

RENEWABLE ENERGY

More and more governments are recognising the importance of promoting sustainable development and combating climate change when setting out their energy policies. Higher energy use has contributed to higher greenhouse gas emissions and higher concentration of these gases in the atmosphere. One way to reduce greenhouse gas emissions is to replace energy from fossil fuels by energy from renewables.

Definition

The table refers to the contribution of renewables to total primary energy supply (TPES) in OECD countries. Renewables include the primary energy equivalent of hydro (excluding pumped storage), geothermal, solar, wind, tide and wave. It also includes energy derived from solid biofuels, biogasoline, biodiesels, other liquid biofuels, biogases, and the renewable fraction of municipal waste. Biofuels are defined as fuels derived directly or indirectly from biomass (material obtained from living or recently living organisms). Included here are wood, vegetal waste (including wood waste and crops used for energy production), ethanol, animal materials/wastes and sulphite lyes. Municipal waste comprises wastes produced by the residential, commercial and public service sectors that are collected by local authorities for disposal in a central location for the production of heat and/or power.

Overview

In OECD countries, total renewables supply grew by 2.5% per annum between 1971 and 2011 as compared to 1.1% per annum for total primary energy supply. Annual growth for hydro (1.2%) was lower than for other renewables such as geothermal (5.3%) and biofuels and waste (2.7%). Due to a very low base in 1971, solar and wind experienced the most rapid growth in OECD member countries, especially where government policies have stimulated expansion of these energy sources.

For the OECD as a whole, the contribution of renewables to energy supply increased from 4.8% in 1971 to 8.2% in 2011. The contribution of renewables varied greatly by country. On the high end, renewables represented 84% of energy supply in Iceland, and 40% in both New Zealand and Norway. On the low end, renewables contributed 3% or less of the energy supply for Japan, Korea and Luxembourg.

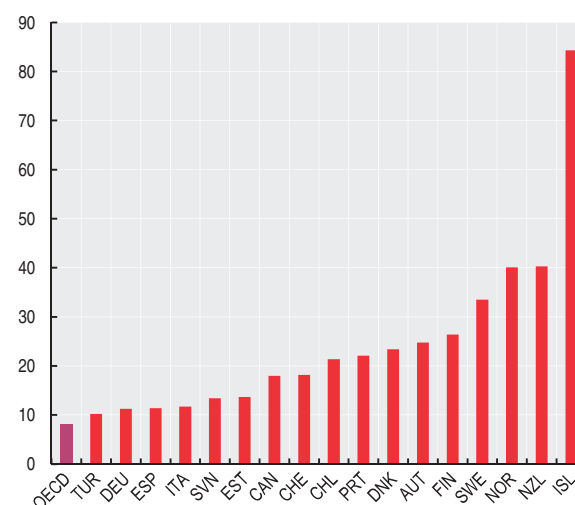
In general, the contribution of renewables to the energy supply in non-OECD countries is higher than in OECD countries. In 2010, renewables contributed 44% to the energy supply of Brazil, 35% in Indonesia, 26% in India, 12% in China, 11% in South Africa and 3% in the Russian Federation.

Comparability

Biofuels and waste data are often based on small sample surveys or other incomplete information. Thus, the data give only a broad impression of developments and are not strictly comparable between countries. In some cases, complete categories of vegetal fuel are omitted due to lack of information.

Contribution of renewables to energy supply

As a percentage of total primary energy supply, 2011



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Sources

- IEA (2012), *Energy Balances of Non-OECD Countries*, IEA, Paris.
- IEA (2012), *Energy Balances of OECD Countries*, IEA, Paris.

Further information

Analytical publications

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- IEA (2012), *Solar Heating and Cooling, IEA Technology Roadmaps*, IEA, Paris.
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Statistical publications

- IEA (2012), *Renewables Information*, IEA, Paris.

Online databases

- IEA World Energy Statistics and Balances.


Websites

- International Energy Agency, www.iea.org.

Contribution of renewables to energy supply

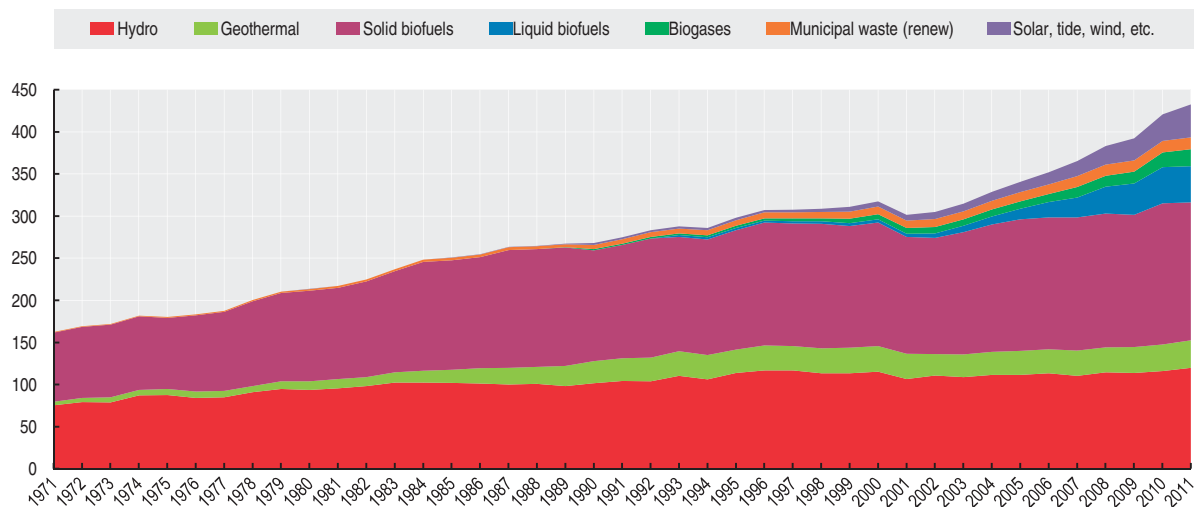

As a percentage of total primary energy supply

| | 1971 | 1990 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Australia | 8.8 | 5.9 | 6.1 | 6.2 | 5.9 | 5.8 | 5.6 | 5.7 | 5.7 | 5.7 | 5.5 | 5.5 | 6.1 |
| Austria | 11.0 | 20.3 | 22.1 | 21.3 | 18.7 | 19.7 | 21.0 | 22.1 | 24.1 | 25.3 | 27.9 | 26.8 | 24.8 |
| Belgium | 0.0 | 1.0 | 1.2 | 1.3 | 1.5 | 1.6 | 2.0 | 2.3 | 2.7 | 3.1 | 3.8 | 4.2 | 4.8 |
| Canada | 15.3 | 16.1 | 15.9 | 16.9 | 15.6 | 15.6 | 15.9 | 15.7 | 16.2 | 16.8 | 17.6 | 17.1 | 18.0 |
| Chile | 20.8 | 27.8 | 26.4 | 26.2 | 24.8 | 24.2 | 25.1 | 25.3 | 23.5 | 24.4 | 26.1 | 22.0 | 21.4 |
| Czech Republic | 0.2 | 1.8 | 3.5 | 3.7 | 3.4 | 3.8 | 4.0 | 4.2 | 4.7 | 4.9 | 5.8 | 6.3 | 7.2 |
| Denmark | 1.8 | 6.2 | 10.3 | 11.2 | 12.1 | 13.8 | 15.1 | 14.3 | 16.3 | 16.9 | 18.0 | 20.3 | 23.4 |
| Estonia | .. | 1.9 | 11.0 | 11.7 | 11.2 | 11.4 | 11.4 | 10.5 | 10.7 | 11.9 | 15.2 | 15.3 | 13.7 |
| Finland | 27.3 | 19.3 | 22.6 | 22.3 | 21.3 | 23.4 | 23.6 | 23.3 | 23.5 | 25.8 | 24.0 | 25.3 | 26.4 |
| France | 8.6 | 6.8 | 6.4 | 5.8 | 5.9 | 5.9 | 5.8 | 5.9 | 6.3 | 7.1 | 7.5 | 8.0 | 7.3 |
| Germany | 1.2 | 1.5 | 2.8 | 3.2 | 3.8 | 4.4 | 4.9 | 5.8 | 7.9 | 8.0 | 8.7 | 9.9 | 11.3 |
| Greece | 7.8 | 5.1 | 4.7 | 4.9 | 5.3 | 5.3 | 5.4 | 5.9 | 5.7 | 5.6 | 6.4 | 7.7 | 7.2 |
| Hungary | 2.9 | 2.6 | 3.4 | 3.4 | 3.5 | 3.6 | 4.3 | 4.5 | 5.1 | 6.0 | 7.4 | 7.6 | 7.8 |
| Iceland | 46.7 | 67.0 | 75.6 | 75.0 | 75.2 | 74.8 | 75.9 | 78.4 | 81.6 | 81.3 | 81.8 | 82.5 | 84.3 |
| Ireland | 0.6 | 1.7 | 1.6 | 1.8 | 1.7 | 1.9 | 2.5 | 2.8 | 3.2 | 3.8 | 4.6 | 4.6 | 5.9 |
| Israel | 0.0 | 3.1 | 3.3 | 3.6 | 3.5 | 3.8 | 4.0 | 3.7 | 3.7 | 4.7 | 5.0 | 5.0 | 4.6 |
| Italy | 5.6 | 4.4 | 6.0 | 5.8 | 6.0 | 6.6 | 6.3 | 6.9 | 6.7 | 7.7 | 9.7 | 10.6 | 11.7 |
| Japan | 2.7 | 3.5 | 3.1 | 3.2 | 3.4 | 3.3 | 3.2 | 3.4 | 3.2 | 3.3 | 3.4 | 3.3 | 3.4 |
| Korea | 0.6 | 1.1 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 |
| Luxembourg | 0.0 | 0.6 | 1.1 | 1.1 | 1.0 | 1.2 | 1.6 | 1.8 | 3.1 | 3.1 | 3.0 | 3.1 | 3.1 |
| Mexico | 16.8 | 12.2 | 10.9 | 10.2 | 10.2 | 10.4 | 10.4 | 10.0 | 10.0 | 10.1 | 9.6 | 9.8 | 9.3 |
| Netherlands | 0.0 | 1.1 | 1.8 | 1.9 | 1.8 | 2.1 | 2.7 | 3.0 | 3.0 | 3.5 | 4.0 | 3.8 | 4.3 |
| New Zealand | 32.0 | 32.8 | 28.0 | 29.8 | 29.7 | 31.3 | 31.6 | 32.0 | 32.2 | 32.9 | 35.8 | 39.0 | 40.3 |
| Norway | 40.9 | 54.3 | 42.9 | 49.5 | 38.2 | 40.0 | 48.5 | 42.6 | 46.5 | 44.9 | 43.1 | 36.1 | 40.1 |
| Poland | 1.4 | 1.5 | 4.5 | 4.7 | 4.6 | 4.7 | 4.8 | 4.8 | 5.0 | 5.7 | 6.7 | 7.2 | 7.8 |
| Portugal | 19.6 | 19.6 | 16.2 | 13.7 | 16.9 | 14.7 | 13.1 | 17.1 | 17.7 | 17.7 | 19.9 | 23.3 | 22.1 |
| Slovak Republic | 2.3 | 1.5 | 4.1 | 4.0 | 3.5 | 4.0 | 4.3 | 4.5 | 5.4 | 5.4 | 7.2 | 7.8 | 7.4 |
| Slovenia | .. | 9.1 | 11.6 | 10.5 | 10.3 | 11.5 | 10.6 | 10.5 | 10.1 | 11.0 | 14.2 | 14.8 | 13.4 |
| Spain | 6.5 | 6.9 | 6.5 | 5.5 | 6.9 | 6.4 | 5.9 | 6.5 | 7.0 | 7.6 | 9.7 | 11.8 | 11.4 |
| Sweden | 20.4 | 24.4 | 28.2 | 25.3 | 24.5 | 25.0 | 28.8 | 28.7 | 30.5 | 31.5 | 34.8 | 34.0 | 33.5 |
| Switzerland | 15.5 | 15.0 | 18.4 | 16.8 | 16.8 | 16.5 | 16.0 | 15.5 | 17.8 | 17.8 | 17.8 | 19.0 | 18.2 |
| Turkey | 31.0 | 18.3 | 13.3 | 13.5 | 12.9 | 13.3 | 12.0 | 11.1 | 9.6 | 9.5 | 10.2 | 11.1 | 10.2 |
| United Kingdom | 0.1 | 0.5 | 1.0 | 1.2 | 1.2 | 1.5 | 1.8 | 1.9 | 2.2 | 2.6 | 3.2 | 3.4 | 4.1 |
| United States | 3.7 | 5.0 | 4.0 | 4.0 | 4.3 | 4.4 | 4.5 | 4.8 | 4.7 | 5.1 | 5.4 | 5.6 | 6.1 |
| EU 27 | .. | 4.3 | 5.8 | 5.7 | 5.9 | 6.3 | 6.5 | 6.9 | 7.6 | 8.2 | 9.2 | 10.1 | .. |
| OECD | 4.8 | 5.9 | 5.7 | 5.7 | 5.9 | 6.0 | 6.2 | 6.4 | 6.6 | 7.0 | 7.5 | 7.8 | 8.2 |
| Brazil | 56.4 | 46.8 | 37.3 | 39.3 | 41.9 | 42.3 | 42.9 | 43.3 | 44.4 | 44.4 | 45.8 | 43.9 | .. |
| China | 40.2 | 24.2 | 19.2 | 18.3 | 16.1 | 14.6 | 13.8 | 12.9 | 12.6 | 12.6 | 12.0 | 11.6 | .. |
| India | 62.8 | 44.1 | 33.9 | 33.2 | 32.9 | 31.7 | 31.2 | 30.3 | 29.2 | 28.2 | 26.5 | 26.3 | .. |
| Indonesia | 75.3 | 46.6 | 38.3 | 37.3 | 37.5 | 35.4 | 34.7 | 34.4 | 35.0 | 36.1 | 35.0 | 34.5 | .. |
| Russian Federation | .. | 3.0 | 3.0 | 2.8 | 2.7 | 2.9 | 2.9 | 2.8 | 2.9 | 2.6 | 2.8 | 2.5 | .. |
| South Africa | 10.4 | 11.5 | 11.6 | 12.1 | 11.3 | 10.5 | 10.7 | 11.0 | 10.2 | 9.6 | 9.9 | 10.7 | .. |
| World | 13.1 | 12.7 | 12.7 | 12.7 | 12.5 | 12.4 | 12.4 | 12.4 | 12.5 | 12.7 | 13.1 | 13.0 | .. |

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OECD renewable energy supply

Million tonnes of oil equivalent (Mtoe)

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