

PRIMARY ENERGY SUPPLY

An analysis of energy problems requires a comprehensive presentation of basic supply and demand data for all fuels in a manner which will allow the easy comparison of the contribution each fuel makes to the economy and their interrelationships through the conversion of one fuel into another. This type of presentation is suitable for the study of energy substitution, energy conservation and forecasting.

Definition

The table refers to total primary energy supply (TPES). TPES equals production plus imports minus exports minus international marine bunkers plus or minus stock changes. The IEA energy balance methodology is based on the calorific content of the energy commodities and a common unit of account. The unit of account adopted is the tonne of oil equivalent (toe) which is defined as 10^7 kilocalories (41.868 gigajoules). This quantity of energy is, within a few per cent, equal to the net heat content of 1 tonne of crude oil. The difference between the “net” and the “gross” calorific value for each fuel is the latent heat of vaporisation of the water produced during combustion of the fuel. For coal and oil, net calorific value is about 5% less than gross, for most forms of natural and manufactured gas the difference is 9-10%, while for electricity there is no difference as the concept has no meaning in this case. The IEA balances are calculated using the physical energy content method to calculate the primary energy equivalent.

Long-term trends

Over the 35-year period of 1971 to 2006, the world's total primary energy supply increased by 112%, reaching 11 740 Mtoe (million tonnes of oil equivalent). This equates to a compound growth rate of 2.2% per annum. By comparison, world population grew by 1.6% and gross domestic product by 3.5% per annum in real terms over the same period.

Energy supply growth was fairly constant over the period, except in 1974-1975 and in the early 1980s as a consequence of the first two oil shocks, and in the early 1990s following the dissolution of the Soviet Union.

The share of OECD in world primary energy supply decreased again in 2006. Strong economic development in Asia led to a large increase in the share of Asia (including China) in world energy supply, from 13% in 1971 to 27% in 2006. By contrast, the combined share of the former USSR and non-OECD Europe decreased significantly in the late 1980s.

The forecasts provided in the table refer to the Reference Scenario of the *World Energy Outlook*. The Reference Scenario projects supply and demand if present policies were to continue. The *World Energy Outlook* also presents a scenario for stabilising greenhouse gas concentrations at 550 parts per million (ppm) of CO₂-equivalent (which would limit the temperature increase to about 3 °C) and another scenario at 450 ppm of CO₂-equivalent (which would limit the temperature increase to about 2 °C).

Comparability

While every effort is made to ensure the accuracy of the data, quality is not homogeneous for all countries/regions. In some countries data are based on secondary sources, and where incomplete or unavailable, the IEA has made estimates. In general, data are likely to be more accurate for production and trade than for international marine bunkers or stock changes. Moreover, statistics for combustible renewables and waste are less accurate than traditional commercial energy data in most countries.

Sources

- IEA (2008), *Energy Balances of OECD Countries*, IEA, Paris.
- IEA (2008), *Energy Balances of Non-OECD Countries*, IEA, Paris.
- IEA (2008), *World Energy Outlook 2008*, IEA, Paris.

Further information

Analytical publications

- IEA (2009), *Lessons Learned from the Energy Policies of IEA Countries*, IEA, Paris.
- IEA (2008), *Energy Technology Perspectives: Scenarios and Strategies to 2050*, IEA, Paris.
- IEA (2008), *Energy Policies of IEA Countries*, series, IEA, Paris.
- IEA (2007), *Energy Use in the New Millennium: Trends in IEA Countries*, IEA, Paris.
- IEA (2007), *Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency*, IEA, Paris.

Online databases

- *World Energy Statistics and Balances*.


Websites

- International Energy Agency, www.iea.org.

Total primary energy supply

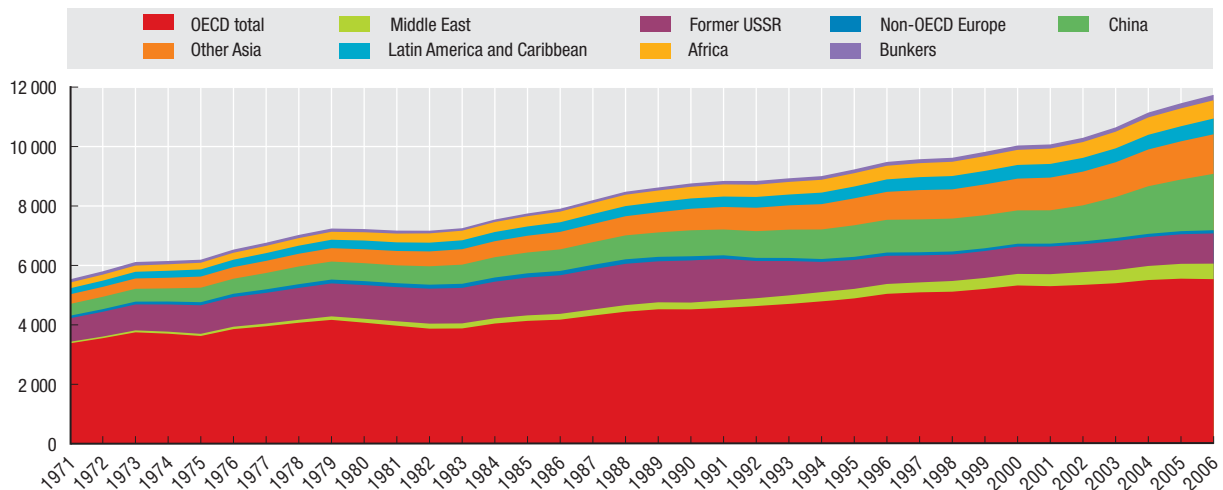
Million tonnes of oil equivalent (Mtoe)

	1971	1990	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2030
Australia	52.1	87.7	103.5	106.4	108.6	110.6	108.4	111.6	112.8	113.1	120.7	122.5	128.2	..
Austria	18.9	25.1	28.7	29.2	29.1	29.0	30.7	31.3	32.8	33.0	34.0	34.2	33.2	..
Belgium	40.1	49.7	59.7	61.0	61.4	61.9	61.3	59.3	62.4	62.2	61.7	61.0	59.0	..
Canada	141.8	209.5	239.7	238.2	245.4	252.1	249.0	249.5	262.2	269.0	273.7	269.7	272.4	..
Czech Republic	45.6	49.0	42.6	41.1	38.5	40.4	41.4	42.0	44.6	45.8	45.2	46.1	45.8	..
Denmark	19.2	17.9	21.0	20.7	19.9	19.4	19.9	19.6	20.8	20.2	19.7	20.9	20.4	..
Finland	18.2	28.7	32.6	32.9	32.8	32.5	33.2	34.9	37.0	37.2	34.4	37.4	37.2	..
France	160.1	227.6	247.2	255.3	255.4	258.2	266.2	266.8	271.4	275.4	276.2	272.7	268.3	..
Germany	307.6	355.6	350.5	348.6	341.2	343.2	353.0	344.8	347.4	349.4	345.3	348.6	334.8	..
Greece	9.1	22.2	25.1	26.4	26.6	27.9	28.8	29.1	29.9	30.5	31.0	31.1	30.8	..
Hungary	19.1	28.6	25.8	25.4	25.3	25.0	25.4	25.8	26.3	26.4	27.8	27.6	27.1	..
Iceland	1.0	2.2	2.5	2.7	3.1	3.2	3.4	3.4	3.4	3.5	3.6	4.3	4.4	..
Ireland	7.0	10.3	12.5	13.2	13.6	14.2	15.2	15.4	14.9	15.0	15.2	15.5	15.5	..
Italy	106.6	148.1	163.1	167.7	170.0	173.3	173.7	173.9	181.2	183.3	185.7	184.2	186.8	..
Japan	268.8	443.9	517.5	508.6	515.9	526.6	518.2	518.6	514.2	530.8	528.4	527.6	522.5	519.4
Korea	17.0	93.4	175.1	160.0	176.5	189.4	192.1	202.5	206.8	212.3	212.5	216.5	227.1	..
Luxembourg	4.1	3.5	3.4	3.3	3.4	3.6	3.8	4.0	4.2	4.6	4.7	4.7	4.6	..
Mexico	43.5	123.0	140.2	146.5	149.7	150.2	152.1	155.4	159.8	165.2	176.6	177.4	184.1	..
Netherlands	51.5	67.1	74.8	75.1	74.3	76.4	78.5	79.1	81.4	82.7	82.4	80.1	83.2	..
New Zealand	7.1	13.8	17.1	16.8	17.7	18.1	18.2	17.8	17.3	17.6	17.3	17.5	18.2	..
Norway	13.5	21.4	24.5	25.5	26.8	25.7	26.4	25.1	27.2	29.1	33.1	26.1	25.7	..
Poland	86.3	99.9	102.4	95.8	93.2	89.4	90.0	89.1	91.4	91.7	92.7	97.7	98.6	..
Portugal	6.5	17.2	21.6	23.3	25.0	25.2	25.4	26.4	25.8	26.5	27.2	25.4	25.4	..
Slovak Republic	14.3	21.3	18.1	17.6	17.7	17.8	18.6	18.8	18.7	18.4	18.9	18.7	18.1	..
Spain	43.2	91.2	107.9	113.3	118.7	124.7	127.8	131.5	136.0	142.2	144.9	144.6	148.1	..
Sweden	36.2	47.6	50.8	51.8	50.8	48.3	51.2	52.3	51.1	53.2	52.2	51.3	50.0	..
Switzerland	16.9	24.8	25.9	26.3	26.2	26.0	27.5	26.6	26.7	27.0	27.0	28.2	27.1	..
Turkey	19.6	52.9	70.9	72.2	70.9	76.9	70.9	75.1	78.7	81.8	85.5	94.0	100.2	..
United Kingdom	211.1	212.3	227.4	230.4	231.6	233.9	234.5	228.6	232.9	233.2	234.5	231.1	226.9	..
United States	1 592.7	1 926.3	2 162.1	2 180.6	2 239.4	2 302.6	2 256.8	2 286.5	2 281.1	2 328.0	2 341.9	2 320.7	2 367.0	2 565.6
EU27 total	..	1 655.9	1 709.1	1 721.2	1 709.6	1 724.2	1 762.4	1 757.0	1 797.8	1 817.7	1 821.1	1 822.5	..	1 903.3
OECD total	3 378.6	4 521.8	5 094.2	5 115.9	5 209.1	5 325.4	5 301.5	5 344.9	5 400.3	5 508.3	5 554.0	5 537.4	5 590.6	6 180.3
Brazil	69.6	140.0	178.8	183.2	187.8	189.8	191.1	196.5	199.9	210.9	216.5	224.1
China	391.7	863.2	1 090.6	1 090.2	1 094.4	1 105.9	1 104.3	1 196.4	1 362.2	1 584.9	1 720.1	1 878.7	..	3 884.9
India	157.0	319.9	416.1	425.2	451.0	459.8	466.4	478.9	491.3	519.4	538.1	565.8	..	1 279.6
Indonesia	36.2	102.8	143.4	132.8	148.0	151.4	158.5	161.6	164.3	172.0	176.0	179.1
Russian Federation	..	878.9	595.7	581.9	603.6	614.6	621.9	618.5	640.4	642.3	656.4	676.2	..	859.4
South Africa	45.3	91.2	107.5	109.0	109.2	111.3	109.2	105.3	118.1	129.3	127.6	129.8
World	5 532.6	8 758.8	9 573.7	9 622.0	9 821.7	10 035.2	10 071.1	10 294.3	10 645.0	11 143.6	11 457.5	11 740.0	..	17 013.6

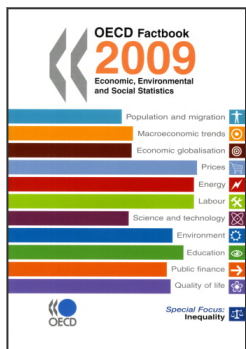
StatLink  <http://dx.doi.org/10.1787/542244378714>

Total primary energy supply by region

Million tonnes of oil equivalent (Mtoe)



StatLink  <http://dx.doi.org/10.1787/536274373476>



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