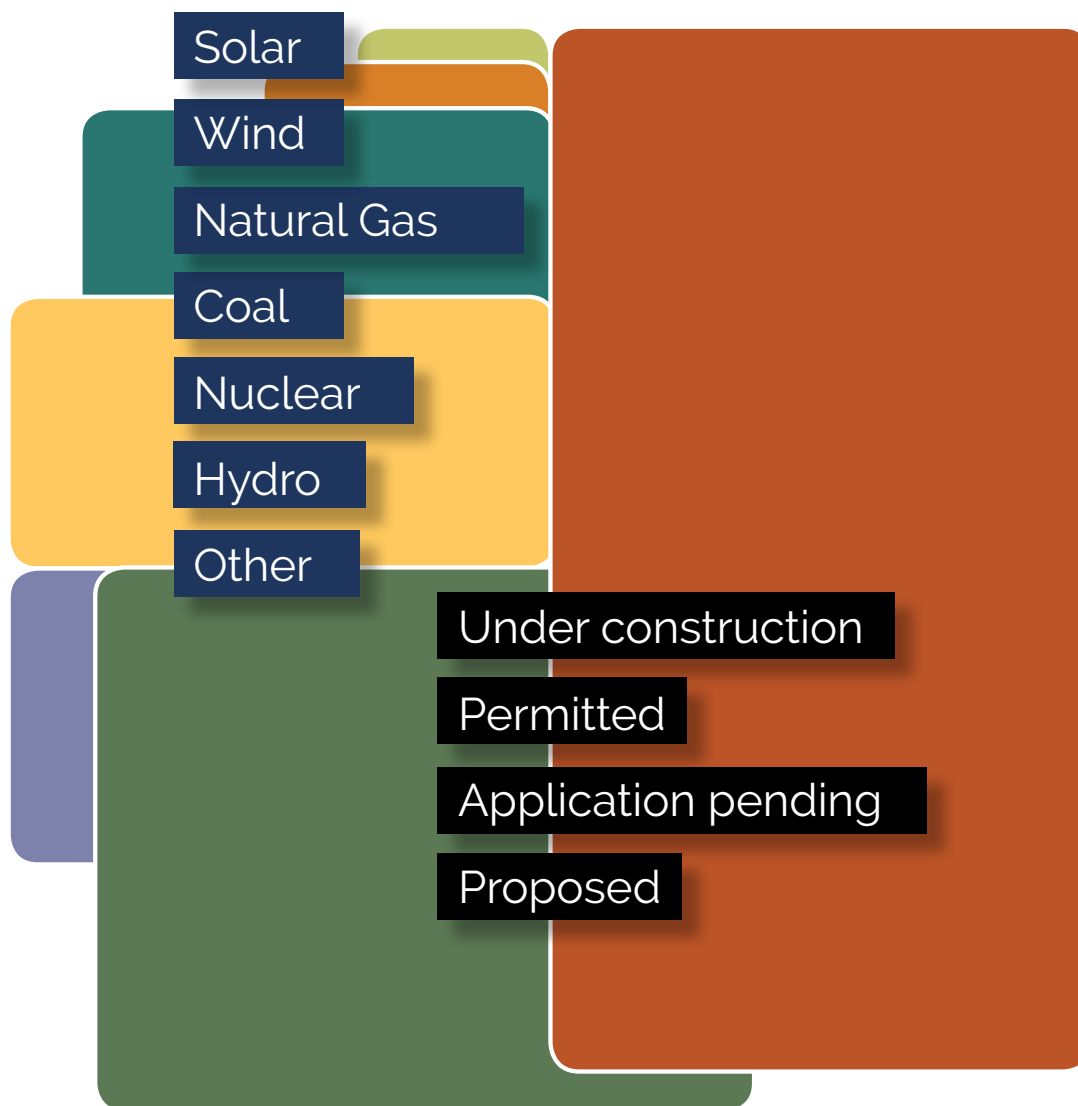


America's Electricity Generation Capacity 2019 Update



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Executive Summary

The American Public Power Association presents the thirteenth annual report on current and imminent electricity generation capacity in America by types of fuel, location, and ownership type.

Currently, America has just over 1.2 million megawatts of generation capacity. **Generation capacity refers to the maximum potential power output of a generation source, and is the amount of power a plant can produce if it were running at full power. Capacity is measured in Megawatts (MW). This should not be confused with generation, which is the actual power output of a generation plant, and is measured in Megawatt-hours (MWh). This report covers generation capacity only.**

The largest fuel source is natural gas, accounting for nearly 44 percent of all generation capacity. Coal, with a share of just over 22 percent of capacity, represents the second largest source of generation capacity. Nuclear, hydro, and wind together account for just over one-quarter of capacity. Solar currently constitutes nearly three percent of all capacity.

This report analyzes prospective generation capacity in four categories — under construction, permitted, application pending, and proposed.

Approximately 330,000 MW of new generation capacity is under development in the United States — 85,718

MW under construction or permitted, and 244,120 MW proposed or pending application.

Almost half of the capacity currently under construction or permitted to begin construction will be fueled by natural gas. Solar and wind together account for 44 percent of near-term potential capacity additions. Natural gas, solar, and wind projects account for 92% of all capacity under construction, accounting for 33,853 MW of the total of 36,669 MW under construction.

Regionally, the Southeast currently has the most generation, with 25 percent of the nation's total capacity, however the Western region is slated to add the most generation in the long-term, projecting 83,359 MW of new capacity.

This report also provides information on retirements and planned retirements, cancellations, and capacity that has been added over the past ten years.

The overall capacity mix continues to change at a gradual pace. Economics and efficiency continue to spur the development of natural gas. Declining capital costs and environmental mandates have also led to continued development of wind, solar, and other forms of renewable generation capacity.

Please note that all capacity figures in this report represent utility-scale capacity only, and does not include distributed and other small-scale generating capacity.

Source: Data analyzed for this report was taken from the ABB Velocity Suite database, accessed February 2019.

Current Generation Capacity

Table 1.1 shows the sources from which electricity is currently generated in America. Current nameplate capacity includes capacity labeled as standby, but not mothballed or out of service.

Table 1.1
2019 Current Electric Generation Capacity, by Fuel

Fuel Type	Nameplate Capacity (MW)	Share
Natural Gas	528,062.51	43.91%
Coal	266,411.27	22.15%
Nuclear	107,810.68	8.97%
Hydro	100,212.32	8.33%
Wind	94,558.97	7.86%
Solar	35,645.34	2.96%
Distillate Fuel Oil	22,459.17	1.87%
Residual Fuel Oil	17,362.80	1.44%
Wood/Wood Waste Solids	5,018.16	0.42%
Wood Waste Liquids	4,805.95	0.40%
Geothermal	3,854.35	0.32%
Waste	2,776.15	0.23%
Landfill Gas	2,571.42	0.21%
Petroleum Coke	2,472.70	0.21%
Kerosene	2,185.30	0.18%
Waste Heat	1,434.63	0.12%
Other Gas	1,410.50	0.12%
Blast Furnace Gas	847.60	0.07%
Jet Fuel	536.64	0.04%
Biomass Gases	492.03	0.04%
Purchased Steam	438.40	0.04%
Other	338.34	0.03%
Agriculture Byproduct	283.40	0.02%
Biomass Liquids	189.29	0.02%
Biomass Solids	186.66	0.02%
Waste Oil and Other Oil	119.91	0.01%
Liquefied Natural Gas	50.63	0.00%
Refuse	15.40	0.00%
Biomass Other	10.66	0.00%
Propane	1.63	0.00%
Grand Total	1,202,562.82	

Table 1.2 shows how America's current generation capacity is distributed through the various regions defined by the North American Electric Reliability Corporation. United States territories are not included in these regions nor in the data in this report.

Table 1.2
2019 Current Electricity Generation Capacity, by Region

Region	Nameplate Capacity (MW)	Share
SERC	300,350.60	24.98%
RFC	249,381.98	20.74%
WECC	233,305.78	19.40%
ERCOT	115,006.87	9.56%
NPCC	84,854.26	7.06%
SPP	77,933.32	6.48%
MRO	71,503.39	5.95%
FRCC	63,911.00	5.31%
HCC	3,228.82	0.27%
ASCC	3,086.81	0.26%
Grand Total	1,202,562.82	

Regions Defined by NERC (see map in Appendix 1)

ASCC: Alaska Systems Coordinating Council (not shown on map)

ERCOT: Electric Reliability Council of Texas

FRCC: Florida Reliability Coordinating Council

HCC: Hawaii Coordinating Council (not shown on map)

NPCC: Northeast Power Coordinating Council

MRO: Midwest Reliability Organization

RFC: Reliability First Corporation

SERC: Southeastern Electric Reliability Council

SPP: Southwest Power Pool

WECC: Western Electricity Coordinating Council

Current Generation Capacity

Table 1.3 shows that more than 258,723 MW of generation capacity was added between 2008 and 2018. Nearly three-quarters of this new capacity is fueled by natural gas or wind, with another 21 percent coming from coal and solar. Most of the coal capacity additions occurred in the early part of this period as no new coal capacity has been added since 2015.

Table 1.3
Generation Capacity Additions by Fuel Type, 2008-2018

Fuel Type	Nameplate Capacity (MW)	Share
Natural Gas	114,503.41	44.26%
Wind	78,399.17	30.30%
Solar	35,120.80	13.57%
Coal	18,718.70	7.24%
Hydro	2,027.48	0.78%
Wood/Wood Waste Solids	1,453.08	0.56%
Landfill Gas	1,318.66	0.51%
Nuclear	1,269.90	0.49%
Distillate Fuel Oil	1,174.20	0.45%
Petroleum Coke	1,048.20	0.41%
Geothermal	891.09	0.34%
Kerosene	705.50	0.27%
Waste Heat	541.93	0.21%
Wood Waste Liquids	437.30	0.17%
Biomass Gases	297.50	0.11%
Biomass Liquids	173.09	0.07%
Waste	150.10	0.06%
Biomass Solids	121.53	0.05%
Blast Furnace Gas	101.00	0.04%
Other	52.60	0.02%
Liquefied Natural Gas	50.63	0.02%
Purchased Steam	46.00	0.02%
Agriculture Byproduct	44.50	0.02%
Other Gas	35.10	0.01%
Refuse	15.40	0.01%
Waste Oil and Other Oil	9.20	0.00%
Biomass Other	8.66	0.00%
Jet Fuel	6.80	0.00%
Propane	1.63	0.00%
Grand Total	258,723.14	

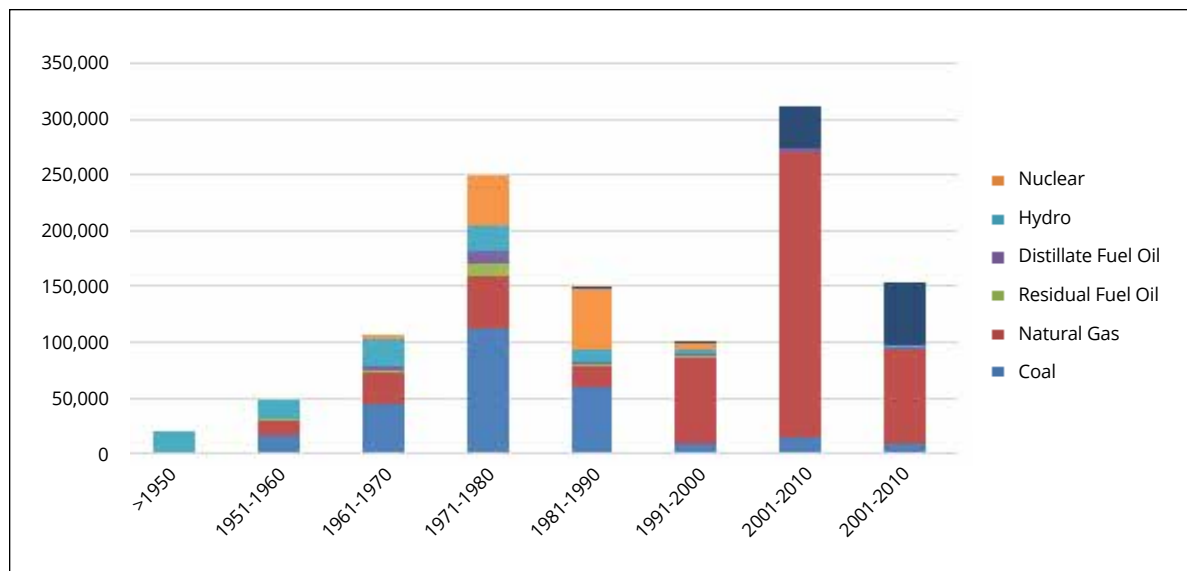
Table 1.4 shows that over 29,000 MW of generation capacity began operating in 2018, with natural gas accounting for two-thirds of the new capacity, and solar and wind making up almost all of the rest.

Table 1.4
Generation Capacity Additions by Fuel Type, 2018

Fuel Type	Nameplate Capacity (MW)	Share
Natural Gas	19,767.38	67.17%
Wind	5,281.72	17.95%
Solar	3,995.49	13.58%
Waste Heat	130.90	0.44%
Geothermal	82.30	0.28%
Liquefied Natural Gas	50.63	0.17%
Biomass Liquids	50.00	0.17%
Hydro	29.30	0.10%
Distillate Fuel Oil	17.90	0.06%
Biomass Gases	8.00	0.03%
Wood/Wood Waste Solids	7.50	0.03%
Other	5.00	0.02%
Landfill Gas	1.30	0.00%
Grand Total	29,427.43	

Figure 1.1 shows the age of traditional forms of generating capacity – coal, nuclear, hydro, natural gas, and oil. Most hydro and coal capacity is approximately 40 years old or more, having come online by 1980. Almost all domestic nuclear capacity became operational between 1969 and 1990. While natural gas capacity dates back to the 1950s, the bulk of natural gas capacity is less than 25 years of age. This chart does not show non-wind renewable generation, almost all which came online after the turn of the century.

Figure 1.1
Age of Traditional Forms of Electric Generation



Future Generating Capacity: Fuel Mix

Tables 2.1 – 2.4 show the fuel makeup of America's future generation capacity.

Table 2.1 shows the sources for the 36,669 MW of generation capacity under construction. Natural gas, wind, and solar account for the lion's share of capacity under construction.

Table 2.1
Plants Under Construction, by Fuel Type

Fuel Type	Nameplate Capacity (MW)	Share
Natural Gas	17,828.79	48.62%
Wind	11,338.99	30.92%
Solar	4,685.69	12.78%
Nuclear	2,200.00	6.00%
Hydro	250.31	0.68%
Wood/Wood Waste Solids	140.00	0.38%
Agriculture Byproduct	49.90	0.14%
Biomass Gases	42.91	0.12%
Biomass Solids	36.50	0.10%
Distillate Fuel Oil	35.20	0.10%
Waste Heat	28.60	0.08%
Coal	17.00	0.05%
Geothermal	10.00	0.03%
Other	3.70	0.01%
Landfill Gas	1.00	0.00%
Grand Total	36,668.59	

Table 2.2 shows the fuel makeup for plants that have received permits to construct 49,049 MW of capacity overall but that have not yet started construction. Natural gas again is the leading resource choice for permitted plants, accounting for nearly 43 percent of the new capacity, with wind and solar accounting for another 45 percent.

Table 2.2
Permitted Plants, by Fuel Type

Fuel Type	Nameplate Capacity (MW)	Share
Natural Gas	21,066.40	42.95%
Wind	15,196.59	30.98%
Solar	6,721.42	13.70%
Nuclear	3,700.00	7.54%
Hydro	955.26	1.95%
Coal	850.00	1.73%
Geothermal	269.90	0.55%
Other Gas	135.00	0.28%
Agriculture Byproduct	74.90	0.15%
Wood/Wood Waste Solids	68.90	0.14%
Landfill Gas	4.82	0.01%
Distillate Fuel Oil	3.50	0.01%
Biomass Gases	2.70	0.01%
Grand Total	49,049.39	

Table 2.3 shows the fuel mix for the 65,178 MW of capacity awaiting approval of applications. Wind is the leading resource in this category, with nearly 35 percent of the total. Solar and natural gas account for 55 percent of the remaining capacity in this category.

Table 2.3
Plants Pending Application, by Fuel Type

Fuel Type	Nameplate Capacity (MW)	Share
Wind	22,445.05	34.44%
Solar	18,469.17	28.34%
Natural Gas	17,250.70	26.47%
Hydro	3,782.15	5.80%
Nuclear	3,076.00	4.72%
Geothermal	150.00	0.23%
Waste	2.27	0.00%
Landfill Gas	1.60	0.00%
Biomass Gases	1.03	0.00%
Grand Total	65,177.96	

Table 2.4 shows the resource mix for the 178,942 MW of capacity still in the planning stage. This is the earliest and most uncertain stage of development, and includes units that are least likely to be built. Wind power accounts for 37.5 percent of planned capacity, with natural gas, hydro, nuclear, and solar accounting for the bulk of the remaining capacity.

Table 2.4
Proposed Plants, by Fuel Type

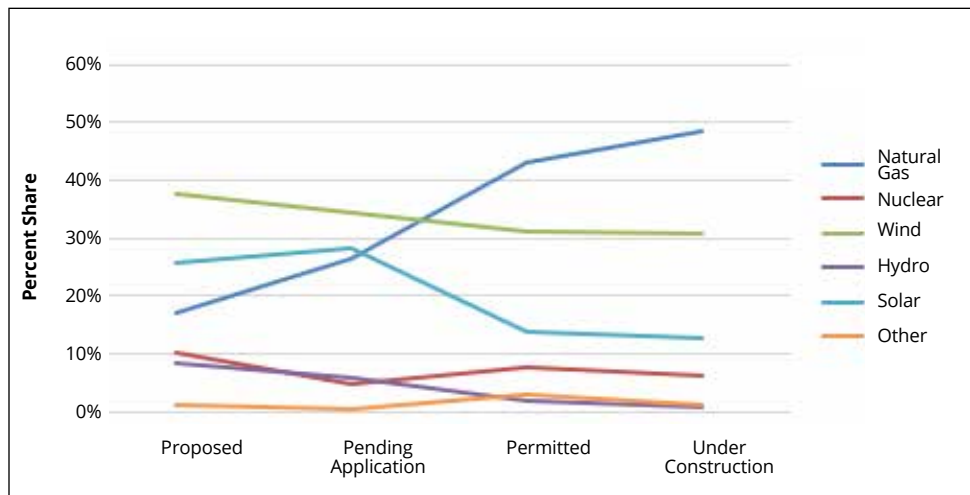
Fuel Type	Nameplate Capacity (MW)	Share
Wind	67,102.10	37.50%
Solar	46,279.81	25.86%
Natural Gas	30,512.43	17.05%
Nuclear	17,972.40	10.04%
Hydro	15,198.50	8.49%
Residual Fuel Oil	632.40	0.35%
Geothermal	512.90	0.29%
Other	429.50	0.24%
Coal	77.00	0.04%
Wood/Wood Waste Solids	60.00	0.03%
Distillate Fuel Oil	57.60	0.03%
Biomass Gases	37.44	0.02%
Biomass Solids	21.40	0.01%
Landfill Gas	21.02	0.01%
Biomass Liquids	10.00	0.01%
Other Gas	6.70	0.00%
Waste Heat	5.84	0.00%
Biomass Other	5.14	0.00%
Grand Total	178,942.17	

Future Generating Capacity: Fuel Mix

Future Generating Capacity: Development Stages

Figure 2.1 tracks the major fuel sources in each stage of development. Natural gas is the dominant fuel choice the under construction and permitted capacity stage, and wind is the leading source in the pending application and proposed stages. Figure 2.1 also shows that the resource mix is more balanced in the earlier stages of development.

Figure 2.1
Share of Fuel Type: Stage of Development, 2018



Future Generating Capacity: Regional Mix

Table 3.1 shows that RFC and SERC have the most capacity under construction, while WECC and ERCOT together account for nearly one-third of the capacity under construction.

Table 3.1
Plants Under Construction, by Region

Region	Nameplate Capacity (MW)	Share
RFC	7,332.18	20.00%
SERC	7,295.55	19.90%
WECC	6,229.08	16.99%
ERCOT	5,272.10	14.38%
MRO	3,643.77	9.94%
FRCC	2,478.18	6.76%
NPCC	2,298.06	6.27%
SPP	1,952.97	5.33%
HCC	139.70	0.38%
ASCC	27.00	0.07%
Grand Total	36,668.59	

Table 3.2 shows that RFC once again has more permitted capacity than any other region. ERCOT, WECC, and SERC have most of the remaining permitted capacity.

Table 3.2
Permitted Plants, by Region

Region	Nameplate Capacity (MW)	Share
RFC	12,025.31	24.52%
SERC	10,966.23	22.36%
WECC	9,988.31	20.36%
ERCOT	6,780.04	13.82%
FRCC	4,060.90	8.28%
MRO	2,444.40	4.98%
SPP	2,148.10	4.38%
NPCC	602.51	1.23%
HCC	24.00	0.05%
ASCC	9.60	0.02%
Grand Total	49,049.39	

Regions Defined by NERC (see map in Appendix 1)

ASCC: Alaska Systems Coordinating Council (not shown on map)

ERCOT: Electric Reliability Council of Texas

FRCC: Florida Reliability Coordinating Council

HCC: Hawaii Coordinating Council (not shown on map)

NPCC: Northeast Power Coordinating Council

MRO: Midwest Reliability Organization

RFC: Reliability First Corporation

SERC: Southeastern Electric Reliability Council

SPP: Southwest Power Pool

WECC: Western Electricity Coordinating Council

Future Generating Capacity: Regional Mix

Tables 3.3 and 3.4 show plants in the pending application and proposed categories. ERCOT has the majority of capacity the pending application stage, while WECC is the leading region in the proposed stage.

Table 3.3
Plants Pending Application, by Region

Region	Nameplate Capacity (MW)	Share
ERCOT	34,624.75	53.12%
WECC	13,232.63	20.30%
RFC	5,451.58	8.36%
SERC	5,123.71	7.86%
NPCC	4,067.20	6.24%
MRO	2,407.80	3.69%
FRCC	126.10	0.19%
SPP	104.40	0.16%
ASCC	39.80	0.06%
Grand Total	65,177.96	

Table 3.4
Proposed Plants, by Region

Region	Nameplate Capacity (MW)	Share
WECC	59,909.32	33.48%
RFC	35,615.90	19.90%
SERC	26,826.63	14.99%
NPCC	26,179.33	14.63%
MRO	11,062.99	6.18%
SPP	8,198.92	4.58%
FRCC	6,443.04	3.60%
ERCOT	2,919.10	1.63%
NPCC	700.00	0.39%
ASCC	675.00	0.38%
HCC	411.95	0.23%
Grand Total	178,942.17	

Tables 3.5 and 3.6 show the fuels of choice for proposed capacity by development stage.

As seen in Table 3.5, for plants most certain to be built — those already under construction or permitted — natural gas and wind account for over 76 percent of the capacity, with solar and nuclear contributing nearly all the rest.

Table 3.5
Permitted Plants and Plants Under Construction, by Fuel Type

Fuel Type	Nameplate Capacity (MW)	Share
Natural Gas	38,895.19	45.38%
Wind	26,535.58	30.96%
Solar	11,407.11	13.31%
Nuclear	5,900.00	6.88%
Hydro	1,205.57	1.41%
Coal	867.00	1.01%
Geothermal	279.90	0.33%
Wood/Wood Waste Solids	208.90	0.24%
Other Gas	135.00	0.16%
Agriculture Byproduct	124.80	0.15%
Biomass Gases	45.61	0.05%
Distillate Fuel Oil	38.70	0.05%
Biomass Solids	36.50	0.04%
Waste Heat	28.60	0.03%
Landfill Gas	5.82	0.01%
Other	3.70	0.00%
Grand Total	85,717.98	

RFC and SERC each account for just over 20 percent of the capacity under construction and permitted, with WECC and ERCOT accounting for over 32 percent combined. Natural gas is the primary resource in the RFC region as well as in FRCC and NPCC regions. In RFC, natural gas accounts for nearly 78 percent of the capacity in these categories. Natural gas is the second leading resource in SERC, just behind nuclear, which represent nearly one-third of the capacity under construction and permitted. All 5,900 MWs of nuclear power under construction or permitted are located in SERC.

Over 44 percent of the solar capacity in the permitted and under construction stages is located in the WECC region. Another 17 percent of solar capacity is located in SERC. Meanwhile, wind is the leading resource in ERCOT (53 percent), MRO (83 percent), SPP (92 percent) and WECC (37 percent).

As seen in **table 3.6**, for plants in the more distant future — those that are proposed or pending application — the fuel mix tends more toward wind and other renewable resources, compared to plants that are scheduled to come online in the near future.

Table 3.6
Plants Pending Application and Proposed, by Fuel Type

Fuel Type	Nameplate Capacity (MW)	Share
Wind	89,547.15	36.68%
Solar	64,748.97	26.52%
Natural Gas	47,763.13	19.57%
Nuclear	21,048.40	8.62%
Hydro	18,980.64	7.78%
Geothermal	662.90	0.27%
Residual Fuel Oil	632.40	0.26%
Other	429.50	0.18%
Coal	77.00	0.03%
Wood/Wood Waste Solids	60.00	0.02%
Distillate Fuel Oil	57.60	0.02%
Biomass Gases	38.47	0.02%
Landfill Gas	22.62	0.01%
Biomass Solids	21.40	0.01%
Biomass Liquids	10.00	0.00%
Other Gas	6.70	0.00%
Waste Heat	5.84	0.00%
Biomass Other	5.14	0.00%
Waste	2.27	0.00%
Grand Total	244,120.13	

Based on pending and proposed plants, wind is slated to account for twenty percent or more of new capacity in all but the Alaska, Florida, and SERC regions and is the leading resource in five regions. Nearly forty percent of the proposed or application pending solar capacity is located in WECC, where solar is the leading resource at 34 percent of all potential capacity. Solar is also the leading resource in SERC, with 15,490 MW of proposed or pending application capacity, representing almost half of all the capacity in these categories in SERC.

Future Generating Capacity: Ownership Type

Analysis of future generation capacity by ownership is summarized in **Tables 4.1 – 4.4**. Non-utility generators account for most of the capacity in all four categories.

Table 4.1
Plants Under Construction, by Utility Type

Utility Type	Nameplate Capacity (MW)	Share
Non-utility Generators	28,908.66	78.84%
Investor Owned	6,172.60	16.83%
Public Power	892.85	2.43%
Co-Op	692.50	1.89%
Federal	1.98	0.01%
Grand Total	36,668.59	

Permitted Plants, by Utility Type

Utility Type	Nameplate Capacity (MW)	Share
Non-utility Generators	38,032.31	77.54%
Investor Owned	7,694.20	15.69%
Co-Op	2,103.00	4.29%
Public Power	1,219.88	2.49%
Grand Total	49,049.39	

Plants Pending Application, by Utility Type

Utility Type	Nameplate Capacity (MW)	Share
Non-utility Generators	60,565.06	92.92%
Investor Owned	2,464.50	1.38%
Public Power	1,073.40	0.60%
Federal	800.00	0.45%
Co-Op	275.00	0.15%
Grand Total	65,177.96	

Proposed Plants, by Utility Type

Utility Type	Nameplate Capacity (MW)	Share
Non-utility Generators	152,635.16	85.30%
Investor Owned	12,362.46	6.91%
Public Power	9,658.24	5.40%
Federal	2,738.90	1.53%
Co-Op	1,547.40	0.86%
Grand Total	178,942.17	

Future Generating Capacity: Regional Transmission Organizations

Tables 5.1 – 5.4 show future generating capacity by regional transmission organization (RTO) region. A significant plurality of the proposed capacity is slated to be constructed in non-RTO regions. At more advanced stages, roughly one-quarter of the new capacity is being developed in non-RTO regions, while much of the capacity within RTO regions that is under construction or permitted is in ERCOT, Midcontinent ISO, and PJM.

Table 5.1
Plants Under Construction, by RTO Region

RTO Region	Nameplate Capacity (MW)	Share
Non-RTO	10,416.54	28.41%
Midcontinent ISO	6,868.82	18.73%
PJM ISO	5,988.63	16.33%
ERCOT ISO	5,272.10	14.38%
California ISO	3,081.06	8.40%
SPP	2,745.42	7.49%
New York ISO	1,299.88	3.54%
New England ISO	996.15	2.72%
Grand Total	36,668.59	

Table 5.2
Permitted Plants, by RTO Region

RTO Region	Nameplate Capacity (MW)	Share
PJM ISO	15,728.39	32.07%
Non-RTO	15,044.16	30.67%
ERCOT ISO	6,780.04	13.82%
Midcontinent ISO	5,116.50	10.43%
California ISO	3,594.30	7.33%
SPP	2,185.00	4.45%
New York ISO	374.00	0.76%
New England ISO	227.01	0.46%
Grand Total	49,049.39	

Table 5.3
Plants Pending Application, by RTO Region

RTO Region	Nameplate Capacity (MW)	Share
ERCOT ISO	35,624.75	54.66%
Non-RTO	8,495.44	13.03%
PJM ISO	6,316.88	9.69%
California ISO	6,073.00	9.32%
Midcontinent ISO	4,249.30	6.52%
New York ISO	3,286.00	5.04%
New England ISO	781.20	1.20%
SPP	351.40	0.54%
Grand Total	65,177.96	

Table 5.4
Proposed Plants, by RTO Region

RTO Region	Nameplate Capacity (MW)	Share
Non-RTO	80,792.33	45.15%
PJM ISO	32,252.08	18.02%
New York ISO	17,511.07	9.79%
Midcontinent ISO	15,547.45	8.69%
SPP	13,020.71	7.28%
New England ISO	8,725.30	4.88%
California ISO	8,354.12	4.67%
ERCOT ISO	2,739.10	1.53%
Grand Total	178,942.17	

Generating Capacity: Retirements and Cancellations

Tables 6.1 and 6.2 show generation capacity retirements by fuel type between 2008 and 2018, when 157,767 MW of capacity was retired. Nearly half of this capacity was coal-fired, with almost all the remainder being natural gas and oil.

Table 6.1
Retired Plants by Fuel Type, 2008-2018

Fuel Type	Nameplate Capacity (MW)	Share
Coal	75,720.10	48.0%
Natural Gas	56,139.42	35.6%
Residual Fuel Oil	8,045.40	5.1%
Distillate Fuel Oil	6,291.42	4.0%
Nuclear	5,584.57	3.5%
Hydro	1,692.30	1.1%
Wind	758.30	0.5%
Petroleum Coke	628.00	0.4%
Wood/Wood Waste Solids	548.35	0.3%
Landfill Gas	425.06	0.3%
Kerosene	336.30	0.2%
Wood Waste Liquids	280.80	0.2%
Blast Furnace Gas	253.20	0.2%
Geothermal	243.40	0.2%
Waste	154.80	0.1%
Agriculture Byproduct	130.20	0.1%
Waste Oil and Other Oil	103.00	0.1%
Other	95.30	0.1%
Biomass Solids	72.80	0.0%
Other Gas	69.50	0.0%
Solar	62.20	0.0%
Purchased Steam	61.00	0.0%
Biomass Gases	35.70	0.0%
Jet Fuel	19.70	0.0%
Biomass Liquids	15.80	0.0%
Grand Total	157,766.63	

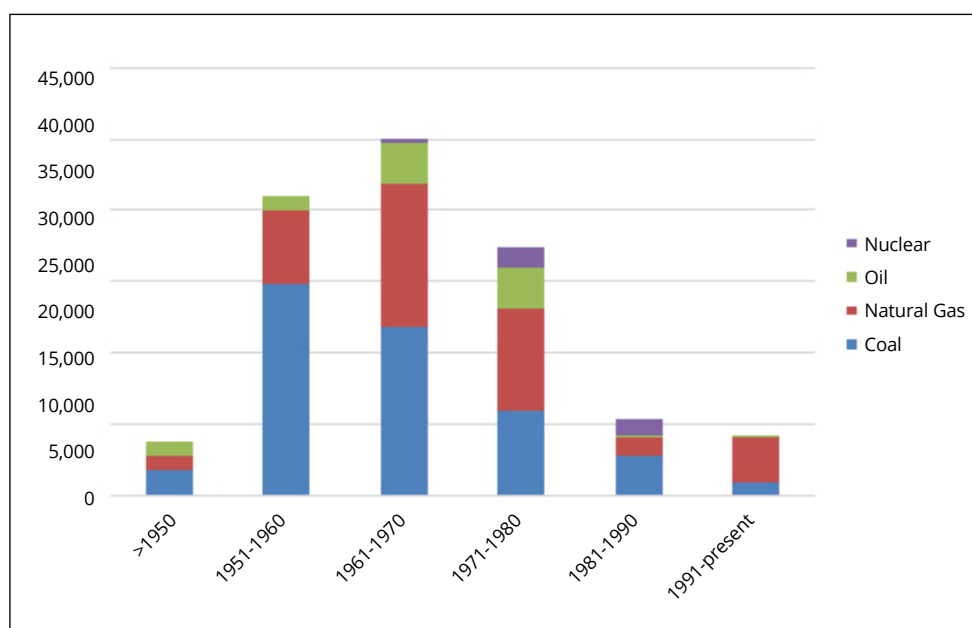
Over 21,000 MW of capacity was retired in 2018, of which coal and natural gas accounted for over 90 percent of the retired capacity.

Table 6.2
Retired Plants by Fuel Type, 2018

Fuel Type	Nameplate Capacity (MW)	Share
Coal	12,655.30	59.1%
Natural Gas	7,130.00	33.3%
Nuclear	550.00	2.6%
Hydro	325.40	1.5%
Distillate Fuel Oil	259.80	1.2%
Residual Fuel Oil	176.40	0.8%
Wind	80.00	0.4%
Biomass Solids	66.00	0.3%
Agriculture Byproduct	62.50	0.3%
Wood/Wood Waste Solids	61.60	0.3%
Landfill Gas	42.10	0.2%
Waste	12.00	0.1%
Jet Fuel	0.40	0.0%
Grand Total	21,421.50	

Figure 6.1 shows the age of plants retired between 2008-2018, by the year in which the plant began operating, for the four most commonly retired plant types. The overwhelming majority came online between 1951-1970, meaning that the plants were generally 50 years old or more.

Figure 6.1
Age of Retired Capacity, 2008-2018



Generating Capacity: Retirements and Cancellations

Approximately 46,500 MW of current operating capacity is scheduled to retire by 2023, over half of which is coal. Almost all planned natural gas retirements are powered by steam or gas combustion turbines. Nearly 10,000 MW of nuclear capacity is also slated to be retired.

Table 6.3 reflects planned retirements that have been publicly announced.

Table 6.3
Planned Retirements to 2023, by Fuel Type

Fuel Type	Nameplate Capacity (MW)	Share
Coal	29,028.50	52.93%
Natural Gas	12,111.60	22.09%
Nuclear	9,874.64	18.01%
Residual Fuel Oil	1,869.00	3.41%
Hydro	860.70	1.57%
Distillate Fuel Oil	586.70	1.07%
Jet Fuel	223.50	0.41%
Wood/Wood Waste Solids	115.90	0.21%
Landfill Gas	98.10	0.18%
Wood Waste Liquids	31.20	0.06%
Kerosene	18.60	0.03%
Waste	13.50	0.02%
Biomass Gases	3.40	0.01%
Solar	2.30	0.00%
Other	1.50	0.00%
Grand Total	54,839.14	

Over 41,000 MW of planned capacity additions were canceled in 2018.

Table 6.4
Plant Cancellations, 2018

Fuel Type	Capacity (MW)	Share
Natural Gas	16,289.96	39.7%
Wind	12,482.73	30.4%
Solar	6,556.80	16.0%
Coal	2,250.00	5.5%
Petroleum Coke	1,196.00	2.9%
Hydro	893.35	2.2%
Other	587.00	1.4%
Geothermal	407.00	1.0%
Wood/Wood Waste Solids	316.20	0.8%
Waste	26.60	0.1%
Biomass Gases	18.52	0.0%
Landfill Gas	3.20	0.0%
Total	41,027.36	

Since 2008, over 550,000 MW of planned capacity additions were ultimately canceled, well above the capacity that was added. Wind represents nearly 28 percent of this canceled capacity.

Table 6.5
Plant Cancellations, 2008-2018

Fuel Type	Capacity (MW)	Share
Wind	152,671.09	27.7%
Natural Gas	107,796.78	19.6%
Solar	95,101.73	17.3%
Hydro	77,146.44	14.0%
Coal	64,057.50	11.6%
Nuclear	28,630.00	5.2%
Petroleum Coke	6,376.20	1.2%
Wood/Wood Waste Solids	4,471.09	0.8%
Other	4,255.07	0.8%
Geothermal	3,852.40	0.7%
Waste	1,731.20	0.3%
Biomass Solids	1,424.10	0.3%
Other Gas	898.00	0.2%
Blast Furnace Gas	600.00	0.1%
Landfill Gas	567.20	0.1%
Biomass Gases	540.92	0.1%
Agriculture Byproduct	299.12	0.1%
Waste Heat	187.60	0.0%
Biomass Liquids	86.60	0.0%
Distillate Fuel Oil	60.53	0.0%
Jet Fuel	60.00	0.0%
Kerosene	49.20	0.0%
Biomass Other	13.60	0.0%
Wood Waste Liquids	3.80	0.0%
Total	550,880.17	

Generating Capacity: Retirements and Cancellations

Figure 6.2 shows additions, cancellations, and retirements from 2008 to 2018. Additions exceeded cancellations for natural gas. For all other resources, far more capacity was cancelled than was added. The amount of retired coal capacity exceeded new coal capacity by a four-to-one ratio.

Figure 6.2
Additions, Cancellations, and Retirements, 2008-2018

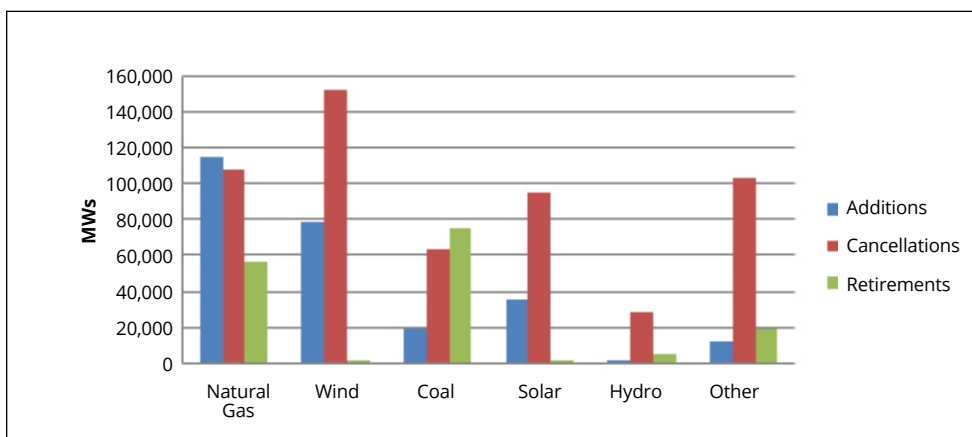
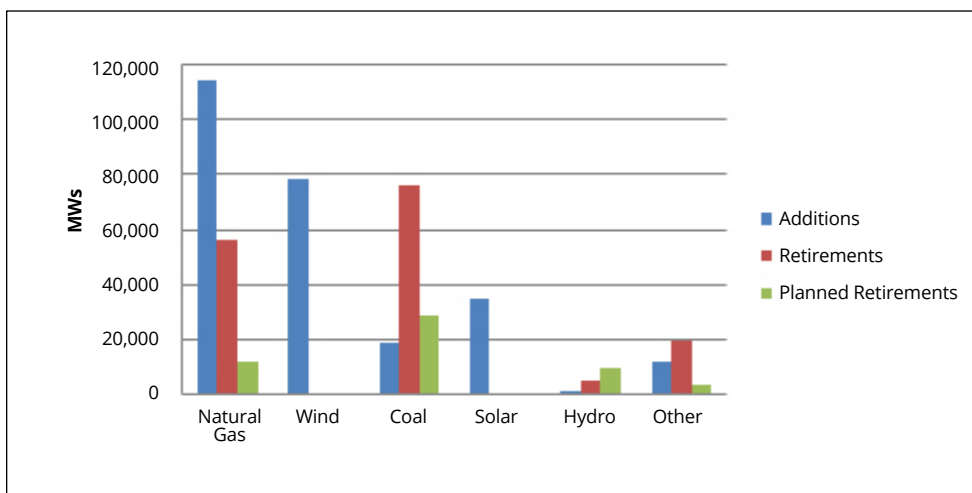


Figure 6.3 shows additions and retirements from 2008 to 2018 as well as planned retirements to 2023.

Figure 6.3
Additions and Retirements, 2008-2018, plus Planned Retirements to 2023



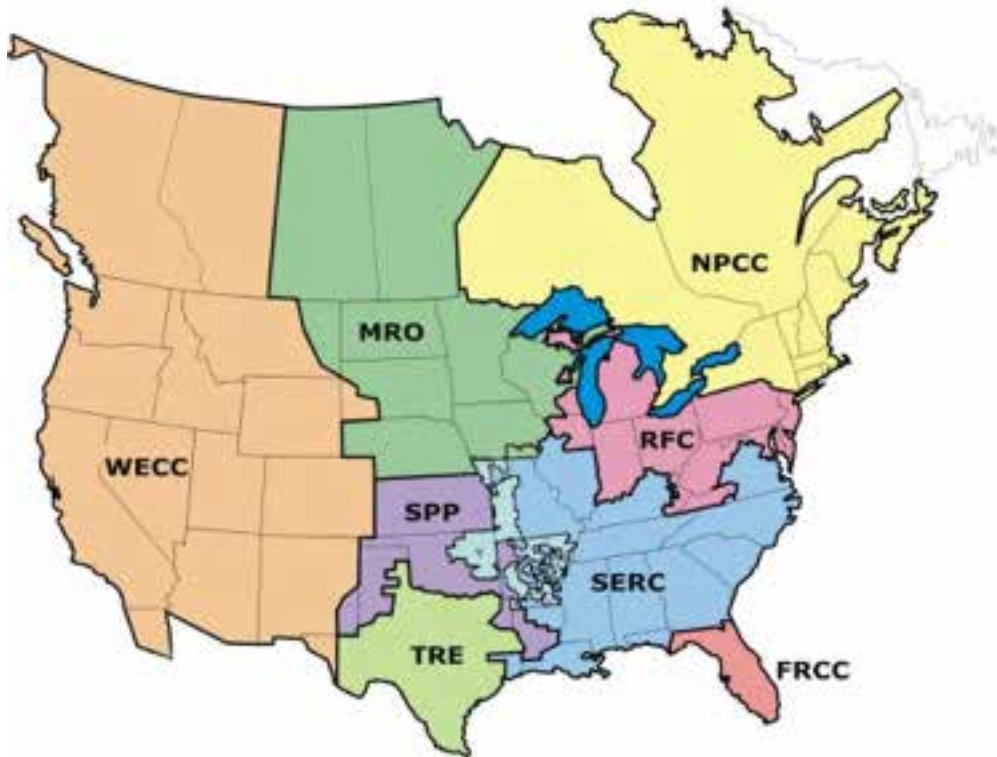
Conclusion

This report shows the continued trend of natural gas being the predominant fuel choice for new electric generation, with solar and wind representing the overwhelming majority of the remainder. These three resources account for between 80 and 93 percent of planned capacity at every stage of development.

While last year's report showed that there were 11,000 MW of new coal capacity being proposed, this year less than 100 MW of coal capacity is being proposed. The amount of coal being retired continues to increase, while almost no new coal-fired power is being deployed. Nearly twice as much nuclear capacity is being proposed as is scheduled to retire over the next five years, but the uncertainty of all proposed capacity should mitigate expectations of new nuclear capacity coming online.

The outlook for America's generation capacity remains fairly stable. The data confirm that coal capacity continues to dwindle, while natural gas, wind, and solar are the major utility-scale resources being developed.

Appendix 1: Regions



This report uses regions defined by the North American Electric Reliability Council:

ASCC - Alaska Systems Coordinating Council (not shown on map)

FRCC - Florida Reliability Coordinating Council

HCC - Hawaii Coordinating Council (not shown on map)

NPCC - Northeast Power Coordinating Council

MRO - Midwest Reliability Organization

RFC - Reliability First Corporation

SERC - Southeastern Electric Reliability Council

SPP - Southwest Power Pool

TRE - Texas Reliability Entity*

WECC - Western Electricity Coordinating Council

* The Independent System Operator that operates the electric grid for nearly all of the state of Texas is the Electric Reliability Council of Texas (ERCOT), and is the name used for this region in the report. The Texas Reliability Entity (TRE) monitors and enforces compliance with reliability standards for NERC.



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