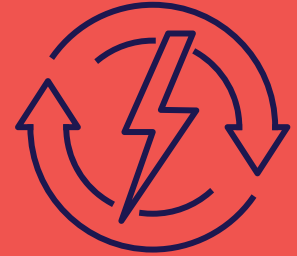
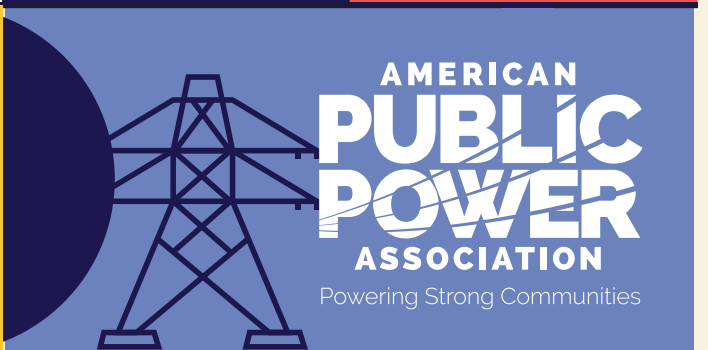
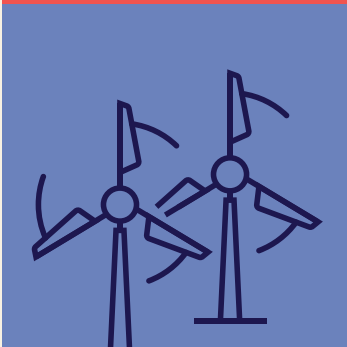
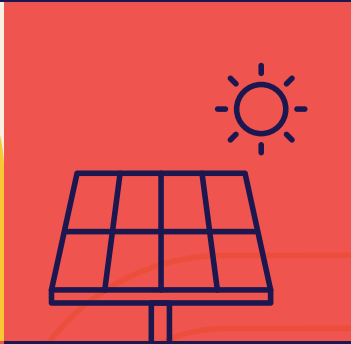
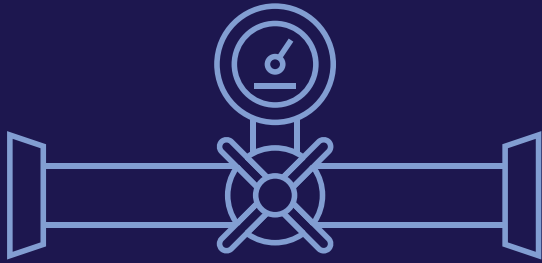


AMERICA'S ELECTRICITY GENERATION CAPACITY



2024 UPDATE



AMERICAN
**PUBLIC
POWER**
ASSOCIATION

Powering Strong Communities

AMERICA'S ELECTRICITY GENERATION CAPACITY 2024 UPDATE

PREPARED BY

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AMERICAN PUBLIC POWER ASSOCIATION

APRIL 2024



Powering Strong Communities

The American Public Power Association is the voice of not-for-profit, community-owned utilities that power 2,000 towns and cities nationwide. We represent public power before the federal government to protect the interests of the more than 54 million people that public power utilities serve, and the 96,000 people they employ. More at www.PublicPower.org.

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EXECUTIVE SUMMARY

The American Public Power Association presents its annual report on current and imminent electricity generation capacity in the United States by types of fuel, region, and ownership.

All figures in this report represent utility-scale capacity only and do not include distributed and other small-scale generation capacity.

This report includes generation capacity data from 50 U.S. states as well as American Samoa, Puerto Rico, Guam, and the U.S. Virgin Islands.



The U.S. has nearly
1.3 million
megawatts of
generation capacity

Current Capacity

Currently, the U.S. has nearly 1.3 million megawatts of generation capacity. The largest fuel source is natural gas, accounting for just under 44% of all generation capacity. Coal, with a share of 16%, represents the second largest source of generation capacity. Wind, nuclear, hydro, and solar together account for more than one-third of capacity.

Under Development

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

Nearly 468,000 MW of new generation capacity is under development in the United States, which is comparable to the total capacity under development this time last year. Of this capacity, 132,518 MW is under construction or permitted, and 335,374 MW is proposed or pending application.

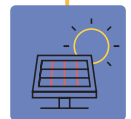
A majority of all new generation capacity under development is for solar energy (51%), followed by wind (33%) and natural gas (7%). However, three-quarters of

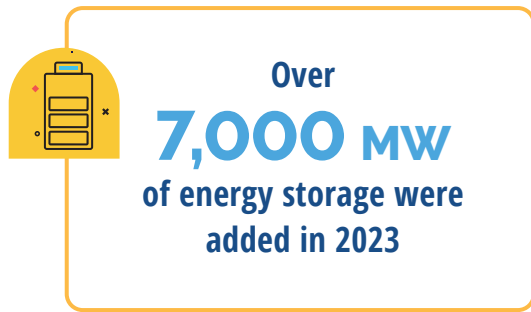
Generation capacity refers to the maximum potential power output of an electricity generation source, i.e., the amount of power a plant can produce if it were running at full power. Capacity is measured in megawatts (MW). This should not be confused with **generation**, which is the actual power output of a generation facility and is measured in megawatt-hours (MWh). This report covers generation capacity only.

the wind capacity is in the "proposed" stage, which is the earliest and most uncertain stage of development and includes units that are least likely to be built. Trends in the development stages of the share of fuel type also show that wind capacity is far less likely than solar to move to the application phase and beyond. Fifty-seven percent of the solar generation in development is for permitted plants and plants that are under construction, which are the stages of development that are most likely to come online.

A large majority of all future capacity is owned by non-utility generators.

51%
of all new
generation capacity
under development is
for solar energy





Surge of Solar, Wind, and Energy Storage

Solar capacity has increased by over 17,000 MW in 2023, and nearly 35,000 MW are under preparation, testing, or construction and projected to come online in 2024. For the third year in a row, solar was the leading source of new utility-scale capacity.

Over 6,000 MW of wind capacity came online in 2023, and over 5,600 MW are projected to come online in 2024.

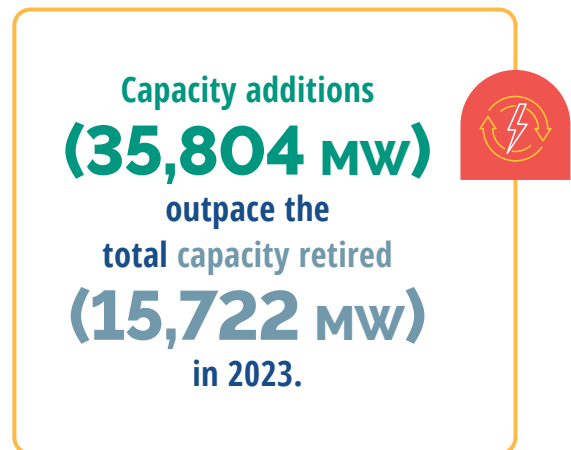
Energy storage is now included in this report due to its increasing deployment and role in integrating renewable energy resources on the grid. In this report, pumped hydro storage is classified as hydropower capacity. Megawatts of energy storage are not included as a part of the capacity totals and are instead reported as standalone additions. Over 7,000 MW of energy storage were added in 2023 to supplement generation capacity, with 11,668 MW of additional energy storage under preparation, testing, or construction projected to come online in 2024.

Retirements and Cancellations

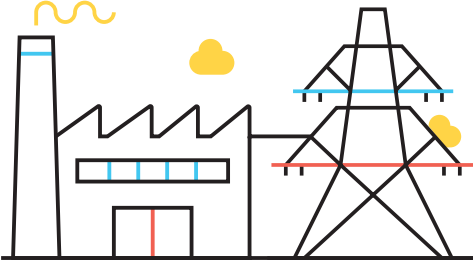
This report also provides information on retirements, planned retirements, and cancellations over the past several years. More than 36,000 MW of planned capacity developments were canceled in 2023. Solar accounts for a plurality (47%) of the cancellations, and wind and natural gas projects account for most of the remaining cancellations in 2023.

Capacity additions (35,804 MW) outpace the total capacity retired (15,722 MW) in 2023. A majority of the capacity retired in 2023 was from coal-fired facilities (65%), with over 10,000 MW retired, and 86,721 MW of coal has been retired since 2016. More than 56,000 MW in coal capacity is planned to be retired through 2028, which represents over a quarter of the current generation capacity of all coal-fired facilities.

Data analyzed for this report was taken from the Hitachi Energy Velocity Suite database, accessed January and February 2024.



1. CURRENT GENERATION CAPACITY



Current nameplate capacity includes capacity labeled as operating, including units that have been restarted as well as capacity that is on standby or mothballed.

Table 1.1 shows the sources from which electricity can be generated in the U.S. Natural gas facilities make up a plurality of America’s current capacity, followed by coal, wind, and nuclear resources. In addition to the 1,296,876 MW nameplate capacity, there is 17,281 MW of supplemental energy storage in the U.S.

CATEGORIES OF OPERATING CAPACITY

- OPERATING:** Generator available to operate
- RESTART:** Generator brought back online after being out of service, retired, or mothballed for more than three months
- STANDBY:** Generator available for service but not normally used, or on short term scheduled or forced outage for less than three months
- MOTHBALLED:** Generator taken out of service but not retired, unit is able to come back online

Table 1.1
2023 Electric Generation Capacity, by Fuel Type

Fuel Type	MW	Share	Fuel Type	MW	Share
Natural Gas	566,036.76	43.65%	Waste Heat	1,288.73	0.10%
Coal	207,573.37	16.01%	Blast Furnace Gas	890.70	0.07%
Wind	151,007.37	11.64%	Biomass Gases	517.39	0.04%
Nuclear	103,269.37	7.96%	Jet Fuel	390.34	0.03%
Hydro	101,513.74	7.83%	Purchased steam	383.60	0.03%
Solar	100,529.42	7.75%	Other	285.64	0.02%
Distillate Fuel Oil	22,882.83	1.76%	Agriculture Byproduct	283.90	0.02%
Residual Fuel Oil	15,619.20	1.20%	Biomass Liquids	193.29	0.01%
Wood/Wood Waste Solids	4,838.06	0.37%	Biomass Solids	140.16	0.01%
Wood Waste Liquids	4,387.65	0.34%	Waste Oil and Other Oil	132.11	0.01%
Geothermal	4,123.49	0.32%	Liquified Natural Gas	50.63	0.00%
Waste	2,542.94	0.20%	Liquified Propane Gas	21.00	0.00%
Petroleum Coke	2,412.70	0.19%	Biomass Other	16.40	0.00%
Landfill Gas	2,196.75	0.17%	Refuse	15.40	0.00%
Kerosene	1,904.40	0.15%	Propane	3.43	0.00%
Other Gas	1,425.15	0.11%	Total	1,296,875.89	

Table 1.2 shows how America's current generation capacity is distributed throughout different regions of the U.S. These regions include both current and former defined regions of the North American Electric Reliability Corporation, as well as U.S. territories, in accordance with how the Energy Information Administration collects and reports this information.

Table 1.2
2023 Current Electricity Generation Capacity, by Region

Region	MW	Share
SERC	378,524.53	29.19%
WECC	254,227.85	19.60%
RFC	246,516.22	19.01%
ERCOT	144,901.62	11.17%
SPP	87,115.08	6.72%
NPCC	85,964.13	6.63%
MRO	84,824.81	6.54%
U.S. Territories	8,111.92	0.63%
HCC	3,420.03	0.26%
ASCC	3,269.71	0.25%
Total	1,296,875.89	

REGIONS

(see map in Appendix 1)

ASCC: Alaska Systems Coordinating Council

ERCOT: Electric Reliability Council of Texas

FRCC: Florida Reliability Coordinating Council

HCC: Hawaii Coordinating Council

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

U.S. territories: These areas are not a part of NERC, but are included in the total electricity generation, including Puerto Rico, American Samoa, Guam, and the Virgin Islands.

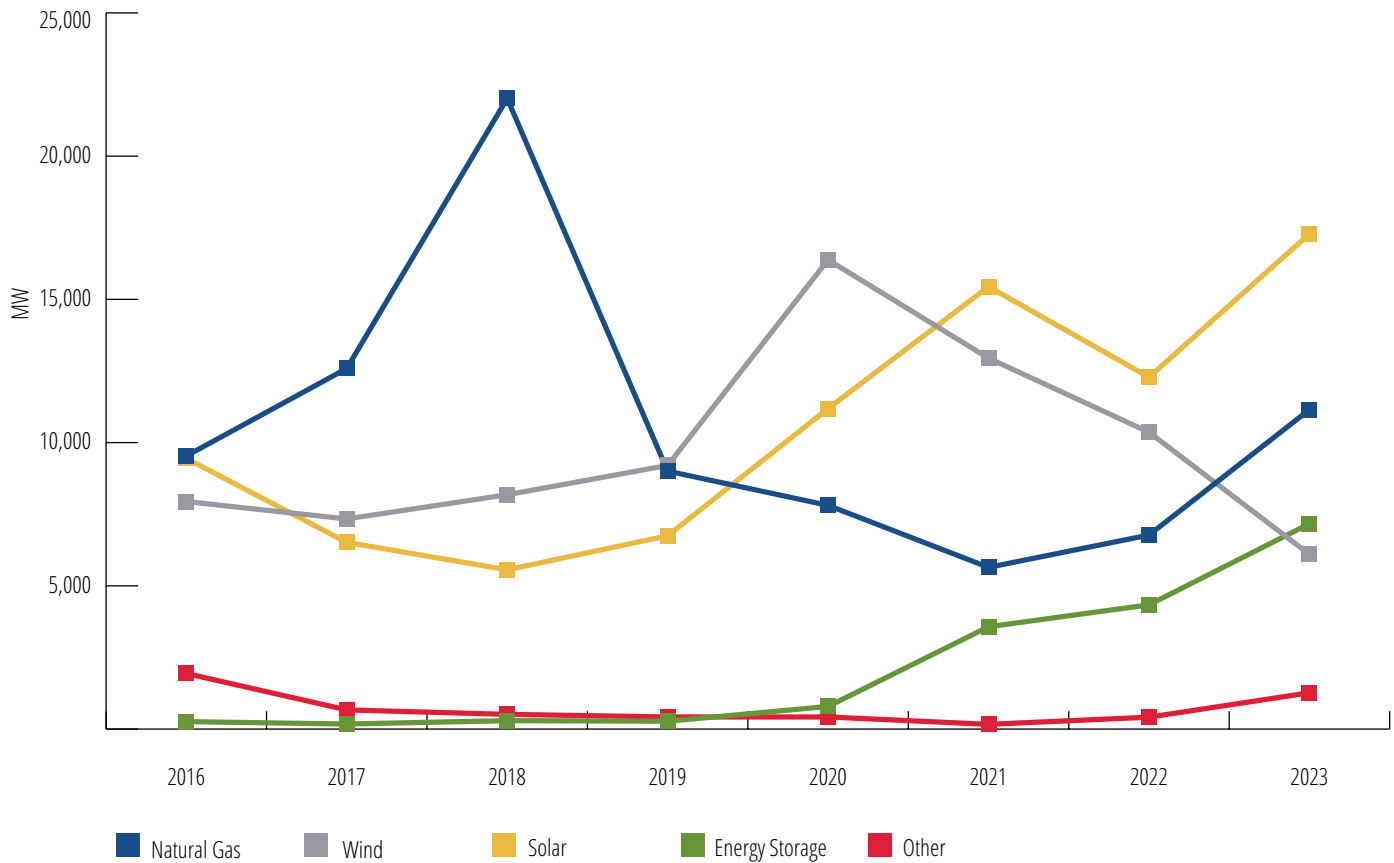


Table 1.3 shows the utility-scale capacity additions from 2016-2023. More than 97% of the 253,262 MW in additions were from natural gas, wind, and solar facilities.

Table 1.3
Generation Capacity Additions by Fuel Type, 2016-2023

Fuel Type	MW	Share
Natural Gas	84,517.11	33.37%
Solar	84,477.42	33.36%
Wind	78,449.69	30.98%
Nuclear	2,386.90	0.94%
Hydro	1,068.06	0.42%
Distillate Fuel Oil	712.05	0.28%
Geothermal	517.30	0.20%
Wood/Wood Waste Solids	411.36	0.16%
Landfill Gas	124.60	0.05%
Biomass Gases	114.55	0.05%
Waste Heat	105.60	0.04%
Wood Waste Liquids	75.00	0.03%
Blast Furnace Gas	70.00	0.03%
Liquefied Natural Gas	50.63	0.02%
Biomass Liquids	50.00	0.02%
Other	36.40	0.01%
Other Gas	23.95	0.01%
Liquefied Propane Gas	21.00	0.01%
Waste	20.29	0.01%
Coal	17.00	0.01%
Biomass Other	5.74	0.00%
Biomass Solids	4.30	0.00%
Propane	1.80	0.00%
Jet Fuel	1.30	0.00%
Total	253,262.05	

Figure 1.1 Capacity Additions by Year, 2016-2023



Note: This table uses the most up-to-date data from Hitachi Energy Velocity Suite database and therefore capacity in MW may change slightly from year to year when the database is updated.

Figure 1.1 shows the capacity additions by fuel type from 2016-2023.

Between 2016 and 2019, natural gas was the leading resource for capacity additions. In 2020, more solar and wind capacity came online than natural gas. Since 2021, more solar capacity has come online than any other energy source. New natural gas capacity significantly increased in the past year, while the amount of wind brought online decreased.

Table 1.4 shows the fuel types of the 35,804 MW of generation capacity that began operating in 2023, including 7,168 MW of additional energy storage. Over 8,000 more MW were brought online in 2023 than were brought online in 2022, with notable increases in solar and natural gas capacity, as well as wind and nuclear to a lesser extent. Wind and solar make up nearly two-thirds of the new capacity. Solar continues to make up an ever-increasing share of new generation capacity. However, wind makes up a significant percent less of the new capacity brought online in 2023 than in 2022. Natural gas makes up 31% of the new capacity.

**Table 1.4
Generation Capacity Additions by Fuel Type, 2023**

Fuel Type	MW	Share
Solar	17,286.47	48.28%
Natural Gas	11,150.10	31.14%
Wind	6,100.21	17.04%
Nuclear	1,100.00	3.07%
Geothermal	40.50	0.11%
Distillate Fuel Oil	36.70	0.10%
Waste Heat	31.00	0.09%
Wood/Wood Waste Solids	28.80	0.08%
Hydro	24.40	0.07%
Landfill Gas	2.90	0.01%
Biomass Gases	2.80	0.01%
Total	35,803.87	

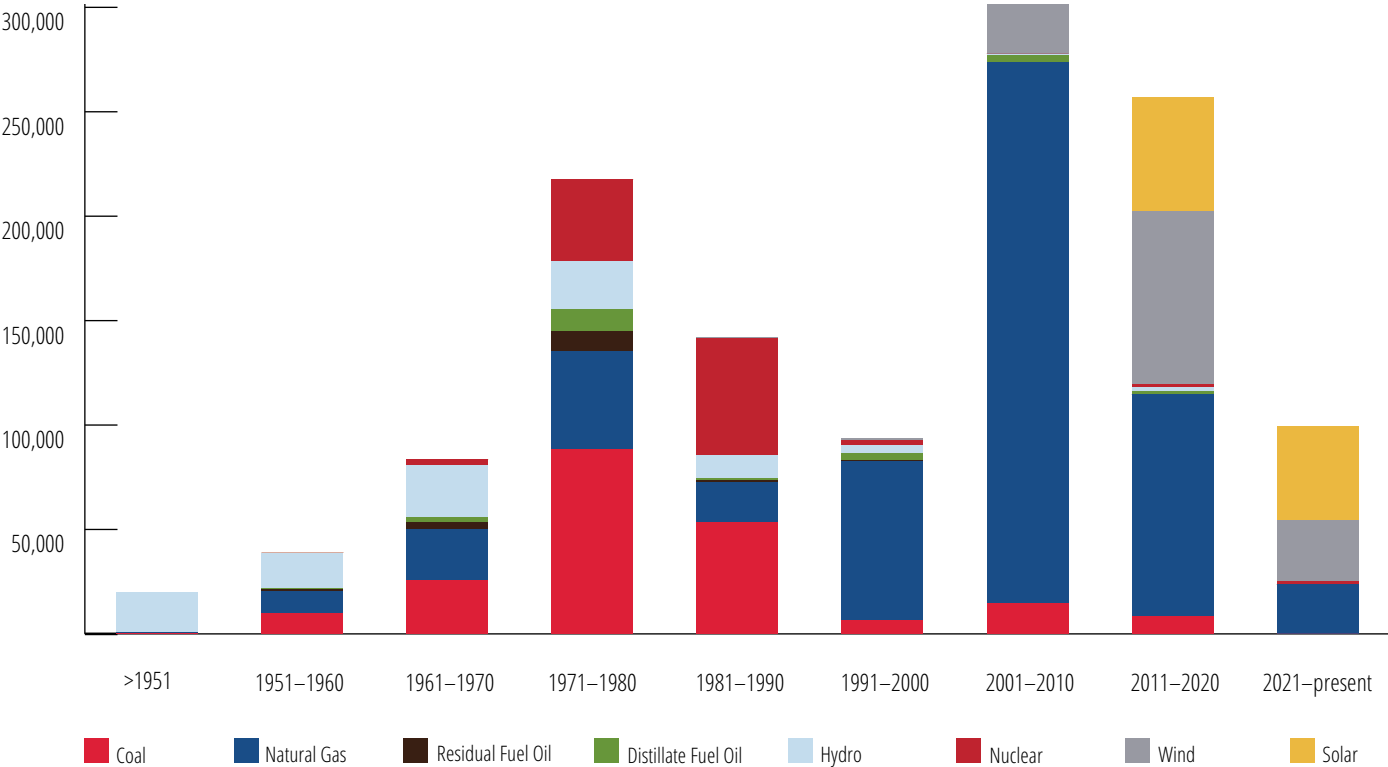
Table 1.5 shows the 45,284 MW of capacity under preparation, testing, and construction and that are scheduled to come online in 2024. Additionally, 11,668 MW of energy storage are scheduled to come online in 2024. The largest share of capacity slated to come online in 2024 is from solar facilities (77%), which is a 20% increase in the share of solar capacity additions compared to the share that was scheduled to come online in 2023. Natural gas and wind capacity make up 20% of projected new capacity in 2024.

Figure 1.2 shows the age of generation capacity facilities by fuel type. Most hydro and coal facilities are at least 40 years old, having come online by 1980. Almost all domestic nuclear capacity became operational between 1969-1990. While natural gas capacity dates to the 1950s, the bulk of natural gas capacity is less than 25 years old. Most solar and wind capacity came online since 2011.

Table 1.5
Projected Generation Capacity Additions, 2024

Fuel Type	MW	Share
Solar	34,867.75	77.00%
Wind	5,658.18	12.49%
Natural Gas	3,500.15	7.73%
Nuclear	1,100.00	2.43%
Biomass Solids	36.00	0.08%
Waste Heat	28.60	0.06%
Biomass Gases	23.00	0.05%
Other	22.80	0.05%
Hydro	22.46	0.05%
Distillate Fuel Oil	20.10	0.04%
Landfill Gas	3.00	0.01%
Biomass Other	2.00	0.00%
Other Gas	0.30	0.00%
Total	45,284.34	

Figure 1.2
Age of Electric Generation Facilities, by Type



2. FUTURE GENERATION CAPACITY BY DEVELOPMENT STAGE

Tables 2.1–2.4 show the fuel makeup of generation capacity under construction, permitted, with an application pending, or proposed.

Table 2.1 shows the sources for the 65,897 MW of generation capacity under site preparation, testing, and construction. Wind and solar account for more than three-quarters of the capacity under construction, with natural gas making up nearly all the rest. Solar makes up 10% more of the fuel share than it did in 2022, and nearly 10,000 MW more solar facilities are under construction in 2023 than were in this phase last year. Approximately half the amount of natural gas is under construction in 2023 compared to the capacity under construction in 2022.

Table 2.1
Plants Under Construction, by Fuel Type

Fuel Type	MW	Share
Solar	43,060.63	65.34%
Wind	14,136.68	21.45%
Natural Gas	6,118.65	9.29%
Nuclear	1,100.00	1.67%
Other Gas	700.30	1.06%
Geothermal	400.00	0.61%
Distillate Fuel Oil	218.10	0.33%
Biomass Solids	51.00	0.08%
Hydro	32.72	0.05%
Waste Heat	28.60	0.04%
Biomass Gases	23.00	0.03%
Other	22.80	0.03%
Landfill Gas	3.00	0.00%
Biomass Other	2.00	0.00%
Total	65,897.48	

Table 2.2 shows the fuel makeup for plants that have received permits but have not yet started construction. Solar is the leading resource choice for permitted plants, accounting for more than two-thirds of the 66,620 MW of permitted capacity. Wind and natural gas account for another 29% of capacity in this category.

Table 2.2
Permitted Plants, by Fuel Type

Fuel Type	MW	Share
Solar	45,123.79	67.73%
Wind	11,563.87	17.36%
Natural Gas	6,440.08	9.67%
Hydro	2,862.45	4.30%
Nuclear	360.00	0.54%
Geothermal	180.00	0.27%
Agriculture Byproduct	49.90	0.07%
Wood/Wood Waste Solids	40.00	0.06%
Total	66,620.09	

Table 2.3 shows the fuel mix for the 61,416 MW of capacity awaiting approval of applications. Solar makes up a majority of the capacity in this category, with wind accounting for another fifth.

Table 2.3
Plants Pending Application, by Fuel Type

Fuel Type	MW	Share
Solar	40,107.23	65.30%
Wind	12,258.80	19.96%
Hydro	4,554.28	7.42%
Natural Gas	4,455.42	7.25%
Geothermal	40.00	0.07%
Total	61,415.73	

Figure 2.1
Share of Fuel Type by Stage of Development

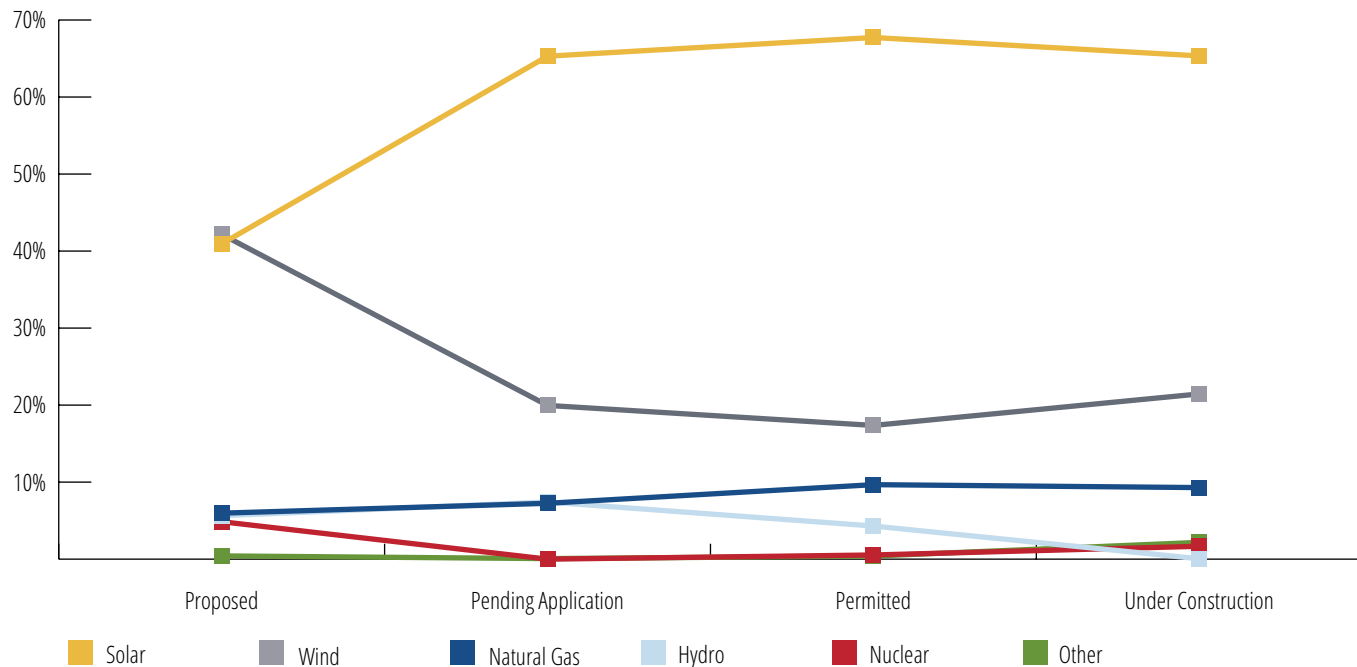


Table 2.4 shows the resource mix for the 273,958 MW of capacity in the proposal stage. This is the earliest and most uncertain stage of development and includes units that are least likely to be built. Over 115,000 MW — 42% — of the proposed capacity is wind, followed by over 112,000 MW of solar.

Table 2.4
Proposed Plants, by Fuel Type

Fuel Type	MW	Share
Wind	115,519.39	42.17%
Solar	112,156.62	40.94%
Natural Gas	16,358.98	5.97%
Hydro	15,444.25	5.64%
Nuclear	13,307.40	4.86%
Residual Fuel Oil	632.40	0.23%
Other Gas	300.00	0.11%
Geothermal	100.32	0.04%
Waste Heat	82.75	0.03%
Other	27.58	0.01%
Biomass Gases	12.00	0.00%
Landfill Gas	6.40	0.00%
Biomass Other	5.93	0.00%
Wood/Wood Waste Solids	2.95	0.00%
Distillate Fuel Oil	1.10	0.00%
Total	273,958.07	

Figure 2.1 tracks the major fuel sources in each stage of development. This chart shows that past the proposal process, solar dominates the share of new capacity. The share of wind capacity falls during the proposal to permitting process.

Table 2.5 shows the total energy storage capacity (for projects 1 MW or more) by development stage. Energy storage is getting added alongside — and standalone from — these capacity projects. These totals do not include pumped hydro systems.

Table 2.5
Energy Storage by Development Stage

Development Stage	MW
Under Construction	11,914.04
Permitted Plants	16,234.17
Pending Application	29,408.99
Proposed	58,622.99
Total	116,180.19

3. FUTURE GENERATION CAPACITY BY REGION

Tables 3.1–3.4 show new plants that are under construction or planned for construction in each region (See Appendix 1 for definition of regions and included states).

Table 3.1 shows that WECC and SERC account for a majority (56%) of the capacity under construction, while another 35% are in RFC and ERCOT. There is nearly 7,000 MW more capacity that is under construction in WECC in 2023 compared to what was under construction in that region in 2022.

Table 3.1
Plants Under Construction, by Region

Region	MW	Share
WECC	20,239.80	30.71%
SERC	16,587.55	25.17%
ERCOT	13,560.08	20.58%
RFC	9,873.16	14.98%
NPCC	2,734.18	4.15%
MRO	1,420.02	2.15%
SPP	976.90	1.48%
HCC	279.50	0.42%
U.S. Territories	226.30	0.34%

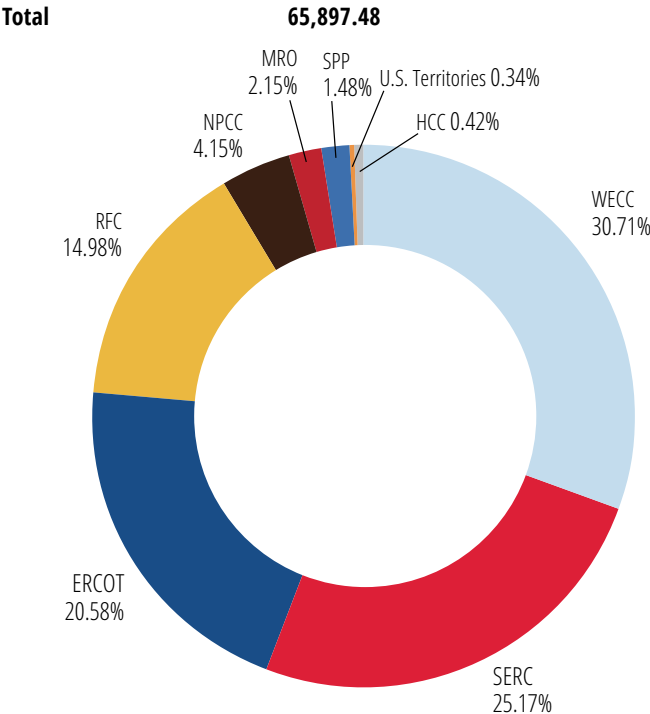
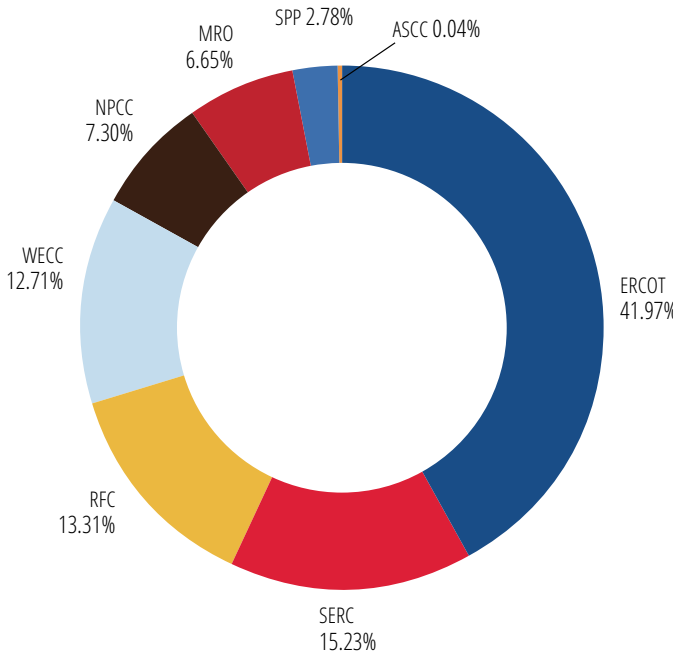


Table 3.2 shows ERCOT has the most capacity permitted, followed by SERC, RFC, and WECC.

Table 3.2
Permitted Plants, by Region

Region	MW	Share
ERCOT	27,962.18	41.97%
SERC	10,144.72	15.23%
RFC	8,869.38	13.31%
WECC	8,469.50	12.71%
NPCC	4,862.60	7.30%
MRO	4,432.25	6.65%
SPP	1,850.07	2.78%
ASCC	29.40	0.04%
Total	66,620.09	



Tables 3.3 and 3.4 show plants in the pending application and proposed categories. ERCOT has a plurality of the capacity in the pending application stage (49%), while NPCC has the largest share of capacity in the proposed stage (36%).

Table 3.3
Plants Pending Application, by Region

Region	MW	Share
ERCOT	30,018.78	48.88%
WECC	14,157.55	23.05%
MRO	4,745.25	7.73%
SERC	4,667.61	7.60%
RFC	4,619.84	7.52%
NPCC	1,962.90	3.20%
SPP	1,224.00	1.99%
ASCC	19.80	0.03%
Total	61,415.73	

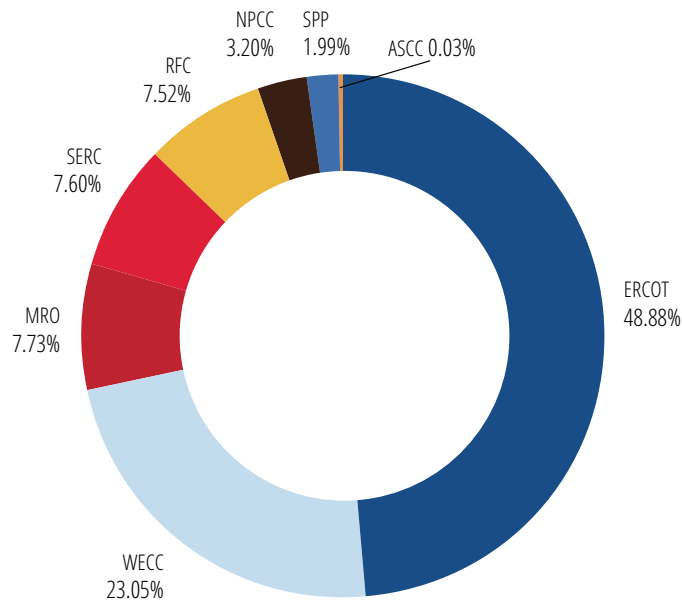
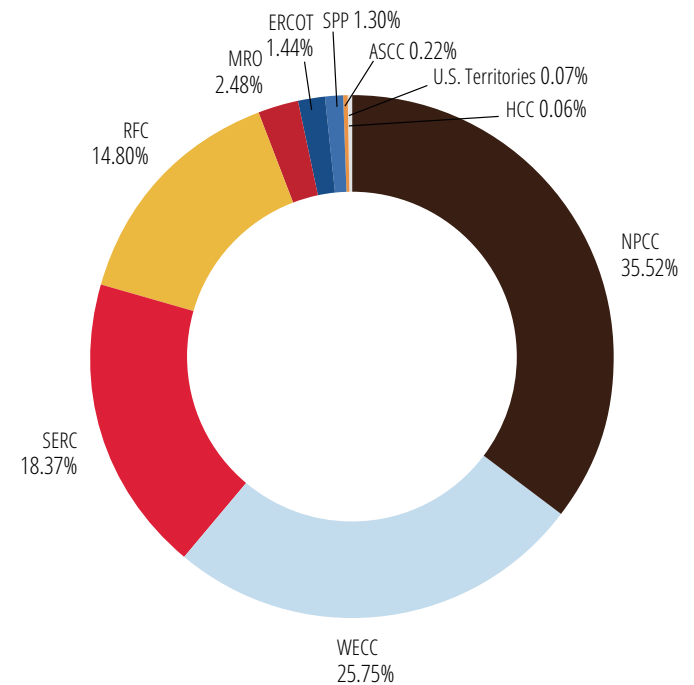


Table 3.4
Proposed Plants, by Region

Region	MW	Share
NPCC	97,306.27	35.52%
WECC	70,539.32	25.75%
SERC	50,320.25	18.37%
RFC	40,549.67	14.80%
MRO	6,790.03	2.48%
ERCOT	3,932.79	1.44%
SPP	3,560.10	1.30%
ASCC	608.50	0.22%
U.S. Territories	200.00	0.07%
HCC	151.14	0.06%
Total	273,958.07	



REGIONS

(see map in Appendix 1)

ASCC: Alaska Systems Coordinating Council

ERCOT: Electric Reliability Council of Texas

FRCC: Florida Reliability Coordinating Council

HCC: Hawaii Coordinating Council

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

U.S. territories: These areas are not a part of NERC, but are included in the total electricity generation, including Puerto Rico, American Samoa, Guam, and the Virgin Islands.

Table 3.5
New Capacity Compared to Current Generation, by Region

Sorted by under construction

Region	Under Construction		Permitted Plants		Pending Application		Proposed		2023 U.S. Generation	
	MW	Share	MW	Share	MW	Share	MW	Share	MWh (in millions)	Share
WECC	20,240	31%	8,470	13%	14,158	23%	70,539	26%	565	16%
SERC	16,588	25%	10,145	15%	4,668	8%	50,320	18%	1,135	33%
ERCOT	13,560	20%	27,962	42%	30,019	49%	3,933	1%	398	11%
RFC	9,873	15%	8,869	13%	4,620	8%	40,550	15%	790	23%
NPCC	2,734	4%	4,863	7%	1,963	3%	97,306	36%	185	5%
MRO	1,420	2%	4,432	7%	4,745	8%	6,790	2%	186	5%
SPP	977	1%	1,850	3%	1,224	2%	3,560	1%	192	6%
HCC	280	0%	—	—	—	—	151	0%	7	0%
ASCC	—	—	29	0%	20	0%	608	0%	1	0%
U.S. Territories	226	0%	—	—	—	—	200	0%	16	0%

2022 Generation Source: Hitachi Velocity Suite Database, accessed February 2024. Only Includes states and Puerto Rico.

Table 3.5 shows the share of future generation capacity by region compared with actual generation in 2023. SERC, which generates a third of electricity in the U.S., has a quarter of the share of plants under construction. WECC, which generates 16% of electricity in the U.S., has the largest share of plants under construction.

Tables 3.6 and 3.7 show the fuels of choice for proposed capacity by development stage.

As shown in Table 3.6, for plants most likely to be built — those already under construction or permitted — solar, wind, and natural gas account for over 95% of this capacity. Solar makes up nearly two-thirds of this capacity. Nearly 5,000 MW more of capacity was permitted or under construction in 2023 compared to 2022.

Table 3.6
Permitted Plants and Plants Under Construction, by Fuel Type

Fuel Type	MW	Share
Solar	88,184.42	66.55%
Wind	25,700.55	19.39%
Natural Gas	12,558.73	9.48%
Hydro	2,895.17	2.18%
Nuclear	1,460.00	1.10%
Other Gas	700.30	0.53%
Geothermal	580.00	0.44%
Distillate Fuel Oil	218.10	0.16%
Biomass Solids	51.00	0.04%
Agriculture Byproduct	49.90	0.04%
Wood/Wood Waste Solids	40.00	0.03%
Waste Heat	28.60	0.02%
Biomass Gases	23.00	0.02%
Other	22.80	0.02%
Landfill Gas	3.00	0.00%
Biomass Other	2.00	0.00%
Total	132,517.58	

Nearly
5,000 MW
more was permitted or
under construction in 2023
compared to 2022



Table 3.7
Plants Pending Application and Proposed, by Fuel Type

Fuel Type	MW	Share
Solar	152,263.85	45.40%
Wind	127,778.19	38.10%
Natural Gas	20,814.40	6.21%
Hydro	19,998.53	5.96%
Nuclear	13,307.40	3.97%
Residual Fuel Oil	632.40	0.19%
Other Gas	300.00	0.09%
Geothermal	140.32	0.04%
Waste Heat	82.75	0.02%
Other	27.58	0.01%
Biomass Gases	12.00	0.00%
Landfill Gas	6.40	0.00%
Biomass Other	5.93	0.00%
Wood/Wood Waste Solids	2.95	0.00%
Distillate Fuel Oil	1.10	0.00%
Total	335,373.79	

Four regions — ERCOT, WECC, SERC, and RFC — together account for approximately 87% of the capacity under construction and permitted. Solar is the leading resource in all four regions, followed by wind in SERC and WECC and natural gas in ERCOT and RFC. A 41% plurality of all new wind capacity and a 91% majority of new hydropower under construction or permitted is in WECC.

As seen in Table 3.7, solar is the leading resource for proposed and pending application capacity, with wind making up most of the remaining capacity.

For the fourth consecutive year, a renewable resource is the leading resource in every region in this category. Solar is the leading resource proposed or pending application in ERCOT, HCC, RFC, SERC, SPP, WECC, and in Puerto Rico. Wind is the primary resource in MRO and NPCC, and hydro is the primary resource proposed or pending application in ASCC. A 42% plurality of all proposed natural gas is in SERC, and a majority (61%) of the wind capacity that is proposed and pending is in NPCC.

4. FUTURE GENERATION CAPACITY BY OWNERSHIP TYPE

Tables 4.1–4.4 summarize the future generation capacity based on ownership. Non-utility generators account for most of the capacity in all four categories. Non-utility generators have over 11,000 MW more capacity under construction than they had in 2022.

Table 4.1
Plants Under Construction, by Owner Type

Owner Type	MW	Share
Non-utility generators	56,878.53	86.31%
Investor-owned utilities	6,685.65	10.15%
Public power	1,446.80	2.20%
Federal	556.50	0.84%
Cooperatives	330.00	0.00%
Total	65,897.48	

Table 4.2
Permitted Plants, by Owner Type

Owner Type	MW	Share
Non-utility generators	60,918.44	91.44%
Investor-owned utilities	5,130.50	7.70%
Federal	360.00	0.54%
Public power	128.35	0.19%
Cooperatives	82.80	0.12%
Total	66,620.09	

Non-utility generators own the majority of plants that are permitted and under construction. Most of the capacity from non-utility generators that is permitted or under construction is for solar (71%). Investor-owned utilities have a 42% plurality of solar capacity permitted or under construction. Natural gas is the leading resource that federal owners and public power have permitted or under construction.

Table 4.3
Plants Pending Application, by Owner Type

Owner Type	MW	Share
Non-utility generators	59,278.83	96.52%
Investor-owned utilities	1,086.10	1.77%
Cooperatives	857.80	1.40%
Public power	193.00	0.31%
Total	61,415.73	

Table 4.4
Proposed Plants, by Owner Type

Owner Type	MW	Share
Non-utility generators	250,742.10	91.53%
Investor-owned utilities	12,173.85	4.44%
Federal	6,461.98	2.36%
Public power	4,270.14	1.56%
Cooperatives	310.00	0.11%
Total	273,958.07	

Additionally, non-utility generators have the overwhelming majority of capacity that is proposed or pending application. Over 88% of the proposed and pending capacity from non-utility generators is for wind and solar. Prior to the passage of the Inflation Reduction Act in 2022, non-profit utilities (including public power and cooperatives) were not eligible for energy tax credits for wind and solar facilities. This limitation influenced public power ownership of renewable energy resources. Public power utilities procure most of their wind and solar energy supply through power purchase agreements (usually with non-utility generators) rather than direct ownership. Nuclear is the top resource investor-owned utilities have that is proposed or pending, and natural gas is the top resource proposed or pending for federal, public power, and cooperative utilities.

5. FUTURE GENERATION CAPACITY BY REGIONAL TRANSMISSION ORGANIZATION

Tables 5.1–5.4 show future generation capacity by regional transmission organization (RTO). A significant plurality of the capacity proposed and under construction is slated to be constructed in non-RTO regions. The Electric Reliability Council of Texas (ERCOT) is the RTO with the most capacity in the application pending and permitted stages.

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

Region	MW	Share
Non-RTO	26,563.88	40.31%
ERCOT	13,560.08	20.58%
Midcontinent ISO	11,190.32	16.98%
PJM	6,619.88	10.05%
California ISO	3,512.90	5.33%
SPP	1,769.73	2.69%
New York ISO	1,518.52	2.30%
New England ISO	1,162.18	1.76%
Total	65,897.48	

**Table 5.2
Permitted Plants, by RTO**

Region	MW	Share
ERCOT	28,553.34	42.86%
Non-RTO	11,271.07	16.92%
PJM	10,641.92	15.97%
Midcontinent ISO	8,135.64	12.21%
New York ISO	2,914.96	4.38%
California ISO	2,350.60	3.53%
SPP	1,817.16	2.73%
New England ISO	935.41	1.40%
Total	66,620.09	

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

Region	MW	Share
ERCOT	30,018.78	48.88%
Non-RTO	14,511.79	23.63%
Midcontinent ISO	5,917.06	9.63%
PJM	4,255.65	6.93%
SPP	2,550.25	4.15%
California ISO	2,203.30	3.59%
New York ISO	1,371.32	2.23%
New England ISO	587.58	0.96%
Total	61,415.73	

**Table 5.4
Proposed Plants, by RTO**

Region	MW	Share
Non-RTO	87,824.77	32.06%
New York ISO	80,495.08	29.38%
PJM	44,662.72	16.30%
Midcontinent ISO	25,522.70	9.32%
California ISO	15,856.06	5.79%
New England ISO	10,901.55	3.98%
SPP	4,942.40	1.80%
ERCOT	3,752.79	1.37%
Total	273,958.07	

6. GENERATION CAPACITY RETIREMENTS AND CANCELLATIONS

Tables 6.1 and 6.2 show generation capacity retirements by fuel type. From 2016-2023, 144,389 MW of capacity was retired. Following trends over the past few years, over half of this capacity was from coal-fired plants, and over a quarter was in natural gas.

Table 6.1
Retired Plants by Fuel Type, 2016-2023

Fuel Type	MW	Share
Coal	86,721.30	60.1%
Natural Gas	36,359.58	25.2%
Nuclear	6,696.68	4.6%
Residual Fuel Oil	5,098.50	3.5%
Distillate Fuel Oil	3,651.23	2.5%
Wind	1,368.98	0.9%
Wood/Wood Waste Solids	753.35	0.5%
Landfill Gas	602.50	0.4%
Hydro	539.35	0.4%
Wood Waste Liquids	385.00	0.3%
Petroleum Coke	364.50	0.3%
Solar	327.70	0.2%
Geothermal	286.00	0.2%
Waste	254.70	0.2%
Kerosene	234.70	0.2%
Waste Heat	138.60	0.1%
Agriculture Byproduct	130.20	0.1%
Biomass Solids	120.80	0.1%
Purchased Steam	110.40	0.1%
Jet Fuel	81.70	0.1%
Other Gas	74.25	0.1%
Biomass Gases	43.68	0.0%
Blast Furnace Gas	35.00	0.0%
Waste Oil and Other Oil	10.20	0.0%
Total	144,388.88	

Nearly double the amount of natural gas was retired in 2023 compared to what was retired in 2022.

Table 6.2
Retired Plants by Fuel Type, 2023

Fuel Type	MW	Share
Coal	10,250.40	65.2%
Natural Gas	3,972.30	25.3%
Residual Fuel Oil	882.00	5.6%
Kerosene	167.20	1.1%
Wood Waste Liquids	144.00	0.9%
Wind	95.32	0.6%
Distillate Fuel Oil	57.50	0.4%
Blast Furnace Gas	35.00	0.2%
Hydro	34.10	0.2%
Landfill Gas	30.95	0.2%
Waste Heat	27.30	0.2%
Wood/Wood Waste Solids	13.00	0.1%
Solar	2.90	0.0%
Total	15,722.16	

Table 6.3 reflects planned retirements that have been publicly announced over the next 5 years. Nearly 78,000 MW of current operating capacity is scheduled to retire by 2028, over 70% which is coal-fired, and just under a quarter is natural gas. Over a third of retirements planned by 2028 are in the SERC region, followed by over a quarter that are planned in the RFC region. Nearly half (48%) of retirements in the next five years are among investor-owned utility plants. Nearly 11% are among public power utility plants.

Table 6.3
Planned Retirements to 2028, by Fuel Type

Fuel Type	MW	Share
Coal	56,045.90	71.87%
Natural Gas	18,723.60	24.01%
Residual Fuel Oil	1,724.70	2.21%
Distillate Fuel Oil	772.20	0.99%
Wood/Wood Waste Solids	213.10	0.27%
Wind	139.99	0.18%
Landfill Gas	131.00	0.17%
Waste	108.00	0.14%
Kerosene	75.60	0.10%
Hydro	34.73	0.04%
Solar	13.00	0.02%
Biomass Gases	2.80	0.00%
Total	77,984.61	

As shown in Table 6.4, 36,433 MW of planned capacity additions were canceled in 2023. Solar projects account for nearly half of the canceled capacity.

Table 6.4
Plant Cancellations, 2023

Fuel Type	MW	Share
Solar	17,269.42	47.40%
Wind	9,621.61	26.41%
Natural Gas	7,864.40	21.59%
Hydro	1,231.55	3.38%
Nuclear	300.00	0.82%
Coal	77.00	0.21%
Geothermal	34.70	0.10%
Distillate Fuel Oil	26.97	0.07%
Landfill Gas	6.14	0.02%
Biomass Other	0.98	0.00%
Total	36,432.77	

Since 2016, over 340,000 MW of planned capacity additions were ultimately canceled, well above the capacity that was added. Wind, natural gas, and solar each make up over a quarter of the canceled capacity.

Table 6.5
Plant Cancellations, 2016-2023

Fuel Type	MW	Share
Wind	100,753.33	29.6%
Natural Gas	95,619.75	28.1%
Solar	88,882.68	26.1%
Hydro	19,924.17	5.9%
Nuclear	18,080.00	5.3%
Coal	9,777.00	2.9%
Geothermal	2,170.10	0.6%
Petroleum Coke	1,196.00	0.4%
Wood/Wood Waste Solids	1,058.58	0.3%
Waste	1,042.60	0.3%
Blast Furnace Gas	500.00	0.1%
Landfill Gas	204.10	0.1%
Biomass Solids	193.03	0.1%
Other Gas	190.50	0.1%
Agriculture Byproduct	93.70	0.0%
Biomass Gases	85.70	0.0%
Distillate Fuel Oil	79.23	0.0%
Waste Heat	65.84	0.0%
Jet Fuel	60.00	0.0%
Biomass Other	58.06	0.0%
Other	45.79	0.0%
Biomass Liquids	19.00	0.0%
Total	340,099.15	

Figure 6.1
Additions, Cancellations, and Retirements, 2016-2023

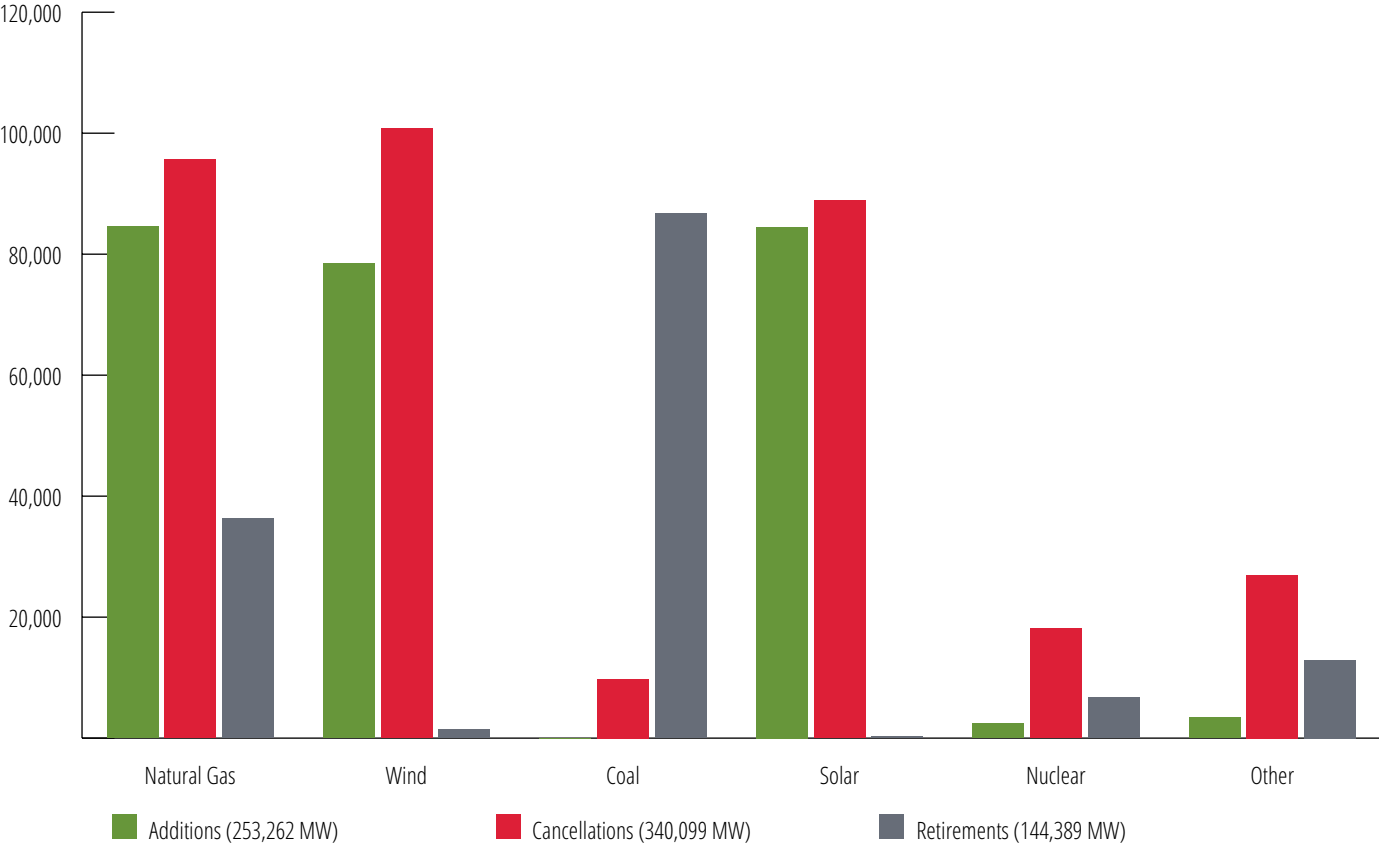


Figure 6.1 shows additions, cancellations, and retirements from 2016 to 2023. While additions exceeded retirements, cancellations far exceeded additions. Most cancellations are in wind, solar, and natural gas capacity.

Figure 6.2
Additions and Retirements, 2016-2023, plus Planned Retirements to 2028

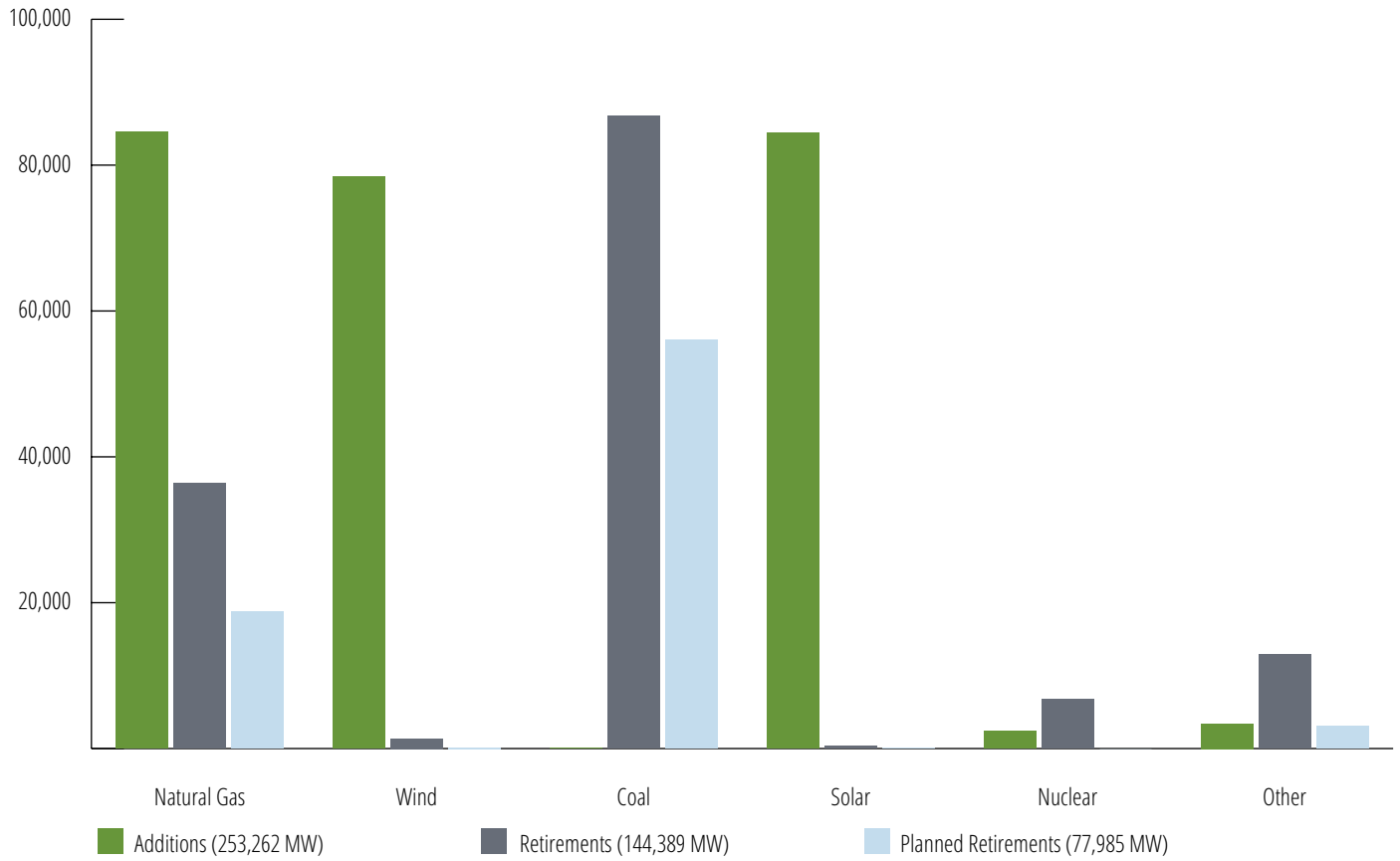
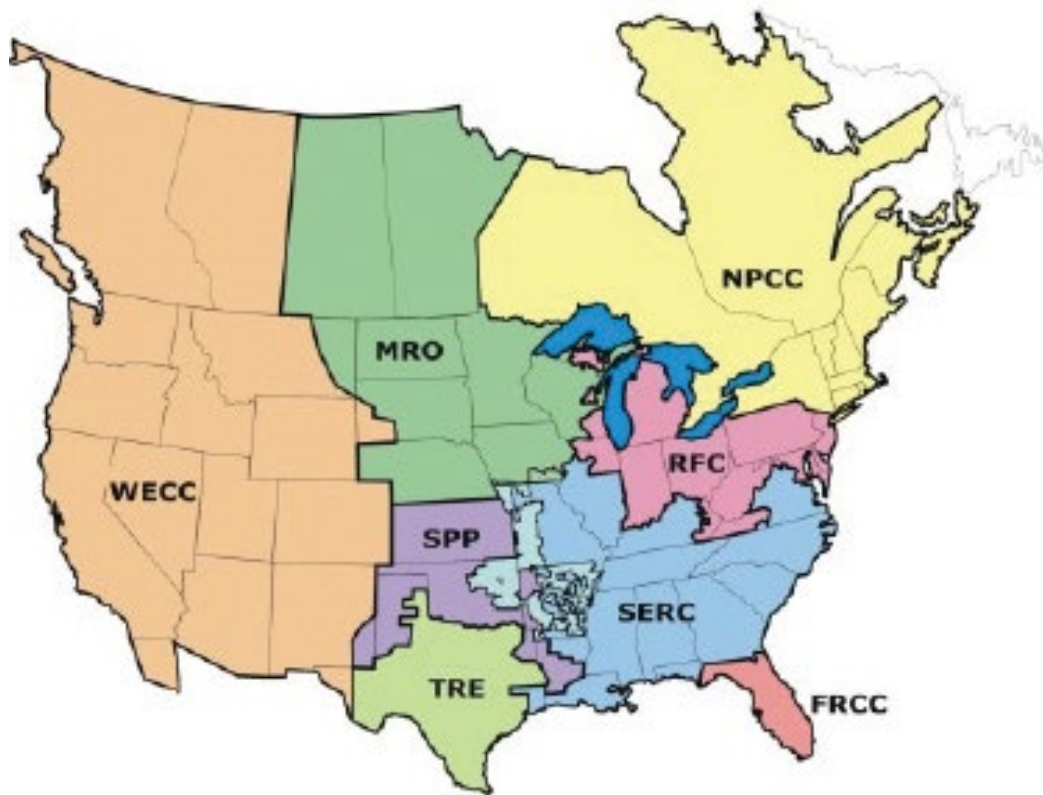


Figure 6.2 shows additions and retirements from 2016-2023 as well as planned retirements to 2028. Additions make up for more than both current as well as planned retirements.

APPENDIX 1. REGIONAL DEFINITIONS



The regions in this report align with the following current and former regions as 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.

U.S. Territories: These areas are not a part of NERC, but are included in the total electricity generation, including Puerto Rico, American Samoa, Guam, and the U.S. Virgin Islands

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