NUCLEAR BY THE NUMBERS

Capacity Factor **93.4%**

Electricity Generation **19.7%**

Carbon-Free Electricity **54.8%**

NEI NUCLEAR ENERGY INSTITUTE

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NUCLEAR BY THE NUMBERS

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for additional information or previous versions of this document.

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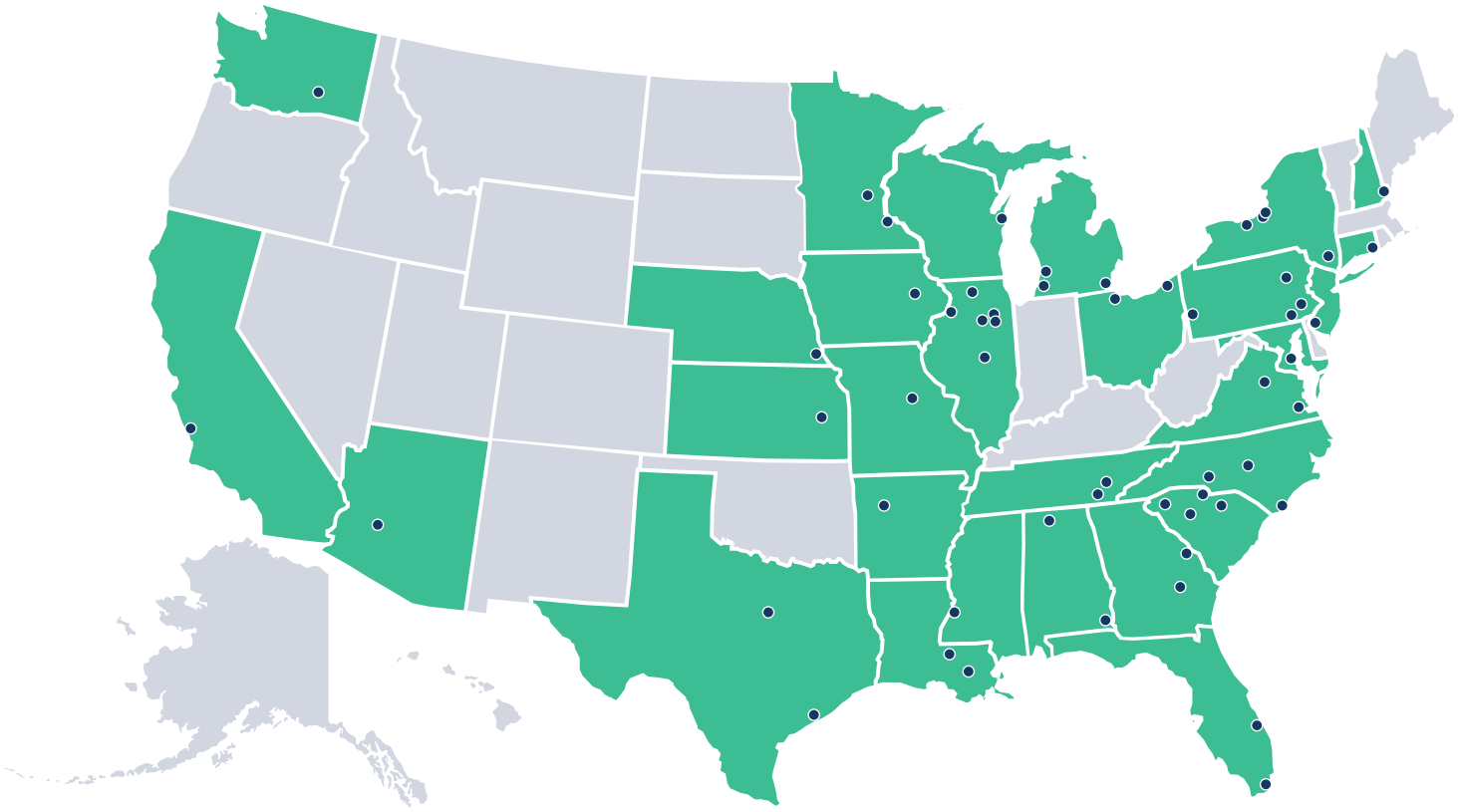
THE NUCLEAR ADVANTAGE

PERFORMANCE AND COST

STATUS AND OUTLOOK

U.S. Nuclear Power Plants Today

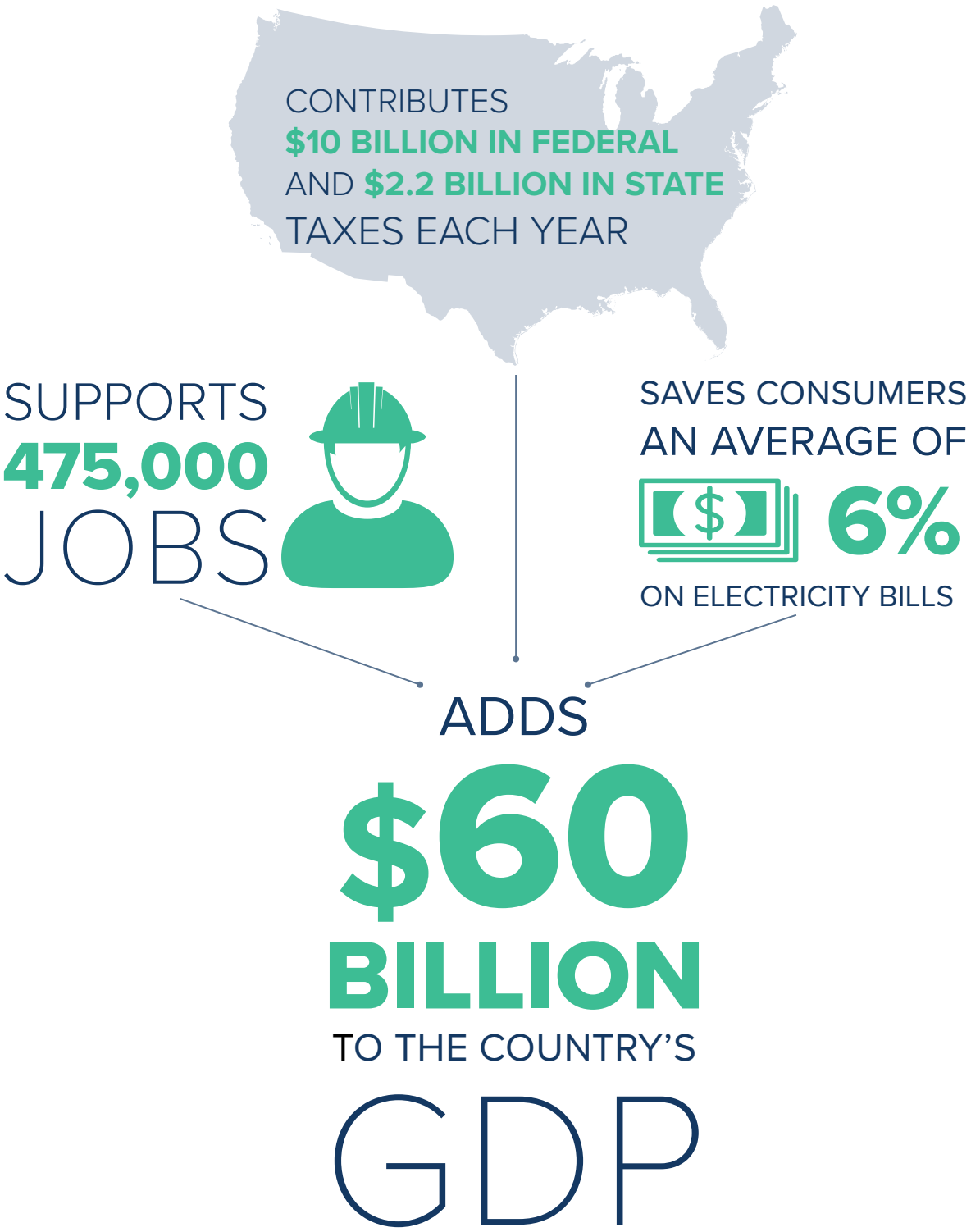
- 96 reactors across 56 sites
- 98,070 megawatts-electric of baseload capacity
- 809.4 billion kilowatt-hours of electricity produced in 2019
- 93.4 percent capacity factor in 2019
- Two nuclear power plants, responsible for over 11.7 billion kilowatt-hours of carbon-free electricity, prematurely retired in 2019



Source: U.S. Energy Information Administration.

Updated: March 2020

Nuclear Energy Creates and Sustains Jobs



Source: *The Nuclear Industry's Contribution to the U.S. Economy*, The Brattle Group, July 2015.

Nuclear Energy = Clean Air

AVOIDS

476

MILLION

METRIC TONS

OF **CO2**

EMISSIONS

EACH YEAR

PREVENTS

244,970

SHORT TONS

OF **NOX**

EMISSIONS

+

PREVENTS

217,357

SHORT TONS

OF **SO2**

EMISSIONS

VALUED AT A SOCIAL COST OF

$25.1

BILLION

ANNUALLY

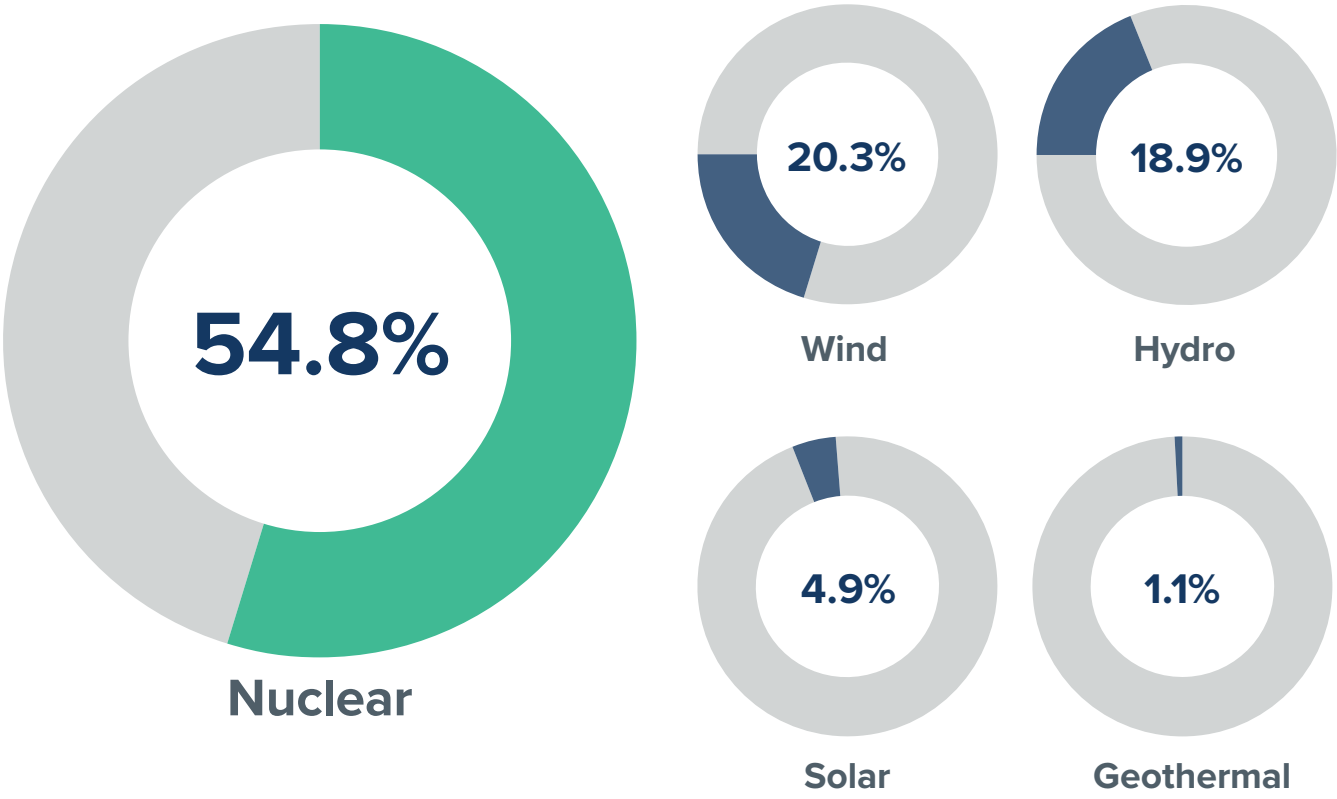
(in 2019 dollars)

Sources: Emissions avoided are calculated using regional and national fossil fuel emissions rates from the U.S. Environmental Protection Agency and latest plant generation data from the U.S. Energy Information Administration. *The Nuclear Industry's Contribution to the U.S. Economy*, The Brattle Group, July 2015.

Updated: March 2020

2019 U.S. Carbon-Free Electricity Fuel Shares

Nuclear power is responsible for more carbon-free electricity than all other sources combined.



Source: U.S. Energy Information Administration.

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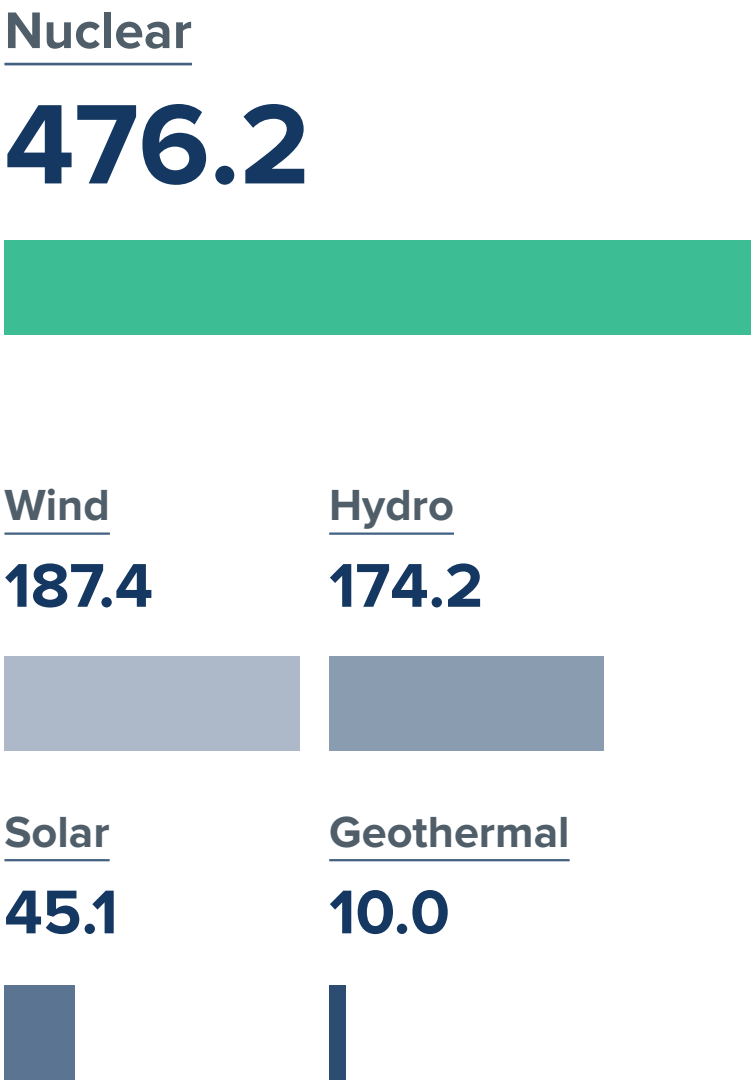
2019 Carbon Emissions Avoided by the U.S. Power Industry

Million Metric Tons

Emissions avoided by the U.S. nuclear industry in 2019 are equivalent to taking over 100 million cars off the road.



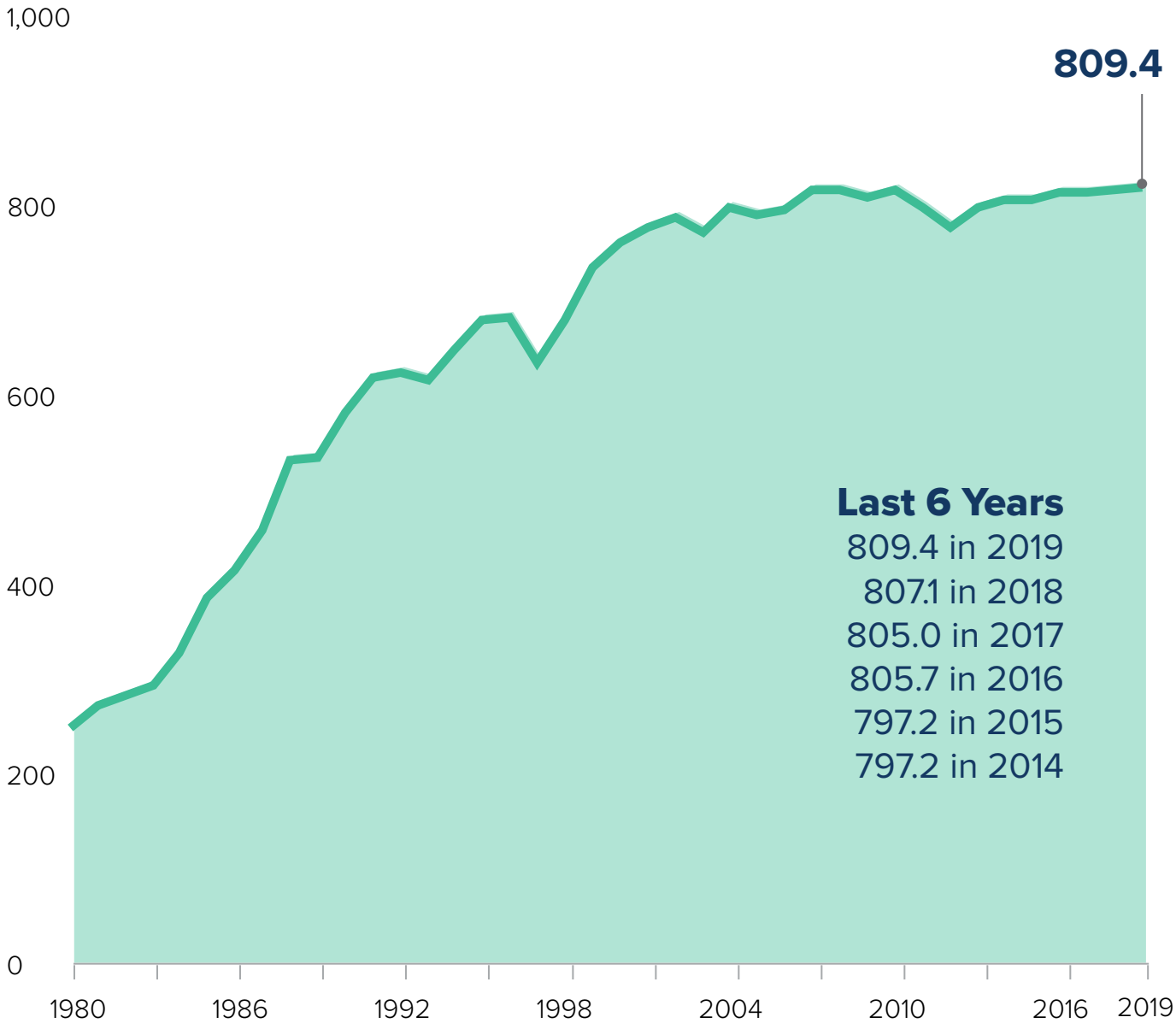
Source: Emissions avoided are calculated using regional and national fossil fuel emissions rates from the U.S. Environmental Protection Agency and latest plant generation data from the U.S. Energy Information Administration.

Updated: March 2020

U.S. Nuclear Electricity Generation

Billion Kilowatt-Hours

U.S. nuclear power plants achieved their highest electricity generation ever in 2019.



Source: U.S. Energy Information Administration.

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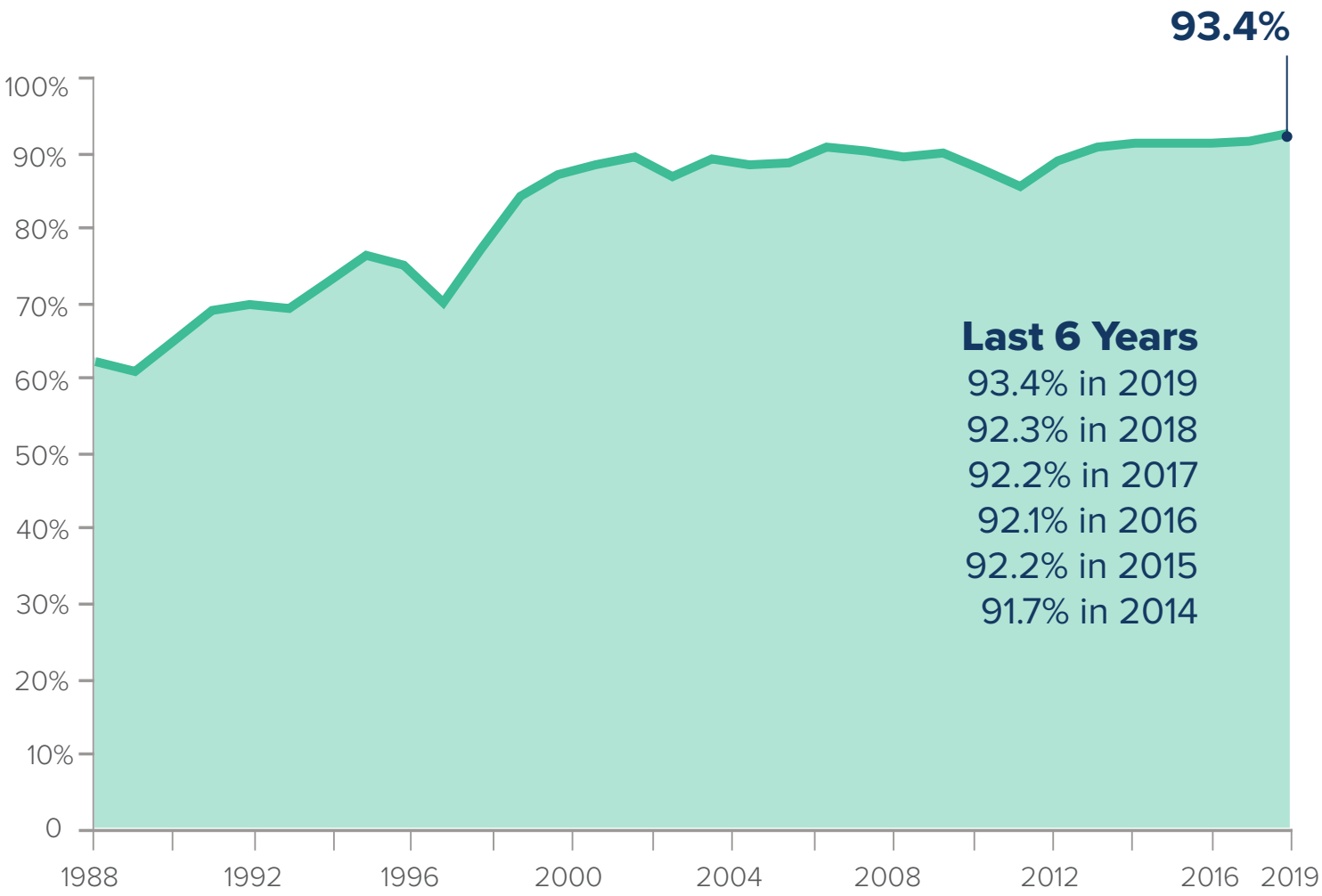
U.S. Nuclear Industrywide Capacity Factors

U.S. nuclear power plants achieved the highest capacity factor ever in 2019 and an average capacity factor of 90 percent over the last 20 years.



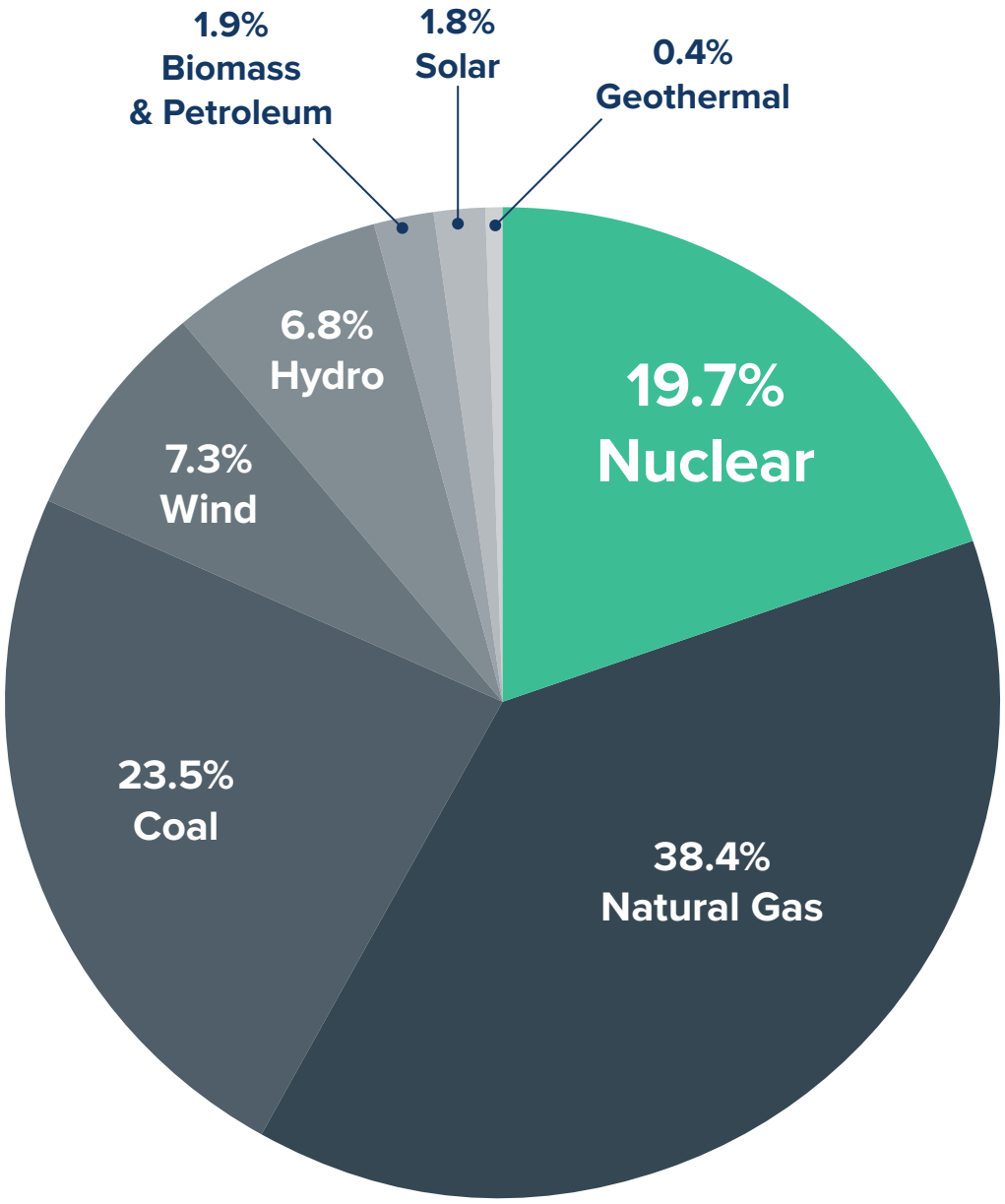
Note: U.S. Energy Information Administration reports 93.5 percent capacity factor for 2019. NEI's calculation (93.4 percent) accurately accounts for Pilgrim Nuclear Power Station's closure in May 2019 and Three Mile Island Nuclear Station's closure in September 2019.

Source: U.S. Energy Information Administration.

Updated: March 2020

2019 U.S. Electricity Generation Fuel Shares

Nearly 20 percent of U.S. energy generation comes from nuclear.



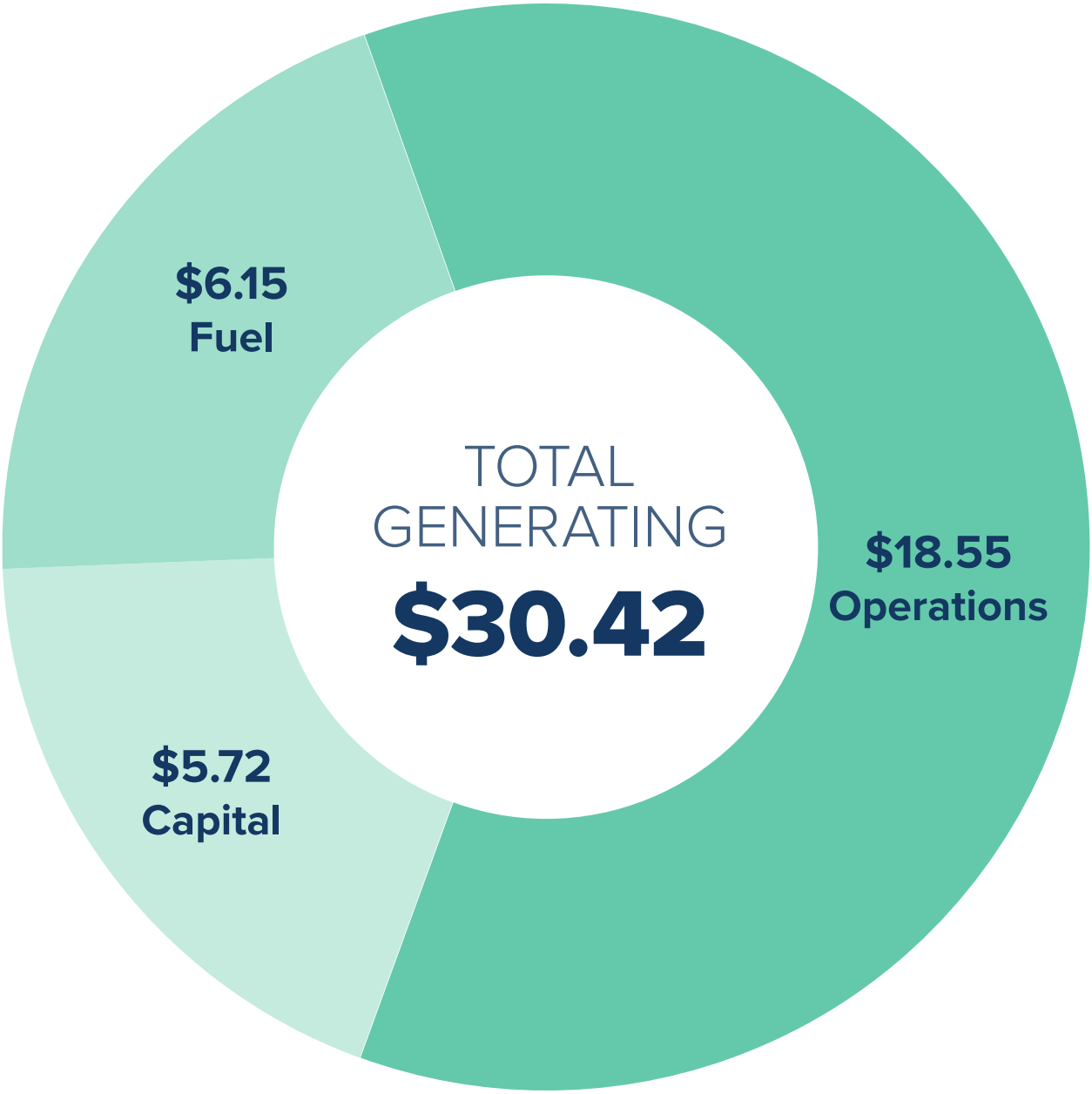
Source: U.S. Energy Information Administration.

Updated: March 2020

Industry Average Total Generating Costs

2019 Dollars per Megawatt-Hour

U.S. nuclear power plants achieved the lowest electricity generating costs since 2002.



Total generating cost is the sum of the fuel, capital expenditure and operations costs. Data is collected by EUCG to perform benchmarking comparisons from nuclear power plant operators. The total generating cost does not include local property taxes or considerations for risk management or returns on investment that would be key factors in business decisions affecting a particular plant.

Source: Electric Utility Cost Group.

Updated: February 2020

Industry Average Total Generating Costs
2019 Dollars Per Megawatt-Hour

Industry Average

$30.42

Multiple Unit Sites

$28.38

Single Unit Sites

$38.40

Total generating cost is the sum of the fuel, capital expenditure and operations costs. Data is collected by EUCG to perform benchmarking comparisons from nuclear power plant operators. The total generating cost does not include local property taxes or considerations for risk management or returns on investment that would be key factors in business decisions affecting a particular plant.

Source: Electric Utility Cost Group.

Updated: February 2020

U.S. Nuclear Industry Total Generating Cost Trends

2019 Dollars Per Megawatt-Hour

- U.S. nuclear industry has achieved the ambitious goal of 30 percent reduction in total generating costs through the industrywide Delivering the Nuclear Promise initiative.
- Average total generating cost have decreased from $44.57 per megawatt-hour in 2012 peak to $30.42 per megawatt-hour in 2019, a reduction of nearly 32 percent.

YEAR	FUEL	CAPITAL	OPERATIONS	TOTAL GENERATING
2002	$6.18	$4.23	$20.08	$30.50
2004	$5.70	$6.10	$20.02	$31.82
2007	$5.54	$6.61	$20.59	$32.73
2010	$7.29	$10.09	$22.46	$39.83
2011	$7.64	$11.02	$23.81	$42.47
2012	$7.97	$12.19	$24.41	$44.57
2015	$7.37	$8.60	$22.49	$38.45
2016	$7.16	$7.18	$21.76	$36.11
2017	$6.71	$6.92	$21.39	$35.03
2018	$6.47	$6.32	$20.12	$32.91
2019	$6.15	$5.72	$18.55	$30.42
2018-2019	**-4.9%**	**-9.5%**	**-7.8%**	**-7.6%**
2012-2019	**-22.7%**	**-53.1%**	**-24.0%**	**-31.7%**

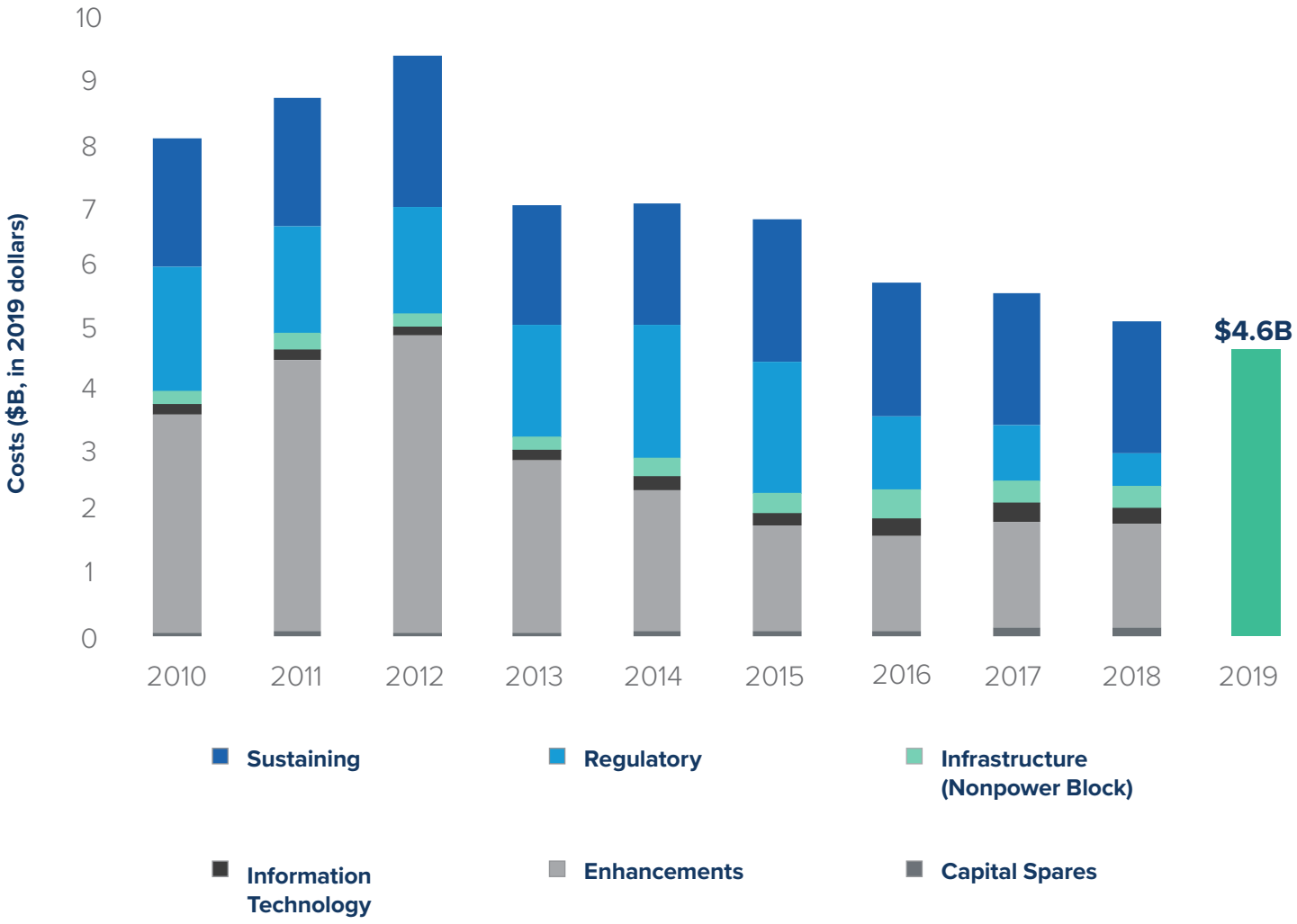
Total generating cost is the sum of the fuel, capital expenditure and operations costs.
Data is collected by EUCG to perform benchmarking comparisons from nuclear power plant operators.
The total generating cost does not include local property taxes or considerations for risk management or returns on investment that would be key factors in business decisions affecting a particular plant.

Source: Electric Utility Cost Group.

Updated: February 2020

U.S. Nuclear Industry Capital Cost Trends

Capital expenditures per megawatt-hour decreased 9.5 percent in 2019 from 2018.



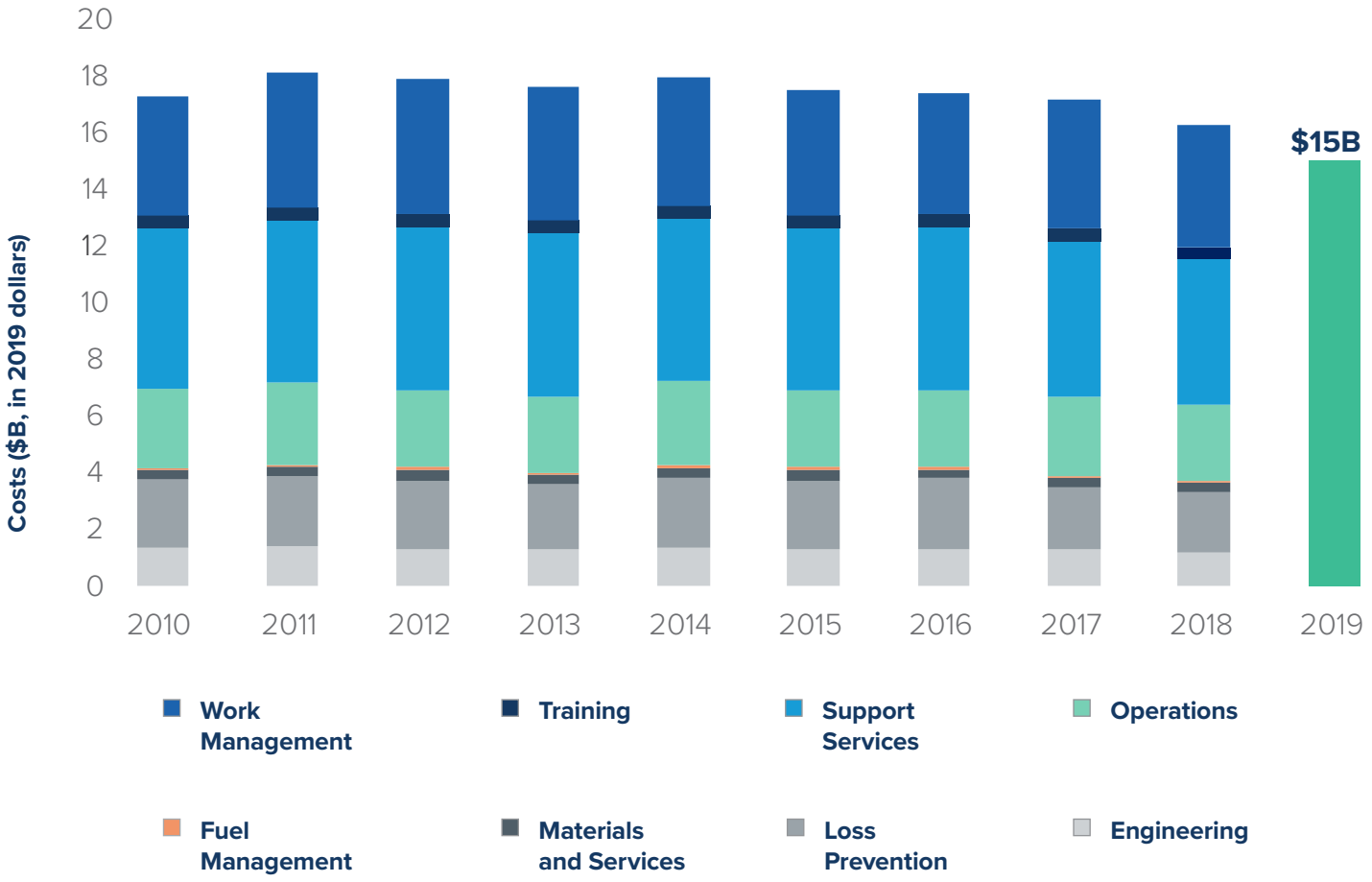
Note: Detailed 2019 cost breakdown will be available in June 2020.

Source: Electric Utility Cost Group.

Updated: February 2020

U.S. Nuclear Industry Operations Cost Trends

Operations costs per megawatt-hour decreased 7.8 percent in 2019 from 2018.



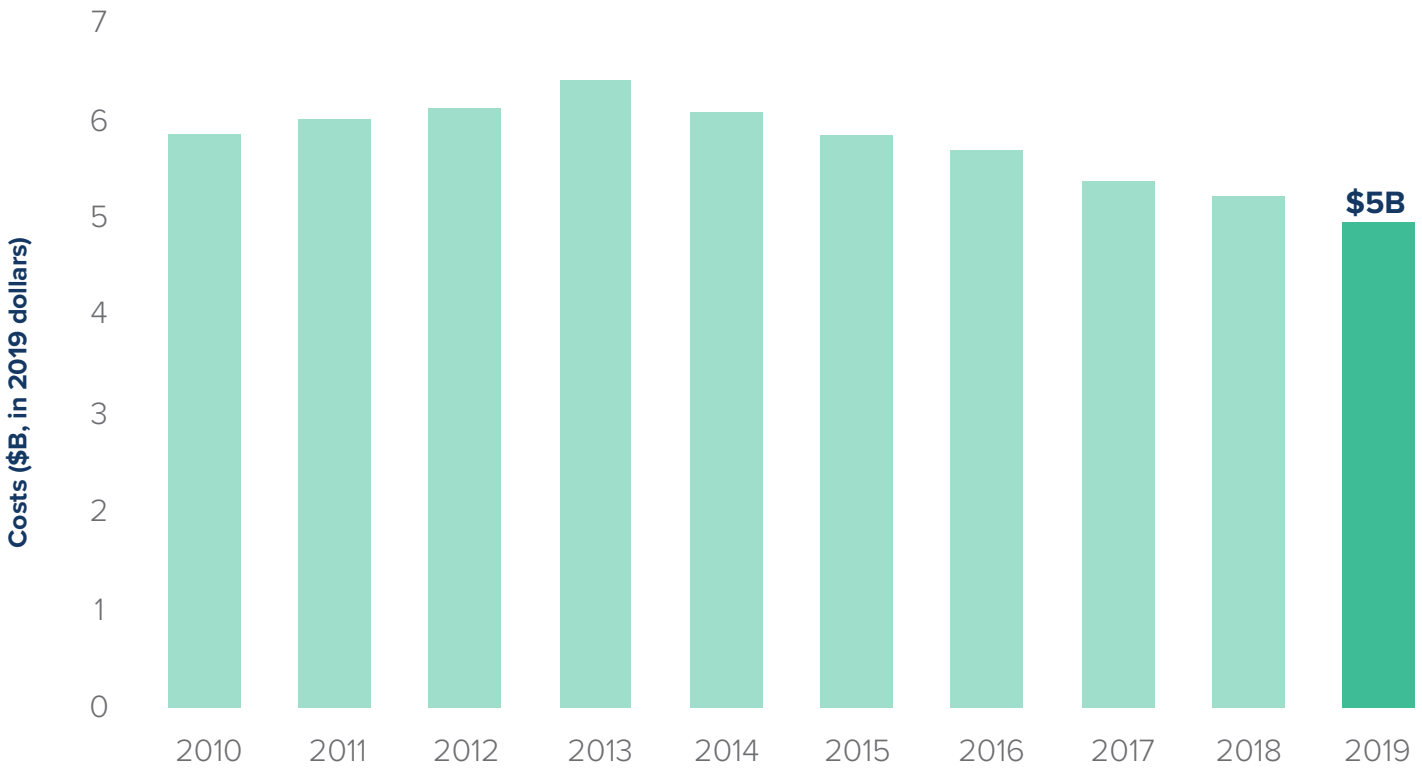
Note: Detailed 2019 cost breakdown will be available in June 2020.

Source: Electric Utility Cost Group.

Updated: February 2020

U.S. Nuclear Industry Fuel Cost Trends

Fuel costs per megawatt-hour decreased 4.9 percent in 2019 from 2018.



Source: Electric Utility Cost Group.

Updated: February 2020

Prematurely Retired Nuclear Power Plants

- 6,726 megawatts-electric of baseload capacity
- 34.1 million metric tons of carbon emissions avoided
- More than 5,800 direct jobs impacted
- The electricity generated by these plants in their final years was equivalent to powering 6.8 million homes

PLANT/SITE	STATE	SUMMER CAPACITY (MWe)	CLOSURE YEAR	FINAL YEAR ELECTRICITY GENERATED (billion kilowatt-hours/year)	FINAL YEAR CARBON EMISSIONS AVOIDED (million metric tons/year)
Crystal River 3	FL	838	2013	7.0	4.8
San Onofre 2 & 3	CA	2,150	2013	18.1	8.0
Kewaunee	WI	566	2013	4.5	4.4
Vermont Yankee	VT	604	2014	5.1	2.5
Fort Calhoun	NE	478	2016	3.4	3.4
Oyster Creek	NJ	608	2018	5.4	3.9
Pilgrim	MA	679	2019	4.4	2.0
Three Mile Island 1	PA	803	2019	7.3	5.0
TOTAL		**6,726**		**55.3**	**34.1**

Source: Emissions avoided are calculated using regional and national fossil fuel emissions rates from the U.S. Environmental Protection Agency and latest plant generation and average household electricity usage data from the U.S. Energy Information Administration.

Updated: March 2020

Nuclear Power Plants Announced for Premature Closure

- 5,667 megawatts-electric of baseload capacity
- 23.9 million metric tons of carbon emissions avoided in 2019
- 45.0 billion kilowatt-hours of electricity generated in 2019
- More than 3,800 direct jobs impacted

PLANT/SITE	STATE	SUMMER CAPACITY (MWe)	PLANNED CLOSURE YEAR	ELECTRICITY GENERATED IN 2019 (billion kilowatt-hours/year)	CARBON EMISSIONS AVOIDED IN 2019 (million metric tons/year)
Duane Arnold	IA	601	2020	5.2	4.6
Indian Point 2 & 3	NY	2,054	2020-2021	16.7	7.5
Palisades	MI	772	2022	6.9	5.3
Diablo Canyon 1 & 2	CA	2,240	2024-2025	16.2	6.5
TOTAL		**5,667**		**45.0**	**23.9**

Source: Emissions avoided are calculated using regional and national fossil fuel emissions rates from the U.S. Environmental Protection Agency and latest plant generation data from the U.S. Energy Information Administration.

Updated: March 2020

Plants Saved From Premature Closure Due to State Actions

- 15,746 megawatts-electric of baseload capacity
- 73.1 million metric tons of carbon emissions avoided
- Nearly twice the electricity generation by all utility solar in the U.S. in 2019
- More than 10,150 direct jobs saved

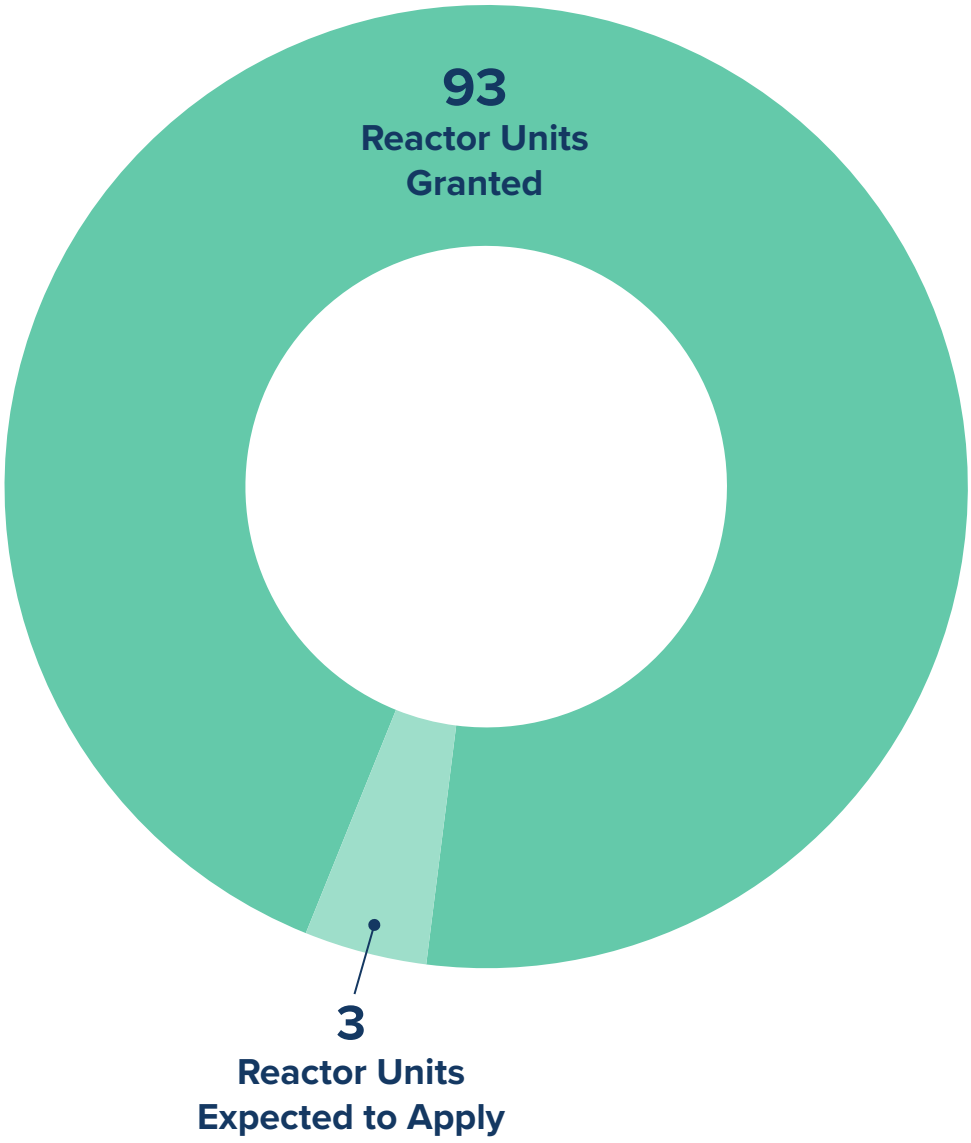
PLANT/SITE	STATE	SUMMER CAPACITY (MWe)	INITIALLY ANNOUNCED CLOSURE YEAR	ELECTRICITY GENERATED IN 2019 (billion kilowatt-hours/year)	CARBON EMISSIONS AVOIDED IN 2019 (million metric tons/year)
Beaver Valley 1 & 2	PA	1,808	2021	15.5	9.5
Clinton	IL	1,065	2017	8.4	7.6
Davis-Besse	OH	894	2020	7.8	4.8
FitzPatrick	NY	848	2017	7.4	3.3
Ginna	NY	582	2017	5.0	2.2
Hope Creek and Salem 1 & 2	NJ	3,500	2020-2021	26.6	16.3
Millstone 2 & 3	CT	2,073	2020	16.7	7.1
Nine Mile Point 1 & 2	NY	1,917	2017-2018	15.8	7.1
Perry	OH	1,240	2020	9.2	5.6
Quad Cities 1 & 2	IL	1,819	2018	15.5	9.5
TOTAL		**15,746**		**127.9**	**73.1**

Source: Emissions avoided are calculated using regional and national fossil fuel emissions rates from the U.S. Environmental Protection Agency and latest plant generation data from the U.S. Energy Information Administration.

Updated: March 2020

Initial License Renewals

Initial License Renewals extend plant life from 40 to 60 years. Nuclear plants with initial license renewals generated more than 731.4 billion kilowatt-hours of carbon-free electricity in 2019, powering over 67.3 million homes.



Note: U.S. Nuclear Regulatory Commission has approved initial license renewal applications for 93 reactors. Six reactors (Fort Calhoun, Kewaunee, Oyster Creek, Pilgrim, Three Mile Island and Vermont Yankee) have since ceased operations prematurely.

Source: Licensing data from the U.S. Nuclear Regulatory Commission and plant generating data and average household electricity usage from the U.S. Energy Information Administration.

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Second License Renewals

Second license renewals extend plant life from 60 to 80 years, ensuring reliable carbon-free electricity well into at least the 2050s.

4	2	5	8
Reactor Units Approved	**Reactor Units Under Review**	**Reactor Units Expected to Apply**	**Publicly Announced Intentions for Renewal**
Turkey Point 3 & 4	Surry 1 & 2	North Anna 1 & 2	Brunswick 1 & 2
Peach Bottom 2 & 3		Oconee 1, 2 & 3	Catawba 1 & 2
			H.B. Robinson
			Harris
			McGuire 1 & 2

Source: U.S. Nuclear Regulatory Commission.

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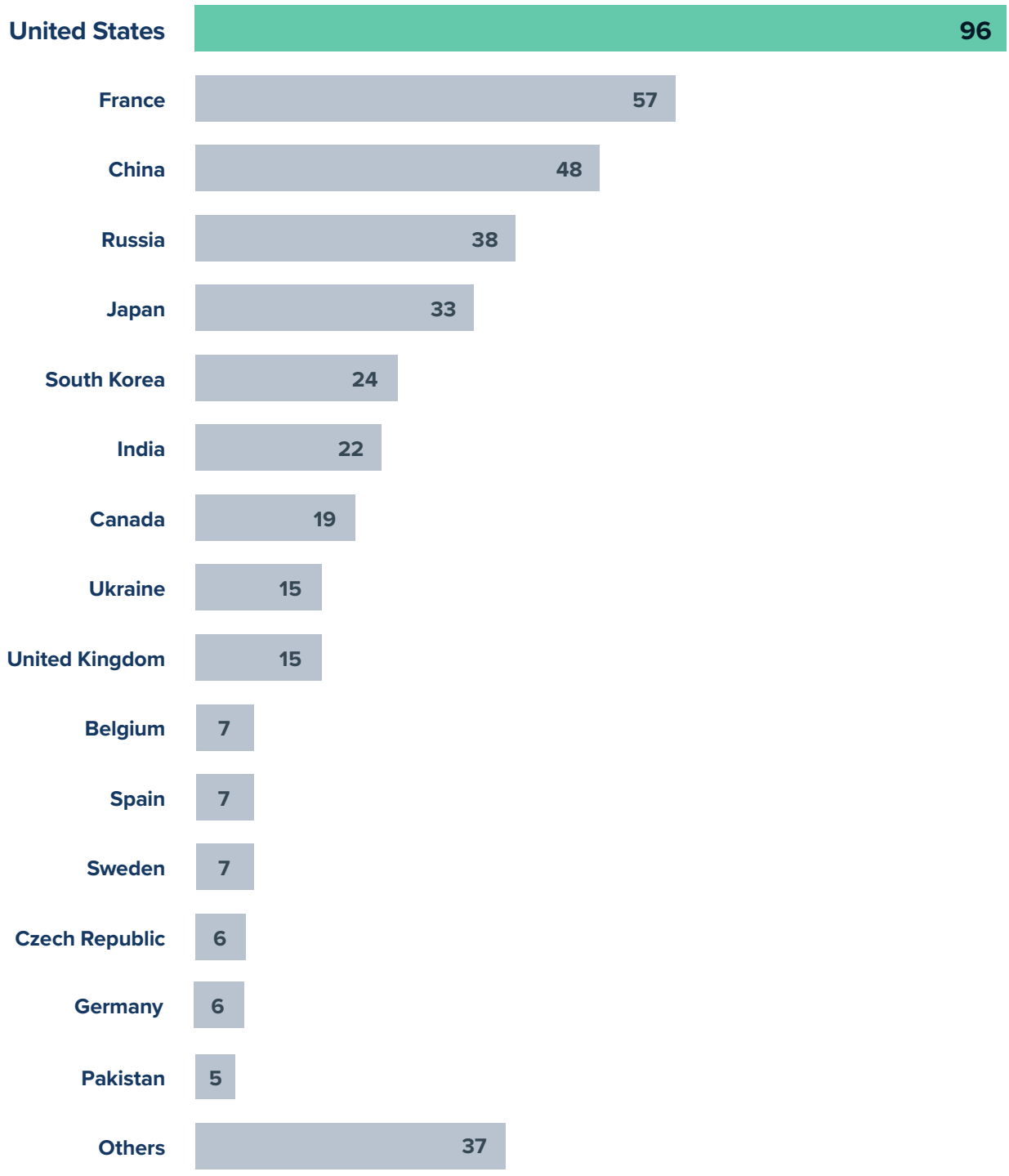
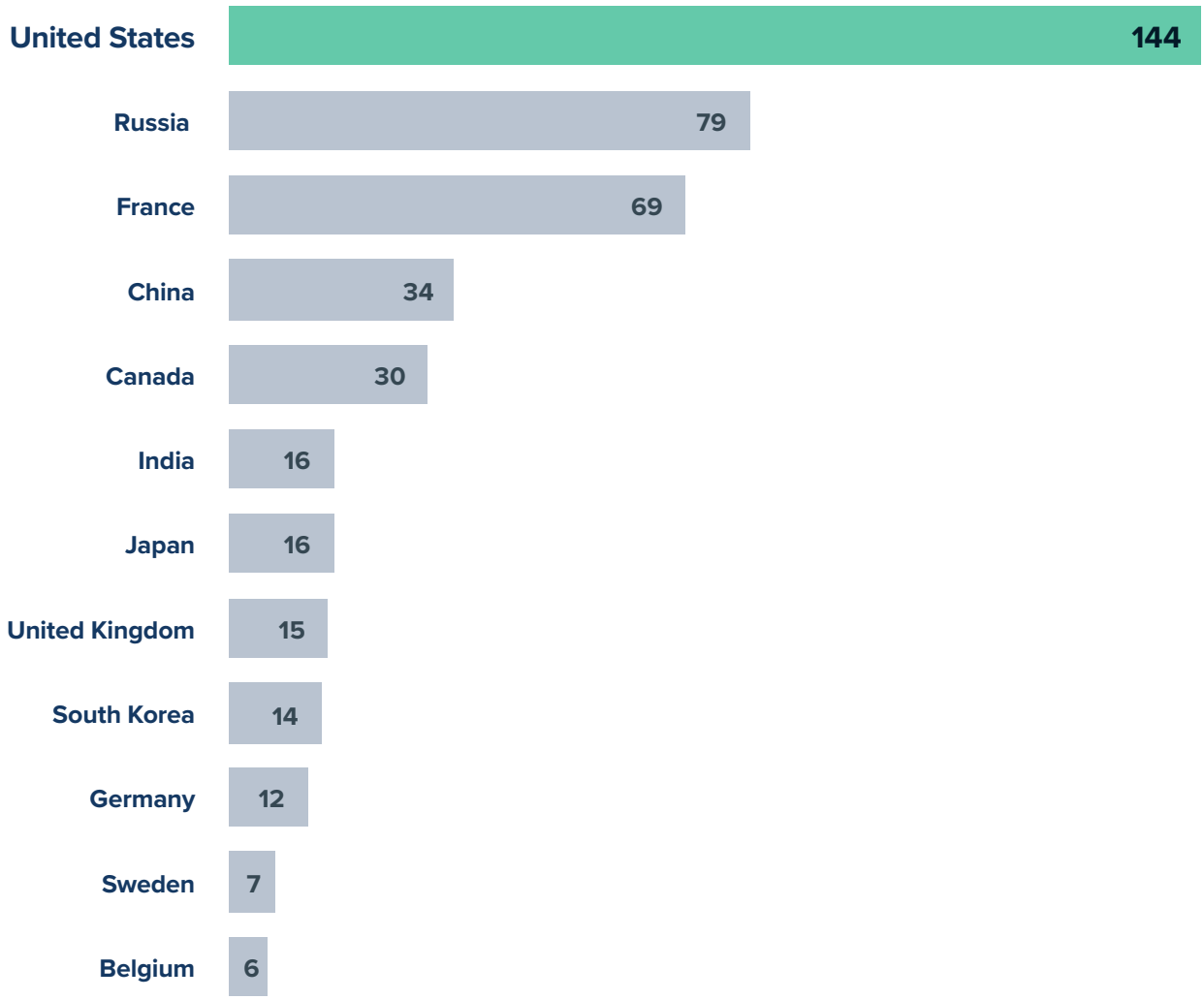
442 Operating Reactors Around the World



Source: International Atomic Energy Agency - Power Reactor Information System.

Updated: March 2020

Operating Reactors, by Supplier Country



Sources: American Nuclear Society, International Atomic Energy Agency-Power Reactor Information System.

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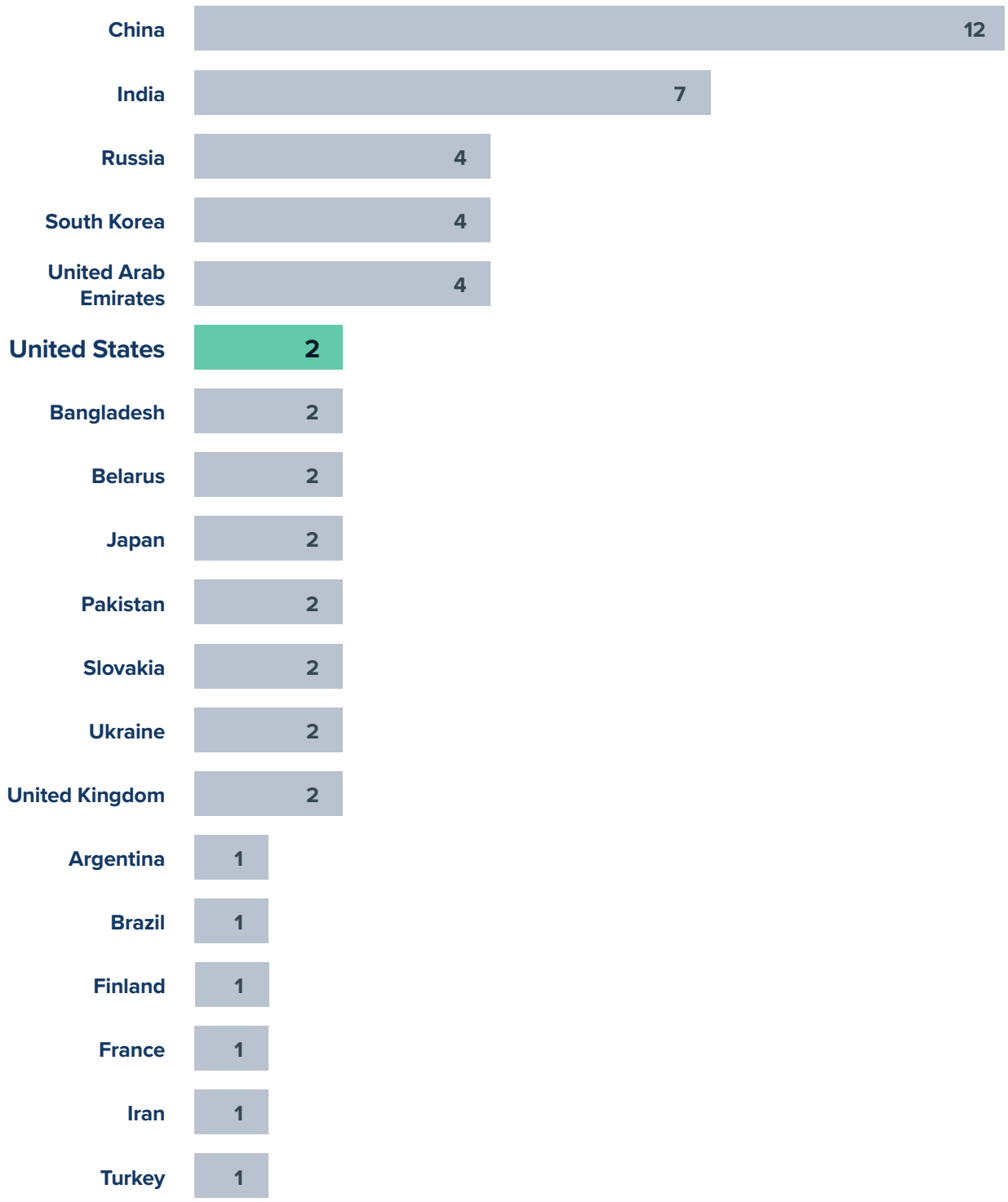
52 Reactors Under Construction Around the World



Source: International Atomic Energy Agency - Power Reactor Information System.

Updated: March 2020

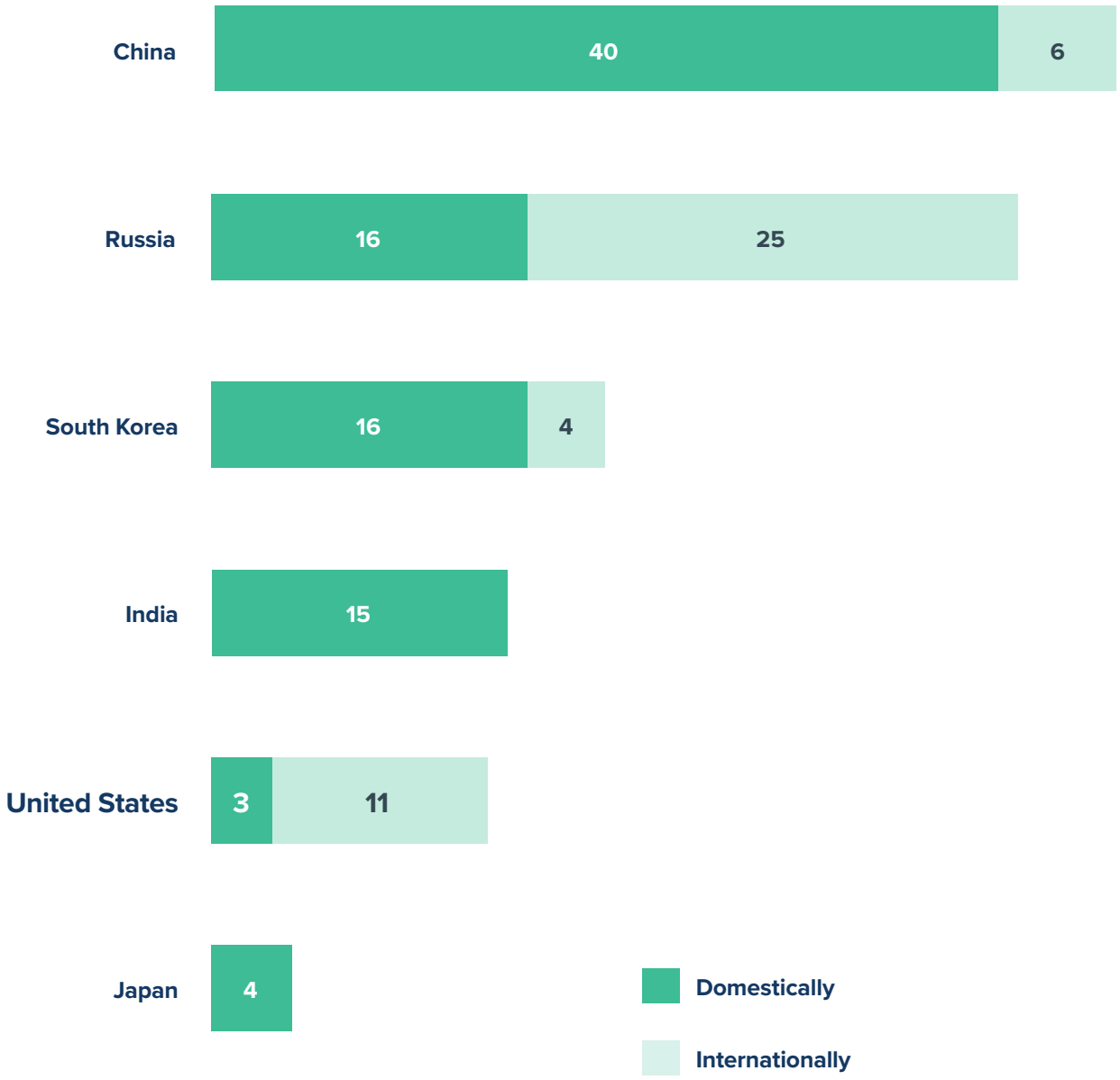
Reactors Under Construction, by Supplier Country

Sources: American Nuclear Society, International Atomic Energy Agency - Power Reactor Information System.

Updated: March 2020

International Nuclear Influence

Nuclear reactors designed by the following countries, under construction or constructed since 1997.



Source: International Atomic Energy Agency - Power Reactor Information System.

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