Investing in Energy

Reshuffling the US energy deck

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Key Implications

- The One Big Beautiful Bill Act, enacted by Congress this month, has codified sharp energy policy shifts that seek to reshuffle the relative attractiveness of different energy types in the US. Ultimately, this law benefits fossil fuels, nuclear and advanced geothermal, and it raises hurdles to investment in solar PV and wind, with indirect negative impacts on battery storage.
- Policy has shifted, but some critical underlying energy market fundamentals have not. Projections for power demand growth relative to the speed at which new capacity can be brought online were already fueling concerns of a power crunch scenario, even prior to the walk-back of solar PV and wind subsidies. These new hurdles risk exacerbating obstacles to grid capacity expansions from supply chain delays, local opposition, a slow pace of permitting, and state and local regulations.
- Demand, cost, time and above-ground risk pressures through 2030 will act as tailwinds for technologies that can help expand capacity while avoiding those obstacles. Options include nuclear uprates, delayed coal plant retirements, behind-the-meter gas, solar and battery storage, and grid orchestration technology.
- It is unclear how successful these near-term policy efforts will be at pushing the US power system onto a different longer-term trajectory. In the interim, all options to add capacity quickly are on the table, from importing mobile simple gas turbines to upgrading underutilized hydropower assets.

Reshuffling the US energy deck

The One Big Beautiful Bill Act (OBBBA), enacted by Congress earlier this month — and a subsequent executive order to build on the OBBBA's cuts to wind and solar PV incentives — reshuffle the relative attractiveness of various electricity generation sources as the sector mobilizes to meet surging power demand growth. The legislation boosts the outlook for fossil fuels, nuclear and advanced geothermal while raising hurdles for investment in solar PV and wind, with indirect negative impacts on battery storage. For more, please see Hammer time: remixing clean energy subsidies and IRA's last stand: Renewables try to seize short window of opportunity before OBBBA era begins.

However, some critical energy market fundamentals in the US remain intact. Projections for power demand growth outpacing the speed at which new capacity can be brought online were already fueling concerns of a power crunch scenario. We expect the OBBBA to present material headwinds to wind and solar PV deployment, exacerbating existing obstacles to expanding grid capacity caused by supply chain delays, local opposition, a slow pace of permitting, and state and local regulations. But investors looking beyond the four-year US presidential election cycle — or companies whose investors and customers will hold them to sustainability standards — have reason to hedge against a possible return to a policy of emissions reductions. This may deter some fossil fuel investments that might otherwise look attractive in the current environment.

A power crunch scenario, which would send electricity prices higher and raise risks of supply shortfalls and related grid instability, can act as a strong tailwind for squeezing more capacity out of existing assets and, where possible, adding capacity behind the meter (BTM). We expect it to boost projects that prolong the life or expand the capacity of existing assets, and encourage the deployment of grid orchestration software, efficiency enhancements, BTM gas, solar PV and battery storage, even as federal subsidies for many of these technologies disappear.

The distributed solar boom in Pakistan may offer a useful example of consumer behavior when a mismatch between grid supply and demand puts upward pressure on electricity prices and dents confidence in the grid's ability to provide reliable power, though the Pakistani and US markets are not comparable in many other respects. High electricity prices and unreliable grid supply enabled more than7 GW of distributed solar capacity additions in Pakistan in 2024, with more than 7 GW of additions expected in 2025, and a total of about 22 GW of distributed capacity additions forecast through 2025–30. Meanwhile, less than 1 GW of utility-scale solar PV is expected to be commissioned in Pakistan in 2025–30. For more, please see Pakistan Power and Renewables Market Profile.

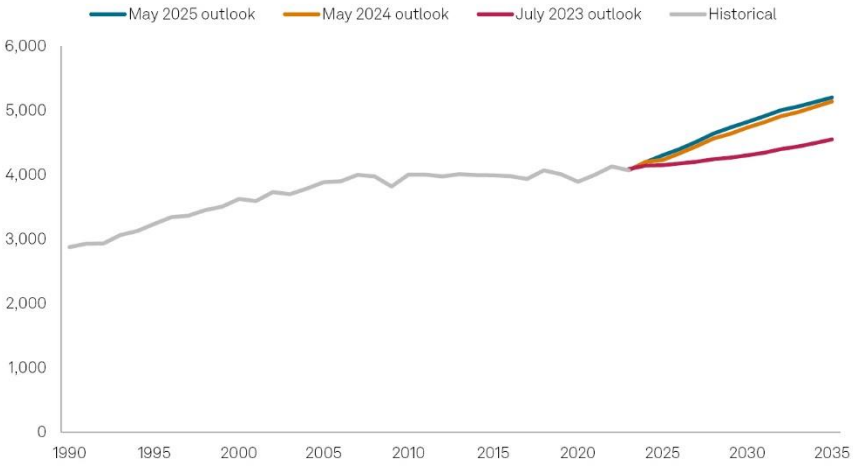
The US demand trajectory calls for more on-grid power, and the sooner the better

S&P Global forecasts show US on-grid electricity demand growth averaging 2.4% per year from 2025–30, up from 0.2% in the 2008–24 period. A large share of that demand growth will be driven by datacenter buildout. S&P Global's technology industry arm, 451 Research, forecasts hyperscale, leased and crypto-mining datacenters' draw on utility power will double to nearly 95 GW in 2028 from 47.4 GW in 2024.

While datacenter consumption is expected to play an outsized role in the US electricity demand trajectory shift, signs of demand growth driven by broader electrification trends — including electric vehicle uptake — were visible as early as 2023, when datacenter demand became a focal point of discussion.

As project developers race to add capacity to match demand growth, the changes in subsidy availability for certain forms of generation are impacting cost comparisons. But while cost is usually the primary baseline determinant of new capacity additions, some states and large power procurers will continue to value other attributes alongside — sometimes over — cost. Those attributes include speed to power, emissions profile and dispatchability. Crucially, key procurers — especially hyperscalers — appear willing to bear much higher costs for electricity with a low emissions profile.

US Lower 48 net on-grid electricity demand by outlook vintage (TWh)



Data compiled May 2025.
Large loads refer to demand driven by investment in new datacenters, manufacturing and other industrial facilities as well as flexible large loads from electrolyzers and cryptocurrency mining.
Sources: S&P Global Commodity Insights; US Energy Information Administration for historical data.

There is no one electricity generation source in the US that meets the full suite of procurement priorities, and hyperscalers are pursuing a mix of options.

	Commercial	Modular	Dispatchable	Duration	Capital costs	Marginal costs	Emissions
Solar	🟢	🟢	🔴	🟠	🟢	🟢	🟢
Wind (onshore)	🟢	🟠	🔴	🟠	🟢	🟢	🟢
Gas	🟢	🟠	🟢	🟢	🟠	🔴	🟠
Batteries	🟢	🟢	🟢	🔴	🟢	🟢	🟢
Advanced geothermal	🔴	🔴	🟢	🟢	🔴	🟢	🟢
Traditional nuclear	🟢	🔴	🟠	🟢	🔴	🟠	🟢
Small Modular Reactors	🔴	🟢	🟠	🟢	🔴	🟠	🟢

Compiled April 10, 2025.
Sources: S&P Global Commodity Insights.

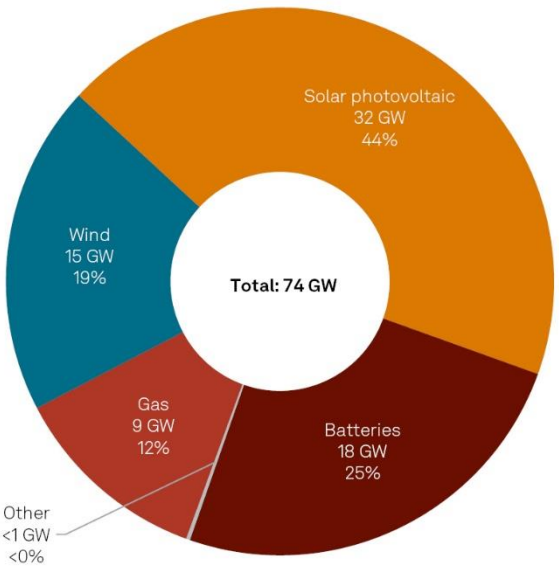
Investment and production tax credits for new solar PV and wind — which will now sunset sooner than outlined under the Inflation Reduction Act of 2022 (IRA) — have boosted mature renewables' cost advantage relative to other generation sources in many US markets over the past few years. While that advantage will erode with the earlier rollback of credits, and fewer wind and solar PV projects will clear investors' return thresholds, it will not disappear entirely, especially in markets with good resources, such as the Electric Reliability Council of Texas' jurisdiction, or those with strong state-level incentives, like New York.

Meanwhile, investors in other generation sources are also facing rising (and in some cases unpredictable) costs.

As mature renewables are becoming a more expensive generation source, so is natural gas. Utilities, independent power producers and industrial players ordered over 14 GW of gas turbines in 2024, the highest amount since 2001, and orders for the first quarter of 2025 are 7 GW, putting the industry on pace for another record-breaking year. Surging demand has tightened the gas turbine market and driven project costs above $2,000/kW, double the levels seen just a few years ago. For more, please see Got capacity? Global gas turbine manufacturing faces soaring US gas power demand.

Nuclear, in particular, has moved into the spotlight after a flurry of deals between hyperscalers and nuclear developers. It meets hyperscalers' demand for dispatchable, low-emission power. But it comes at a far higher cost than alternatives — even with ongoing federal government support — and with much longer lead times. The potential for next-generation small modular reactors to meet material levels of demand over the next decade is still highly uncertain.

US Lower 48 capacity under construction, May 2025 (nameplate GW)



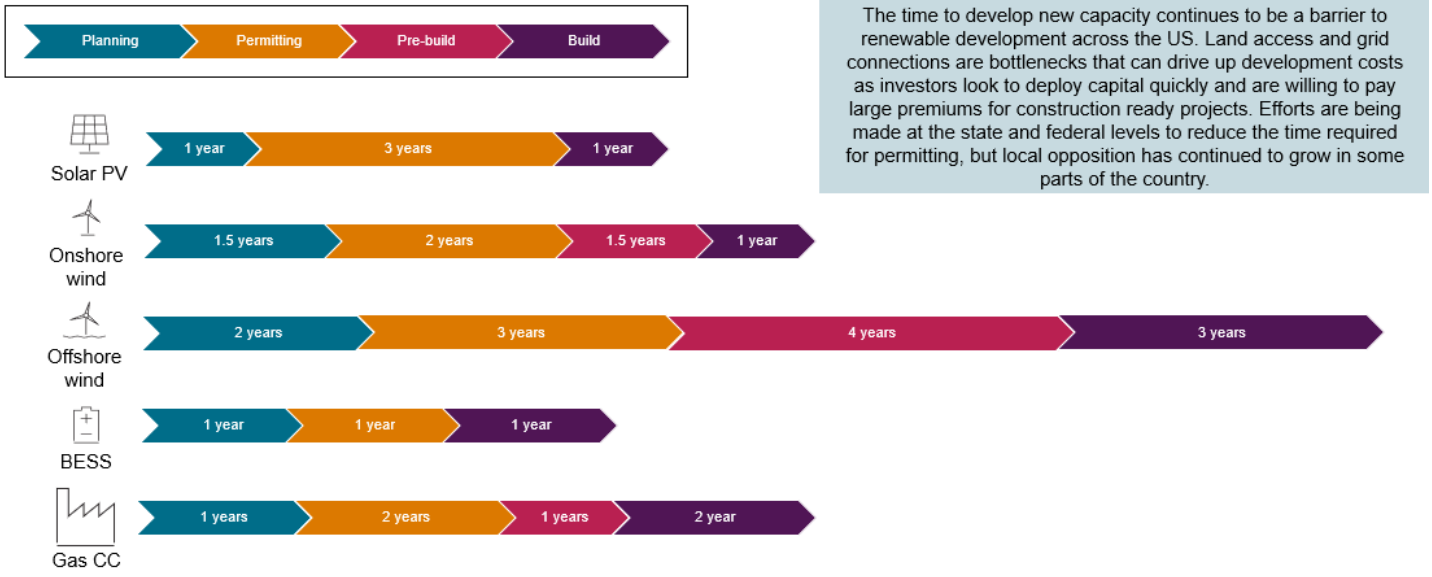
As of May 2025.
Source: S&P Global Commodity Insights.

Bridging the supply-demand gap

The rapid expansion of datacenter investment has compressed the available runway before hitting grid supply constraints, putting a premium on speed to power. The vast majority of the capacity under construction right now is concentrated in wind, solar PV and battery storage. This is at least in part a legacy of the generous subsidies for all three under the IRA. Around 30 GW of tax credit-eligible wind and solar PV capacity is set to begin commercial operation this year, with another 44.5 GW of projects expected to begin operating in 2026. The earlier-than-expected sunsetting of subsidies may also trigger a rush to

stockpile inventory and bring capacity online in the remaining window of availability, further boosting near-term additions. For more, please see IRA's last stand: Renewables try to seize short window of opportunity before OBBBA era begins.

The outlook for additions dims beyond 2027, not only due to the loss of tax credit eligibility for wind and solar PV. Impending restrictions on inputs from foreign entities of concern have particularly acute implications for batteries, and ongoing announcements of policy measures that seek to further stymie sector growth — including a July 7 executive order directing the US Treasury Department to revise rules for energy projects seeking tax credits — further undermine investor confidence that market conditions will eventually stabilize.



Data compiled April 2025.
Planning = The project is in early planning stages. It has not obtained approvals from the relevant authorities. Permitting = The project is in its permitting process. Planning documentation (for environmental permits, interconnection rights, etc.) are being prepared or are submitted to the relevant authorities for approval. Pre-build = The project has its required permits and is preparing for construction. Financing is being finalized, tenders for equipment and construction contracts are being awarded and site preparations and front-end engineering and design studies are being completed. Build = The project is under construction or in testing/commissioning phase.
Source: S&P Global Commodity Insights.

Given the pressing need for new power supply, the time it takes to connect projects to the grid will play a crucial role in technology investment and deployment. While solar PV and battery storage are particularly quick to install, long interconnection queues push the average time to market to five to six years, which can grow to 10 years or more if a project requires high-voltage transmission. This puts mature renewables on par with interconnection times for natural gas-fired generation, even with growing lead times for gas turbine purchases. However, uncertainty as to the durability of gas turbine demand will limit manufacturer investments in new capacity, which will prolong the supply bottleneck.

New nuclear capacity will be slower to come to market than other power generation sources. The US' most recent conventional nuclear additions, at the Vogtle plant in Georgia, came online several years late and billions of dollars over budget, and we expect efforts to build new conventional reactors and develop small modular reactors at scale to take at least until the 2030s. With that said, there are nearer-term options for increasing nuclear generation. We expect investment to increase in uprating existing nuclear plants; proposed projects would increase reactor capacity 6% on average across 19 reactors. We also expect there to be more interest in reactivating shutdown nuclear capacity where possible. Constellation Energy has set a target start date of 2027 to bring unused capacity at Three Mile Island back online. For more, please see Igniting nuclear momentum in the US.

Persistent political risk

Investors and companies will have to weigh these long-range deployment decisions in what looks likely to remain a highly volatile and politically divided policy environment. Energy policy has swung wildly over the past roughly two decades of Democratic and Republican administrations, and that pendulum looks likely to continue to swing as power passes between the parties in the years ahead. Companies are balancing the latest US policy pivot toward fossil fuels against the longer-term direction of domestic policy, while considering prevailing trends among consumers, shareholders and trade partners in other markets, all of which continue to trend toward emissions reductions, albeit with some relaxation of ambitious targets relative to the 2020–22 period.

Focusing power capacity investments in lower-emissions technologies — which, in addition to renewables or nuclear, could include leveraging expanded carbon capture, utilization and storage credits to prolong the life of natural gas assets — can hedge against the risk of future blowback from any fossil fuel investments made in the current environment.

Permitting and interconnection timelines will also pose persistent challenges. Efforts to streamline permitting at the federal level may ease the regulatory burden on project developers, but they must still contend with state and local regulations and rising local opposition to new installations. While the uptick in local opposition has been highly visible in mature renewables as installations have grown rapidly, public perceptions of the dangers of nuclear pose an ongoing siting risk, especially as projects move to the permitting and development stages. For more, please see States fight local opposition to renewable development in the US.

In the interim, all options are on the table. Hyperscalers are deploying new and creative efforts to speed up behind-the-meter capacity expansions, including xAI reportedly importing mobile simple gas turbines to speed up construction and powering of its large-scale datacenter in Tennessee. Google has entered into 20-year power purchase agreements with Brookfield for up to 670 MW of hydropower, which may require upgrades to operating hydropower assets. The US Energy Department has estimated that up to 30 MW of non-powered dams in the US could be transformed to produce power, and additional capacity expansions could be achieved through modifications to producing dams. For more, please see Can hydropower help meet growing demand for low-carbon power?

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