

Regional Overview

Electricity generation and consumption

Total electricity generation in the ESCAP region continued to grow during 2001 and 2002, owing primarily to the economic growth experienced by such countries as China, Japan and the Republic of Korea in recent years. The total annual growth rate in electricity generation for the region during the period from 1990 to 2002 was 5.6 per cent; compared with an annual growth rate of 6 per cent between 1990 and 1996.¹ The electricity generation from 1992 to 2002 for selected countries in the ESCAP region is shown in figure 1.

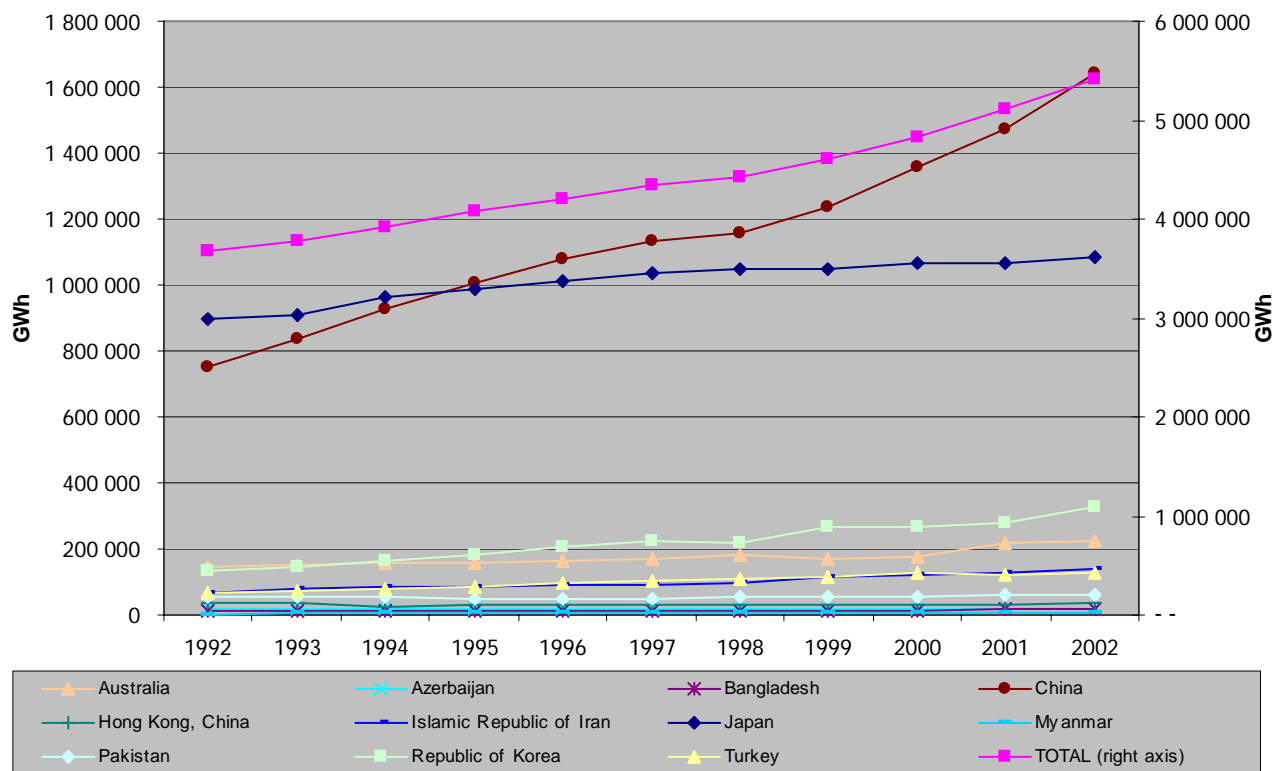
Despite the growth in electricity generation for the region overall, electricity generation in some countries, such as Azerbaijan, Armenia and Myanmar, has remained fairly steady. Azerbaijan and Armenia had undergone some market reform and financial difficulties in previous years. However, a number of changes have been made in these countries, which are outlined in the "Country/area

information" section of this publication. For economies in transition, estimates indicate an electricity demand growth rate of close to 2 per cent, though there is considerable scope for these countries to use electricity much more efficiently.

Figure 2 displays the most significant electricity producers in the region in 2002. This figure shows that generation is primarily dominated by a few countries, with China, the Russian Federation and Japan collectively accounting for approximately two-thirds of all electricity generation in the region.

Demand for electricity is linked closely with economic growth, and it is estimated that Asian economies will experience the highest growth in electricity demand over the next few years. For example, the demand in India and China has been estimated to grow at a rate of 4.9 per cent and 4.5 per cent respectively, and these trends suggest that,

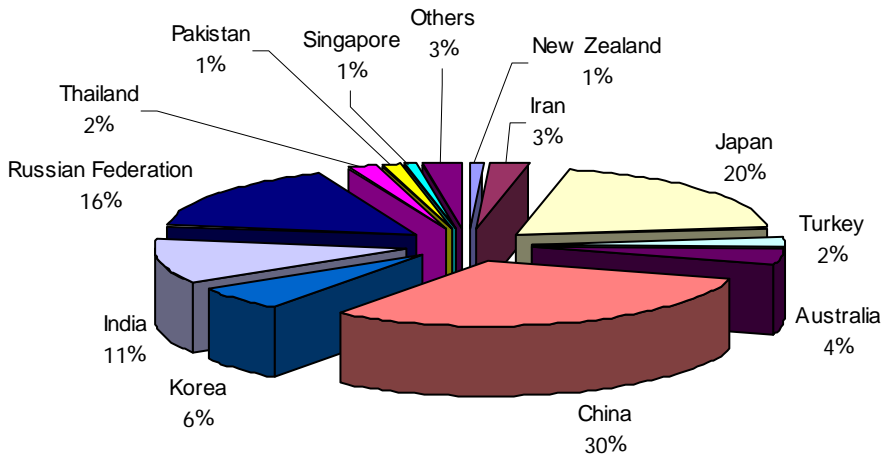
Figure 1: Electricity generation, 1992 - 2002



Note: Total includes data from the above-named countries as well as Armenia, Brunei Darussalam, Fiji, India, New Zealand, Philippines, Macao (China), Russian Federation, Singapore, and Thailand.

¹ - These figures do not include data from the Russian Federation.

Figure 2: Electricity generation by country, 2002



Note: Others includes data from Armenia, Azerbaijan, Bangladesh, Bhutan, Brunei Darussalam, Fiji, Hong Kong (China), Macao (China), Mongolia, Myanmar and the Philippines.

by 2030, China will generate as much electricity as the United States of America.

On a per capita basis, electricity consumption in China is still quite low compared with other countries, owing primarily to the large population. Japan ranks among the highest energy consumers per capita within the region; only Australia and New Zealand consume more. However, for the indicator of energy efficiency based on the gross domestic product (GDP),

Figure 3: Electricity consumption per capita, 2002

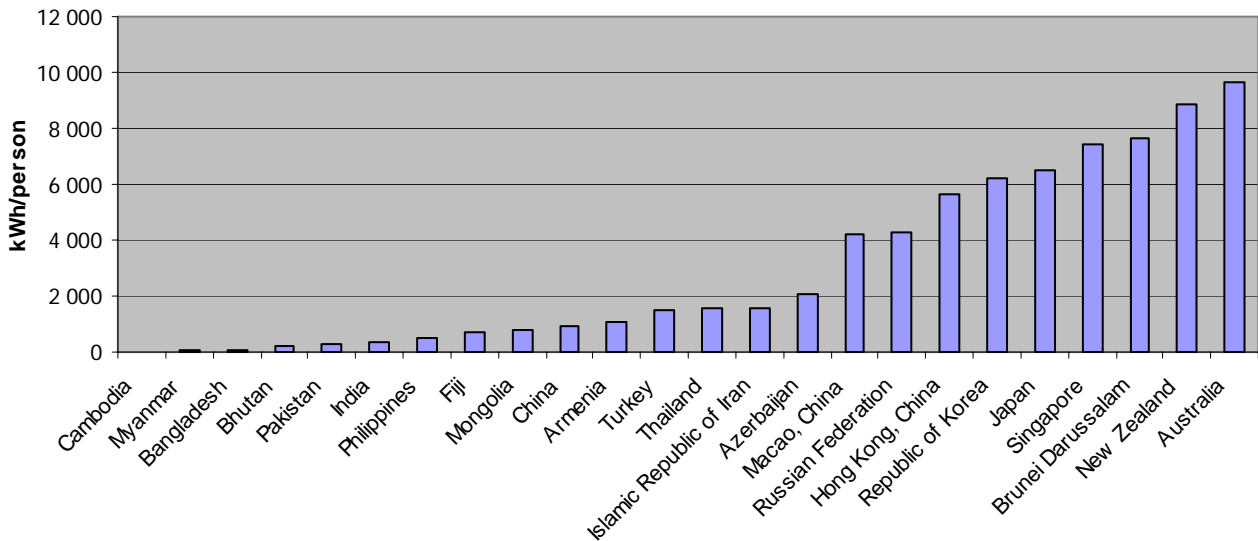
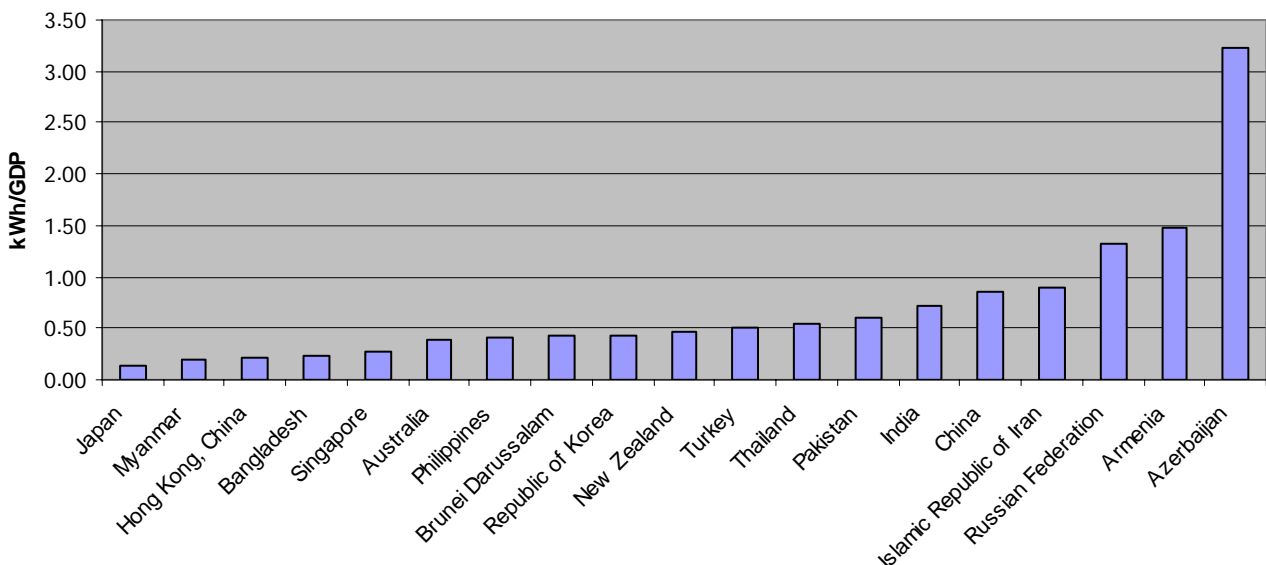


Figure 4: Electricity consumption in relation to gross domestic product, 2002

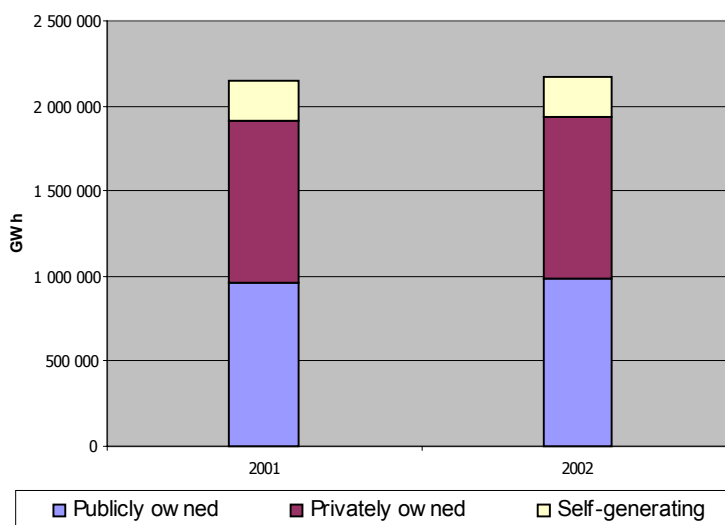


Japan ranks as one of the most efficient in the world. The electricity consumption per capita and in relation to GDP, respectively, can be seen in figures 3 and 4.

A considerable disparity can be seen between countries when comparing electricity consumption per capita. Countries such as Australia and New Zealand consume almost one hundred times more electricity per person than countries such as Bangladesh and Myanmar.

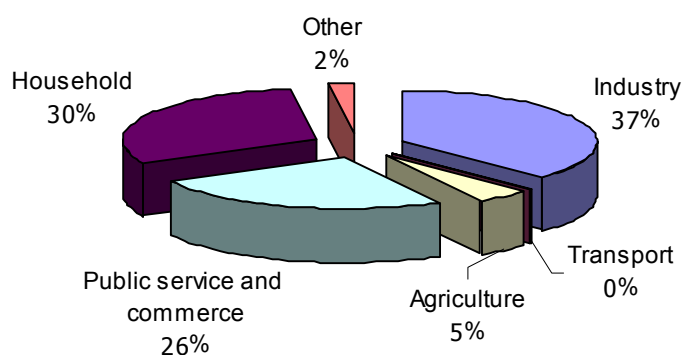
Figure 5 depicts the electricity generation by ownership for selected countries. The percentage of electricity generated by publicly and privately owned facilities remained fairly steady between 2001 and 2002, although this primarily reflects the ownership of

Figure 5: Total generation by ownership



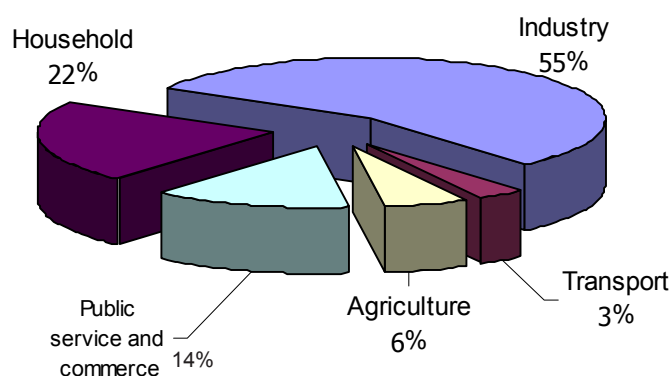
Note: Includes data from Armenia, Azerbaijan, Bangladesh, Bhutan, Brunei Darussalam, China, Fiji, Hong Kong (China), India, Islamic Republic of Iran, Japan, Macao (China), Mongolia, Myanmar, Pakistan, Philippines, Singapore, and Turkey

Figure 6: Electricity consumption per sector, 2002 (excluding major consumers)



Note: Includes data from Armenia, Azerbaijan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Fiji, Hong Kong (China), Islamic Republic of Iran, Macao (China), Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Singapore, Thailand and Turkey

Figure 7: Electricity consumption per sector, 2002 (Australia, China, India, Japan, Republic of Korea and Russian Federation)



facilities in Japan and India. Over this period some countries, such as Turkey, Bangladesh and the Philippines, have implemented electricity market reform measures. Further information for specific countries can be found under the chapter on “Country/area information.”

An overview of total consumption for selected countries in the ESCAP region can be seen in figure 6. Electricity is primarily consumed in the industrial and residential sectors, with 25 per cent from commercial and public services. However, to obtain a clearer picture of electricity consumption across the ESCAP region, figure 6 does not include the six largest energy consumers: China, the Russian Federation, the Republic of Korea, Japan, India and Australia. Figure 7, which only includes the six major energy-consuming countries, shows the strength of the industrial sector as more than half of the electricity consumption is attributed to this sector.

Table 7 provides further detail on electricity consumption for various countries in the ESCAP region.

Electricity price

Figure 8 shows a comparison of electricity tariffs for 100 kWh of electricity for selected countries in the ESCAP region. A variety of pricing schemes exist within some countries due to factors such as different geographical regions or power generating

companies. Therefore, figure 8 is only indicative of the typical price of electricity within each country. There is considerable variation between different countries and between domestic, commercial and industrial customers within a country. Table 13 provides more specific information on electricity tariffs.

Installed capacity

The mix of energy capacities for 2002 can be seen in figures 9 and 10. Although renewable energy sources do not play a substantial role in electricity generation for many countries, its contribution to the overall capacity in Bhutan, New Zealand, Pakistan, Philippines and Turkey should be noted. In the Philippines, around 30 per cent of

Figure 8: Electricity prices, 2002

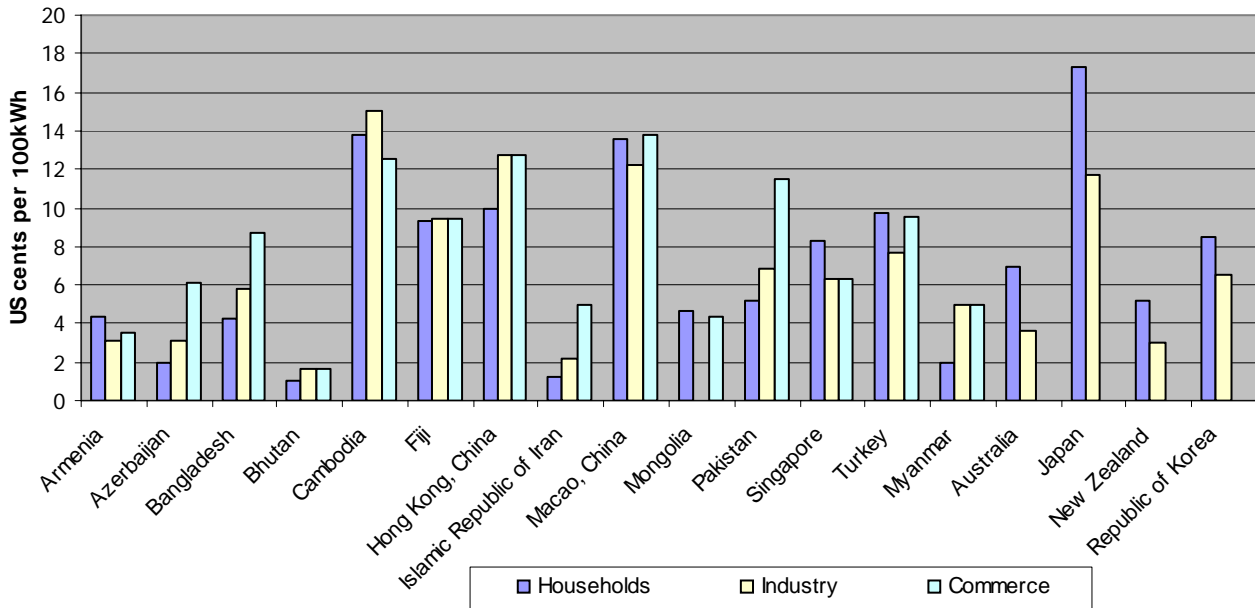


Figure 9: Capacity by energy type, 2002

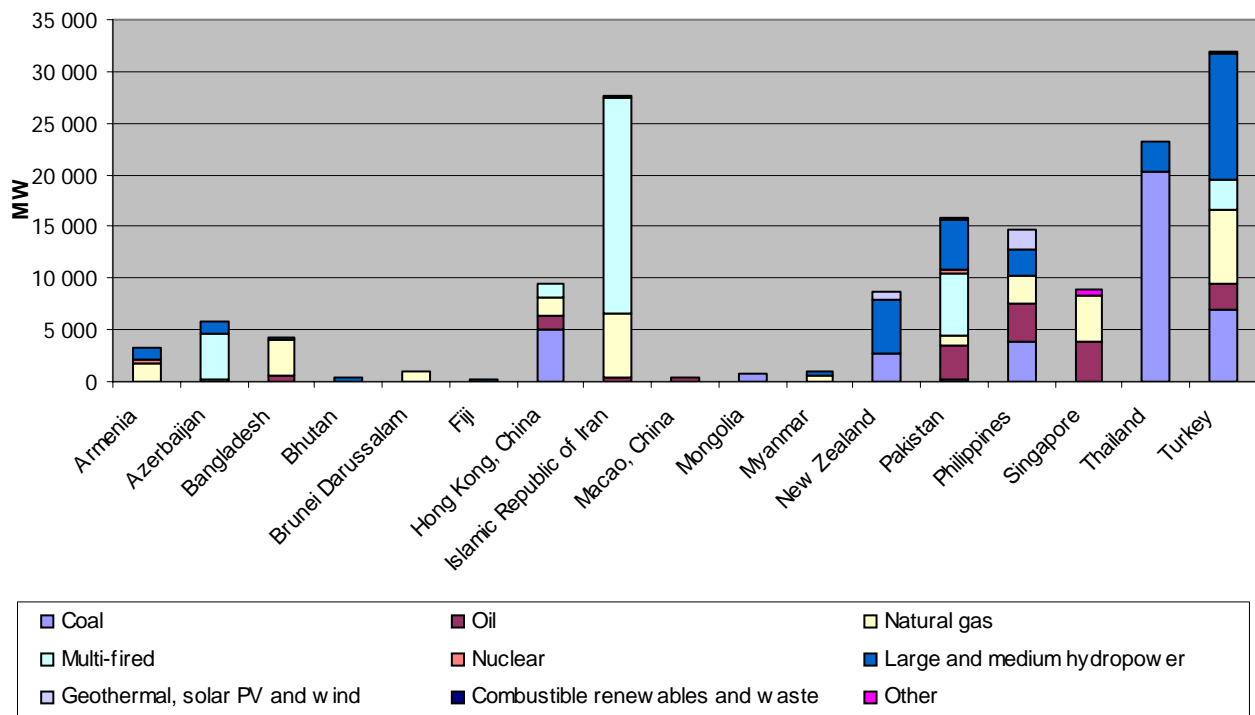
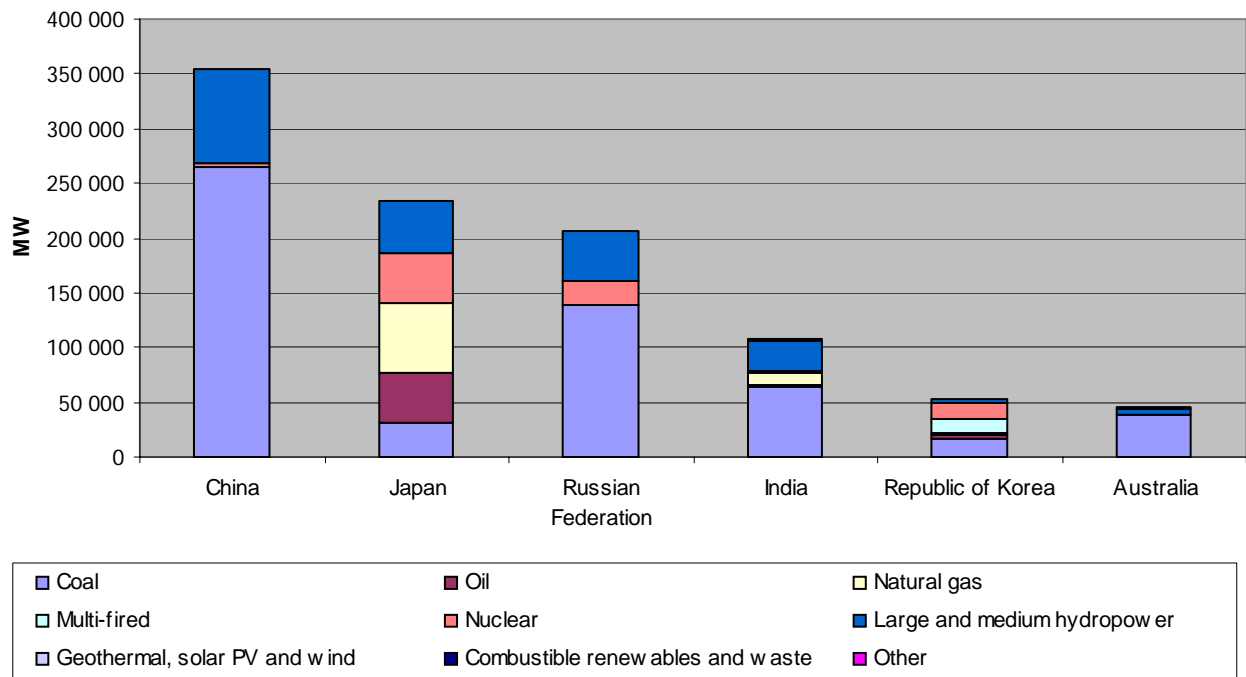


Figure 10: Capacity by energy type (large electricity generators), 2002



the electricity generated is from renewable resources, specifically hydropower and geothermal power. Bhutan, Pakistan and Turkey also utilize a reasonable amount of hydropower. Otherwise, thermal generation dominates electricity production.

There was no substantial change in the ratio of new and renewable energy sources to thermal sources from 2001 to 2002. The use of renewable energy sources is increasing, however, with many countries planning to expand their use of renewable resources. This is described in further detail for some countries in the "Country/area information" section.

Access to electricity

Table 1 provides some detail on the level of access to electricity. The population of a number of countries, particularly people living in rural or remote areas, have little access to electricity. Such countries as Bangladesh, Fiji and Mongolia are progressing steadily in the expansion of their electricity supply, which is represented in table 1 by a slight increase in the percentage of electrified villages. Many countries see a benefit in exploiting renewable energy resources for their rural electricity supply and, to facilitate this, a number of programmes are currently being investigated or implemented.

Carbon emissions

Figure 11 shows the total electricity-related carbon dioxide (CO₂) emissions for 2001 of a number of countries in the ESCAP region. The most significant emitters generate the most electricity (see figure 2). China's strong growth in electricity generation and large population are reflected in its position as the most significant carbon emitter. However, other factors that may affect carbon dioxide emissions in some countries include inefficient operation of generating facilities, the type of energy source or fuel used, loss of power through the distribution system, reliance on energy-intensive industries for economic growth and limited demand-side management.

Australia's heavy dependence on fossil fuels for power generation and its high electricity consumption per capita have ranked it the most significant emitter of carbon dioxide per person compared with other countries in the ESCAP region. Some other countries with high rates of electricity consumption per capita, such as New Zealand and Japan, have much lower carbon emissions per capita, as can be seen in figure 12. This is primarily due to less reliance on fossil fuels and more on hydropower or nuclear energy.

Figure 11: Total carbon dioxide emissions for 2001

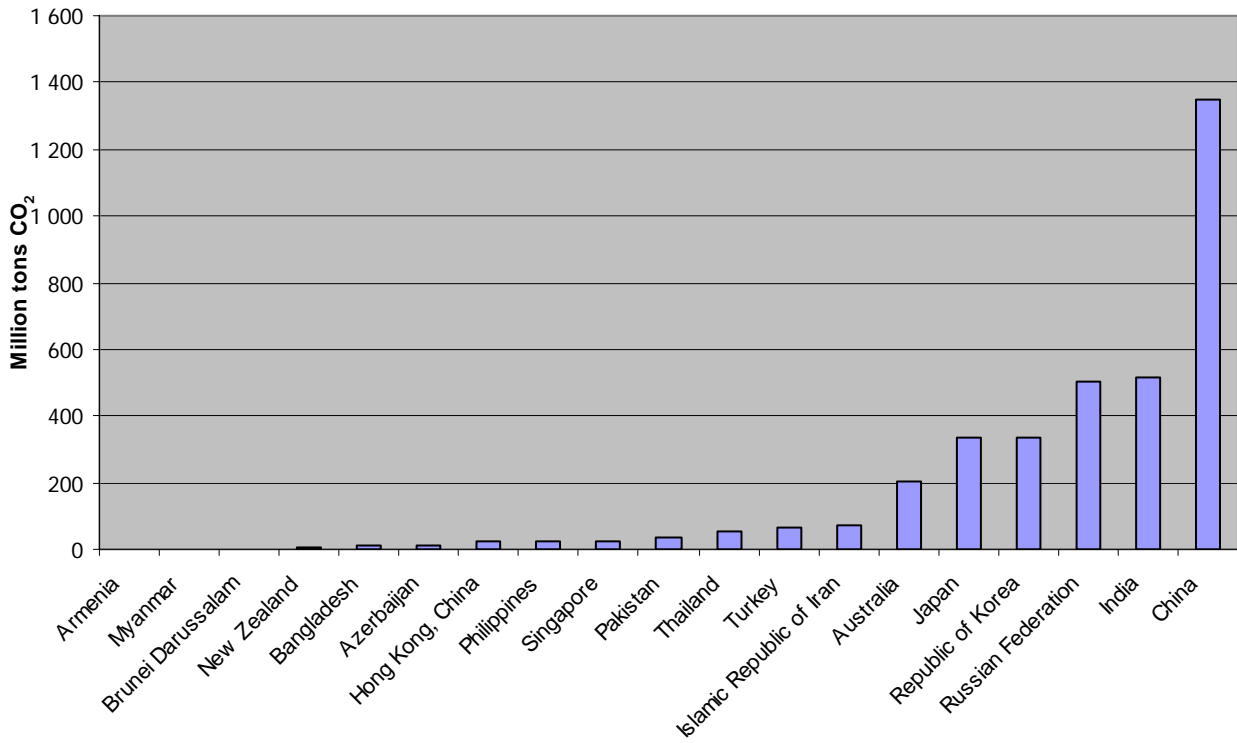


Figure 12: Carbon dioxide emissions per capita for 2001

