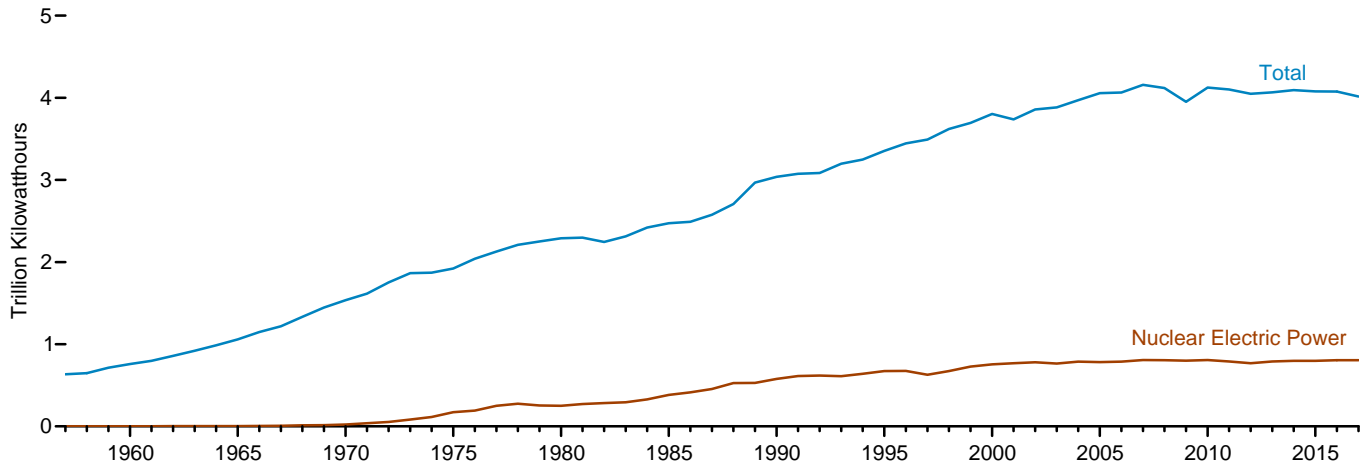


# 8. Nuclear Energy

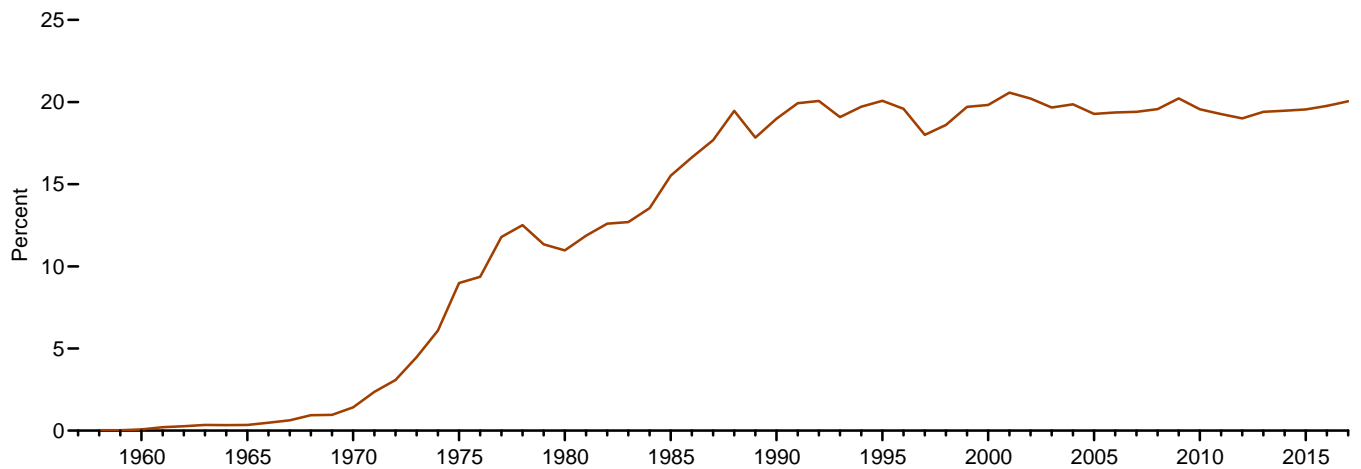
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## Figure 8.1 Nuclear Energy Overview

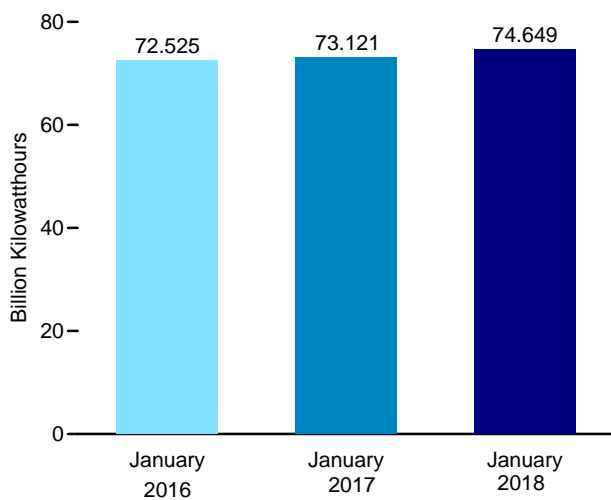
Electricity Net Generation, 1957–2017



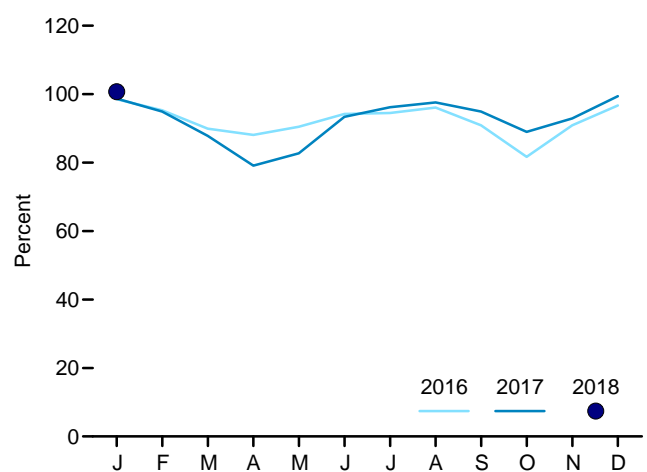
Nuclear Share of Electricity Net Generation, 1957–2017



Nuclear Electricity Net Generation



Capacity Factor, Monthly



Web Page: <http://www.eia.gov/totalenergy/data/monthly/#nuclear>.  
Sources: Tables 7.2a and 8.1.

**Table 8.1 Nuclear Energy Overview**

	Total Operable Units <sup>a,b</sup>	Net Summer Capacity of Operable Units <sup>b,c</sup>	Nuclear Electricity Net Generation	Nuclear Share of Electricity Net Generation	Capacity Factor <sup>d</sup>
	Number	Million Kilowatts	Million Kilowatt-hours	Percent	
1957 Total .....	1	0.055	10	(s)	NA
1960 Total .....	3	.411	518	.1	NA
1965 Total .....	13	.793	3,657	.3	NA
1970 Total .....	20	7.004	21,804	1.4	NA
1975 Total .....	57	37.267	172,505	9.0	55.9
1980 Total .....	71	51.810	251,116	11.0	56.3
1985 Total .....	96	79.397	383,691	15.5	58.0
1990 Total .....	112	99.624	576,862	19.0	66.0
1995 Total .....	109	99.515	673,402	20.1	77.4
2000 Total .....	104	97.860	753,893	19.8	88.1
2001 Total .....	104	98.159	768,826	20.6	89.4
2002 Total .....	104	98.657	780,064	20.2	90.3
2003 Total .....	104	99.209	763,733	19.7	87.9
2004 Total .....	104	99.628	788,528	19.9	90.1
2005 Total .....	104	99.988	781,986	19.3	89.3
2006 Total .....	104	100.334	787,219	19.4	89.6
2007 Total .....	104	100.266	806,425	19.4	91.8
2008 Total .....	104	100.755	806,208	19.6	<sup>d</sup> 91.1
2009 Total .....	104	101.004	798,855	20.2	90.3
2010 Total .....	104	101.167	806,968	19.6	91.1
2011 Total .....	104	<sup>c</sup> 101.419	790,204	19.3	89.1
2012 Total .....	104	101.885	769,331	19.0	86.1
2013 Total .....	100	99.240	789,016	19.4	89.9
2014 Total .....	99	98.569	797,166	19.5	91.7
2015 Total .....	99	98.672	797,178	19.6	92.3
<b>2016</b> January .....	99	98.921	72,525	20.6	98.5
February .....	99	98.921	65,638	20.9	95.3
March .....	99	98.921	66,149	21.7	89.9
April .....	99	98.921	62,732	21.4	88.1
May .....	99	98.921	66,576	21.0	90.5
June .....	99	100.043	67,175	18.3	94.2
July .....	100	100.043	70,349	17.1	94.5
August .....	100	100.043	71,526	17.5	96.1
September .....	100	100.043	65,448	18.6	90.9
October .....	99	99.565	60,733	19.4	81.7
November .....	99	99.565	65,179	21.9	90.9
December .....	99	99.565	71,662	20.8	96.7
<b>Total</b> .....	<b>99</b>	<b>99.565</b>	<b>805,694</b>	<b>19.8</b>	<b>92.3</b>
<b>2017</b> January .....	99	<sup>E</sup> 99.616	73,121	21.4	<sup>E</sup> 98.7
February .....	99	<sup>E</sup> 99.616	63,560	21.9	<sup>E</sup> 94.9
March .....	99	<sup>E</sup> 99.616	65,093	20.3	<sup>E</sup> 87.8
April .....	99	<sup>E</sup> 99.616	56,743	19.3	<sup>E</sup> 79.1
May .....	99	<sup>E</sup> 99.616	61,313	19.1	<sup>E</sup> 82.7
June .....	99	<sup>E</sup> 99.616	67,011	18.8	<sup>E</sup> 93.4
July .....	99	<sup>E</sup> 99.635	71,314	17.8	<sup>E</sup> 96.2
August .....	99	<sup>E</sup> 99.635	72,384	18.9	<sup>E</sup> 97.6
September .....	99	<sup>E</sup> 99.635	68,098	20.4	<sup>E</sup> 94.9
October .....	99	<sup>E</sup> 99.635	65,995	20.7	<sup>E</sup> 89.0
November .....	99	<sup>E</sup> 99.635	66,618	21.7	<sup>E</sup> 92.9
December .....	99	<sup>E</sup> 99.635	73,700	21.3	<sup>E</sup> 99.4
<b>Total</b> .....	<b>99</b>	<b><sup>E</sup>99.635</b>	<b>804,950</b>	<b>20.0</b>	<b><sup>E</sup>92.2</b>
<b>2018</b> January .....	99	<sup>E</sup> 99.630	74,649	20.0	<sup>E</sup> 100.7

<sup>a</sup> Total of nuclear generating units holding full-power licenses, or equivalent permission to operate, at end of period. See Note 1, "Operable Nuclear Reactors," at end of section.

<sup>b</sup> At end of period.

<sup>c</sup> For the definition of "Net Summer Capacity," see Note 2, "Nuclear Capacity," at end of section. Beginning in 2011, monthly capacity values are estimated in two steps: 1) uprates and derates reported on Form EIA-860M are added to specific months; and 2) the difference between the resulting year-end capacity (from data reported on Form EIA-860M) and final capacity (reported on Form EIA-860) is allocated to the month of January.

<sup>d</sup> Beginning in 2008, capacity factor data are calculated using a new

methodology. For an explanation of the method of calculating the capacity factor, see Note 2, "Nuclear Capacity," at end of section.

<sup>E</sup>=Estimate. NA=Not available. (s)=Less than 0.05%.

Notes: • For a discussion of nuclear reactor unit coverage, see Note 1, "Operable Nuclear Reactors," at end of section. • Nuclear electricity net generation totals may not equal sum of components due to independent rounding. • Geographic coverage is the 50 states and the District of Columbia.

Web Page: See <http://www.eia.gov/totalenergy/data/monthly/#nuclear> (Excel and CSV files) for all available annual data beginning in 1957 and monthly data beginning in 1973.

Sources: See end of section.

## Nuclear Energy

**Note 1. Operable Nuclear Reactors.** A reactor is defined as operable when it possesses a full-power license from the Nuclear Regulatory Commission or its predecessor, the Atomic Energy Commission, or equivalent permission to operate, at the end of the year or month shown. The definition includes units retaining full-power licenses during long, non-routine shutdowns that for a time rendered them unable to generate electricity.

Year	Retirements	Openings and Restarts
2007		Browns Ferry 1 <sup>a</sup> (AL)
2008		
2009		
2010		
2011		
2012		
2013	Kewaunee (WI); San Onofre 2 and 3 (CA); Crystal River 3 <sup>b</sup> (FL)	
2014	Vermont Yankee (VT)	
2015		
2016	Fort Calhoun (NE)	Watts Bar 2 (TN)
2017		

<sup>a</sup> Restarted after long-term shutdown from 1986 to 2006, but counted as operable for those years.

<sup>b</sup> Official 2013 retirement for reactor closed in 2009.

Note: “Opening” refers to the plant’s commercial operations date.

Source: International Atomic Energy Agency, Power Reactor Information System database. See <https://www.iaea.org/PRIS/CountryStatistics/CountryDetails.aspx?current=US>.

**Note 2. Nuclear Capacity.** Nuclear generating units may have more than one type of net capacity rating, including the following:

(a) Net Summer Capacity—The steady hourly output that generating equipment is expected to supply to system load, exclusive of auxiliary power, as demonstrated by test at the time of summer peak demand. Auxiliary power of a typical nuclear power plant is about 5% of gross generation.

(b) Net Design Capacity or Net Design Electrical Rating (DER)—The nominal net electrical output of a unit, specified by the utility and used for plant design.

Through 2007, the monthly capacity factors are calculated as the monthly nuclear electricity net generation divided by the maximum possible nuclear electricity net generation for that month. The maximum possible nuclear electricity net generation is the number of hours in the month (assuming 24-hour days, with no adjustment for changes to or from Daylight Savings Time) multiplied by the net summer capacity of operable nuclear generating units at the end of the month. That fraction is then multiplied by 100 to obtain a percentage. Annual capacity factors are calculated as the annual nuclear electricity net generation divided by the annual maximum possible nuclear electricity net generation (the sum of the monthly values for maximum possible nuclear electricity net generation). For the methodology used to calculate capacity factors beginning in 2008, see U.S. Energy Information Administration, *Electric Power Monthly*, Appendix C notes on “Average Capacity Factors.”

### Table 8.1 Sources

#### Total Operable Units and Net Summer Capacity of Operable Units

1957–1982: Compiled from various sources, primarily U.S. Department of Energy, Office of Nuclear Reactor Programs, “U.S. Central Station Nuclear Electric Generating Units: Significant Milestones.”

1983 forward: U.S. Energy Information Administration (EIA), Form EIA-860, “Annual Electric Generator Report,” and predecessor forms; Form EIA-860M, “Monthly Update to the Annual Electric Generator Report”; and monthly updates as appropriate. See <https://www.eia.gov/nuclear/generation/index.html> for a list of operable units.

#### Nuclear Electricity Net Generation and Nuclear Share of Electricity Net Generation

1957 forward: Table 7.2a.

#### Capacity Factor

1973–2007: Calculated by EIA using the method described above in Note 2.

2008 forward: EIA, Form EIA-860, “Annual Electric Generator Report”; Form EIA-860M, “Monthly Update to the Annual Electric Generator Report”; and Form EIA-923, “Power Plant Operations Report.”