

	Total energy production		Energy use					Energy use per capita		
	thousands of metric tons of oil equivalent		Total thousands of metric tons of oil equivalent		Combustible renewables and waste % of total		average annual % growth	kg of oil equivalent		average annual % growth
	1990	2002	1990	2002	1990	2002	1990-2002	1990	2002	1990-2002
Afghanistan	..	..	..	..	..	..	..	..	..	..
Albania	2,449	771	2,662	1,944	13.6	6.9	-0.2	812	617	0.3
Algeria	104,507	150,292	23,874	30,845	0.1	0.2	1.8	954	985	-0.1
Angola	28,652	51,548	6,280	8,815	68.8	67.8	2.8	672	672	0.0
Argentina	48,456	81,692	46,110	56,297	3.7	5.3	2.3	1,428	1,543	1.3
Armenia	263	738	4,298	1,938	0.0	0.1	-2.6	1,231	632	-1.3
Australia	157,712	255,192	87,536	112,712	4.5	6.2	2.4	5,130	5,732	1.2
Austria	8,080	9,926	25,260	30,443	9.7	11.1	1.6	3,270	3,774	1.3
Azerbaijan	18,150	19,753	16,675	11,728	0.0	0.0	-3.5	2,259	1,435	-4.5
Bangladesh	10,747	16,747	12,815	21,004	53.6	37.5	4.4	116	155	2.6
Belarus	4,103	3,589	39,703	24,771	1.5	4.4	-3.3	3,886	2,496	-3.0
Belgium	12,490	13,164	48,685	56,887	1.4	1.6	1.6	4,884	5,505	1.3
Benin	1,774	1,546	1,678	2,231	93.2	69.3	2.6	356	340	-0.1
Bolivia	4,923	8,152	2,774	4,310	27.2	16.8	4.9	416	499	2.7
Bosnia and Herzegovina	3,642	3,318	4,474	4,324	3.6	4.2	5.8	..	1,052	..
Botswana	..	..	..	..	..	..	..	..	..	..
Brazil	97,616	161,737	133,531	190,664	30.9	24.3	3.4	902	1,093	2.0
Bulgaria	9,613	10,512	28,820	19,019	0.6	3.4	-2.5	3,306	2,417	-1.7
Burkina Faso	..	..	..	..	..	..	..	..	..	..
Burundi	..	..	..	..	..	..	..	..	..	..
Cambodia	..	..	..	..	..	..	..	..	..	..
Cameroon	12,090	12,004	5,031	6,569	75.9	79.2	2.4	431	417	-0.1
Canada	273,680	385,412	209,089	250,035	3.9	4.5	1.7	7,524	7,973	0.7
Central African Republic	..	..	..	..	..	..	..	..	..	..
Chad	..	..	..	..	..	..	..	..	..	..
Chile	7,640	8,783	13,629	24,708	19.6	17.4	5.7	1,040	1,585	4.2
China	902,689	1,220,812	879,923	1,228,574	22.8	17.7	2.8	775	960	1.7
Hong Kong, China	43	48	10,662	16,377	0.5	0.3	3.6	1,869	2,413	1.9
Colombia	48,479	72,275	25,048	27,397	23.2	18.0	0.9	716	625	-1.0
Congo, Dem. Rep.	12,019	16,134	11,903	15,402	84.0	93.6	2.2	319	299	-0.4
Congo, Rep.	9,005	13,199	1,056	923	69.4	67.3	-1.9	423	252	-5.0
Costa Rica	1,032	1,762	2,025	3,564	36.6	7.5	4.8	664	904	2.6
Côte d'Ivoire	3,382	6,528	4,408	6,555	72.1	66.0	3.7	374	397	0.9
Croatia	4,346	3,706	6,714	8,222	3.8	3.6	2.1	1,502	1,852	2.5
Cuba	6,271	6,480	16,524	14,197	33.7	17.1	0.0	1,555	1,262	-0.5
Czech Republic	38,474	30,668	47,379	41,725	1.2	2.0	-0.8	4,572	4,090	-0.7
Denmark	9,735	28,754	17,581	19,749	6.5	10.5	0.6	3,420	3,675	0.2
Dominican Republic	1,031	1,513	4,139	8,167	24.2	17.6	6.2	586	948	4.4
Ecuador	16,474	22,209	6,128	9,048	13.5	8.0	3.4	597	706	1.6
Egypt, Arab Rep.	54,869	59,766	31,895	52,393	3.3	2.6	4.3	608	789	2.3
El Salvador	1,722	2,367	2,535	4,299	48.2	33.1	4.3	496	670	2.3
Eritrea	..	..	..	..	..	..	..	..	..	..
Estonia	4,118	3,160	6,271	4,514	2.9	11.6	-2.2	4,091	3,324	-1.0
Ethiopia	14,158	18,445	15,151	19,934	92.8	91.7	2.5	296	297	0.2
Finland	12,081	16,089	29,171	35,622	15.6	19.9	1.8	5,851	6,852	1.4
France	111,439	134,379	227,276	265,881	4.9	4.2	1.2	4,006	4,470	0.8
Gabon	14,630	12,690	1,242	1,590	59.8	61.9	2.1	1,303	1,209	-0.6
Gambia, The	..	..	..	..	..	..	..	..	..	..
Georgia	1,470	1,325	8,757	2,559	7.7	25.2	-10.4	1,611	494	-10.0
Germany	186,159	134,771	356,221	346,352	1.3	2.6	0.0	4,485	4,198	-0.3
Ghana	4,392	5,974	5,337	8,344	73.1	66.4	4.0	349	411	1.5
Greece	9,200	10,232	22,181	29,025	4.0	3.6	2.5	2,183	2,637	1.8
Guatemala	3,390	5,408	4,478	7,384	67.9	52.8	4.7	512	616	2.0
Guinea	..	..	..	..	..	..	..	..	..	..
Guinea-Bissau	..	..	..	..	..	..	..	..	..	..
Haiti	1,253	1,515	1,585	2,081	76.5	71.6	3.2	245	251	1.0

# Energy production and use

	Total energy production		Energy use					Energy use per capita		
	thousands of metric tons of oil equivalent		Total thousands of metric tons of oil equivalent		Combustible renewables and waste % of total		average annual % growth	kg of oil equivalent		average annual % growth
	1990	2002	1990	2002	1990	2002	1990-2002	1990	2002	1990-2002
Honduras	1,694	1,618	2,416	3,426	62.0	41.1	2.7	496	504	-0.1
Hungary	14,325	10,834	28,553	25,449	1.3	1.6	-0.6	2,755	2,505	-0.4
India	334,056	438,797	365,377	538,305	48.1	38.7	3.4	430	513	1.6
Indonesia	161,308	240,908	94,836	156,086	39.3	27.4	4.1	532	737	2.7
Iran, Islamic Rep.	179,738	240,522	68,775	133,960	1.0	0.6	5.4	1,264	2,044	3.8
Iraq	106,715	105,414	20,841	28,996	0.1	0.1	4.1	1,153	1,199	1.6
Ireland	3,467	1,499	10,575	15,303	1.0	1.2	3.6	3,016	3,894	2.7
Israel	433	722	12,112	20,954	0.0	0.0	5.0	2,599	3,191	2.2
Italy	25,548	26,590	152,553	172,720	0.6	1.5	1.2	2,690	2,994	1.0
Jamaica	485	463	2,943	3,914	16.2	11.6	2.8	1,231	1,493	2.0
Japan	76,129	98,133	445,916	516,927	1.3	1.4	1.4	3,610	4,058	1.1
Jordan	162	261	3,499	5,359	0.1	0.1	3.6	1,104	1,036	-0.2
Kazakhstan	89,007	95,780	79,661	46,455	0.1	0.2	-5.5	4,823	3,123	-4.4
Kenya	10,272	12,877	12,479	15,324	78.4	80.1	2.1	534	489	-0.4
Korea, Dem. Rep.	28,725	18,358	32,874	19,537	2.9	5.2	-4.5	1,647	869	-5.4
Korea, Rep.	21,908	36,206	92,650	203,498	0.3	1.4	6.7	2,161	4,272	5.7
Kuwait	50,401	105,991	7,579	22,189	0.1	..	9.1	3,567	9,503	7.8
Kyrgyz Republic	1,818	1,204	5,066	2,536	0.1	0.2	-5.4	1,114	507	-6.4
Lao PDR	..	..	..	..	..	..	..	..	..	..
Latvia	794	1,870	5,979	4,266	8.1	30.1	-2.8	2,272	1,825	-1.6
Lebanon	143	192	2,309	5,369	4.5	2.4	7.1	635	1,209	5.3
Lesotho	..	..	..	..	..	..	..	..	..	..
Liberia	..	..	..	..	..	..	..	..	..	..
Libya	73,173	69,519	11,541	18,704	1.1	0.8	4.0	2,680	3,433	2.0
Lithuania	4,298	4,915	11,085	8,589	2.6	7.7	-2.1	2,996	2,476	-1.4
Macedonia, FYR	..	..	..	..	..	..	..	..	..	..
Madagascar	..	..	..	..	..	..	..	..	..	..
Malawi	..	..	..	..	..	..	..	..	..	..
Malaysia	48,727	80,243	22,455	51,753	9.5	4.8	6.7	1,234	2,129	4.1
Mali	..	..	..	..	..	..	..	..	..	..
Mauritania	..	..	..	..	..	..	..	..	..	..
Mauritius	..	..	..	..	..	..	..	..	..	..
Mexico	194,482	229,888	124,057	157,308	5.9	5.2	1.9	1,491	1,560	0.3
Moldova	58	66	6,884	2,993	0.5	2.0	-7.8	1,582	703	-7.6
Mongolia	..	..	..	..	..	..	..	..	..	..
Morocco	773	589	6,725	10,753	4.7	4.2	3.9	280	363	2.1
Mozambique	6,846	8,041	7,203	8,045	94.4	86.1	0.5	509	436	-1.8
Myanmar	10,651	15,825	10,683	12,578	84.4	76.7	1.6	264	258	0.0
Namibia	218	301	652	1,188	16.0	15.2	5.2	445	599	2.3
Nepal	5,501	7,618	5,806	8,515	93.4	87.2	3.4	320	353	0.9
Netherlands	60,316	59,924	66,491	77,923	1.1	1.7	1.1	4,447	4,827	0.5
New Zealand	12,153	14,876	13,914	18,013	4.9	6.9	2.4	4,035	4,573	1.3
Nicaragua	1,495	1,659	2,118	2,908	53.3	49.9	2.7	554	544	-0.2
Niger	..	..	..	..	..	..	..	..	..	..
Nigeria	150,453	192,660	70,905	95,675	79.8	79.1	2.3	737	718	-0.5
Norway	120,304	232,221	21,492	26,515	4.8	5.5	1.8	5,067	5,843	1.2
Oman	38,312	62,516	4,562	10,825	..	..	5.8	2,804	4,265	2.4
Pakistan	34,360	49,677	43,424	65,806	43.2	37.4	3.6	402	454	1.1
Panama	612	738	1,490	3,022	28.3	14.7	6.1	621	1,028	4.3
Papua New Guinea	..	..	..	..	..	..	..	..	..	..
Paraguay	4,578	6,293	3,083	3,905	72.3	55.0	2.5	743	709	0.1
Peru	10,596	9,234	9,952	12,024	26.9	18.8	2.3	461	450	0.5
Philippines	13,701	21,941	26,159	42,008	29.2	23.9	4.8	429	525	2.5
Poland	99,228	79,633	99,847	89,185	2.2	5.0	-0.9	2,619	2,333	-0.9
Portugal	3,393	3,643	17,746	26,392	14.0	10.7	3.6	1,793	2,546	3.3
Puerto Rico	..	..	..	..	..	..	..	..	..	..

# 3.7 Energy production and use

	Total energy production		Energy use					Energy use per capita		
	thousands of metric tons of oil equivalent		Total thousands of metric tons of oil equivalent		Combustible renewables and waste % of total		average annual % growth	kg of oil equivalent		average annual % growth
	1990	2002	1990	2002	1990	2002	1990-2002	1990	2002	1990-2002
Romania	40,834	28,406	62,403	36,976	1.0	6.7	-3.6	2,689	1,696	-3.2
Russian Federation	1,118,707	1,034,519	774,823	617,843	1.6	1.1	-2.0	5,211	4,288	-1.7
Rwanda	..	..	..	..	..	..	..	..	..	..
Saudi Arabia	372,985	462,807	65,538	126,387	0.0	0.0	5.0	4,147	5,775	2.2
Senegal	1,362	1,807	2,238	3,192	60.6	56.6	3.4	305	319	0.6
Serbia and Montenegro	11,835	10,876	15,002	16,169	5.0	5.0	1.7	1,435	1,981	2.8
Sierra Leone	..	..	..	..	..	..	..	..	..	..
Singapore	..	64	13,357	25,307	..	..	4.5	4,384	6,078	1.7
Slovak Republic	5,273	6,650	21,426	18,546	0.8	1.7	-0.7	4,056	3,448	-0.9
Slovenia	2,765	3,379	5,008	6,951	5.3	6.7	3.0	2,508	3,486	3.0
Somalia	..	..	..	..	..	..	..	..	..	..
South Africa	114,534	146,506	91,229	113,458	11.4	11.2	1.9	2,592	2,502	-0.3
Spain	34,648	31,737	91,209	131,558	4.5	3.3	3.2	2,349	3,215	2.7
Sri Lanka	4,191	4,557	5,516	8,179	71.0	52.9	3.7	339	430	2.4
Sudan	8,775	25,013	10,627	15,850	81.8	79.8	3.7	426	483	1.3
Swaziland	..	..	..	..	..	..	..	..	..	..
Sweden	29,754	32,403	46,658	51,031	11.8	16.3	0.7	5,451	5,718	0.4
Switzerland	9,831	11,942	25,106	27,139	4.1	6.1	0.8	3,740	3,723	0.2
Syrian Arab Republic	22,570	36,706	11,928	18,054	0.0	0.0	3.3	984	1,063	0.4
Tajikistan	1,553	1,330	9,087	3,247	..	..	-7.3	1,631	518	-8.5
Tanzania	9,063	13,286	9,808	14,339	91.0	90.7	3.3	385	408	0.6
Thailand	26,496	45,303	43,860	83,339	33.4	16.4	5.2	789	1,353	4.4
Togo	778	1,081	1,001	1,540	77.7	70.2	4.4	290	324	1.5
Trinidad and Tobago	12,612	21,321	5,795	9,286	0.8	0.3	4.1	4,770	7,121	3.6
Tunisia	6,127	6,943	5,536	8,276	18.7	15.3	3.8	679	846	2.2
Turkey	25,857	24,432	53,005	75,418	13.6	8.0	3.6	944	1,083	1.7
Turkmenistan	48,822	53,645	11,314	16,606	..	..	3.3	2,914	3,465	1.2
Uganda	..	..	..	..	..	..	..	..	..	..
Ukraine	110,170	71,520	218,376	130,743	0.1	0.2	-4.8	4,187	2,684	-4.1
United Arab Emirates	109,446	142,148	17,839	36,072	0.2	0.0	5.9	10,061	9,609	-0.5
United Kingdom	207,007	257,541	212,176	226,508	0.3	1.0	0.6	3,686	3,824	0.4
United States	1,650,474	1,666,050	1,927,638	2,290,410	3.2	3.0	1.6	7,722	7,943	0.4
Uruguay	1,149	1,239	2,251	2,510	24.3	16.7	1.6	725	747	1.0
Uzbekistan	40,461	55,788	44,994	51,740	..	..	1.8	2,098	2,047	0.1
Venezuela, RB	148,854	210,150	43,918	54,006	1.2	1.0	2.1	2,224	2,141	0.0
Vietnam	24,711	53,439	24,324	42,645	77.7	54.5	4.9	367	530	3.2
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	9,384	22,235	2,708	4,107	2.8	1.9	2.8	228	221	-0.5
Zambia	4,923	6,226	5,470	6,549	73.4	81.3	1.4	703	639	-0.9
Zimbabwe	8,500	8,468	9,334	9,761	50.7	59.0	0.3	911	751	-1.7
<b>World</b>	<b>8,801,246 t</b>	<b>10,274,551 t</b>	<b>8,616,766 t</b>	<b>10,196,821 t</b>	<b>10.8 w</b>	<b>10.6 w</b>	<b>1.5 w</b>	<b>1,686 w</b>	<b>1,699 w</b>	<b>0.1 w</b>
Low income	846,065	1,145,938	799,880	1,080,050	54.9	49.4	2.6	463	493	0.6
Middle income	4,724,337	5,359,274	3,557,855	3,969,589	11.3	10.8	0.9	1,372	1,338	-0.2
Lower middle income	3,574,000	3,956,799	2,968,825	3,232,254	12.6	12.3	0.7	1,286	1,227	-0.4
Upper middle income	1,147,843	1,400,237	585,444	733,823	4.0	4.1	1.9	2,072	2,232	0.7
Low & middle income	5,567,198	6,493,223	4,348,016	5,030,378	18.6	18.4	1.2	1,020	990	-0.3
East Asia & Pacific	1,228,554	1,712,927	1,145,883	1,652,046	25.6	19.6	3.1	721	904	1.9
Europe & Central Asia	1,890,149	1,565,055	1,736,182	1,272,422	1.9	2.3	-2.7	3,725	2,697	-2.9
Latin America & Carib.	617,206	859,786	458,283	606,747	18.1	14.6	2.7	1,055	1,156	1.1
Middle East & N. Africa	978,411	1,229,008	262,130	458,221	1.4	1.0	4.5	1,107	1,504	2.4
South Asia	392,135	521,760	436,590	647,223	48.7	39.3	3.4	393	468	1.5
Sub-Saharan Africa	489,230	652,199	321,208	418,008	56.7	57.5	2.2	693	667	-0.3
High income	3,276,666	3,831,019	4,299,133	5,201,115	3.0	3.1	1.7	4,859	5,395	1.0
Europe EMU	466,852	442,010	1,050,939	1,192,147	3.1	3.7	1.2	3,583	3,895	0.8

## About the data

In developing countries growth in energy use is closely related to growth in the modern sectors—industry, motorized transport, and urban areas—but energy use also reflects climatic, geographic, and economic factors (such as the relative price of energy). Energy use has been growing rapidly in low- and middle-income countries, but high-income

countries still use more than five times as much on a per capita basis.

Energy data are compiled by the International Energy Agency (IEA). IEA data for countries that are not members of the Organisation for Economic Co-operation and Development (OECD) are based on national energy data adjusted to conform to

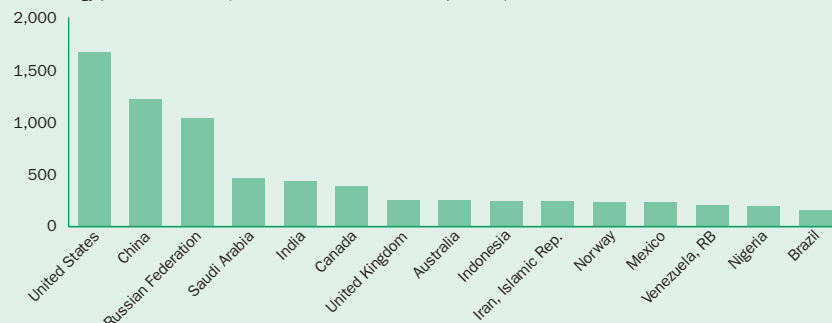
annual questionnaires completed by OECD member governments.

Total energy use refers to the use of domestic primary energy before transformation to other end-use fuels (such as electricity and refined petroleum products). It includes energy from combustible renewables and waste—solid biomass and animal products, gas and liquid from biomass, and industrial and municipal waste. Biomass is defined as any plant matter used directly as fuel or converted into fuel, heat, or electricity. (The data series published in World Development Indicators 1998 and earlier editions did not include energy from combustible renewables and waste.) Data for combustible renewables and waste are often based on small surveys or other incomplete information. Thus the data give only a broad impression of developments and are not strictly comparable between countries. The IEA reports (see Data sources) include country notes that explain some of these differences. All forms of energy—primary energy and primary electricity—are converted into oil equivalents. To convert nuclear electricity into oil equivalents, a notional thermal efficiency of 33 percent is assumed; for hydroelectric power 100 percent efficiency is assumed.

## 3.7a

### Ten of the top 15 energy producers are low-income countries . . .

Total energy production, 2002 (millions of metric tons of oil equivalent)

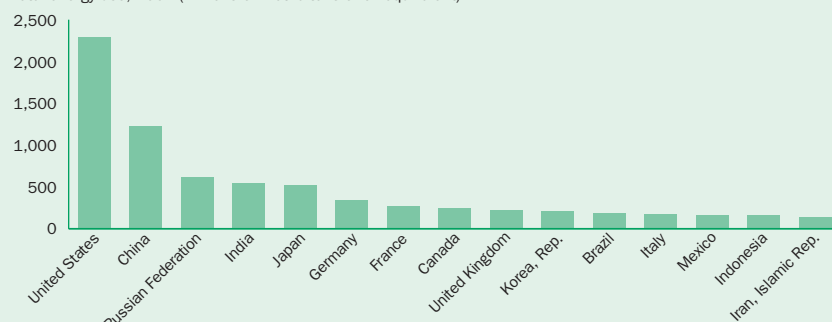


Source: Table 3.7.

## 3.7b

### . . . but only 7 of the top 15 energy users are

Total energy use, 2002 (millions of metric tons of oil equivalent)

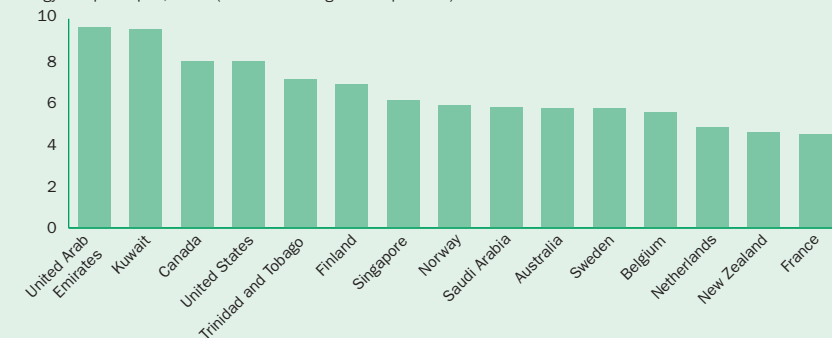


Source: Table 3.7.

## 3.7c

### High-income countries have the highest energy use per capita

Energy use per capita, 2002 (thousands of kg of oil equivalent)



Source: Table 3.7.

### Definitions

- Total energy production refers to forms of primary energy—petroleum (crude oil, natural gas liquids, and oil from nonconventional sources), natural gas, solid fuels (coal, lignite, and other derived fuels), and combustible renewables and waste—and primary electricity, all converted into oil equivalents (see About the data).
- Energy use refers to apparent consumption, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport (see About the data).
- Combustible renewables and waste comprise solid biomass, liquid biomass, biogas, industrial waste, and municipal waste, measured as a percentage of total energy use.

### Data sources

The data on energy production and use come from IEA electronic files. The IEA's data are published in its annual publications, Energy Statistics and Balances of Non-OECD Countries, Energy Statistics of OECD Countries, and Energy Balances of OECD Countries.