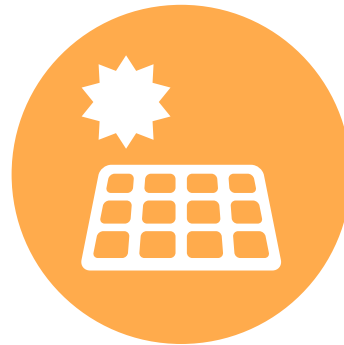
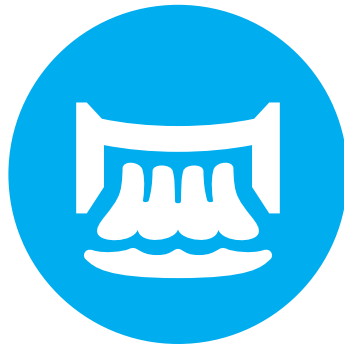
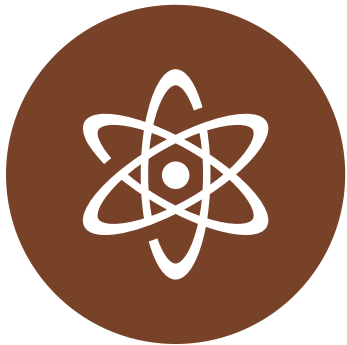


# America's Electricity Generation Capacity 2017 Update



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PUBLISHED FEBRUARY 2017



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# Executive Summary

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

Currently, America has just over 1.19 million megawatts of generation capacity.

The largest fuel source is natural gas, accounting for nearly 43 percent of all generation capacity. Coal, with a share of just over 24 percent of capacity, is the second largest generation source. Nuclear, hydro, and wind together account for just over 24 percent of capacity. Solar currently constitutes two percent of all capacity.

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

Over 316,000 MW of new generation capacity is under development in the United States — 96,864 MW under construction or permitted, and just under 219,580 MW proposed or pending application.

Most of the capacity currently under construction or permitted to begin construction will be fueled by natural gas. Solar and wind together account for nearly one-third of near-term potential capacity additions.

While the Southeast has the most generation currently, with 25 percent of the nation's total capacity, the Western region is slated to add the most generation in the near- and long-term, projecting nearly 95,000 MW of new capacity.

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

The overall capacity mix continues to change at a gradual pace. Almost no new coal plants are slated to come online in future years, and other traditional forms of electric generation are being displaced by wind, solar, and other forms of renewable generation, however; natural gas continues to be the most popular fuel choice due to costs and efficiency considerations.

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 January 2017.*

## SECTION 1

# 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**  
**2017 Current Electricity Generation Capacity, by Fuel**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	513,021.89	43.09%
Coal	290,852.98	24.43%
Nuclear	106,581.11	8.95%
Hydro	100,608.90	8.45%
Wind	81,721.54	6.86%
Distillate Fuel Oil	24,244.00	2.04%
Solar	23,660.22	1.99%
Residual Fuel Oil	18,995.10	1.60%
Wood/Wood Waste Solids	5,131.61	0.43%
Wood Waste Liquids	4,869.05	0.41%
Geothermal	3,933.73	0.33%
Waste	2,797.45	0.23%
Landfill Gas	2,757.84	0.23%
Petroleum Coke	2,472.70	0.21%
Other Gas	2,067.80	0.17%
Kerosene	1,888.40	0.16%
Waste Heat	1,178.73	0.10%
Blast Furnace Gas	929.60	0.08%
Jet Fuel	538.24	0.05%
Biomass Gases	455.77	0.04%
Purchased Steam	417.40	0.04%
Agriculture Byproduct	416.70	0.04%
Other	315.64	0.03%
Biomass Solids	292.16	0.02%
Biomass Liquids	139.29	0.01%
Waste Oil and Other Oil	119.91	0.01%
Biomass Other	75.38	0.01%
Propane	22.63	0.00%
Refuse	15.40	0.00%
<b>Total</b>	<b>1,190,521.13</b>	<b>100.00%</b>

Table 1.2 shows how America's current generation capacity is distributed through the various regions defined by the North American Electric Reliability Corporation.

**Table 1.2**  
**2017 Current Electricity Generation Capacity, by Region**

Region	Capacity (MW)	Share
SERC	296,203.70	24.88%
RFC	243,472.44	20.45%
WECC	235,822.13	19.81%
ERCOT	112,512.87	9.45%
NPCC	83,520.98	7.02%
SPP	76,540.67	6.43%
MRO	68,883.21	5.79%
FRCC	67,404.13	5.66%
HCC	3,096.61	0.26%
ASCC	3,064.39	0.26%
<b>Total</b>	<b>1,190,521.13</b>	<b>100.00%</b>

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



As seen in Table 1.3, nearly 200,000 MW of current generation capacity was added between 2008 and 2016. Nearly three-quarters of this new capacity is fueled by natural gas or wind, with another 21 percent coming from coal and solar.

**Table 1.3**  
**Generation Capacity Additions by Fuel Type, 2008 - 2016**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	81,382.22	40.70%
Wind	65,259.19	32.64%
Solar	22,734.97	11.37%
Coal	19,220.20	9.61%
Hydro	1,539.00	0.77%
Wood/Wood Waste Solids	1,342.68	0.67%
Landfill Gas	1,312.37	0.66%
Nuclear	1269.9	0.64%
Petroleum Coke	1,048.20	0.52%
Distillate Fuel Oil	895.55	0.45%
Other Gas	871.40	0.44%
Geothermal	757.57	0.38%
Waste Heat	506.03	0.25%
Kerosene	440.00	0.22%
Wood Waste Liquids	437.30	0.22%
Biomass Gases	253.24	0.13%
Waste	148.20	0.07%
Biomass Liquids	123.09	0.06%
Biomass Solids	121.43	0.06%
Blast Furnace Gas	101.00	0.05%
Biomass Other	69.70	0.03%
Agriculture Byproduct	46.10	0.02%
Other	23.50	0.01%
Propane	22.63	0.01%
Refuse	15.40	0.01%
Waste Oil and Other Oil	9.20	0.00%
Jet Fuel	6.40	0.00%
Purchased Steam	1.00	0.00%
<b>Total</b>	<b>199,957.45</b>	<b>100.00%</b>

Table 1.4 shows that in 2016 alone, over 25,000 MW of generation began operating, with natural gas, wind, and solar accounting for 93 percent of the new capacity.

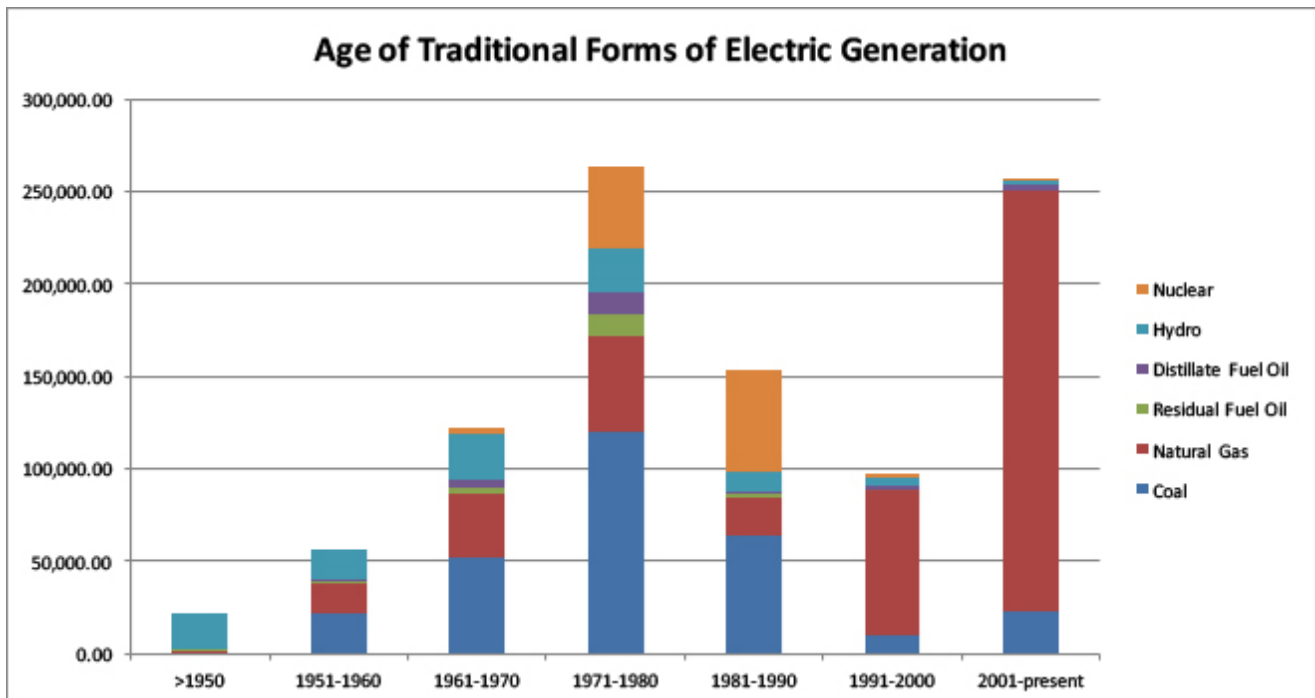
**Table 1.4**  
**Generation Capacity Additions by Fuel Type, 2016**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	8,580.08	33.80%
Wind	7,634.62	30.07%
Solar	7,364.12	29.01%
Nuclear	1,269.90	5.00%
Hydro	256.92	1.01%
Landfill Gas	87.96	0.35%
Wood Waste Liquids	75.00	0.30%
Waste Heat	22.80	0.09%
Propane	21.00	0.08%
Other Gas	21.00	0.08%
Waste	15.70	0.06%
Distillate Fuel Oil	12.20	0.05%
Biomass Other	10.00	0.04%
Wood/Wood Waste Solids	8.50	0.03%
Biomass Gases	6.30	0.02%
Other	0.00	0.00%
<b>Total</b>	<b>25,386.10</b>	<b>100.00%</b>

Figure 1.1 shows the age of traditional forms of generating capacity – namely, 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 overwhelming bulk of natural gas capacity is less than 25 years of age. This chart does not show renewable generation, almost all which came online after the turn of the century.

**Figure 1.1**



## SECTION 2

# 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 51,004 MW of generation capacity under construction. Natural gas accounts just over three-fifths of the capacity under construction. Wind, solar, and nuclear account for nearly all the rest of the capacity under construction.

**Table 2.1**  
**Plants Under Construction, by Fuel Type**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	31,539.70	61.84%
Wind	9,687.29	18.99%
Nuclear	4,434.00	8.69%
Solar	4,250.50	8.33%
Hydro	343.12	0.67%
Coal	320.00	0.63%
Waste Heat	80.00	0.16%
Distillate Fuel Oil	60.65	0.12%
Geothermal	57.60	0.11%
Liquefied Natural Gas	50.63	0.10%
Wood/Wood Waste Solids	50.00	0.10%
Agriculture Byproduct	50.00	0.10%
Waste	39.20	0.08%
Landfill Gas	16.10	0.03%
Biomass Solids	15.00	0.03%
Biomass Gases	9.10	0.02%
Other	1.40	0.00%
<b>Total</b>	<b>51,004.30</b>	<b>100.00%</b>

Table 2.2 shows the fuel makeup for plants that have received permits to construct 45,860 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 half of the new capacity. Wind is second and accounts for just over a quarter of potential capacity.

**Table 2.2**  
**Permitted Plants, by Fuel Type**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	22,390.20	48.82%
Wind	12,446.95	27.14%
Nuclear	3,680.00	8.02%
Solar	3,436.48	7.49%
Coal	1,485.00	3.24%
Petroleum Coke	775.00	1.69%
Other	587.00	1.28%
Hydro	585.98	1.28%
Geothermal	331.90	0.72%
Waste Heat	60.00	0.13%
Agriculture Byproduct	49.90	0.11%
Biomass Gases	14.40	0.03%
Wood/Wood Waste Solids	13.50	0.03%
Landfill Gas	3.22	0.01%
<b>Total</b>	<b>45,859.54</b>	<b>100.00%</b>



Table 2.3 shows the fuel mix for the 60,845 MW of capacity awaiting approval of applications. Natural gas is the leading resource choice, accounting for nearly 50 percent of the capacity. Nuclear, solar, and wind each account for over 10 percent of capacity pending application.

**Table 2.3**  
**Plants Pending Application, by Fuel Type**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	29,208.20	48.00%
Wind	9,790.30	16.09%
Solar	9,303.02	15.29%
Nuclear	7,596.00	12.48%
Hydro	4,445.71	7.31%
Geothermal	256.00	0.42%
Petroleum Coke	200.00	0.33%
Wood/Wood Waste Solids	42.00	0.07%
Landfill Gas	3.80	0.01%
Other	0.00	0.00%
<b>Total</b>	<b>60,845.03</b>	<b>100.00%</b>

Table 2.4 shows the resource mix for the 158,735 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 approximately one-third 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**

Primary Fuel Type	Capacity (MW)	Share
Wind	52,151.33	32.85%
Natural Gas	43,940.39	27.68%
Solar	29,320.34	18.47%
Hydro	15,959.04	10.05%
Nuclear	14,372.40	9.05%
Geothermal	1,177.60	0.74%
Residual Fuel Oil	632.40	0.40%
Wood/Wood Waste Solids	551.60	0.35%
Other	363.30	0.23%
Landfill Gas	103.87	0.07%
Waste	46.20	0.03%
Biomass Other	45.60	0.03%
Biomass Liquids	19.00	0.01%
Coal	17.00	0.01%
Distillate Fuel Oil	13.00	0.01%
Biomass Solids	9.60	0.01%
Biomass Gases	8.39	0.01%
Other Gas	3.50	0.00%
<b>Grand Total</b>	<b>158,734.55</b>	<b>100.00%</b>



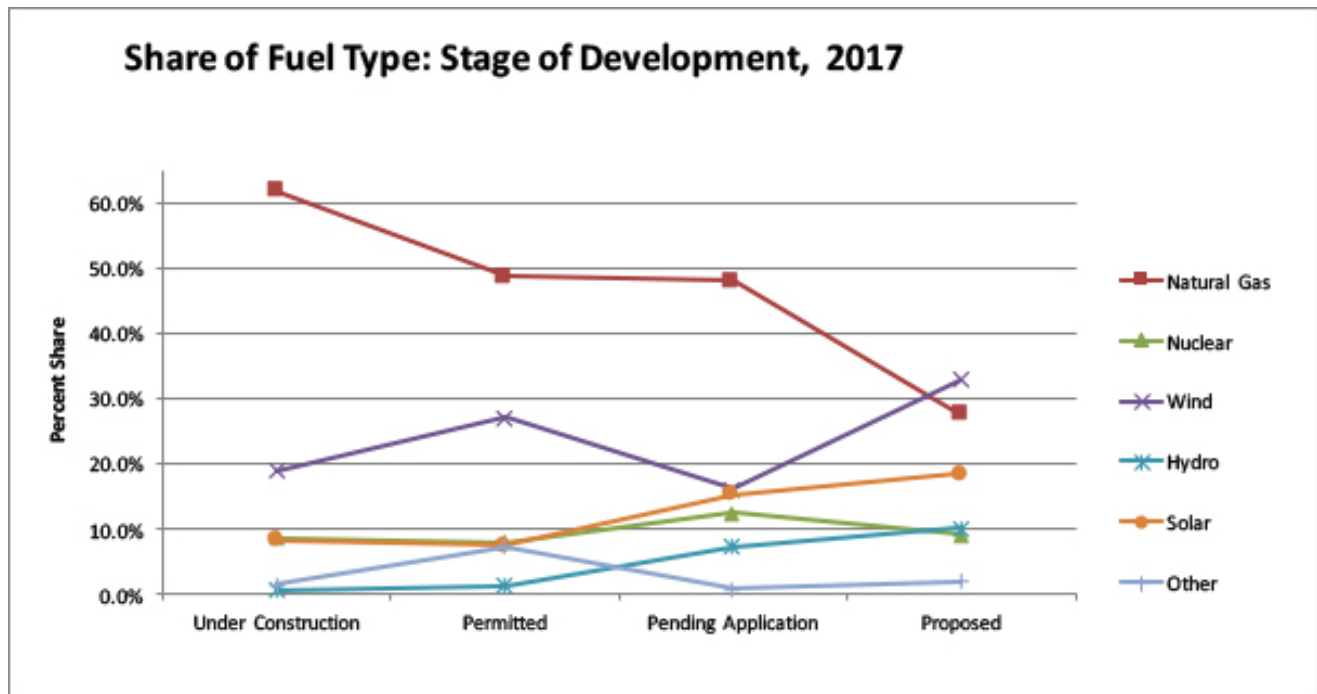


## Future Generating Capacity: Development Stages

Figure 2.1 tracks the major fuel sources in each stage of development. Natural gas is the dominant fuel choice in the first three stages — under construction, permitted, and

pending application. Wind is the leading source of generating capacity in the proposed capacity stage. Figure 2.1 also shows that the resource mix is more balanced in the earlier stages of development.

**Figure 2.1**



## SECTION 3

# Future Generating Capacity: Regional Mix

Tables 3.1 – 3.4 show where the new plants are being built or planned for construction by North American Electric Reliability Corporation regions. (See Appendix 1 for definition of regions and included states).

Table 3.1 shows that four regions account for roughly three-quarters of the capacity under construction.

**Table 3.1**  
**Plants Under Construction, by NERC Region**

Region	Capacity (MW)	Share
RFC	15,366.98	30.13%
SERC	11,093.51	21.75%
ERCOT	7,963.90	15.61%
WECC	5,909.70	11.59%
SPP	3,815.17	7.48%
MRO	2,752.16	5.40%
FRCC	1,907.81	3.74%
NPCC	1,837.44	3.60%
HCC	202.63	0.40%
ASCC	155.00	0.30%
<b>Total</b>	<b>51,004.30</b>	<b>100.00%</b>

Table 3.2 shows that the Western Electricity Coordinating Council (WECC) and Electric Reliability Council of Texas (ERCOT) regions account for over half of the capacity at this stage.

**Table 3.2**  
**Permitted Plants, by NERC Region**

Region	Capacity (MW)	Share
WECC	9,741.95	21.24%
ERCOT	9,415.40	20.53%
RFC	8,991.20	19.61%
SERC	5,538.93	12.08%
NPCC	3,918.65	8.54%
MRO	3,142.80	6.85%
SPP	2,928.90	6.39%
FRCC	2,140.00	4.67%
HCC	32.12	0.07%
ASCC	9.60	0.02%
<b>Total</b>	<b>45,859.54</b>	<b>100.00%</b>



Tables 3.3 and 3.4 show plants in the pending application and proposed categories, in both of which WECC has far more potential capacity than any other region, although ERCOT has a similar amount in the pending application category.

**Table 3.3**  
**Plants Pending Application, by Region**

Region	Capacity (MW)	Share
WECC	19,688.75	32.36%
ERCOT	19,208.80	31.57%
RFC	8,410.58	13.82%
SERC	4,631.72	7.61%
NPCC	3,227.48	5.30%
FRCC	3,006.00	4.94%
SPP	1,736.00	2.85%
MRO	796.90	1.31%
HCC	99.00	0.16%
ASCC	39.80	0.07%
<b>Total</b>	<b>60,845.03</b>	<b>100.00%</b>

**Table 3.4**  
**Proposed Plants, by Region**

Region	Capacity (MW)	Share
WECC	59,975.09	37.78%
RFC	29,745.48	18.74%
SERC	22,126.42	13.94%
NPCC	20,315.60	12.80%
MRO	10,370.06	6.53%
ERCOT	6,752.46	4.25%
SPP	5,378.92	3.39%
FRCC	2,976.68	1.88%
ASCC	789.74	0.50%
HCC	304.10	0.19%
<b>Total</b>	<b>158,734.55</b>	<b>100.00%</b>

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 78 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**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	53,929.90	55.68%
Wind	22,134.25	22.85%
Nuclear	8,114.00	8.38%
Solar	7,686.99	7.94%
Coal	1,805.00	1.86%
Hydro	929.10	0.96%
Petroleum Coke	775.00	0.80%
Other	588.40	0.61%
Geothermal	389.50	0.40%
Waste Heat	140.00	0.14%
Agriculture Byproduct	99.90	0.10%
Wood/Wood Waste Solids	63.50	0.07%
Distillate Fuel Oil	60.65	0.06%
Liquefied Natural Gas	50.63	0.05%
Waste	39.20	0.04%
Biomass Gases	23.50	0.02%
Landfill Gas	19.32	0.02%
Biomass Solids	15.00	0.02%
<b>Total</b>	<b>96,863.84</b>	

Reliability First Corporation (RFC) accounts for approximately 25 percent of the capacity under construction and permitted, with the Southeastern Electric Reliability Council (SERC), WECC, and ERCOT almost evenly dividing another 55 percent. Natural gas is the primary resource in the ERCOT and RFC regions as well as in the Florida Reliability Coordinating Council (FRCC) and Northeast Power Coordinating Council (NPCC) regions. In each of these four regions, natural gas accounts for at least 70 percent of future capacity. Natural gas is also the leading resource in SERC, with just under 43 percent of impending capacity. Nuclear – due to the construction of three large facilities – accounts for almost 40 percent of the capacity in this region.

Just over half of the solar capacity in the permitted and under construction stages is located in the WECC region. Another 20 percent of solar capacity is located in SERC. Four regions account for nearly 80 percent of new wind capacity — ERCOT and WECC as well as the Midwest Reliability Organization (MRO) and Southwest Power Pool (SPP) regions.

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. There is slightly more impending natural gas than wind capacity.

**Table 3.6**  
**Plants Pending Application and Proposed,**  
**by Fuel Type**

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	73,148.59	33.31%
Wind	61,941.63	28.21%
Solar	38,623.36	17.59%
Nuclear	21,968.40	10.00%
Hydro	20,404.74	9.29%
Geothermal	1,433.60	0.65%
Residual Fuel Oil	632.40	0.29%
Wood/Wood Waste Solids	593.60	0.27%
Other	363.30	0.17%
Petroleum Coke	200.00	0.09%
Landfill Gas	107.67	0.05%
Waste	46.20	0.02%
Biomass Other	45.60	0.02%
Biomass Liquids	19.00	0.01%
Coal	17.00	0.01%
Distillate Fuel Oil	13.00	0.01%
Biomass Solids	9.60	0.00%
Biomass Gases	8.39	0.00%
Other Gas	3.50	0.00%
<b>Total</b>	<b>219,579.58</b>	<b>100.00%</b>

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 four regions. Sixty-two percent of the proposed or application pending solar capacity is located in WECC, a region that accounts for much of the future renewable capacity. Other forms of renewable energy, particularly wood, waste, and waste heat, are more dispersed through the various regions.

SECTION 4

## 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 Ownership**

Utility Type	Capacity (MW)	Share
Non-utility Generators	37,198.64	72.93%
Investor Owned	5,029.32	9.86%
Public Power	4,678.77	9.17%
Federal	2,104.31	4.13%
Co-Op	1,993.27	3.91%
<b>Total</b>	<b>51,004.30</b>	<b>100.00%</b>

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

**Table 4.2**  
**Permitted Plants, by Ownership**

Utility Type	Capacity (MW)	Share
Non-utility Generators	37,083.94	80.86%
Investor Owned	7,320.00	15.96%
Co-Op	965.00	2.10%
Public Power	490.60	1.07%
<b>Total</b>	<b>45,859.54</b>	<b>100.00%</b>

**Table 4.3**  
**Plants Pending Application, by Ownership Type**

Ownership	Capacity (MW)	Share
Non-utility Generators	52,833.17	86.83%
Investor Owned	5,345.00	8.78%
Co-Op	967.00	1.59%
Public Power	888.86	1.46%
Federal	811.00	1.33%
<b>Total</b>	<b>60,845.03</b>	<b>100.00%</b>

**Table 4.4**  
**Proposed Plants, by Ownership Type**

Ownership	Capacity (MW)	Share
Non-utility Generators	129,461.94	81.56%
Investor Owned	13,451.02	8.47%
Public Power	10,826.09	6.82%
Federal	3,031.00	1.91%
Co-Op	1,964.50	1.24%
<b>Total</b>	<b>158,734.55</b>	<b>100.00%</b>

## SECTION 5

## Future Generating Capacity: Regional Transmission Organizations

Tables 5.1 – 5.4 show future generating capacity by Regional Transmission Organization (RTO) region. In the proposed category, a significant plurality of the 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 RTO capacity currently or soon to be under construction is located in ERCOT and PJM.

**Table 5.1**  
**Plants Under Construction, by RTO**

RTO Region	Capacity (MW)	Share
PJM ISO	15,750.73	30.88%
Non RTO	13,731.04	26.92%
ERCOT ISO	8,164.30	16.01%
SPP	4,714.63	9.24%
Midcontinent ISO	4,168.96	8.17%
California ISO	2,637.19	5.17%
New England ISO	1,000.89	1.96%
New York ISO	836.55	1.64%
<b>Total</b>	<b>51,004.30</b>	<b>100.00%</b>

**Table 5.2**  
**Permitted Plants, by RTO**

RTO Region	Capacity (MW)	Share
Non RTO	12,431.45	27.11%
ERCOT ISO	9,695.40	21.14%
PJM ISO	8,156.29	17.79%
Midcontinent ISO	5,688.90	12.41%
SPP	3,148.90	6.87%
California ISO	2,899.95	6.32%
New England ISO	2,595.36	5.66%
New York ISO	1,243.29	2.71%
<b>Total</b>	<b>45,859.54</b>	<b>100.00%</b>

**Table 5.3**  
**Plants Pending Application, by RTO Region**

RTO	Capacity (MW)	Share
ERCOT ISO	18,508.80	30.42%
Non RTO	12,905.97	21.21%
California ISO	11,619.20	19.10%
PJM ISO	9,482.18	15.58%
Midcontinent ISO	2,592.40	4.26%
SPP	2,509.00	4.12%
New York ISO	2,475.40	4.07%
New England ISO	752.08	1.24%
<b>Total</b>	<b>60,845.03</b>	<b>100.00%</b>

**Table 5.4**  
**Proposed Plants, by RTO Region**

RTO	Capacity (MW)	Share
Non RTO	66,269.83	41.75%
PJM ISO	30,177.86	19.01%
California ISO	14,479.19	9.12%
Midcontinent ISO	12,310.20	7.76%
New York ISO	10,885.73	6.86%
SPP	10,213.83	6.43%
New England ISO	8,050.45	5.07%
ERCOT ISO	6,347.46	4.00%
<b>Total</b>	<b>158,734.55</b>	<b>100.00%</b>

## SECTION 6

## Generating Capacity: Retirements and Cancellations

Tables 6.1 and 6.2 show generation capacity retirements by fuel type between 2008 and 2016, when 104,411 MW of capacity was retired. Over 80 percent of this retired capacity was natural gas or coal, and 11 percent was oil. More than 80 percent of the retired natural gas capacity used steam turbines.

**Table 6.1**  
**Retired Plants by Fuel Type, 2008-2016**

Primary Fuel Type	Capacity (MW)	Share
Coal	52,559.50	50.3%
Natural Gas	32,082.45	30.7%
Residual Fuel Oil	6,409.50	6.1%
Nuclear	5,034.57	4.8%
Distillate Fuel Oil	4,574.14	4.4%
Hydro	1,130.50	1.1%
Petroleum Coke	628.00	0.6%
Kerosene	336.30	0.3%
Wood/Wood Waste Solids	291.00	0.3%
Wood Waste Liquids	222.80	0.2%
Wind	219.00	0.2%
Landfill Gas	198.60	0.2%
Blast Furnace Gas	171.20	0.2%
Waste	118.00	0.1%
Waste Oil and Other Oil	103.00	0.1%
Other	94.30	0.1%
Geothermal	78.60	0.1%
Solar	39.50	0.0%
Other Gas	37.50	0.0%
Purchased Steam	37.00	0.0%
Jet Fuel	17.60	0.0%
Biomass Liquids	15.80	0.0%
Biomass Gases	12.30	0.0%
<b>Total</b>	<b>104,411.17</b>	<b>100.0%</b>

Just over 11,000 MW of capacity was retired in 2016, of which coal accounted for almost three-quarters of the retired capacity.

**Table 6.2**  
**Retired Plants by Fuel Type, 2016**

Primary Fuel Type	Capacity (MW)	Share
Coal	8,357.30	73.9%
Natural Gas	1,468.90	13.0%
Nuclear	577.00	5.1%
Distillate Fuel Oil	428.90	3.8%
Petroleum Coke	304.50	2.7%
Wind	48.60	0.4%
Wood/Wood Waste Solids	47.20	0.4%
Solar	30.00	0.3%
Landfill Gas	25.40	0.2%
Wood Waste Liquids	15.50	0.1%
Hydro	7.25	0.1%
Biomass Gases	1.80	0.0%
Waste	1.20	0.0%
<b>Total</b>	<b>11,313.55</b>	<b>100.0%</b>



Approximately 33,000 MW of current operating capacity is scheduled to retire by 2020, over half of which is coal. Almost all planned natural gas retirements are powered by steam or gas combustion turbines.

Table 6.3 reflects planned retirements that have been publicly announced.

**Table 6.3**  
**Planned Retirements to 2020, by Fuel Type**

Primary Fuel Type	Capacity (MW)	Share
Coal	16,855.30	50.65%
Natural Gas	11,309.20	33.98%
Nuclear	2,643.23	7.94%
Hydro	828.70	2.49%
Residual Fuel Oil	651.90	1.96%
Wind	307.85	0.93%
Distillate Fuel Oil	250.90	0.75%
Geothermal	148.00	0.44%
Petroleum Coke	140.60	0.42%
Kerosene	72.60	0.22%
Wood/Wood Waste Solids	44.10	0.13%
Landfill Gas	11.91	0.04%
Waste	11.00	0.03%
Biomass Gases	1.80	0.01%
<b>Total</b>	<b>33,277.09</b>	<b>100.00%</b>

Nearly 66,000 MW of planned capacity additions were canceled in 2016, or 40,000 MWs more than the amount of capacity actually added to the grid.

**Table 6.4**  
**Plant Cancellations, 2016**

Row Labels	Capacity (MW)	Share
Wind	21,284.80	32.4%
Natural Gas	12,659.89	19.3%
Solar	10,363.89	15.8%
Nuclear	8,500.00	12.9%
Hydro	5,722.64	8.7%
Other	2,892.59	4.4%
Coal	1,870.00	2.8%
Wood/Wood Waste Solids	623.98	0.9%
Waste	573.50	0.9%
Blast Furnace Gas	500.00	0.8%
Geothermal	432.50	0.7%
Biomass Solids	90.23	0.1%
Jet Fuel	60.00	0.1%
Other Gas	50.00	0.1%
Landfill Gas	40.68	0.1%
Distillate Fuel Oil	14.25	0.0%
Agriculture Byproduct	12.50	0.0%
#N/A	8.00	0.0%
Biomass Gases	7.20	0.0%
<b>Total</b>	<b>65,706.64</b>	<b>100.0%</b>





Since 2008, over 374,000 MW of planned capacity additions were ultimately canceled, well more than double the amount that was actually added. Wind represents nearly 29 percent of this canceled capacity. Nearly equal shares of coal, natural gas, hydro, and solar were also canceled during this time.

**Table 6.5**  
**Plant Cancellations, 2008-2016**

Row Labels	Capacity (MW)	Share
Wind	129,563.04	28.6%
Solar	75,239.00	16.6%
Natural Gas	73,110.35	16.2%
Hydro	68,204.44	15.1%
Coal	59,157.50	13.1%
Nuclear	25,630.00	5.7%
Petroleum Coke	4,980.20	1.1%
Wood/Wood Waste Solids	4,100.89	0.9%
Other	3,608.87	0.8%
Geothermal	2,738.50	0.6%
Waste	1,456.80	0.3%
Biomass Solids	1,394.10	0.3%
Other Gas	898.00	0.2%
Blast Furnace Gas	600.00	0.1%
Biomass Gases	495.30	0.1%
Landfill Gas	435.30	0.1%
Agriculture Byproduct	292.82	0.1%
Waste Heat	127.60	0.0%
Biomass Liquids	77.60	0.0%
Jet Fuel	60.00	0.0%
Distillate Fuel Oil	58.73	0.0%
Kerosene	49.20	0.0%
Unknown	8.00	0.0%
Wood Waste Liquids	3.80	0.0%
<b>Total</b>	<b>452,290.04</b>	<b>100.0%</b>

**The overall capacity mix continues to change at a gradual pace. Almost no new coal plants are slated to come online in future years, and other traditional forms of electric generation are being displaced by wind, solar, and other forms of renewable generation, however; natural gas continues to be the most popular fuel choice due to costs and efficiency considerations.**

Figure 6.1 shows additions, cancellations, and retirements from 2008 to 2016. Natural gas is the only resource for which additions outnumber cancellations. For all other resources, far more capacity was cancelled than was added.

**Figure 6.1**

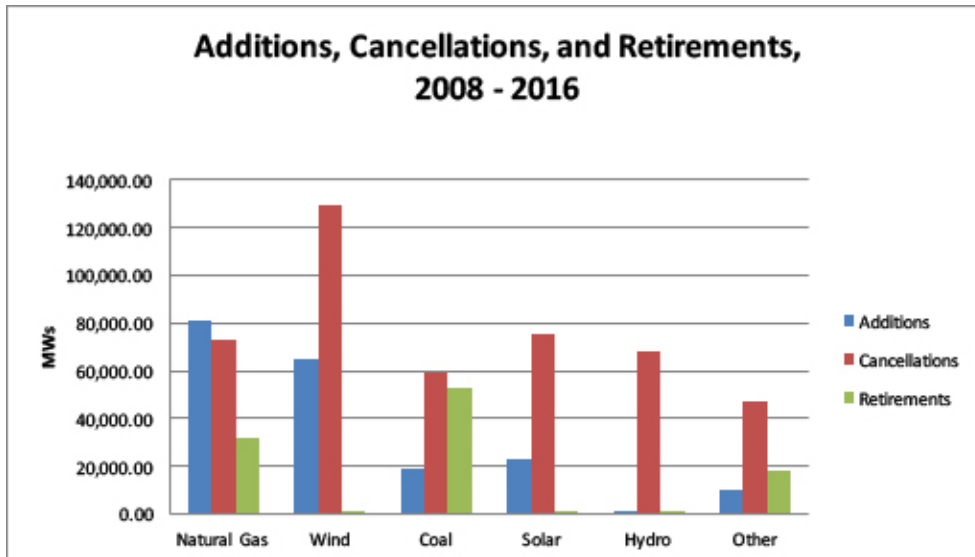


Figure 6.2 shows additions and retirements from 2008 to 2016, as well as planned retirements to 2020. Most of the planned retirements in the “other category” are nuclear retirements.

**Figure 6.2**

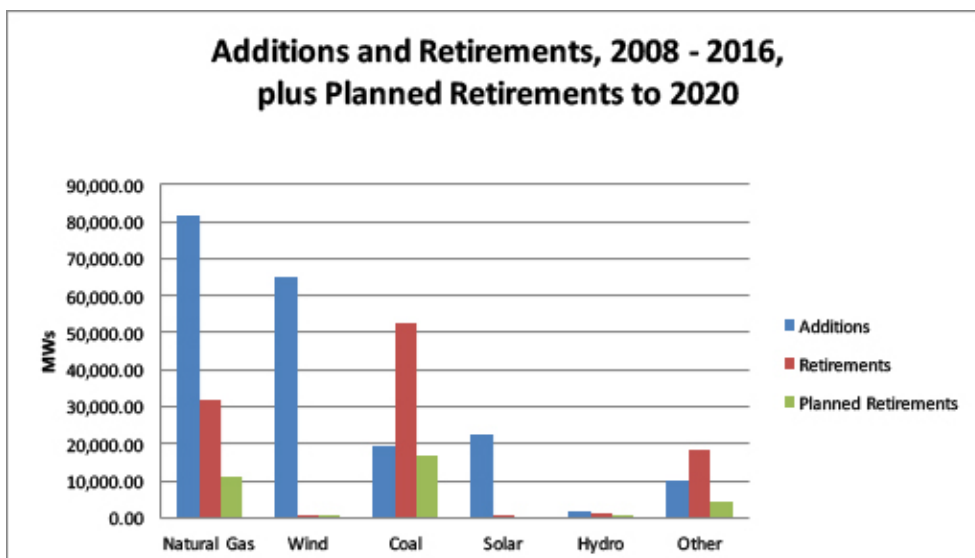
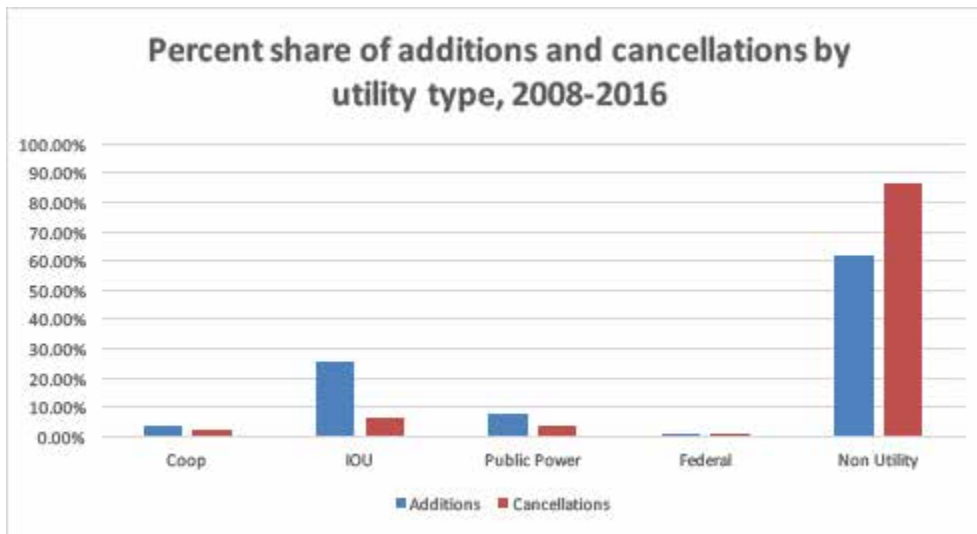




Figure 6.3 shows additions and cancellations by utility type. Though non-utility generators accounted for just over 60 percent of the capacity additions from 2008-2016, they accounted for nearly 87 percent of cancellations during the same time.

**Figure 6.3**



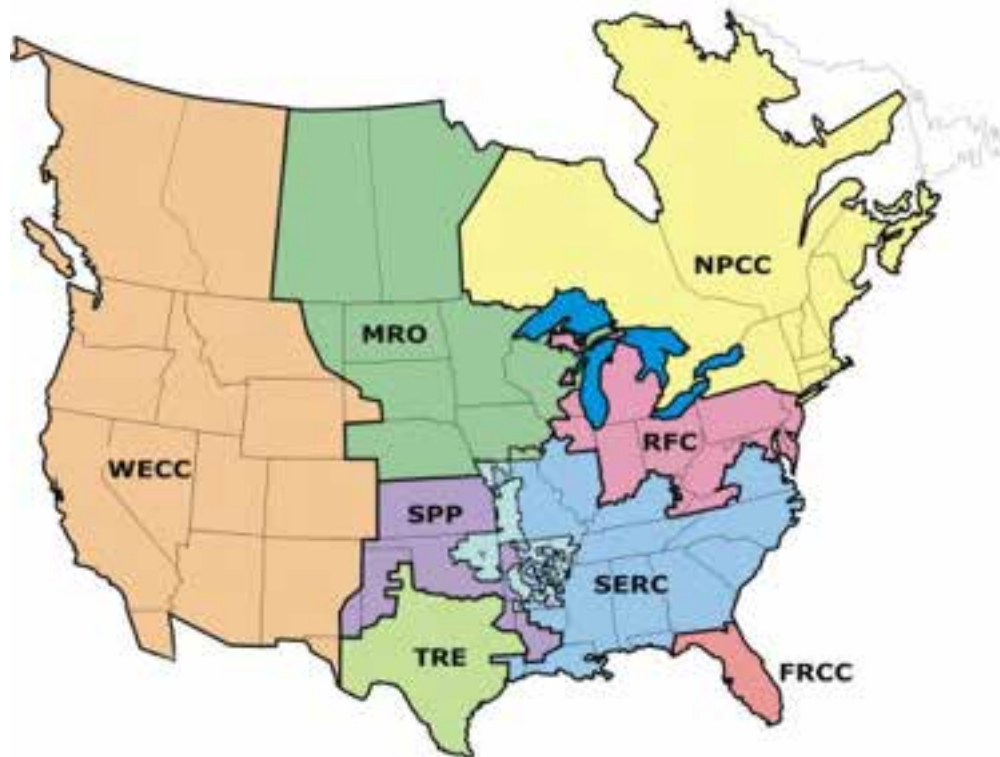
# Conclusion

This latest report continues to show a consistent trend in the development of U.S. generating capacity. Natural gas remains the predominant fuel for much of America's utility-scale generation, while wind and solar incrementally increase as a share of generating capacity. The report also shows that wind and natural gas resources are being constructed nation-wide, while solar generating capacity is mostly, though far from entirely, developing in the western and southeastern regions.

Despite the uncertain fate of the Clean Power Plan (CPP), development of new coal capacity has almost completely halted, while existing coal capacity continues to retire at a steady pace. New nuclear capacity has come online for the first time in decades, and more is scheduled to do so over the next few years. Almost all of this capacity, however, is being developed in the southeastern part of the United States.

Federal and state-wide regulatory and legislative developments, as well as shifts in fuel costs, could force sudden changes in resource allocation. Clearly, slow shifts in generating resources continue. Yet the data show that wildly fluctuating changes in the relative shares of generating capacity should not be expected in the near-term.

## 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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