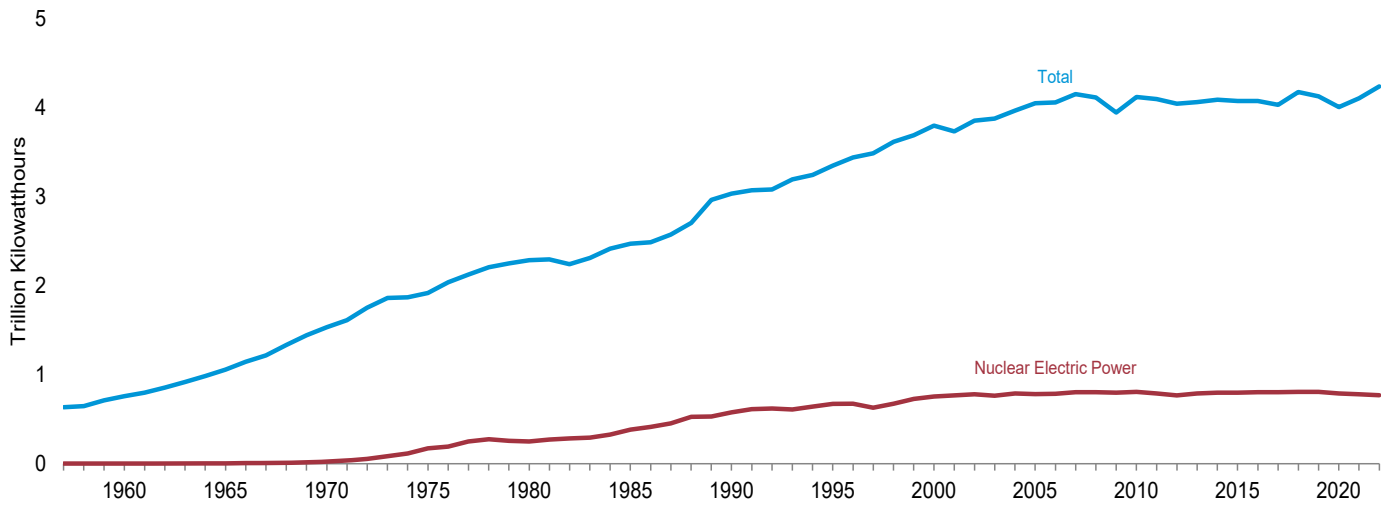


# 8. Nuclear Energy

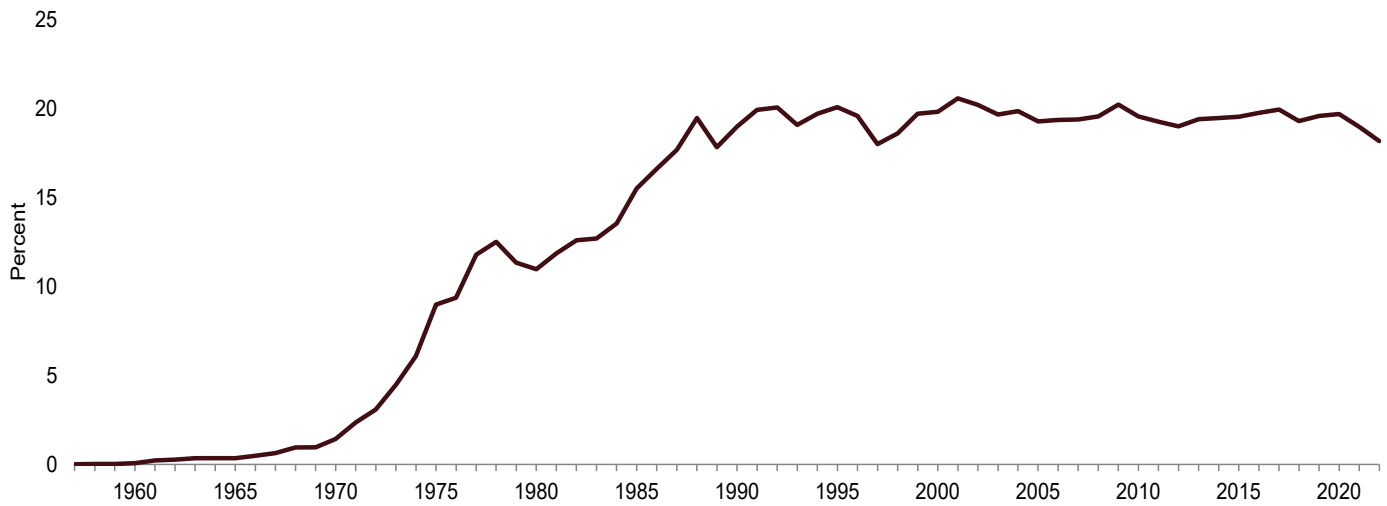
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**Figure 8.1 Nuclear Energy Overview**

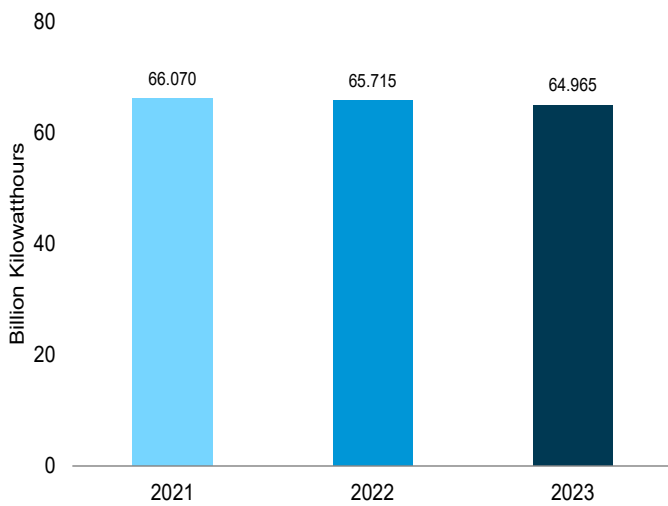
Electricity Net Generation, 1957–2022



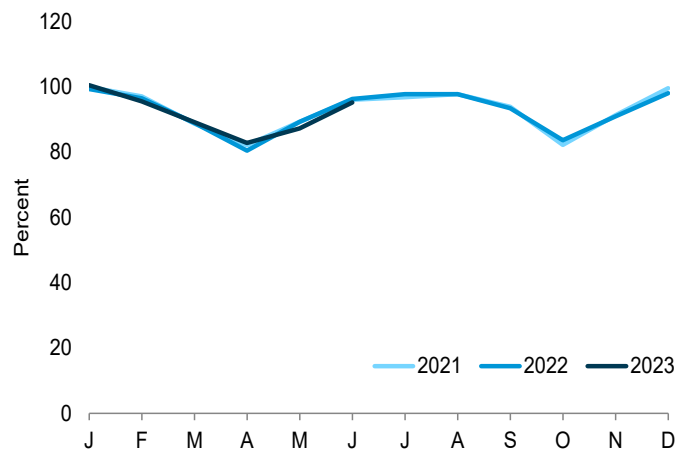
Nuclear Share of Electricity Net Generation, 1957–2022



Nuclear Electricity Net Generation—June



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 Kilowatthours	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
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	90.8
2014 Total .....	99	98.569	797,166	19.5	91.7
2015 Total .....	99	98.672	797,178	19.5	92.3
2016 Total .....	99	99.565	805,694	19.8	92.3
2017 Total .....	99	99.629	804,950	19.9	92.3
2018 Total .....	98	99.433	807,084	19.3	92.5
2019 Total .....	96	98.119	809,409	19.6	93.4
2020 Total .....	94	96.501	789,879	19.7	92.4
2021 January .....	94	96.586	71,732	20.5	99.9
February .....	94	96.586	62,954	19.4	97.0
March .....	94	96.586	63,708	20.5	88.7
April .....	93	95.546	57,092	19.5	82.1
May .....	93	95.546	63,394	19.8	89.2
June .....	93	95.546	66,070	17.7	96.0
July .....	93	95.546	68,832	17.0	96.8
August .....	93	95.546	69,471	16.8	97.7
September .....	93	95.546	64,520	18.6	93.8
October .....	93	95.546	58,401	18.2	82.2
November .....	93	95.546	62,749	20.0	91.2
December .....	93	95.546	70,720	21.0	99.5
<b>Total .....</b>	<b>93</b>	<b>95.546</b>	<b>779,645</b>	<b>19.0</b>	<b>92.8</b>
2022 January .....	93	<sup>E</sup> 95.512	70,577	18.7	<sup>E</sup> 99.3
February .....	93	<sup>E</sup> 95.512	61,852	18.9	<sup>E</sup> 96.4
March .....	93	<sup>E</sup> 95.512	63,154	19.4	<sup>E</sup> 88.9
April .....	93	<sup>E</sup> 95.512	55,290	18.2	<sup>E</sup> 80.4
May .....	93	<sup>E</sup> 95.533	63,382	18.5	<sup>E</sup> 89.2
June .....	92	<sup>E</sup> 94.765	65,715	17.3	<sup>E</sup> 96.3
July .....	92	<sup>E</sup> 94.765	68,857	16.2	<sup>E</sup> 97.7
August .....	92	<sup>E</sup> 94.765	68,897	16.7	<sup>E</sup> 97.7
September .....	92	<sup>E</sup> 94.765	63,733	18.2	<sup>E</sup> 93.4
October .....	92	<sup>E</sup> 94.765	58,945	18.8	<sup>E</sup> 83.6
November .....	92	<sup>E</sup> 94.765	62,041	19.2	<sup>E</sup> 90.9
December .....	92	<sup>E</sup> 94.765	69,094	19.0	<sup>E</sup> 98.0
<b>Total .....</b>	<b>92</b>	<b><sup>E</sup>94.765</b>	<b>771,537</b>	<b>18.2</b>	<b><sup>E</sup>92.6</b>
2023 January .....	92	<sup>E</sup> 94.768	70,870	20.4	<sup>E</sup> 100.5
February .....	92	<sup>E</sup> 94.768	60,807	19.6	<sup>E</sup> 95.5
March .....	92	<sup>E</sup> 94.768	62,820	19.0	<sup>E</sup> 89.1
April .....	92	<sup>E</sup> 94.767	56,501	18.8	<sup>E</sup> 82.8
May .....	92	<sup>E</sup> 94.767	61,473	18.7	<sup>E</sup> 87.2
June .....	92	<sup>E</sup> 94.767	64,965	18.2	<sup>E</sup> 95.2
<b>6-Month Total .....</b>	<b>92</b>	<b><sup>E</sup>94.767</b>	<b>377,436</b>	<b>19.1</b>	<b><sup>E</sup>91.7</b>
2022 6-Month Total .....	92	<sup>E</sup> 94.765	379,969	18.5	<sup>E</sup> 91.7
2021 6-Month Total .....	93	95.546	384,951	19.5	92.1

<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%.

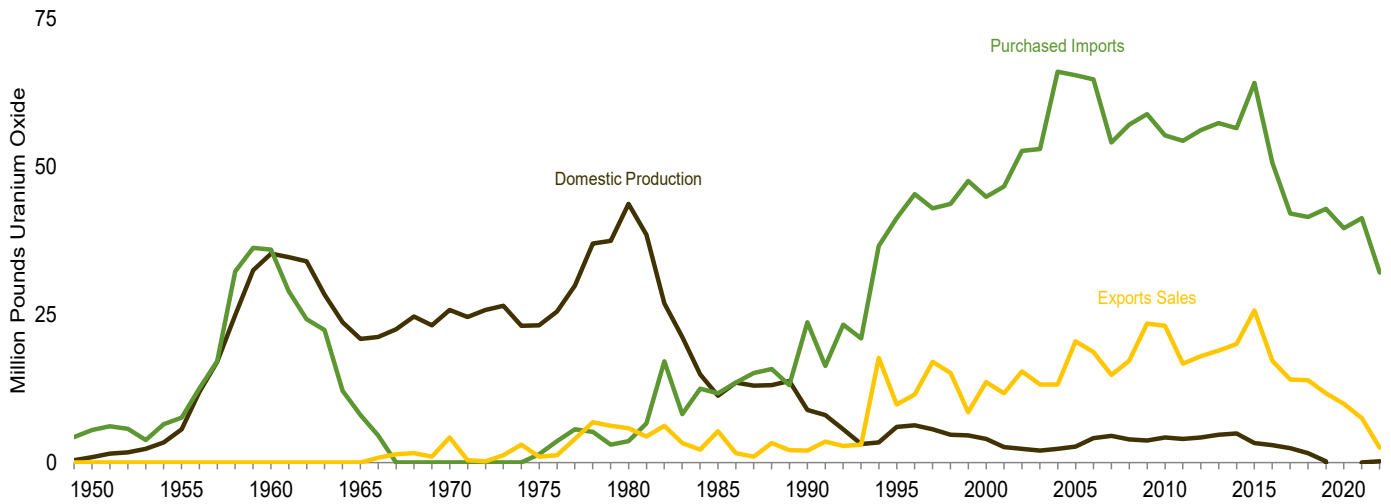
Notes: • For a discussion of nuclear reactor unit coverage, see Note 1, "Operable Nuclear Reactors," at end of section. • Nuclear electricity net generation totals may not equal sum of components due to independent rounding. • Geographic coverage is the 50 states and the District of Columbia.

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.

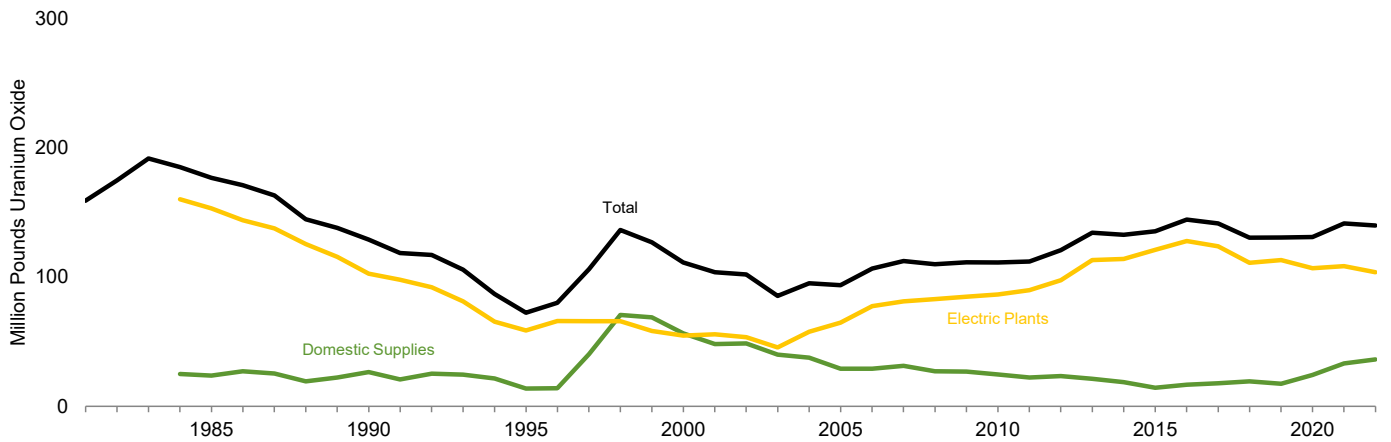
Sources: See end of section.

**Figure 8.2 Uranium Overview**

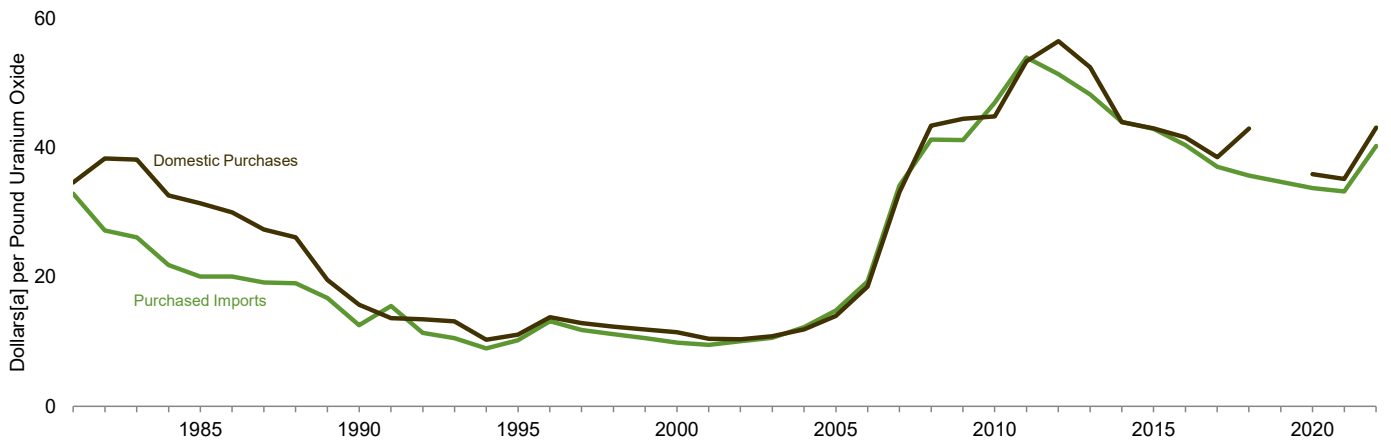
Production and Trade, 1949–2022



Inventories, End of Year 1981–2022



Average Prices, 1981–2022



[a] Prices are not adjusted for inflation. See “Nominal Dollars” in Glossary.  
 Note: See “Uranium Oxide” in Glossary.

Web Page: <http://www.eia.gov/totalenergy/data/monthly/#nuclear>.  
 Source: Table 8.2.

**Table 8.2 Uranium Overview**

	Domestic Concentrate Production <sup>a</sup>	Purchased Imports <sup>b</sup>	Export <sup>b</sup> Sales	Electric Plant Purchases From Domestic Suppliers	Loaded Into U.S. Nuclear Reactors <sup>c</sup>	Inventories			Average Price	
						Domestic Suppliers	Electric Plants	Total	Purchased Imports	Domestic Purchases
Million Pounds Uranium Oxide									Dollars <sup>d</sup> per Pound Uranium Oxide	
1950 .....	0.92	5.5	0.0	NA	NA	NA	NA	NA	NA	NA
1955 .....	5.56	7.6	.0	NA	NA	NA	NA	NA	NA	NA
1960 .....	35.28	36.0	.0	NA	NA	NA	NA	NA	NA	NA
1965 .....	20.88	8.0	.0	NA	NA	NA	NA	NA	NA	NA
1970 .....	25.81	.0	4.2	NA	NA	NA	NA	NA	--	NA
1975 .....	23.20	1.4	1.0	NA	NA	NA	NA	NA	NA	NA
1980 .....	43.70	3.6	5.8	NA	NA	NA	NA	NA	NA	NA
1981 .....	38.47	6.6	4.4	32.6	NA	NA	NA	159.2	32.90	34.65
1982 .....	26.87	17.1	6.2	27.1	NA	NA	NA	174.8	27.23	38.37
1983 .....	21.16	8.2	3.3	24.2	NA	NA	NA	191.8	26.16	38.21
1984 .....	14.88	12.5	2.2	22.5	NA	25.0	160.2	185.2	21.86	32.65
1985 .....	11.31	11.7	5.3	21.7	NA	23.7	153.2	176.9	20.08	31.43
1986 .....	13.51	13.5	1.6	18.9	NA	27.0	144.1	171.1	20.07	30.01
1987 .....	12.99	15.1	1.0	20.8	NA	25.4	137.8	163.2	19.14	27.37
1988 .....	13.13	15.8	3.3	17.6	NA	19.3	125.5	144.8	19.03	26.15
1989 .....	13.84	13.1	2.1	18.4	NA	22.2	115.8	138.1	16.75	19.56
1990 .....	8.89	23.7	2.0	20.5	NA	26.4	102.7	129.1	12.55	15.70
1991 .....	7.95	16.3	3.5	26.8	34.6	20.7	98.0	118.7	15.55	13.66
1992 .....	5.65	23.3	2.8	23.4	43.0	25.2	92.1	117.3	11.34	13.45
1993 .....	3.06	21.0	3.0	15.5	45.1	24.5	81.2	105.7	10.53	13.14
1994 .....	3.35	36.6	17.7	22.7	40.4	21.5	65.4	86.9	8.95	10.30
1995 .....	6.04	41.3	9.8	22.3	51.1	13.7	58.7	72.5	10.20	11.11
1996 .....	6.32	45.4	11.5	23.7	46.2	13.9	66.1	80.0	13.15	13.81
1997 .....	5.64	43.0	17.0	19.4	48.2	40.4	65.9	106.2	11.81	12.87
1998 .....	4.70	43.7	15.1	21.6	38.2	70.7	65.8	136.5	11.19	12.31
1999 .....	4.61	47.6	8.5	21.4	58.8	68.8	58.3	127.1	10.55	11.88
2000 .....	3.98	44.9	13.6	24.3	51.5	56.5	54.8	111.3	9.84	11.45
2001 .....	2.64	46.7	11.7	27.5	52.7	48.1	55.6	103.8	9.51	10.45
2002 .....	e,E2.34	52.7	15.4	22.7	57.2	48.7	53.5	102.1	10.05	10.35
2003 .....	e,E2.00	53.0	13.2	21.7	62.3	39.9	45.6	85.5	10.59	10.84
2004 .....	2.28	66.1	13.2	28.2	50.1	37.5	57.7	95.2	12.25	11.91
2005 .....	2.69	65.5	20.5	27.3	58.3	29.1	64.7	93.8	14.83	13.98
2006 .....	4.11	64.8	18.7	27.9	51.7	29.1	77.5	106.6	19.31	18.54
2007 .....	4.53	54.1	14.8	18.5	45.5	31.2	81.2	112.4	34.18	33.13
2008 .....	3.90	57.1	17.2	20.4	51.3	27.0	83.0	110.0	41.30	43.43
2009 .....	3.71	58.9	23.5	17.6	49.4	26.8	84.8	111.5	41.23	44.53
2010 .....	4.23	55.3	23.1	16.2	44.3	24.7	86.5	111.3	47.01	44.88
2011 .....	3.99	54.4	16.7	19.8	50.9	22.3	89.8	112.1	54.00	53.41
2012 .....	4.15	56.2	18.0	21.5	49.5	23.3	97.6	120.9	51.44	56.51
2013 .....	4.66	57.4	18.9	23.3	42.6	21.3	113.1	134.4	48.27	52.51
2014 .....	4.89	56.5	20.0	20.5	50.5	18.7	114.0	132.7	44.03	43.99
2015 .....	3.34	64.2	25.7	19.6	47.4	14.3	121.1	135.5	42.95	43.03
2016 .....	2.92	50.7	17.2	18.8	41.7	16.7	128.0	144.6	40.45	41.64
2017 .....	2.44	42.1	14.0	14.0	45.5	17.8	123.9	141.7	37.09	38.57
2018 .....	1.65	41.5	13.9	11.1	50.4	19.3	111.2	130.5	35.73	42.98
2019 .....	.17	42.9	11.7	W	43.2	17.5	113.1	130.7	34.77	W
2020 .....	W	39.6	9.9	10.5	48.6	24.2	106.9	131.0	33.79	35.92
2021 .....	.02	41.3	7.5	8.2	44.4	33.2	108.5	141.7	33.26	35.18
2022 .....	.20	32.1	2.5	4.4	P 44.4	P 36.2	P 103.8	P 140.0	40.31	43.15

<sup>a</sup> See "Uranium Concentrate" in Glossary.

<sup>b</sup> Import quantities through 1970 are reported for fiscal years. Prior to 1968, the Atomic Energy Commission was the sole purchaser of all imported uranium oxide. Trade data prior to 1982 were for transactions conducted by uranium suppliers only. For 1982 forward, transactions by uranium buyers (consumers) have been included. Buyer imports and exports prior to 1982 are believed to be small.

<sup>c</sup> Does not include any fuel rods removed from reactors and later reloaded.

<sup>d</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>e</sup> Value has been rounded to avoid disclosure of individual company data.

P=Preliminary. E=Estimate. NA=Not available. W=Value withheld to avoid disclosure of individual company data. --=Not applicable.

Note: See "Uranium Oxide" in Glossary.

Web Page: See <http://www.eia.gov/totalenergy/data/monthly#nuclear> (Excel and CSV files) for all available annual data beginning in 1949.

Sources: • **1949–1966:** U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual reports. • **1967–2002:** U.S. Energy Information Administration (EIA), *Uranium Industry Annual*, annual reports. • **2003–2020:** EIA, "Domestic Uranium Production Report," annual reports; and EIA, "Uranium Marketing Annual Report," annual reports. • **2021 forward:** EIA, "2022 Domestic Uranium Production Report" (May 2023), Table 3; and EIA, "2022 Uranium Marketing Annual Report" (June 2023), Tables 5, 18, 19, 21, and 22.

**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.

**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 Annual*, Appendix technical notes on “Capacity Factors and Usage 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: Table 7.8a.