World on the Edge - Energy Data - United States Energy Profile

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A full listing of data for the entire book is on-line at:
http://www.earth-policy.org/books/wote/wote_data

This is part of a supporting dataset for Lester R. Brown, **World On the Edge: How to Prevent Environmental and Economic Collapse** (New York: W.W. Norton & Company, 2010). For more information and a free download of the book, see Earth Policy Institute on-line at www.earth-policy.org.

Average Capacity Factors for Selected Electric Power Sources in the United States

Source	Capacity Factor
	Percent
Fossil Fuels and Nuclear	
Coal	72.2
Oil	18.9
Natural Gas	37.3
Nuclear	89.8
Renewables	
Wind	36.0
Solar Photovoltaics	22.5
Solar Thermal	24.4
Geothermal	90.0
Biomass	80.0
Hydropower	44.2

Note: Capacity factor is the ratio of actual electricity generated during a period of time (usually one year) to the electricity that could have been generated over that same period with continuous operation at full power. Capacity factors given here represent averages for a range of recent years.

Source: Fossil fuels and Nuclear from "Average Capacity Factors by Energy Source, 1996 through 2007," Table A.6 in U.S. Department of Energy (DOE), Energy Information Administration, *Electric Power Annual 2007* (Washington, DC: January 2009); Renewables from DOE, National Renewable Energy Laboratory, *Power Technologies Energy Data Book* (Golden, CO: August 2006), p. 201.

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Cumulative Installed Wind Power Capacity and Annual Addition in the United States, 1980-2009

Year	Cumulative Installed Capacity	Net Annual Addition*
	Megawatts	
1980	8	
1981	18	10
1982	84	66
1983	254	170
1984	653	399
1985	945	292
1986	1,265	320
1987	1,333	68
1988	1,231	-102
1989	1,332	101
1990	1,484	152
1991	1,709	225
1992	1,680	-29
1993	1,635	-45
1994	1,663	28
1995	1,612	-51
1996	1,614	2
1997	1,611	-3
1998	1,837	226
1999	2,490	653
2000	2,578	88
2001	4,275	1,697
2002	4,685	410
2003	6,372	1,687
2004	6,725	353
2005	9,149	2,424
2006	11,575	2,426
2007	16,824	5,249
2008	25,068	8,244
2009	35,064	9,996

* Note: Net annual addition equals new installations minus retirements.

Source: Compiled by Earth Policy Institute with 1980-1999 data from Worldwatch Institute, *Signposts 2001* , CD-ROM (Washington, DC: 2001); 2000-2009 data from Global Wind Energy Council (GWEC), *Global Wind 2009 Report* (Brussels: 2010), p. 63.

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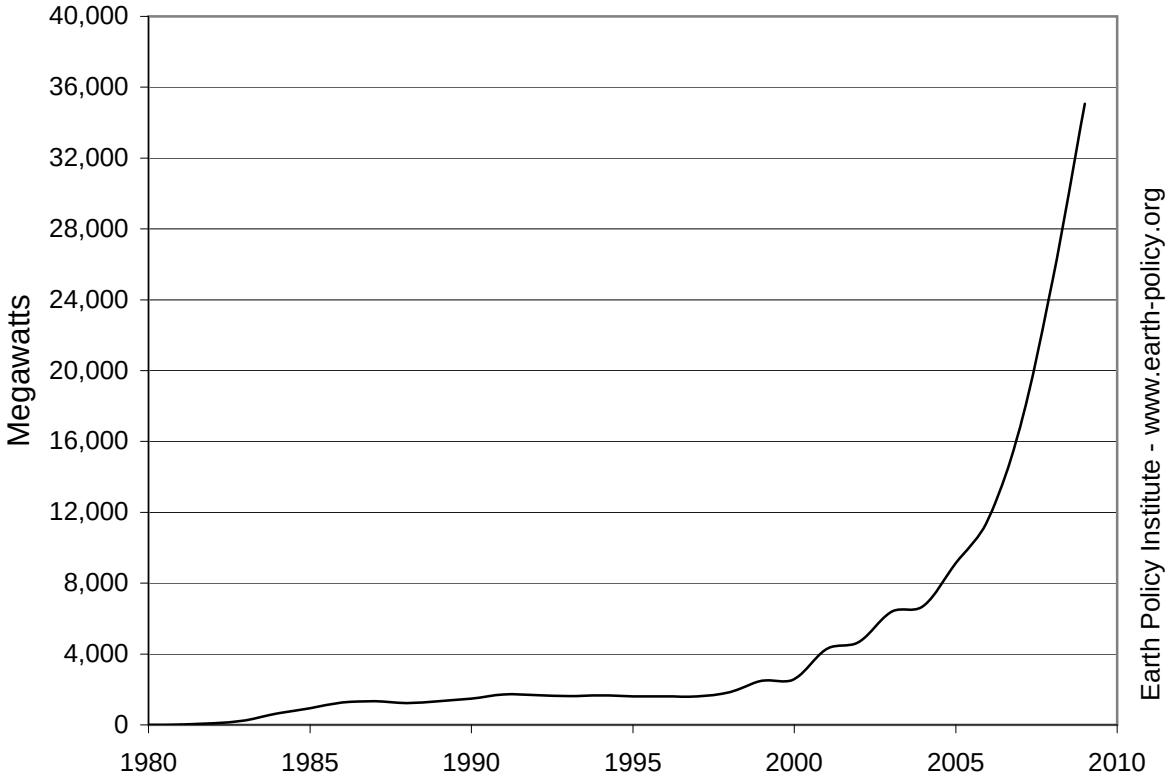
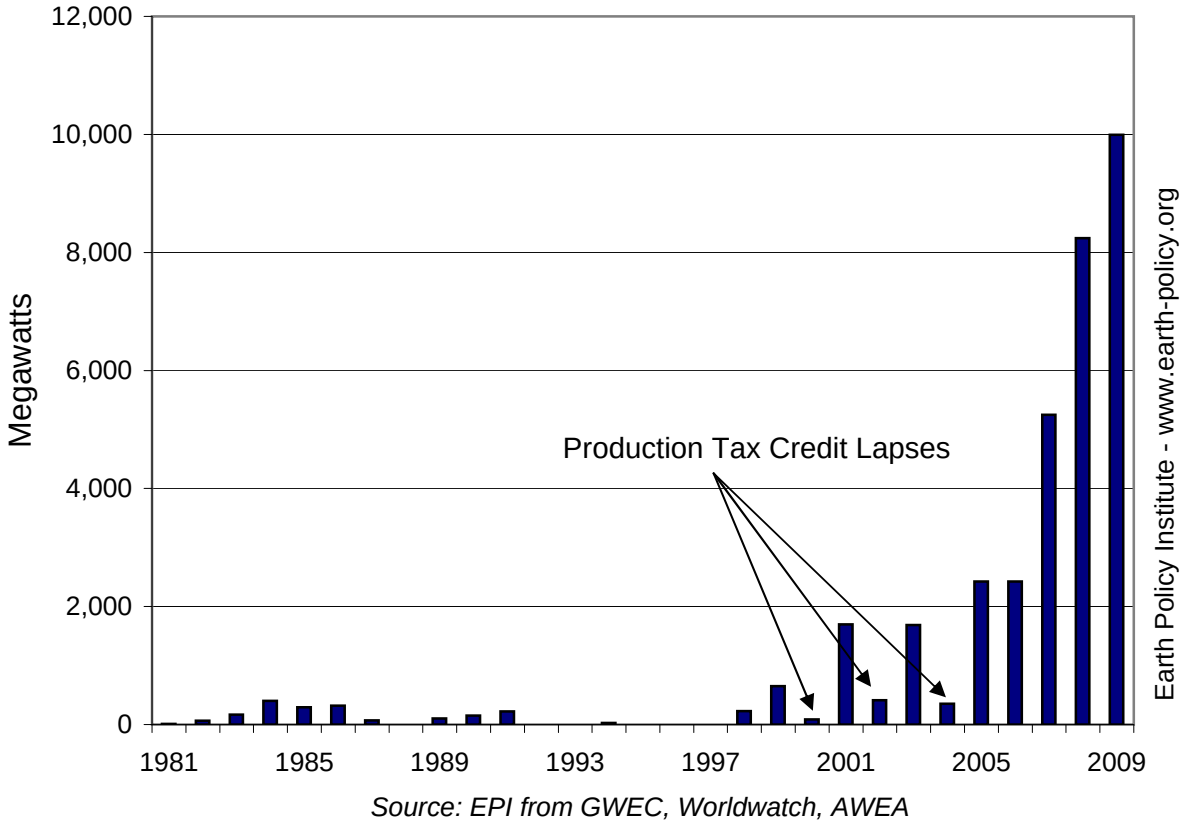
Cumulative Installed Wind Power Capacity in the United States,1980-2009



Source: EPI from GWEC, Worldwatch

Net Annual Installed Wind Power Capacity Additions in the United States, 1981-2009



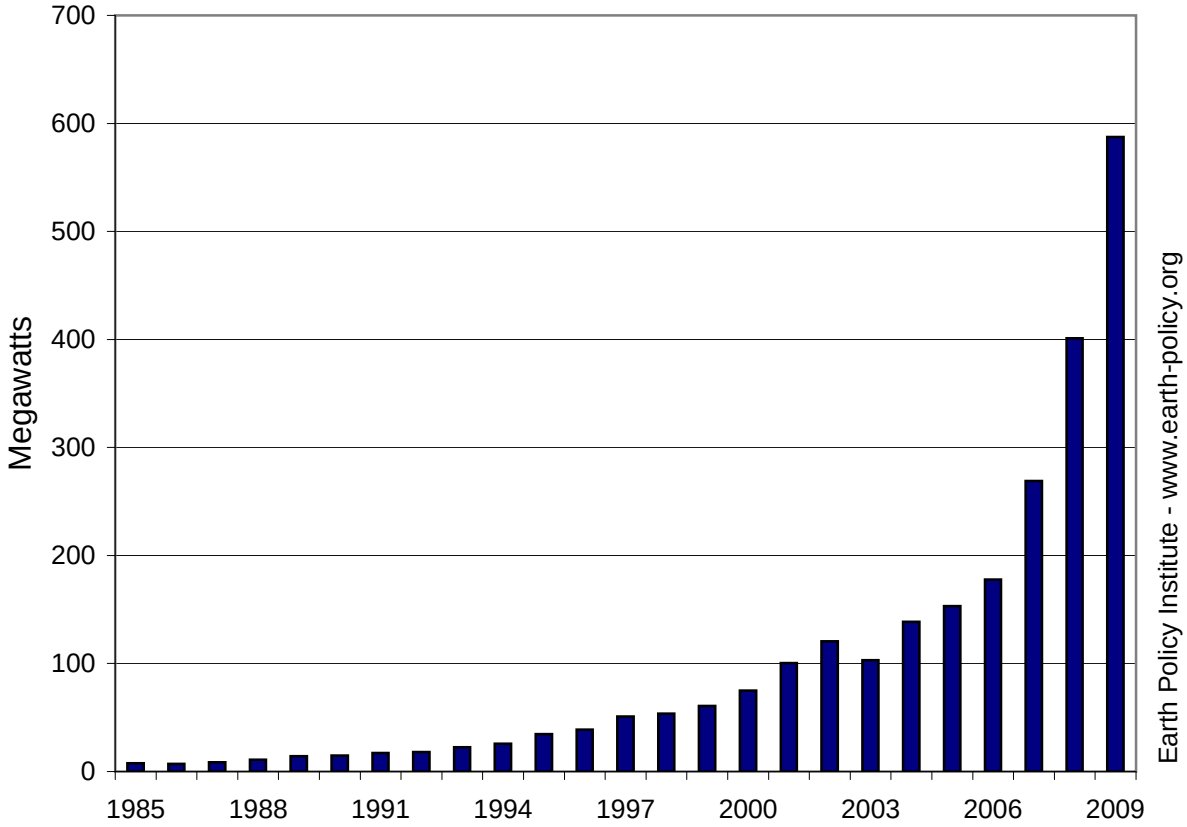
Source: EPI from GWEC, Worldwatch, AWEA

Solar Photovoltaics Production in the United States, 1976-2009

Year	Annual Production	Cumulative Production
	Megawatts	
1976	0.3	0.3
1977	0.4	0.7
1978	0.8	1.6
1979	1.2	2.8
1980	2.5	5.3
1981	3.5	8.8
1982	5.2	14.0
1983	8.2	22.2
1984	8.0	30.2
1985	7.7	37.9
1986	7.1	45.0
1987	8.7	53.7
1988	11.1	64.8
1989	14.1	78.9
1990	14.8	93.7
1991	17.1	110.8
1992	18.1	128.9
1993	22.4	151.4
1994	25.6	177.0
1995	34.8	211.8
1996	38.9	250.6
1997	51.0	301.6
1998	53.7	355.3
1999	60.8	416.1
2000	75.0	491.1
2001	100.3	591.4
2002	120.6	712.0
2003	103.0	815.0
2004	138.7	953.7
2005	153.1	1,106.8
2006	177.6	1,284.4
2007	269.1	1,553.5
2008	401.1	1,954.6
2009	587.4	2,542.0

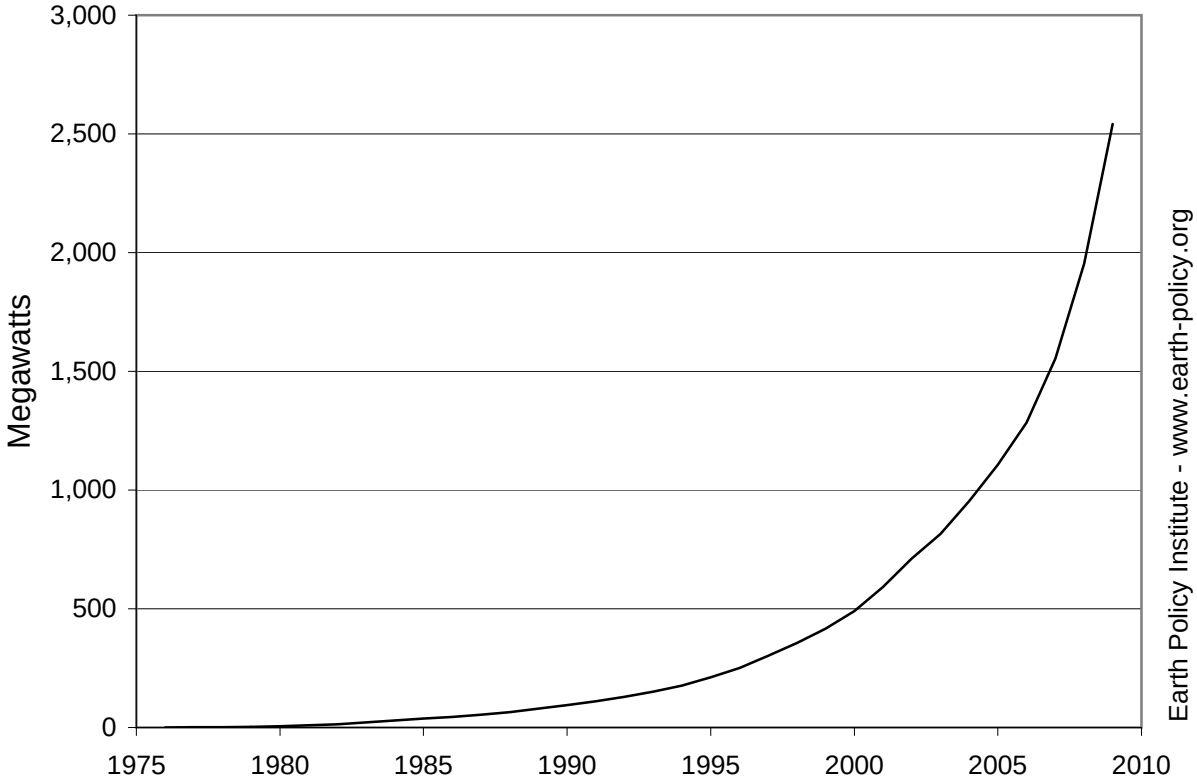
Source: Compiled by Earth Policy Institute with 1976-1993 from Hillary Flynn, Content Manager at Prometheus Institute for Sustainable Development, Cambridge, MA, e-mail to Joseph Florence, Earth Policy Institute, 21 March 2006; 1994-2000 data from Worldwatch Institute, *Signposts 2004* , CD-ROM (Washington, DC: 2005); 2001-2006 from Prometheus Institute and Greentech Media, "25th Annual Data Collection Results: PV Production Explodes in 2008," *PVNews* , vol. 28, no. 4 (April 2009), pp. 15-18; 2007-2009 from Shyam Mehta, GTM Research, e-mail to J. Matthew Roney, Earth Policy Institute, 21 June 2010.

Annual Solar Photovoltaics Production in the United States, 1985-2009



Source: EPI from Prometheus Institute; Worldwatch; Greentech Media

Cumulative Solar Photovoltaics Production in the United States, 1976-2009



Source: EPI from Prometheus Institute; Worldwatch; Greentech Media

Cumulative Installed Geothermal Electricity-Generating Capacity in the United States, 1990-2010

Year	Cumulative Installed Capacity
	Megawatts
1990	2,775
1995	2,817
2000	2,228
2005	2,564
2010 *	3,086

* Note: Installed capacity as of May 2010.

Source: Compiled by Earth Policy Institute with 1990 and 1995 from International Geothermal Association, "Installed Generating Capacity," at http://iga.igg.cnr.it/geoworld/geoworld.php?sub=elgen, updated 3 July 2009; 2000 and 2005 from Ruggero Bertani, "World Geothermal Generation in 2007," *GHC Bulletin*, September 2007, p. 9; 2010 from Alison Holm et al., *Geothermal Energy International Market Update* (Washington, DC: Geothermal Energy Association, May 2010), pp. 47–48.

Confirmed U.S. Geothermal Projects Under Development as of May 2010

State	Number of Projects	Expected Capacity	
		Low Range	High Range
		Megawatts	
Alaska	5	35.0	35.0
California	29	1,402.8	1,765.8
Colorado	1	10.0	10.0
Hawaii	2	8.0	8.0
Idaho	9	413.0	676.0
Louisiana	2	5.3	5.3
Mississippi	1	0.1	0.1
Nevada	68	1,804.4	3,265.4
New Mexico	2	35.0	35.0
Oregon	11	242.0	373.0
Texas	1	0.4	0.4
Utah	20	628.0	883.0
Wyoming	1	0.3	0.3
Total	152	4,584.3	7,057.3

Source: Alison Holm et al., *Geothermal Energy International Market Update* (Washington, DC: Geothermal Energy Association, May 2010), pp. 47–48.

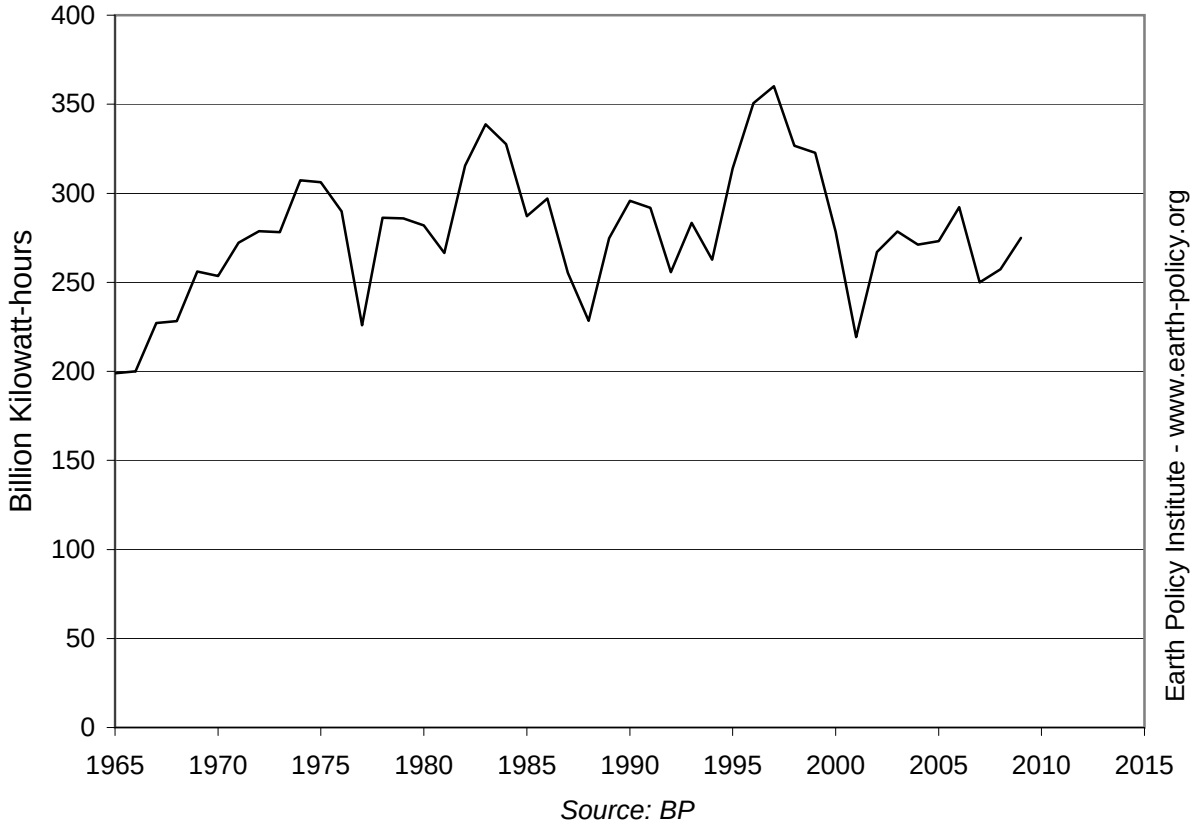
Hydroelectric Consumption in the United States, 1965-2009

Year	Consumption
	Billion Kilowatt-hours
1965	199
1966	200
1967	227
1968	228
1969	256
1970	253
1971	272
1972	279
1973	278
1974	307
1975	306
1976	290
1977	226
1978	286
1979	286
1980	282
1981	267
1982	316
1983	339
1984	328
1985	287
1986	297
1987	255
1988	228
1989	275
1990	296
1991	292
1992	256
1993	283
1994	263
1995	314
1996	351
1997	360
1998	327
1999	323
2000	278
2001	219
2002	267
2003	279
2004	271
2005	273
2006	292
2007	250
2008	257
2009	275

Source: BP, *Statistical Review of World Energy June 2010* (London: 2010).

This is part of a supporting dataset for Lester R. Brown, **World on the Edge: How to Prevent Environmental and Economic Collapse** (New York: W.W. Norton & Company, 2011). For more information and a free download of the book, see Earth Policy Institute on-line at www.earth-policy.org.

Hydroelectric Consumption in the United States, 1965-2009



Source: BP

Fuel Ethanol Production in the United States, 1978-2010

Year	Production
	Million Gallons
1978	10
1979	40
1980	175
1981	215
1982	350
1983	375
1984	430
1985	610
1986	710
1987	830
1988	845
1989	870
1990	900
1991	950
1992	1,100
1993	1,200
1994	1,350
1995	1,400
1996	1,100
1997	1,300
1998	1,387
1999	1,472
2000	1,630
2001	1,766
2002	2,153
2003	2,805
2004	3,409
2005	3,898
2006	4,856
2007	6,486
2008	9,238
2009	10,725
2010 *	11,993

* Projection.

Source: Compiled by Earth Policy Institute with data for 1978-1998 from F.O. Licht, *World Ethanol and Biofuels Report*, vol. 6, no. 4 (23 October 2007), p. 63; 1999-2005 from F.O. Licht, *World Ethanol and Biofuels Report*, vol. 7, no. 18 (26 May 2009), p. 3; 2006-2010 from F.O. Licht, *World Ethanol and Biofuels Report*, vol. 8, no. 16 (28 April 2010), p. 328.

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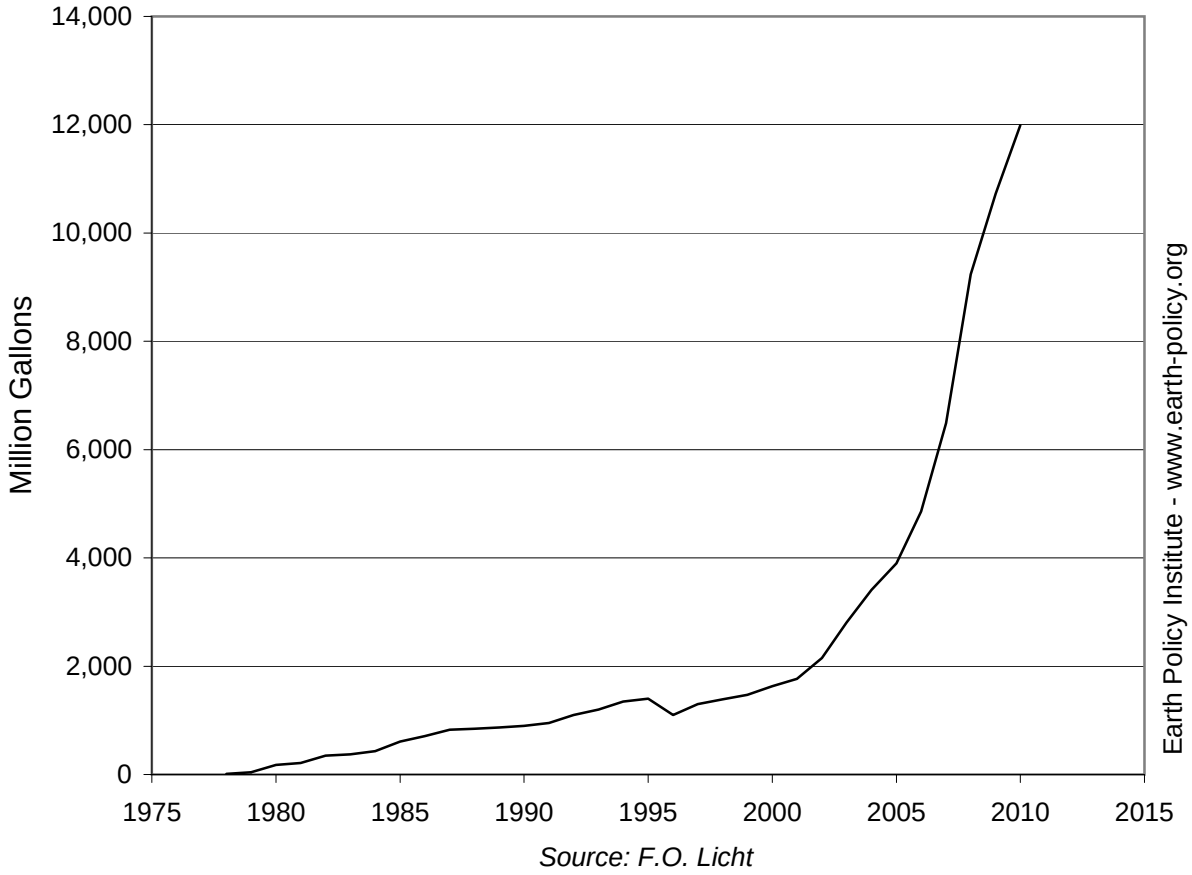
Fuel Ethanol Production in the United States, 1978-2010



Source: F.O. Licht

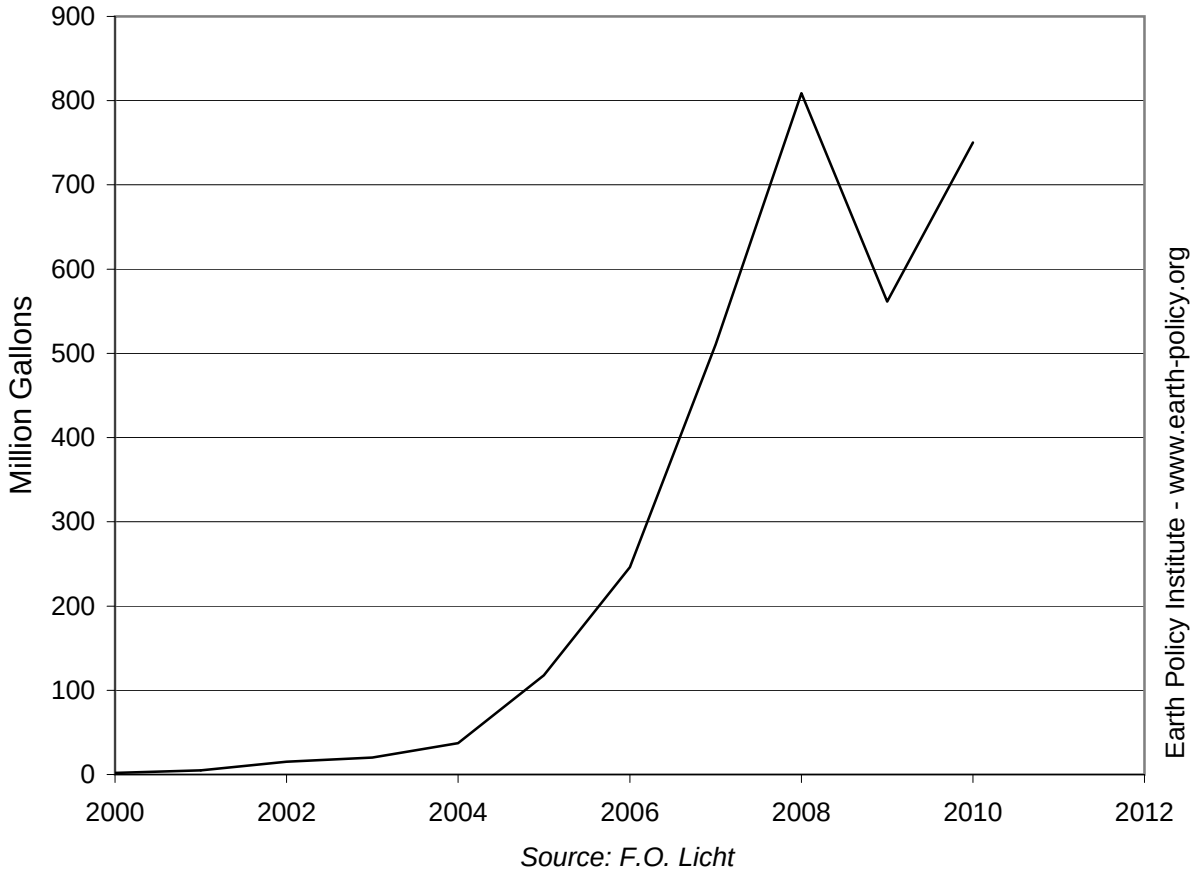
Biodiesel Production in the United States, 2000-2010

Year	Production
	Million Gallons
2000	2
2001	5
2002	15
2003	20
2004	37
2005	118
2006	246
2007	511
2008	809
2009	561
2010 *	750

* Projection.

Source: Compiled by Earth Policy Institute with 2000-2004 data from F.O. Licht, *World Ethanol and Biofuels Report*, vol. 7, no. 2 (23 September 2008), p. 29; 2005-2010 data from F.O.Licht, *World Ethanol and Biofuels Report*, vol. 8, no. 13 (15 March 2010), p. 265.

Biodiesel Production in the United States, 2000-2010



Source: F.O. Licht

Natural Gas Consumption in the United States, 1965-2009

Year	Consumption
	Million Tons Oil Equivalent
1965	397
1966	428
1967	452
1968	484
1969	521
1970	549
1971	566
1972	572
1973	567
1974	548
1975	503
1976	513
1977	502
1978	504
1979	521
1980	510
1981	498
1982	463
1983	434
1984	464
1985	446
1986	418
1987	445
1988	465
1989	494
1990	494
1991	505
1992	522
1993	535
1994	548
1995	571
1996	582
1997	585
1998	575
1999	577
2000	600
2001	574
2002	594
2003	575
2004	577
2005	569
2006	560
2007	597
2008	600
2009	589

Source: BP, *Statistical Review of World Energy June 2010* (London: 2010).

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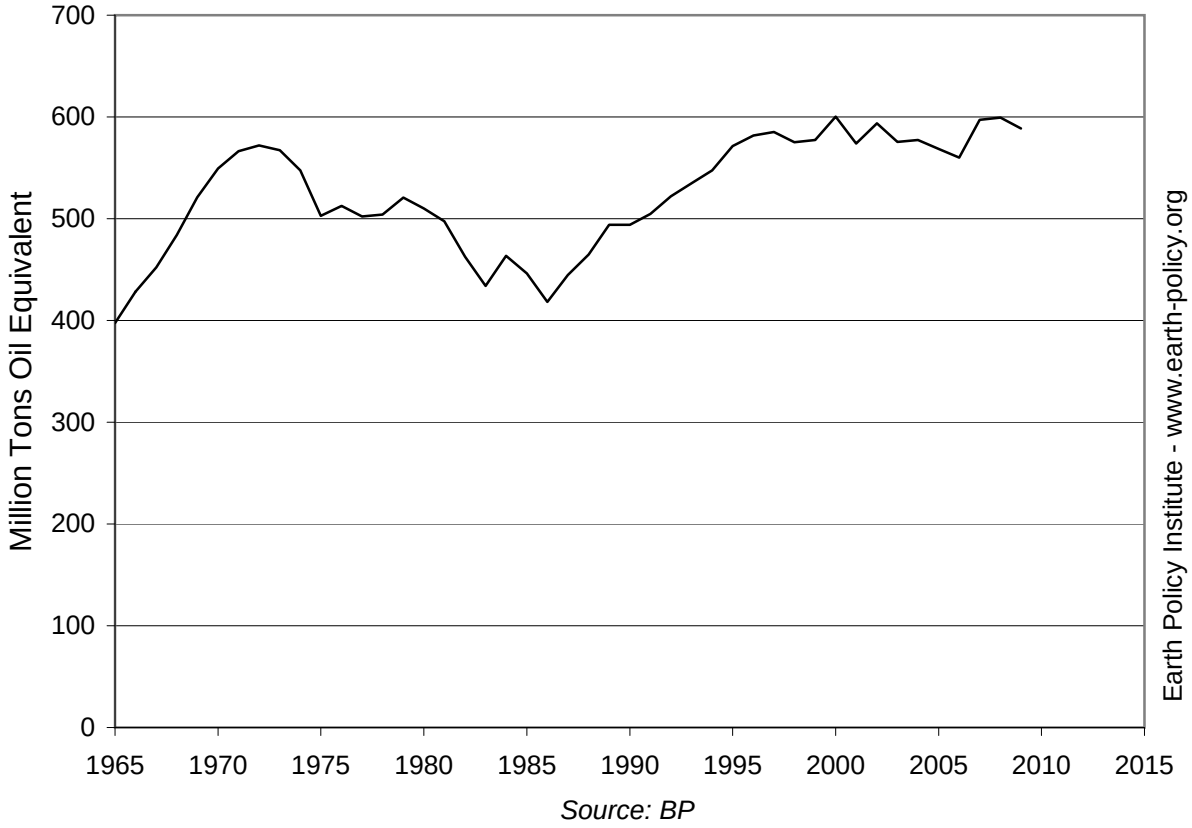
Natural Gas Consumption in the United States,
1965-2009



Source: BP

Oil Production in the United States, 1900-2009

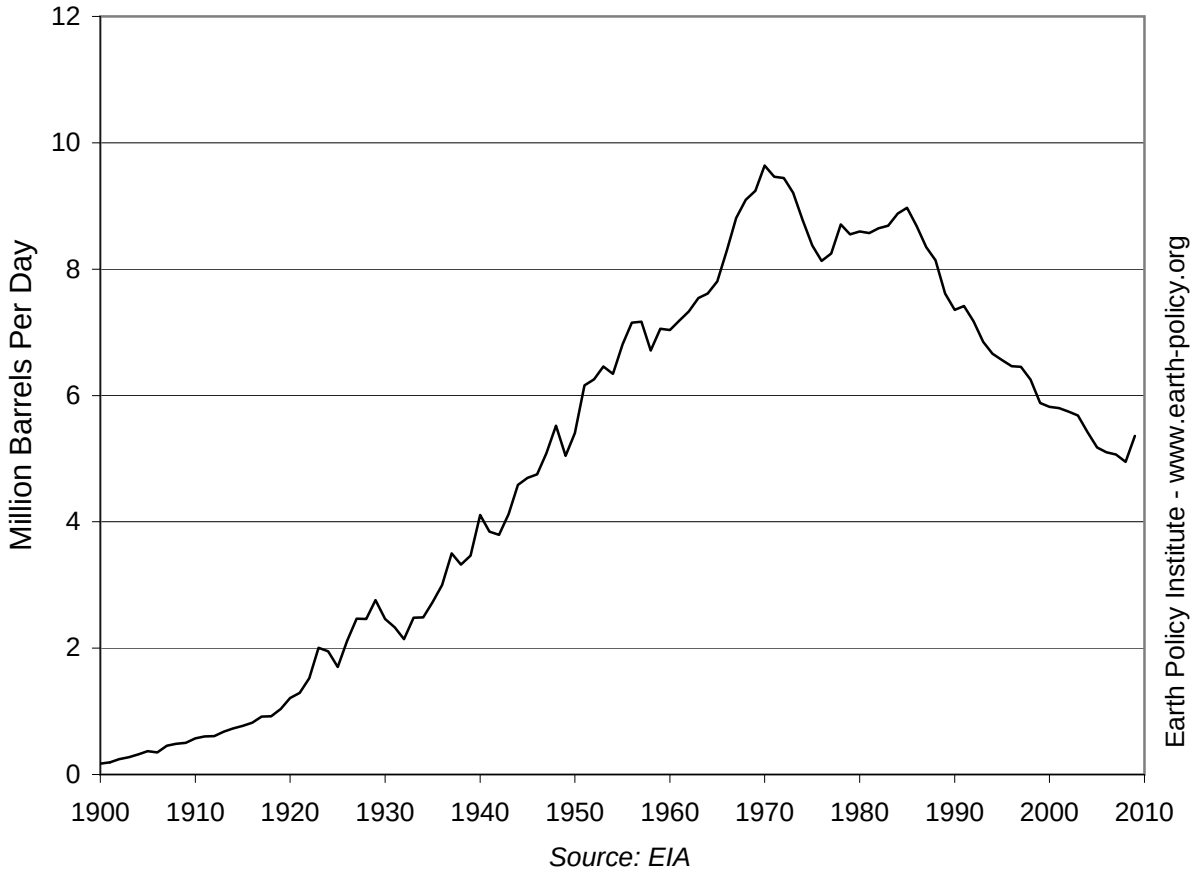
Year	Production* Million Barrels per Day
1900	0.17
1901	0.19
1902	0.24
1903	0.28
1904	0.32
1905	0.37
1906	0.35
1907	0.46
1908	0.49
1909	0.50
1910	0.57
1911	0.60
1912	0.61
1913	0.68
1914	0.73
1915	0.77
1916	0.82
1917	0.92
1918	0.92
1919	1.04
1920	1.21
1921	1.29
1922	1.53
1923	2.01
1924	1.95
1925	1.70
1926	2.11
1927	2.47
1928	2.46
1929	2.76
1930	2.46
1931	2.33
1932	2.15
1933	2.48
1934	2.49
1935	2.72
1936	3.00
1937	3.50
1938	3.32
1939	3.46
1940	4.11
1941	3.85
1942	3.80
1943	4.13
1944	4.58
1945	4.70
1946	4.75
1947	5.09
1948	5.52
1949	5.05
1950	5.41
1951	6.16
1952	6.26
1953	6.46
1954	6.34
1955	6.81
1956	7.15
1957	7.17
1958	6.71

1959	7.05
1960	7.04
1961	7.18
1962	7.33
1963	7.54
1964	7.61
1965	7.80
1966	8.30
1967	8.81
1968	9.10
1969	9.24
1970	9.64
1971	9.46
1972	9.44
1973	9.21
1974	8.77
1975	8.38
1976	8.13
1977	8.25
1978	8.71
1979	8.55
1980	8.60
1981	8.57
1982	8.65
1983	8.69
1984	8.88
1985	8.97
1986	8.68
1987	8.35
1988	8.14
1989	7.61
1990	7.36
1991	7.42
1992	7.17
1993	6.85
1994	6.66
1995	6.56
1996	6.47
1997	6.45
1998	6.25
1999	5.88
2000	5.82
2001	5.80
2002	5.75
2003	5.68
2004	5.42
2005	5.18
2006	5.10
2007	5.06
2008	4.95
2009	5.36

* Includes crude oil, shale oil, and oil sands. For the full list of included items, see U.S. Department of Energy (DOE), Energy Information Administration (EIA), "Petroleum Navigator: Definitions, Sources and Explanatory Notes," at www.eia.gov/dnav/pet/TblDefs/pet_cons_psup_tbldef2.asp.

Source: DOE, EIA, *Petroleum Navigator: Crude Oil Production* , electronic database, at www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbblpd_a.htm, updated 29 July 2010.

Oil Production in the United States, 1900-2009



Source: EIA

Oil Consumption in the United States, 1950-2010

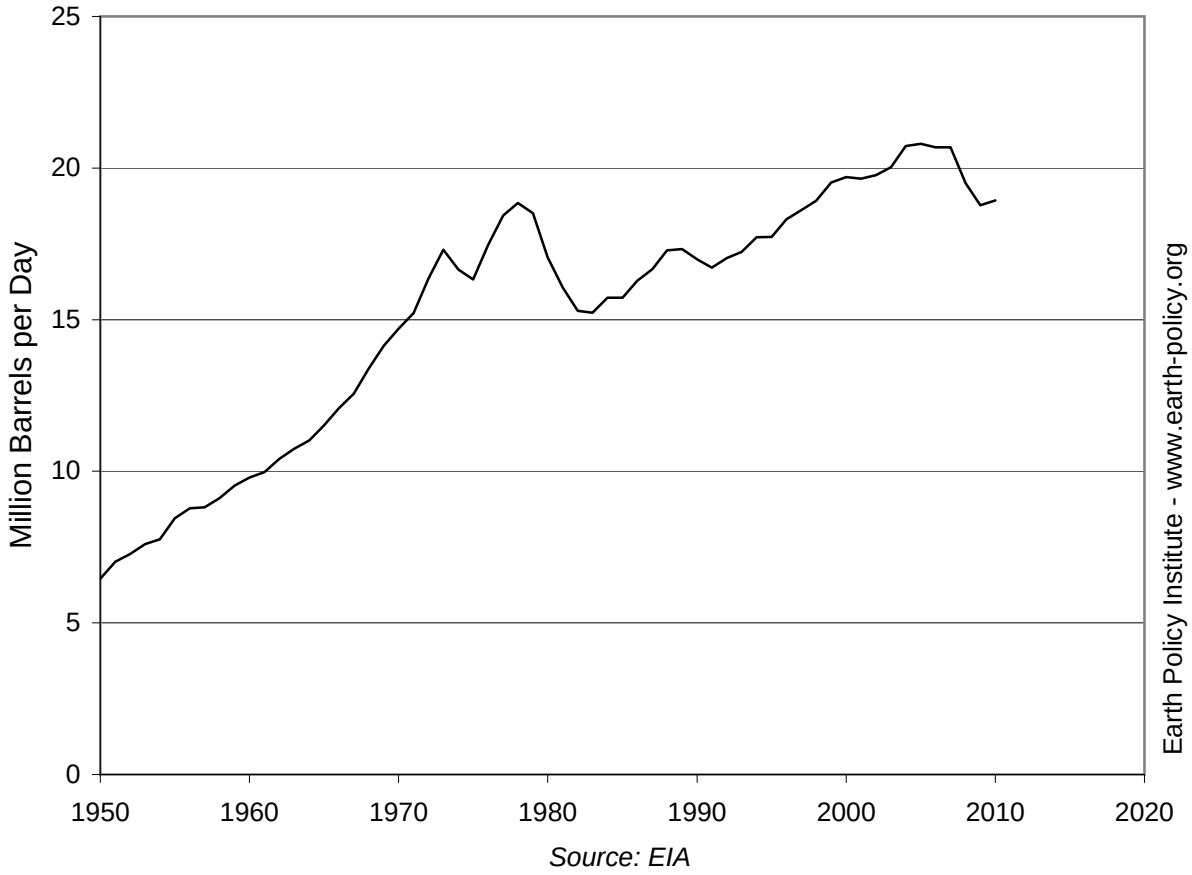
Year		Consumption* Million Barrels per Day
1950		6.46
1951		7.02
1952		7.27
1953		7.60
1954		7.76
1955		8.46
1956		8.78
1957		8.81
1958		9.12
1959		9.53
1960		9.80
1961		9.98
1962		10.40
1963		10.74
1964		11.02
1965		11.51
1966		12.08
1967		12.56
1968		13.39
1969		14.14
1970		14.70
1971		15.21
1972		16.37
1973		17.31
1974		16.65
1975		16.32
1976		17.46
1977		18.43
1978		18.85
1979		18.51
1980		17.06
1981		16.06
1982		15.30
1983		15.23
1984		15.73
1985		15.73
1986		16.28
1987		16.67
1988		17.28
1989		17.33
1990		16.99
1991		16.71
1992		17.03
1993		17.24
1994		17.72
1995		17.72
1996		18.31
1997		18.62
1998		18.92
1999		19.52
2000		19.70
2001		19.65
2002		19.76
2003		20.03
2004		20.73
2005		20.80
2006		20.69
2007		20.68
2008		19.50
2009		18.77
2010	**	18.93

* Includes ethanol, distillate fuel oil, residual fuel oil, petrochemical feedstocks, asphalt, and other petroleum products. For the full list of included items, see U.S. Department of Energy (DOE), Energy Information Administration (EIA), "Petroleum Navigator: Definitions, Sources and Explanatory Notes," at www.eia.gov/dnav/pet/TblDefs/pet_cons_psup_tbldef2.asp.

** Consumption for 2010 is a projection.

Source: 1950-2005 from "Petroleum Products Supplied by Type, 1949-2008," Table 5.11 in DOE, EIA, "Annual Energy Review: Petroleum," at www.eia.doe.gov/aer/petro.html, updated 26 June 2009; 2006-2010 from DOE, EIA, "Short Term Energy Outlook," at www.eia.doe.gov/emeu/steo, updated 8 September 2010.

Oil Consumption in the United States, 1950-2010



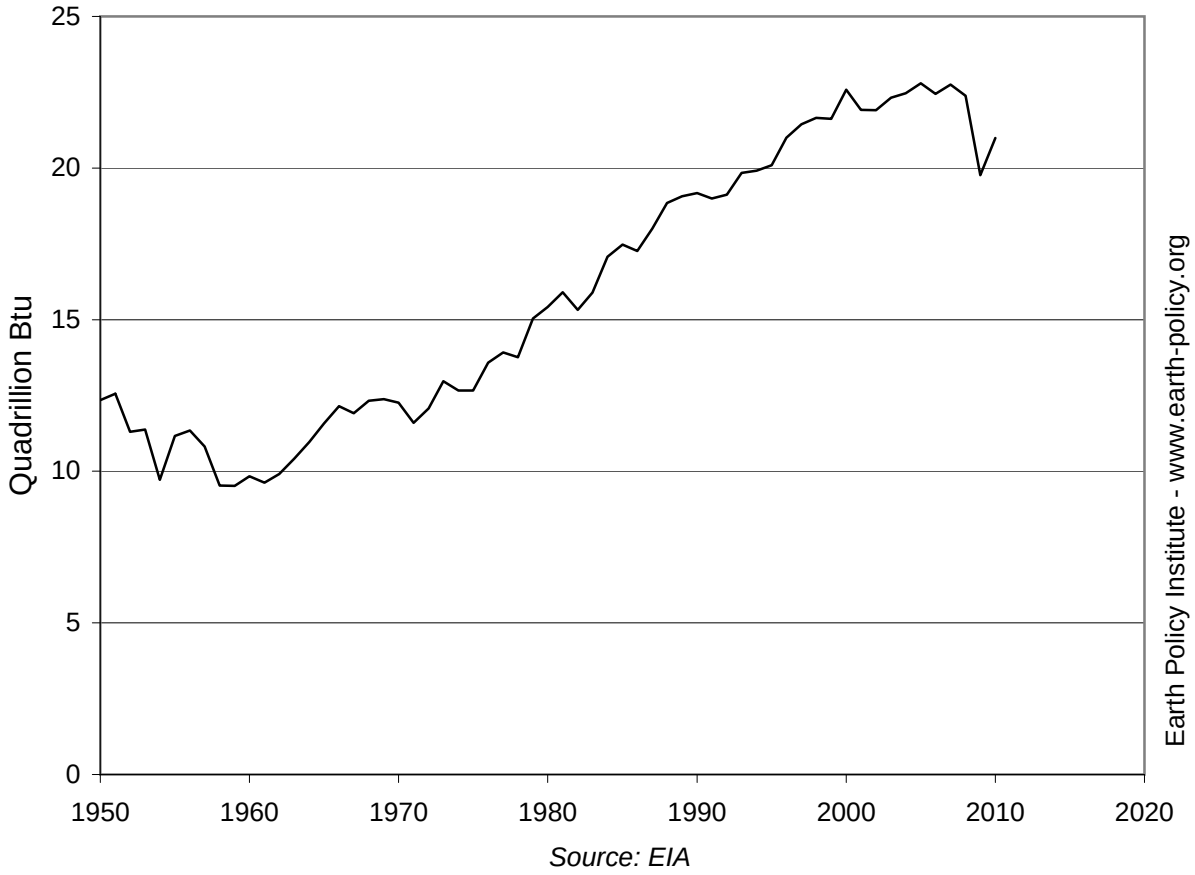
Source: EIA

Coal Consumption in the United States, 1950-2010

Year	Consumption
	Quadrillion Btu
1950	12.3
1951	12.6
1952	11.3
1953	11.4
1954	9.7
1955	11.2
1956	11.3
1957	10.8
1958	9.5
1959	9.5
1960	9.8
1961	9.6
1962	9.9
1963	10.4
1964	11.0
1965	11.6
1966	12.1
1967	11.9
1968	12.3
1969	12.4
1970	12.3
1971	11.6
1972	12.1
1973	13.0
1974	12.7
1975	12.7
1976	13.6
1977	13.9
1978	13.8
1979	15.0
1980	15.4
1981	15.9
1982	15.3
1983	15.9
1984	17.1
1985	17.5
1986	17.3
1987	18.0
1988	18.8
1989	19.1
1990	19.2
1991	19.0
1992	19.1
1993	19.8
1994	19.9
1995	20.1
1996	21.0
1997	21.4
1998	21.7
1999	21.6
2000	22.6
2001	21.9
2002	21.9
2003	22.3
2004	22.5
2005	22.8
2006	22.4
2007	22.7
2008	22.4
2009	19.8
2010	21.0

Source: Compiled by Earth Policy Institute, with data for 1950-2005 from U.S. Department of Energy (DOE), Energy Information Administration (EIA), "Annual Energy Review: Coal," at www.eia.doe.gov/aer/coal.html, updated 26 June 2009; 2006-2010 projection from DOE, EIA, "Short Term Energy Outlook," at www.eia.doe.gov/emeu/steo, updated 8 September 2010; short ton values converted into Btu using annual heat content of U.S. coal from DOE, EIA, "Annual Energy Review: Thermal Conversion Factors," at www.eia.doe.gov/emeu/aer/append_a.html, updated 19 August 2010, assuming 2010 heat content equals that of 2009.

Coal Consumption in the United States, 1950-2010



Source: EIA

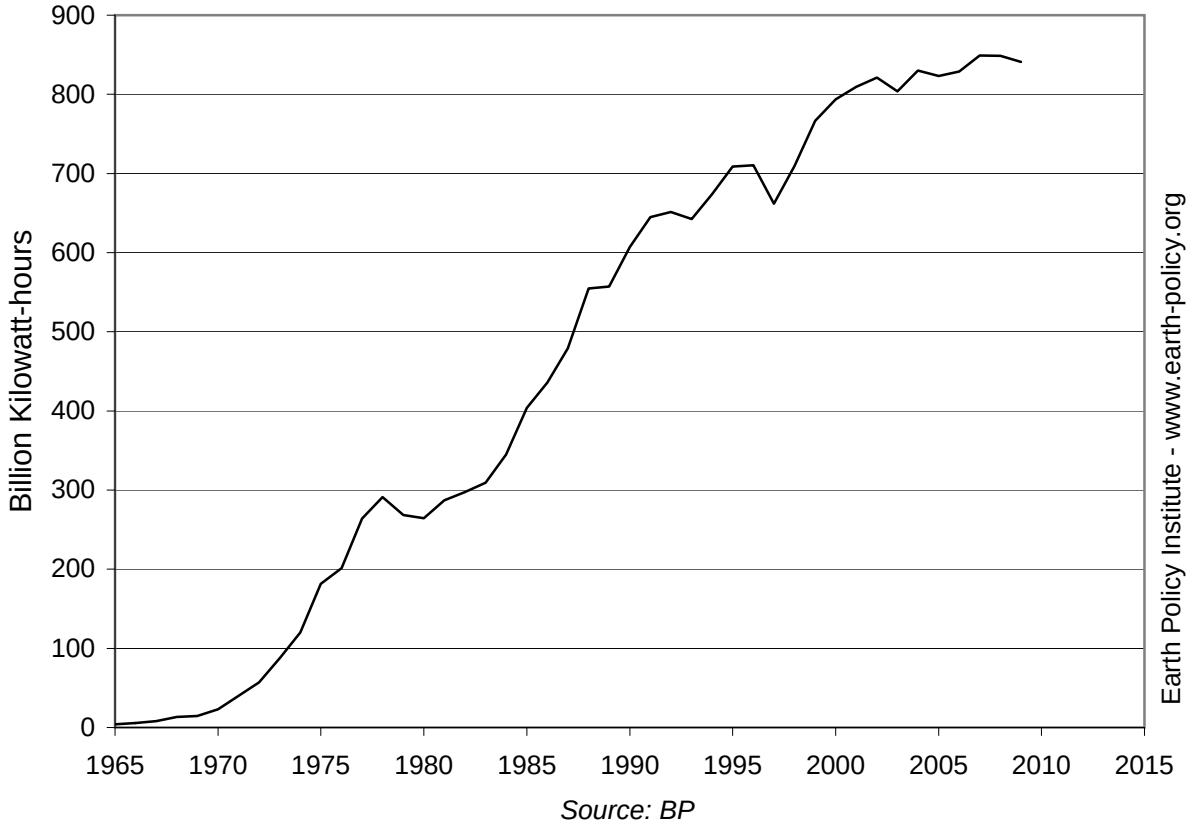
Nuclear Energy Consumption in the United States, 1965-2009

Year	Consumption
	Billion Kilowatt-hours
1965	4
1966	6
1967	8
1968	13
1969	15
1970	23
1971	40
1972	57
1973	88
1974	120
1975	182
1976	201
1977	264
1978	291
1979	269
1980	264
1981	287
1982	298
1983	309
1984	345
1985	404
1986	436
1987	479
1988	555
1989	557
1990	607
1991	645
1992	651
1993	642
1994	674
1995	709
1996	710
1997	662
1998	709
1999	767
2000	794
2001	809
2002	821
2003	804
2004	830
2005	823
2006	829
2007	849
2008	849
2009	841

Source: BP, *Statistical Review of World Energy June 2010* (London: 2010).

This is part of a supporting dataset for Lester R. Brown, **World on the Edge: How to Prevent Environmental and Economic Collapse** (New York: W.W. Norton & Company, 2011). For more information and a free download of the book, see Earth Policy Institute on-line at www.earth-policy.org.

Nuclear Energy Consumption in the United States, 1965-2009



Source: BP