

# U.S. energy storage monitor

Q3 2022 executive summary

Wood Mackenzie Power & Renewables/American Clean Power Association | September 2022



A Verisk Business

## About this report

**The U.S. energy storage monitor** is a quarterly publication of Wood Mackenzie Power & Renewables and the American Clean Power Association. Each quarter, we gather data on U.S. energy storage deployments, prices, policies, regulations and business models. We compile this information into this report, which is intended to provide the most comprehensive, timely analysis of energy storage in the U.S.

### Notes:

- All forecasts are from Wood Mackenzie Power & Renewables; ACP does not predict future pricing, costs or deployments.
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## Executive summary

### Q2 saw impressive grid-scale and residential storage volumes – and ongoing procurement challenges

#### **In Q2 2022, the U.S. grid-scale energy storage segment installed 1,170 MW/2,608 MWh, for the largest Q2 on record**

- Grid-scale storage was bolstered by a series of deployments in Texas, with the state contributing 60% of installed capacity this quarter. Despite impressive growth, the pipeline continues to face rolling delays into 2023 and beyond.
- Over 1.1 GW of projects originally scheduled to come online in Q2 were delayed or cancelled – though 61% of this capacity, 709 MW, is still scheduled to come online in Q3 or Q4 2022. Supply chain issues, transportation delays, and interconnection queue challenges were the main drivers of project COD delays.
- Solar procurement issues related to the UFLPA case and the AD/CVD tariff suit from last quarter negatively impacted the 2022 forecast for grid-scale hybrid deployment. Though tariffs have been paused, the solar industry continues to wrestle with UFLPA issues, resulting in continued procurement hesitation.

#### **The residential segment executed another record quarter with 154 MW/375 MWh installed, beating the previous quarterly record (334.1 MWh in Q1 2022)**

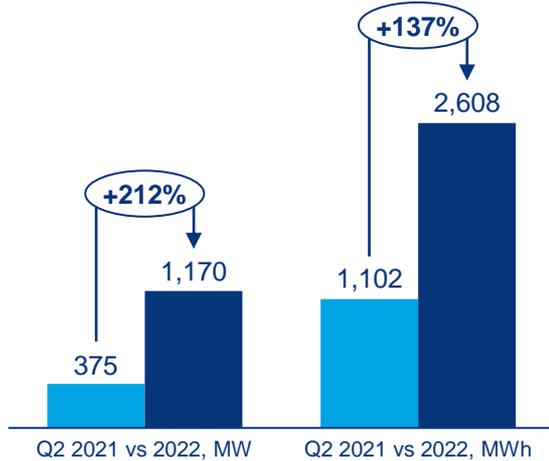
- Demand is rising in the residential segment with over 150MW of residential storage installed for the first time, but ongoing supply shortfalls and rising prices have suppressed deployment. New solar installers continue to add storage to their product offerings, despite ongoing procurement issues.
- As assumed in previous reports, the solar ITC extension is good news for the residential storage industry, preventing a drop in residential solar-plus-storage installs that would have otherwise arrived in 2024. The standalone storage ITC will also boost storage retrofits on homes with existing solar.

#### **Community commercial and industrial (CCI) storage deployment continues to underwhelm relative to other market segments**

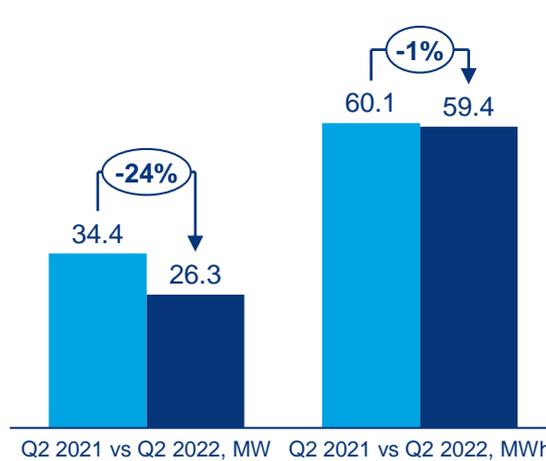
- The 26.3 MW/59.4 MWh of CCI storage installed in Q2 represents one of the least active quarters in recent memory for the segment, with less capacity installed in MW terms than any quarter since 2019. Procurement challenges are compounding the long-term problem of lackluster project economics in the segment.
- June's stay of the AD/CVD petition was welcome news for the commercial solar industry, but the storage forecast has been downgraded for the year tied to tenacious procurement challenges and rising prices.

# Q2 2022 U.S. energy storage deployments scorecard

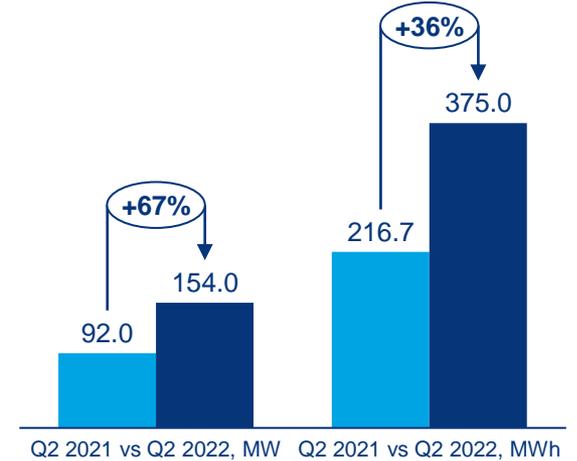
Grid-scale segment, YoY changes



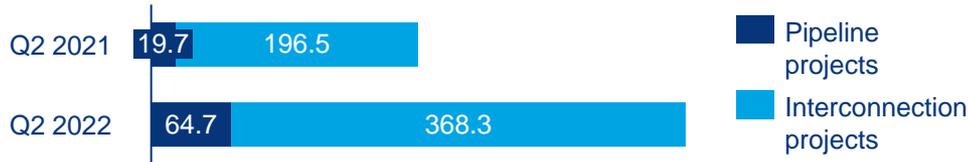
CCI segment, YoY changes



Residential segment, YoY changes



Grid-scale segment pipeline (GW), YoY changes



Grid-scale battery system price (\$/kW), YoY changes



## Scope of this report

**Capacity metrics:** The electric utility sector generally uses the term “capacity” to refer to power capacity (i.e., megawatts). We report energy storage capacity and deployments in power capacity (measured in watts) and energy capacity (measured in watt-hours). All of our data sources (details on data sources provided in the appendix), including program administrators, utility companies, utility commissions and system operators, currently track and report energy storage queue, deployments and interconnections in terms of power capacity: watts, kilowatts or megawatts. Wood Mackenzie Power & Renewables converts data in energy capacity (watt-hours, kilowatt-hours or megawatt-hours) using a mix of publicly available and survey data as well as by multiplying by discharge duration (hours). In keeping with industry convention, Wood Mackenzie Power & Renewables defines capacity in terms of the interconnected power capacity, not in terms of the flexible resource capability a given storage asset can provide (charging and discharging).

Please note that some projects are publicly announced based on flexible resource capacity. For these projects, the announced capacity may differ from our capacity totals.

**Historical deployment data:** This report is referred to in places as “Q3 2022” to reflect the release quarter, but it covers historical deployment data ending at the end of Q2 2022.

**Market size:** Market size is reported in megawatts (or kilowatts) and megawatt-hours (or kilowatt-hours) of deployments (i.e., interconnected and operational) by year and segment, as well as in U.S. dollars based on system price estimates and annual deployments.

**Technologies:** Electrochemical (batteries) and electromechanical technologies, excluding pumped hydro, are included in the historical deployment and forecast data. The FTM prices shown are for lithium-ion battery systems and do not include any special interconnection requirements and are not associated with specific projects being deployed in Q4 2021. Pricing data is considered sensitive by vendors and developers. This system-price data is instead an estimation for projects based on the results of the bottom-up cost survey from interviews with industry participants across the value chain, including battery vendors, system integrators, and developers.

## Energy storage market segment overview

We report energy storage capacity data in four segments: residential, community-scale, commercial & industrial, and grid-scale. To simplify this landscape, community and commercial & industrial projects are grouped together under the banner 'CCI' in many of our reports. Each category includes both standalone storage and hybrid (usually solar-paired) storage projects. All systems tracked are connected to the grid, though some may have islanding capability.

A **residential storage** installation is defined as a storage system installed at a residential, single-family household, with a residential offtaker.

The **commercial and industrial storage segment** includes all storage that does not have a utility or residential offtaker, as long as A.) it is located on the distribution (not transmission) system, and B.) it is not part of a community-scale program. The commercial and industrial segment includes both onsite and remotely net-metered projects with commercial, industrial, education, military, nonprofit, and other non-utility offtakers.

**Community-scale storage** projects are projects where solar-paired storage, or occasionally standalone storage, is brought online within a specific community-scale generation program. Community-scale programs in the US allow customers to subscribe to a project installed in their region and receive credits on their utility bills. Of the existing US community-scale programs, most only facilitate solar projects, with only a few are structured to also incentivize storage.

**Grid-scale storage** is defined as a project in which the offtaker of the power is a utility, a third party power supplier, or a commercial/industrial entity (only if the project is connected to the transmission system). Grid-scale storage is typically limited to projects over 1MW and excludes projects that are part of community-scale programs.

## Metrics, methodology and data sources

- **Metrics:** Wood Mackenzie Power & Renewables reports energy-storage capacity data in terms of power capacity (watts) and energy capacity (watt-hours). All of our data sources (details on data sources below), including program administrators, utility companies, utility commissions and system operators, currently track and report energy storage queue, deployments and interconnections in terms of power capacity: watts, kilowatts or megawatts. Wood Mackenzie Power & Renewables reports storage capacity data in power capacity terms (watts, kilowatts or megawatts) based on the reported data, and in energy capacity terms (watt-hours, kilowatt-hours or megawatt-hours) using a mix of publicly available and survey data and converting power capacity to energy capacity by multiplying by discharge duration (hours). This distinction is particularly important, as energy storage technology can be deployed for a wide range of discharge durations, from a few minutes (for applications such as power quality and frequency regulation) to a few hours (for applications such as bulk energy arbitrage).
- **Historical deployment data:** Quarterly capacity deployment data is collected from program administrators, system operators, utility companies, utility commissions, developers and installers. In some cases, the program administrators report incentive application and award payment dates instead of deployed dates. In such cases, Wood Mackenzie Power & Renewables consults with the utility companies or estimates the most likely installation date, based on our knowledge of typical project installation cycles in various markets. For front-of-the-meter projects, WoodMac maintains a database that tracks the status of planned and deployed front-of-the-meter projects. WoodMac reports deployment dates based on their “interconnection” or “online date” from interconnection queue data maintained by independent system operators and utility companies. In certain cases, WoodMac consults with project developers and installers to provide the project commissioning (deployment) date. WoodMac also uses the U.S. DOE Global Energy Storage Database for information on technology in instances in which the information is not received from our primary data sources.
- **System price data:** Reported system price data is not associated with specific projects deployed, since pricing data is considered to be sensitive by vendors and developers, given the number of projects that are being deployed and the varying project cycles. System price data is the outcome of WoodMac’s bottom-up cost survey based on interviews with vendors across the value chain.

## About the analysts

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Chloe Holden is an Energy Storage Analyst at Wood Mackenzie focused on residential, commercial, and community-scale storage. Chloe initially joined Wood Mackenzie as part of the marketing team where she led strategic communications on the energy transition before joining the storage team as an analyst. Chloe's energy industry experience began in the technology commercialization space, connecting high-tech intellectual property owners with corporate partners. She holds a bachelor's degree in Political Science from Wesleyan University.



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