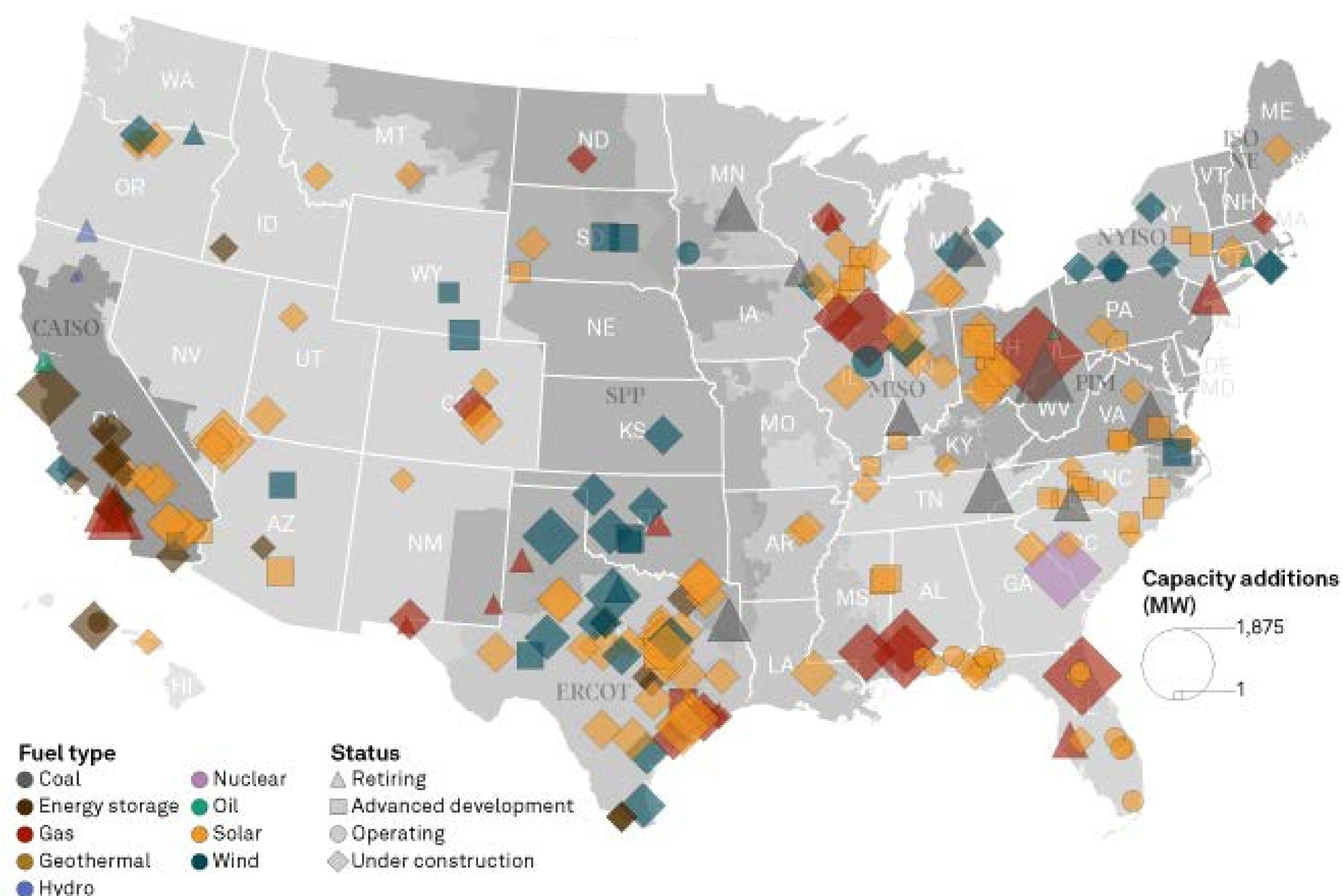


U.S. ISO Markets Outlook 2023



Much like 2022, planned US capacity additions in 2023 are expected to be dominated by intermittent renewable resources, with more than 45 GW of intermittent solar generation alone planned to come online, according to an analysis of S&P Global Market Intelligence data. The analysis shows more than 12 GW of wind is planned to come online in 2023, along with over 12 GW of energy storage and nearly 10 GW of natural gas generation, for an overall addition of nearly 81 GW. More than 6 GW of US coal capacity and about 4 GW of gas-fired generation will come offline in 2023. [Read More >](#)

US 2023 Capacity additions and retirements



Data compiled March 22, 2023.
Map is limited to new build plants with at least 50 MW that are either operating, under construction or in advanced development, and plants that have received regulatory approval to retire.
Map credit: Joe Felizadio.
Source: S&P Global Market Intelligence.
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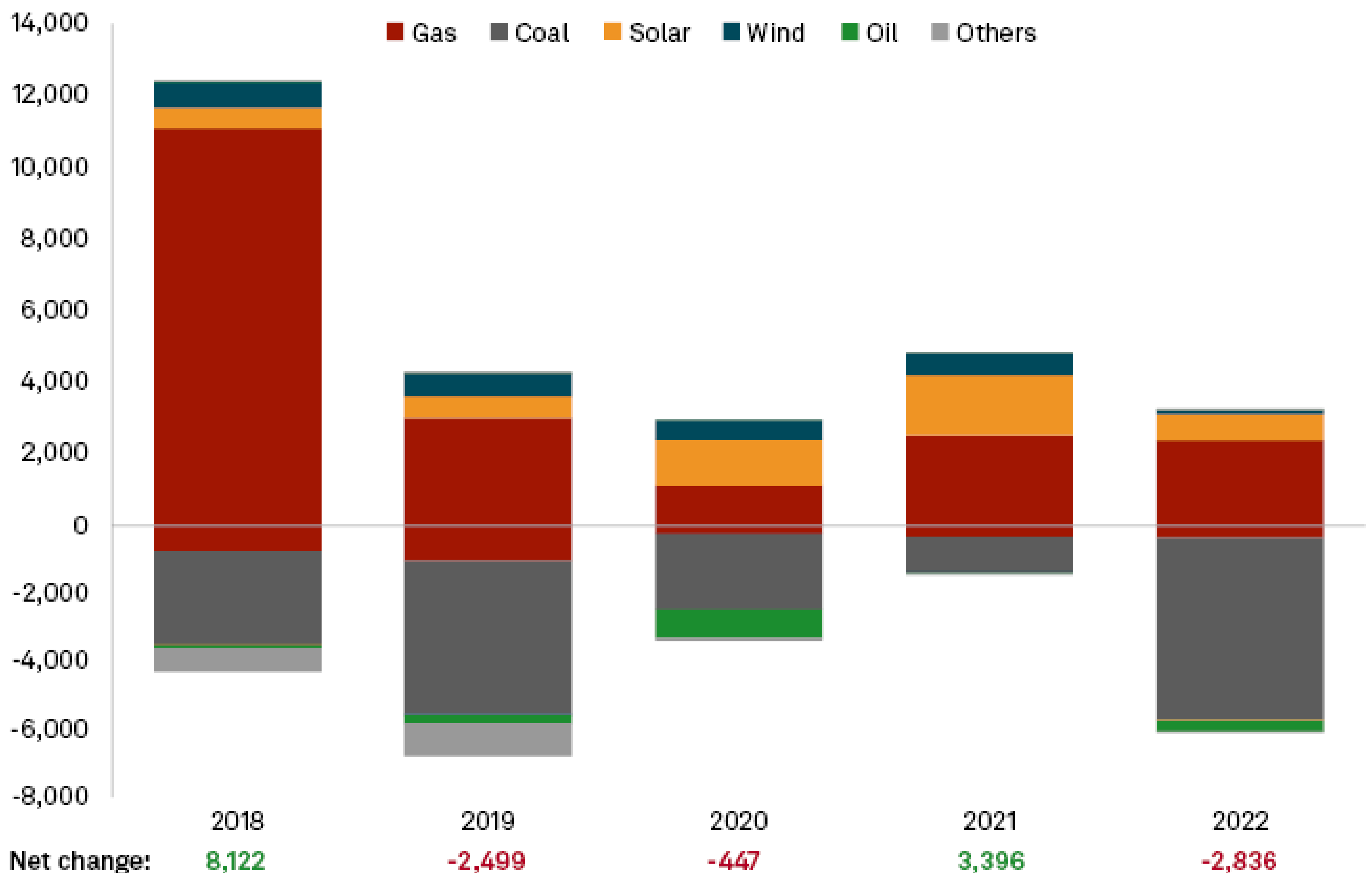
PJM

The PJM Interconnection LLC continues to deal with a backlog of renewable resources clogging up its interconnection queue, a steady pace of fossil fuel retirements and suppressed forward capacity prices. Developers plan to add more than 11 GW of capacity in 2023 across the region, which includes all or parts of 13 states and Washington, DC.

About 2,345 MW of retirements are scheduled, almost all tied to the deactivation of coal-fired power plants. In its most recent Regional Transmission Expansion Plan, PJM noted that solar made up 66% of the generation in its interconnection queue as of the end of 2022 at more than 57 GW of planned capacity. That amount equals a nameplate capacity exceeding 93 GW.

There also is more than 14 GW of storage in PJM's queue and more than 6 GW of planned wind capacity. The region's existing installed capacity totals about 185 GW, close to half of which is gas-fired resources. Over the next 15 years, PJM anticipates the integration of 105 GW of onshore wind, offshore wind, solar and energy storage. PJM has projected that more than \$3 billion in grid improvements will be needed to interconnect these resources. [Read More >](#)

PJM's historical capacity additions, retirements (MW)



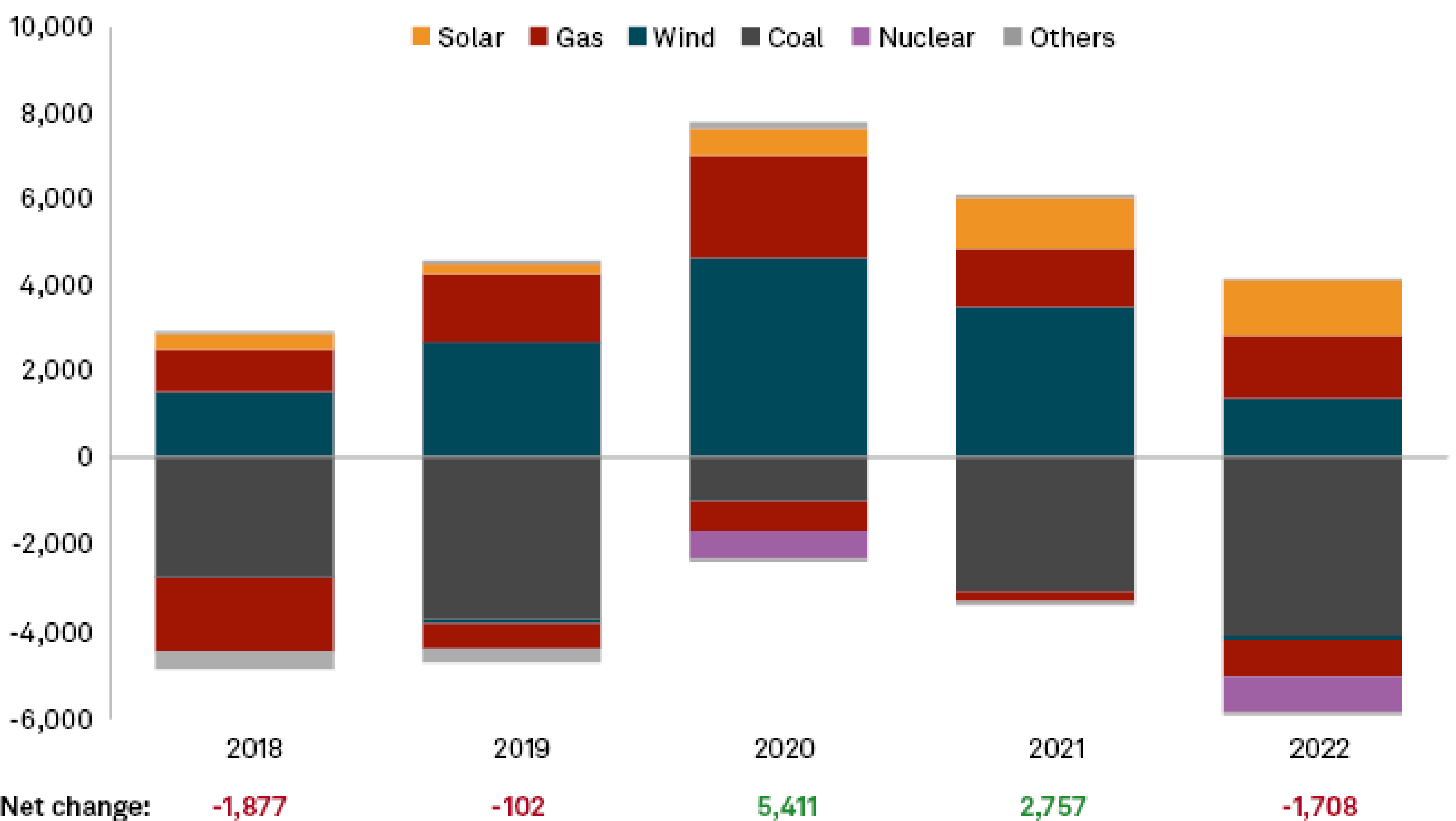
Data compiled March 22, 2023.
Others include biomass, energy storage, hydro, nuclear and other fuel types.
Source: S&P Global Market Intelligence.
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MISO

Concerns about resource adequacy in the Midcontinent ISO region remain, even though more generating capacity will be added than retired in 2023. The scheduled net addition of 8,937 MW in 2023 includes 10,890 MW of new capacity offset by 1,952 MW of retirements. Developers anticipate adding 7,410 MW of solar, 2,660 MW of wind and 815 MW of combined-cycle gas. MISO expects retirements of 1,872 MW of coal-fired generation and one gas plant totaling 80 MW. Utilities in MISO are retiring fossil capacity in exchange for investments in renewable energy resources either contracted or added to their rate base; however, those exchanges are not happening fast enough to replace all the generation coming offline, said Steve Piper, director of energy research for S&P Global Commodity Insights.

"MISO is facing resource shortfalls across this entire assessment period," the North American Electric Reliability Corp. said in December 2022 in a long-term reliability report. "Since the 2021 [Long-term Resource Assessment], 5,900 MW of generation has retired (mostly coal-fired generators) and 1,700 MW of new generation has been added. In the summer of 2023, MISO's capacity shortfall is projected to be 1,395 MW even after adding over 6.5 GW of new generation with signed interconnection agreements." MISO forecasts a decrease from its 2022 reserve margins, a decline driven mainly by lower capacity contribution from weather-dependent new generation additions replacing retiring units with higher contributions. Increasing demand projections also contribute to lower reserve margins, according to the NERC report. [Read More >](#)

MISO's historical capacity additions, retirements (MW)



Data compiled March 22, 2023.
Others includes biomass, energy storage, hydro, oil and other fuel types.
Source: S&P Global Market Intelligence.
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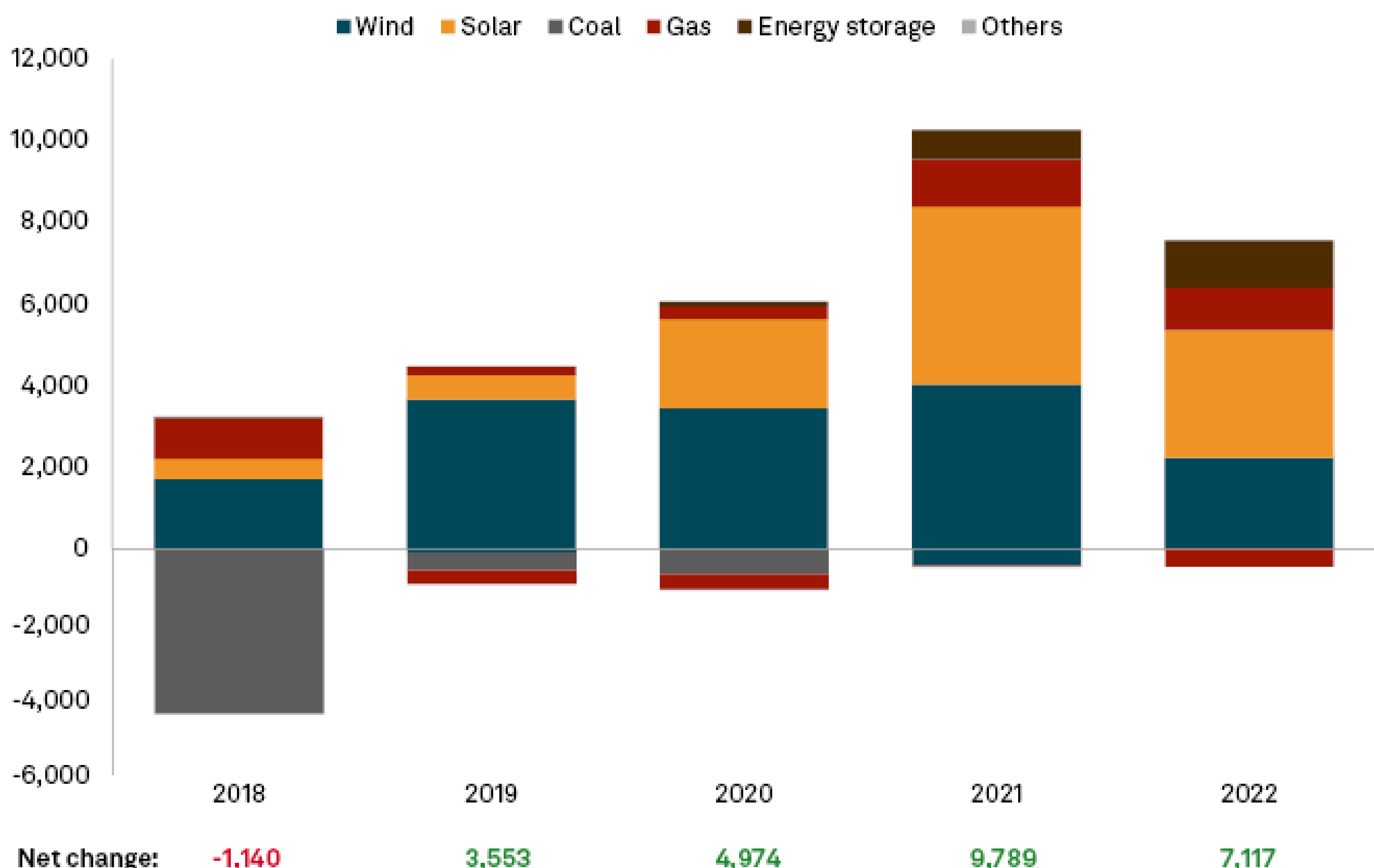
ERCOT

More electric generating capacity is scheduled to connect to Texas' main wholesale grid in 2023 than during the previous two years combined, with developers planning to energize up to 18.5 GW of mostly renewables even as state officials rewrite the rules governing Texas' prized competitive energy market to attract more thermal plants.

A deadly winter storm in February 2021 prompted regulatory and legislative efforts to shore up grid reliability, with top state officials eyeing gas-fired power plants as a solution. But the investment appetite for clean energy installations has far outpaced that for fossil fuel plants on the grid operated by the Electric Reliability Council of Texas Inc. Armed with lucrative federal tax credits, developers plan to energize up to 9.7 GW of new solar, 4.5 GW of wind and 4.1 GW of battery storage capacity in 2023. Overall, the data show that 19.5 GW is scheduled to come online 2023, including 1.1 GW of gas-fired resources. If all planned projects are completed in 2023, ERCOT's installed generating capacity will increase 15% year-over-year to 153.9 GW, according to the data. The only noted retirement is about 200 MW of wind capacity.

ERCOT is projecting summer peak demand for energy will grow 1.2% annually until 2032. ERCOT should have enough installed capacity to meet that swelling demand as energy additions are forecast to increase by 1.9% annually. ERCOT said in its spring 2023 seasonal assessment, released in March, that it will have 99,773 MW available to meet a peak demand in May of 69,921 MW, providing an operating reserve margin of nearly 30%. [Read More >](#)

ERCOT's historical capacity additions, retirements (MW)



Data compiled March 22, 2023.
Others include biomass, hydro and oil.
Source: S&P Global Market Intelligence.
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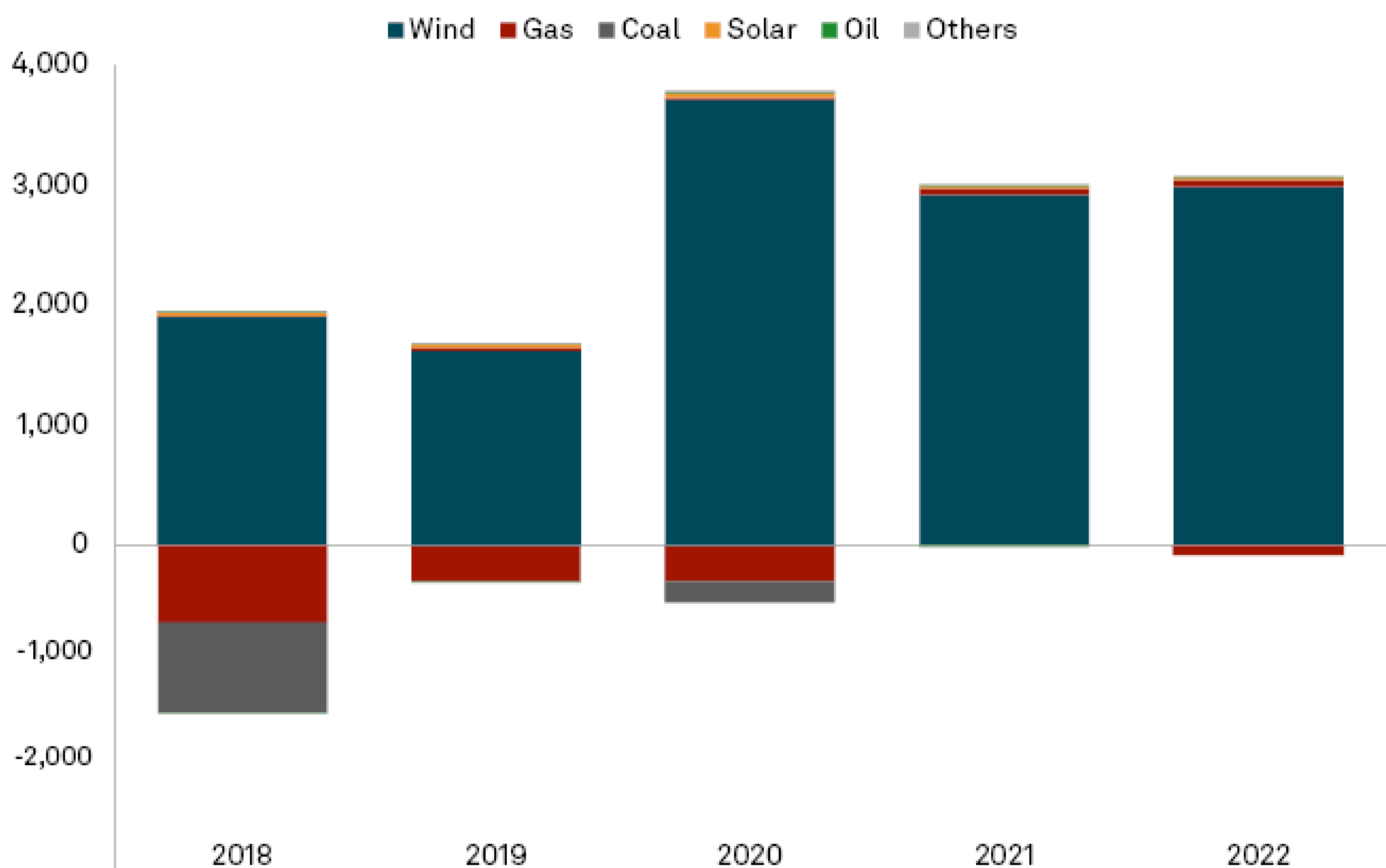
SPP

The Southwest Power Pool (SPP) could see a 2% increase in generating capacity in 2023 as the grid operator determines how to most effectively deploy electricity produced from one of the nation's largest fleets of wind farms, though little else from other renewable resources. This means that SPP relies heavily on thermal power plants that have faced fuel supply issues during severe weather.

In total, the SPP is scheduled to have a generating capacity of 98,707 MW if all new projects, totaling a net addition of 1,996 MW, connect to the grid by the end of 2023. That includes 32,157 MW of wind, 31,916 MW of gas, 24,428 MW of coal and 9,572 MW of other types of generating capacity, a category that includes hydropower, nuclear, energy storage, biomass and oil.

The SPP made headlines in 2020 as the US' first grid operator to have wind power at the top of its generation stack. Three years later, wind developers still prize the territory's strong and low-flying gales. Our data shows scheduled additions of 1,649 MW of wind power capacity in the SPP in 2023, more than a 5.4% increase from a cumulative 2022 wind power capacity of 30,507 MW. But unlike other grid operators, the SPP has struggled to attract similarly substantial investment from developers of solar farms or battery storage facilities that would give it more tools to manage the intermittency of its renewable energy generation fleet. [Read More >](#)

SPP's historical capacity additions, retirements (MW)



Net change: 358 (2018), 1,334 (2019), 3,243 (2020), 2,985 (2021), 2,971 (2022)

Data compiled March 22, 2023.
Others include biomass, hydro and energy storage.
Source: S&P Global Market Intelligence.
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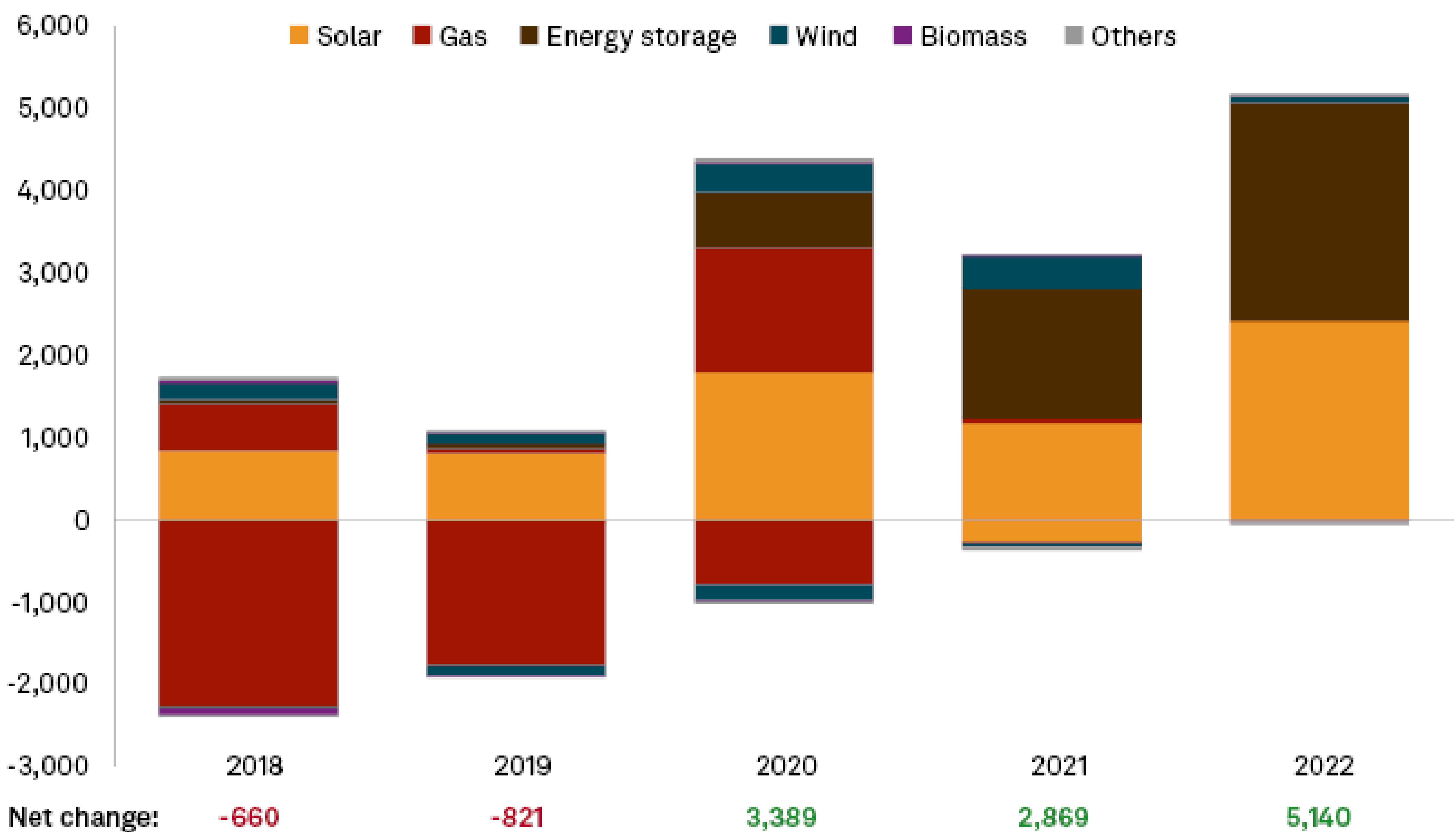
CAISO

The California ISO will have a host of new zero-emission resources at its disposal as it prepares to ride through another summer of potentially precarious grid conditions. Lithium-ion battery stations installed alongside large-scale solar farms, adjacent to natural gas-fired generators and in stand-alone configuration account for many of CAISO's new tools for keeping the lights on. Mostly designed with four hours of energy storage capacity, the CAISO-connected battery fleet is on pace to add another 3.3 GW in 2023, growing to a total installed capacity of 7.8 GW by year's end. In addition, 4.7 GW of solar photovoltaic (PV) capacity is scheduled to enter operation this year, which would drive cumulative large-scale solar capacity over 22 GW, the data indicates. For a third consecutive year, PV and batteries are lined up as the dominant new additions for utilities within CAISO's footprint.

Overall, nearly 8.3 GW of capacity additions, mostly solar and batteries, are planned in CAISO territory this year. That total is offset somewhat by 2.3 GW of scheduled retirements, largely gas-fired generation. But retirements will pivot on a forthcoming state decision on extending the operation of several facilities on CAISO's system.

Wholesale power prices in the CAISO market are expected to peak in August in Southern California, with forward prices reaching \$109.47/MWh in the SP-15 zone. In Northern California, forward prices peak in December, at \$118.20/MWh in the NP-15 zone. [Read More >](#)

CAISO's historical capacity additions, retirements (MW)



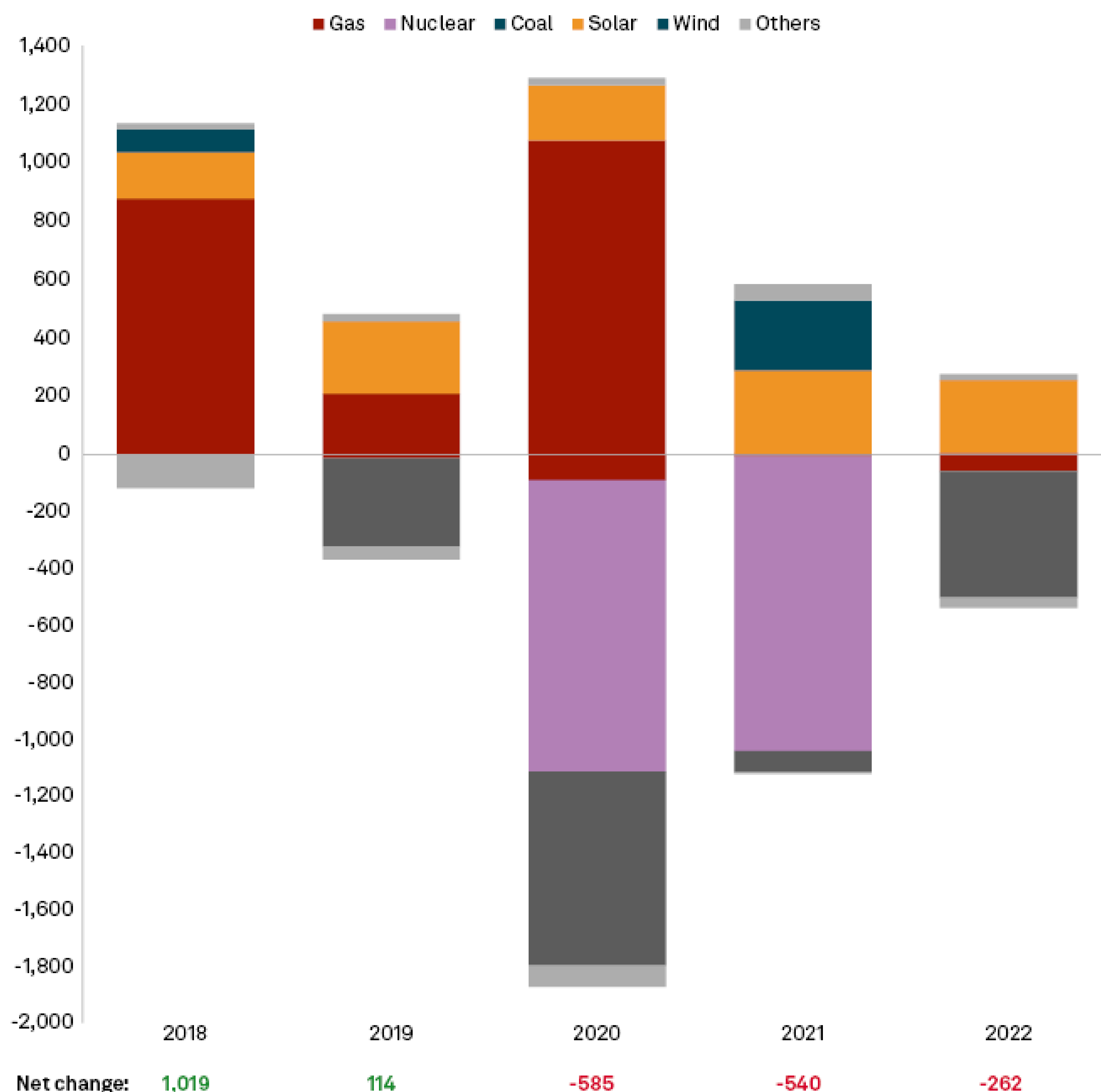
Data compiled March 22, 2023.
Others includes geothermal, hydro, oil and other fuel type.
Source: S&P Global Market Intelligence.
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NYISO

If the construction schedules hold, the New York ISO (NYISO) will soon see the start of operations of the largest offshore wind facility in the US today. The 132-MW South Fork Offshore Wind Project to be developed by Ørsted A/S and Eversource Energy, is among nearly 1 GW of wind capacity anticipated to start operations in 2023. It is the smaller of two offshore wind facilities the partners are building to supply power to New York. Legislation approved in 2019 targets the development of 9 GW of offshore wind resources by 2035, and the ISO's only planned power plant retirement is tied to that target.

Oil majors and offshore wind development partners Equinor ASA and BP PLC in January closed the acquisition of the 541-MW Astoria Gas Turbines facility in Queens, NY, from NRG Energy Inc. The new owners intend to repurpose the site as a converter station to interconnect their planned 1,230-MW Beacon Offshore Wind Project beginning in the late 2020s. The future of the Astoria site reflects New York's broader energy transition, as the state pursues a goal of 70% renewable energy by 2030 and the elimination of emissions from the state's electric sector by 2040. To hit the 2030 interim target, the New York ISO forecasts it will need 20 GW of new renewable capacity in operation, roughly doubling the 12.9 GW of new generation developed since 1999. To hit the 2040 goal, total installed capacity in the system must triple, bringing online at least 95 GW of new generation through new projects or modifications to existing plants. [Read More >](#)

NYISO's historical capacity additions, retirements (MW)



Data compiled March 22, 2023.
Others include biomass, energy storage, oil, hydro and other fuel types.
Source: S&P Global Market Intelligence.
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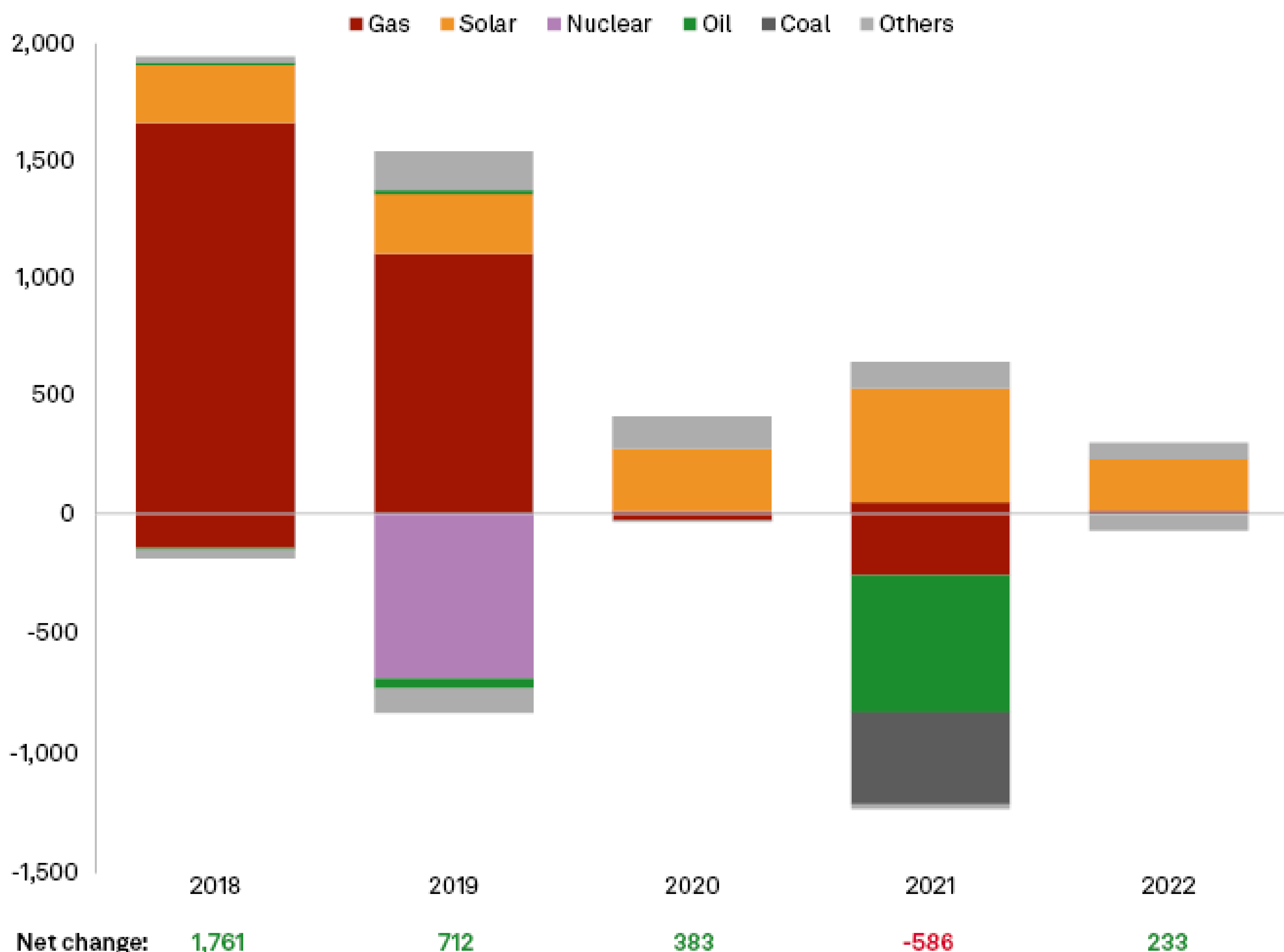
ISO New England

ISO New England is set to add 1,376 MW of new generating capacity in 2023, nearly all of which is renewable, and experience almost no power plant retirements, but broader reliability concerns are mounting. Capacity additions in New England in 2023 comprise 872 MW of solar, 170 MW of energy storage and 126 MW of onshore wind. The closure of the 22-MW Tunnel CT plant in Connecticut, which runs on jet fuel, marks the region's only planned retirement.

Over the past decade, about 7,000 MW of mainly coal, oil and nuclear generating capacity has been retired or announced for retirement, ISO-NE said in a January presentation to state lawmakers throughout the region. Another 5,000 MW of coal- and oil-fired capacity is at risk of retirement. These coal and oil resources have played a critical role in recent winters when gas supplies are constrained, ISO-NE noted.

But following a winter in which consumers grappled with skyrocketing bills, driven largely by gas price volatility, attention is again turning to reliability in New England, particularly as electrification is expected to grow and more intermittent renewable capacity comes online. Approximately \$1.3 billion in planned transmission upgrades will take place in ISO-NE over the next 10 years to accommodate the renewable generation slated to come online, according to a December 2022 report by the North American Electric Reliability Corp. [Read More >](#)

ISO-NE's historical capacity additions, retirements (MW)



Data compiled March 22, 2023.
Others include biomass, energy storage, hydro and wind.
Source: S&P Global Market Intelligence.
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Canada

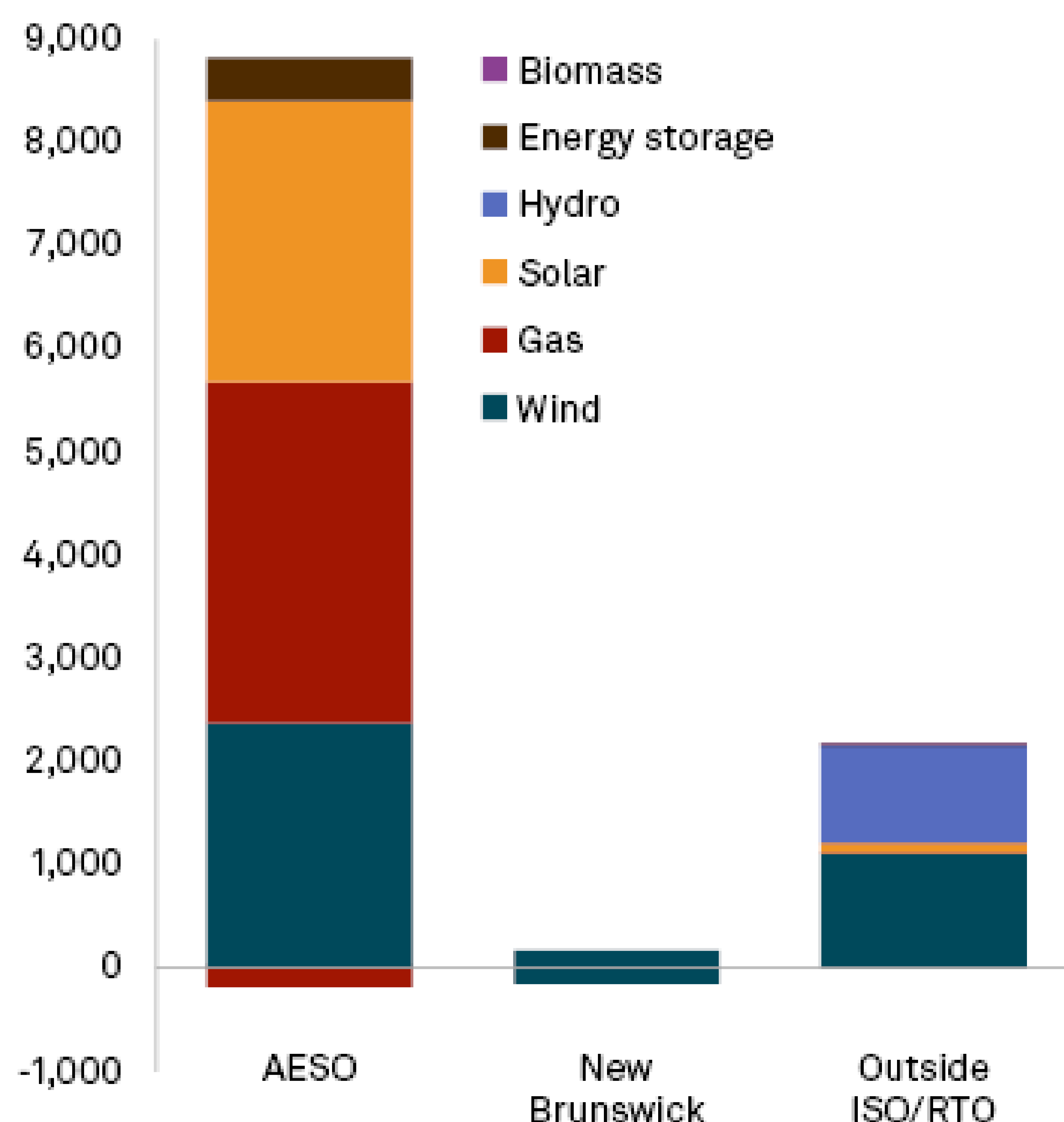
With repowering and expansion projects nearing completion, the Canadian grid could receive a sizeable influx of new gas capacity in 2023, according to an S&P Global Market Intelligence analysis.

Canada is projected to add 11,172 MW and retire 354 MW of capacity on its grid in 2023, for a net change of 10,818 MW. Wind accounts for the largest amount of scheduled additions, at 3,650 MW, slightly ahead of gas with 3,222 MW. Planned retirements include 204 MW of gas and 150 MW of wind.

Most of the changes for 2023, including all gas capacity additions, are forecast to occur in the province of Alberta. The addition of new gas capacity should help the Alberta Electric System Operator in its goal to improve and ensure frequency response capability.

In 2022, renewables provided more net-to-grid power than coal on an annual basis, according to AESO. Pure gas-generation technologies delivered approximately 64% of net-to-grid generation. Like 2022, renewables dominate new capacity additions, with wind continuing as the main driver in Canada. In Alberta, where the province in April declared aspirations for a "carbon neutral" economy by 2050, new wind and solar resources are helping offset the reduction in coal-fired generation. [Read More >](#)

Canada's 2023 additions, retirements* by ISO/RTO (MW)



Data compiled March 22, 2023.

RTO/ISO = regional transmission organization/independent system operator.

* Only includes units that have received regulatory approval to retire.

Source: S&P Global Market Intelligence.

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S&P Global Market Intelligence integrates financial and industry data, research, and news into tools that help track performance, generate alpha, identify investment ideas, understand competitive and industry dynamics, perform valuation, and assess risk.

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