



3.7 Energy production and use

	Commercial energy production		Commercial energy use			Commercial energy use per capita			Net energy imports ^a	
	thousand metric tons of oil equivalent		thousand metric tons of oil equivalent		average annual % growth	kg of oil equivalent		average annual % growth	% of commercial energy use	
	1980	1997	1980	1997	1980-97	1980	1997	1980-97	1980	1997
Albania	3,428	912	3,049	1,048	-6.7	1,142	317	-8	-12	13
Algeria	67,061	125,576	12,410	26,497	3.6	665	904	0.9	-440	-374
Angola	11,301	41,430	4,538	6,848	2.4	647	587	-0.6	-149	-505
Argentina	38,813	80,134	41,868	61,710	2.3	1,490	1,730	0.9	7	-30
Armenia	1,263	537	1,070	1,804	-4.9	346	476	-6.0	-18	70
Australia	86,096	199,167	70,372	101,626	2.3	4,790	5,484	0.9	-22	-96
Austria	7,655	8,007	23,450	27,761	1.4	3,105	3,439	0.9	67	71
Azerbaijan	14,821	14,027	15,001	11,987	-4.9	2,433	1,529	-6.3	1	-17
Bangladesh	13,204	21,894	14,900	24,327	3.1	172	197	0.9	11	10
Belarus	2,566	3,275	2,385	25,142	6.3	247	2,449	5.9	-8	87
Belgium	7,986	13,153	46,100	57,125	1.7	4,682	5,611	1.5	83	77
Benin	1,212	1,897	1,363	2,182	2.5	393	377	-0.6	11	13
Bolivia	4,241	5,953	2,287	4,254	2.6	427	548	0.4	-85	-40
Bosnia and Herzegovina	..	626	..	1,750	..	..	479	..	..	64
Botswana	..	..	..	..	..	..	..	..	..	..
Brazil	62,069	120,236	108,999	172,030	2.9	896	1,051	1.1	43	30
Bulgaria	7,737	9,981	28,673	20,616	-2.5	3,236	2,480	-2.1	73	52
Burkina Faso	..	..	..	..	..	..	..	..	..	..
Burundi	..	..	..	..	..	..	..	..	..	..
Cambodia	..	..	..	..	..	..	..	..	..	..
Cameroon	5,824	11,250	3,687	5,756	2.3	426	413	-0.5	-58	-95
Canada	207,417	362,701	193,000	237,983	1.6	7,848	7,930	0.4	-7	-52
Central African Republic	..	..	..	..	..	..	..	..	..	..
Chad	..	..	..	..	..	..	..	..	..	..
Chile	5,664	8,168	9,525	23,012	5.7	854	1,574	4.0	41	65
China	608,664	1,097,210	598,628	1,113,050	4.0	610	907	2.6	-2	1
Hong Kong, China	39	48	5,518	14,121	5.9	1,095	2,172	4.6	99	100
Colombia	18,212	67,524	19,127	30,481	3.0	672	761	0.9	5	-122
Congo, Dem. Rep.	8,697	14,364	8,706	14,539	3.1	322	311	-0.2	0	1
Congo, Rep.	3,970	13,540	845	1,242	2.1	506	459	-0.8	-370	-990
Costa Rica	767	1,157	1,527	2,663	4.0	669	769	1.5	50	57
Côte d'Ivoire	2,419	4,908	3,662	5,597	2.8	447	394	-0.5	34	12
Croatia	..	4,011	..	7,650	..	..	1,687	..	..	48
Cuba	3,891	7,255	14,570	14,273	-1.1	1,501	1,291	-1.9	73	49
Czech Republic	42,913	31,539	47,029	40,576	-1.4	4,596	3,938	-1.5	9	22
Denmark	896	20,274	19,734	21,107	0.9	3,852	3,994	0.8	95	4
Dominican Republic	1,332	1,423	3,464	5,453	2.4	608	673	0.2	62	74
Ecuador	11,756	22,792	5,191	8,513	2.7	652	713	0.3	-126	-168
Egypt, Arab Rep.	34,168	57,997	15,970	39,581	4.9	391	656	2.5	-114	-47
El Salvador	1,913	2,649	2,537	4,095	2.7	553	691	1.1	25	35
Eritrea	..	..	..	..	..	..	..	..	..	..
Estonia	6,951	3,788	6,275	5,556	-1.1	4,240	3,811	-0.9	-11	32
Ethiopia	10,588	16,316	11,157	17,131	2.7	296	287	-0.1	5	5
Finland	6,912	15,059	25,413	33,075	1.6	5,317	6,435	1.2	73	54
France	46,829	127,843	190,111	247,534	2.1	3,528	4,224	1.5	75	48
Gabon	9,441	19,786	1,493	1,635	-0.7	2,161	1,419	-3.7	-532	-1,110
Gambia, The	..	..	..	..	..	..	..	..	..	..
Georgia	1,504	694	4,474	2,295	-6.2	882	423	-6.5	66	70
Germany	185,684	139,734	360,441	347,272	-0.1	4,603	4,231	-0.5	48	60
Ghana	3,305	5,843	4,071	6,896	3.6	379	383	0.5	19	15
Greece	3,696	9,645	15,960	25,556	3.1	1,655	2,435	2.6	77	62
Guatemala	2,503	4,433	3,754	5,633	2.8	550	536	0.2	33	21
Guinea	..	..	..	..	..	..	..	..	..	..
Guinea-Bissau	..	..	..	..	..	..	..	..	..	..
Haiti	1,877	1,298	2,099	1,779	-0.7	392	237	-2.6	11	27
Honduras	1,316	2,003	1,878	3,182	3.0	526	532	-0.1	30	37



Energy production and use 3.7

	Commercial energy production		Commercial energy use			Commercial energy use per capita			Net energy imports ^a	
	thousand metric tons of oil equivalent		thousand metric tons of oil equivalent		average annual % growth	kg of oil equivalent		average annual % growth	% of commercial energy use	
	1980	1997	1980	1997	1980-97	1980	1997	1980-97	1980	1997
Hungary	14,857	12,747	28,870	25,311	-1.1	2,696	2,492	-0.8	49	50
India	221,887	404,503	242,024	461,032	3.9	352	479	1.9	8	12
Indonesia	128,403	221,549	59,561	138,779	5.4	402	693	3.5	-116	-60
Iran, Islamic Rep.	84,001	224,935	38,918	108,289	7.0	995	1,777	4.2	-116	-108
Iraq	136,643	62,088	12,030	27,091	4.1	925	1,240	0.9	-1,036	-129
Ireland	1,894	2,871	8,485	12,491	2.4	2,495	3,412	2.1	78	77
Israel	153	601	8,609	17,591	5.1	2,220	3,014	2.6	98	97
Italy	19,644	29,311	138,629	163,315	1.4	2,456	2,839	1.3	86	82
Jamaica	224	595	2,378	3,963	3.7	1,115	1,552	2.6	91	85
Japan	43,247	106,978	346,491	514,898	2.8	2,967	4,084	2.4	88	79
Jordan	1	193	1,714	4,795	5.1	786	1,081	0.6	100	96
Kazakhstan	76,799	64,784	76,799	38,418	-5.3	5,163	2,439	-5.6	0	-69
Kenya	7,891	11,651	9,791	14,138	2.2	589	494	-1.1	19	18
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	9,644	24,037	41,238	176,351	9.8	1,082	3,834	8.6	77	86
Kuwait	94,085	116,087	9,564	16,165	1.5	6,956	8,936	1.2	-884	-618
Kyrgyz Republic	2,190	1,408	1,717	2,793	4.9	473	603	3.5	-28	50
Lao PDR	..	..	..	..	..	..	..	..	..	..
Latvia	261	1,636	566	4,460	20.9	222	1,806	21.1	54	63
Lebanon	178	207	2,483	5,244	4.2	827	1,265	2.2	93	96
Lesotho	..	..	..	..	..	..	..	..	..	..
Libya	96,662	78,942	7,173	15,090	4.2	2,357	2,909	1.1	-1,248	-423
Lithuania	534	3,970	11,701	8,806	-3.6	3,428	2,376	-4.1	95	55
Macedonia, FYR	..	..	..	..	..	..	..	..	..	..
Madagascar	..	..	..	..	..	..	..	..	..	..
Malawi	..	..	..	..	..	..	..	..	..	..
Malaysia	16,644	73,979	11,128	48,473	9.1	809	2,237	6.2	-50	-53
Mali	..	..	..	..	..	..	..	..	..	..
Mauritania	..	..	..	..	..	..	..	..	..	..
Mauritius	..	..	..	..	..	..	..	..	..	..
Mexico	149,359	223,132	98,898	141,520	2.1	1,464	1,501	0.1	-51	-58
Moldova	35	98	..	4,436	..	..	1,029	..	..	98
Mongolia	..	..	..	..	..	..	..	..	..	..
Morocco	877	1,067	4,778	9,275	4.3	247	340	2.2	82	88
Mozambique	7,417	6,994	8,079	7,664	-0.4	668	461	-2.0	8	9
Myanmar	9,513	12,249	9,430	13,009	1.7	279	296	0.2	-1	6
Namibia	..	..	..	..	..	..	..	..	..	..
Nepal	4,504	6,559	4,663	7,160	2.7	322	321	0.1	3	8
Netherlands	71,830	65,298	65,000	74,910	1.5	4,594	4,800	0.9	-11	13
New Zealand	5,488	14,158	9,251	16,679	3.8	2,972	4,435	2.6	41	15
Nicaragua	910	1,529	1,558	2,573	2.7	533	551	-0.1	42	41
Niger	..	..	..	..	..	..	..	..	..	..
Nigeria	148,479	191,034	52,846	88,652	2.9	743	753	-0.1	-181	-115
Norway	55,743	212,653	18,819	24,226	1.7	4,600	5,501	1.3	-196	-778
Oman	15,090	51,620	996	6,775	13.0	905	3,003	8.3	-1,415	-662
Pakistan	20,998	42,048	25,479	56,818	4.9	308	442	2.3	18	26
Panama	529	808	1,865	2,328	1.7	956	856	-0.3	72	65
Papua New Guinea	..	..	..	..	..	..	..	..	..	..
Paraguay	1,605	6,960	2,094	4,191	4.5	672	824	1.4	23	-66
Peru	14,655	12,225	11,700	15,127	1.1	675	621	-0.9	-25	19
Philippines	10,670	16,616	21,212	38,251	3.7	439	520	1.1	50	57
Poland	122,420	100,935	124,806	105,155	-1.4	3,508	2,721	-1.8	2	4
Portugal	1,481	2,317	10,291	20,400	4.4	1,054	2,051	4.4	86	89
Puerto Rico	..	..	..	..	..	..	..	..	..	..
Romania	52,587	31,013	64,694	44,135	-2.7	2,914	1,957	-2.8	19	30
Russian Federation	748,647	927,341	763,707	591,982	-3.6	5,494	4,019	-3.9	2	-57



3.7 Energy production and use

	Commercial energy production		Commercial energy use			Commercial energy use per capita			Net energy imports ^a	
	thousand metric tons of oil equivalent		thousand metric tons of oil equivalent		average annual % growth	kg of oil equivalent		average annual % growth	% of commercial energy use	
	1980	1997	1980	1997	1980-97	1980	1997	1980-97	1980	1997
Rwanda	..	..	..	..	..	..	..	..	..	..
Saudi Arabia	533,071	487,095	35,357	98,449	5.2	3,773	4,906	0.6	-1,408	-395
Senegal	1,046	1,654	1,921	2,770	2.2	347	315	-0.6	46	40
Sierra Leone	..	..	..	..	..	..	..	..	..	..
Singapore	..	61	6,062	26,878	10.1	2,656	8,661	8.1	..	100
Slovak Republic	3,416	4,688	20,810	17,216	-1.4	4,175	3,198	-1.8	84	73
Slovenia	1,623	2,870	4,313	6,380	1.4	2,269	3,213	1.1	62	55
South Africa	73,169	142,139	65,417	107,220	2.2	2,372	2,636	-0.1	-12	-33
Spain	15,781	31,358	68,583	107,328	3.1	1,834	2,729	2.8	77	71
Sri Lanka	3,209	4,345	4,493	7,159	2.3	305	386	0.9	29	39
Sudan	7,089	9,881	8,406	11,480	1.7	450	414	-0.5	16	14
Sweden	16,133	33,067	40,984	51,934	1.3	4,932	5,869	0.9	61	36
Switzerland	7,030	10,993	20,861	26,218	1.5	3,301	3,699	0.8	66	58
Syrian Arab Republic	9,502	32,794	5,348	14,642	5.4	614	983	2.2	-78	-124
Tajikistan	1,986	1,253	1,650	3,384	5.9	416	562	3.4	-20	63
Tanzania	9,502	13,529	10,280	14,258	2.0	553	455	-1.1	8	5
Thailand	11,182	46,166	22,740	79,963	8.8	487	1,319	7.1	51	42
Togo	..	..	..	..	..	..	..	..	..	..
Trinidad and Tobago	13,141	13,579	3,873	8,196	4.3	3,579	6,414	3.4	-239	-66
Tunisia	6,966	6,655	3,900	6,805	3.6	611	738	1.3	-79	2
Turkey	17,190	27,556	31,314	71,273	4.9	704	1,140	2.9	45	61
Turkmenistan	8,034	18,739	7,948	12,181	-5.5	2,778	2,615	-8.4	-1	-54
Uganda	..	..	..	..	..	..	..	..	..	..
Ukraine	109,708	81,175	97,893	150,059	0.6	1,956	2,960	0.5	-12	46
United Arab Emirates	93,915	153,555	8,576	30,874	7.0	8,222	11,967	1.5	-995	-397
United Kingdom	197,864	268,985	201,299	227,977	1.1	3,574	3,863	0.8	2	-18
United States	1,553,260	1,683,810	1,811,650	2,162,190	1.4	7,973	8,076	0.4	14	22
Uruguay	763	1,086	2,636	2,883	1.1	905	883	0.5	71	62
Uzbekistan	4,615	49,054	4,821	42,553	8.2	302	1,798	5.8	4	-15
Venezuela, RB	133,269	203,979	35,361	57,530	2.3	2,343	2,526	-0.2	-277	-255
Vietnam	18,052	43,525	19,347	39,306	3.5	360	521	1.4	7	-11
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	60	19,105	1,424	3,355	4.8	167	208	0.7	96	-469
Yugoslavia, FR (Serb./Mont.)	..	..	..	..	..	..	..	..	..	..
Zambia	4,198	5,556	4,551	5,987	1.3	793	634	-1.7	8	7
Zimbabwe	5,711	8,152	6,488	9,926	3.0	926	866	0.0	12	18
World	6,889,350 t	9,579,862 t	6,922,832 t	9,431,190 t	2.8 w	1,625 w	1,692 w	0.9 w	.. w	.. w
Low income	1,296,366	2,267,533	1,148,189	2,116,021	3.9	480	646	2.0	-14	-9
Excl. China & India	465,815	765,820	307,537	541,939	3.7	425	500	1.1	..	..
Middle income	2,804,139	3,607,537	2,001,642	2,601,928	4.7	1,854	1,830	1.8	-35	-33
Lower middle income	1,506,934	2,027,998	1,336,321	1,499,478	6.9	2,045	1,765	-2.4	-13	-20
Upper middle income	1,297,205	1,579,539	665,321	1,102,450	3.0	1,560	1,926	1.2	-98	-65
Low & middle income	4,100,505	5,875,070	3,149,831	4,717,949	4.3	907	1,005	2.0	-32	-28
East Asia & Pacific	812,772	1,535,331	783,284	1,647,182	4.8	574	942	3.2	..	..
Europe & Central Asia	1,244,462	1,395,787	1,344,673	1,240,586	6.4	3,316	2,689	-3.1	7	-13
Latin America & Carib.	468,809	788,918	377,189	575,389	2.5	1,063	1,181	0.6	-24	-35
Middle East & N. Africa	989,401	1,155,761	145,825	374,375	5.4	839	1,353	2.5	-577	-225
South Asia	263,802	479,349	291,559	556,496	4.0	329	443	1.8	10	15
Sub-Saharan Africa	321,259	519,924	207,301	323,921	2.4	719	695	-0.5	..	..
High income	2,788,845	3,704,792	3,773,001	4,713,241	1.7	4,794	5,369	1.0	27	24
Europe EMU	365,725	434,996	940,146	1,094,605	1.2	3,408	3,767	0.9	61	59

a. A negative value indicates that a country is a net exporter.



Energy production and use 3.7

About the data

In developing countries growth in commercial energy use is closely related to growth in the modern sectors—industry, motorized transport, and urban areas—but commercial energy use also reflects climatic, geographic, and economic factors (such as the relative price of energy). Commercial energy use has been growing rapidly in low- and middle-income countries, but high-income countries still use almost seven times as much on a per capita basis. Because commercial energy is widely traded, it is necessary to distinguish between its production and its use. Net energy imports show the extent to which an economy's use exceeds its domestic production. High-income countries are net energy importers; middle-income countries have been their main suppliers.

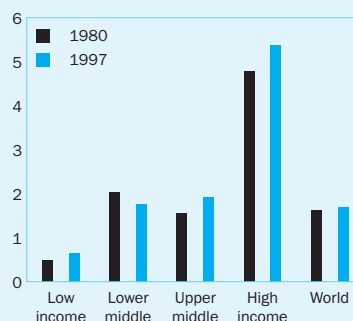
Energy data are compiled by the International Energy Agency (IEA) and the United Nations Statistics Division (UNSD). IEA data for non-OECD countries are based on national energy data adjusted to conform with annual questionnaires completed by OECD member governments. UNSD data are primarily from responses to questionnaires sent to national governments, supplemented by official national statistical publications and by data from intergovernmental organizations. When official data are not available, the UNSD prepares estimates based on the professional and commercial literature. This variety of sources affects the cross-country comparability of data.

Commercial 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, which comprises solid biomass and animal products, gas and liquid from biomass, industrial waste, 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.) All forms of commercial 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.

Figure 3.7a

Access to energy is uneven

Per capita energy use
(thousands of kilograms of oil equivalent)



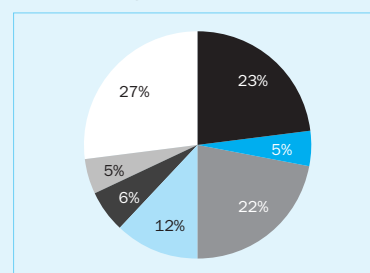
Source: Table 3.7.

People in high-income economies use more than eight times as much commercial energy as do people in low-income economies.

Figure 3.7b

Wealthy countries consume a disproportionate share of the world's energy

Commercial energy use, 1997



- United States
- Japan
- Other high-income countries
- China
- Russian Federation
- India
- Rest of world

Source: Table 3.7.

The United States, Japan, and other high-income countries, with 15 percent of the world's population, consume half of the world's commercial energy.

Definitions

- **Commercial energy production** refers to commercial forms of primary energy—petroleum (crude oil, natural gas liquids, and oil from nonconventional sources), natural gas, and solid fuels (coal, lignite, and other derived fuels)—and primary electricity, all converted into oil equivalents (see *About the data*).
- **Commercial 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*).
- **Net energy imports** are calculated as energy use less production, both measured in oil equivalents. A negative value indicates that the country is a net exporter.

Data sources

The data on commercial energy production and use are primarily from IEA electronic files and from the United Nations Statistics Division's *Energy Statistics Yearbook*. The IEA 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*.