

Table ERC.2 Energy Consumption by Source

Source: International Energy Agency

	Energy Consumption								Final Consumption of Electricity (1000 TOE) (b)	Trade in Energy	
	From All Sources			From Non-Renewable Energy Sources (a)				Imports (1000 Metric TOE) (b)		Exports (1000 Metric TOE) (b)	
	Percent Change (1000 Metric TOE) (b)	Per Capita (kg oil equivalent)	Solid Fuels (1000 Metric TOE) (b)	Liquid Fuels (1000 Metric TOE) (b)	Gaseous Fuels (1000 Metric TOE) (b)	Nuclear Fuels (1000 Metric TOE) (b)					
	Since 1987	1997	1997	1997	1997	1997					
WORLD	9,521,506	16	1,635	2,254,969	3,409,241	1,911,171	624,162	986,677	3,454,233	3,419,104	
ASIA (EXCL. MIDDLE EAST)	2,958,844	36	899	1,028,240	926,399	258,379	119,586	254,119	1,076,015	392,653	
Armenia	1,804	(77)	508	2	155	1,110	417	371	1,267	0	
Azerbaijan	11,987	(63)	1,568	3	6,951	4,829	0	1,099	461	2,502	
Bangladesh	24,327	28	198	0	2,440	5,794	0	813	2,440	0	
Bhutan	X	X	X	X	X	X	X	X	X	X	
Cambodia	X	X	X	X	X	X	X	X	X	X	
China	1,098,931	42	883	658,083	193,761	18,825	3,757	72,534	66,531	53,769	
Georgia	2,295	(63)	448	2	955	767	0	533	1,841	176	
India	461,032	45	477	153,279	87,937	17,815	2,632	30,018	59,162	2,376	
Indonesia	138,779	71	682	9,545	50,503	31,506	0	5,674	23,282	106,647	
Japan	514,898	37	4,085	86,532	271,600	54,948	83,148	78,524	427,020	10,557	
Kazakhstan	38,418	(65)	2,346	21,888	9,119	6,201	0	3,515	4,673	31,038	
Korea, Dem People's Rep	23,323	(39)	1,015	18,959	1,466	0	0	468	X	301	
Korea, Rep	176,351	166	3,856	32,799	108,245	13,326	20,089	19,172	190,773	31,247	
Kyrgyzstan	2,793	45	605	959	500	512	0	547	2,218	833	
Lao People's Dem Rep	X	X	X	X	X	X	X	X	X	X	
Malaysia	48,473	161	2,310	1,581	25,026	19,191	0	4,383	13,718	39,025	
Mongolia	X	X	X	X	X	X	X	X	X	X	
Myanmar	13,009	23	296	9	1,307	1,281	0	215	953	7	
Nepal	7,160	30	321	71	531	0	0	75	610	22	
Pakistan	56,818	51	394	2,045	17,056	13,434	90	3,673	15,110	241	
Philippines	38,251	55	536	2,648	19,449	5	0	2,734	22,269	1,344	
Singapore	26,878	202	7,843	0	25,541	1,275	0	2,120	90,301	47,725	
Sri Lanka	7,159	35	392	1	2,813	0	0	362	3,288	203	
Tajikistan	3,384	61	571	48	1,228	851	0	1,127	2,512	381	
Thailand	79,963	157	1,339	8,631	37,595	12,406	0	7,089	40,546	5,830	
Turkmenistan	12,181	(84)	2,878	0	3,659	8,750	0	374	845	7,403	
Uzbekistan	42,553	1	1,833	984	6,953	34,039	0	3,349	3,361	10,346	
Viet Nam	39,306	68	515	4,435	7,770	3,311	0	1,316	7,730	11,949	
EUROPE	2,553,858	(20)	3,507	499,633	851,600	762,970	300,479	283,538	1,341,347	961,926	
Albania	1,048	(63)	335	16	476	15	0	242	135	0	
Austria	27,761	14	3,428	3,624	12,087	6,537	0	4,201	21,501	2,239	
Belarus	25,142	(40)	2,429	1,011	9,013	13,775	0	2,302	25,705	3,371	
Belgium	57,125	21	5,641	8,482	24,167	11,261	12,355	6,177	71,574	22,701	
Bosnia and Herzegovina	1,750	134	497	348	896	211	0	150	1,140	16	
Bulgaria	20,616	(33)	2,457	7,492	4,713	3,699	4,633	2,290	12,916	1,972	
Croatia	7,650	178	1,706	258	4,027	2,246	0	948	5,621	1,884	
Czech Rep	40,576	(18)	3,939	21,111	7,920	7,667	3,256	4,269	19,105	9,347	
Denmark	21,107	4	4,016	6,579	9,570	3,861	0	2,739	18,975	15,267	
Estonia	5,556	(1,713)	3,839	3,168	1,262	618	0	435	2,691	925	
Finland	33,075	10	6,433	6,854	10,288	2,906	5,445	6,051	23,294	4,362	
France	247,534	19	4,233	14,631	88,035	31,330	103,065	30,545	150,764	27,667	
Germany	347,272	(5)	4,232	86,264	139,311	71,928	44,406	39,709	233,959	23,769	
Greece	25,556	36	2,418	8,450	15,322	171	0	3,153	23,462	3,984	
Hungary	25,311	(18)	2,492	4,354	6,975	9,696	3,640	2,480	15,730	2,609	
Iceland	2,330	22	8,516	56	793	0	0	408	882	0	
Ireland	12,491	31	3,415	2,955	6,541	2,771	0	1,435	11,068	1,353	
Italy	163,315	14	2,846	11,302	93,533	47,472	0	21,346	157,047	21,677	
Latvia	4,460	505	1,812	160	1,744	1,065	0	373	2,883	242	
Lithuania	8,806	(40)	2,377	139	3,229	2,001	3,196	579	9,118	4,178	
Macedonia, FYR	2,841	184	1,430	1,496	1,064	0	0	454	1,147	5	
Moldova, Rep	4,436	(54)	1,014	151	899	3,127	0	451	4,440	2	
Netherlands	74,910	15	4,798	9,228	27,590	35,323	628	7,698	119,534	96,357	
Norway	24,226	12	5,511	1,029	8,345	3,921	0	8,900	6,888	194,412	
Poland	105,155	(20)	2,718	71,277	19,323	9,415	0	8,148	29,990	21,824	
Portugal	20,400	58	2,068	3,529	14,218	87	0	2,742	21,261	2,441	
Romania	44,135	(36)	1,957	9,169	12,727	15,934	1,407	3,305	17,325	3,113	
Russian Federation	591,982	(52)	4,009	97,216	127,422	309,719	28,774	50,428	20,163	353,530	
Slovakia	17,216	(23)	3,204	4,694	3,284	5,634	2,814	1,964	15,001	2,457	
Slovenia	6,380	19	3,197	1,269	2,705	715	1,308	846	3,850	292	
Spain	107,328	43	2,709	18,154	57,113	11,305	14,411	13,184	89,804	8,765	
Sweden	51,934	6	5,864	2,498	16,135	719	18,224	10,687	31,362	10,992	
Switzerland	26,218	12	3,616	110	13,394	2,294	6,640	4,197	17,903	2,875	
Ukraine	150,059	(24)	2,939	43,532	18,431	66,314	20,701	10,677	73,701	4,818	
United Kingdom	227,977	9	3,894	40,010	82,489	76,378	25,577	26,596	76,963	112,399	
Yugoslavia	15,842	319	1,491	8,706	3,650	2,230	0	2,872	X	0	
MIDDLE EAST & N. AFRICA	525,927	58	1,388	30,732	301,815	174,602	0	41,487	129,890	1,075,597	
Afghanistan	X	X	X	X	X	X	X	X	X	X	
Algeria	26,497	23	901	272	8,780	16,919	0	1,426	763	99,278	
Egypt	39,581	41	611	644	25,598	11,070	0	4,170	2,677	11,838	
Iran, Islamic Rep	108,289	83	1,676	927	67,626	38,316	0	6,094	12,079	128,389	
Iraq	27,091	33	1,279	0	23,314	3,701	0	2,542	0	34,997	
Israel	17,591	70	3,002	5,478	11,669	13	0	2,544	18,942	2,146	
Jordan	4,795	52	783	0	4,602	189	0	456	4,602	0	
Kuwait	16,165	29	9,332	0	11,706	4,455	0	2,005	5	99,742	
Lebanon	5,244	76	1,669	132	4,852	0	0	688	5,038	0	
Libyan Arab Jamahiriya	15,090	33	2,896	0	10,424	4,541	0	1,563	29	63,795	
Morocco	9,275	61	345	2,019	6,631	23	0	994	8,714	320	
Oman	6,775	265	2,939	0	2,482	4,294	0	507	340	45,030	
Saudi Arabia	98,449	60	5,054	0	60,861	37,584	0	7,049	4	386,792	
Syrian Arab Rep	14,642	46	979	1	11,706	2,066	0	995	737	18,890	
Tunisia	6,805	43	739	69	3,470	2,087	0	562	4,236	3,685	
Turkey	71,273	54	1,124	21,176	30,863	8,339	0	6,853	44,674	1,333	
United Arab Emirates	30,874	62	13,381	0	7,149	23,708	0	1,769	12,575	124,913	
Yemen	3,355	30	206	0	3,278	0	0	129	1	13,785	

Notes: Negative values are shown in parentheses. "0" is either zero or less than one-half the unit of measure. "(0)" indicates a value less than zero and greater than negative one-half.

a. See ERC.4 for data on renewable energy. b. TOE is Tons of oil equivalent. See the technical notes for more information on TOE.

Table ERC.2 Energy Consumption by Source

Source: International Energy Agency

	Energy Consumption									
	From All Sources			From Non-Renewable Energy Sources (a)				Final	Trade in Energy	
	(1000 Metric TOE) (b)	Percent Change Since 1987	Per Capita (kg oil equivalent)	(1000 Metric TOE) (b)	(1000 Metric TOE) (b)	(1000 Metric TOE) (b)	(1000 Metric TOE) (b)	(1000 TOE) (b)	(1000 Metric TOE) (b)	(1000 Metric TOE) (b)
SUB-SAHARAN AFRICA	X	X	X	X	X	X	X	X	X	X
Angola	6,848	37	585	0	1,118	465	0	64	65	33,997
Benin	2,182	36	388	0	331	0	0	22	340	70
Botswana	X	X	X	X	X	X	X	X	X	X
Burkina Faso	X	X	X	X	X	X	X	X	X	X
Burundi	X	X	X	X	X	X	X	X	X	X
Cameroun	5,756	24	413	0	863	0	0	216	15	5,454
Central African Rep	X	X	X	X	X	X	X	X	X	X
Chad	X	X	X	X	X	X	X	X	X	X
Congo	1,242	(12)	459	0	331	3	0	46	24	12,312
Congo, Dem Rep	14,539	36	303	241	1,317	0	0	484	1,271	1,063
Côte d'Ivoire	5,597	39	398	0	1,489	0	0	222	2,073	1,218
Equatorial Guinea	X	X	X	X	X	X	X	X	X	X
Eritrea	X	X	X	X	X	X	X	X	X	X
Ethiopia	17,131	25	294	0	815	0	0	110	962	79
Gabon	1,635	10	1,438	0	643	68	0	75	218	18,116
Gambia	X	X	X	X	X	X	X	X	X	X
Ghana	6,896	44	370	2	1,447	0	0	427	1,316	236
Guinea	X	X	X	X	X	X	X	X	X	X
Guinea-Bissau	X	X	X	X	X	X	X	X	X	X
Kenya	14,138	19	497	57	2,418	0	0	312	2,863	170
Lesotho	X	X	X	X	X	X	X	X	X	X
Liberia	X	X	X	X	X	X	X	X	X	X
Madagascar	X	X	X	X	X	X	X	X	X	X
Malawi	X	X	X	X	X	X	X	X	X	X
Mali	X	X	X	X	X	X	X	X	X	X
Mauritania	X	X	X	X	X	X	X	X	X	X
Mozambique	7,664	1	416	12	641	0	0	67	777	43
Namibia	X	X	X	X	X	X	X	X	X	X
Niger	X	X	X	X	X	X	X	X	X	X
Nigeria	88,652	36	853	86	14,867	4,429	0	850	43	102,342
Rwanda	X	X	X	X	X	X	X	X	X	X
Senegal	2,770	27	316	0	1,116	20	0	81	1,192	65
Sierra Leone	X	X	X	X	X	X	X	X	X	X
Somalia	X	X	X	X	X	X	X	X	X	X
South Africa	107,220	15	2,766	80,492	10,459	1,543	3,296	13,292	12,525	43,715
Sudan	11,480	21	414	0	1,858	0	0	116	1,601	0
Tanzania, United Rep	14,258	21	454	3	725	0	0	146	781	29
Togo	X	X	X	X	X	X	X	X	X	X
Uganda	X	X	X	X	X	X	X	X	X	X
Zambia	5,987	13	697	102	564	0	0	457	606	175
Zimbabwe	9,926	17	885	2,636	1,504	0	0	906	1,893	88
NORTH AMERICA	2,400,174	16	7,947	540,674	935,332	578,709	195,194	313,067	673,759	285,889
Canada	237,983	17	7,864	27,376	80,826	70,738	0	40,854	59,098	180,771
United States	2,162,191	16	7,956	513,299	854,506	507,971	173,658	272,213	614,662	105,118
C. AMERICA & CARIBBEAN	198,317	26	1,202	6,801	117,549	35,678	2,725	15,838	58,677	115,951
Belize	X	X	X	X	X	X	X	X	X	X
Costa Rica	2,663	48	710	0	1,517	0	0	403	1,631	133
Cuba	14,273	(5)	1,290	47	8,656	18	0	993	6,977	0
Dominican Rep	5,453	25	673	85	3,945	0	0	432	4,021	0
El Salvador	4,095	49	693	1	1,438	0	0	274	1,450	65
Guatemala	5,633	47	535	0	2,279	0	0	365	2,328	1,015
Haiti	1,779	16	227	0	480	0	0	27	480	0
Honduras	3,182	44	532	1	1,178	0	0	212	1,150	0
Jamaica	3,963	104	1,575	41	3,326	0	0	477	3,352	67
Mexico	141,520	24	1,501	6,592	88,214	28,832	2,725	11,831	15,103	95,567
Nicaragua	2,573	26	550	0	1,030	0	0	115	991	16
Panama	2,328	44	855	35	1,490	0	0	269	3,092	564
Trinidad and Tobago	8,196	77	6,419	0	1,336	6,828	0	370	2,140	7,003
SOUTH AMERICA	379,732	35	1,148	20,679	179,005	72,463	2,883	42,975	91,009	236,800
Argentina	61,710	36	1,730	856	24,425	28,857	2,057	5,012	4,766	22,951
Bolivia	4,254	67	547	0	2,095	1,085	0	261	244	1,918
Brazil	172,030	31	1,051	12,315	85,673	5,288	826	24,540	59,393	3,282
Chile	23,012	121	1,573	4,240	11,288	2,164	0	2,529	15,030	150
Colombia	30,481	29	761	2,704	14,332	5,339	0	3,047	1,427	38,000
Ecuador	8,513	44	713	0	6,794	0	0	627	924	14,890
Guyana	X	X	X	X	X	X	X	X	X	X
Paraguay	4,191	49	824	0	1,162	0	0	332	1,118	3,948
Peru	15,127	20	621	305	8,572	768	0	1,272	5,721	3,453
Suriname	X	X	X	X	X	X	X	X	X	X
Uruguay	2,883	30	883	1	1,809	0	0	480	2,189	93
Venezuela	57,530	32	2,526	258	22,855	28,962	0	4,873	196	148,115
OCEANIA	118,305	31	4,038	43,703	41,892	21,613	0	15,950	30,122	122,289
Australia	101,626	30	5,543	42,346	35,607	16,908	0	13,239	24,483	119,382
Fiji	X	X	X	X	X	X	X	X	X	X
New Zealand	16,679	39	4,434	1,357	6,285	4,705	0	2,711	5,638	2,906
Papua New Guinea	X	X	X	X	X	X	X	X	X	X
Solomon Islands	X	X	X	X	X	X	X	X	X	X
DEVELOPED	5,827,461	(4)	4,505	1,280,399	2,152,070	1,476,854	582,534	717,830	2,520,891	1,479,201
DEVELOPING	3,631,617	49	803	973,694	1,244,028	434,089	41,628	267,035	908,491	1,931,077

Notes: Negative values are shown in parentheses. "0" is either zero or less than one-half the unit of measure. "(0)" indicates a value less than zero and greater than negative one-half.

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Table ERC.2 Energy Consumption by Source

Source: International Energy Agency (IEA), Energy Balances of Organization for Economic Cooperation and Development (OECD) Countries, 1960–1997, on diskette (OECD, Paris, 1999), and Energy Balances of Non-OECD Countries, 1971–1997, on diskette (OECD, Paris, 1999).

We present all energy data in a common unit of 1,000 metric tons of oil equivalent (toe) to facilitate comparisons of energy sourcing, consumption, substitution, and conservation. A toe is defined as 41.868 gigajoules.

Energy consumption from all sources is the amount of energy from all sources used by each country in the year specified. In addition to solid, liquid, and gaseous fuels and nuclear electricity, the total also includes hydropower, geothermal, solar, combustible renewables and waste, and indigenous heat production from heat pumps. Per capita shows the amount produced per person for that country.

It is important to note that the World Resources Institute (WRI) includes losses through transportation, friction, heat loss, and other inefficiencies as energy consumption. In these energy tables, total consumption equals IEA's total primary energy supply (TPES). TPES is indigenous production plus imports, minus exports, plus stock changes, minus international marine bunkers. (Note that IEA counts production after the removal of impurities such as sulfur.)

Stock change is the difference between stocks held by producers, transformation industries, importers, and large consumers the first day of the year and the last day of the year on national territory.

International marine bunker fuel is energy delivered to sea-going ships of all flags, including warships; ships traveling in inland and coastal waters are excluded.

Energy consumption from solid fuels is the total energy produced from all types of coal. Peat is also included in this category.

Energy consumption from liquid fuels is the energy consumed from liquid fuels such as crude oil or natural gas liquids.

Energy consumption from gaseous fuels is the amount of energy consumed from natural gas.

Energy consumption from nuclear fuels shows the primary heat equivalent of the electricity consumed from nuclear power plants. Heat-to-electricity conversion efficiency is assumed to be 33 percent.

Final consumption of electricity is the toe equivalent of the electrical energy consumed by the end user. This variable differs from the others in the table in that it does not present TPES but rather total final consumption, which does not include the energy lost to inefficiencies and transport losses.

Trade in energy imports and exports comprise the total amount of energy having crossed national territorial boundaries of the country, whether or not customs clearance has taken place. Coal imports and exports comprise the amount of fuels obtained from or supplied to other countries, whether or not there is an economic or customs union between the relevant countries. Coal in transit is not included. Oil and gas imported or exported under processing agreements (i.e., refining on account) are included. Quantities of oil in transit are excluded. Crude oil, natural gas liquids, and natural gas are reported as coming from the country of origin; refinery feedstocks and oil products are reported as coming from the country of last consignment. Re-exports of oil imported for processing within bonded areas are shown as exports of products from the processing country to the final destination. Electricity is considered as imported or exported when it has crossed the national boundaries of the country.

Table ERC.2 Energy Consumption by Source

To account for the differences in quality between types of coal and other energy sources, the IEA has applied specific factors (to correctly convert that specific fuel to toe) supplied by national administrations for the main categories of energy sources and flows or uses (i.e., production, imports, exports, industry).

Energy statistics are expressed in terms of net calorific value and therefore may be slightly lower than values presented by other statistical compendia. The difference between the net and the gross calorific value for each fuel is the latent heat of vaporization of the water produced during combustion of the fuel. For oil and coal, net calorific value is 5 percent less than gross; for most forms of natural and manufactured gas the difference is 9–10 percent.