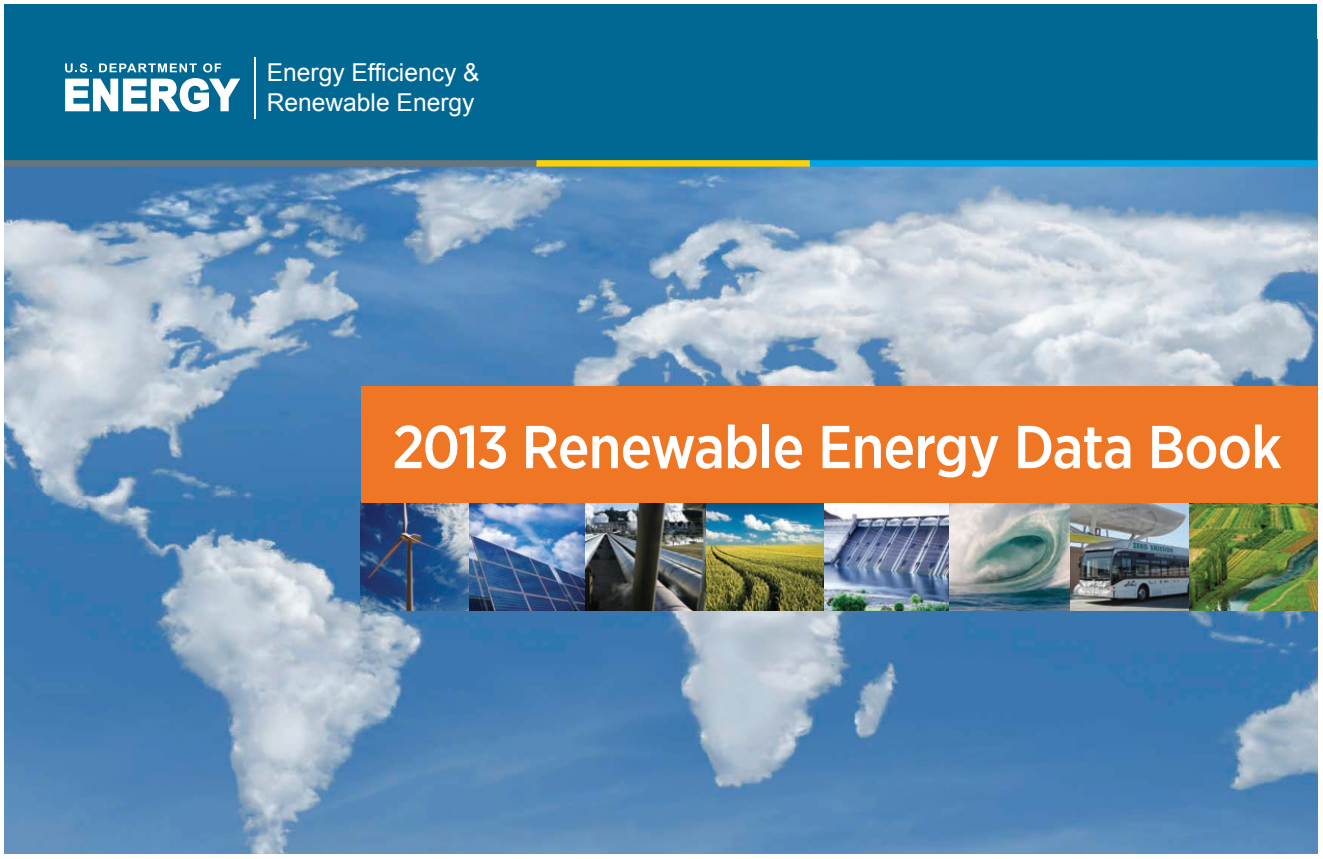

U.S. DEPARTMENT OF
ENERGY
Energy Efficiency &
Renewable Energy
2013 Renewable Energy Data Book

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The primary data represented and synthesized in the *2013 Renewable Energy Data Book* come from the publicly available data sources identified on page 124.

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Key Findings

- **United States overall energy consumption** grew to 97.3 quadrillion Btu in 2013, a **2.4% increase** from 2012. Energy consumption from coal and renewables grew slightly, while consumption from petroleum and natural gas fell slightly.
- United States **electric power sector energy consumption** grew to 38.4 quadrillion Btu in 2013, a **0.6% increase** from 2012.*
- **Renewable electricity**** **grew to nearly 15% of total installed capacity and 13% of total electricity generation in the United States** in 2013. Installed renewable electricity capacity exceeded 171 gigawatts (GW) in 2013, generating 534 TWh.
- In 2013 in the United States, solar electricity was the fastest growing electricity generation technology, with **cumulative installed capacity increasing by nearly 66% from the previous year**.
- In the United States, **wind electricity generation increased 20% in 2013**, while wind electricity capacity grew 1.8%.

*Source: Energy Information Administration (EIA); full references are provided beginning on page 125.

**Unless noted, renewable electricity includes hydropower and biopower

Key Findings (continued)

- In the United States, renewable electricity has been capturing a growing percentage of new capacity additions during the past few years. **In 2013, renewable electricity accounted for more than 61% of all new electricity capacity installations** in the United States. By comparison, renewable electricity captured 4% of new capacity additions in 2004 and 57% in 2008.*

- The installed **global renewable electricity* capacity more than doubled between 2000 and 2013**, and comprises 27% of the total electricity capacity globally, representing a significant and growing portion of the total energy supply.

- Worldwide, solar photovoltaics (PV) and concentrated solar power (CSP) are among the fastest growing renewable electricity technologies—**between 2000 and 2013, solar electricity generation worldwide increased by a factor of nearly 68**.

- Biodiesel was the fastest growing biofuel type, with production increasing by 64% in the United States and 17% globally, from a relatively small base.

*Source: EIA

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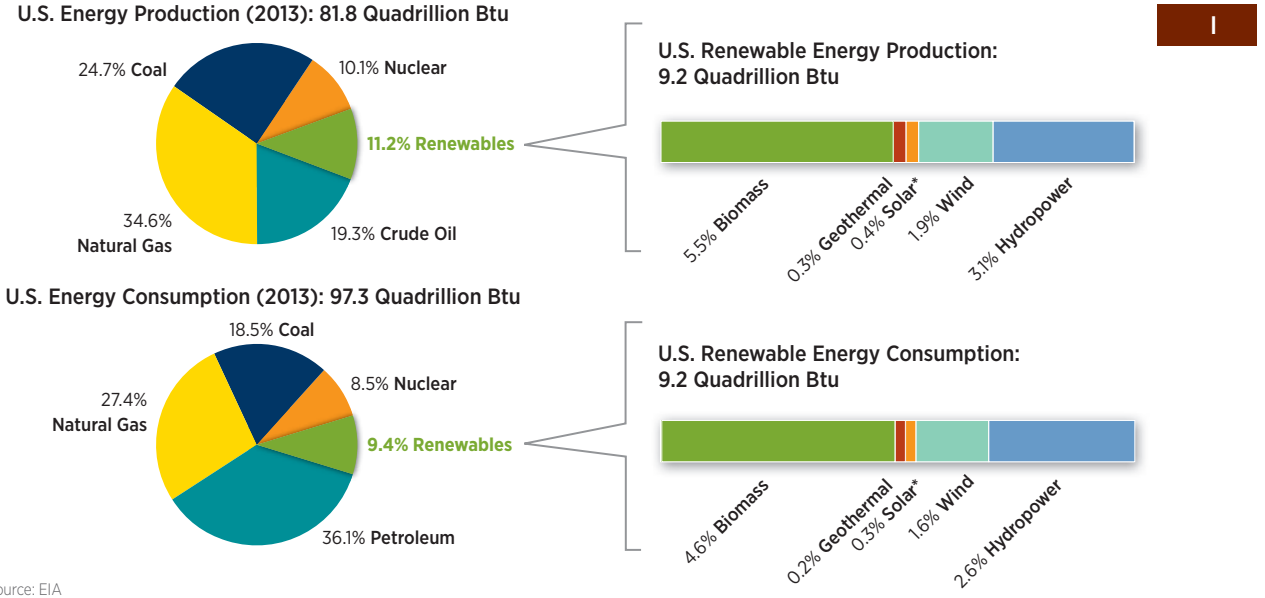
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I. U.S. Energy Background Information

U.S. Energy Production and Consumption (2013)



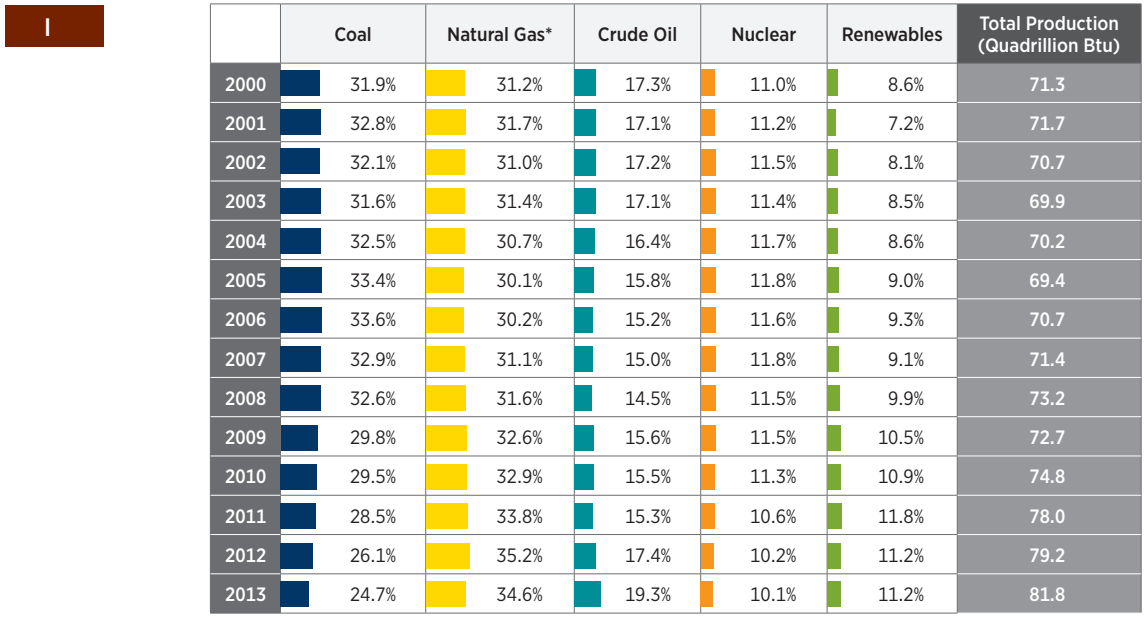
Source: EIA

The difference in the amount of energy consumed and produced is made up by net imports.

All data are reported as primary energy.

*Solar PV data provided includes only on-grid systems of 1 MW or higher in capacity. Grid-connected distributed capacity and associated generation of 1 MW or less, a rapidly growing market segment, is included in subsequent figures in later sections.

U.S. Energy Production by Energy Source



	Coal	Natural Gas*	Crude Oil	Nuclear	Renewables	Total Production (Quadrillion Btu)
2000	31.9%	31.2%	17.3%	11.0%	8.6%	71.3
2001	32.8%	31.7%	17.1%	11.2%	7.2%	71.7
2002	32.1%	31.0%	17.2%	11.5%	8.1%	70.7
2003	31.6%	31.4%	17.1%	11.4%	8.5%	69.9
2004	32.5%	30.7%	16.4%	11.7%	8.6%	70.2
2005	33.4%	30.1%	15.8%	11.8%	9.0%	69.4
2006	33.6%	30.2%	15.2%	11.6%	9.3%	70.7
2007	32.9%	31.1%	15.0%	11.8%	9.1%	71.4
2008	32.6%	31.6%	14.5%	11.5%	9.9%	73.2
2009	29.8%	32.6%	15.6%	11.5%	10.5%	72.7
2010	29.5%	32.9%	15.5%	11.3%	10.9%	74.8
2011	28.5%	33.8%	15.3%	10.6%	11.8%	78.0
2012	26.1%	35.2%	17.4%	10.2%	11.2%	79.2
2013	24.7%	34.6%	19.3%	10.1%	11.2%	81.8

Source: EIA

*Includes natural gas liquids.

Annual totals may not equal 100% due to rounding.

U.S. Energy Consumption by Energy Source

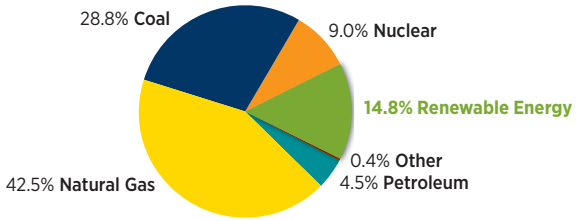
	Coal	Natural Gas	Petroleum	Nuclear	Renewables	Total Consumption (Quadrillion Btu)
2000	22.9%	24.1%	38.7%	8.0%	6.2%	98.7
2001	22.8%	23.7%	39.7%	8.4%	5.4%	96.1
2002	22.4%	24.1%	39.2%	8.3%	5.9%	97.6
2003	22.8%	23.3%	39.6%	8.1%	6.1%	97.9
2004	22.5%	22.9%	40.3%	8.2%	6.1%	100.0
2005	22.7%	22.5%	40.3%	8.1%	6.2%	100.2
2006	22.5%	22.3%	40.1%	8.3%	6.7%	99.6
2007	22.5%	23.4%	39.3%	8.3%	6.5%	101.3
2008	22.5%	24.0%	37.5%	8.5%	7.3%	99.3
2009	20.8%	24.8%	37.4%	8.8%	8.1%	94.6
2010	21.3%	25.1%	36.7%	8.6%	8.2%	98.0
2011	20.2%	25.6%	36.3%	8.5%	9.3%	97.5
2012	18.2%	27.5%	36.4%	8.5%	9.3%	95.0
2013	18.5%	27.4%	36.1%	8.5%	9.4%	97.3

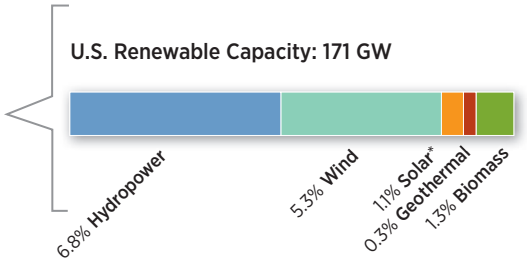
Source: EIA

U.S. Electricity Nameplate Capacity and Generation (2013)

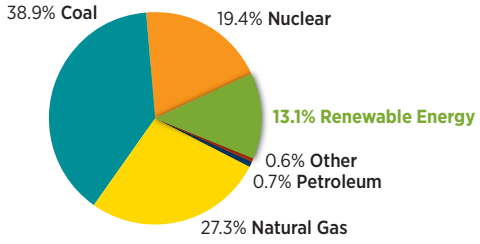
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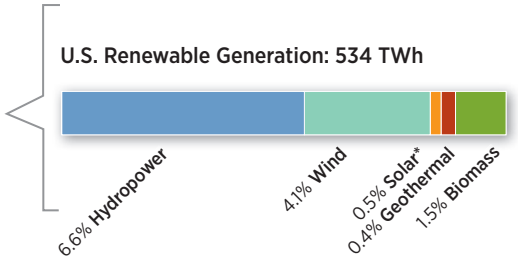
U.S. Electric Nameplate Capacity (2013): 1,155 GW





U.S. Electric Net Generation (2013): 4,074 TWh





Sources: EIA, Larry Sherwood/Interstate Renewable Energy Council (IREC)

Other includes pumped storage, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, tire-derived fuels, and miscellaneous technologies.

*Grid-connected only

U.S. Electricity Generating Capacity by Source

	Coal	Petroleum	Natural Gas	Other Gases	Nuclear	Renewables	Other	Total Capacity (MW)
2000	39.6%	8.0%	28.6%	0.3%	12.3%	11.0%	0.1%	848,112
2001	37.6%	8.2%	31.6%	0.2%	11.7%	10.6%	0.1%	895,186
2002	35.2%	6.9%	36.7%	0.2%	10.9%	10.0%	0.1%	960,306
2003	33.2%	6.6%	39.9%	0.2%	10.4%	9.6%	0.1%	1,012,402
2004	32.5%	6.3%	41.0%	0.2%	10.2%	9.5%	0.1%	1,030,056
2005	32.1%	6.2%	41.7%	0.2%	10.1%	9.7%	0.1%	1,047,704
2006	31.8%	6.1%	41.9%	0.2%	10.0%	9.9%	0.1%	1,056,289
2007	31.5%	5.8%	42.1%	0.2%	9.9%	10.3%	0.1%	1,066,961
2008	30.5%	5.6%	41.4%	0.2%	9.6%	11.0%	0.1%	1,083,175
2009	30.7%	5.7%	41.7%	0.2%	9.7%	11.9%	0.1%	1,102,331
2010	30.6%	5.6%	41.7%	0.3%	9.5%	12.3%	0.1%	1,120,188
2011	30.2%	5.1%	42.1%	0.2%	9.4%	12.9%	0.1%	1,135,959
2012	29.2%	4.6%	42.3%	0.2%	9.4%	14.2%	0.1%	1,167,503
2013	28.8%	4.5%	42.5%	0.3%	9.0%	14.8%	0.1%	1,151,812

Sources: EIA

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U.S. Electricity Generation by Source

	Coal	Petroleum Liquids	Petroleum Coke	Natural Gas	Other Gases	Nuclear	Renewables	Other	Total Generation (GWh)
2000	51.6%	2.7%	0.2%	15.8%	0.4%	19.8%	9.4%	0.1%	3,807,955
2001	50.8%	3.1%	0.3%	17.1%	0.2%	20.5%	7.7%	0.3%	3,745,745
2002	50.0%	2.0%	0.4%	17.9%	0.3%	20.2%	8.9%	0.3%	3,867,498
2003	50.7%	2.6%	0.4%	16.7%	0.4%	19.6%	9.1%	0.4%	3,892,115
2004	49.7%	2.5%	0.5%	17.8%	0.4%	19.8%	8.8%	0.4%	3,979,023
2005	49.5%	2.5%	0.6%	18.7%	0.3%	19.2%	8.8%	0.3%	4,062,458
2006	48.9%	1.1%	0.5%	20.1%	0.3%	19.3%	9.5%	0.3%	4,071,962
2007	48.4%	1.2%	0.4%	21.5%	0.3%	19.4%	8.5%	0.3%	4,164,748
2008	48.1%	0.8%	0.3%	21.4%	0.3%	19.5%	9.3%	0.3%	4,127,019
2009	44.4%	0.7%	0.3%	23.3%	0.3%	20.2%	10.6%	0.3%	3,956,990
2010	44.7%	0.6%	0.3%	23.9%	0.3%	19.5%	10.4%	0.3%	4,133,854
2011	42.2%	0.4%	0.3%	24.7%	0.3%	19.2%	12.6%	0.3%	4,112,181
2012	37.3%	0.3%	0.2%	30.3%	0.3%	18.9%	12.4%	0.3%	4,067,551
2013	38.9%	0.3%	0.3%	27.3%	0.3%	19.4%	13.1%	0.3%	4,074,457

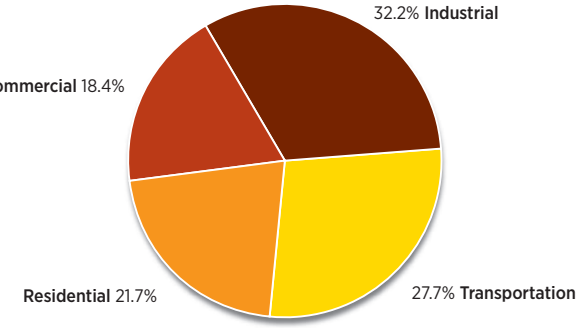
Sources: EIA

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U.S. Energy Consumption by Sector (2013)

U.S. Energy Consumption, 2013: 97.4 Quadrillion Btu

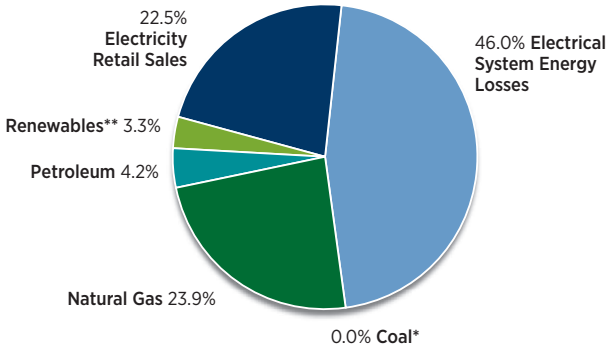
U.S. buildings represent 40.1% of total energy use.



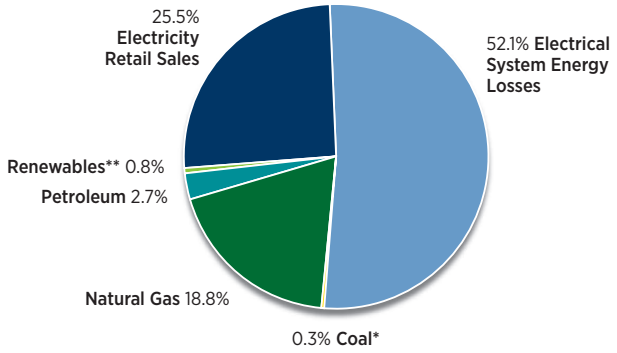
Source: EIA
Totals may not equal 100% due to rounding.

U.S. Energy Consumption – Residential and Commercial (2013)

2013 Residential Energy Consumption
21.1 Quadrillion Btu



2013 Commercial Energy Consumption
17.9 Quadrillion Btu



Source: EIA

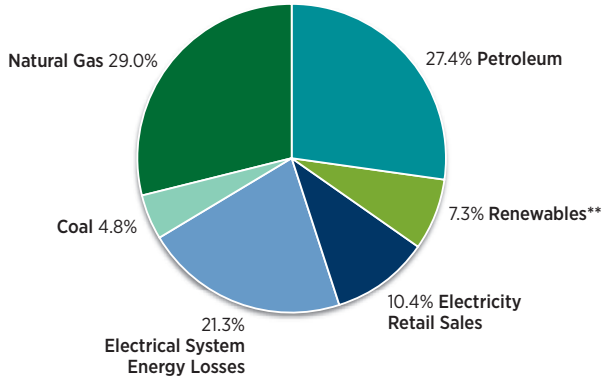
*While coal is a small direct contributor to residential and commercial energy consumption, coal is a major fuel for electricity generation and therefore contributes to electricity retail sales and electrical system energy losses.

**The direct renewables contribution consists primarily of wood and wood-derived fuels, municipal solid waste, solar thermal direct-use energy and PV electricity net generation, and geothermal heat pump and direct-use energy.

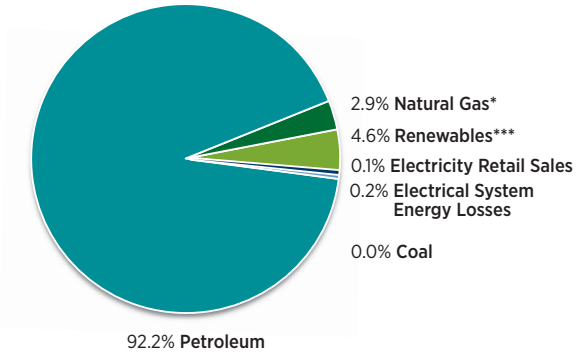
U.S. Energy Consumption – Industry and Transportation (2013)

I

2013 Industrial Energy Consumption
31.4 Quadrillion Btu



2013 Transportation Energy Consumption
27.0 Quadrillion Btu



Source: EIA

*More than 95% of natural gas use powers natural gas pipeline compressors

**For industrial consumption, the direct renewables contribution consists primarily of wood and wood-derived fuels, municipal solid waste, and conventional hydropower.

***For transportation consumption, the direct renewables contribution consists primarily of fuel ethanol and biodiesel.



II. Renewable Electricity in the United States

Renewable Electricity in the United States: Summary

II

- Since 2000, cumulative renewable electricity* installations in the United States have nearly doubled, and in 2013 they represented **171 GW of installed U.S. capacity**. Every renewable electricity technology added capacity in 2013, with overall renewable electricity capacity increasing 4.6%.
- Installed renewable electricity capacity has grown at a compound annual growth rate (CAGR) of **4.8% per year from 2000 to 2013**.
- U.S. renewable electricity in 2013 was 14.8% of total overall installed electricity capacity and **13.1% of total annual generation in the United States**.
- Overall renewable generation increased 6.1% in 2013, with generation from geothermal and hydropower dropping slightly.
- Over the timeframe of 2008 to 2013, the United States' **total renewable electricity generation increased by 40%**, while non-hydro renewable electricity generation more than doubled.

*Unless noted, renewable electricity includes hydropower and biopower

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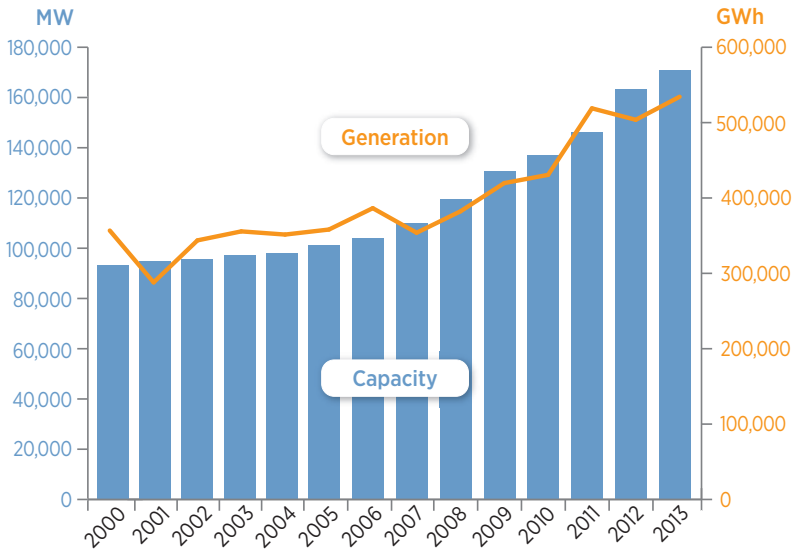
Renewable Electricity in the United States: Summary (continued)

II

- In 2013, solar PV and CSP were the fastest growing renewable electricity technologies, with **cumulative installed PV capacity increasing by nearly 65% (7.3 GW to 12.0 GW) and CSP capacity increasing by 81% (0.5 GW to 0.9 GW)**. Solar PV accounted for about 63% of U.S. renewable electricity installed in 2013.
- Cumulative installed wind capacity increased only 1.8% in 2013, much lower than the increases in previous years. However, wind generation increased by nearly 20%, reflecting new generation from capacity installed in 2012.
- Electricity capacities of biomass, geothermal, and hydropower have remained relatively stable from 2000 to 2013, experiencing a combined increase in capacity of 9% over the timeframe.
- In 2013, **hydropower produced 50% of total renewable electricity generation, wind produced 31%, biomass produced about 11%, solar** (PV and CSP) **produced 4%,** and **geothermal produced 3%**.

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U.S. Capacity and Generation: All Renewables



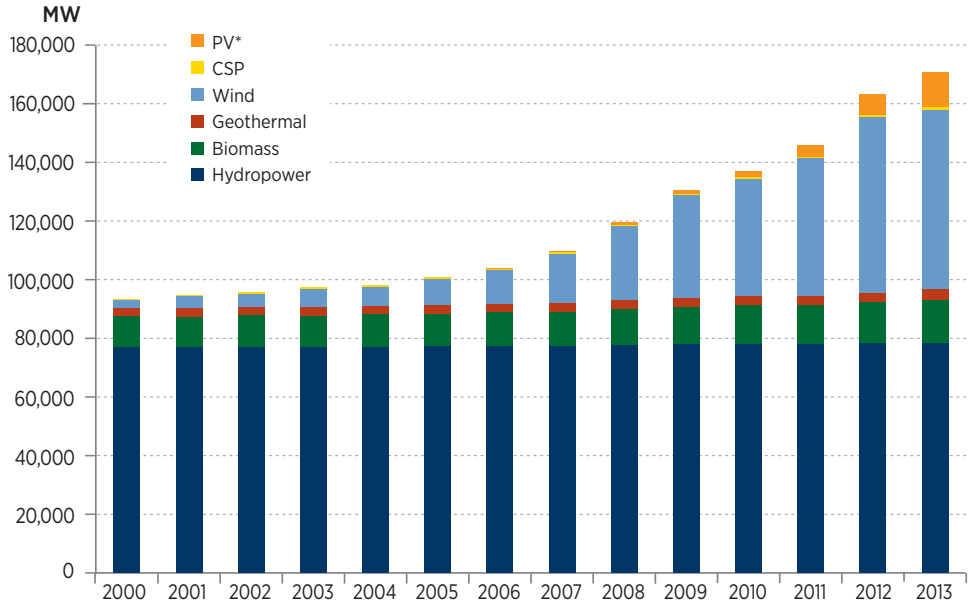
	Total Nameplate Capacity (MW)	Total Generation (GWh)
2000	93,370	356,789
2001	94,943	288,009
2002	95,804	343,740
2003	97,478	355,686
2004	98,195	351,465
2005	101,113	358,129
2006	104,072	386,474
2007	109,845	353,854
2008	119,639	382,276
2009	130,673	419,756
2010	137,286	430,670
2011	146,073	518,956
2012	163,530	503,731
2013	171,069	534,286

II

Sources: EIA, Geothermal Energy Association (GEA), Lawrence Berkeley National Laboratory (LBNL), Solar Energy Industries Association and Greentech Media (SEIA/GTM), Larry Sherwood/IREC

U.S. Renewable Electricity Nameplate Capacity by Source

II



Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only

U.S. Renewable Electricity Nameplate Capacity Added (MW)

	Solar PV*	CSP	Wind	Geothermal	Biomass	Hydropower	Total Capacity Added	Capacity Added as a Percentage of Total Renewable Energy
2001	11	0	1,697	0	(100)	(35)	**1,573**	**2%**
2002	23	0	411	0	291	136	**861**	**1%**
2003	45	0	1,667	0	(11)	(27)	**1,674**	**2%**
2004	58	0	372	0	177	110	**717**	**1%**
2005	79	0	2,396	30	189	224	**2,918**	**3%**
2006	105	1	2,454	3	331	65	**2,959**	**3%**
2007	169	64	5,237	105	185	13	**5,773**	**5%**
2008	311	0	8,425	103	747	208	**9,794**	**8%**
2009	438	11	9,918	46	351	270	**11,034**	**8%**
2010	896	78	5,112	15	218	294	**6,613**	**5%**
2011	1,858	0	6,816	138	154	(10)	**8,955**	**6%**
2012	3,333	0	13,131	147	840	47	**17,498**	**11%**
2013	4,746	410	1,087	407	658	216	**7,524**	**4%**



Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only

2013 Geothermal: Shift in capacity represents a source change from GEA to EIA.

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Cumulative U.S. Renewable Electricity Nameplate Capacity (MW) and Annual Percent Change

II

	Hydropower	Solar PV*	CSP	Wind	Geothermal	Biomass	Total Renewables
2000	76,946	18	354	2,578	2,798	10,676	93,370
2001	76,911 (0%)	29 (62.4%)	354 (0%)	4,275 (65.8%)	2,798 (0%)	10,576 (-0.9%)	94,943 (1.7%)
2002	77,047 (0.2%)	52 (76.9%)	354 (0%)	4,686 (9.6%)	2,798 (0%)	10,867 (2.8%)	95,804 (0.9%)
2003	77,020 (0%)	97 (87.3%)	354 (0%)	6,353 (35.6%)	2,798 (0%)	10,856 (-0.1%)	97,478 (1.7%)
2004	77,130 (0.1%)	155 (59.2%)	354 (0%)	6,725 (5.9%)	2,798 (0%)	11,033 (1.6%)	98,195 (0.7%)
2005	77,354 (0.3%)	234 (51.0%)	354 (0%)	9,121 (35.6%)	2,828 (1.1%)	11,222 (1.7%)	101,113 (3.0%)
2006	77,419 (0.1%)	339 (44.7%)	355 (0.3%)	11,575 (26.9%)	2,831 (0.1%)	11,553 (2.9%)	104,072 (2.9%)
2007	77,432 (0%)	508 (49.8%)	419 (18%)	16,812 (45.2%)	2,936 (3.7%)	11,738 (1.6%)	109,845 (5.5%)
2008	77,640 (0.3%)	819 (61.2%)	419 (0%)	25,237 (50.1%)	3,039 (3.5%)	12,485 (6.4%)	119,639 (8.9%)
2009	77,910 (0.3%)	1,257 (53.5%)	430 (2.6%)	35,155 (39.3%)	3,085 (1.5%)	12,836 (2.8%)	130,677 (9.2%)
2010	78,204 (0.4%)	2,153 (71.3%)	508 (18.1%)	40,267 (14.5%)	3,100 (0.5%)	13,053 (1.7%)	137,286 (5.1%)
2011	78,194 (0%)	4,011 (86.3%)	508 (0%)	46,916 (16.5%)	3,238 (4.4%)	13,207 (1.2%)	146,073 (6.4%)
2012	78,241 (0.1%)	7,344 (83.1%)	508 (0%)	60,005 (27.9%)	3,385 (4.5%)	14,047 (6.4%)	163,530 (12.0%)
2013	78,457 (0.3%)	12,090 (64.6%)	918 (80.7%)	61,107 (1.8%)	3,792 (12.0%)	14,705 (4.7%)	171,069 (4.6%)

- annual decrease annual increase +

Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only

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U.S. Renewable Electricity Capacity as a Percentage of Total Electricity Capacity

II

	Hydropower	Solar PV*	CSP	Wind	Geothermal	Biomass	Total Renewables
2000	9.1%	0.0%	0.0%	0.3%	0.3%	1.3%	**11.0%**
2001	8.6%	0.0%	0.0%	0.5%	0.3%	1.2%	**10.6%**
2002	8.0%	0.0%	0.0%	0.5%	0.3%	1.1%	**10.0%**
2003	7.6%	0.0%	0.0%	0.6%	0.3%	1.1%	**9.6%**
2004	7.5%	0.0%	0.0%	0.7%	0.3%	1.1%	**9.5%**
2005	7.4%	0.0%	0.0%	0.9%	0.3%	1.1%	**9.7%**
2006	7.3%	0.0%	0.0%	1.1%	0.3%	1.1%	**9.9%**
2007	7.3%	0.0%	0.0%	1.6%	0.3%	1.1%	**10.3%**
2008	7.2%	0.1%	0.0%	2.3%	0.3%	1.2%	**11.0%**
2009	7.1%	0.1%	0.0%	3.2%	0.3%	1.2%	**11.9%**
2010	7.0%	0.2%	0.0%	3.6%	0.3%	1.2%	**12.3%**
2011	6.9%	0.4%	0.0%	4.1%	0.3%	1.2%	**12.9%**
2012	6.8%	0.6%	0.0%	5.2%	0.3%	1.2%	**14.2%**
2013	6.8%	1.0%	0.1%	5.3%	0.3%	1.3%	**14.8%**

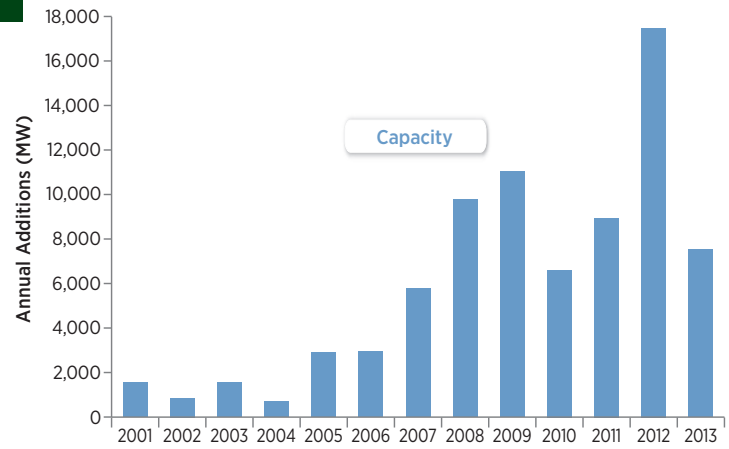
Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only

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U.S. Annual Installed Renewable Electricity Capacity Growth

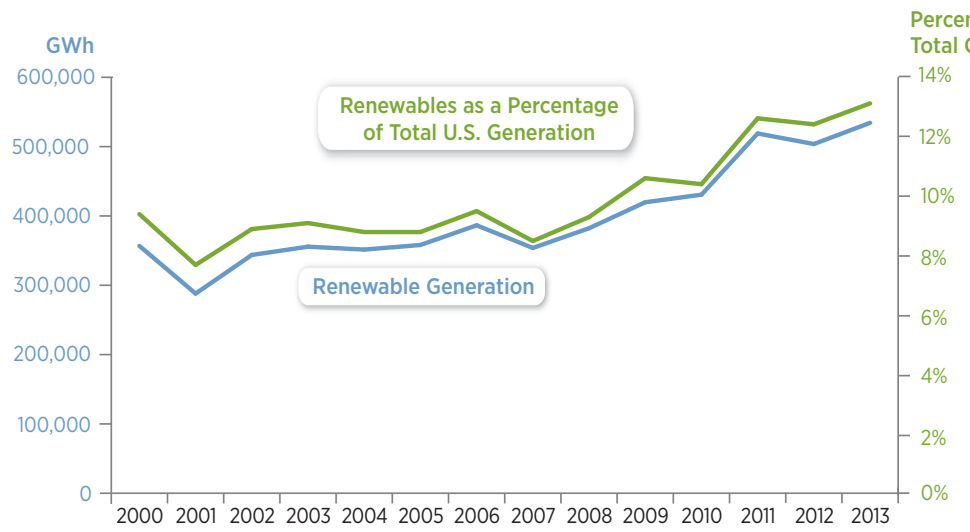
II



	Compounded Annual Growth Rate (2000–2013)
Wind	**26.3%**
Solar PV*	**64.1%**
CSP	**9.0%**
Biomass	**2.8%**
Geothermal	**2.8%**
Hydropower	**0.2%**
All Renewables	**4.8%**

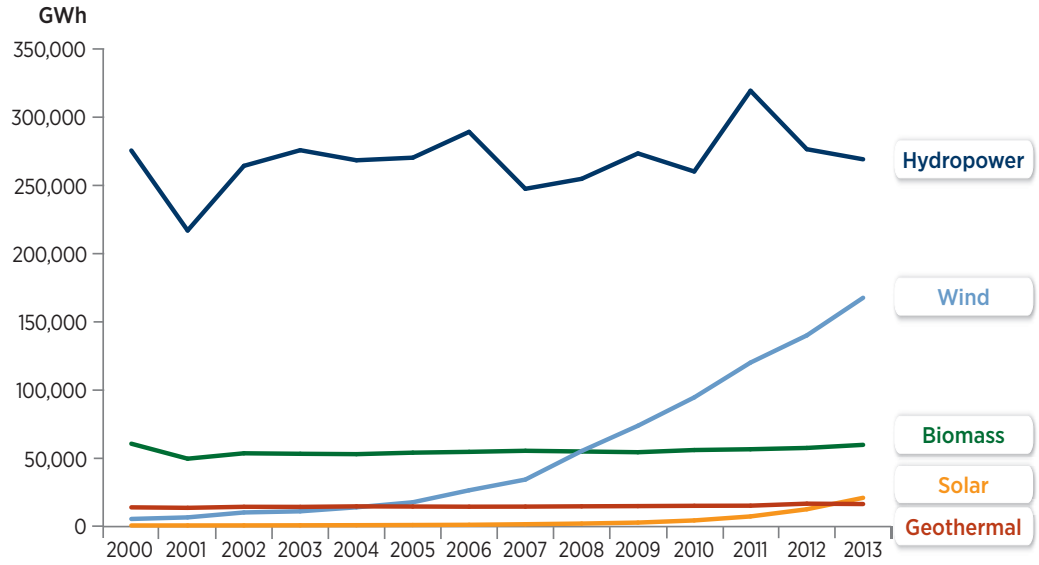
Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC
*Grid-connected only

U.S. Renewable Electricity Generation



Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC

U.S. Renewable Electricity Generation by Technology



Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC

U.S. Renewable Electricity Generation as a Percentage of Total Generation

	Hydropower	Solar	Wind	Geothermal	Biomass	Total Renewables
2000	7.2%	0.0%	0.1%	0.4%	1.6%	9.4%
2001	5.8%	0.0%	0.2%	0.4%	1.3%	7.7%
2002	6.8%	0.0%	0.3%	0.4%	1.4%	8.9%
2003	7.1%	0.0%	0.3%	0.4%	1.4%	9.1%
2004	6.7%	0.0%	0.4%	0.4%	1.3%	8.8%
2005	6.7%	0.0%	0.4%	0.4%	1.3%	8.8%
2006	7.1%	0.0%	0.7%	0.4%	1.3%	9.5%
2007	5.9%	0.0%	0.8%	0.4%	1.3%	8.5%
2008	6.2%	0.1%	1.3%	0.4%	1.3%	9.3%
2009	6.9%	0.1%	1.9%	0.4%	1.4%	10.6%
2010	6.3%	0.1%	2.3%	0.4%	1.4%	10.4%
2011	7.8%	0.2%	2.9%	0.4%	1.4%	12.6%
2012	6.8%	0.3%	3.4%	0.4%	1.4%	12.4%
2013	6.6%	0.5%	4.1%	0.4%	1.5%	13.1%

II

Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC
Totals may not equal 100% due to rounding.

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U.S. Renewable Electricity Generation (GWh) and Annual Percent Change

II

	Hydropower	Solar	Wind	Geothermal	Biomass	All Renewables
2000	275,573 (-13.8%)	804 (8.3%)	5,593 (24.6%)	14,093 (-5.0%)	60,726 (1.9%)	356,789 (-10.6%)
2001	216,961 (-21.3%)	822 (2.2%)	6,737 (20.5%)	13,741 (-2.5%)	49,748 (-18.1%)	288,009 (-19.3%)
2002	264,329 (21.8%)	857 (4.3%)	10,354 (53.7%)	14,491 (5.5%)	53,709 (8.0%)	343,740 (19.4%)
2003	275,806 (4.3%)	929 (8.4%)	11,187 (8.0%)	14,424 (-0.5%)	53,340 (-0.7%)	355,686 (3.5%)
2004	268,417 (-2.7%)	1,020 (9.8%)	14,144 (26.4%)	14,811 (2.7%)	53,073 (-0.5%)	351,465 (-1.2%)
2005	270,321 (0.7%)	1,145 (12.2%)	17,811 (25.9%)	14,692 (-0.8%)	54,160 (2.0%)	358,129 (1.9%)
2006	289,246 (7.0%)	1,312 (14.6%)	26,589 (49.3%)	14,568 (-0.8%)	54,759 (1.1%)	386,474 (7.9%)
2007	247,510 (-14.4%)	1,718 (31.0%)	34,450 (29.6%)	14,637 (0.5%)	55,539 (1.4%)	353,854 (-8.4%)
2008	254,831 (3.0%)	2,208 (28.5%)	55,363 (60.7%)	14,840 (1.4%)	55,034 (-0.9%)	382,276 (8.0%)
2009	273,455 (7.3%)	2,923 (32.4%)	73,886 (33.5%)	15,009 (1.1%)	54,493 (-1.0%)	419,756 (9.8%)
2010	260,203 (-4.8%)	4,507 (54.2%)	94,652 (28.1%)	15,219 (1.4%)	56,089 (2.9%)	430,670 (2.6%)
2011	319,355 (22.7%)	7,437 (65.0%)	120,177 (27.0%)	15,316 (0.6%)	56,671 (1.0%)	518,956 (20.5%)
2012	276,535 (-13.4%)	12,692 (70.7%)	140,089 (16.6%)	16,791 (9.6%)	57,624 (1.7%)	503,731 (-2.9%)
2013	269,137 (-2.7%)	21,074 (66.0%)	167,663 (19.7%)	16,518 (-1.6%)	59,894 (3.9%)	534,286 (6.1%)

- annual decrease annual increase +

Sources: EIA, GEA, LBNL, SEIA/GTM, Larry Sherwood/IREC

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State Renewable Energy Information: Summary

II

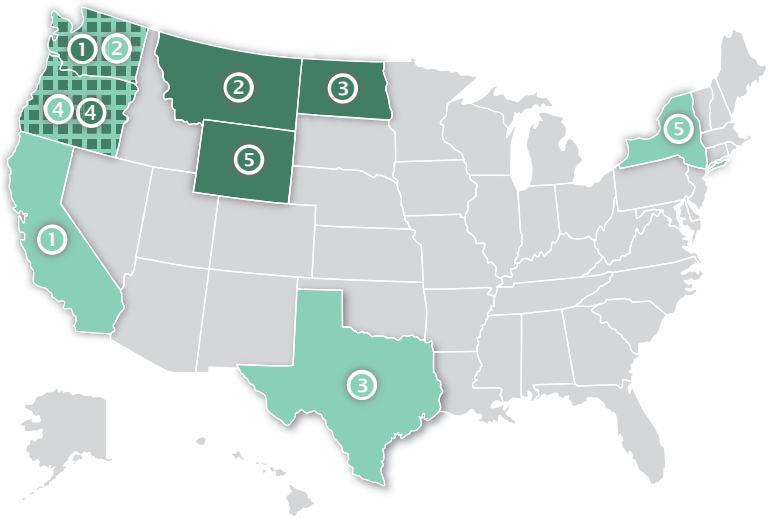
- In 2013, **California had the most installed renewable electricity capacity** of any U.S. state (26.0 GW), and also had the most grid-connected solar PV capacity (5.1 GW).
- In 2013, **Washington had the most installed renewable electricity capacity per capita**, followed by Montana, North Dakota, Oregon, and Wyoming.
- California installed nearly 2.6 GW of solar and 0.3 GW of wind capacity in 2013, the most of any state.
- **Texas** continued in 2013 as the state with the **most installed wind capacity**, with **12.3 GW**.
- A combination of **state renewable portfolio standards and state and federal incentives** for renewable electricity and renewable resource development continues to contribute to growth of renewable generation in many states.*

*Although the federal production tax credit (PTC) expired on December 31, 2013, its last extension included an adjustment of eligibility criteria that is expected to result in the qualification of renewable generation projects that began construction in 2013 and maintain construction into 2014 and 2015. The solar component of the federal investment tax credit (ITC) is scheduled to be reduced from 30% to 10% beginning in 2017 (Source: Lantz et al. 2014).

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Top States for Cumulative Renewable Electricity Installed Capacity (2013)

II



Total Renewables	
1	California
2	Washington
3	Texas
4	Oregon
5	New York

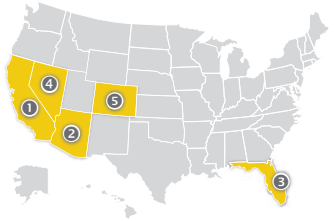
Per Capita Renewables	
1	Washington
2	Montana
3	North Dakota
4	Oregon
5	Wyoming

Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC, U.S. Census

Top States for Cumulative Renewable Electricity Installed Capacity (2013)



Solar PV*
1 California
2 Arizona
3 New Jersey
4 North Carolina
5 Massachusetts

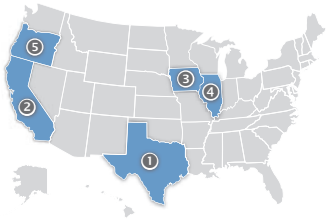


CSP
1 California
2 Arizona
3 Florida
4 Nevada
5 Colorado

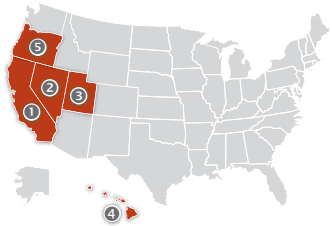
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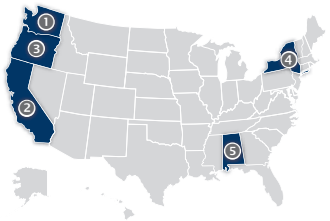
Biomass
1 California
2 Florida
3 Georgia
4 Virginia
5 Alabama



Wind
1 Texas
2 California
3 Iowa
4 Illinois
5 Oregon



Geothermal
1 California
2 Nevada
3 Utah
4 Hawaii
5 Oregon



Hydropower
1 Washington
2 California
3 Oregon
4 New York
5 Alabama

Sources: EIA, LBNL, Larry Sherwood/IREC, SEIA/GTM
*Grid-connected only

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Cumulative Renewable Electricity Installed Capacity (MW) (2013)
NORTHEAST

II

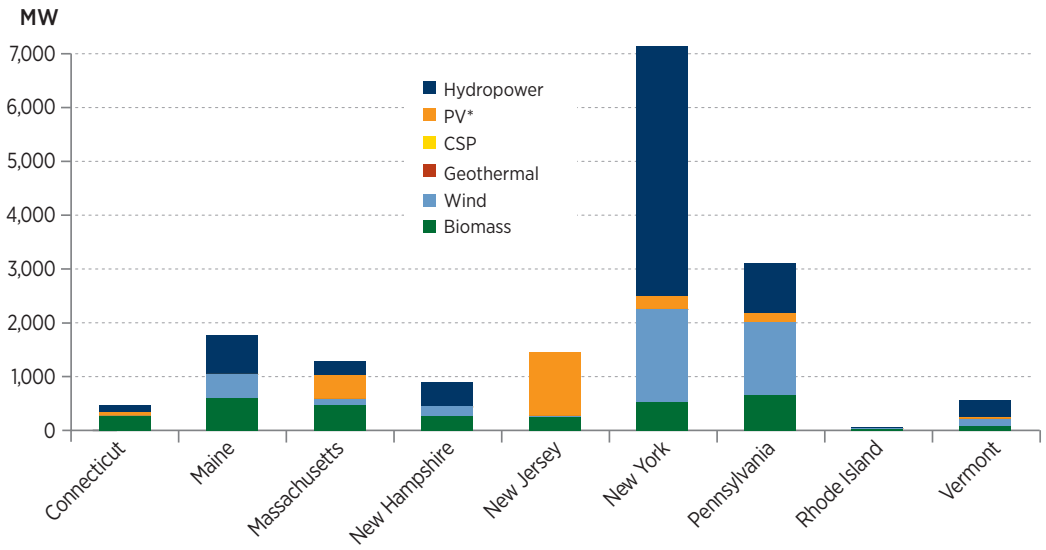
	Wind	PV*	CSP	Geothermal	Biomass	Hydropower	Total Renewables	Per capita Renewable Electricity watts/person
New York	1,722	241	0	0	526	4,659	**7,147**	**364**
Pennsylvania	1,340	180	0	0	665	915	**3,101**	**243**
Maine	431	5	0	0	609	725	**1,769**	**1,332**
New Jersey	9	1,185	0	0	254	13	**1,461**	**164**
Massachusetts	106	445	0	0	472	267	**1,290**	**193**
New Hampshire	171	10	0	0	266	446	**893**	**675**
Vermont	119	42	0	0	88	315	**563**	**899**
Connecticut	0	77	0	0	263	119	**459**	**128**
Rhode Island	9	8	0	0	26	3	**46**	**43**

Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC, U.S. Census
*Grid-connected only

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Cumulative Renewable Electricity Installed Capacity (2013)
NORTHEAST

II



Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only

Cumulative Renewable Electricity Installed Capacity (MW) (2013)
MIDWEST

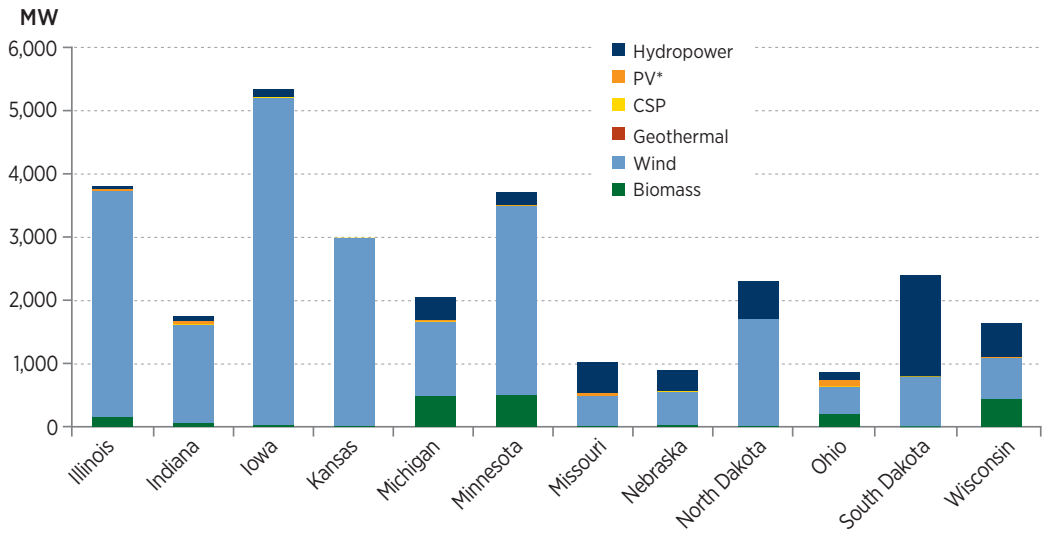
II

	Wind	PV*	CSP	Geothermal	Biomass	Hydropower	Total Renewables	Per capita Renewable Electricity watts/person
Iowa	5,177	5	0	0	19	131	**5,332**	**1,725**
Illinois	3,568	43	0	0	143	40	**3,794**	**294**
Minnesota	2,987	15	0	0	491	205	**3,698**	**682**
Kansas	2,967	1	0	0	7	7	**2,982**	**1,031**
South Dakota	783	0	0	0	0	1,602	**2,385**	**2,823**
North Dakota	1,681	0	0	0	10	614	**2,305**	**3,186**
Michigan	1,163	22	0	0	488	370	**2,043**	**206**
Indiana	1,544	49	0	0	62	92	**1,748**	**266**
Wisconsin	648	23	0	0	430	525	**1,626**	**283**
Missouri	459	49	0	0	12	499	**1,019**	**169**
Nebraska	534	1	0	0	16	332	**883**	**472**
Ohio	431	98	0	0	195	129	**853**	**74**

Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC, U.S. Census
*Grid-connected only

Cumulative Renewable Electricity Installed Capacity (2013)
MIDWEST

II



Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only

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Cumulative Renewable Electricity Installed Capacity (MW) (2013)
SOUTH

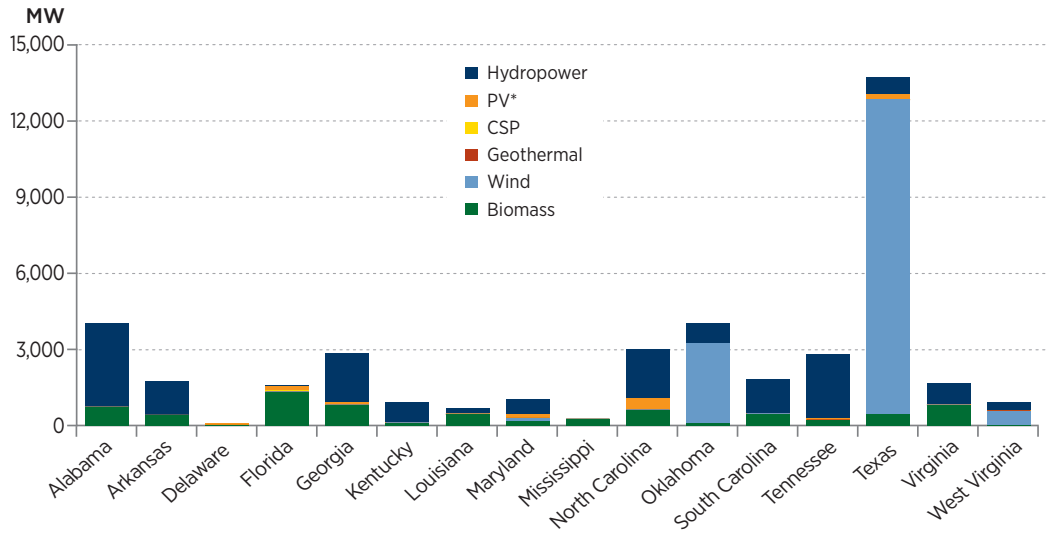
II

	Wind	PV*	CSP	Geothermal	Biomass	Hydropower	Total Renewables	Per capita Renewable Electricity watts/person
Texas	12,354	216	0	0	463	676	**13,709**	**518**
Oklahoma	3,134	1	0	0	88	805	**4,028**	**1,046**
Alabama	0	2	0	0	720	3,280	**4,001**	**828**
North Carolina	0	469	0	0	616	1,890	**2,976**	**302**
Georgia	0	110	0	0	807	1,927	**2,844**	**285**
Tennessee	29	65	0	0	197	2,499	**2,791**	**430**
South Carolina	0	8	0	0	467	1,364	**1,839**	**385**
Arkansas	0	2	0	0	399	1,321	**1,721**	**582**
Virginia	0	13	0	0	808	832	**1,653**	**200**
Florida	0	137	75	0	1,324	56	**1,592**	**81**
Maryland	120	175	0	0	163	551	**1,009**	**170**
Kentucky	0	8	0	0	110	804	**922**	**210**
West Virginia	583	2	0	0	2	326	**914**	**493**
Louisiana	0	47	0	0	445	192	**684**	**148**
Mississippi	0	1	0	0	246	0	**247**	**82**
Delaware	2	63	0	0	8	0	**73**	**79**

Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC, U.S. Census
*Grid-connected only

Cumulative Renewable Electricity Installed Capacity (2013)
SOUTH

II



Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only

Cumulative Renewable Electricity Installed Capacity (MW) (2013)
WEST

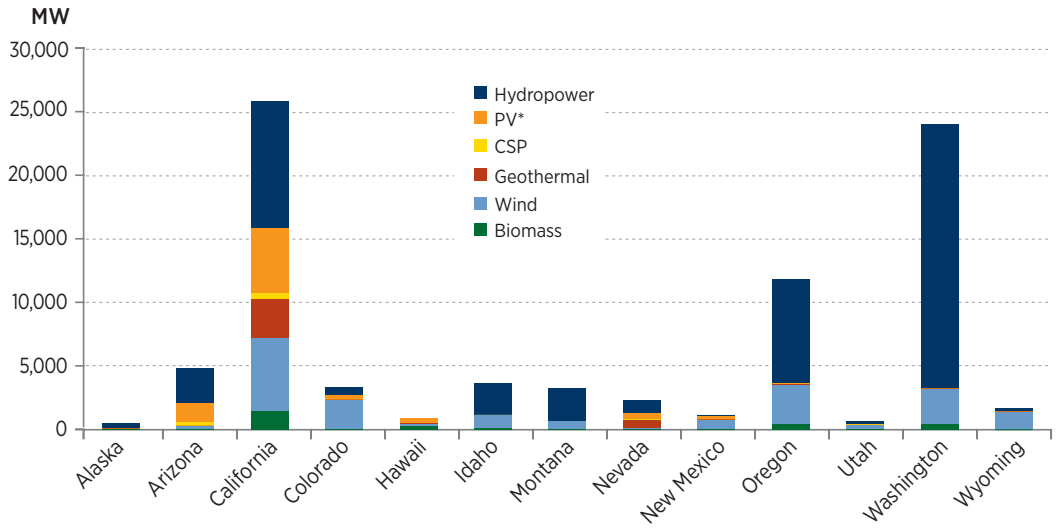
II

	Wind	PV*	CSP	Geothermal	Biomass	Hydropower	Total Renewables	Per capita Renewable Electricity watts/person
California	5,829	5,183	489	3,012	1,452	10,040	**26,005**	**678**
Washington	2,808	27	0	0	423	20,957	**24,215**	**3,474**
Oregon	3,153	63	0	33	409	8,243	**11,900**	**3,028**
Arizona	238	1,563	283	0	41	2,718	**4,843**	**731**
Idaho	973	2	0	18	148	2,541	**3,682**	**2,264**
Colorado	2,332	360	0	0	18	645	**3,356**	**637**
Montana	645	3	0	0	4	2,639	**3,291**	**3,242**
Nevada	152	424	64	626	3	1,052	**2,322**	**832**
Wyoming	1,410	1	0	0	0	303	**1,714**	**2,942**
New Mexico	778	257	0	0	7	82	**1,123**	**538**
Hawaii	206	358	7	51	270	26	**919**	**654**
Utah	325	16	0	52	13	262	**668**	**230**
Alaska	62	0	0	0	12	420	**494**	**672**

Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC, U.S. Census
*Grid-connected only

Cumulative Renewable Electricity Installed Capacity (2013)
WEST

II



Sources: EIA, LBNL, SEIA/GTM, Larry Sherwood/IREC

*Grid-connected only



III. Global Renewable Energy Development

Global Renewable Energy Development: Summary

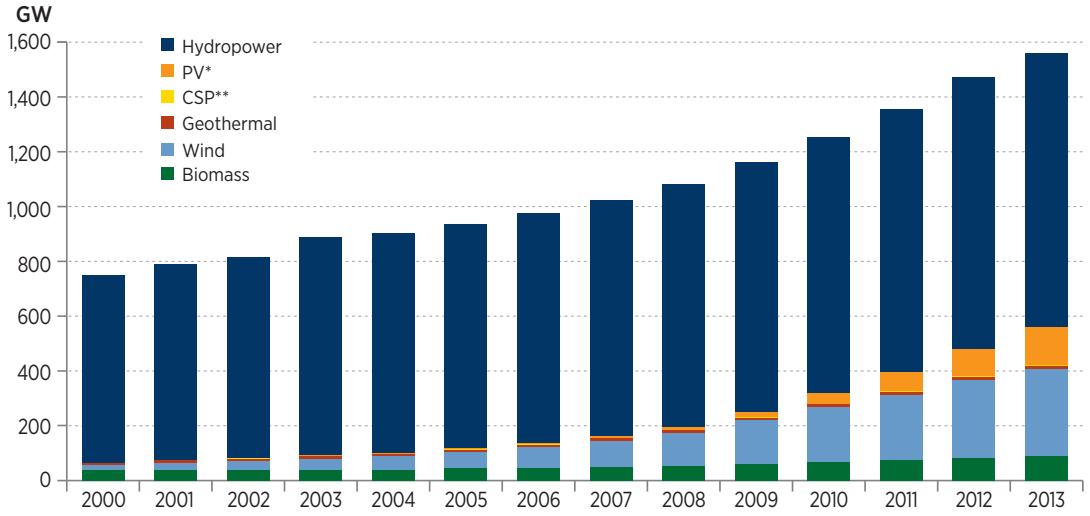
III

- Cumulative global renewable electricity **installed capacity grew by 108%** from 2000 to 2013 (from 748 GW to 1,560 GW).
- Renewable sources accounted for **23% of all electricity generation worldwide** (5,095 TWh) in 2013.
- Wind and solar electricity have been the fastest growing renewable electricity technologies worldwide. **Wind electricity generation grew by a factor of 18 and solar electricity generation grew by a factor of 68** between 2000 and 2013.
- In 2013, China led the world in cumulative total renewable electricity installed capacity, as well as cumulative wind and hydropower capacity. Germany led the world in cumulative PV installed capacity. The United States led the world in geothermal and biomass installed capacity.

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Global Renewable Electricity Capacity

III



*Grid-connected only

**CSP includes Concentrated Photovoltaic (CPV)

Source: Renewable Energy Policy Network for the 21st Century (REN21)

Global Renewable Cumulative Electricity Capacity Annual Percent Change

	Hydropower	Solar PV*	CSP	Wind	Geothermal	Biomass	All Renewables
2000	0%	22%	0%	31%	0%	6%	1%
2001	5%	29%	0%	33%	0%	8%	6%
2002	2%	33%	0%	29%	3%	0%	3%
2003	9%	25%	0%	29%	9%	-3%	9%
2004	1%	33%	0%	20%	0%	0%	2%
2005	2%	38%	0%	23%	5%	13%	4%
2006	3%	32%	0%	25%	3%	7%	4%
2007	3%	5%	5%	27%	0%	6%	5%
2008	3%	71%	14%	29%	4%	4%	6%
2009	3%	62%	22%	31%	7%	16%	7%
2010	3%	91%	83%	25%	3%	13%	8%
2011	3%	78%	43%	20%	1%	9%	8%
2012	3%	41%	57%	19%	5%	12%	8%
2013	1%	39%	36%	12%	3%	6%	6%



Source: REN21

*Grid-connected only

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Renewable Electricity as a Percentage of Total Installed Global Electricity Capacity

III

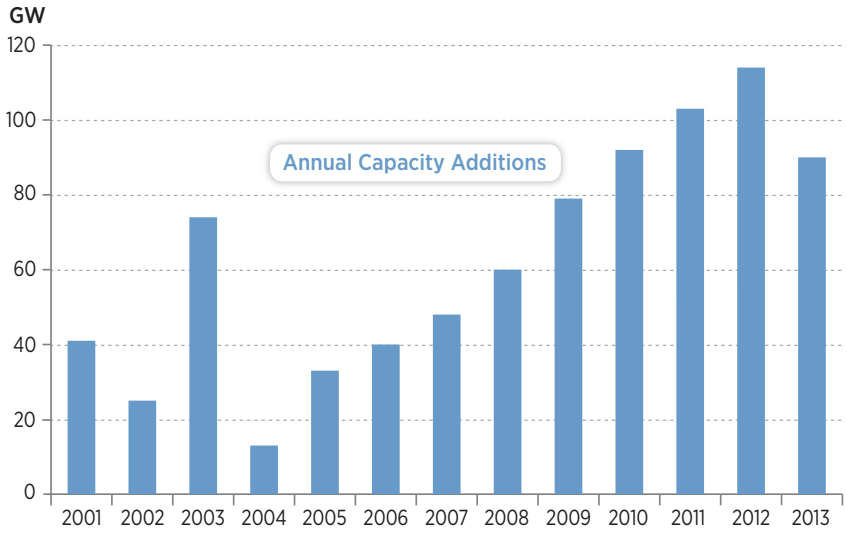
	Hydropower	Solar PV*	CSP	Wind	Geothermal	Biomass	All Renewables	Renewable Capacity (GW)
2000	19.8%	0.0%	0.0%	0.5%	0.2%	1.1%	**21.6%**	**748**
2001	20.1%	0.1%	0.0%	0.7%	0.2%	1.1%	**22.2%**	**789**
2002	19.8%	0.1%	0.0%	0.8%	0.2%	1.1%	**22.0%**	**814**
2003	20.7%	0.1%	0.0%	1.0%	0.2%	1.0%	**23.1%**	**888**
2004	20.1%	0.1%	0.0%	1.2%	0.2%	1.0%	**22.6%**	**901**
2005	19.8%	0.1%	0.0%	1.4%	0.2%	1.1%	**22.7%**	**934**
2006	19.4%	0.2%	0.0%	1.7%	0.2%	1.1%	**22.7%**	**974**
2007	19.2%	0.2%	0.0%	2.1%	0.2%	1.1%	**22.8%**	**1,022**
2008	19.1%	0.3%	0.0%	2.6%	0.2%	1.1%	**23.3%**	**1,082**
2009	18.8%	0.4%	0.0%	3.3%	0.2%	1.2%	**24.0%**	**1,161**
2010	18.4%	0.8%	0.0%	3.9%	0.2%	1.3%	**24.6%**	**1,253**
2011	18.0%	1.3%	0.0%	4.5%	0.2%	1.4%	**25.4%**	**1,356**
2012	17.8%	1.8%	0.0%	5.1%	0.2%	1.5%	**26.5%**	**1,470**
2013	17.3%	2.4%	0.1%	5.5%	0.2%	1.5%	**27.0%**	**1,560**

Source: REN21

*Grid-connected only

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Global Annual Installed Renewable Electricity Capacity Growth



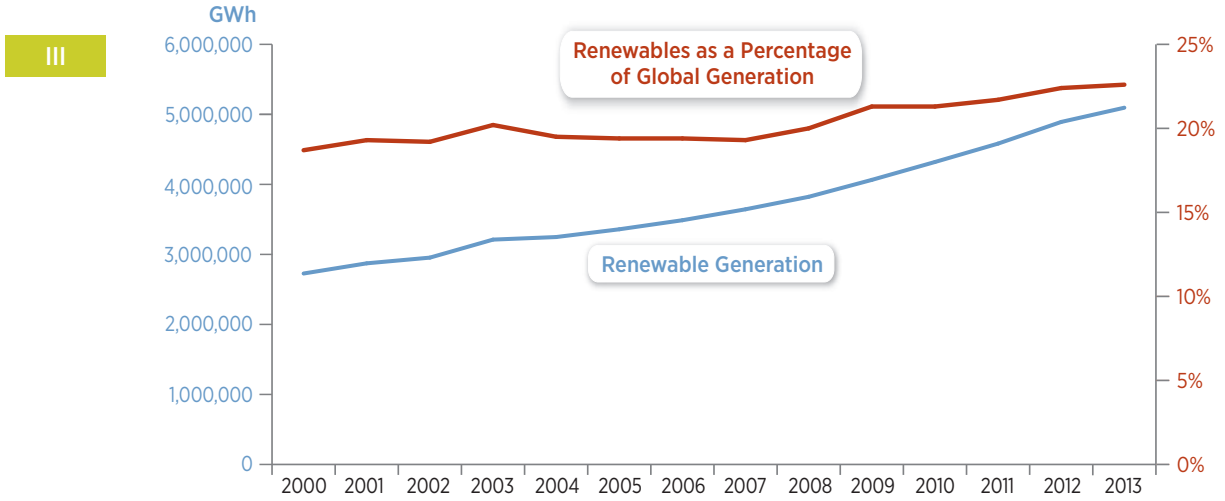
III

	Compounded Annual Growth Rate (2000–2013)
Wind	23.0%
PV*	46.8%
CSP	23.3%
Geothermal	3.0%
Biomass	8.5%
Hydropower	2.3%
All Renewables	5.8%

Source: REN21

*Grid-connected only

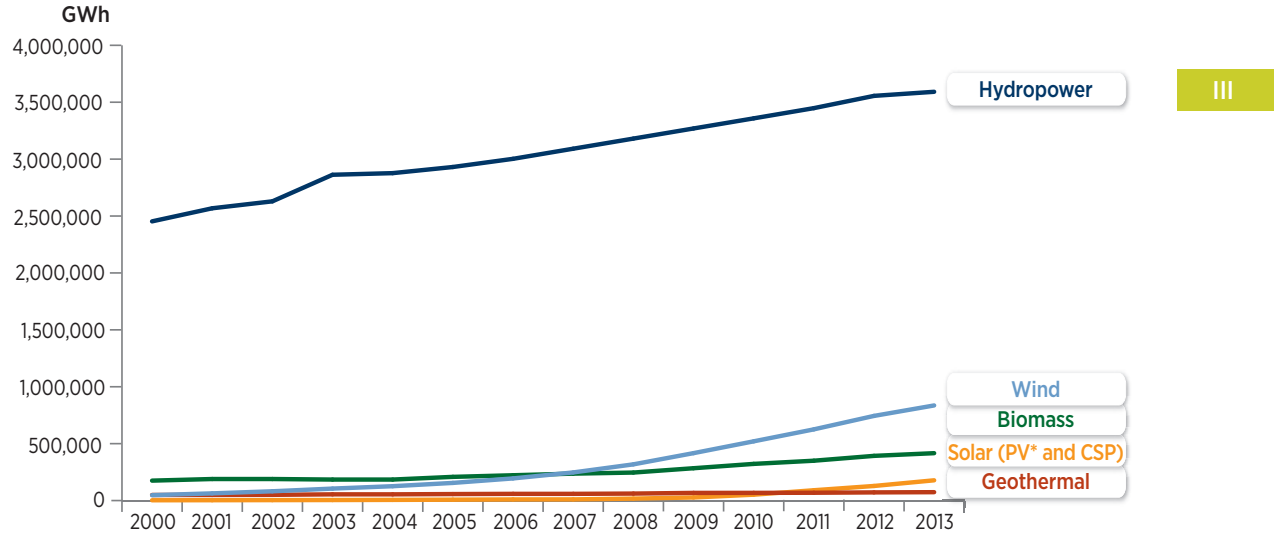
Global Renewable Electricity Generation



Generation derived using capacity factors of 14% for PV, 30% for wind, 70% for geothermal, 54% for biomass, 25% for CSP, and 41% for hydropower.

Source: REN21

Global Renewable Electricity Generation by Technology



Generation derived using capacity factors of 14% for PV, 30% for wind, 70% for geothermal, 54% for biomass, 25% for CSP, and 41% for hydropower.

Source: REN21

*Grid-connected only

Global Renewable Electricity Generation as a Percentage of Total Generation

III

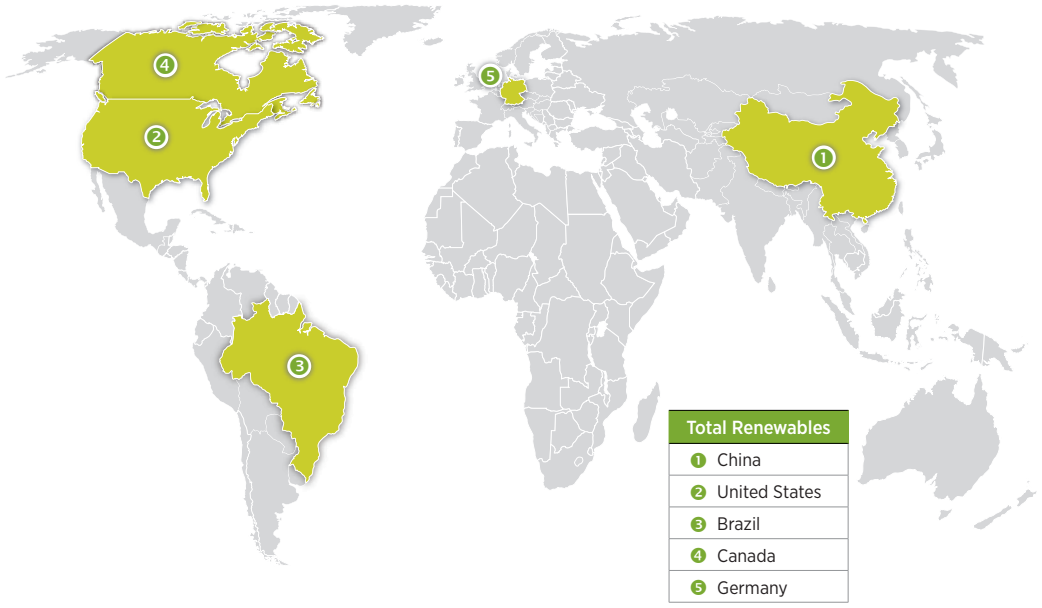
	Hydropower	Solar (PV* and CSP)	Biomass	Wind	Geothermal	All Renewables	Renewable Generation (GWh)
2000	16.8%	0.0%	1.2%	0.3%	0.3%	18.7%	2,727,082
2001	17.3%	0.0%	1.3%	0.4%	0.3%	19.3%	2,872,463
2002	17.1%	0.0%	1.2%	0.5%	0.3%	19.2%	2,953,879
2003	18.0%	0.0%	1.2%	0.7%	0.3%	20.2%	3,211,282
2004	17.3%	0.0%	1.1%	0.8%	0.3%	19.5%	3,247,899
2005	16.9%	0.0%	1.2%	0.9%	0.3%	19.4%	3,358,626
2006	16.7%	0.1%	1.2%	1.1%	0.3%	19.4%	3,488,055
2007	16.4%	0.1%	1.3%	1.3%	0.3%	19.3%	3,644,173
2008	16.6%	0.1%	1.3%	1.7%	0.3%	20.0%	3,822,689
2009	17.2%	0.1%	1.5%	2.2%	0.4%	21.3%	4,064,206
2010	16.6%	0.3%	1.6%	2.6%	0.3%	21.3%	4,319,733
2011	16.4%	0.4%	1.7%	3.0%	0.3%	21.7%	4,582,578
2012	16.3%	0.6%	1.8%	3.4%	0.3%	22.4%	4,891,891
2013	15.9%	0.8%	1.8%	3.7%	0.3%	22.6%	5,095,079

Source: REN21

*Grid-connected only

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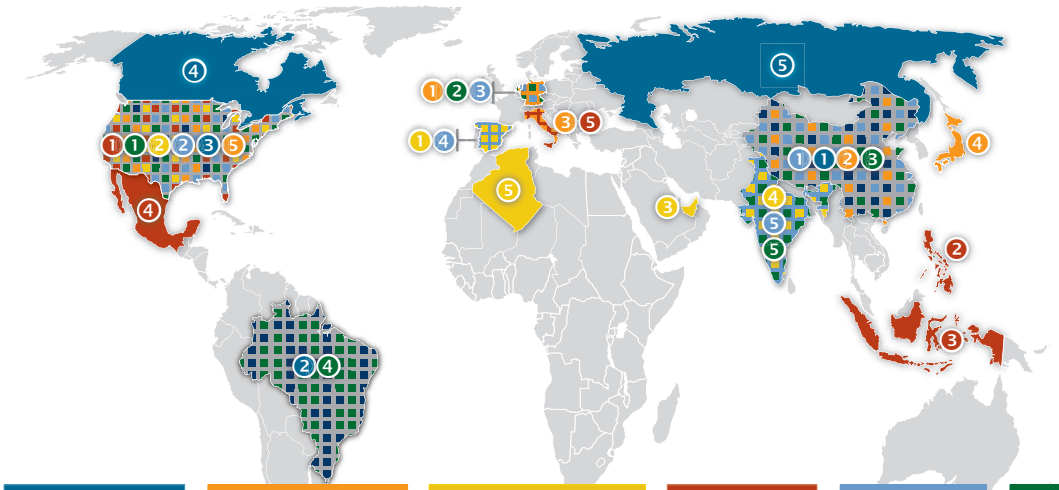
Top Countries for Renewable Electricity Installed Capacity (2013)



Sources: REN21

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Top Countries with Installed Renewable Electricity by Technology (2013)



Hydropower	Solar PV*	CSP	Geothermal	Wind	Biomass
1 China	1 Germany	1 Spain	1 United States	1 China	1 United States
2 Brazil	2 China	2 United States	2 Philippines	2 United States	2 Germany
3 United States	3 Italy	3 United Arab Emirates	3 Indonesia	3 Germany	3 China
4 Canada	4 Japan	4 India	4 Mexico	4 Spain	4 Brazil
5 Russia	5 United States	5 Algeria	5 Italy	5 India	5 India

Sources: REN21

*Grid-connected only

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IV. Wind

Wind: Summary

- In the United States, wind electricity experienced limited growth, with only 1.1 GW of new capacity added, a 92% reduction from the record-setting 13.1 GW installed in 2012. This drop can be attributed largely to a late extension of and modified eligibility requirements for the federal production tax credit (PTC).*

- At the end of 2013, there was more U.S. wind power capacity under construction than at any time previously: construction activity was started on more than 10.9 GW during the fourth quarter, resulting in a total pipeline of 12.0 GW of projects under construction.**

- **China continued in 2013 to lead the world in cumulative installed wind capacity**, with more than 91 GW installed as of the end of 2013.

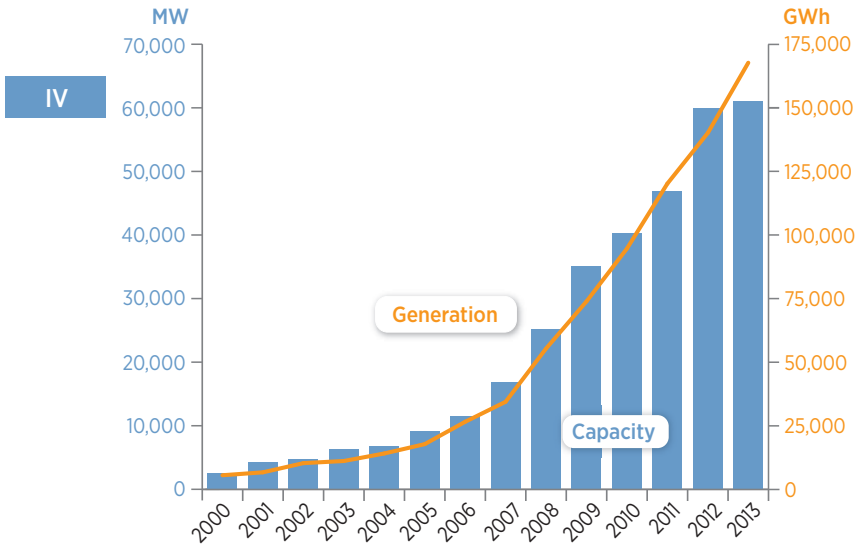
- **Global cumulative installed offshore wind capacity surpassed 7 GW** in 2013. While projects have been proposed, no commercial offshore wind turbines have yet been commissioned in the United States.

*Source: LBNL

**Source: American Wind Energy Association (AWEA). Although the federal production tax credit (PTC) expired on December 31, 2013, its last extension included an adjustment of eligibility criteria that is expected to result in the qualification of wind projects that began construction in 2013 and maintain construction into 2014 and 2015.

U.S. Total Installed Wind Electricity Capacity and Generation

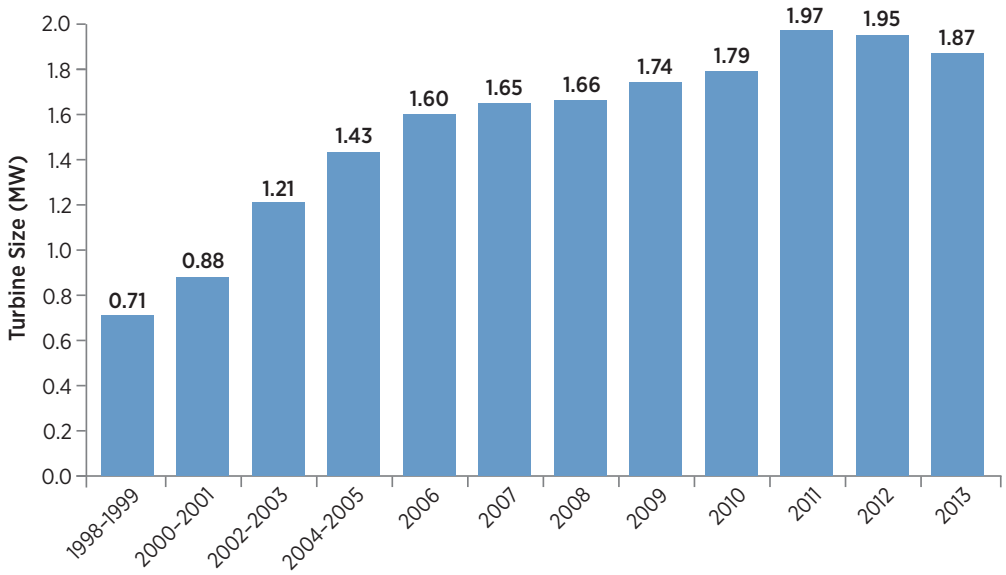
IV



	U.S. Wind Electricity Generation (GWh)	U.S. Wind Electricity Capacity and Percent Increase from Previous Year	
		Total (MW)	% Increase
2000	5,593	2,578	2.6%
2001	6,737	4,275	65.8%
2002	10,354	4,686	9.6%
2003	11,187	6,353	35.6%
2004	14,144	6,725	5.9%
2005	17,811	9,121	35.6%
2006	26,589	11,575	26.9%
2007	34,450	16,812	45.2%
2008	55,363	25,237	50.1%
2009	73,886	35,155	39.3%
2010	94,652	40,267	14.5%
2011	120,177	46,916	16.5%
2012	140,089	60,005	27.9%
2013	167,663	61,107	1.8%

Sources: LBNL, EIA

U.S. Average Installed Turbine Size



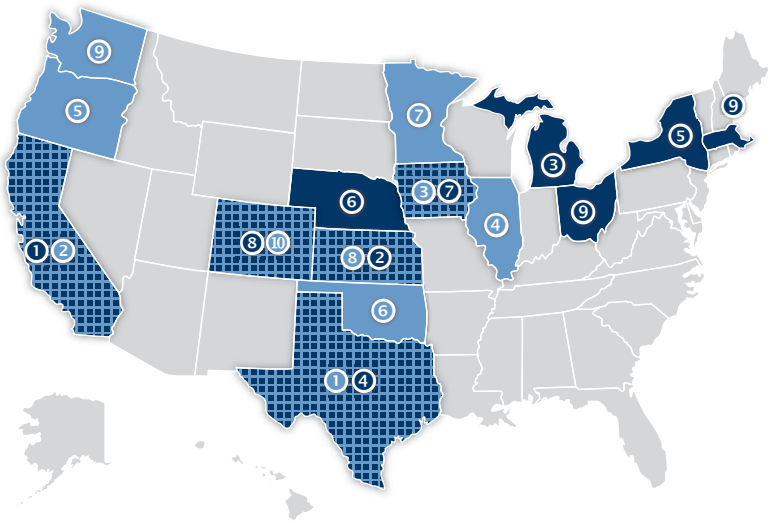
IV

Average turbine size for turbines installed in the given year(s).

Source: AWEA

States Leading Wind Power Development (2013)

IV

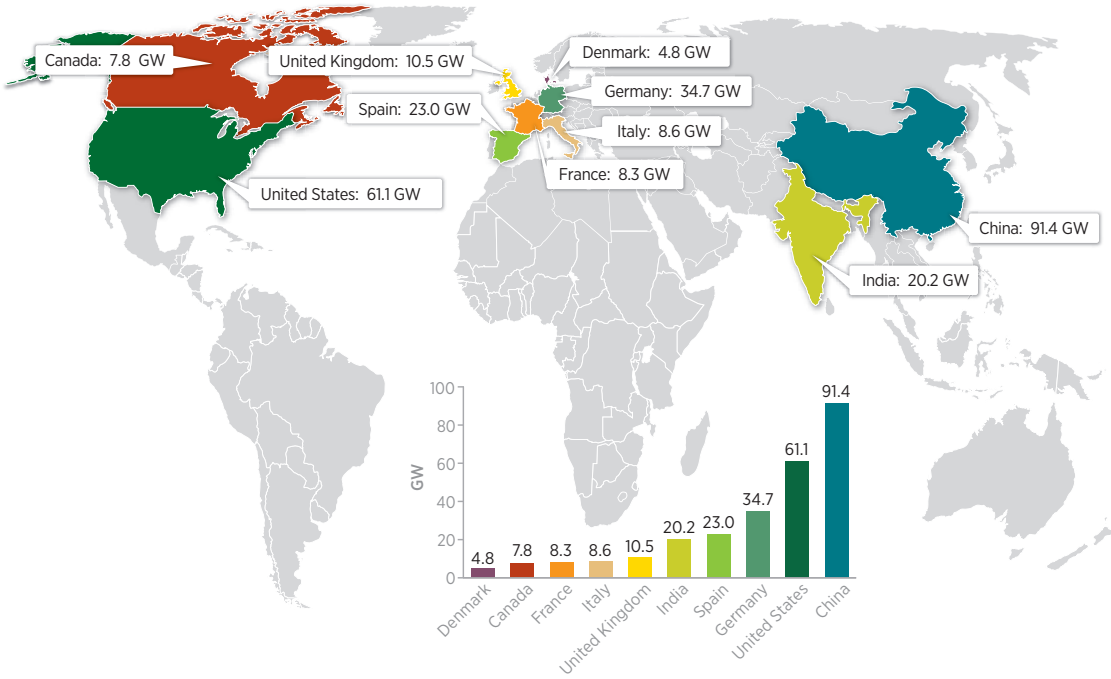


Cumulative Capacity (MW)	
1 Texas	12,354
2 California	5,829
3 Iowa	5,177
4 Illinois	3,568
5 Oregon	3,153
6 Oklahoma	3,134
7 Minnesota	2,987
8 Kansas	2,967
9 Washington	2,808
10 Colorado	2,332

Annual Capacity (MW)	
1 California	269
2 Kansas	254
3 Michigan	175
4 Texas	141
5 New York	84
6 Nebraska	75
7 Iowa	45
8 Colorado	32
9 Ohio	3
9 Massachusetts	3

Source: LBNL

Cumulative Wind Electricity Capacity (2013) – Top 10 Countries



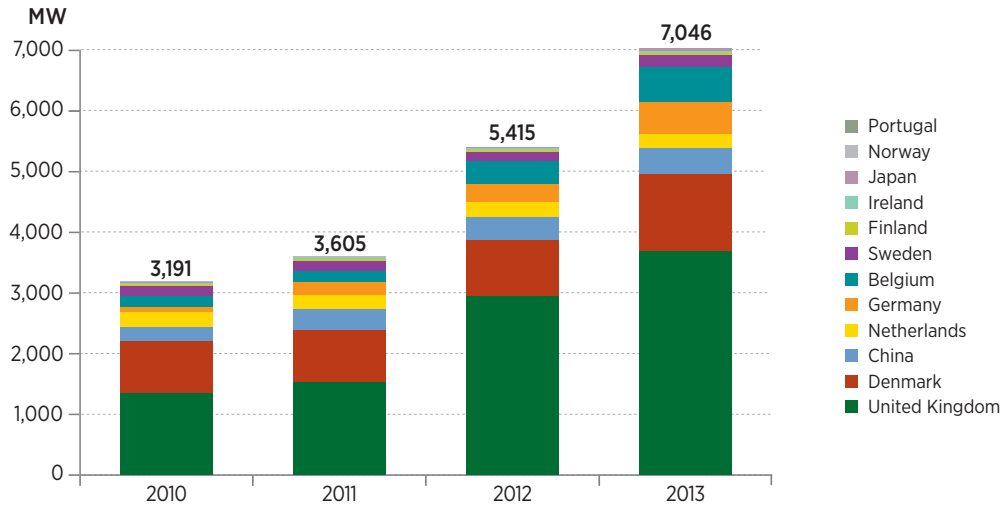
IV

Sources: LBNL, REN21
Includes offshore wind

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Cumulative Installed Offshore Wind Capacity by Country (MW)

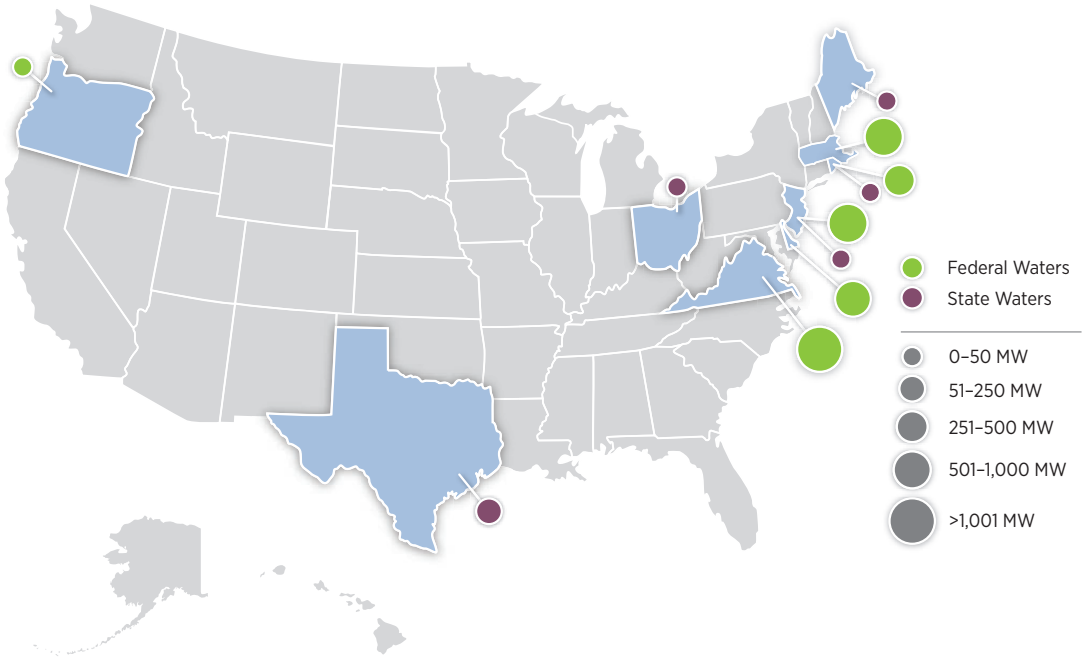
IV



Sources: Global Wind Energy Council (GWEC), LBNL

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U.S. Offshore Wind Electricity Proposed Projects (2013)



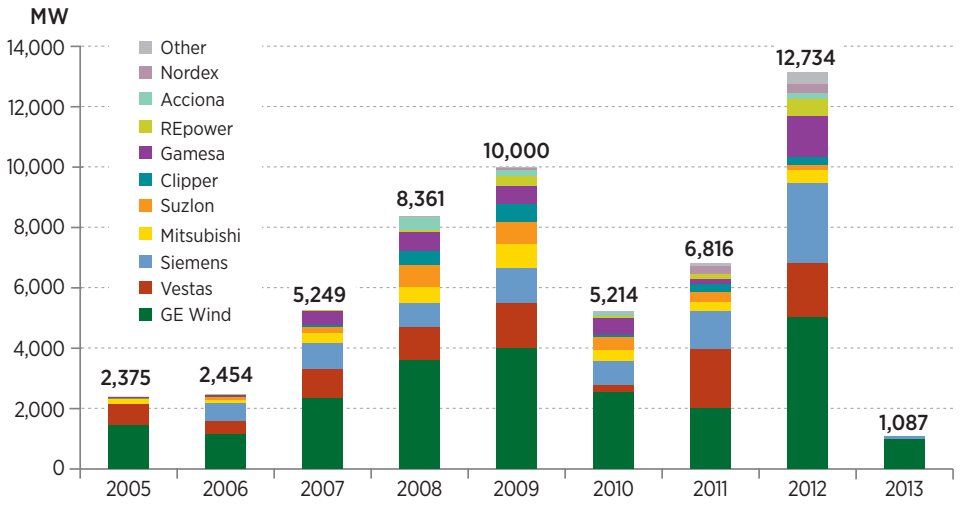
IV

Source: LBNL, prepared by Navigant Consulting, 2013

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Annual U.S. Wind Turbine Installations by Manufacturer (MW)

IV



Source: LBNL

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IV



V. Solar

Solar: Summary

- Solar electricity generating capacity **grew by a factor of 35 between 2000 and 2013** and currently accounts for 0.5% of annual U.S. electricity generation. PV cumulative capacity increased 65% in 2013 alone.*
- Countries with extensive solar policies—such as Germany and Spain—lead the world in solar PV and CSP deployment, respectively. Similarly, **U.S. states with extensive solar incentives led the United States in both cumulative and annual installations in 2013** (California, Arizona, New Jersey, North Carolina, and Massachusetts).**
- U.S. manufacturers currently have a small share of the worldwide PV market (2%). **Asian—particularly Chinese—manufacturers lead the market with 86% of the global photovoltaic module production**.
- **410 MW of new CSP capacity came online in the United States in 2013**, an increase in cumulative capacity of 81%. Approximately 400-500 MW of CSP capacity is currently under construction and expected to come online in 2014 and 2015, while another 3,600 MW is under development.***

V

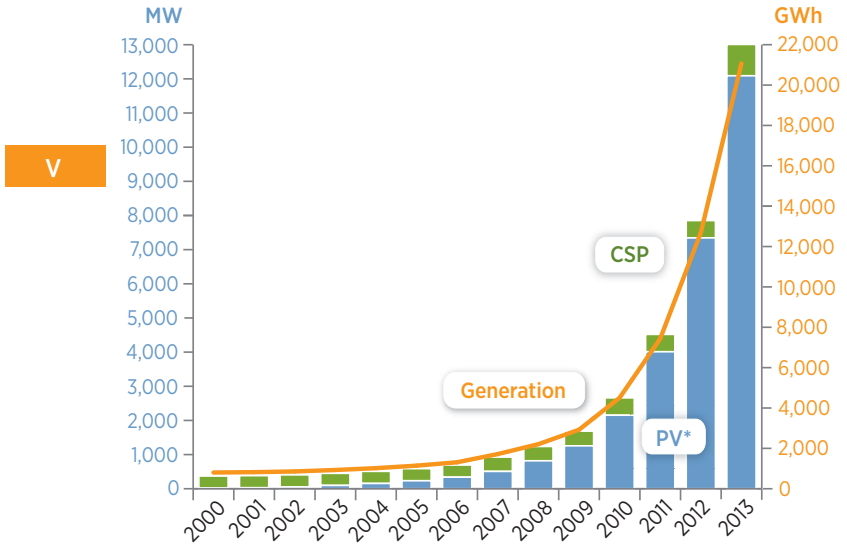
*Approximately 39% (1,874 MW) of the solar PV installed in 2013 was grid-connected distributed capacity (Source: Larry Sherwood/IREC).

**Source: SEIA 2014a.

***Source: SEIA 2014b.

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U.S. Total Solar Electricity Installed Capacity and Generation



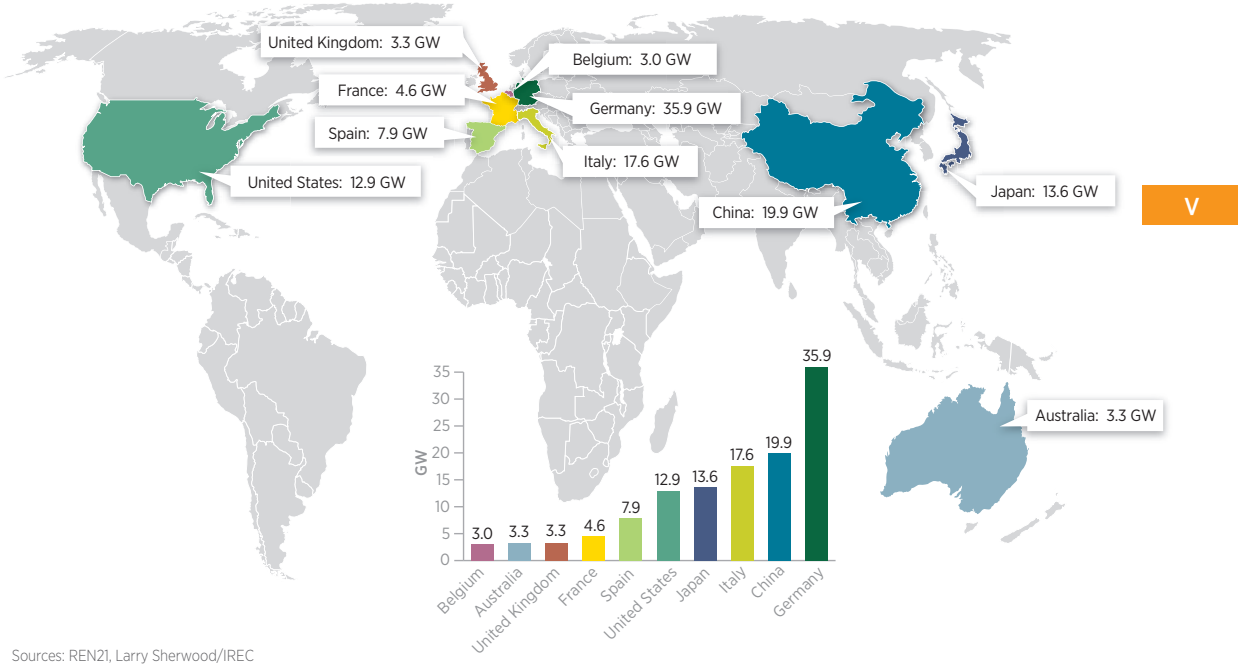
	U.S. Solar Energy Generation (GWh)	U.S. Solar Energy Capacity (MW) and % Increase from Previous Year			
		PV*	CSP	Total	Increase
2000	804	18	354	372	4.3%
2001	822	29	354	383	3.0%
2002	857	52	354	406	5.9%
2003	929	97	354	451	11.2%
2004	1,020	155	354	509	12.8%
2005	1,145	234	354	588	15.5%
2006	1,312	339	355	694	18.0%
2007	1,718	508	419	927	33.5%
2008	2,208	819	419	1,237	33.5%
2009	2,923	1,257	430	1,687	36.3%
2010	4,507	2,153	508	2,661	57.7%
2011	7,437	4,011	508	4,519	69.8%
2012	12,692	7,344	508	7,852	73.8%
2013	21,074	12,090	918	13,008	65.7%

Sources: SEIA/GTM, Larry Sherwood/IREC

Generation numbers calculated from installed capacity using an 18% capacity factor for PV and a 25% capacity factor for CSP.

*Grid-connected only

Solar Electricity Installed Capacity (2013) – Select Countries

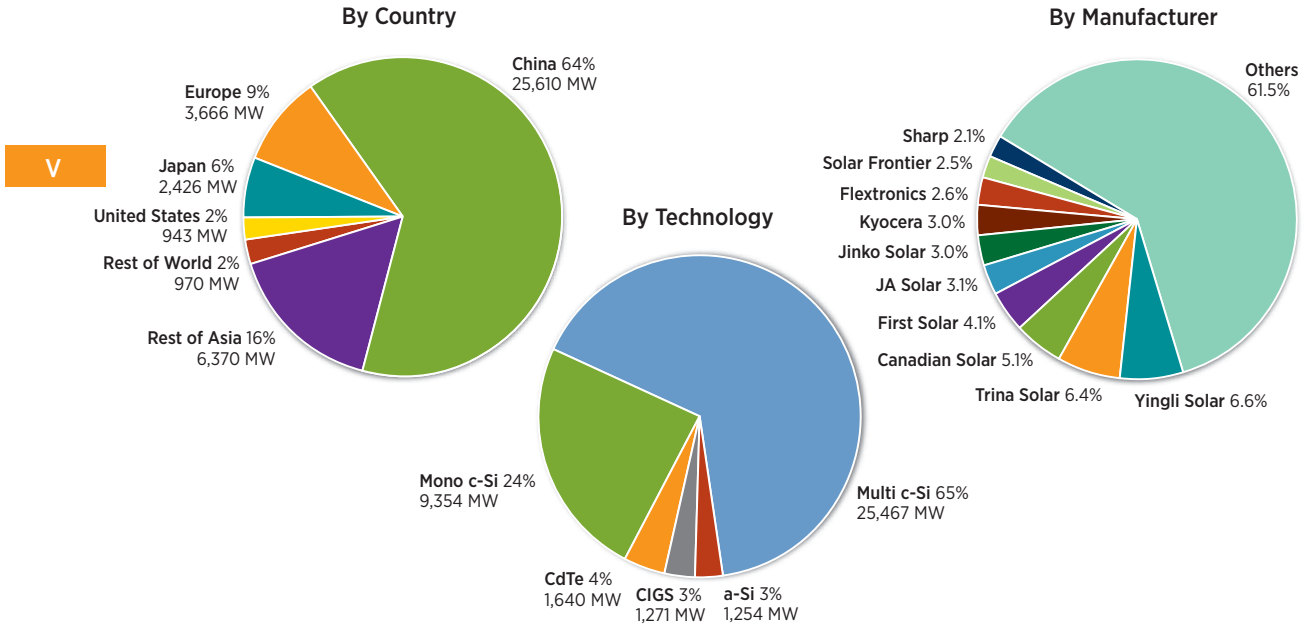


Sources: REN21, Larry Sherwood/IREC
Includes CSP and grid-connected PV

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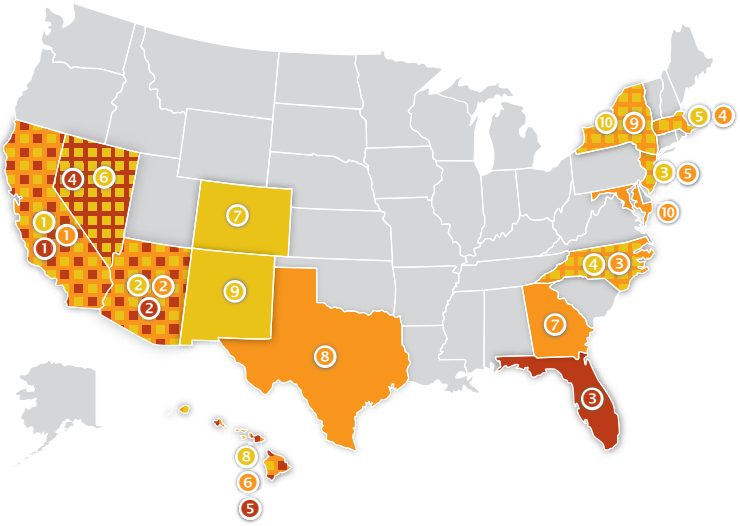
Worldwide Photovoltaic Manufacturing (2013)

Global Solar Module Production, 2013: 39,985 MW



Source: GTM PV News, May 2014

States Leading Solar Electricity Development (2013)



PV Cumulative Capacity (MW)	
1 California	5,183.4
2 Arizona	1,563.1
3 New Jersey	1,184.6
4 North Carolina	469.0
5 Massachusetts	445.0
6 Nevada	424.0
7 Colorado	360.4
8 Hawaii	358.2
9 New Mexico	256.6
10 New York	240.5

PV Annual Capacity Additions (MW)	
1 California	2,607.7
2 Arizona	423.7
3 North Carolina	261.1
4 Massachusetts	222.6
5 New Jersey	202.3
6 Hawaii	153.0
7 Georgia	88.5
8 Texas	75.6
9 New York	61.1
10 Maryland	58.7

CSP Cumulative Capacity (MW)	
1 California	489.0
2 Arizona	283.0
3 Florida	75.0
4 Nevada	64.0
5 Hawaii	7.0

V

Sources: SEIA/GTM, Larry Sherwood/IREC
Note: Grid-connected only


VI. Geothermal

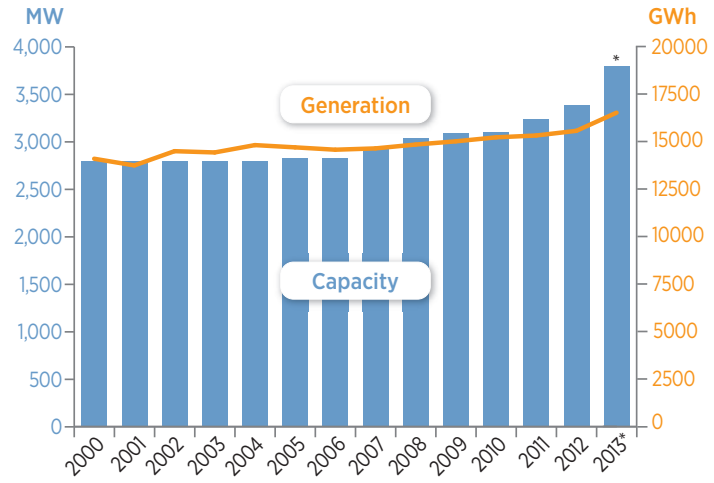
Geothermal: Summary

- **The United States leads the world in installed geothermal electricity capacity and generation**, with most of that capacity installed in California, followed by Nevada.
- U.S. geothermal electricity capacity has remained relatively stable, increasing at a **2.4% compound annual growth rate (CAGR) since 2000**.
- As a base load source of energy, geothermal is distinct from variable renewables, such as wind and solar, because **it can provide consistent electricity throughout the day and year.**
- Five Enhanced Geothermal System (EGS) technology multi-year demonstration projects were active in 2013.

VI

U.S. Geothermal Electricity Capacity and Generation

VI



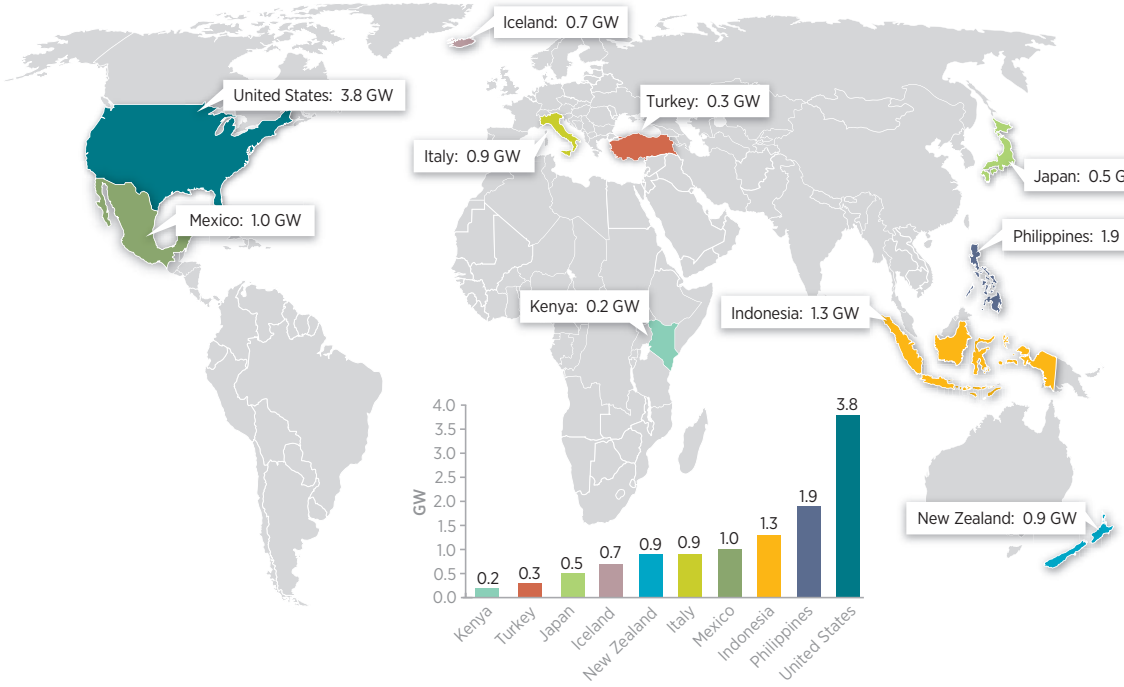
	U.S. Geothermal Electricity Generation (GWh)	U.S. Geothermal Electricity Capacity and % Increase from Previous Year	
		Total (MW)	% Increase
2000	14,093	2,798	2.2%
2001	13,741	2,798	0.0%
2002	14,491	2,798	0.0%
2003	14,424	2,798	0.0%
2004	14,811	2,798	0.0%
2005	14,692	2,828	1.1%
2006	14,568	2,831	0.1%
2007	14,637	2,936	3.7%
2008	14,840	3,039	3.5%
2009	15,009	3,085	1.5%
2010	15,219	3,100	0.5%
2011	15,316	3,238	4.4%
2012	15,562	3,385	4.5%
2013*	16,517	3,792*	12.0%*

Source for generation: EIA

Sources for capacity: GEA (2000 – 2012), EIA (2013)

*The increase in capacity in 2013 is partially due to a change in data sources from GEA to EIA, which account for capacity differently.

Cumulative Geothermal Electricity Capacity (2013) – Top 10 Countries



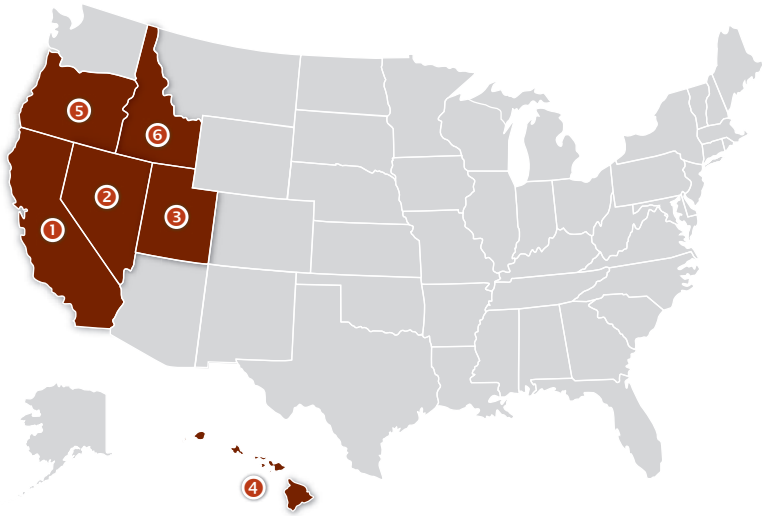
VI

Source: EIA

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Cumulative State Geothermal Electricity Development (2013)

VI



Total Installed Capacity (MW)	
1 California	3,011.6
2 Nevada	626.3
3 Utah	52.1
4 Hawaii	51.0
5 Oregon	33.0
6 Idaho	18.0

Source: EIA

U.S. Enhanced Geothermal Systems Demonstration Projects (2013)

PROJECT NAME	Company	Project Location	Start Date	End Date
1 Desert Peak East EGS Project	Ormat Technologies, Inc.	Churchill County, Nevada	2002	2015
2 Demonstration of an Enhanced Geothermal System at the Northwest Geysers Geothermal Field	Geysers Power Company, LLC	The Geysers, Cloverdale-Geyserville, California	2008	2015
3 Feasibility of EGS Development at Brady's Hot Springs	Ormat Technologies, Inc.	Churchill County, Nevada	2008	2015
4 Concept Testing and Development at the Raft River Geothermal Field	University of Utah	Raft River, Idaho	2009	2015
5 Newberry Volcano EGS Demonstration	AltaRock Energy, Inc.	La Pine, Oregon	2010	2015



VI

Source: Office of Energy Efficiency and Renewable Energy (EERE)


VII. Biopower

Biopower: Summary

- In 2013, biopower electricity generation accounted for **11% of all renewable energy generated in the United States**.

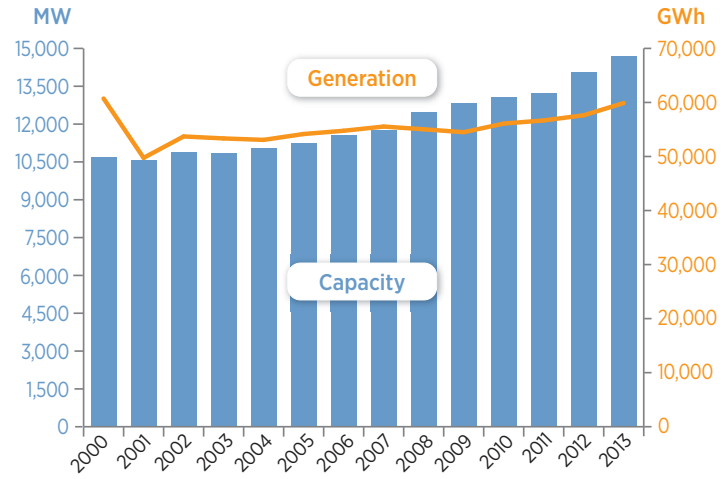
- Biopower electricity comes primarily from wood and agricultural residues that are burned as a fuel for cogeneration in the industrial sector (such as in the pulp and paper industry).

- U.S. installed biopower electricity capacity has grown recently, with a **compound annual growth rate (CAGR) of 3.8% from 2007 to 2013**.

VII

U.S. Biopower Electricity Capacity and Generation

VII



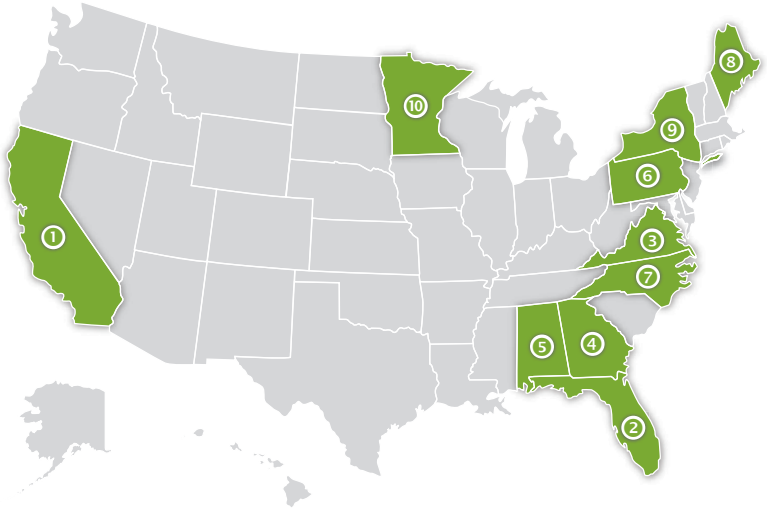
	U.S. Biopower Generation (GWh)	U.S. Biopower Capacity and % Change from Previous Year	
		Total (MW)	% Change
2000	60,726	10,676	- 2.9%
2001	49,748	10,576	- 0.9%
2002	53,709	10,867	2.8%
2003	53,340	10,856	- 0.1%
2004	53,073	11,033	1.6%
2005	54,160	11,222	1.7%
2006	54,759	11,553	2.9%
2007	55,539	11,738	1.6%
2008	55,034	12,485	6.4%
2009	54,493	12,836	2.8%
2010	56,089	13,053	1.7%
2011	56,671	13,207	1.2%
2012	57,624	14,047	6.4%
2013	59,894	14,705	4.7%

Source: EIA

The generation decrease from 2000 to 2001 reflects an EIA classification change. Beginning in 2001, non-biogenic municipal solid waste and tire-derived fuels were reclassified from waste biopower to non-renewable energy sources.

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States Leading Biopower Electricity Development (2013)



Total Installed Capacity (MW)*	
1 California	1,452
2 Florida	1,324
3 Virginia	808
4 Georgia	807
5 Alabama	720
6 Pennsylvania	665
7 North Carolina	616
8 Maine	609
9 New York	526
10 Minnesota	491

VII

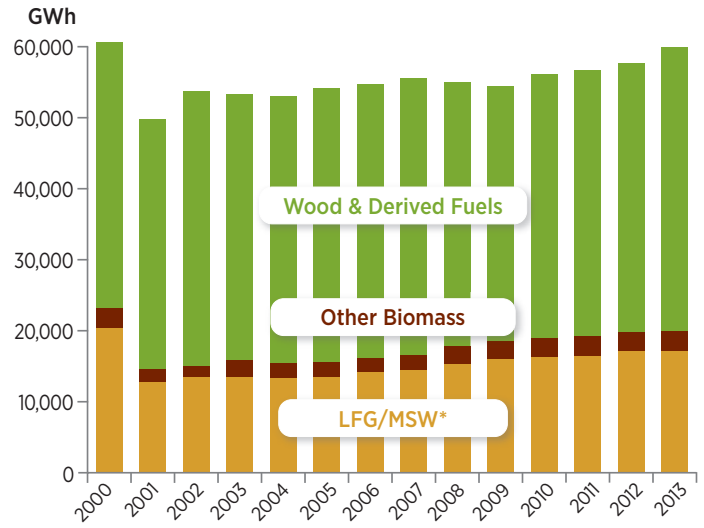
Source: EIA

*Estimated based on proposed capacity additions.

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U.S. Biopower Electricity Generation Sources (GWh)

VII



	LFG/ MSW*	Other Biomass	Wood and Derived Fuel	Total
2000	20,305	2,826	37,595	60,726
2001	12,714	1,834	35,200	49,748
2002	13,398	1,646	38,665	53,709
2003	13,383	2,428	37,529	53,340
2004	13,281	2,216	37,576	53,073
2005	13,470	2,009	38,681	54,160
2006	14,106	2,004	38,649	54,759
2007	14,462	2,063	39,014	55,539
2008	15,253	2,481	37,300	55,034
2009	15,982	2,461	36,050	54,493
2010	16,304	2,613	37,172	56,089
2011	16,398	2,824	37,449	56,671
2012	17,125	2,701	37,798	57,624
2013	17,142	2,816	39,936	59,894

Source: EIA

*LFG: Landfill Gas; MSW: Municipal Solid Waste.

**The generation decrease from 2000 to 2001 reflects an EIA classification change. Beginning in 2001, non-biogenic municipal solid waste and tire-derived fuels were reclassified from waste biopower to non-renewable energy sources.

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VII

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VIII. Hydropower

Hydropower: Summary

- Hydropower **capacity has remained essentially constant since 2000**, with less than a 2% total increase. Generation has fluctuated depending on water supply.

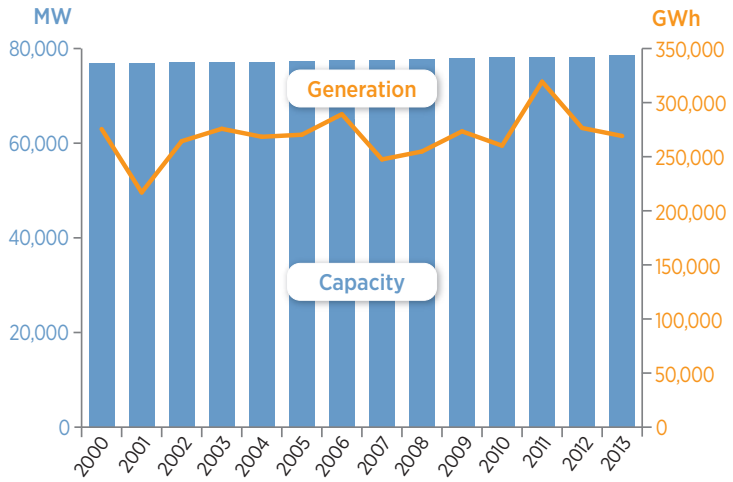
- Hydropower remains the largest source of renewable electricity generation, primarily large-scale hydropower, which **accounted for 6.6% of U.S. electricity generation in 2013**.

- Additional hydropower capacity was installed in the United States in 2013. However, generation from existing hydropower facilities has been declining since 2011.

VIII

U.S. Hydropower* Electricity Capacity and Generation

VIII

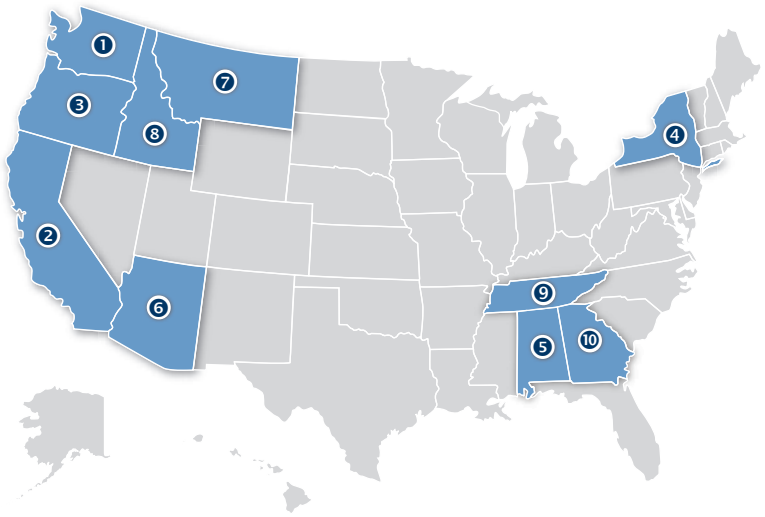


	U.S. Hydropower Generation (GWh)	U.S. Hydropower Capacity and % Increase from Previous Year	
		Total (MW)	% Increase
2000	275,573	76,946	0.0%
2001	216,961	76,911	0.0%
2002	264,329	77,047	0.2%
2003	275,806	77,020	0.0%
2004	268,417	77,130	0.1%
2005	270,321	77,354	0.3%
2006	289,246	77,419	0.1%
2007	247,510	77,432	0.0%
2008	254,831	77,640	0.3%
2009	273,445	77,910	0.3%
2010	260,203	78,204	0.4%
2011	319,355	78,194	0.0%
2012	276,535	78,241	0.1%
2013	269,137	78,457	0.3%

Source: EIA

*Excludes pumped storage

States Leading Hydropower Electricity Development (2013)



Capacity (MW)	
1 Washington	20,957
2 California	10,040
3 Oregon	8,243
4 New York	4,659
5 Alabama	3,280
6 Arizona	2,718
7 Montana	2,639
8 Idaho	2,541
9 Tennessee	2,499
10 Georgia	1,927

VIII

Source: EIA



IX. Advanced Water Power

Advanced Water Power: Summary

- U.S. interest in advanced water power—such as **tidal, river, ocean current**, and **ocean wave** energy—continues to steadily grow with many prototype projects in testing stages and permits for production facilities being filed with the Federal Energy Regulatory Commission (FERC).

- There were no new tidal power project licenses issued by FERC in 2013. However, in September 2013, Ocean Renewable Power Company's Tidal Energy Project became the first tidal power project to deliver power to an electric utility grid in the United States. More information may be found at these websites:

  - Federal Energy Regulatory Commission (FERC): www.ferc.gov/industries/hydropower/gen-info/licensing/hydrokinetics.asp

  - The Water Power Program at the U.S. Department of Energy: www1.eere.energy.gov/water

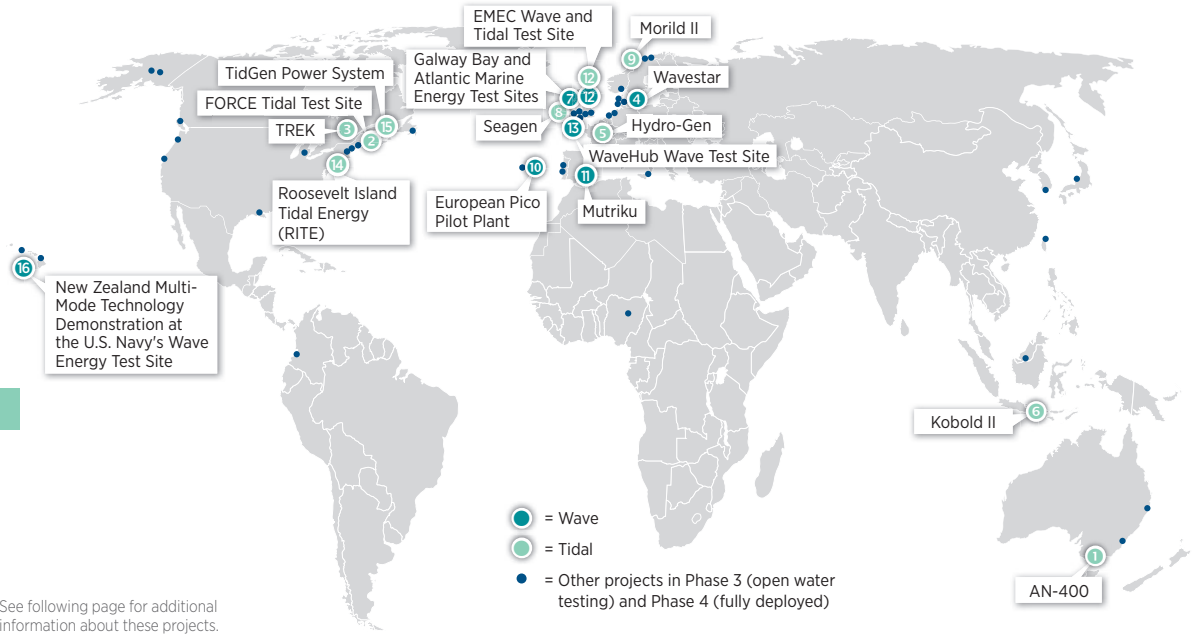
  - The Ocean Energy Systems Implementing Agreement, established by the International Energy Agency: www.ocean-energy-systems.org

- Advanced water power development activity is concentrated in the North America and Europe.

IX

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Worldwide Advanced Water Power – Select Commercial and Pilot Plants



IX

See following page for additional information about these projects.

Information about additional projects can be found in the EERE Marine and Hydrokinetic Technology Database, accessible at: http://en.openei.org/wiki/Marine_and_Hydrokinetic_Technology_Database.

Sources: EERE, Ocean Energy Systems

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Worldwide Advanced Water Power – Select Commercial and Pilot Plants

PROJECT NAME	Type	Country	Location	Project Capacity (MW)	Installed
1 AN-400	Tidal/Current	Australia	San Remo, Victoria	0.40	2008
2 FORCE Tidal Test Site (Multiple Devices)	Tidal/Current	Canada	Bay of Fundy, Parrsboro, NS	3.00+	2009
3 TREK	Tidal/Current	Canada	Saint-Lawrence River	0.25	2010
4 Wavestar	Wave	Denmark	Hanstholm	0.60	2010
5 Hydro-Gen	Tidal	France	Paimpol-Brehat	2.00	2011
6 Kobold II	Tidal/Current	Indonesia	Lombok Island	0.15	2012
7 Galway Bay and Atlantic Marine Energy Test Sites (Multiple Devices)	Wave	Ireland	Galway Bay and Belmullet Bay	1.00	2006
8 Seagen	Tidal/Current	Ireland	Strangford Lough	1.20	2006
9 Morild II	Tidal/Current	Norway	Lofoten	1.50	2010
10 European Pico Pilot Plant	Wave	Portugal	Cachorro, Pico Island	0.40	2005
11 Mutriku	Wave	Spain	Near Bilbao	0.30	2011
12 EMEC Wave and Tidal Test Site (Multiple Devices)	Wave/Tidal	United Kingdom	Stromness, Orkney, Scotland	10+	2008
13 WaveHub Wave Test Site (Multiple Devices)	Wave	United Kingdom	Hayle, Cornwall	50+	2011
14 Roosevelt Island Tidal Energy (RITE)	Tidal	United States	New York City, New York	0.07	2015
15 TidGen Power System	Tidal	United States	Cobscook Bay, Maine	0.15	2012
16 New Zealand Multi-Mode Technology Demonstration at the U.S. Navy's Wave Energy Test Site	Wave	United States	Kaneohe Bay, Hawaii	0.02	2012

Information about additional projects can be found in the EERE Marine and Hydrokinetic Technology Database, accessible at: http://en.openei.org/wiki/Marine_and_Hydrokinetic_Technology_Database.

Sources: EERE, Ocean Energy Systems

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X. Hydrogen and Fuel Cells

Hydrogen and Fuel Cells: Summary

- The cumulative installed **global fuel cell capacity for stationary power increased by a factor of 3 between 2008 and 2013**, reaching approximately 150–160 MW in 2013.
- In 2013, **global electrical generation capacity from stationary fuel cells increased by nearly 25%** from the previous year.
- In 2013, **global fuel cell shipments increased approximately 25%** from the previous year.
- In 2013, **revenues from fuel cell systems shipped increased by more than 30%** over the previous year.
- In the United States, **nearly 9 million metric tons of hydrogen are produced today**, mostly serving the petroleum refining and chemicals industries; there are more than 1,500 miles of hydrogen pipelines.

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Sources: EERE, Navigant

Hydrogen and Fuel Cells: Summary (continued)

- **The world's largest fuel cell power plant was opened in Hwasung City**, South Korea in 2013. The 59 MW facility will provide baseload power to the electricity grid and high-grade heat for district heating. Another fuel cell power generation plant (19.6 MW) is being planned for construction in Seoul City, South Korea.

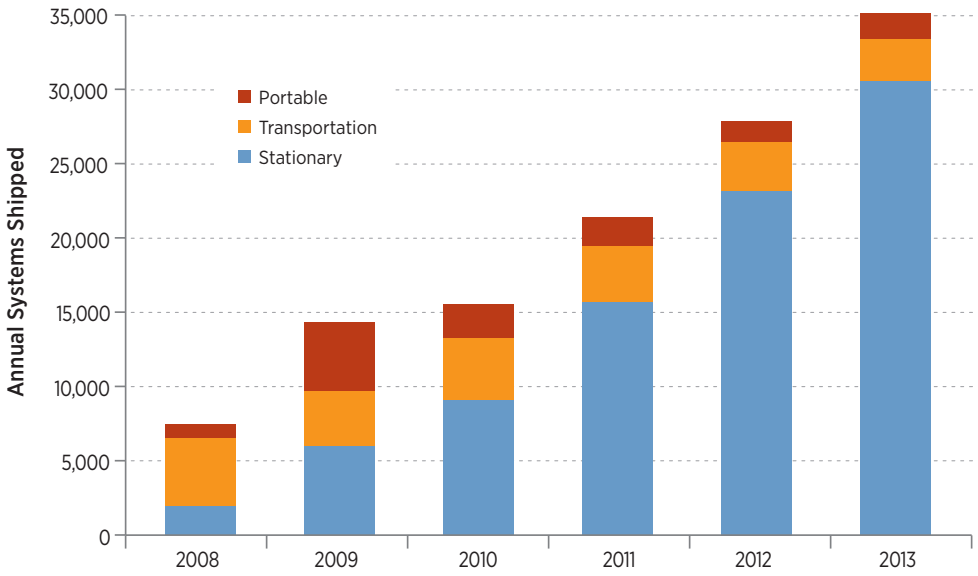
- In the United States, a 15-MW fuel cell power park was completed in Bridgeport, Connecticut and is delivering baseload power to the electricity grid.

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- Globally, more than 5,000 fuel cell units have been installed or ordered for backup power applications. These units have a successful startup rate greater than 99.7%.

- Globally, more than 8,200 fuel cells have been ordered or installed in forklifts.

Annual Fuel Cell Systems Shipped by Application, World Markets

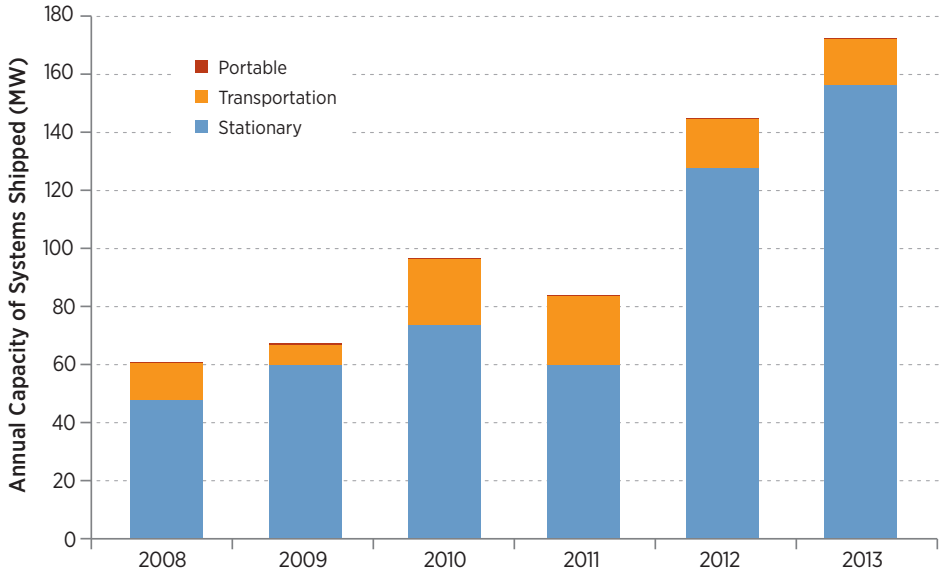


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Sources: EERE, Navigant

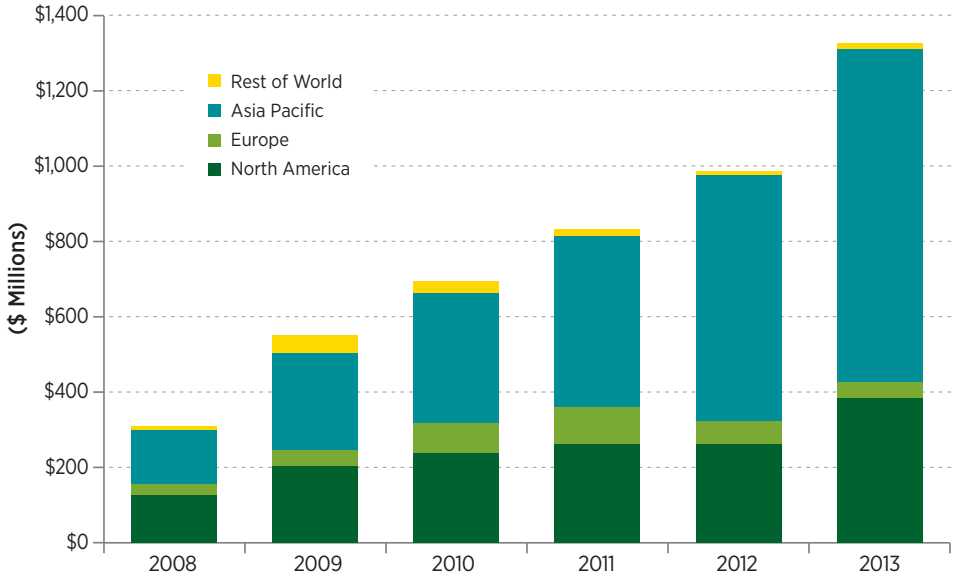
Annual Capacity of Systems Shipped by Application, World Markets

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Sources: EERE, Navigant

Fuel Cell System Revenue by Region of Manufacture



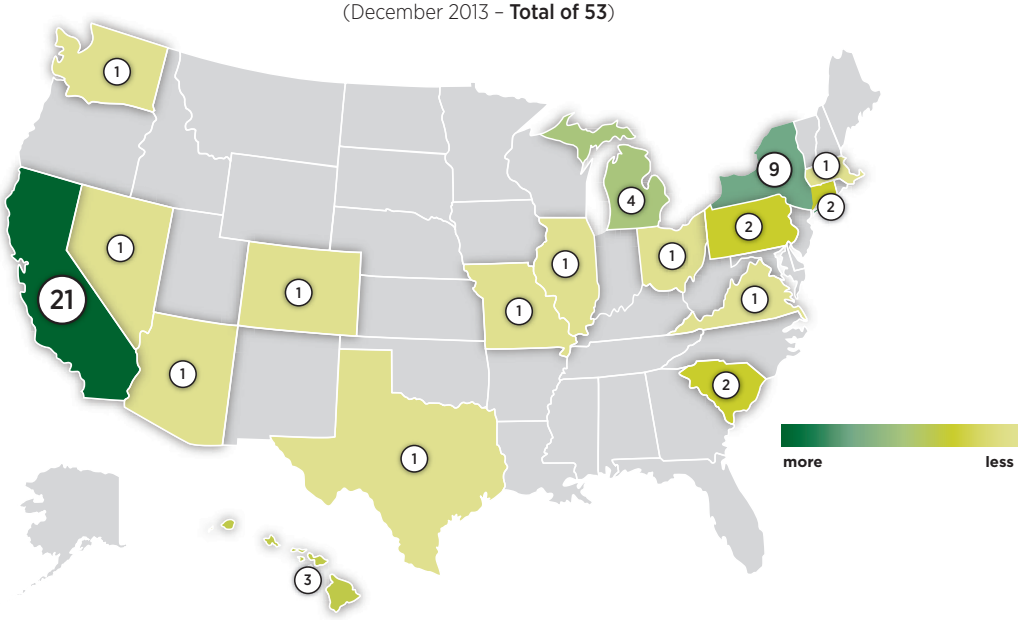
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Sources: EERE, Navigant

Hydrogen – Transportation

Number of Operational U.S. Hydrogen Fueling Stations

(December 2013 – **Total of 53**)

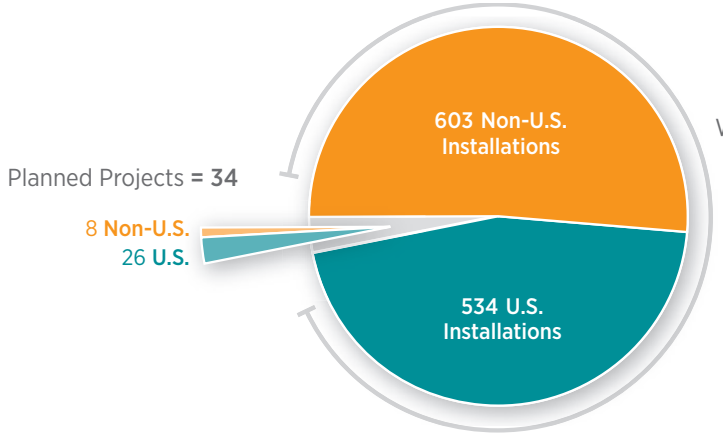


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Sources: EERE, FuelCells.org

Hydrogen – Electricity

Stationary Fuel Cell Installations, 2013



Number of installed stationary fuel cells >1 MW = 45

Located in the United States (24), South Korea (16), Japan (2), Canada (1), Germany (1), Italy (1)

X

Source: FuelCells.org



XI. Renewable and Alternative Fuels

Renewable and Alternative Fuels: Summary

- **U.S. ethanol production totaled 13,300 million gallons** per year in 2013.*
- Corn ethanol production—in contrast to Brazil's ethanol, which is produced from sugar cane—has expanded rapidly in the United States. **Between 2000 and 2013, production increased by a factor of eight**, but has leveled off since 2010.**
- In 2013, the United States** produced 57% of the world's ethanol, followed by Brazil at 27%, the European Union at 6%, China at 3%, and Canada at 2%.
- In 2013, the Indian River BioEnergy Center began producing cellulosic ethanol at commercial volumes for the first time. Several other cellulosic ethanol plants were under construction in 2013.*** In future years, at design capacity, these plants are expected to produce approximately 80 million gallons per year.
- In 2013, the number of **public and private electric vehicle charging stations was 9,214, with more than 22,000 charging outlets**.

XI

*Most U.S. ethanol is currently produced from corn, but efforts are underway by the U.S. Department of Energy and others to study and commercialize cellulosic ethanol and biobased hydrocarbon fuels, which are produced from non-food crops.

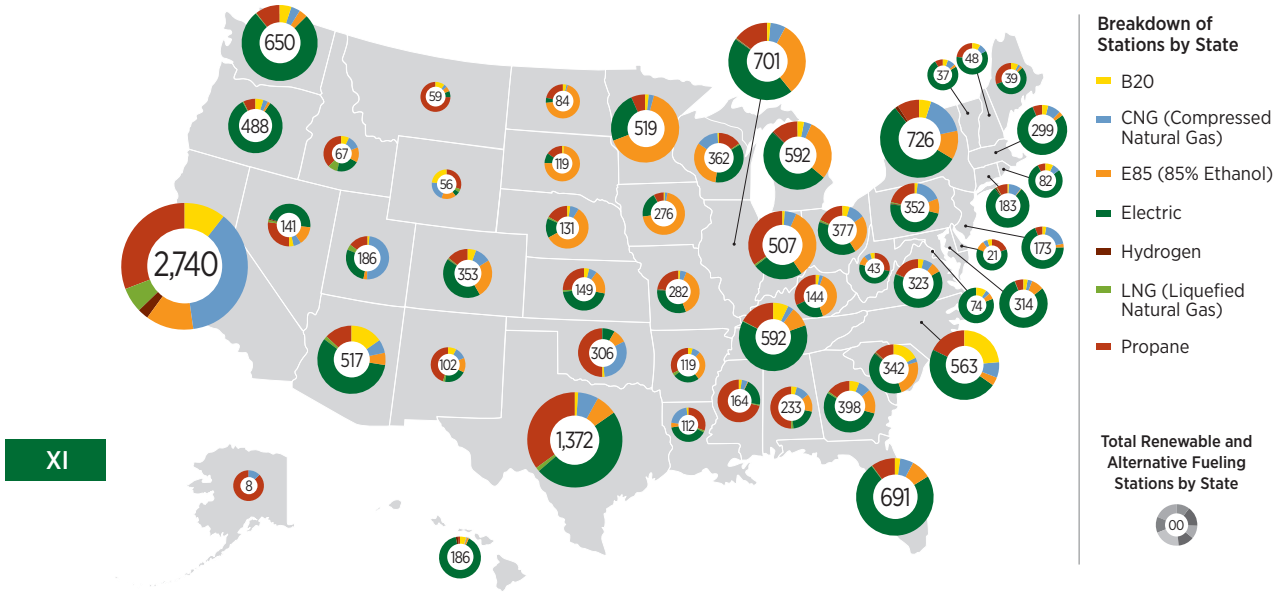
Ethanol is blended with gasoline and generally comprises up to 10% of the fuel with gasoline as the other 90% (E10). Additionally, flex-fuel vehicles can use a blend of 85% ethanol and 15% gasoline (E85).

**Constraints on corn ethanol production have included annual compliance targets established in the federal Renewable Fuels Standard (RFS); going forward, the current 10% ethanol limit in gasoline (blend wall) and the RFS advanced biofuel mandate are also expected to play a role (Source: EIA).

***Source: EERE

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Renewable and Alternative Fueling Stations by State



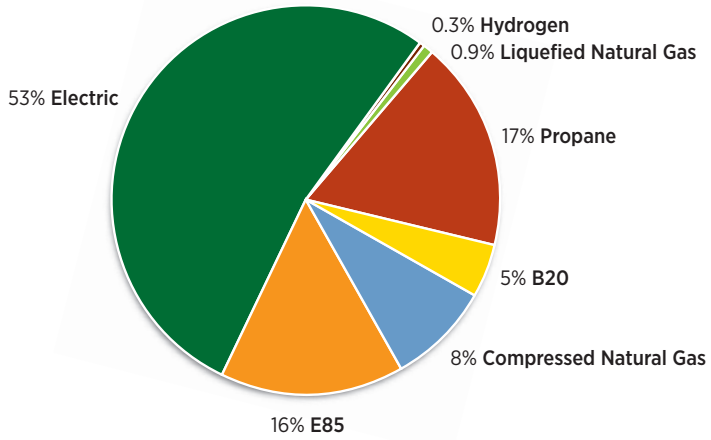
XI

Source: EERE

Data as of February 4, 2014. For the full list of fueling station counts by state, visit http://www.afdc.energy.gov/afdc/fuels/stations_counts.html.

Renewable and Alternative Fueling Stations by Type

17,402 Alternative Fueling Stations in the United States

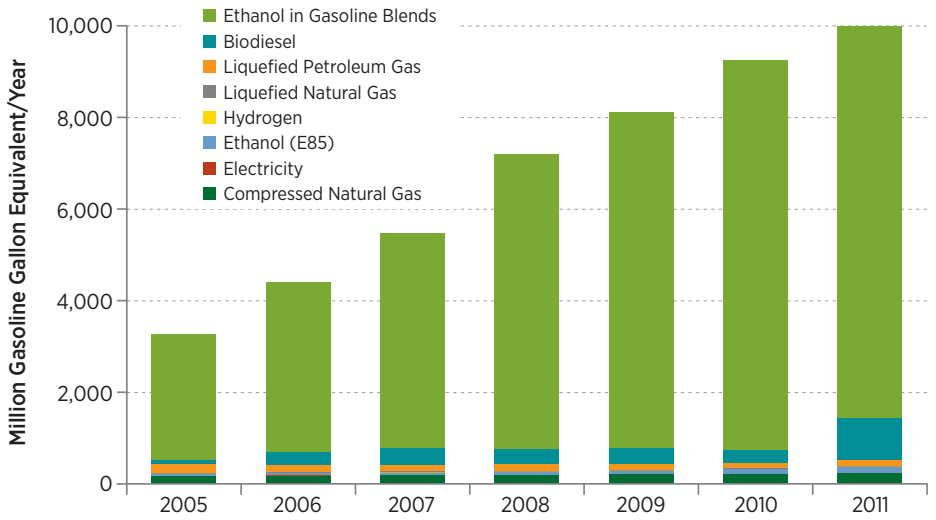


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Source: EERE
Data as of February 4, 2014

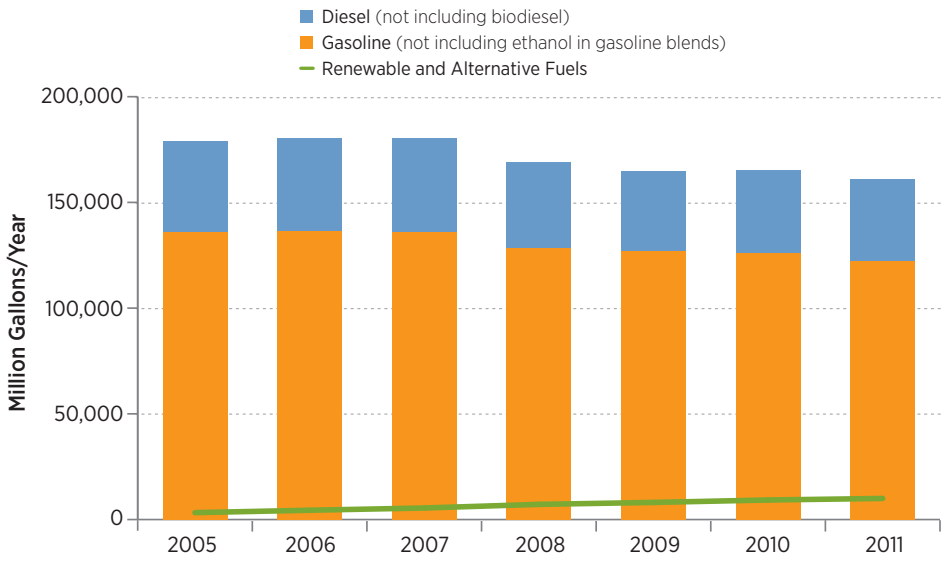
Consumption of Renewable and Alternative Fuel in the United States

XI



Source: EIA
Data as of April 2013.
2012 and 2013 data were not available at the time of publication.

Consumption of Traditional Fuel in the United States

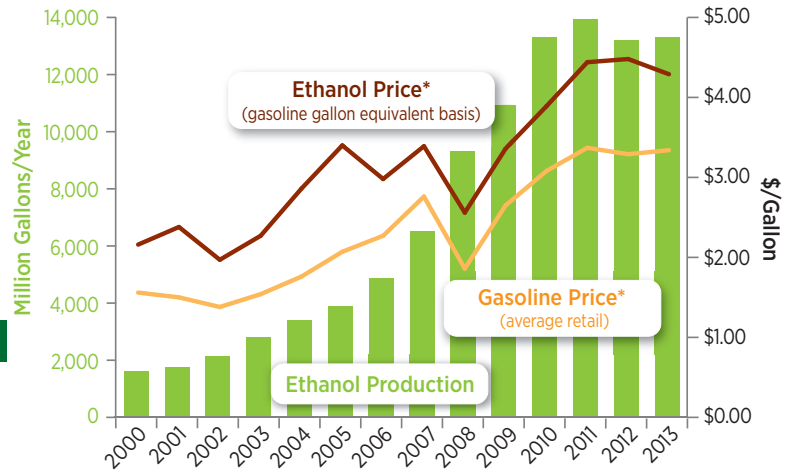


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Source: EIA
Data as of April 2013.
2012 and 2013 data were not available at the time of publication.

U.S. Corn Ethanol Production and Price Trends

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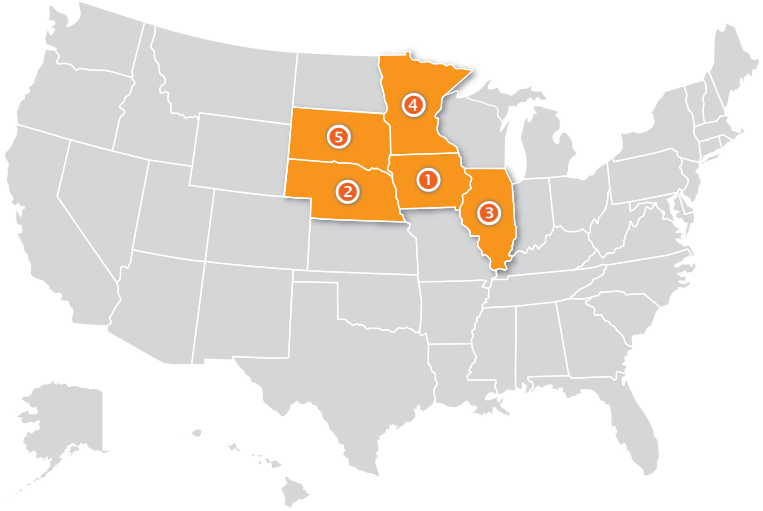


	Gasoline Price (average retail, $/gallon)	Ethanol Price (gasoline gallon equivalent basis, $/gallon)	Ethanol Production (million gallons/ year)
2000	$1.56	$2.16	1,622
2001	$1.50	$2.38	1,765
2002	$1.38	$1.97	2,140
2003	$1.54	$2.27	2,810
2004	$1.76	$2.86	3,404
2005	$2.07	$3.40	3,904
2006	$2.27	$2.98	4,884
2007	$2.76	$3.39	6,521
2008	$1.86	$2.56	9,309
2009	$2.65	$3.36	10,938
2010	$3.08	$3.89	13,298
2011	$3.37	$4.44	13,929
2012	$3.29	$4.48	13,218
2013	$3.34	$4.29	13,300

Sources: Renewable Fuels Association (RFA), EERE

*Prices include taxes.

U.S. Corn Ethanol Production Capacity (2013)



Top Five States for U.S. Ethanol (operating) Production Capacity in 2013 (millions of gallons/year)	
1 Iowa	3,958
2 Nebraska	1,897
3 Illinois	1,384
4 Minnesota	1,129
5 South Dakota	1,019

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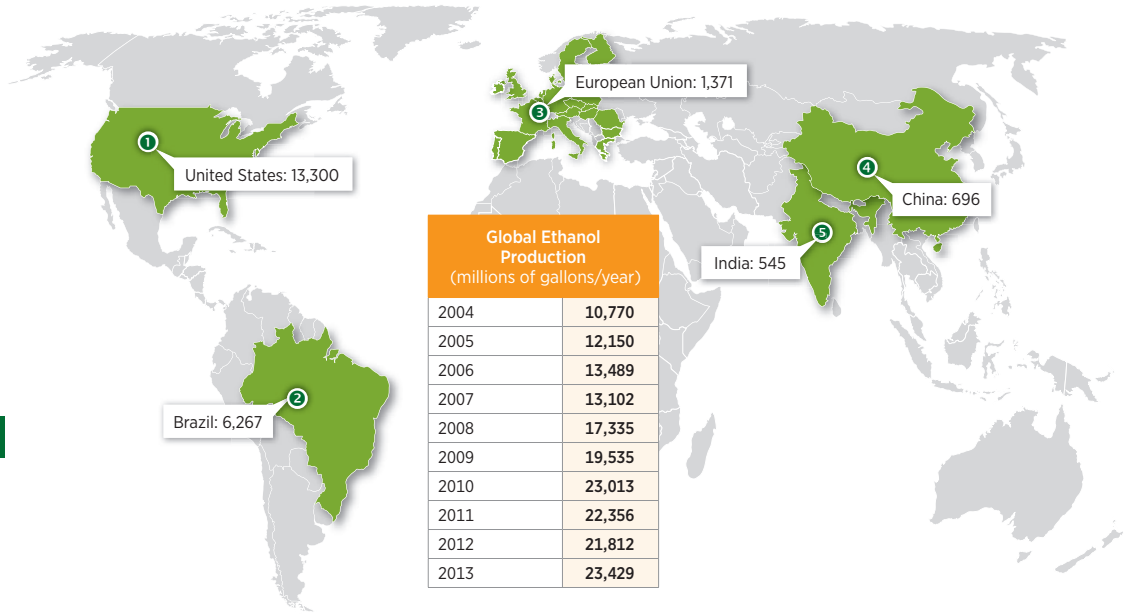
Source: RFA

No sugarcane ethanol is currently produced in the United States.

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Global Ethanol* Production

Top Five Regions (2013) **Ethanol Production** (millions of gallons/year)



Global Ethanol Production (millions of gallons/year)	
2004	**10,770**
2005	**12,150**
2006	**13,489**
2007	**13,102**
2008	**17,335**
2009	**19,535**
2010	**23,013**
2011	**22,356**
2012	**21,812**
2013	**23,429**

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Source: RFA
*Various feedstocks

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Biodiesel: Summary

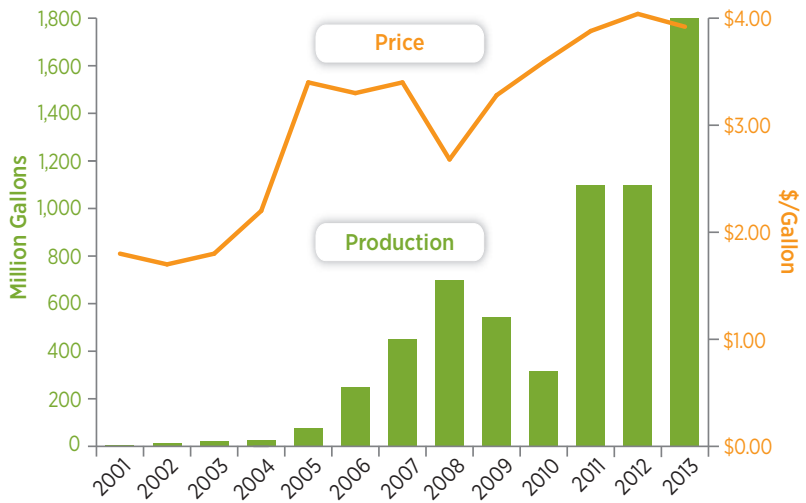
- **U.S. biodiesel production expanded to 1.8 billion gallons** (1.9 billion gasoline gallon equivalent) in 2013, a 63% increase from 2012.
- Biodiesel production in the United States in 2013 was **360 times what it was in 2001**.
- In 2013 the **United States led the world in biodiesel production**, followed by Germany, Brazil, Argentina, and France and Indonesia.
- **Worldwide, biodiesel production globally grew nearly 17%** from 2012 to 2013.

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U.S. Biodiesel Production and Price

XI



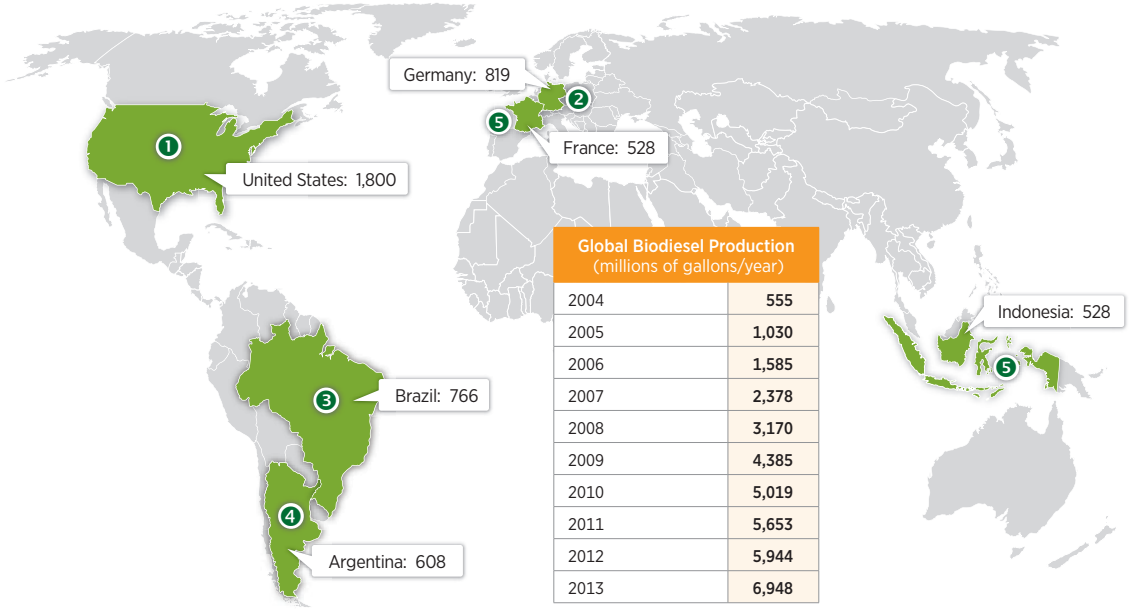
	Biodiesel Price (gasoline gallon equivalent basis) ($ per gallon)	Total U.S. Production (million gallons)
2001	1.80	5
2002	1.70	15
2003	1.80	20
2004	2.20	25
2005	3.40	75
2006	3.30	250
2007	3.40	450
2008	2.68	700
2009	3.28	545
2010	3.59	315
2011	3.88	1,100
2012	4.04	1,100
2013	3.92	1,800

Sources: Biodiesel.org, EERE

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Global Biodiesel Production

Top Countries (2013) **Biodiesel Production** (millions of gallons/year)



Global Biodiesel Production (millions of gallons/year)	
2004	555
2005	1,030
2006	1,585
2007	2,378
2008	3,170
2009	4,385
2010	5,019
2011	5,653
2012	5,944
2013	6,948

XI

Source: REN21

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XII. Clean Energy Investments

Clean Energy Investment: Summary

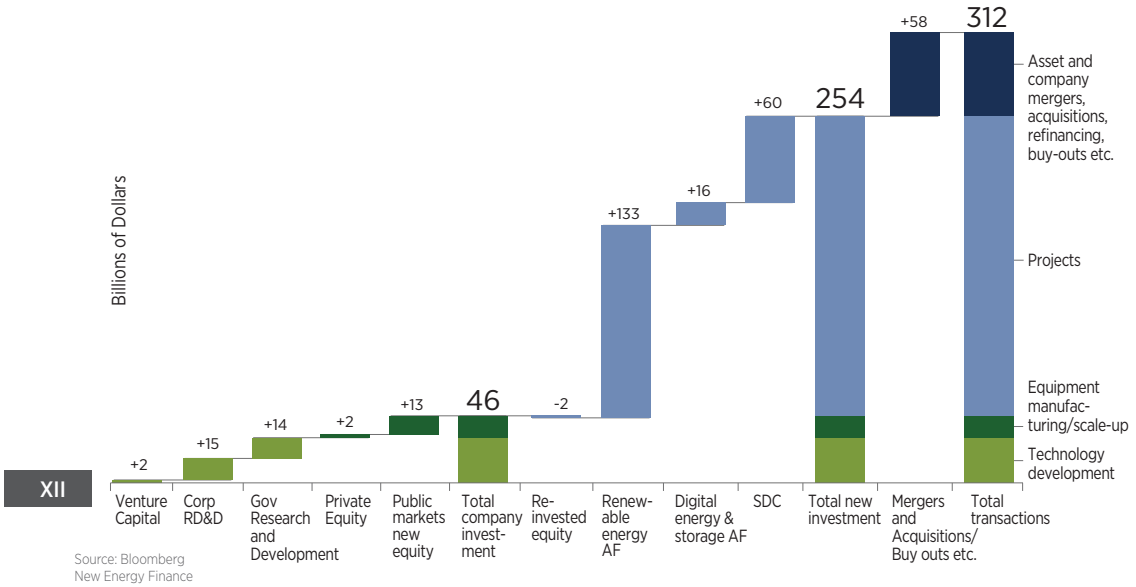
- **Global new investments** in renewable energy have grown dramatically in the past decade, but have seen an 11% decrease since 2011, **with $254 billion in new investments in 2013**.
- New investment in clean energy in the **U.S. totaled $36.7 billion** in 2013.
- In 2013, solar experienced the highest levels of new investment, followed by wind.
- **Global venture capital and private equity** new investment in clean energy has increased from $1.4 billion in 2004 to **$4.4 billion in 2013**.

XII

Source: Bloomberg New Energy Finance

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Clean Energy Investment Types & Flows (2013)

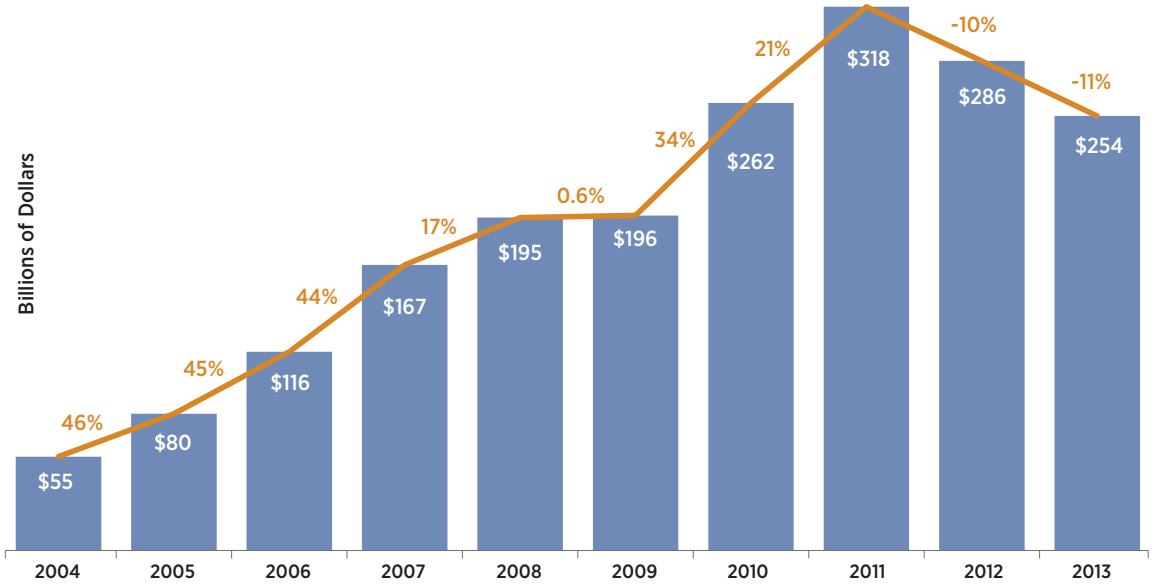


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Source: Bloomberg New Energy Finance

Total values include estimates for undisclosed deals.
AF = asset finance, RD&D = Research, Development, and Demonstration, SDC = small distributed capacity.

New Investment In Clean Energy – Global

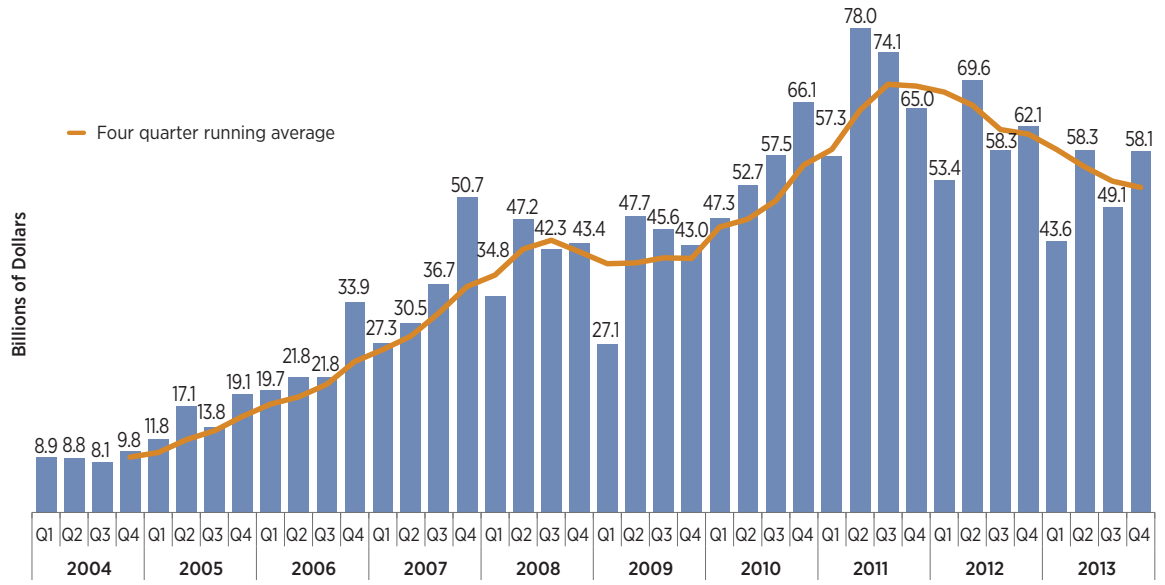


XII

Total values include estimates for undisclosed deals. Includes corporate and government R&D, and spending for digital energy and energy storage projects (not reported in quarterly statistics).

Source: Bloomberg New Energy Finance

New Investment In Clean Energy – Global



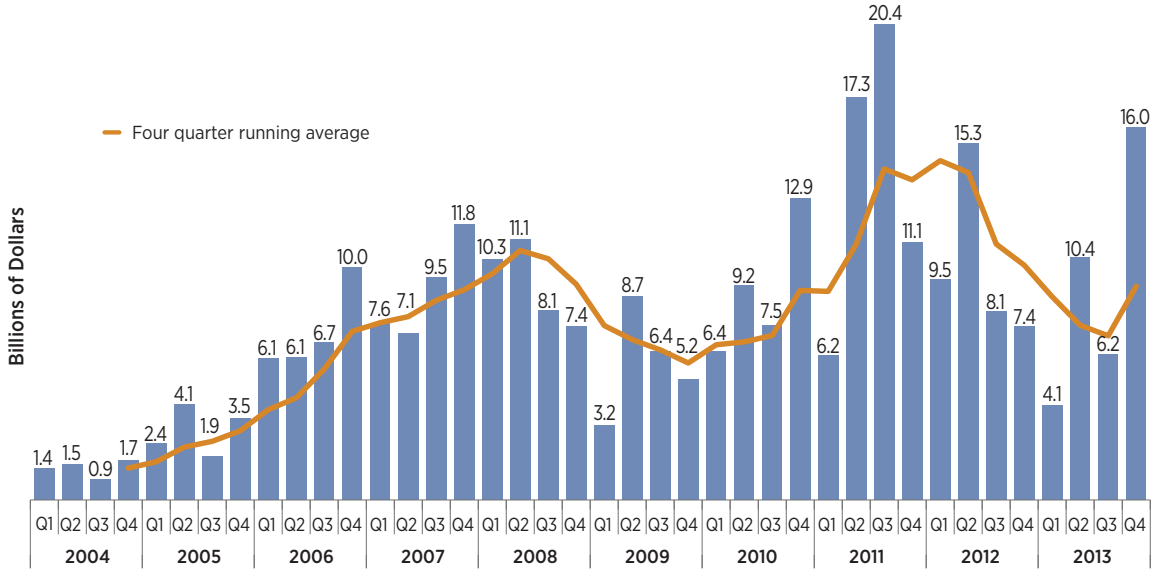
XII

Total values include estimates for undisclosed deals. Excludes corporate and government R&D, and spending for digital energy and energy storage projects (reported in annual statistics only).

Source: Bloomberg New Energy Finance

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New Investment In Clean Energy – United States

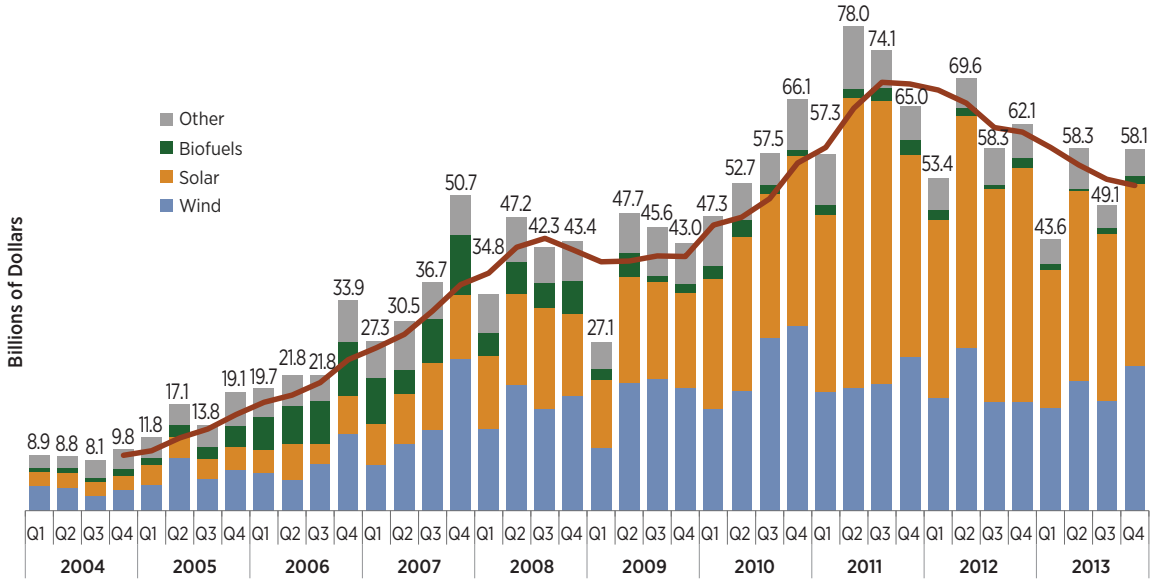


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Total values include estimates for undisclosed deals. Excludes corporate and government R&D, and spending for digital energy and energy storage projects (reported in annual statistics only).

Source: Bloomberg New Energy Finance

New Investment In Global Clean Energy By Technology – Global

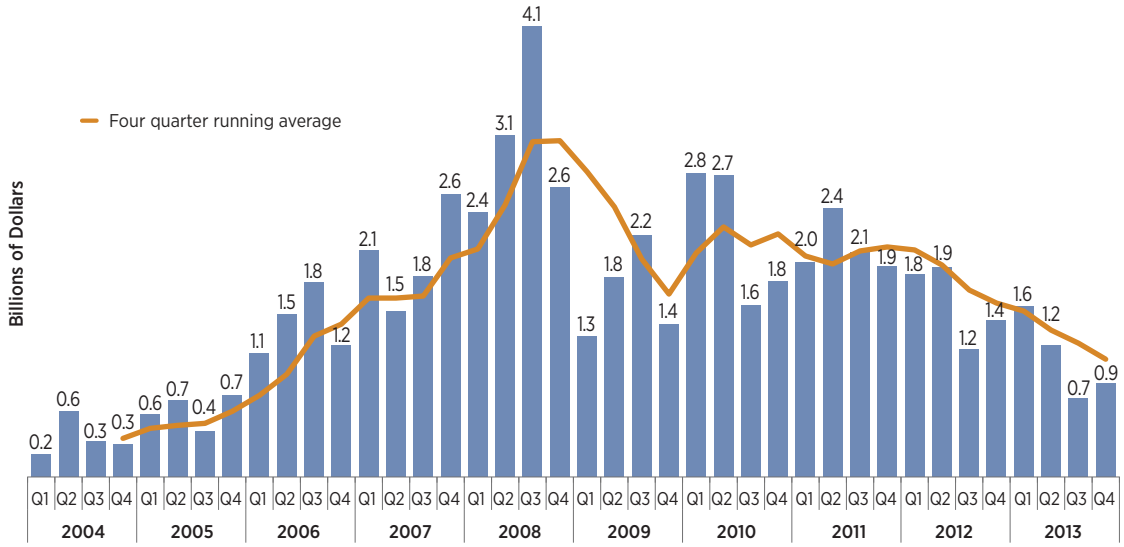


XII

Total values include estimates for undisclosed deals. Excludes corporate and government R&D, and spending for digital energy and energy storage projects (reported in annual statistics only).

Source: Bloomberg New Energy Finance

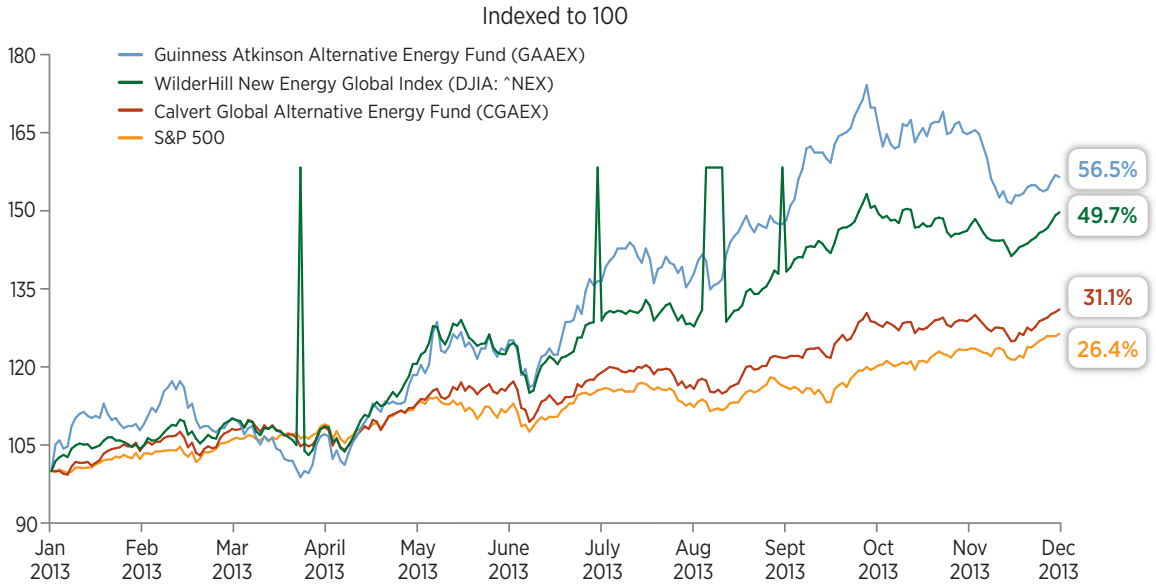
Venture Capital and Private Equity New Investment In Clean Energy – Global



XII

Total values include estimates for undisclosed deals.
Source: Bloomberg New Energy Finance

Public Renewable Energy Index Performance (2013)



XII

Source: Public data; downloaded from the Yahoo! Finance website

XII

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Glossary

Asset Financing (AF)

Using balance sheet assets (such as accounts receivable, short-term investments or inventory) to obtain a loan or borrow money - the borrower provides a security interest in the assets to the lender. This differs from traditional financing methods, such as issuing debt or equity securities, as the company simply pledges some of its assets in exchange for a quick cash loan.

B2O

A fuel containing a mixture of 20% biodiesel and 80% petrodiesel.

Baseload Capacity

The generating equipment normally operated to serve loads on an around-the-clock basis.

Biodiesel

Any liquid biofuel suitable as a diesel fuel substitute or diesel fuel additive or extender. Biodiesel fuels are typically made from oils such as those derived from soybeans, rapeseed, or sunflowers; or from animal tallow. Biodiesel can also be made from hydrocarbons derived from agricultural products such as rice hulls.

Biofuels

Liquid fuels and blending components produced from biomass (plant) feedstocks, used primarily for transportation.

Biomass

Organic non-fossil material of biological origin.

British Thermal Unit (Btu)

The quantity of heat required to increase the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).

Capacity Factor

The ratio of the electrical energy produced by a generating unit for a given period of time to the electrical energy that could have been produced at continuous full power operation during the same period.

Compound Annual Growth Rate

The year-over-year growth rate applied during a multiple-year period. The formula for calculating CAGR is (Current Value/Base Value)^(1/# of years) - 1.

Concentrating Solar Power (CSP)

A solar energy conversion system characterized by the optical concentration of solar rays through an arrangement of mirrors to heat working fluid to a high temperature. Concentrating solar power (but not solar thermal power) may also refer to a system that focuses solar rays on a photovoltaic cell to increase conversion efficiency.

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Glossary (continued)

Digital Energy

The integration of digital communication technologies into energy systems, especially the electrical grid. Smart meters, along with other digital communication devices embedded in electrical transmission and distribution systems, allow for a two-way flow of information between utilities and their customers as well as greater digital control of the electrical grid, a concept known as the Smart Grid.

E85

A fuel containing a mixture of 85% ethanol and 15% gasoline.

Ethanol

A clear, colorless, flammable oxygenated hydrocarbon. Ethanol is typically produced chemically from ethylene, or biologically from fermentation of various sugars from carbohydrates found in agricultural crops and cellulosic residues from crops or wood. It is used in the United States as a gasoline octane enhancer and oxygenate (blended up to 10% concentration). Ethanol can also be used in high concentrations (E85) in vehicles designed for its use.

Federal Energy Regulatory Commission (FERC)

The federal agency with jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, some natural gas pricing, oil pipeline rates, and gas pipeline certification. FERC is an independent regulatory agency within the Department of Energy (DOE) and is the successor to the Federal Power Commission

Flexible-Fuel Vehicles

Vehicles that can operate on (1) alternative fuels (such as E85); (2) 100% petroleum-based fuels; (3) any mixture of an alternative fuel (or fuels) and a petroleum-based fuel. Flexible-fuel vehicles have a single fuel system to handle alternative and petroleum-based fuels.

Fuel Cell

A device that produces electricity by converting the chemical energy of a fuel (e.g., hydrogen) directly into electrical energy. Fuel cells differ from conventional electrical cells in that the active materials such as fuel and oxygen are not contained within the cell but are supplied from outside. It does not contain an intermediate heat cycle as do most other electrical generation techniques.

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Glossary (continued)

Gasoline Gallon Equivalent (GGE)

The amount of alternative fuel it takes to equal the energy content of one liquid gallon of gasoline. GGE allows consumers to compare the energy content of competing fuels against a commonly known fuel—gasoline.

Generation

The total amount of electric energy produced by generating units and measured at the generating terminal in kilowatt-hours (kWh) or megawatt-hours (MWh).

Ground Source (Geothermal) Energy

The heat that is extracted from hot water or steam that is mined from geothermal reservoirs in the Earth's crust. Water or steam can be used as a working fluid for geothermal heat pumps, water heating, or electricity generation, and then is injected back into the Earth.

Geothermal Heat Pump

A heat pump in which the refrigerant exchanges heat (in a heat exchanger) with a fluid circulating through an earth connection medium (ground or ground water). The fluid is contained in a variety of loop (pipe) configurations depending on the temperature of the ground and the ground area available. Loops may be installed horizontally or vertically in the ground or submersed in a body of water.

Gigawatt (GW)

One billion watts or one thousand megawatts or one million kW.

Gigawatt-hour (GWh)

One billion watt-hours.

Incremental Capacity

Capacity added on an annual basis.

Insolation

The amount of radiation from the sun received at the surface of the Earth in a particular geographic location or region.

Kilowatt (kW)

One thousand watts.

Kilowatt-hour (kWh)

A measure of electrical energy defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kWh is equivalent to 3,412 Btu.

Landfill Gas

Gas that is generated by decomposition of organic material at landfill disposal sites. The average composition of landfill gas is approximately 50% methane and 50% carbon dioxide and water vapor by volume. The methane in landfill gas may be vented, flared, or combusted to generate electricity or useful thermal energy on-site, or injected into a pipeline for combustion off site.

Megawatt (MW)

One million watts of electricity.

Megawatt-hour (MWh)

One thousand kilowatt-hours or 1 million watt-hours.

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Glossary (continued)

Mergers and Acquisitions (M&A)

A general term used to refer to the consolidation of companies. A merger is a combination of two companies to form a new company, while an acquisition is the purchase of one company by another in which no new company is formed.

Municipal Solid Waste (MSW)

Residential solid waste and some nonhazardous commercial, institutional, and industrial wastes.

Nameplate Capacity

The maximum rated output of a generator under specific conditions designated by the manufacturer. Nameplate capacity is usually indicated in units of kilovolt-amperes (kVA) and in kilowatts (kW) on a nameplate physically attached to the generator.

Ocean Energy

Energy conversion technologies that harness the energy in tides, waves, and thermal gradients in the oceans.

Photovoltaic (PV) Cell

PV cells convert incident light directly into electricity (direct current). An electronic device consisting of layers of semiconductor materials fabricated to form a junction (adjacent layers of materials with different electronic characteristics) and electrical contacts.

Private Equity (PE)

Equity capital that is not quoted on a public exchange. Private equity consists of investors and funds that make investments directly into private companies or conduct buyouts of public companies that result in a delisting of public equity. Capital for private equity is raised from retail and institutional investors, and can be used to fund new technologies, expand working capital within an owned company, make acquisitions, or to strengthen a balance sheet.

Pumped-Storage Hydroelectric Plant

A plant that usually generates electric energy during peak load periods by using water previously pumped into an elevated storage reservoir during off-peak periods when excess generating capacity is available to do so.

Renewable Energy Resources

Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include biomass, hydropower, geothermal, solar, wind, and ocean energy.

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Solar Thermal Collector

A device designed to receive solar radiation and convert it to thermal energy. Normally, a solar thermal collector includes a frame, glazing, and an absorber, together with appropriate insulation. The heat collected by the solar collector may be used immediately or stored for later use. Solar collectors are used for space heating; domestic hot water heating; and heating swimming pools, hot tubs, or spas.

Thermoelectric Power Plant

A term used to identify a type of electric generating station, capacity, capability, or output in which the source of energy for the prime mover is heat.

Venture Capital (VC)

Money provided by investors to startup firms and small businesses with perceived long-term growth potential. This is a very important source of funding for startups that do not have access to capital markets. It typically entails high risk for the investor, but it has the potential for above-average returns.

Wind Energy

Kinetic energy present in wind motion that can be converted to mechanical energy for driving pumps, mills, and electric power generators.

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Principal Data Sets

DATA PROVIDER	Data Set/ Report	Geographic Scope	Technologies Addressed	Date Available/ Accessed
American Wind Energy Association (AWEA)	Fourth Quarter 2013 Market Report	United States	Wind	January 2014
	U.S. Wind Industry Annual Market Report 2013	United States	Wind	April 2014
Bloomberg New Energy Finance (BNEF)	Global Trends in Clean Energy Investment	Global	Biofuels, Solar, Wind, Energy Storage, Digital Energy	January 2014
Energy Information Administration (EIA)	Form 860	United States	Biopower, Geothermal, Hydropower, Solar, Wind*	February 2014
	Monthly Energy Review	United States	Biopower, Coal, Geothermal, Hydropower, Natural Gas, Nuclear, Petroleum, Solar, Wind**	March 2014
	Electric Power Monthly	United States	Biopower, Geothermal, Hydropower, Solar, Wind	March 2014
Geothermal Energy Association (GEA)	Annual U.S. Geothermal Power Production and Development Report	United States	Geothermal	April 2014, April 2013, May 2012
Global Wind Energy Council (GWEC)	Global Wind Report 2013: Annual Market Update	Global	Wind	April 2014
Larry Sherwood/Interstate Renewable Energy Council (IREC)	U.S. Solar Market Trends 2013	United States	Solar***	July 2014
Lawrence Berkeley National Laboratory (LBNL)	2013 Wind Technologies Market Report	United States	Wind	August 2014
Renewable Energy Policy Network for the 21st Century (REN21)	2014 Renewables Global Status Report	Global	Biomass, Geothermal, Hydropower, Solar, Wind	June 2014
Renewable Fuels Association (RFA)	2014 Ethanol Industry Outlook	United States	Ethanol	February 2014
Solar Energy Industries Association and Greentech Media (SEIA/GTM)	2013 Solar Industry Year in Review	United States	Solar	March 2014

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**Includes production and consumption by end use sector and electricity

***Includes distributed grid-connected PV less than 1 MW

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