

20
22 | Q3



CLEAN POWER QUARTERLY
Market Report



Table of Contents

- 2022 Q3 Highlights** 4
- Clean Power Capacity Growth** 6
- Clean Power Policy Impact** 22
- Clean Power Procurement** Members only
- Mergers and Acquisitions** Members only
- Offshore Wind Activity** Members only
- Land-Based Wind Activity** Members only
- Utility-Scale Solar** Members only
- Utility-Scale Battery Storage** Members only
- Hybrid Projects** Members only

Clean Power Definitions & Acronyms

Definitions

Advanced development: Projects not under construction, but with a PPA, firm equipment order, or moving forward with plans to be placed under utility ownership as of the end of the most recent quarter. For offshore wind, advanced development consists of projects that have secured offtake or have had successful bids in response to a state solicitation even if final offtake negotiations have not concluded.

Capacity: Project nameplate capacity. Unless otherwise stated, ACP reports capacity in MW-ac.

Clean power: For the purposes of this report, clean power includes land-based wind, offshore wind, utility-scale solar, and battery storage technology.

Decommissioned: Project is offline and is no longer delivering power to the grid on a permanent basis. Physical removal of equipment is not a requirement.

Duration: The amount of time, in hours, a battery can discharge its power capacity before depleting its energy capacity. For example, a 2 MW battery that has 4 MWh of energy capacity has a duration of 2 hours.

Full repowering: Full decommissioning of a utility-scale project. The original equipment is physically removed from the project site and replaced with new utility-scale equipment.

Inverter Loading Ratio (ILR): The ratio of installed DC capacity to the inverter's AC power rating. Also known as the AC-to-DC ratio.

Online: Project has reached commercial operation and is delivering electricity to the ultimate point of delivery.

Partial repowering, nacelle replacement: Complete replacement of a utility-scale wind turbine's nacelle, rotor, and blades. The tower and foundation are retained.

Partial repowering, major retrofit: Complete replacement of a utility-scale wind turbine's rotor and blades, along with the replacement of at least one major component within the nacelle, typically the gearbox or the generator.

Pipeline: Projects either under construction or in advanced development.

Repowered: Full or partial equipment replacement. Currently only wind repowering activity is tracked, but ACP will expand repowering activity tracked as the market progresses.

Under construction: Construction team has begun work on the ground at the project site. For offshore wind, under construction is defined as in-ocean construction.

Acronyms

AC	Alternating Current
C&I	Commercial & Industrial
CAISO	California ISO
DC	Direct Current
ERCOT	Electric Reliability Council of Texas
GW	Gigawatts
GWh	Gigawatt hours
ILR	Inverter Loading Ratio
IOU	Investor-Owned Utility
ISO	Independent System Operator
MISO	Midcontinent Independent System Operator
MW	Megawatts
MWh	Megawatt hours
NE-ISO	New England ISO
NYISO	New York ISO
OEM	Original Equipment Manufacturer
PJM	Pennsylvania-New Jersey-Maryland Interconnection
PPA	Power Purchase Agreement
RTO	Regional Transmission Organizations
SPP	Southwest Power Pool



2022 Q3 Highlights

2022 Q3 Highlights

Inflation Reduction Act

President Biden signed the Inflation Reduction Act (IRA) into law on August 16th. This unprecedented national commitment to clean power is the largest policy investment in clean energy on record. The IRA is set to catalyze clean energy growth, ultimately more than tripling annual installations of wind, solar, and battery storage by the end of the decade. ACP anticipates this large-scale shift to clean energy will deliver 550 GW of new build by 2030, reduce economy-wide carbon emissions an estimated 40% below 2005 levels, and support a clean power workforce of nearly 1 million by 2030.

Clean Power Project Installations

- Clean power installations in the third quarter were the lowest the industry has seen since the third quarter of 2019. Developers brought 3.4 GW of new capacity online, bringing 2022 installations to 14.2 GW. These projects can power the equivalent of 490,800 American homes with clean energy and represent \$4.6 billion of capital investment.
- Year-to-date (YTD) installations are down 18% compared to the same period in 2021, while comparable third quarter additions fell 22%. Difficulty sourcing solar panels and supply chain constraints have proved to be major barriers for projects. Interconnection challenges and the previous phase-down schedule of the production tax credit (PTC) are at work, as well.
- Clean power developers brought 60 project phases spread across 19 states online this quarter. With 1,404 MW commissioned, California led the nation this quarter for new installations, accounting for almost half of all quarterly installs. Texas ranks second with 1,272 MW installed, followed by Virginia (255 MW), and Iowa (105 MW). No other state installed more than 100 MW.
- By technology, 1,877 MW of new solar capacity was brought online this quarter, bringing 2022 solar installations to 7,071 MW. Battery storage, with 1,195 MW/ 2,774 MWh of new capacity deployed, delivered its second strongest quarter after the fourth quarter of 2021. Only two new wind projects with a total capacity of 356 MW were commissioned this quarter.

Solar capacity is reported in MWac units.

Clean Power Under Construction and in Advanced Development

- There is currently 132 GW of clean power capacity in development across the nation. This includes 39,404 MW under construction and 93,087 MW in the advanced development stage.
- In the first and second quarters of the year, the pipeline grew just 3-4% each quarter, much slower than 12% quarterly growth the industry experienced in 2021. On par with the first half of the year, the pipeline grew just 3% this quarter.
- Accounting for almost a fifth of all capacity in development, Texas leads the nation with 23,820 MW in the pipeline. California sits in second with 12,779 MW in development, 98% of which is solar or battery storage. New York rounds out the top three with 10,755 MW in the pipeline, thanks in part to 4,362 MW of offshore wind capacity being developed off the State's coast.
- Solar constitutes 59% of the pipeline, while land-based wind makes up 17%, offshore wind 13%, and battery storage the remaining 11%.
- Project delays persist. Nearly 14.2 GW of clean power capacity was delayed this quarter, of which more than half already experienced previous delays. In total, ACP is tracking 36.2 GW of delayed projects plus a further 3.5 GW that have terminated. Solar accounts for the lion's share of delayed capacity at 63%. Land-based wind accounts for 23% of delays and battery storage the remaining 14%.

Clean Power Procurement Activity

- Power Purchase Agreement (PPA) announcements also slowed this quarter. Developers and purchasers announced 7.2 GW of new PPAs in the third quarter, down 31% compared to the same period last year. Year-to-date, announcements are down only 3% thanks to a high announcement volume last quarter.
- Utilities make up a quarter of all PPA announcements this quarter, while commercial & industrial (C&I) customers account for 43%. State governments and undisclosed purchasers make up the remaining 32% of announced PPA capacity.
- 90% of PPAs announced this quarter were for solar capacity. The technology makes up 81% of announcements so far in 2022. Storage accounts for 7% of PPA announcements this quarter, typically paired with solar, and land-based wind makes up the remaining 3%.



Clean Power Capacity Growth

Lowest quarter since Q3 2019

2022 Q3 installs

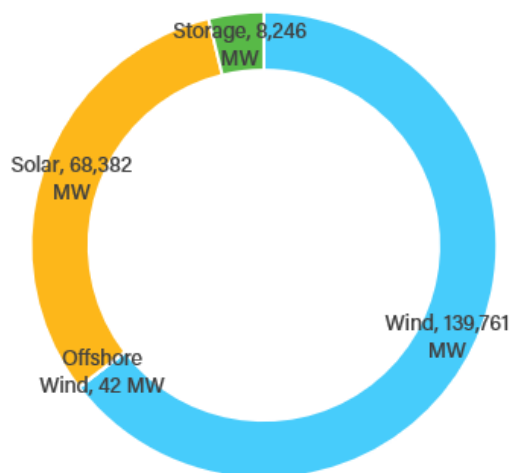
- The industry installed 3,427 MW of new clean power capacity commissioned this quarter, the lowest three month period in three years. Quarterly installs are down 22% compared to 2021 and 18% YTD.
- This quarter developers commissioned 41 solar projects with a total capacity of 1,877 MW, bringing YTD solar installs to 7,071 MW. Additionally, 17 battery storage projects with a total capacity of 1,195 MW/ 2,774 MWh commissioned, bringing storage installs for the year to 3,059 MW/ 7,952 MWh. Finally, only two land-based wind projects came online this quarter with a total capacity of 356 MW. Total wind installs for the year are now at 4,105 MW.
- Both solar and land-based wind had the lowest quarterly installs the industry has seen in several years. Q3 was the lowest solar quarter since the third quarter of 2020, and the lowest land-based wind quarter since the second quarter of 2017.
- Developers reported the inability to source solar panels as the primary cause for the slowdown in solar project installations. Lingering effects of the Withhold Release Order (WRO) as well as elongated detentions stemming from the Uyghur Forced Labor Prevention Act (UFLPA) has effectively removed significant panel supply from the U.S. market.

- The slowdown in wind installations was partially expected given the phase-down of the PTC prior to the passage of the IRA. Compounding this expected slowdown are lingering supply chain challenges as well as delays in approvals for synchronization with the grid.
- Battery storage, on the other hand, has continued its upward trajectory, experiencing its second strongest quarter on record, even despite some projects being delayed.
- Compared to the third quarter of 2021, land-based wind and solar additions are down 78% and 23%, respectively, while battery storage installs increased 227%.

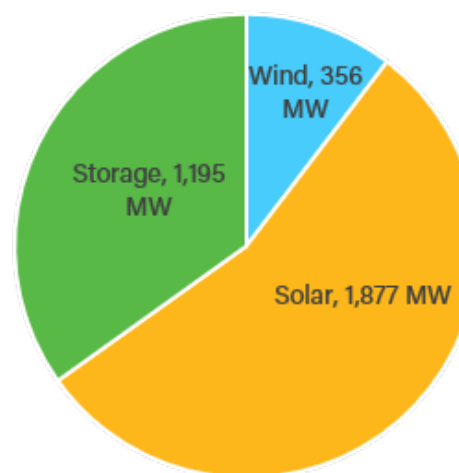
Cumulative operating clean power capacity

- Operating clean power capacity in the U.S. now totals 216,432 MW, enough capacity to power approximately 59 million American homes. Total operating capacity increased 2% this quarter and has grown 7% YTD.
- Broken down by technology, operating clean power capacity is made up of 139,761 MW of land-based wind, 68,382 MW of solar, 8,246 MW/20,494 MWh of battery storage capacity, and 42 MW of offshore wind.

Total Operating Clean Power Capacity by Technology



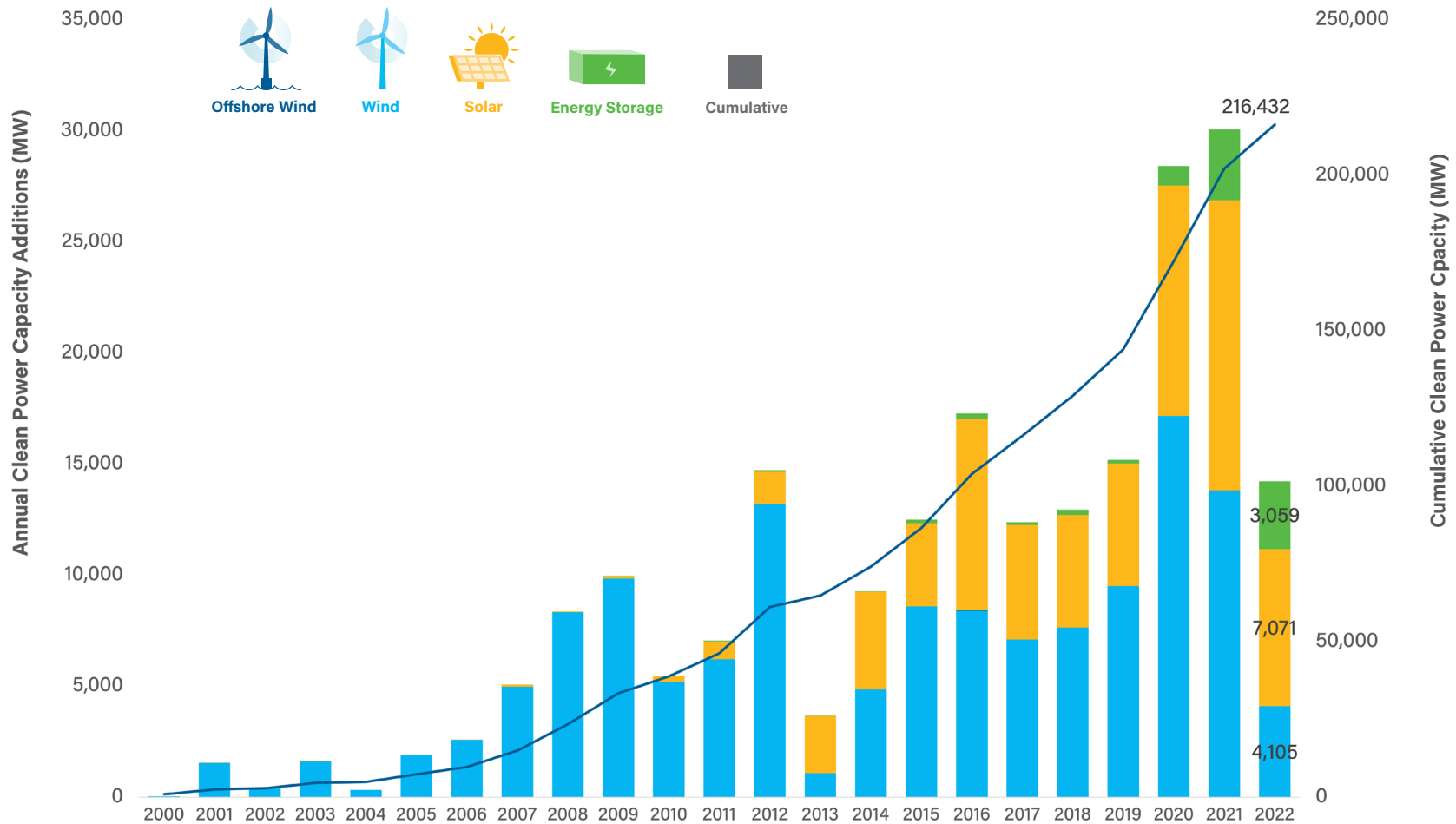
Q3 Clean Power Installs by Technology



CLEAN POWER CAPACITY GROWTH

Lowest quarter since Q3 2019 *(continued)*

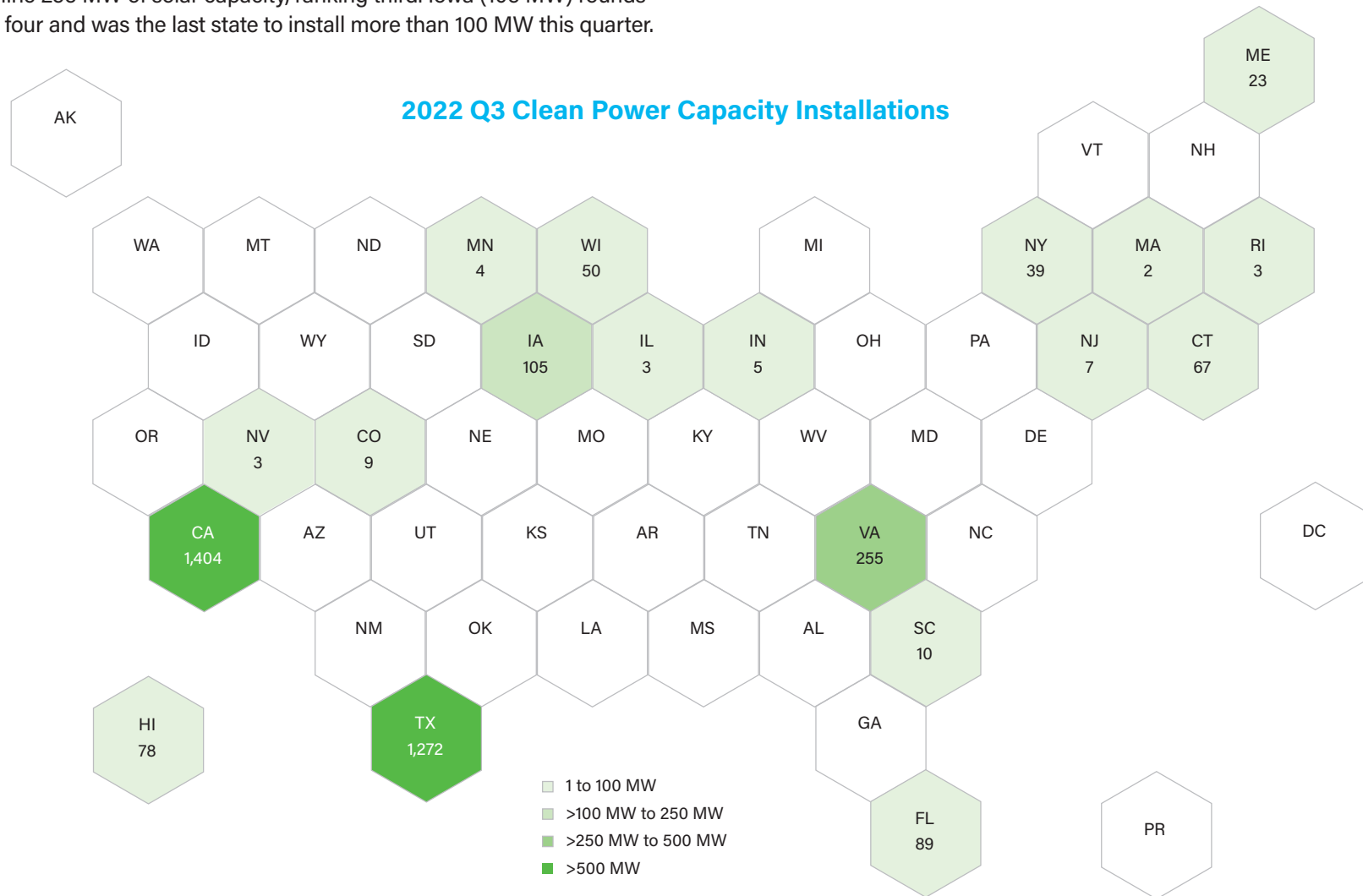
U.S. Annual and Cumulative Clean Power Capacity Growth



Solar capacity is reported in MWac units.

California and Texas both add a gigawatt of clean power

- Developers commissioned 60 project phases across 19 states from July to September.
- California and Texas were the only states to install more than 1 GW of new clean power capacity this quarter; the Golden State added 1,404 MW, accounting for almost half of all installs, and Texas installed 1,272 MW. Virginia brought online 255 MW of solar capacity, ranking third. Iowa (105 MW) rounds out the top four and was the last state to install more than 100 MW this quarter.
- The two wind projects commissioned this quarter are located in Texas and California. While solar projects are spread out across 18 states, almost 30% of solar capacity online this quarter is in California. Battery storage projects were commissioned in seven states, though only California and Texas installed more than 100 MW.

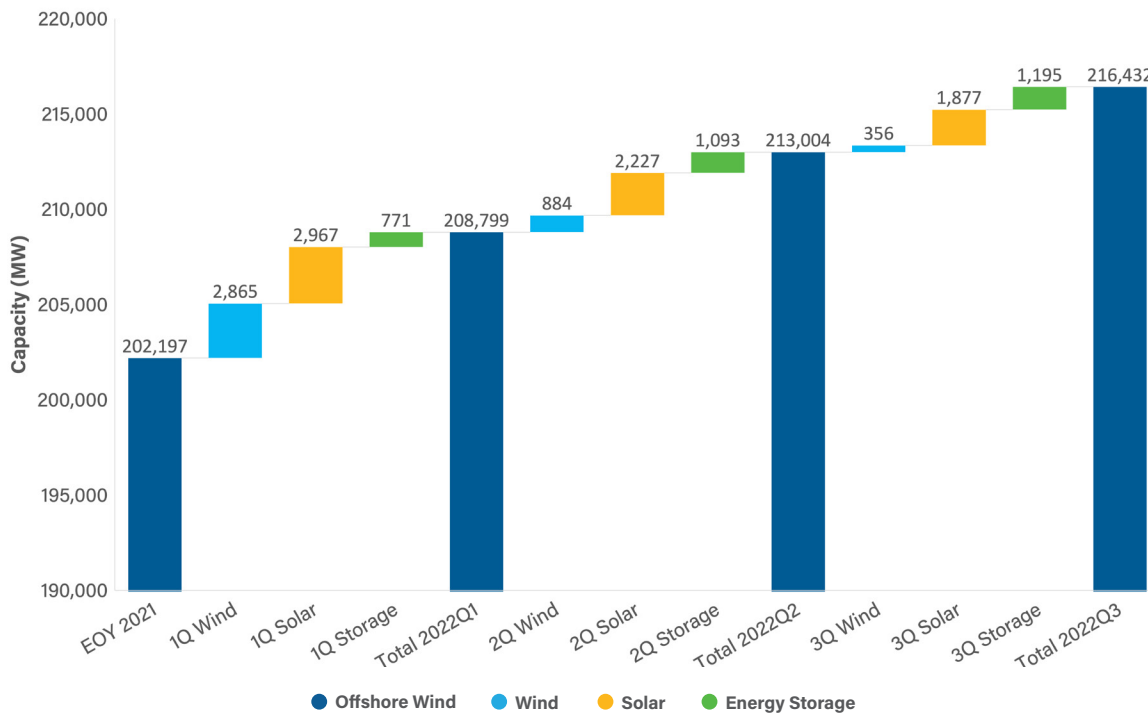


CLEAN POWER CAPACITY GROWTH

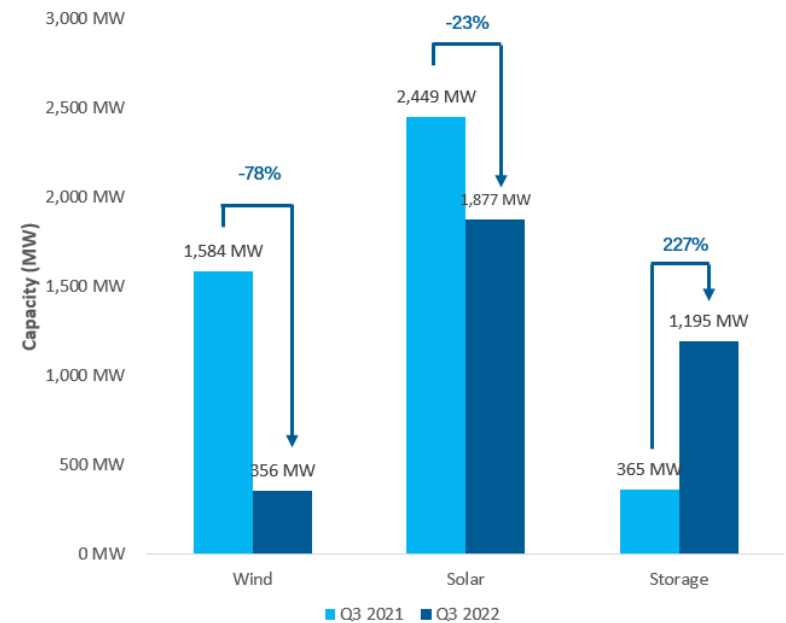
Quarterly clean power capacity growth

- Compared with the third quarter of 2021, Q3 2022 installations decreased 22%. Battery storage was the only technology to experience growth, a 227% increase. Solar installations fell 23% compared to the same quarter in 2021, while land-based wind installations dropped 78%.
- Supply chain challenges and the limited availability of solar panels continue to constrain the industry. Solar installations this quarter were the lowest the industry has experienced since the third quarter of 2020, though, thanks to a strong first quarter, year-to-date installs remain second only to 2021.
- Of the 17 battery storage projects commissioned this quarter, nine are paired with wind or solar, and 68% of storage capacity online this quarter is paired with another clean power source.
- The industry installed 41 solar projects this quarter with a total capacity of 1,877 MW. Only two wind projects with a capacity of 356 MW came online, and 17 battery storage projects were installed this quarter with a capacity of 1,195 MW/2,774 MWh.
- NextEra led installations this quarter, commissioning 647 MW of solar and storage capacity. Ørsted takes second this quarter with the commissioning of the 430 MW Old 300 Solar project. National Grid renewables completes the top three with the 404 MW Nobel Solar + Storage project coming online.

Clean Power Quarterly Capacity Growth



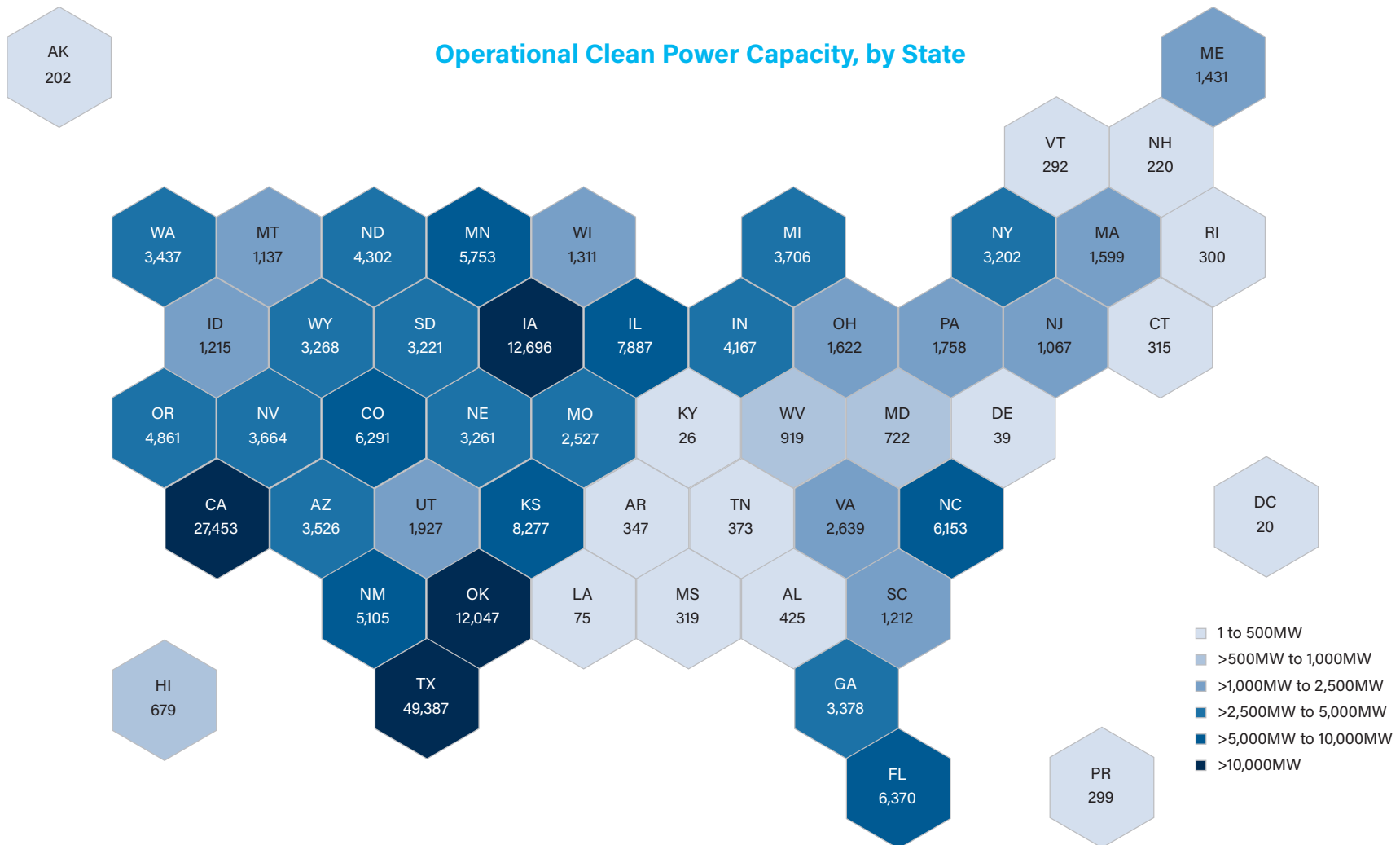
Q3 Clean Power Installations Comparison



CLEAN POWER CAPACITY GROWTH

Operational clean power capacity

- There is clean power operating and powering American homes and businesses in every state in the country, as well as DC and Puerto Rico.
- Total operating clean power capacity has reached 216,432 MW, enough to power more than 59 million American homes.
- Texas leads the nation in terms of total operating clean power capacity (49,387 MW), as well as for total land-based wind capacity (37,422 MW). California places second overall at 27,453 MW online, but first for solar (16,783 MW) and battery storage (4,553 MW). Iowa ranks third overall with 12,696 MW operating and second for wind (12,428 MW).

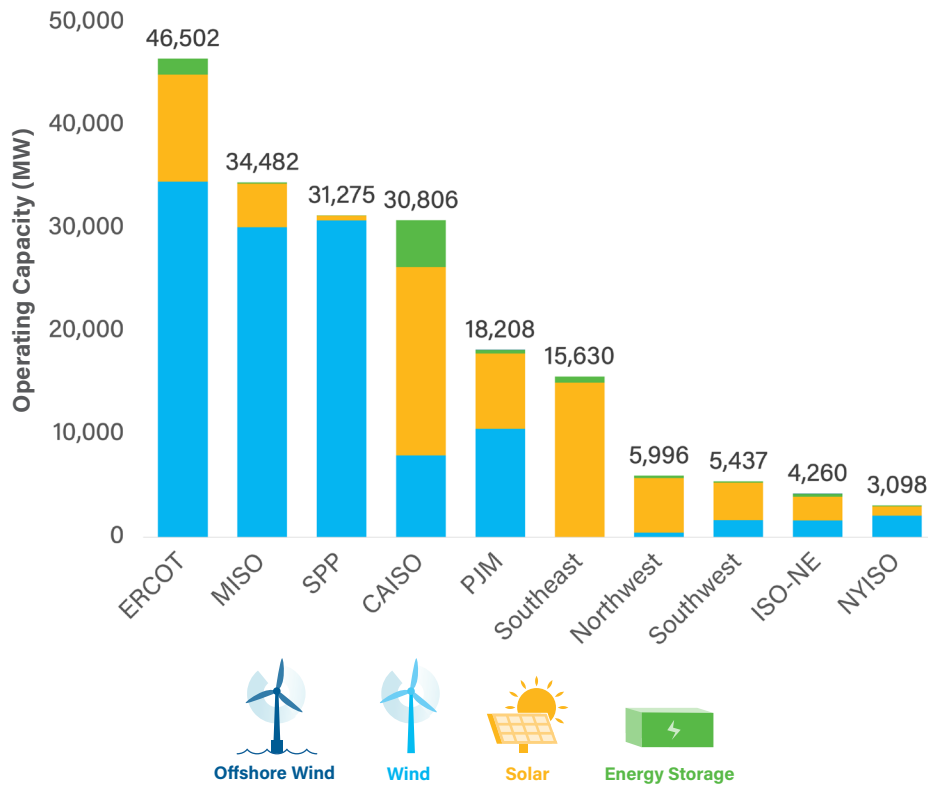


CLEAN POWER CAPACITY GROWTH

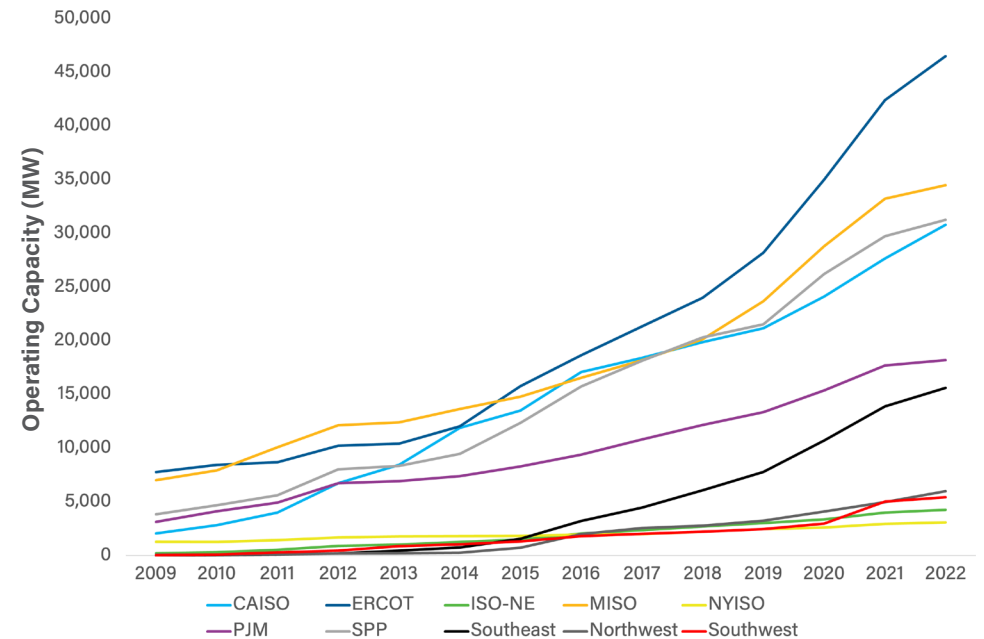
Operating clean power capacity by region

- On a regional basis, ERCOT takes the top spot for operating clean power capacity with more than 46.5 GW online. ERCOT has been the leading region back through 2015, after taking the top spot from MISO.
- Land-based wind makes up the highest portion of operating capacity in SPP (98%) and MISO (87%). On the other hand, the solar share is highest in the non-ISO Southeast (96%) and non-ISO Northwest (89%).
- So far this year, the Northwest has increased its operating clean power capacity the most, a 20% increase, and PJM the least, just 3% growth from 2021.
- Between 2012 and 2021, the non-ISO Southeast had the highest average annual growth rate at 68%, but the region still only ranks sixth in terms of total operating capacity. ERCOT, the leader for operating capacity, experienced an average annual growth rate of 17%.

Online Capacity by RTO ISO or non-ISO Region



Cumulative Online Capacity by Region, Over Time



Region is based on capacity point of delivery.

Clean power pipeline by technology

Wind

- The land-based wind pipeline is comprised of 100 projects with a total capacity of 22,543 MW, including 13,133 MW under construction and 9,411 MW in advanced development.
- The land-based wind pipeline decreased 3% this quarter and is down 43% year-over-year. The sharp decline can be pegged to the previous phase-down of the PTC and a need to replenish the pipeline of viable projects following record installation levels in 2020 and 2021.
- At the state level, Texas dominates the land-based wind pipeline with 6,250 MW in development, 28% of the total pipeline. Wyoming takes second place with one 3,000 MW project in development, and Illinois sits in third with 2,301 MW. Twelve states currently have more than 500 MW of land-based wind capacity in the pipeline.
- With numerous states setting offshore wind targets, the technology now accounts for a significant portion of the clean power pipeline in several states. Based on the state of power delivery, New York is leading the nation with in 4,362 MW in development, followed by New Jersey with 3,758 MW development. Massachusetts is in third with 3,242 MW followed by Virginia with 2,587 MW.

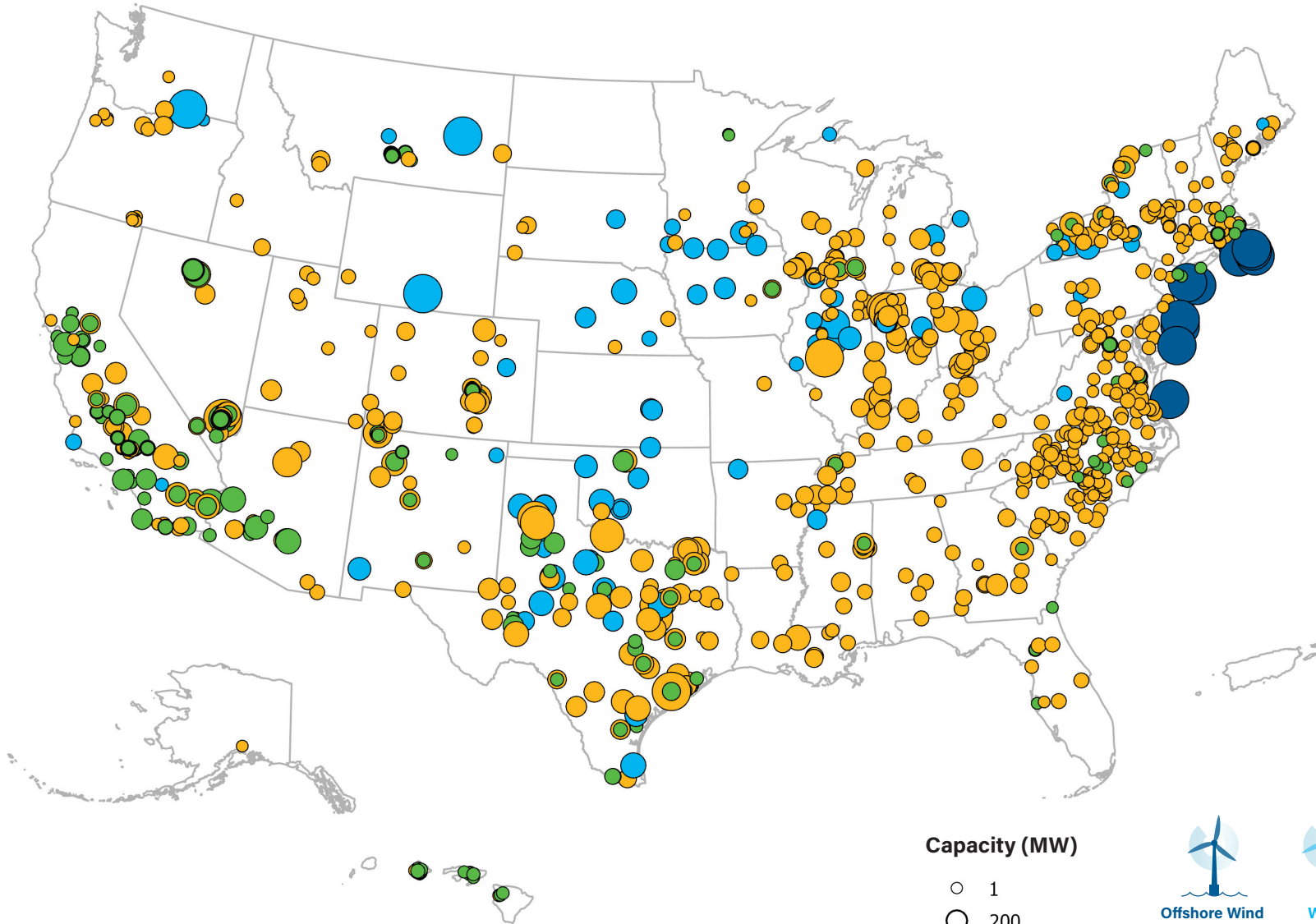
Solar

- Nearly 60% of the clean power pipeline is solar, with 78,181 MW in development.
- Solar capacity in the pipeline increased 6% compared to last quarter, an improvement from the 6% decrease the industry experienced between Q1 and Q2 of this year, though still much slower than the 15% quarterly growth experienced in 2021.
- All but two states, North Dakota and Kansas, currently have solar projects in development. Texas leads with 14,828 MW of solar in development, constituting 19% of the solar pipeline. California follows Texas with 7,050 MW in development, and Indiana is a close third with 6,264 MW of solar in development.

Battery Storage

- As of the end of September, there were 14,265 MW/36,965 MWh of storage capacity in development. Of that, approximately 72% is part of a hybrid project. The proportion of clean power-paired storage to standalone storage capacity in the pipeline is much higher compared to the operating fleet, where only 48% is part of a hybrid project.
- This quarter, the storage pipeline decreased by 2%, a drop from the 2% increase the storage pipeline experienced last quarter. This is far from the 20% average quarterly growth that occurred in 2021.
- California dominates the battery storage pipeline with 5,474 MW in development, 38% of the total pipeline. Texas (2,742 MW), Nevada (1,473 MW), and Arizona (1,356 MW) join California with more than 1 GW of battery storage in development. In total, 23 states have battery storage capacity in development, including 14 that have 100 MW or more in the pipeline.

Projects in pipeline



Capacity (MW)

- 1
- 200
- 400
- 600 or more



Offshore Wind



Wind



Solar

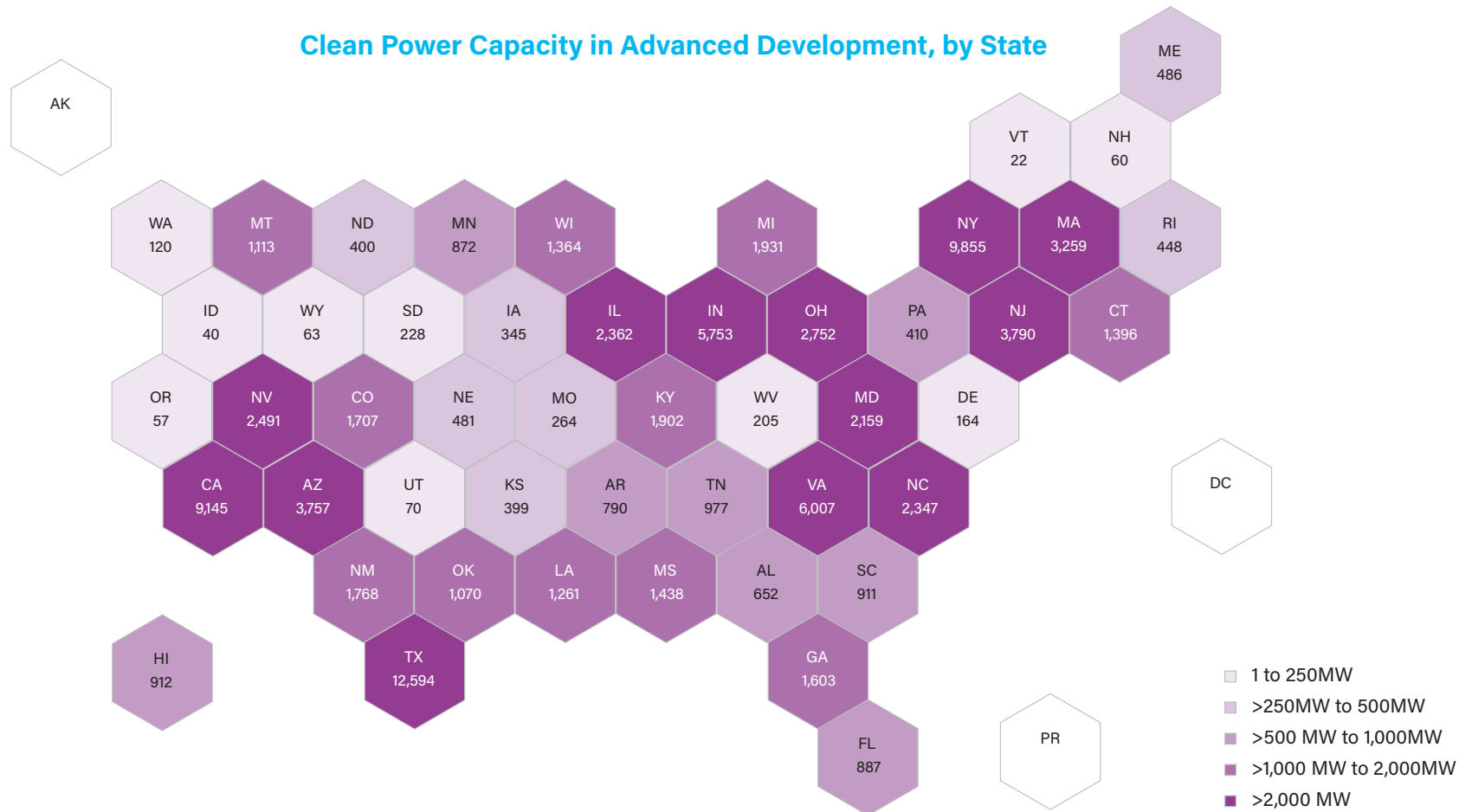


Energy Storage

Advanced development activity

- The advanced development pipeline of 93,087 MW spans 49 states and 767 project phases. Capacity in advanced development has increased 6% compared to last quarter.
- Texas had the most capacity enter the advanced development phase this quarter (1,813 MW) and has the most total clean power capacity in advanced development, 12,594 MW. The Lone Star State also leads the nation for solar and land-based wind capacity in advanced development. New York ranks second for total capacity in advanced development at 9,855 MW and leads for offshore wind capacity in development. California, the nation's leader for battery storage capacity in advanced development, ranks third overall with 9,145 MW in advanced development.
- By technology, the advanced development pipeline is comprised of 55,704 MW (60%) of solar capacity, 17,502 MW (19%) offshore wind, 9,411 MW (10%) land-based wind, and 10,471 MW (11%) battery storage.

Clean Power Capacity in Advanced Development, by State



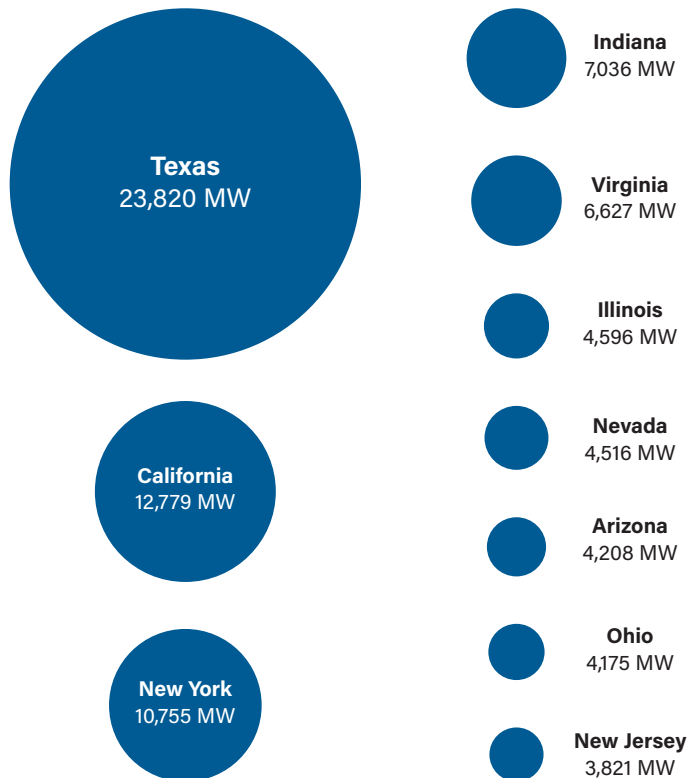
Offshore wind capacity is attributed to states based on the state that awarded ORECs or PPAs to the projects.

CLEAN POWER CAPACITY GROWTH

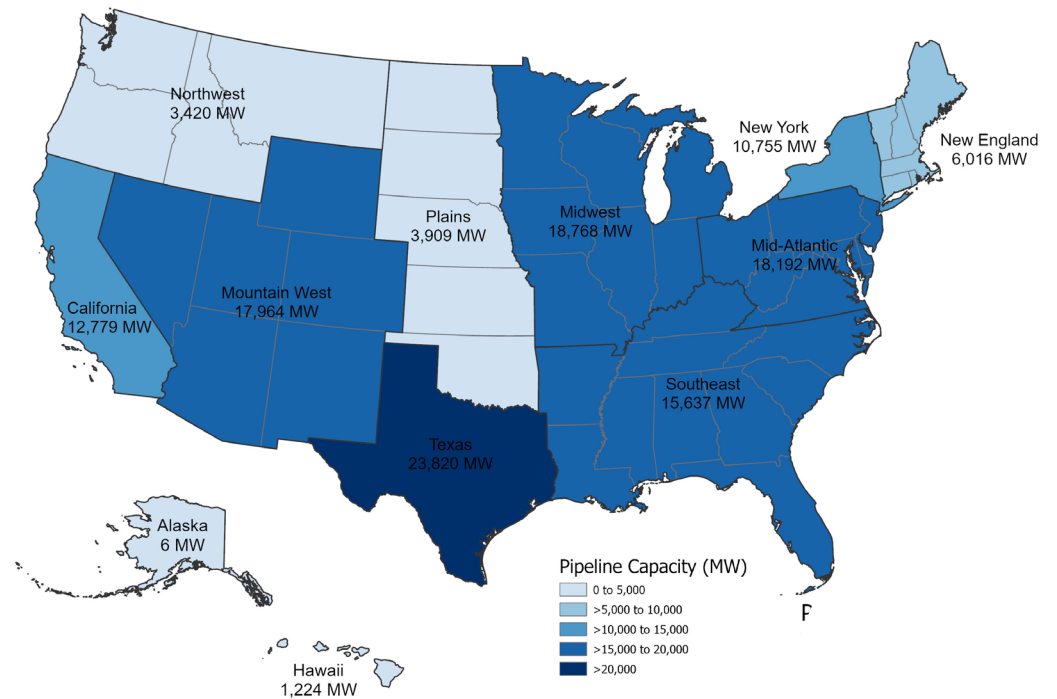
Clean power pipeline by state and region

- There are 132,491 MW of clean power capacity in development across all 50 states.
- Texas and California, which also lead the country for operating clean power capacity, sit at the top of the pipeline, with 23,820 MW and 12,779 MW in development, respectively. New York, which ranks 23rd for total operating capacity, sits in third for capacity in development at 10,755 MW. Iowa, which ranks third for total operating capacity, is only 32nd for capacity in development.
- Texas and the Midwest have both the most capacity operating and in development. The Mid-Atlantic, Mountain West, and Southeast, which rank eighth, fifth, and sixth respectively for operating capacity, are third, fourth, and fifth for capacity in development, showing potential to move up in the operating rankings in the future.

Top States with Capacity Under Construction and in Advanced Development



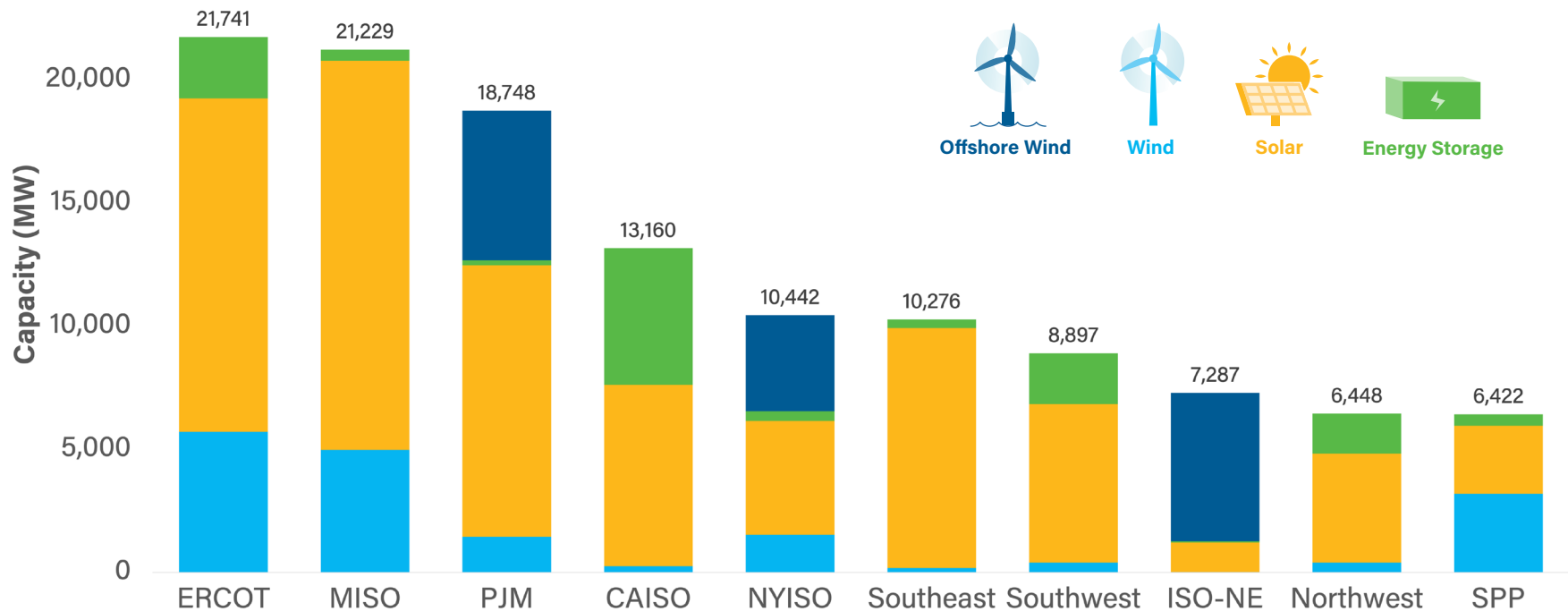
Capacity Under Construction and in Advanced Development by Region



Regional market clean power pipeline

- ERCOT has the most clean power capacity in development at 21,741 MW. The total capacity in development within Texas, 23,820 MW, is slightly larger. MISO is close behind ERCOT with 21,229 MW in development, followed by PJM (18,748 MW), and CAISO (13,160 MW).
- PJM, NYISO, and ISO-NE all have 3.9 GW or more of offshore wind capacity in development. Offshore wind makes up 83% of capacity in development in ISO-NE, 37% in NYISO, and 32% in PJM.
- On average, solar comprises 59% of development capacity across all the regions. Almost all, 95%, of the non-ISO Southeast's pipeline is solar, followed by MISO, whose pipeline is 74% solar. Solar makes up the smallest portion of the pipeline in ISO-NE at 16%.
- SPP is the only region where the majority of the pipeline is land-based wind capacity.

Pipeline capacity by RTO/ISO

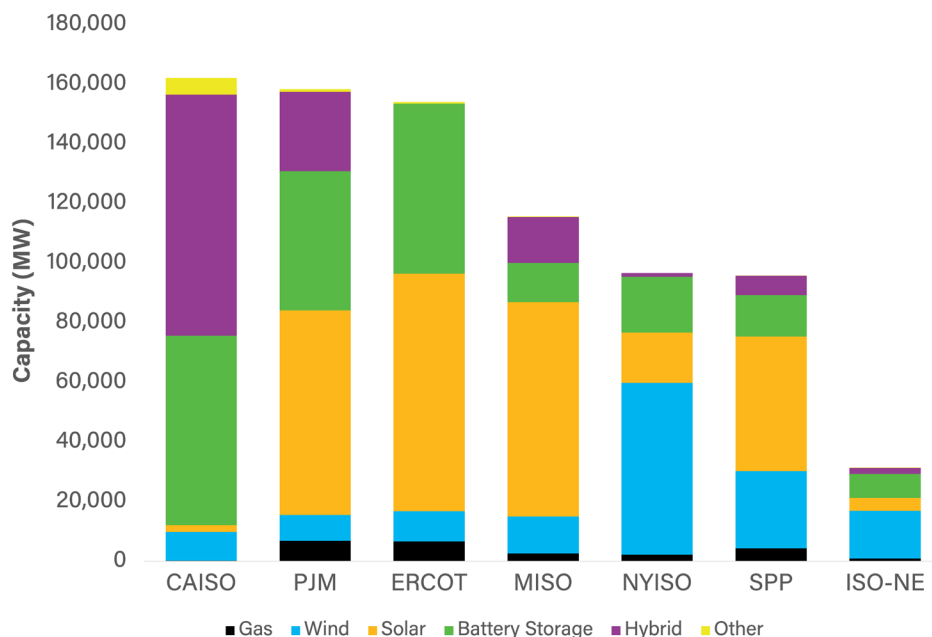


CLEAN POWER CAPACITY GROWTH

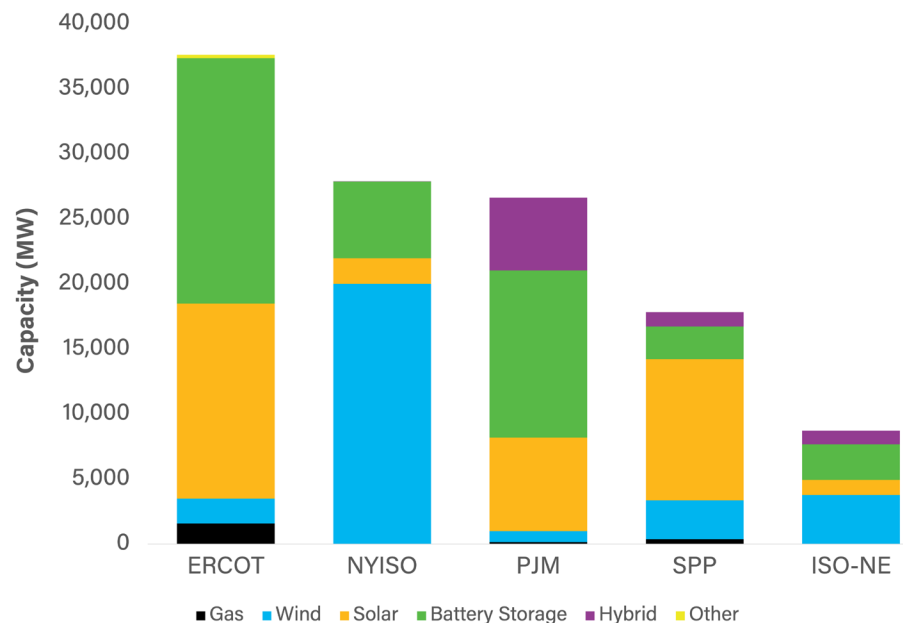
Interconnection Queues

- Examination of the interconnection queues provides a forward look at the larger clean power development landscape, including projects that are too early in development to qualify as advanced development under ACP's methodology.
- CAISO leads all RTO/ISOs with over 162 GW of capacity in its interconnection queue. PJM and ERCOT follow with 158 GW and 154 GW, respectively.
- Solar projects are the most popular in PJM, ERCOT, MISO, and SPP. In CAISO, hybrid projects dominate. However, 90% of the hybrid projects in CAISO's queue are PV solar plus battery storage projects.
- CAISO also leads in standalone battery storage capacity in the queue with roughly 64 GW waiting to be interconnected. ERCOT and PJM follow with 57 GW and 47 GW of battery storage capacity in their queues, respectively.
- In NYISO and ISO-NE, wind projects make up the majority of capacity in the queue, driven, in part, by offshore wind projects off New York and New England.
- This year, nearly 38 GW of projects have been added to the interconnection queue in ERCOT followed by 28 GW in NYISO and 27 GW in PJM.
- Data for CAISO and MISO covering 2022 is not yet available.

Capacity in Interconnection Queues



Capacity Added to Interconnection Queues in 2022



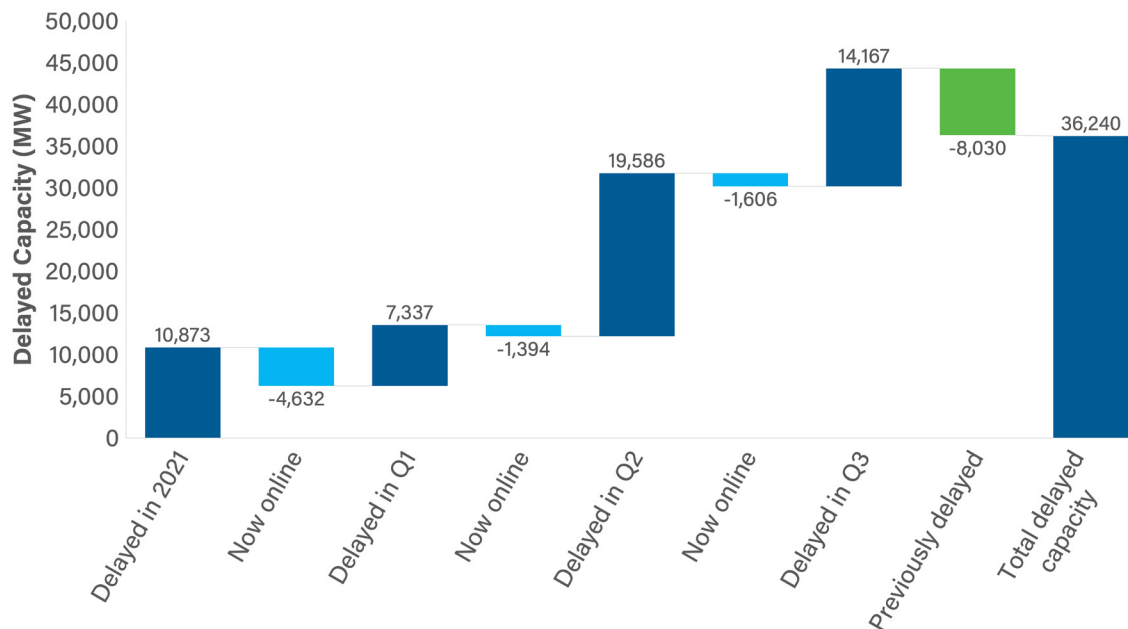
Source: RTO/ISOs

CLEAN POWER CAPACITY GROWTH

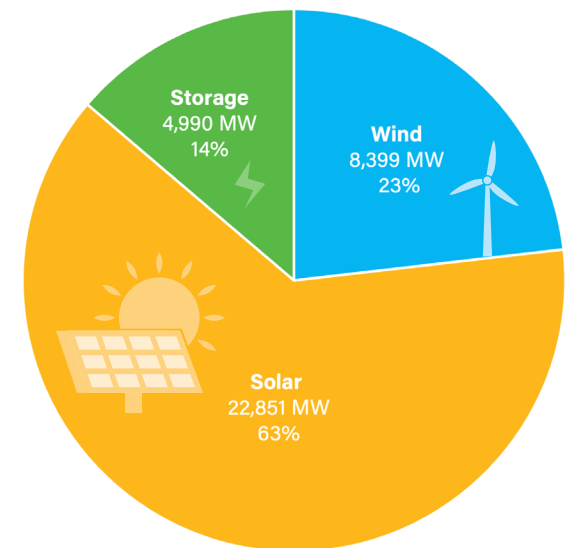
Clean power project delays

- Delayed clean power capacity continued to mount from July to September. Nearly 14.2 GW of capacity experienced delays this quarter, of which 6.5 GW was expected to come online this quarter. The remaining 7.7 GW was initially expected online between the last quarter of 2022 and 2024.
- Of the 14.2 GW delayed, more than half, 8 GW, has experienced previous delays. Additionally, less than half of the delayed capacity initially expected online this quarter is expected to be operational by the end of the year. The majority of the rest of the delayed capacity is now expected online next year, though a few projects have experienced more significant delays.
- Capacity delayed in previous quarters is still yet to come online. Of the 37.7 GW delayed between the end of 2021 and the second quarter of 2022, only 7.6 GW has since come online. Total delayed capacity has now reached 36.2 GW.
- Solar, which makes up the majority of the pipeline, also accounts for the bulk of delays at 63%. This is primarily due to an inability to obtain panels to complete projects as a result of trade restrictions.
- Wind represents 23% of total delays. Causes of wind delays range from on-going supply chain constraints to grid interconnection delays. Battery storage projects are the least affected, making up just 14% of delays. Most delayed storage projects are co-located with delayed solar projects.
- In addition to capacity that has been delayed, more than 3.5 GW of clean power capacity has been terminated since the end of 2021.

Clean Power Project Capacity Delayed



Total Clean Power Capacity Delayed, by Technology





Clean Power Policy Impact

Passage of an unprecedented national commitment to clean power – the Inflation Reduction Act

Signed into law on August 16th, the Inflation Reduction Act represents the single largest investment in renewable power in the history of this country, and the largest investment in climate action to date.

The bill extends the production tax credit and investment tax credit for wind and solar through 2024 before transitioning to a technology-neutral tax credit that will remain in place until 2032 or when electric-sector emissions fall to 75% of 2022 levels, whichever is later. Energy storage, for the first time, is made eligible to qualify for the investment tax credit, while domestic manufacturing of clean energy components is incentivized through component-specific production tax credits and an expansion of the 48(c) advanced manufacturing tax credit. ACP's preliminary assessment of the IRA is that its policies will deliver an estimated 525 to 550 gigawatts (GW) of new, utility-scale clean power from 2022-2030. As a result, we now expect there will be roughly 750 GW of operating clean power capacity in 2030. With stable policies in place, we expect annual wind, solar, and energy storage capacity installations to grow to over 90 GW by the end of the decade, more than tripling the 28 GW installed in 2021.

The pace of clean energy installations is expected to quicken over the course of the decade with the IRA's provisions. By mid-decade, annual installations are expected to reach more than 50 GW before climbing further to over 90 GW by decade's end. For comparison, the average industry forecasts under business-as-usual conditions anticipate 335 GW of new clean power additions, with the most prolific year clocking just under 50 GW installed.

Building 525-550 GW of new clean power capacity will generate \$550 to \$600 billion in capital investment. More broadly, construction of these projects is expected to generate over \$900 billion in economic activity and add nearly \$500 billion to U.S. GDP across the decade. After construction, ongoing maintenance and operations will contribute over \$14 billion to U.S. GDP each year while generating nearly \$29 billion in annual economic activity.



The Inflation Reduction Act *(continued)*

Investment Tax Credit

Wind, solar, energy storage

- Credits available for 30% of project cost
- Phase-out begins in latter of 2032 or when emissions fall to 25% of 2022 levels
- Projects must meet prevailing wage and apprenticeship requirements

Production Tax Credit

for renewable or zero-carbon electricity

- Available for the first 10-years of asset operating life
- \$27.50/MWh for wind and solar
- Phase-out begins in latter of 2032 or when emissions fall to 25% of 2022 levels
- Projects must meet prevailing wage and apprenticeship requirements

PTC & ITC Bonus Credits

ENERGY COMMUNITIES

10% bonus for projects located on brownfield sites or fossil fuel communities with high unemployment

DOMESTIC CONTENT

10% bonus for meeting certain domestic content requirements

LOW-INCOME COMMUNITIES

10% bonus for projects <5 MW located in low-income communities or on tribal lands

Bonus credits are stackable

Manufacturing Credits

PTC for specific solar, wind, and battery storage components

Clean Hydrogen PTC

Up to \$3 per kilogram depending on carbon intensity. Available for first 10-years of operating life

Transferability

Monetization of tax credits is enabled by allowing entities to sell the credits to unrelated parties

\$5 BILLION

to DOE to support retooling and repowering of generation and transmission facilities

\$2 BILLION

to DOE for loans financing transmission projects of national interest

\$760 MILLION

to DOE for state grants targeting transmission line siting

\$395 MILLION

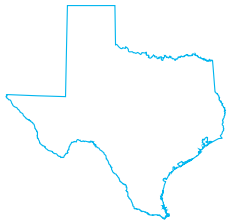
across DOE, FERC, DOI, and NOAA to hire personnel to permit projects

\$100 MILLION

to DOE to study interregional and offshore wind transmission

OCSLA extended to U.S. territories for offshore wind

State policy roundup



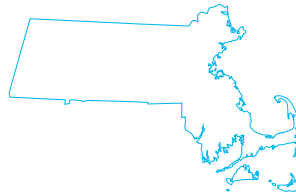
Texas

The Public Utility Commission of Texas (PUCT) adopted expanded weather preparation rules for electricity generators and transmission utilities to enhance grid reliability during both summer and winter weather events. The rules build on the winter weather preparation requirements adopted by the PUCT in November 2021 and add new summer requirements

to begin in June 2023. In addition to extending current winter weather preparation requirements into the future, the rule adopts specific temperature standards for ten distinct areas of the state and establishes minimum and maximum temperatures at which owners of electric generation and transmission entities need to prepare their facilities to be able to operate. These temperature standards go into effect in 2023.

Massachusetts

Governor Baker signed new clean energy legislation into law which eliminates the price cap for offshore wind and removes investor-owned utilities from the bid selection process. The bill also reduces barriers to solar installations in agricultural areas and asks the State to issue recommendations to add more storage capacity to the grid. Pending the study, the State could issue solicitations for up to 4,800 gigawatt-hours of storage. Finally, the bill permits the Department of Energy Resources to work with other New England states to build new transmission capacity and to upgrade existing infrastructure.



New York

Governor Kathy Hochul announced a competitive solicitation calling for 2,000 MW or more of new large-scale renewable energy projects, that New York State operations would be 100% renewable by 2023, and for the \$50 billion in state agency investments, net zero investment portfolios by 2040.

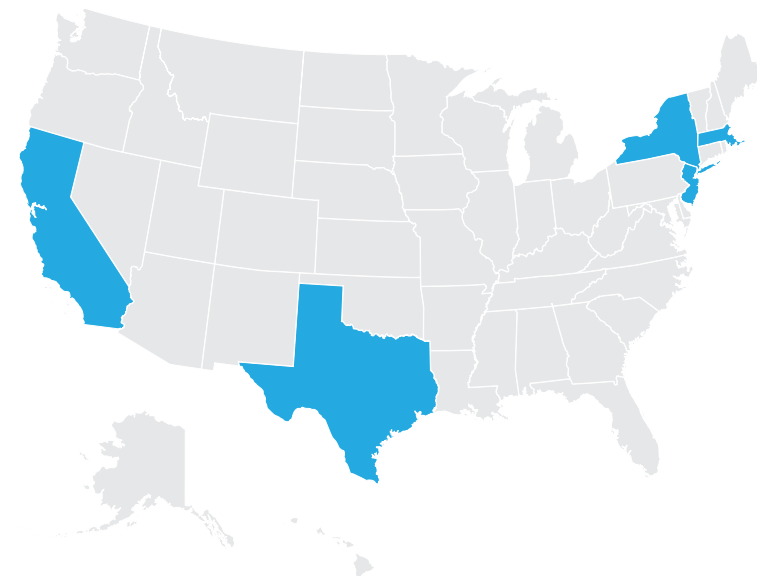


New Jersey

Governor Phil Murphy announced an executive order increasing the State's offshore wind goal to 11,000 MW by 2030 and directed the State's Board of Public Utilities to look at feasibility of future offshore wind increases.

California

Governor Gavin Newsom spearheaded a major climate and clean energy package in August that codifies California's net-zero goal by 2045, accelerates the State's zero-carbon electricity targets, and makes unprecedented investments in clean energy technologies such as long-duration storage (\$140M) and green hydrogen (\$100M). The package also invests in critical infrastructure such as new transmission (\$200M) and upgrading California's ports (\$45M) to deliver on the goal of building 25 GW of offshore wind by 2045 that the state adopted on August 10.

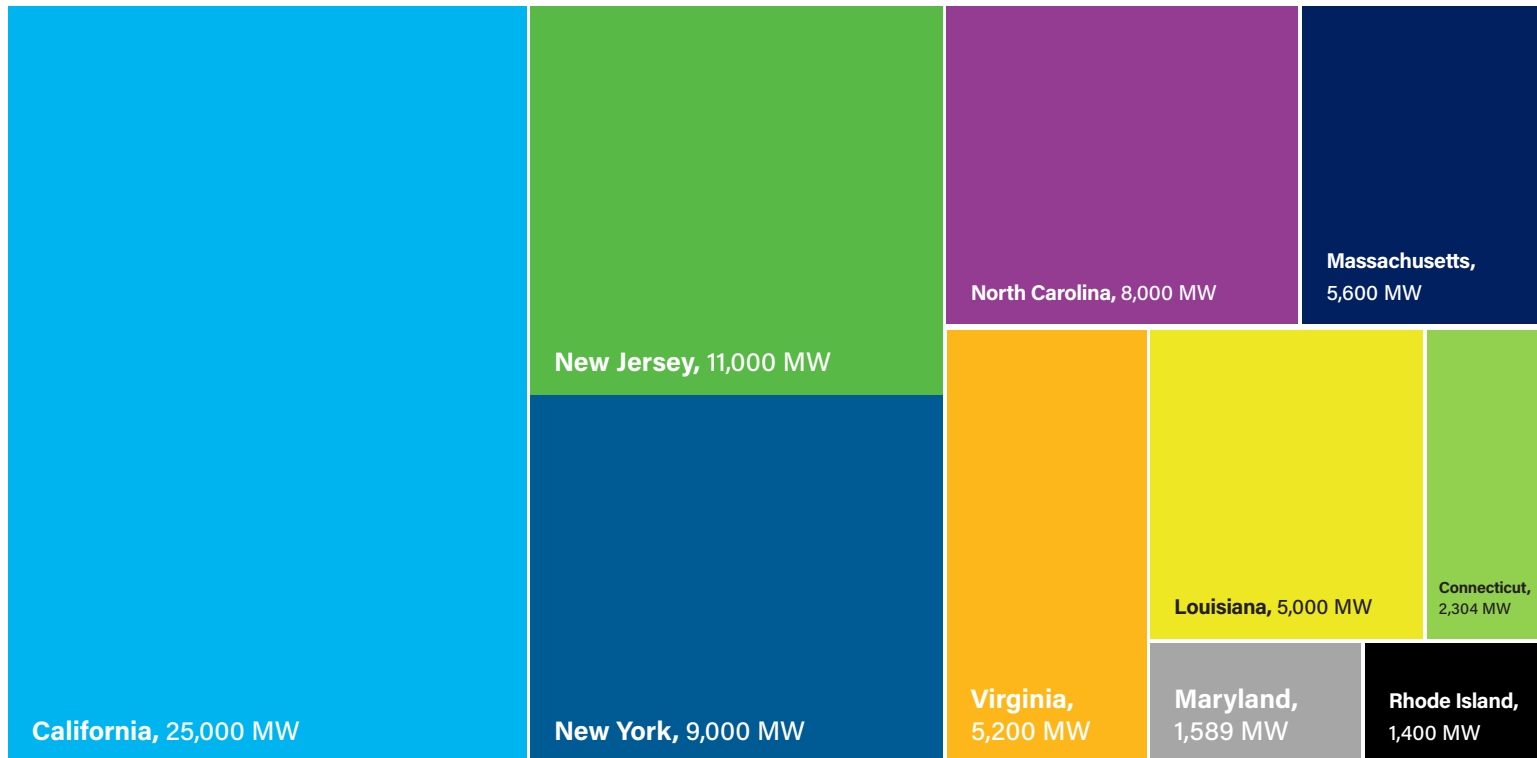


OFFSHORE WIND ACTIVITY

State Updates

- On July 27th, New York released a Request for Proposals (RFP) for the state's third offshore wind solicitation. The solicitation calls for at least 2,000 MW of offshore wind and includes a \$500 million investment in offshore wind ports, manufacturing, and supply chain infrastructure.
- On August 10th, the California Energy Commission (CEC) adopted a report establishing offshore wind goals for the state of California. The report sets planning goals of 2 – 5 GW of offshore wind by 2030 and 25 GW by 2045.
- At the start of September, five New England states (Connecticut, Massachusetts, Maine, New Hampshire, and Rhode Island) released a joint Request for Information (RFI) seeking comment on an initiative to integrate offshore wind and other resources in a cost-effective, reliable, and efficient manner.
- On September 21st, New Jersey Governor Phil Murphy announced an executive order increasing the state's offshore wind goal by nearly 50% to 11 GW by 2040. The executive order, which built on the original state goal of 7,500 MW by 2035, also directs the State's Board of Public Utilities to study the feasibility of increasing the target further.
- To date, ten states have combined to set offshore wind procurement targets totaling more than 74,000 MW .

Offshore Wind State Targets

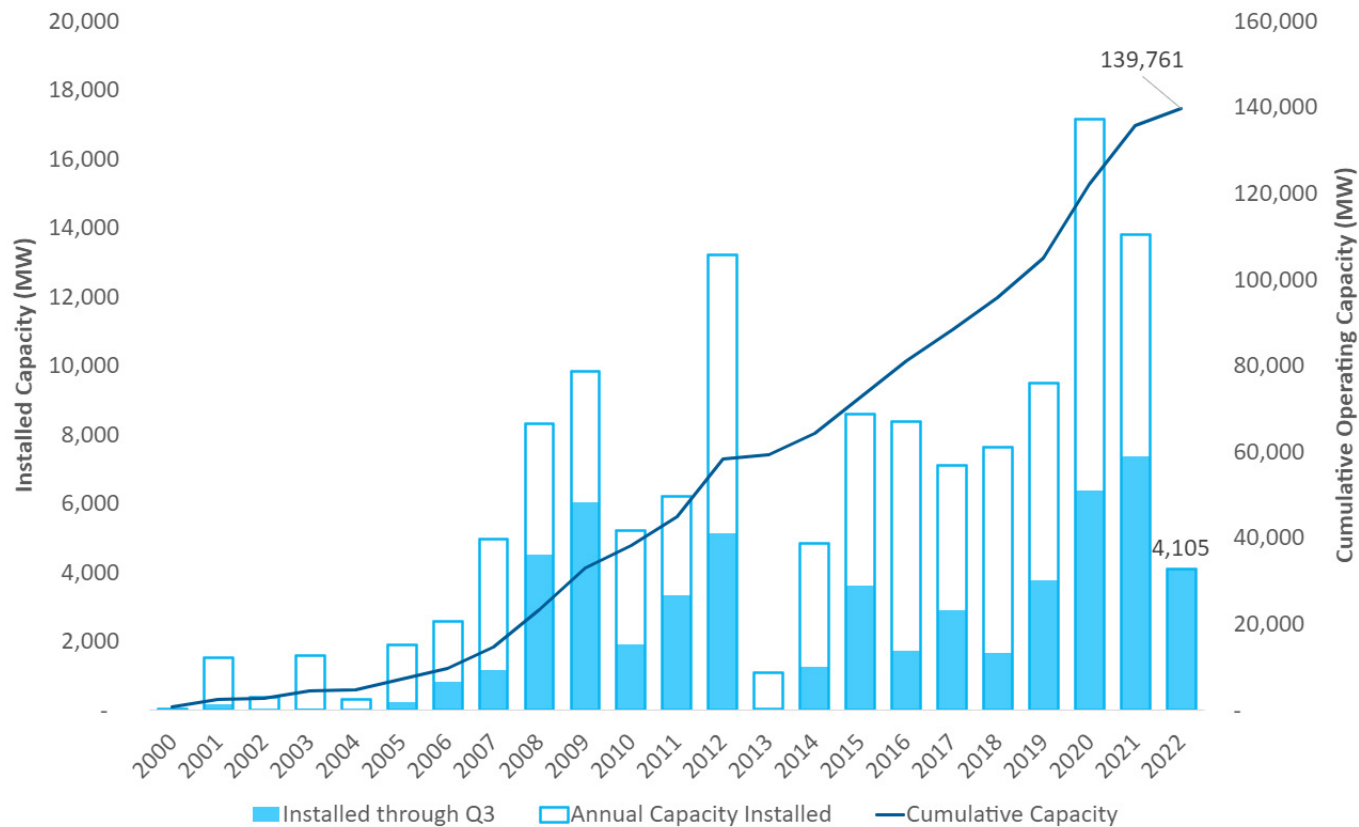


LAND-BASED WIND ACTIVITY

Lowest third quarter for wind in nine years

- In the third quarter, developers commissioned two wind projects totaling 356 MW, making it the lowest third quarter for the wind industry since 2013. Total 2022 installed wind capacity is now 4,105 MW.
- Compared to the third quarter of 2021, installations were down 78%. This is due in part to supply chain-induced project delays and delays in grid interconnections. More than 1.1 GW of land-based wind capacity expected to come online this quarter was delayed. Most of these projects are still expected to be online by the end of the year.
- So far in 2022, the grid has added 4,105 MW of wind power, bringing cumulative land-based wind operating within the U.S. to 139,761 MW.
- The average size of project phases installed in the first nine months of 2022 was 417 MW, up significantly from an average size of 234 MW in 2021, and 258 MW in 2020. Traverse Wind, which came online in the first quarter and has a capacity of over 997 MW, drives up this average.
- The largest project to start commercial operation this quarter was Enel's 350 MW Azure Sky project in Texas. The project is powered by both Vestas and Nordex turbines.

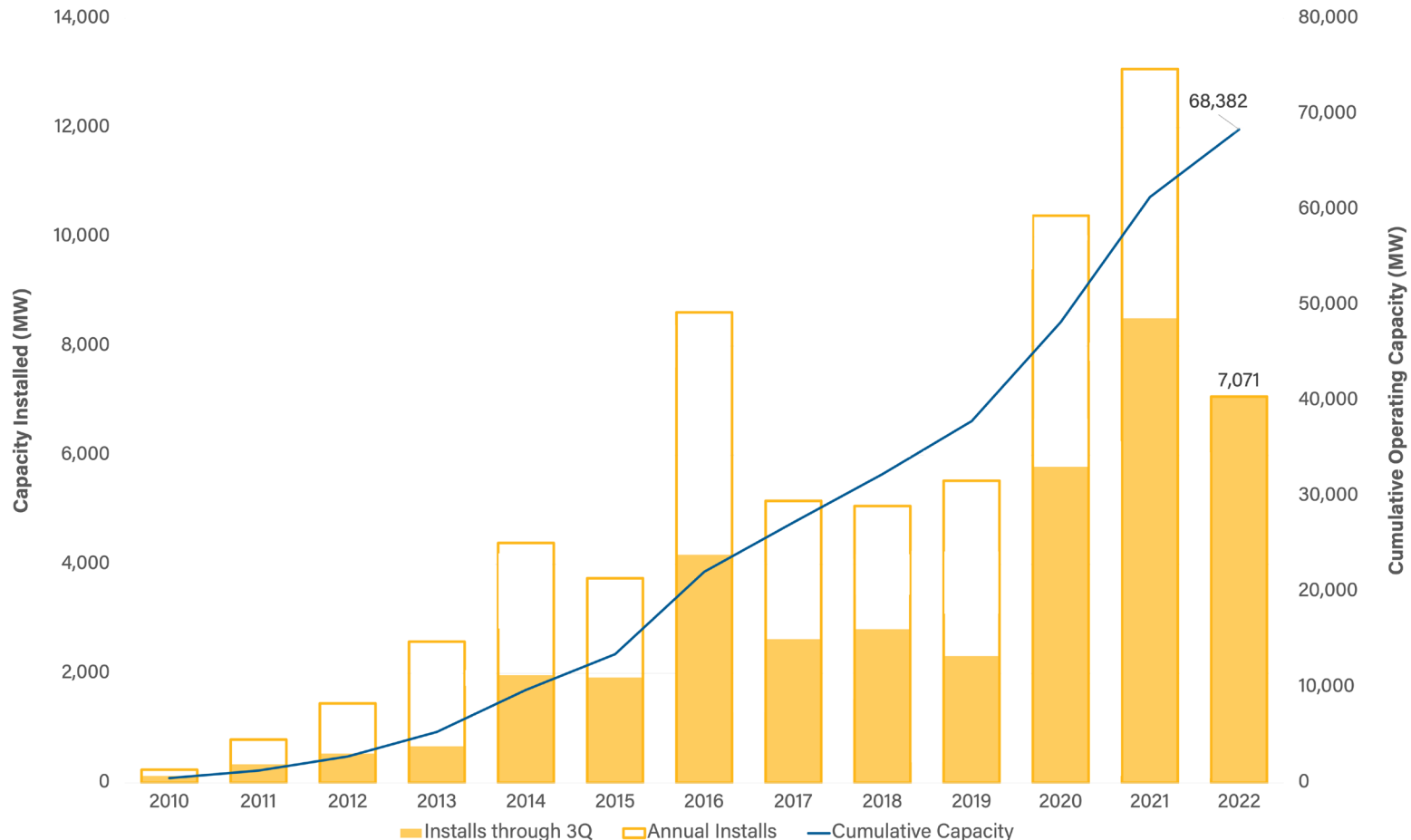
U.S. Annual and Cumulative Land-based Wind Capacity Growth



Lowest quarter for solar in two years

- With 1,877 MW commissioned, Q3 of 2022 was the lowest quarter the solar industry experienced since the third quarter of 2020. Quarterly installs were down 23% compared to the same period last year, and YTD installs decreased 17%.
- Despite a slow quarter, 2022 is still the second highest year for installations through the third quarter, trailing only 2021. Yet, 2022 was previously expected to be a banner year for solar, prior to import detentions that have prevented projects from progressing towards completion.
- Total 2022 solar installs sum to 7,071 MW, bringing total operating utility-scale solar capacity in the country to 68,382 MW.
- All fifty states and the District of Columbia currently host operating utility-scale solar farms.
- Projects installed in the third quarter had an average inverter loading ratio (ILR) of 1.32, on par with 2021 and 0.1 lower than the rest of 2022 solar projects. Projects in the pipeline have a weighted average ILR of 1.32.

U.S. Annual and Cumulative Utility Solar Power Capacity Growth



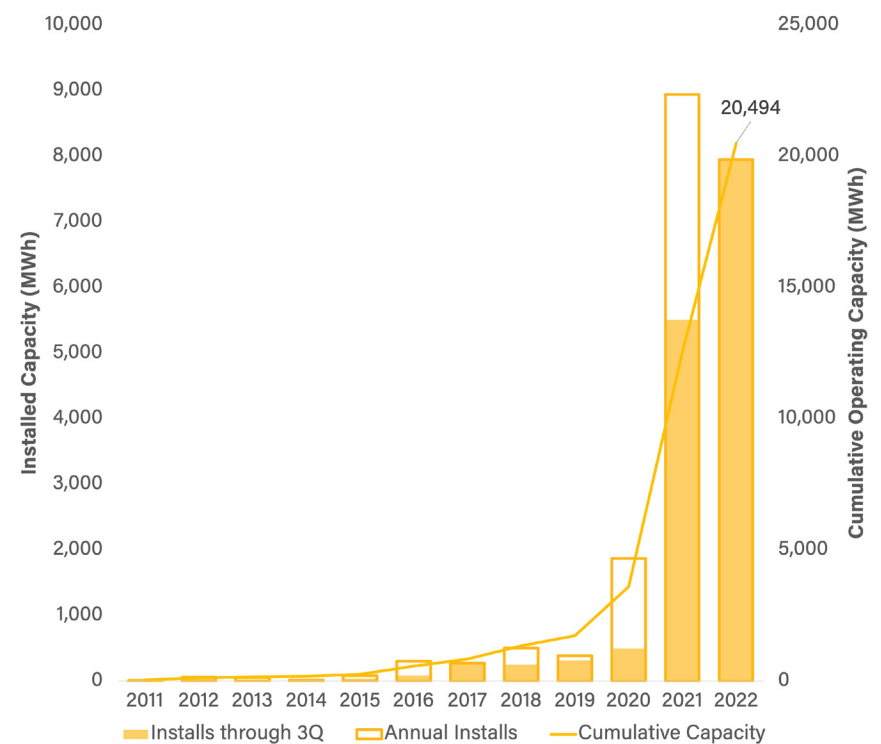
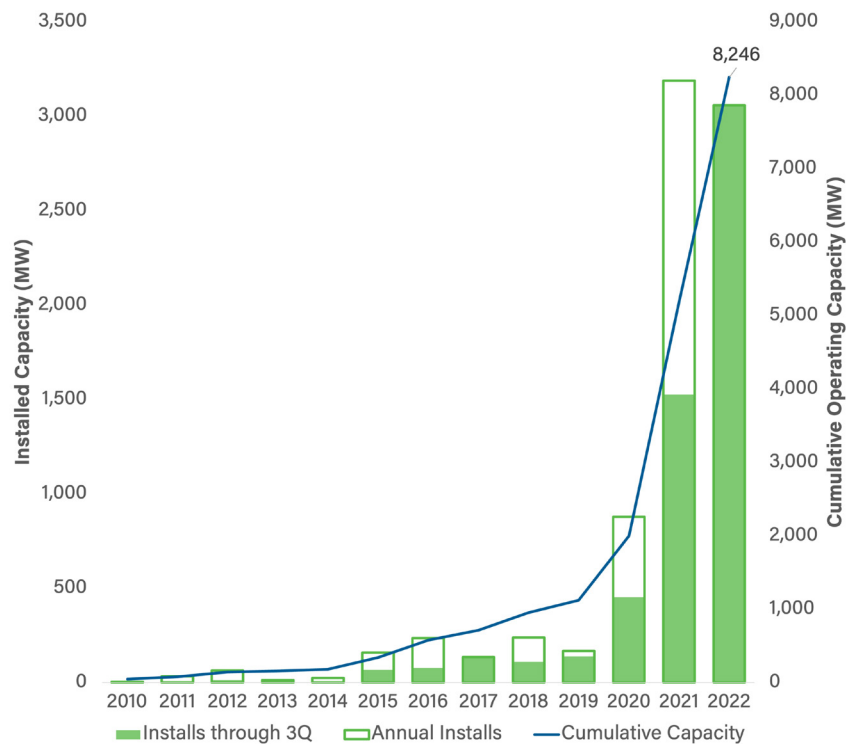
UTILITY-SCALE BATTERY STORAGE

Second highest quarter for battery storage installations

- Battery storage capacity is tracked in terms of rated power capacity (MW), the total maximum possible instantaneous discharge, and energy capacity (MWh), the maximum amount of stored energy.
- The third quarter of 2022 was battery storage's second strongest quarter to date behind the last quarter of 2021. Developers commissioned 17 battery storage projects with a total capacity of 1,195 MW/ 2,774 MWh. Total 2022 installed capacity is now 3,059 MW/ 7,952 MWh.
- The 17 storage projects installed this quarter are almost evenly split between hybrid and standalone, with eight being standalone and nine paired with another technology. However, 68% of capacity commissioned is part of

- a hybrid project. This is a good margin higher than the proportion of all operating storage capacity that is co-located, which stands at 48%.
- Battery storage deployments are 3.3x higher than the same period last year. YTD, storage capacity commissioned has doubled compared to the first three quarters of 2021.
- The largest standalone storage project to commission this quarter was the Lancaster Battery Storage Project. Owned and developed by AES, the 127 MW California storage project has a duration of four hours, for a total energy capacity of 508 MWh.

U.S. Annual and Cumulative Utility Battery Storage Capacity Growth



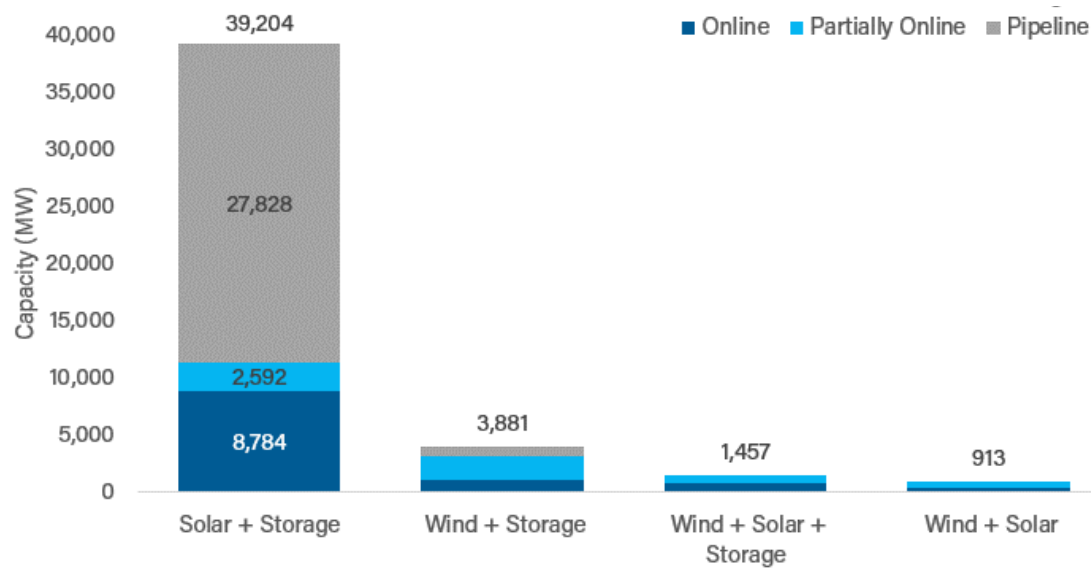
ACP is able to determine the MW capacity for all battery storage projects tracked, but the storage energy capacity cannot be determined for 6% of operating projects.

HYBRID PROJECTS

2.9 GW of new hybrid capacity commissioned

- In the third quarter, 2,874 MW of hybrid clean power capacity was installed, of which 2,524 MW was solar + storage and 350 MW was wind + storage. This is the first time wind + storage project capacity has come online since the second quarter of 2020.
- Across the country, 11,003 MW of hybrid projects are fully operational, meaning all phases and technologies included in the project are operating. An additional 5,809 MW are partially online, meaning one or more phases/technologies are operating, but other phases or technologies within the project are still under development. Finally, 28,642 MW of hybrid projects are currently in the pipeline.
- The hybrid pipeline is 97% solar + storage capacity and 3% wind + storage. There are no projects combining wind and solar or all three technologies in the pipeline, though 536 MW and 701 MW of each hybrid type is partially online.
- This quarter, Enel commissioned the wind portion of the Azure Sky Wind + Storage Project, at 350 MW in Texas. The 123 MW/ 189 MWh storage portion of the project is expected online by the end of the year.
- NextEra has brought online two of the three phases of the Arlington (Riverside County Solar) Project. 231 MW of solar capacity along with 242 MW/ 968 MWh of storage capacity came online this quarter, and an additional 133 MW of solar capacity is still in development.
- Miliani 1 is the first solar + storage project to reach commercial operations on the island of O’ahu. The project includes 39 MW of solar and 39 MW/156 MWh of battery storage capacity.

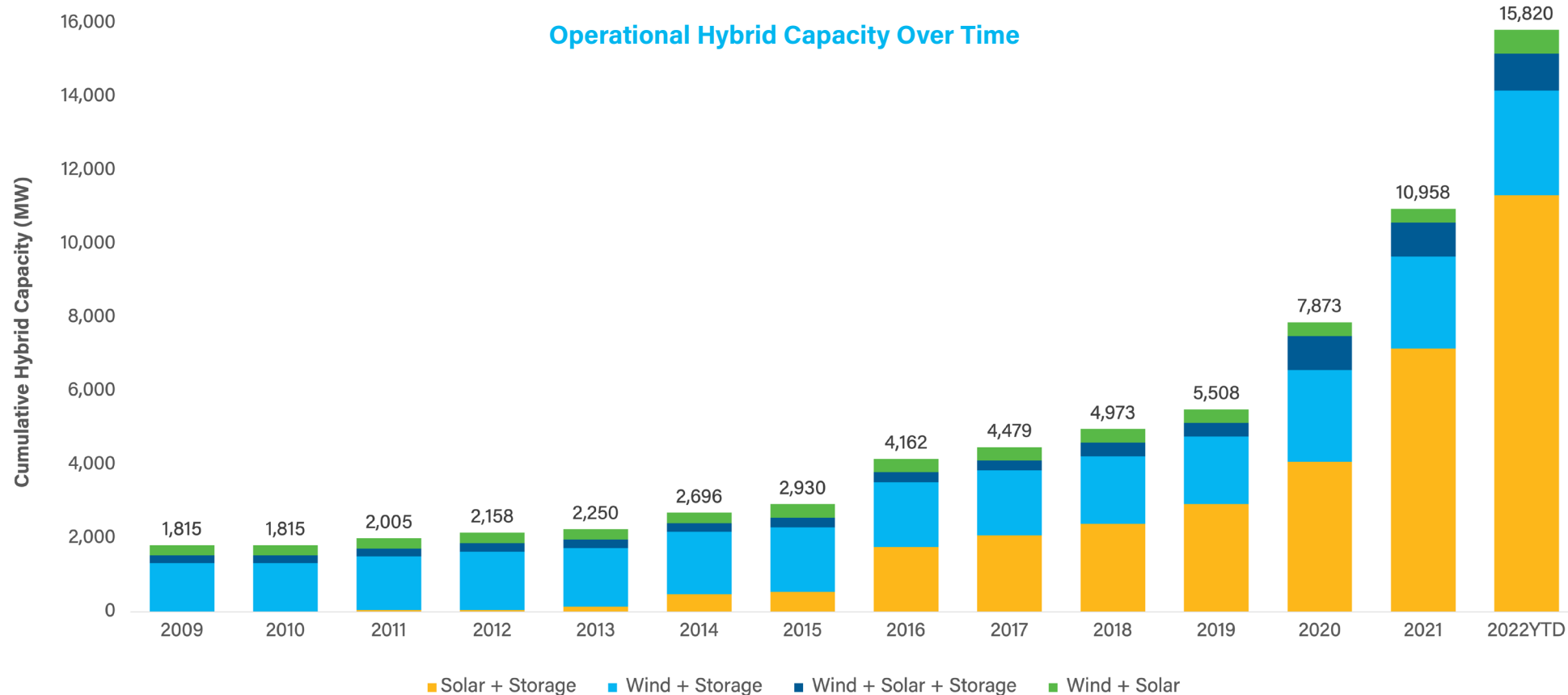
Hybrid Clean Power Projects



HYBRID PROJECTS

Over 15.5 GW of hybrid capacity online

- Operating hybrid capacity, including fully operational projects and phases of projects that are operating, is now 15,820 MW. Operating hybrid capacity increased 20% since the end of the second quarter and 44% since the end of 2021.
- Over the past five years, operating hybrid capacity has increased 30% annually on average.
- Almost 75% of all operating hybrid capacity is part of a solar + storage project. That percentage has increased by an average of 7% each year over the past decade. Wind + storage, which represented almost 75% of operating hybrid capacity a decade ago, now makes up 18% of operational capacity.
- There are 11,326 MW of solar + storage capacity operating, 2,843 MW of wind + storage, 1,007 MW of wind + solar + storage capacity, and 377 MW of wind + solar project capacity operating.
- NextEra is the top owner of hybrid capacity with 4,449 MW online. Enel, RWE, and Energy Capital partners follow, all with more than 1 GW of hybrid capacity operating.





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