was established in order to promote the introduction of energy saving facilities, new energy facilities, etc. It allows for such measures as special depreciation and corporate tax or income tax credit in the event that an entity acquires facilities that implement energy supply and demand reforms as long as those reforms are applied to their operations within a one-year period (only certain small and medium sized enterprises below a level of 100 million yen in capital can elect to use the tax credit).

1.8 Waste

Waste mainly falls into two categories: municipal solid waste and industrial waste. Industrial waste refers to waste generated through enterprising activities and is comprised of 20 types specified by cabinet order. Municipal solid waste covers those other than industrial waste, and mainly includes household waste disposed of by families, business waste disposed of from offices, and restaurants, as well as night soil.

Even though the total amount of municipal solid waste and the waste disposed per capita per day have decreased after the second oil shock (1979), it rapidly increased again during the bubble economy period since around 1985. It continued to increase gradually between 1989 and 2000, however, has been decreasing since 2001. The total amount of municipal solid waste disposed of in 2006 was 52.04 million tonnes, which equates to about 1.1 kilograms per capita per day. This is comprised of 30.4 percent business waste and 69.6 percent household waste. In terms of the disposal methods, most is directly incinerated (77.7 percent), some is recycled (19.9 percent), and the rest buried as direct landfill (2.5 percent).

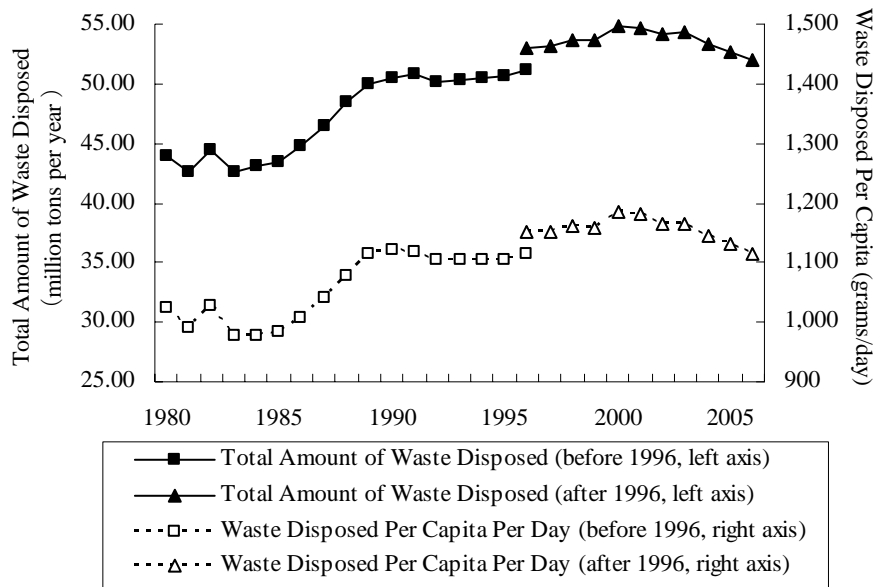


Figure 1.25 Changes in Amount of Municipal Solid Waste Disposed

Source: Ministry of the Environment – ‘Status of Municipal Solid Waste Discharge and Disposal’

*The ‘Total Amount of Waste Disposed’ has been corrected to include previous data from results gathered in FY2005 so as to be the same as ‘Municipal Solid Waste Discharge Amounts’ under ‘the basic policy for comprehensive and planned promotion of measures for proper waste management focusing on waste reduction, etc.,’ based on Article 5 Section 2 of the Waste Disposal and Public Cleansing Law.

‘Total Amount of Waste Disposed’ before FY1996 was comprised of the amount of waste collected, amount of waste directly hauled, and the amount of household waste disposed.

‘Total Amount of Waste Disposed’ after FY1996 was comprised of the amount of waste collected, amount of waste directly hauled, and the amount of waste collected by groups.

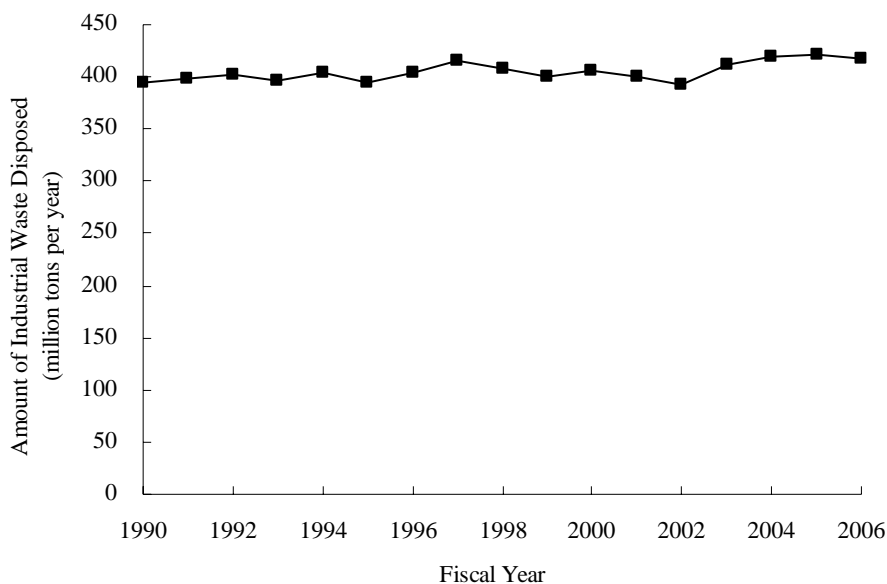


Figure 1.26 Changes in Amounts of Industrial Waste Disposed

Source: Ministry of the Environment – ‘Status of Industrial Waste Discharge and Disposal’

The amount of industrial waste disposed of has not changed significantly since 1990, but has remained fairly static. The total amount of industrial waste disposed of in 2006 was about 400 million tonnes. After such industrial waste is disposed of, about 215 million tonnes (51%) is recycled and about 22 million tonnes (5%) is finally disposed.

1.9 Agriculture

In Japan, which falls within the Asian Monsoon region, rice cultivation in paddy fields has long formed part of the agricultural system suited to the humid and rainy summer condition. In order to develop paddy field cultivation, measures to improve irrigation have been implemented, and, as a result, the ratio of irrigated paddy fields out of the total agricultural area in Japan (54.4 percent) is quite high compared to other countries.

However, as Japan is mountainous and does not have much flat land (the mountain area accounts for 61 percent of the national land), there is intense competition over land use. Therefore, the ratio of national land used for agriculture is about 13 percent and the cultivated field per household is small (approximately 1.6 hectares). Furthermore, the cultivated area has been decreasing each year, and in 2006, it had fallen about 28 percent from the peak period to 4.60 million hectares. In terms of paddy fields, new development was restricted in 1969, and since then the total area has declined by the rate of 1 percent per year due to the conversion of paddy fields to fields for other crops and/or non-agricultural land use. Since the latter half of the 1980s, farmland development has been reduced and much

farmland is being left uncultivated mainly in hilly and mountainous regions. As a result the total area under cultivation has also been reduced. This trend remains current.

Japan’s food self-sufficiency ratio has also fallen significantly. During the period from 1965 to 2007, the food self-sufficiency ratio in terms of calorie base¹⁵ decreased from 73 percent to 40 percent, or 62 percent to 28 percent in terms of grain base. The main long-term cause for the decrease is significant changes in Japanese eating habits, including decreased consumption of rice and increased consumption of meat and fats, which rely on imported feed grain and oilseeds due to restrictions on the national land.

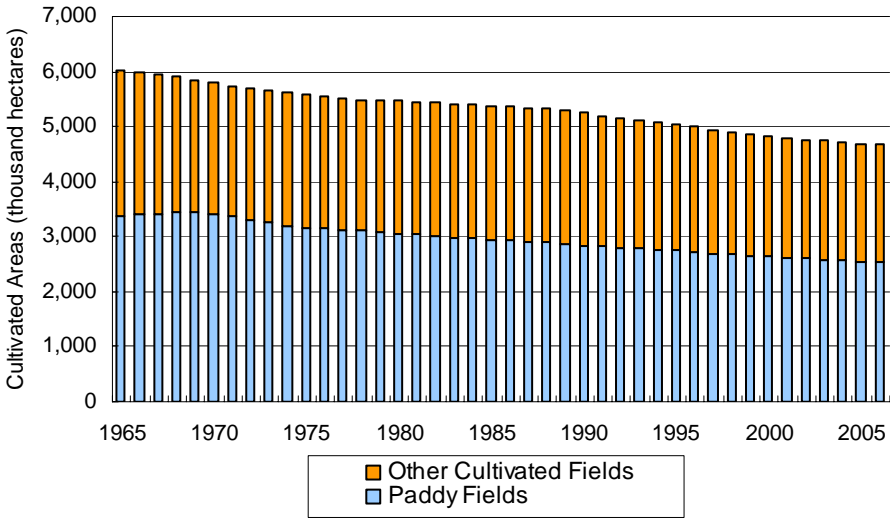


Figure 1.27 Changes in Cultivated Areas

Source: Ministry of Agriculture, Forestry and Fisheries of Japan – ‘Statistics on Cultivated land and Planted Area’

1.10 Forestry

Forestry plays an important role in Japan in maintaining and exercising functions for the public benefit. This includes national land conservation through forestry activities, including thinning and tending, as well as providing products such as timber.

Currently forest covers about 25 million hectares, or about 70 percent, of Japan’s national land area. It is comprised of national forest (approximately 7.7 million hectares (30 %)) and non-national forest (approximately 17.4 million hectares (70%). In Japan over 300 thousand hectares of trees were planted each year between the early 1950s and early 1970s, and at the effort’s peak over 400 thousand hectares were being planted in a single year. This allowed for actively creating over ten million hectares of planted forests. And as a result of the growth of these planted forests, which is more than two times the

¹⁵ Food self-sufficiency ratio in terms of calorie base: Ratio of calorific value of food produced domestically over the total calorific value of food (including feed grain) supplied to the total population.

level between 1945 and 1954, the volume of 25 million hectares of forests amounts to approximately 4.4 billion cubic meters.

Meanwhile, wood demand in Japan has recently declined to about 80 million cubic meters per year. However, domestic wood supply is increasing slightly, and its supply ratio in 2007 was approximately 23 percent.

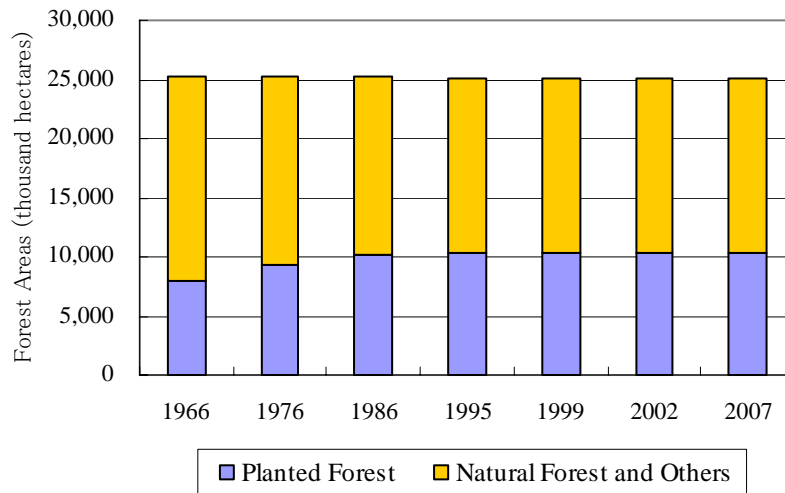


Figure 1.28 Changes in Forested Area

Source: Forestry Agency

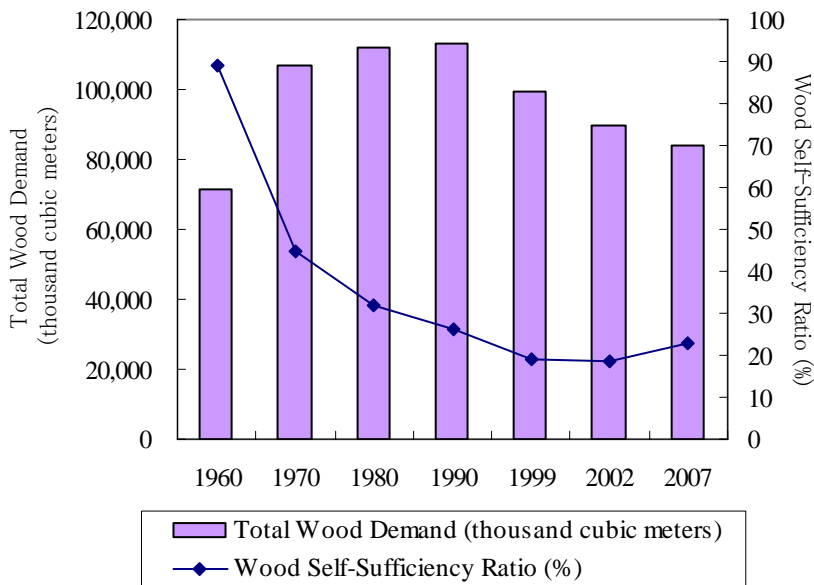


Figure 1.29 Change in Total Wood Demand and Wood Self-Sufficiency Ratio

Source: Forestry Agency – ‘Demand and Supply of Woods’

1.11 Information and Telecommunications

There were 88.11 million Internet users in Japan at the end of 2007, whereas the diffusion rate among the Japanese population was 69 percent, a figure which continues to increase. User numbers from mobile phones and other mobile network devices were 72.87 million, while users from personal computers were 78.13 million (Figure 1.30).

The use of broadband lines¹⁶ to connect to the Internet from household personal computers is increasing by the year. By the end of 2007, 40.6 percent of the entire population six years old or over used broadband lines, while 79.6 percent of people who use the Internet from household personal computers used broadband lines. The number of broadband connection contracts at the end of 2007 was 2.83 million, of which 13.13 million were DSL contracts. While the number of DSL contracts is on the decline, the number of FTTH contracts, 11.33 million, is on the rise. In addition, FTTH contracts accounted for over 40 percent of all broadband contracts. According to net contract numbers, DSL contract numbers continue to decrease while FTTH contract numbers have steadily increased since 2004. In this way, FTTH contracts are leading the increase in broadband contracts (Figure 1.31).

The purpose for Internet usage is also expanding to include various different sites such as Internet shopping, Internet auctions, financial trading, enjoying images and music, online games, and viewing and writing on SNS sites, in addition to the traditional activities of searching and viewing information (Figure 1.32).

E-commerce web sites targeting consumers using personal computers and mobile phones are also spreading. This can be attributed to factors such as the tremendously vast variety of products sold through Internet shopping and the ability to conveniently purchase products that would otherwise be unavailable without traveling to a far away location. The size of the consumer-targeted e-commerce market in Japan had expanded to 4.4 trillion yen in 2006, and personal computers and mobile phones are currently becoming the second most prominent purchasing method behind actual store visits (Figure 1.33).

¹⁶ 'Broadband lines' includes cable television lines, fixed wireless access (FWA), third generation (3G) mobile phone lines, fiber optic lines (FTTH), and DSL lines.

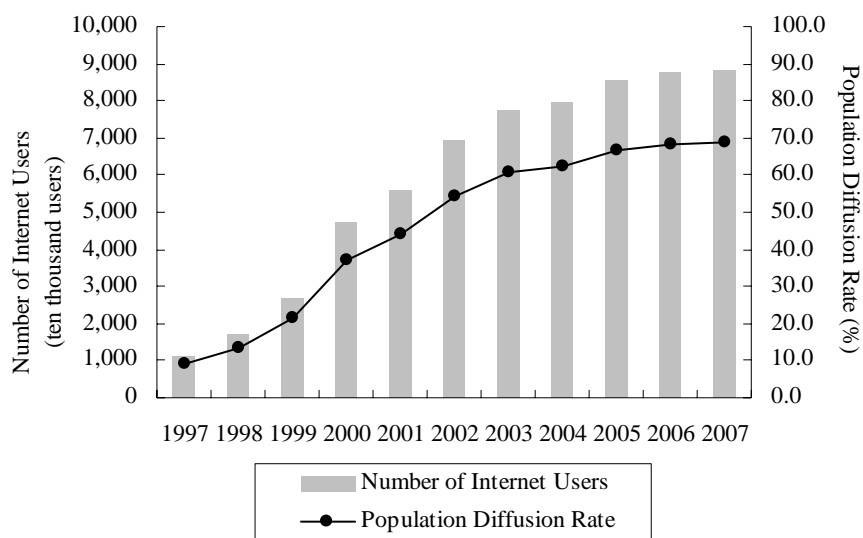


Figure 1.30 Number of Internet Users and the Internet Diffusion Rate

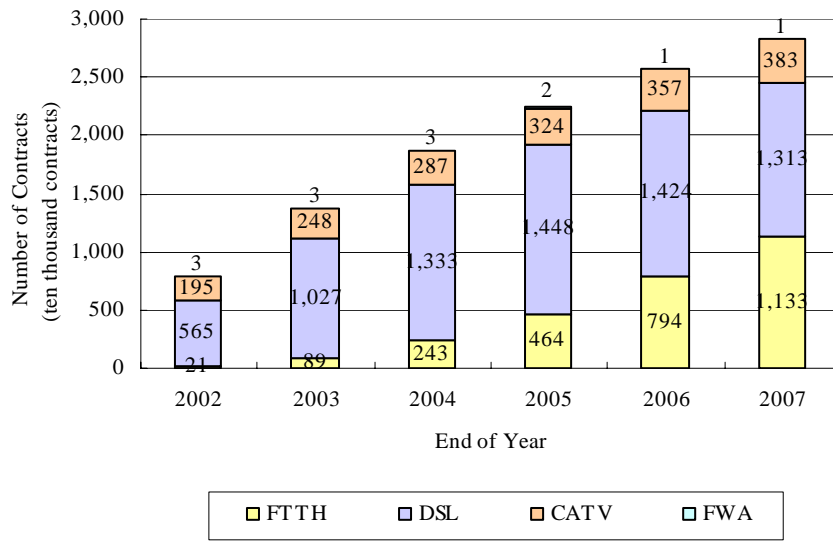
*The number of Internet users (estimate) is an estimated figure based on the results from a survey conducted over the past year on people aged six and over that use the Internet. Internet connection devices include personal computers, mobile phones and PHS, handheld information devices, gaming devices, and all other devices (subjects were not asked whether they possess said devices). The purpose of Internet use also includes all purposes, such as personal use, business use, and academic use.

*The population diffusion rate (estimate) is a figure acquired by dividing the estimated number of Internet users (88.11 million) from the estimate for the entire population as of October 2007 (127.69 million) (National Institute of Population and Social Security Research, 'Population Projections for Japan').

*Figures for between 1997 and the end of 2000 were taken from 'Information and Communications in Japan.' Figures for between 2001 and the end of 2007 are estimates from the 'Communications Usage Trend Survey.'

*The target age for surveys was 15-69 years old until 1999, however, this changed to 15-79 years old in 2000, and then to all persons age six and above from 2001 in consideration of the increase in usage by elderly people and primary and junior high school students. Therefore it is not possible to conduct a precise comparison between surveys.

Source: 2008 White Paper - Information and Communications in Japan



1.31 Changes in Numbers of Broadband Contracts

Source: Information and Communications in Japan 2008

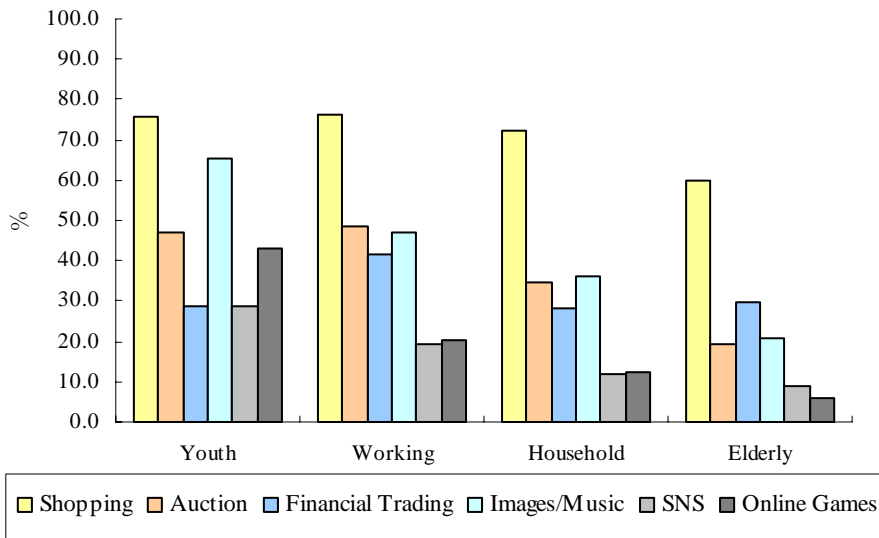


Figure 1.32 Functions and Services Used on Websites (personal computers and mobile phones) (multiple response)

Source: Information and Communications in Japan 2008

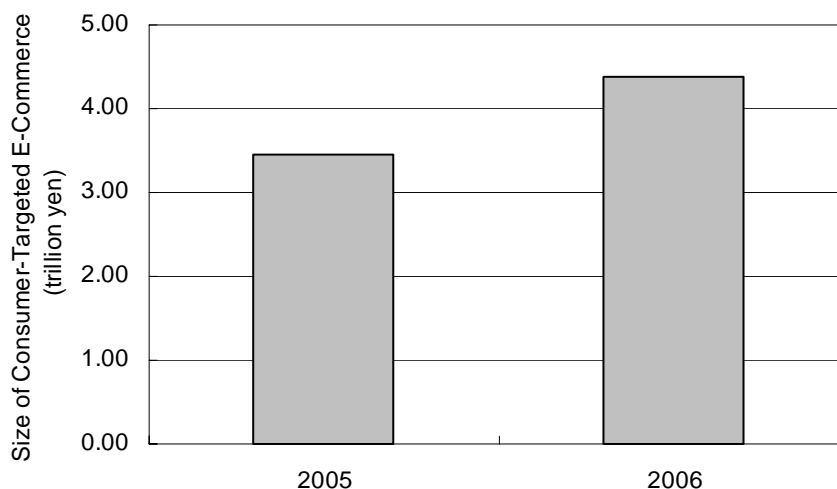


Figure 1.33 Scale of Consumer-Targeted E-commerce

Source: Information and Communications in Japan 2008

1.12 Administration and Finances

1.12.1 Administration

Under the Japanese Constitution enacted in 1947, sovereign power resides with the people while the judicial, legislative, and executive powers of government are vested, respectively, in the mutually independent courts, Diet, and Cabinet. The constitution establishes a parliamentary cabinet linking the Cabinet to the Diet; the Diet designates the Prime Minister; the Prime Minister and a majority of the Ministers of State must be Diet members; and the Cabinet is collectively responsible to the Diet.

Organs of national administration under Cabinet jurisdiction are established – the Cabinet Office and eleven ministries, namely: the ministries of Internal Affairs and Communications; Justice; Foreign Affairs; Finance; Education, Culture, Sports, Science and Technology; Health, Labour and Welfare; Agriculture, Forestry, and Fisheries; Economy, Trade and Industry; Land, Infrastructure and Transport; Environment; and Defense. As the chief ministers of state, the Prime Minister and the individual ministers divide responsibility for national administrative duties. Councils are among the representative organs established under law with the object of ensuring that expert opinions and the views of the people are reflected in administrative actions. The main duty of the councils and other advisory bodies is to investigate and deliberate on the jurisdiction and stipulation of laws and to inform administrative organs of their views. As of July 2008, there were 115 councils and similar organs in existence.

Concerning the global warming issue, government level plans have been drawn up and countermeasures advanced. For example, there is the Action Program to Arrest Global Warming of

October 1990, the Guideline of Measures to Prevent Global Warming of June 1998 (drawn up in response to the adoption of the Kyoto Protocol (December 1997)), and the revision of the Outline for Promotion of Efforts to Prevent Global Warming in March 2002, in response to the adoption of the Marrakesh Accords (November 2001). Concerning structures for the promotion of global warming countermeasures, in December 1997 the Global Warming Prevention Headquarters was established with all of the government cabinet ministers as its members. The headquarters annually checks the level of progress of the specified measures for ways to address global warming.

In October 1998, the ‘Law Concerning the Promotion of the Measures to Cope with Global Warming’ (the “Act on Promotion of Global Warming Countermeasures”) was enacted and the basic framework for the promotion of measures to cope with global warming in Japan was constructed. The law was amended in June 2002 and when the Kyoto Protocol came into force, the Kyoto Protocol Target Achievement Plan was formulated. After the development of this domestic framework, Japan ratified the Kyoto Protocol in June 2002.

The Outline for Promotion of Efforts to Prevent Global Warming, revised in 2002, divided the years from 2002 until the completion of the first commitment period into three step periods, adopting a step-by-step approach of evaluating the progress of measures and emissions in 2004 and 2007, as well as adopting additional policies and measures as necessary. A complete evaluation and revision was conducted in 2004. Meanwhile, in February 2005 the Kyoto Protocol came into force and it became necessary to make a decision on the Kyoto Protocol Target Achievement Plan based on the Act on Promotion of Global Warming Countermeasures. In response to this need, in April 2005 the Cabinet approved the Kyoto Protocol Target Achievement Plan, which stipulated the countermeasures and policies necessary to reliably achieve Japan’s 6% reduction commitment under the Kyoto Protocol.

The Act on Promotion of Global Warming Countermeasures stipulates that in 2007 considerations are to be paid to the targets and measures stipulated in the Kyoto Protocol Target Achievement Plan, and that changes must be promptly made if deemed necessary, based on the results of said considerations (Article 9). In response to these considerations, the entire plan was revised in March 2008. Specialized discussions are held regarding plan revisions by expert panels including the Central Environmental Council of the Ministry of the Environment, the Industrial Structural Council and the Advisory Council for Resources and Energy of the Ministry of Economy, Trade and Infrastructure, as well as the Council for Social Infrastructure and Council for Transport Policy of the Ministry of Land, Infrastructure, Transport and Tourism. Specifically, for approximately one year from the end of 2006 the progress of currently employed countermeasures and policies were evaluated, future emission amounts of greenhouse gasses were forecasted, and considerations were paid to the details of additional countermeasures and policies. In addition, the views of citizens have been reflected in these considerations by listening to the opinions of the industrial sector, local authorities, NGOs, and other bodies, while also conducting procedures for public comments. Persons were also allowed to sit in on meetings and meeting materials as well as agenda overviews were released publicly in effort to ensure the transparency of discussions. Later in March 2008, the Global Warming Prevention Headquarters,

which is composed of all Cabinet members, completed a proposal for the plan's revision and amendments to the Kyoto Protocol Target Achievement Plan were adopted by the Cabinet. In order to continuously assess and ensure the plan's effectiveness following its draft, each year rigorous inspections are made on such factors as the progress of each countermeasure employed by the government using an evaluation index and other measures, and when necessary the plan is amended in a flexible manner by adding additional, or strengthening existing, countermeasures and policies. In addition, in FY2009 projections are to be provided on Japanese greenhouse gas emissions during the first commitment period (five years) while a comprehensive evaluation is to be conducted on the progress of countermeasures and policies stipulated in the plan along with emission amounts. This is to allow for promptly implementing effective additional countermeasures and policies to ensure that targets are achieved following from FY2010 onward, which is the middle of the first commitment period.

Against this backdrop, revisions were made to the Act on Promotion of Global Warming Countermeasures and the Law Concerning the Rational Use of Energy. Regarding the Act on Promotion of Global Warming Countermeasures, from April 2006 the "system on calculation, reporting, and official announcement of green house effect gases effluent" was introduced, requiring entities that emit over a certain level of greenhouse gasses to measure their emissions and report those measurements to the government. The Law also allowed the government to count and publish the data reported. In addition, a revision made in June 2008 expanded the scope of the calculation, reporting, and official announcement system mainly in the business sector, and set new obligations for businesses to make efforts to control emissions. Regarding the Law Concerning the Rational Use of Energy, a revision in April 2006 stipulated unifying the regulations category for factories and business sites, strengthening countermeasures in the transport sector (requiring that freight transporters, passenger transporters, and shippers above a stipulated size create energy conservation plans and report energy usage amounts), enhancing energy conservation countermeasures in the housing and architecture sector, and developing policies that promote efforts for energy conservation by consumers. For the industrial and business sectors, a May 2008 revision was also made to promote improvements to overall corporate energy management by introducing corporate-based energy management as well as to introduce sector-based benchmarks for energy conservation standards to factories and offices while further strengthening the energy conservation measures for housing performance in the housing and architecture sector. Again in August 2009, the new Law on Advancing Energy Supply Structure was executed, requiring energy suppliers (electric power companies, gas companies, and oil companies) above a certain size to use non-fossil energy resources, such as solar power, nuclear power, hydroelectric power, geothermal power, or biomass, and to use fossil energy resources more effectively.

Japan has also proposed the long-term target of at least halving global greenhouse gas emissions from the current level by 2050 as an internationally shared objective. In order to achieve this objective, it is vital for all of the nations in the world to address this problem. The Action Plan for Achieving a Low-Carbon Society (approved by the Cabinet in July 2008) announces Japan's long-term target of

reducing emissions by 60 to 80 percent from the current level by 2050, which indicates that global emission levels should be made to peak in the next 10 to 20 years. The Action Plan also proposes that Japan announce a quantified national emission reduction target at a proper time during 2009.

In April 2009, Japan proposed a Draft Protocol on a new framework beyond 2012, which includes the target for at least halving global emissions by 2050 in the preamble and contains such content as indicating the obligations of advanced nations using total emission amounts and reduction rates taken from multiple reference years. In June 2009, then Prime Minister Taro Aso announced that, in order to achieve the long-term objective, developed nations must aim to have their emission levels peak by 2015 and developing nations by 2025, and that Japan had established a mid-term objective of cutting emissions by 15 percent by 2020 compared with the 2005 levels.

Also, at the United Nations Summit on Climate Change on September 22, 2009 Prime Minister Yukio Hatoyama announced that Japan would aim to reduce its emissions by 25% by 2020, if compared to the 1990 level, premised on the formulation of a fair and effective international framework by all major economies and agreement on their ambitious targets.

In addition, Prime Minister Hatoyama also voiced that a vast amount of financial resources would be required to resolve the climate change problem, in particular to support adaptive measures in vulnerable developing nations and island states. The Prime Minister thereupon announced that Japan is prepared to provide more financial and technical assistance than in the past, in accordance with the progress of the international negotiations. In addition, with regard to the assistance to developing nations the Prime Minister expressed that 1) developed countries must contribute through substantial, new and additional public and private financing, 2) rules must be developed that will facilitate international recognition of developing countries' emissions reductions, in particular those achieved through financial assistance, in a measurable, reportable, and verifiable manner 3) considerations need to be paid to an innovative mechanisms for financial assistance in a predictable manner, while a system is also needed for providing information and matching on bilateral and multilateral funds, and 4) a framework must be constructed to ensure the protection of intellectual property rights in order to promote the transfer of low-carbon technology. These were proposed under the title of the Hatoyama Initiative, and Japan intends to exert every effort for the success of Copenhagen, in the course of formulating this initiative.

As of June 31st, 2009, local public organizations included 47 prefectures and 1,758 municipalities (cities, towns, and villages) with local assemblies serving as their legislatures; their executive branches being headed by a governor in the case of prefectures and by a mayor in the case of municipalities. The size of the prefectures and municipalities varies.

It is becoming increasingly more important for these local public organizations to make active efforts.

The Act on Promotion of Global Warming Countermeasures revised in June 2008, requires that local public organizations in prefectures, designated cities, core cities, and specially designated cities

expand their action plans to include measures in response to area-wide natural conditions commensurate to traditional regional promotion plans. Moreover, the Act on Promotion of Global Warming Countermeasures requested that efforts be made to collaborate between related policies, including new local public organization action plans (such as area-based measures), city plans, and development plans for agricultural promotion areas.

As of December 2008, local public organization action plans (clerical affairs) had been drafted by all 47 prefectures and 1,061 municipalities (cities, towns, and villages). In addition, 183 more municipalities are planning to establish them within FY2008. Moreover, as of December 2008 regional promotion plans—the area-based local public organization action plans—had been drafted for all 47 prefectures as well as for 113 municipalities, while 88 more municipalities plan to draft them within FY2008.

Furthermore, 6,796 volunteers to promote activities to mitigate global warming have been commissioned by 45 prefectures (there were 3,677 as of April 2005). Prefectural centers for the promotion of activities to stop global warming have been designated in 45 prefectures, and 461 global warming countermeasure regional councils have been established in 47 prefectures (there were 128 as of April 2005).

In addition, as a part of the promotional structure of the Kyoto Protocol Target Achievement Plan, the government will establish Regional Committees on Energy Supply and Demand and Prevention of Global Warming in nine regional blocks from Hokkaido to Okinawa. This will allow for concerned ministries and agencies to cooperate to back up efforts in the regions for global warming countermeasures, in collaboration with local governments, etc.

Among local public organizations, Tokyo is implementing particularly advanced undertakings. In June 2007, the Tokyo Climate Change Strategy was drafted, which defines the basic policy for climate change countermeasures over the ensuing ten years in Tokyo. Based on this strategy, the Tokyo Metropolitan Ordinance on Environmental Preservation was revised in June 2008, requiring large business establishments to cut total greenhouse gas emissions. It also introduced an emissions trade system and implemented a global warming countermeasures reporting system for small- to medium-sized enterprises, amongst other revisions. In addition, in January 2009 environment-related tax breaks (tax system promoting energy conservation for small- to medium-sized enterprises, tax system promoting the introduction of next-generation automobiles, etc.), which are unique to Tokyo, were implemented.

Regarding the creation of a low-carbon society, the Action Plan for Achieving a Low-Carbon Society sets high targets for significantly cutting greenhouse gas emissions. The plan selected ten cities nationwide to challenge themselves with pioneering efforts in creating an Eco-Model city. Thirteen cities had been selected as of January 2009. Support and result follow-ups will be conducted on these efforts in the future in order to promote distinguished cases nationwide. In addition, partnerships will be

formed with overseas cities that are aggressively addressing environmental measures so that Japan can transmit its leading efforts to the rest of the world. The Promotion Council for the Low Carbon Cities, which is formed of local public organizations and other entities eager to create a low-carbon society, was established in December 2008 as a venue for nationally promoting the aforementioned distinguished cases and forming partnerships with overseas cities in addition to other activities. The Council is currently promoting activities aimed at constructing a low-carbon society (membership of 168 organizations as of October 5, 2009).

In this way, the efforts of Japan's local governments are steadily growing and it is expected that they will develop even more in future.

1.12.2 Finances

Japan's national finances are administered as follows. Every fiscal year (April 1 to March 31 the following year), the government prepares a budget, which must be approved by the Diet before it is implemented by the administrative organs. The national budget consists of three parts: the general account, special accounts, and government-related operating accounts.

The general account is the record of the national government's ordinary revenues and outlays. It is sourced from taxes and, when necessary, national bonds. This account covers the most fundamental national expenses, such as social welfare, education, and defense. In FY2009, ordinary expenditure totaled 51.731 trillion yen, 9.4 percent more than the initial budget for the previous year. The general account totaled 88.548 trillion yen, an increase of 6.6 percent.

Special accounts are specially established under the Finance Law independent of the general account in cases where the national government runs certain enterprises, invests certain funds, or allots certain revenues to particular expenditures. At the end of 2010 there will be a total of 17 such accounts, including 12 special accounts for government enterprises, 2 special accounts for fund management, and 3 special accounts for the consolidation of funds (there were 21 funds in FY2008, which have been sequentially integrated). Government-related organizations are wholly state-owned financial institutions established via special legislation. Currently, the Okinawa Development Finance Corporation, Japan Finance Corporation, and Japan International Cooperation Agency are two banks and one organization set up this way in the loan assistance sector.

Table 1.3 FY2009 General Expenditure Budget

(Hundred million yen)

	FY2008 budget			FY2009 estimates		
		2007-2008 change	Growth rate (%)		2008-2009 change	Growth rate (%)
Social Security	217,829	6,415	3.0	248,344	30,515	14.0
Education and Science	53,119	265	0.5	53,104	-15	0.0
Science and Technology Promotion	13,628	151	1.1	13,777	149	1.1
Government Employee Pensions and Others	8,522	-713	-7.7	7,872	-650	-7.6
National Defense	47,796	-217	-0.5	47,741	-55	-0.1
Public Works	67,352	-2,121	-3.1	70,701	3,349	5.0
Economic Assistance	6,660	-253	-3.7	6,295	-365	-5.5
(Reference) ODA	7,002	-291	-4.0	6,722	-280	-4.0
Small- and Medium-sized Businesses	1,761	121	7.3	1,890	129	7.3
Energy Measures	8,655	12	0.1	8,562	-93	-1.1
Major Foodstuff Measures	8,582	27	0.3	8,659	77	0.9
Miscellaneous	49,069	272	-0.6	50,642	1,573	3.2
Economic Emergency Response Preparation	-	-	-	10,000	10,000	-
Contingencies	3,500	0	0.0	3,500	0	0.0
General Expenditure Total	472,845	3,061	0.7	517,310	44,465	9.4

Source: Ministry of Finance

Beginning in FY2003, funds related to global warming countermeasures in the draft budgets of concerned ministries and agencies have been classified under the Outline for Promotion of Efforts to Prevent Global Warming. In response to the Cabinet approval in April 28, 2005 for the Kyoto Protocol Target Achievement Plan, the budget from FY2006 was classified according to the countermeasures category of the budget related to the Kyoto Protocol Target Achievement Plan. The budget related to the Kyoto Protocol Target Achievement Plan in FY2009 was 538.5 billion yen for “items directly affecting the six percent emission cut commitment of the Kyoto Protocol,” 344.6 billion yen for “items affecting greenhouse gas cuts in the mid- to long-term,” 271.6 billion yen for “other items that result in contributing to greenhouse gas cuts,” and 65.1 billion yen for “basic measures, etc.” The following table is a breakdown of the budget.

**Table 1.4 Budget Related to the Kyoto Protocol Target Achievement Plan
(by ministry and office)**

(Unit: million yen)

	A		B		C		D	
	Items directly affecting the six percent emission cut commitment of the Kyoto Protocol		Items affecting greenhouse gas cuts in the mid- to long-term		Other items that result in contributing to greenhouse gas cuts		Basic measures, etc.	
	FY2009	FY2008	FY2009	FY2008	FY2009	FY2008	FY2009	FY2008
Cabinet Office, etc.	1,057	1,525	140	141	729	426	2	15
Internal Affairs and Communications					300	299		
Justice	492	465						
Foreign Affairs	375	310					574	579
Finance	355	427						
Education, Culture, Sports, Science and Technology	200		158,926	159,066			19,360	24,661
Health, Labour and Welfare	789	1,496						
Agriculture, Forestry and Fisheries	201,023	194,057	27,464	34,242	123,394	130,927	2,815	2,321
Economy, Trade and Industry	282,123	273,908	128,211	100,769	40,211	31,334	25,644	10,038
Land, Infrastructure and Transport	12,262	9,936	25,085	10,729	60,507	132,968	10,722	2,169
Environment	39,786	37,239	4,821	4,603	46,495	47,087	5,936	4,919
All ministries and offices	538,462	519,365	344,647	309,550	271,636	343,043	65,054	44,701

Note 1: 'Cabinet Office, etc.' represents the Cabinet Office, National Police Agency, etc.

Note 2: Amounts that include items not pertinent to the budget related to the Kyoto Protocol Target Achievement Plan are not calculated in these figures.

Note 3: The total may not be consistent due to the processing of fractions (rounding).

Table 1.5 Budget Related to the Kyoto Protocol Target Achievement Plan
(classification by type of measure)

(Unit: million yen)

	FY2008	FY2009	2008-2009 change	Growth Rate
A. Items directly affecting the six percent emission cut commitment of the Kyoto Protocol	5,194	5,385	191	3.7%
B. Items affecting greenhouse gas cuts in the mid- to long-term	3,096	3,446	350	11.3%
C. Other items that result in contributing to greenhouse gas cuts	3,430	2,716	-714	-20.8%
D. Basic measures, etc.	447	651	204	45.6%

