

BP Statistical Review of World Energy June 2009



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Renewable energy – geothermal



Cumulative installed geothermal power capacity*

Megawatts	1980	1985	1990	1995	2000	2003	2004	2005	2006	2007	2008	Change 2008 over 2007	2008 share of total
Argentina			0.7	0.7	0.7	–	–	–	–	–	–	–	–
Austria			–	–	–	1.3	1.2	1.2	1.2	1.2	1.2	–	♦
Australia			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	–	♦
China			31.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	–	0.3%
Costa Rica			–	55.0	142.5	162.5	162.5	162.5	162.5	162.5	162.5	–	1.6%
El Salvador			95.0	105.0	161.2	161.2	151.2	151.2	204.0	204.2	204.2	–	2.0%
Ethiopia			–	–	7.3	7.3	7.3	7.3	7.3	7.3	7.3	–	0.1%
France (Guadeloupe)			4.2	4.2	4.2	4.2	14.7	14.7	14.7	14.7	16.0	8.8%	0.2%
Germany			–	–	–	0.2	0.2	0.2	0.2	3.2	6.6	106.3%	0.1%
Guatemala			–	–	28.0	28.0	28.0	48.0	48.0	48.0	57.0	18.8%	0.5%
Iceland			44.6	50.0	172.1	202.1	202.1	232.1	422.1	485.5	573.0	18.0%	5.5%
Indonesia			144.8	309.8	589.5	807.0	807.0	855.5	872.5	982.5	1042.5	6.1%	10.0%
Italy			545.0	631.7	785.0	790.5	790.5	790.5	810.5	810.5	810.5	–	7.7%
Japan			214.6	413.7	535.3	535.3	535.3	535.3	537.3	537.3	537.3	–	5.1%
Kenya			45.0	45.0	45.0	121.0	127.0	127.0	127.0	127.0	163.0	28.3%	1.6%
Mexico			809.5	849.5	949.5	959.5	959.5	959.5	959.5	959.5	964.5	0.5%	9.2%
New Zealand			283.2	282.0	431.0	399.0	397.0	434.0	434.0	471.6	586.6	24.4%	5.6%
Nicaragua			35.0	70.0	70.0	77.5	77.5	77.5	77.5	87.4	87.4	–	0.8%
Papua New Guinea			–	–	–	5.5	5.5	5.5	36.0	56.0	56.0	–	0.5%
Philippines			888.0	1154.0	1931.0	1931.5	1931.0	1978.0	1978.0	1978.0	1978.0	–	18.9%
Portugal (The Azores)			3.0	5.0	16.0	16.0	16.0	16.0	16.0	23.0	23.0	–	0.2%
Russia (Kamchatka)			11.0	11.0	23.0	73.0	79.0	79.0	79.0	79.0	79.0	–	0.8%
Thailand			0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	–	♦
Turkey			20.6	20.4	20.4	20.4	20.4	20.4	24.7	38.0	83.0	118.4%	0.8%
US			2774.6	2816.7	2228.0	2020.0	2534.0	2828.3	2830.7	2936.5	2998.5	2.1%	28.6%
Total World	3887.0	4764.0	5950.4	6856.3	8172.3	8355.6	8879.5	9356.3	9675.3	10045.5	10469.7	4.2%	100.0%

*End of year.

♦Less than 0.05%.

Note: Because of rounding, some totals may not agree exactly with the sum of their component parts.

Source: International Geothermal Association, conference papers presented at various IGA workshops and congresses.

Renewable energy – solar



Cumulative installed photovoltaic (PV) power*

Megawatts	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Change 2008 over 2007	2008 share of total
US	100.1	117.3	138.8	167.8	212.2	275.2	376.0	479.0	624.0	830.5	1172.5	41.2%	8.7%
Canada	4.5	5.8	7.2	8.8	10.0	11.8	13.9	16.7	20.5	25.8	32.4	25.6%	0.2%
Mexico	12.0	12.9	13.9	15.0	16.2	17.1	18.2	18.7	19.7	20.8	21.8	5.0%	0.2%
Total North America	116.6	136.0	159.9	191.6	238.4	304.1	408.1	514.4	664.2	877.0	1226.7	39.9%	9.1%
Austria	2.9	3.7	4.9	6.1	10.3	16.8	21.1	24.0	25.6	27.7	30.2	9.0%	0.2%
Denmark	0.5	1.1	1.5	1.5	1.6	1.9	2.3	2.7	2.9	3.1	3.2	4.4%	♦
Finland	2.2	2.4	2.6	2.7	3.1	3.4	3.7	4.0	4.1	4.4	4.9	12.6%	♦
France	7.6	9.1	11.3	13.9	17.2	21.1	26.0	33.0	43.9	75.2	121.2	61.1%	0.9%
Germany	53.8	69.4	113.7	194.6	278.0	431.0	1044.0	1910.0	2863.0	3998.0	5498.0	37.5%	40.9%
Italy	17.7	18.5	19.0	20.0	22.0	26.0	30.7	37.5	50.0	120.2	458.2	281.2%	3.4%
Netherlands	6.5	9.2	12.8	20.5	26.3	45.9	49.5	51.2	52.7	54.3	55.9	2.9%	0.4%
Norway	5.4	5.7	6.0	6.2	6.4	6.6	6.9	7.3	7.7	8.0	8.3	4.4%	0.1%
Portugal	0.6	0.9	1.1	1.2	1.7	2.1	2.7	3.3	3.8	18.2	68.2	274.3%	0.5%
Spain	8.0	9.1	12.1	15.7	20.5	27.0	37.4	57.7	118.2	630.2	3291.2	422.2%	24.5%
Sweden	2.4	2.6	2.8	3.0	3.3	3.6	3.9	4.2	4.8	6.2	7.9	27.3%	0.1%
Switzerland	11.5	13.4	15.3	17.6	19.5	21.0	23.1	27.1	29.7	36.2	46.2	27.6%	0.3%
United Kingdom	0.7	1.1	1.9	2.7	4.1	5.9	8.1	10.9	14.0	17.9	21.4	19.6%	0.2%
Total Western Europe	119.8	146.1	205.0	305.8	414.0	612.3	1259.4	2172.8	3220.4	4999.6	9614.9	92.3%	71.5%
Israel	0.3	0.4	0.4	0.5	0.5	0.5	0.9	1.0	1.3	1.8	2.3	27.5%	♦
Japan	133.4	208.6	330.2	452.8	636.8	859.6	1132.0	1421.9	1708.5	1918.9	2148.9	12.0%	16.0%
Korea	3.0	3.5	4.0	4.8	5.4	6.0	8.5	13.5	34.7	77.6	351.6	353.1%	2.6%
Australia	22.5	25.3	29.2	33.6	39.1	45.6	52.3	60.6	70.3	82.5	100.5	21.8%	0.7%
Total Others	159.2	237.8	363.8	491.6	681.9	911.8	1193.7	1497.1	1814.9	2080.8	2603.3	25.1%	19.4%
Total IEA PVPS**	395.6	519.9	728.8	989.0	1334.3	1828.2	2861.2	4184.3	5699.5	7957.4	13444.9	69.0%	100.0%

*End of year.

Source: Data to 2007 from IEA Photovoltaic Power Systems Programme, 2008 estimates from EPIA and EurObserver.

**IEA Photovoltaic Power Systems Programme member countries.

♦Less than 0.05%.

Note: Because of rounding, some totals may not agree exactly with the sum of their component parts.

Renewable energy – wind



Cumulative installed wind turbines*

Megawatts	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Change 2008 over 2007	2008 share of total
US	2141	2445	2610	4245	4674	6361	6750	9181	11635	16879	25237	49.5%	20.7%
Canada	83	126	139	214	270	351	444	683	1459	1845	2371	28.5%	1.9%
Mexico	2	2	3	3	3	3	3	3	86	86	332	286.0%	0.3%
Total North America	2226	2573	2752	4462	4947	6715	7197	9867	13180	18810	27940	48.5%	22.9%
Argentina	14	15	16	27	28	30	30	31	31	31	33	6.5%	♦
Brazil	19	22	22	24	24	31	31	31	231	392	687	75.3%	0.6%
Costa Rica	27	51	51	71	79	79	79	79	79	79	104	31.6%	0.1%
Other S. & Cent. America	6	7	7	9	9	50	54	54	56	79	153	93.7%	0.1%
Total S. & Cent. America	66	95	96	131	140	190	194	195	397	581	977	68.2%	0.8%
Belgium	10	11	19	34	45	78	106	177	222	297	385	29.6%	0.3%
Denmark	1420	1738	2341	2456	2880	3076	3083	3087	3101	3088	3159	2.3%	2.6%
Finland	18	39	39	40	44	53	83	85	89	113	113	–	0.1%
France	21	25	63	115	183	274	386	775	1585	2471	3671	48.6%	3.0%
Germany	2874	4442	6107	8734	11968	14612	16649	18445	20652	22277	23933	7.4%	19.6%
Greece	55	158	274	358	462	538	587	705	862	987	1102	11.7%	0.9%
Ireland	64	74	122	129	167	230	339	498	748	807	1015	25.8%	0.8%
Italy	197	277	424	700	806	922	1261	1713	2118	2721	3731	37.1%	3.1%
Netherlands	379	433	473	523	727	938	1081	1221	1557	1745	2222	27.3%	1.8%
Poland	2	2	3	24	54	55	55	65	170	313	472	50.8%	0.4%
Portugal	51	61	111	153	204	311	585	1087	1716	2150	2829	31.6%	2.3%
Spain	880	1812	2836	3550	5043	6420	8263	10027	11614	14714	16543	12.4%	13.5%
Sweden	176	220	265	318	372	428	478	554	571	789	1024	29.8%	0.8%
United Kingdom	338	362	425	525	570	759	889	1336	1967	2394	3263	36.3%	2.7%
Other Europe & Eurasia	87	102	148	174	329	631	904	1294	1679	1985	2536	27.8%	2.1%
Total Europe & Eurasia	6572	9756	13650	17833	23854	29325	34749	41068	48651	56851	65998	16.1%	54.0%
Iran	9	9	9	9	24	63	91	91	91	91	91	–	0.1%
Other Middle East	9	9	9	9	9	9	9	9	9	9	9	–	♦
Total Middle East	18	18	18	18	33	72	101	101	101	101	101	–	0.1%
Egypt	6	36	69	69	69	123	146	180	231	310	384	23.9%	0.3%
Morocco	–	14	54	54	54	54	54	64	122	124	206	66.1%	0.2%
Other Africa	4	14	14	14	25	34	34	34	34	34	106	211.8%	0.1%
Total Africa	10	64	137	137	148	211	234	278	386	469	696	48.4%	0.6%
Australia	10	10	30	71	190	240	421	717	796	972	1587	63.3%	1.3%
China	200	262	352	406	473	571	769	1264	2588	5875	12121	106.3%	9.9%
India	992	1035	1220	1456	1702	2125	3000	4388	6228	7845	9655	23.1%	7.9%
Japan	30	68	142	357	486	761	991	1159	1457	1681	2033	20.9%	1.7%
New Zealand	25	35	35	35	35	56	167	167	170	321	325	1.2%	0.3%
Other Asia Pacific	5	16	19	24	30	37	90	194	351	498	725	45.6%	0.6%
Total Asia Pacific	1261	1426	1798	2349	2916	3790	5438	7889	11591	17193	26446	53.8%	21.6%
Total World	10153	13932	18450	24927	32037	40301	47912	59398	74306	94005	122158	29.9%	100.0%

*End of year.

♦Less than 0.05%.

Note: Because of rounding, some totals may not agree exactly with the sum of their component parts.

Source: BTM consult Aps.

Renewable energy – fuel ethanol



Production

Thousand tonnes oil equivalent	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Change 2008 over 2007	2008 share of total
US	2637	2782	3080	3332	4057	5303	6435	7380	9233	12327	17460	41.3%	50.2%
Canada	n/a	n/a	n/a	n/a	n/a	n/a	115	127	295	424	694	63.1%	2.0%
Total North America	2637	2782	3080	3332	4057	5303	6550	7508	9527	12751	18154	42.0%	52.2%
Brazil	7052	6483	5343	5726	6286	7226	7314	8010	8871	11264	13549	20.0%	38.9%
Colombia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	50	134	142	129	-9.3%	0.4%
Paraguay	1	4	5	3	5	17	20	22	23	30	45	49.6%	0.1%
Total South America	7053	6487	5349	5729	6291	7243	7334	8082	9028	11436	13723	19.7%	39.4%
Austria	n/a	n/a	-	-	-	-	-	-	-	7	44	491.7%	0.1%
Czech Republic	n/a	n/a	-	-	-	-	-	1	7	16	38	129.7%	0.1%
Finland	n/a	n/a	-	-	-	-	1	6	-	-	25	n/a	0.1%
France	n/a	n/a	57	57	111	101	50	72	146	289	499	72.5%	1.4%
Germany	n/a	n/a	-	-	-	-	12	82	215	197	284	43.8%	0.8%
Hungary	n/a	n/a	-	-	-	-	-	17	17	15	75	398.6%	0.2%
Italy	n/a	n/a	-	-	-	-	-	4	61	28	30	9.5%	0.1%
Latvia	n/a	n/a	-	-	-	-	6	6	6	9	10	10.8%	♦
Lithuania	n/a	n/a	-	-	-	-	-	4	9	10	10	0.0%	♦
Netherlands	n/a	n/a	-	-	-	-	7	4	7	7	4	-35.9%	♦
Poland	n/a	n/a	-	-	41	38	24	32	80	77	100	28.7%	0.3%
Spain	n/a	n/a	50	50	57	52	127	151	198	174	158	-9.2%	0.5%
Sweden	n/a	n/a	13	28	32	33	35	76	70	35	39	11.1%	0.1%
Turkey	n/a	n/a	-	-	-	-	-	15	20	20	20	-	0.1%
Total Europe	n/a	n/a	120	136	241	223	264	472	837	884	1337	50.8%	3.8%
Australia	n/a	n/a	n/a	n/a	n/a	26	12	14	31	56	76	35.3%	0.2%
China	n/a	n/a	n/a	n/a	n/a	37	137	580	985	1043	1021	-2.4%	2.9%
India	n/a	n/a	n/a	n/a	n/a	90	75	50	60	70	125	78.0%	0.4%
Pakistan	n/a	n/a	n/a	n/a	n/a	39	63	77	107	172	199	15.4%	0.6%
Thailand	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30	64	91	164	80.0%	0.5%
Total Asia Pacific	n/a	n/a	n/a	n/a	n/a	191	287	750	1247	1432	1586	10.4%	4.6%
Total World	9690	9269	8549	9198	10589	12961	14435	16811	20640	26503	34800	30.9%	100.0%

n/a not available.
♦Less than 0.05%.

Sources: Official Sources; European Bioethanol Fuel Association; F.O. Lichts; Renewable Fuels Association; US Department of Agriculture; US Energy Information Administration.