



Energy
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U.S. Energy Storage Monitor Q4 2020 and 2020 Year in Review

March 17, 2021

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All lines will be muted during the webinar.

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Today's Speakers



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U.S. energy storage monitor

2020 year in review presentation

Wood Mackenzie | March 2021



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About Wood Mackenzie

We provide commercial insight and access to our experts leveraging our integrated proprietary metals, energy and renewables research platform

Wood Mackenzie is ideally positioned to support consumers, producers and financiers of the new energy economy.

- Acquisition of MAKE and Greentech Media (GTM)
- Leaders in renewables, EV demand and grid-connected storage
- Over 500 sector-dedicated analysts and consultants globally, including 75 specifically to power and renewables
- Located close to clients and industry contacts



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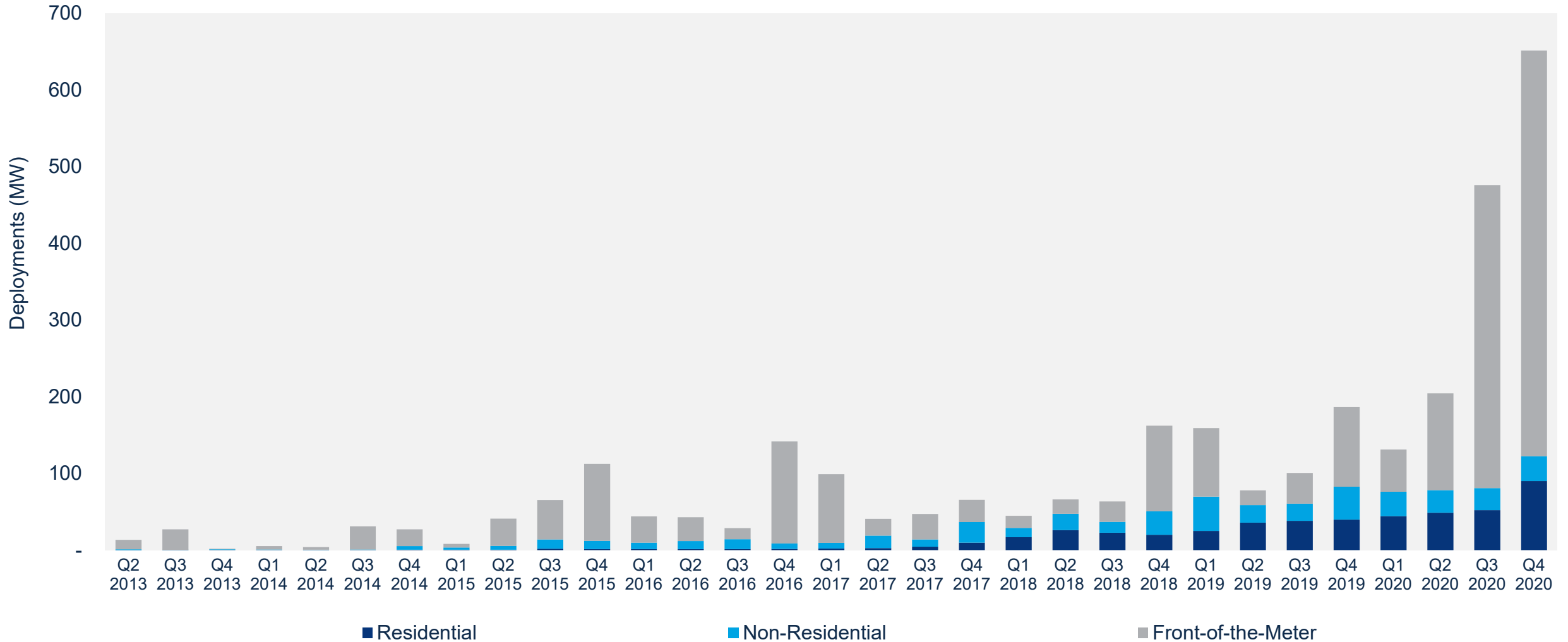
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2020 U.S. energy storage market scorecard

	2019	2020	Change
Total deployments (MWh)	1,116	3,511	Up 214%
Front-of-the-meter deployments (MWh)	474	2,672	Up 464%
Behind-the-meter deployments (MWh)	642	837.6	Up 30%
Total deployments (MW)	524	1,463	Up 179%
Front-of-the-meter system price, 2-hour (\$/kW)	\$1,375	\$1,275	Down 7%
Front-of-the-meter pipeline (MW)	80,230	144,745	Up 80%

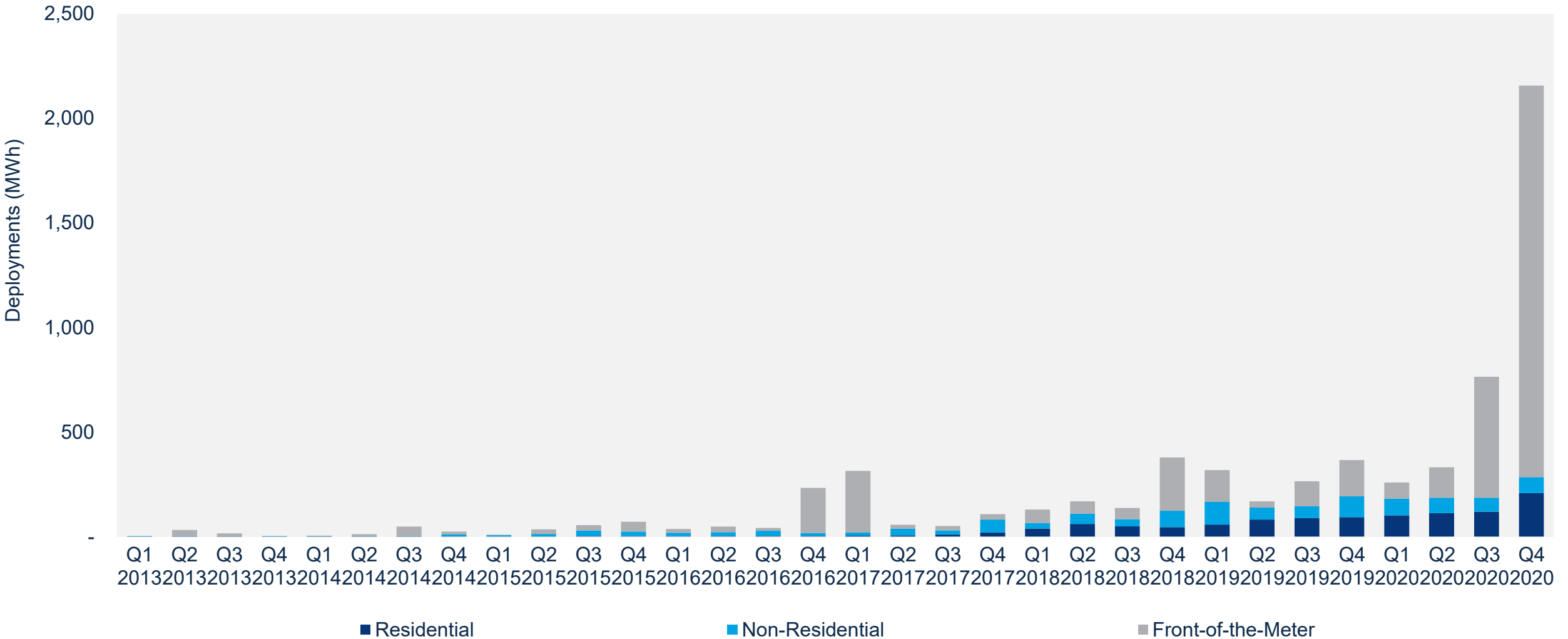
U.S. deployments set a new quarterly record: 651.2 MW in Q4

After an unprecedented FTM spike in Q3, the final quarter of 2020 spiked even further



U.S. market deployed 2,156 MWh in Q4 2020

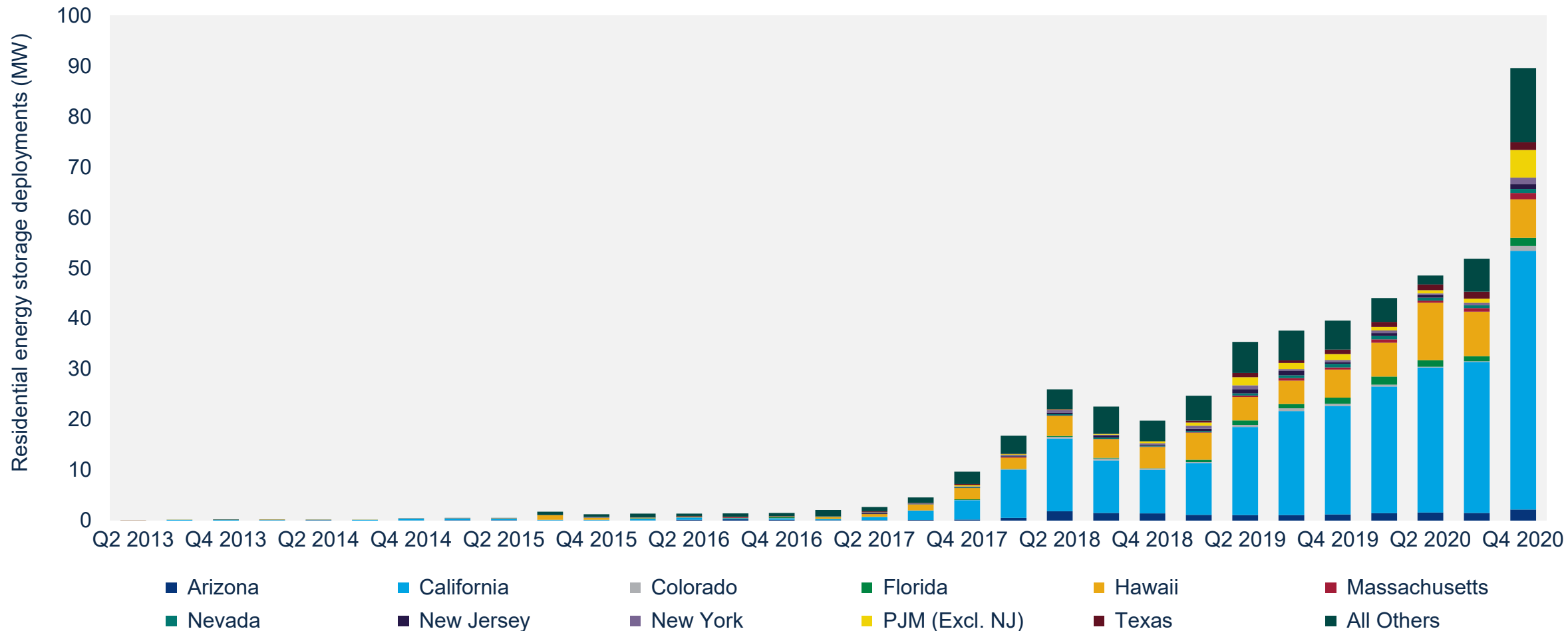
Quarterly MWh deployment totals dwarf the scale of previous quarters, revealing exponential growth



U.S. residential storage market sets another new record with 90.1 MW installed

The residential market grew 73% QOQ, a sharp upswing driven by primarily by California

U.S. quarterly residential energy storage deployments (MW)

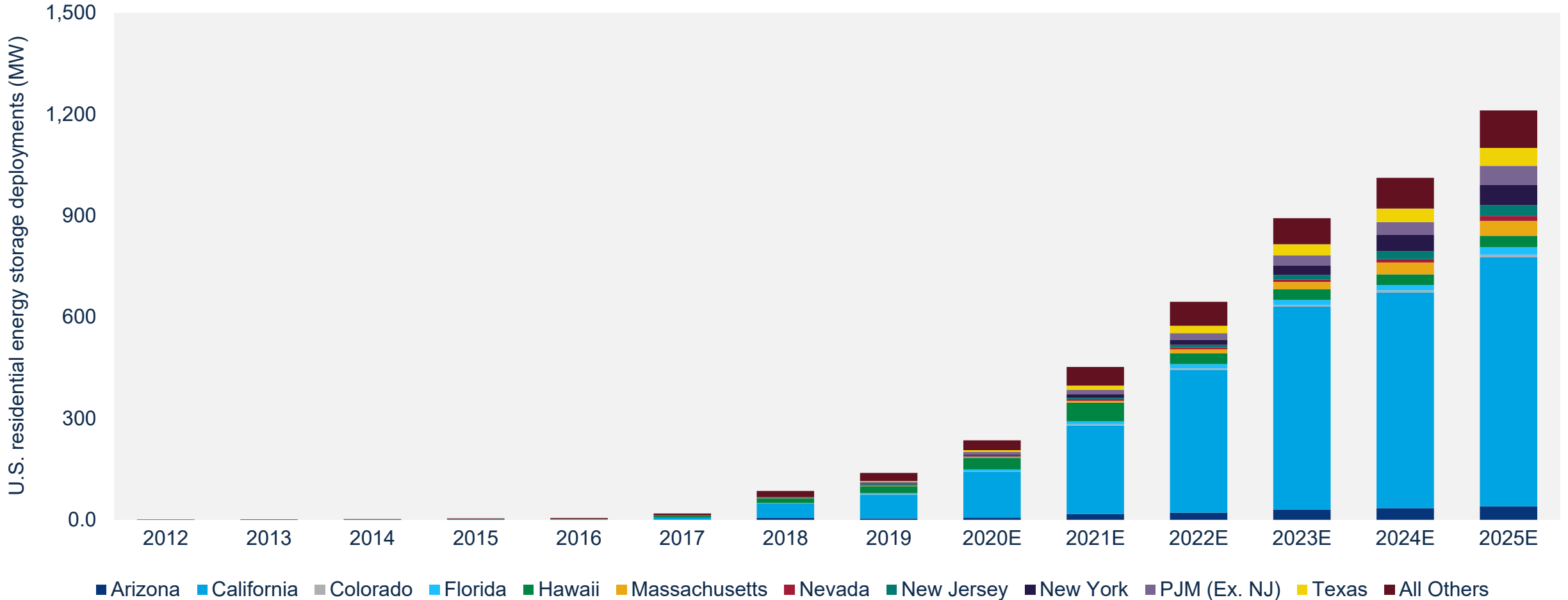


Source: Wood Mackenzie Power & Renewables

Residential market outlook (MW)

The residential storage market will see 1,211 MW installed in 2025, a 415% increase over 2020

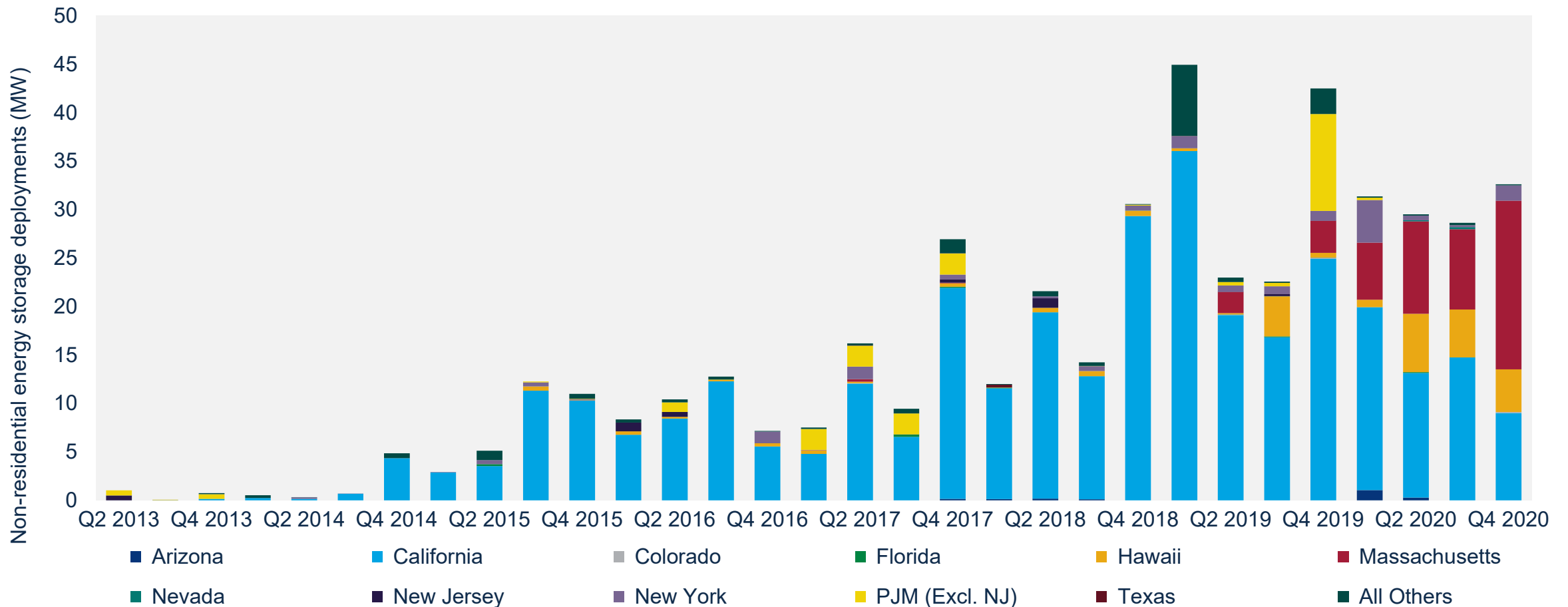
U.S. annual residential energy storage deployment forecast, 2012-2025E (MW)



Non-residential segment rebounds slightly in megawatt terms

Massachusetts claimed more than half of MW deployed for the first time, driven by community storage projects

U.S. quarterly non-residential energy storage deployments (MW)



Behind-the-meter policy and market developments, Q4 2020

California

In December **PG&E** included a contract for behind-the-meter batteries in one of its storage procurements for the first time. In their pitch to regulators, PG&E included a 27 MW/108 MWh BTM project, which would provide grid services in the utility's territory starting in 2022. Additional developments in California include the most notable step taken so far on vehicle to grid integration by the **California Public Utilities Commission**. In February the CPUC proposed framework for vehicle-grid integration, which would give California utilities the go-ahead to propose vehicle-grid integration pilots. Also in February, the city government of **Santa Barbara** instated On-Demand Permitting allowing residential solar-plus-storage systems with under 27 kWh of storage to receive permits immediately. (A similar program was launched by Hawaiian Electric in January, but does not include residential storage.)

Arizona

In December, the **Arizona Corporation Commission** directed Arizona Public Service Company to move forward on a tariff that would outline how aggregators of energy storage systems and other customer-sited DERs are to be compensated in the state.

Massachusetts

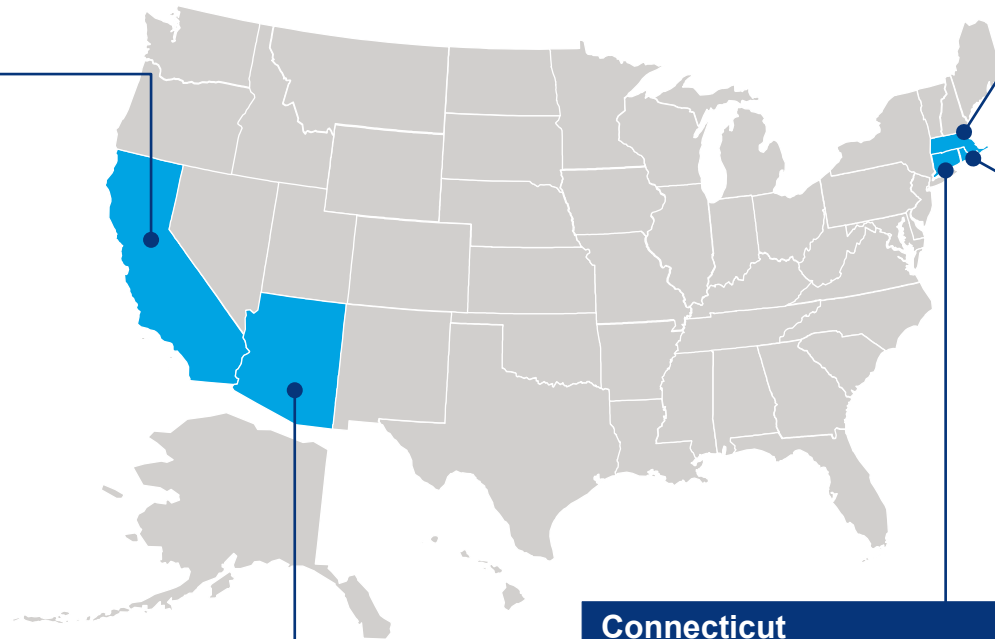
As of early February, **Governor Charlie Baker** and the MA legislature are going back and forth over a state climate bill, which would have implications for the state's solar and storage markets. The bill's original provisions included tax breaks for solar installation behind the meter and incentives for SMART program participants to serve lower income areas.

Rhode Island

In October **Rhode Island Office of Energy Resources** launched a \$1.5 million pilot energy storage incentive that supports both residential and commercial projects. Projects must be paired with new solar and must qualify for National Grid's ConnectedSolutions program.

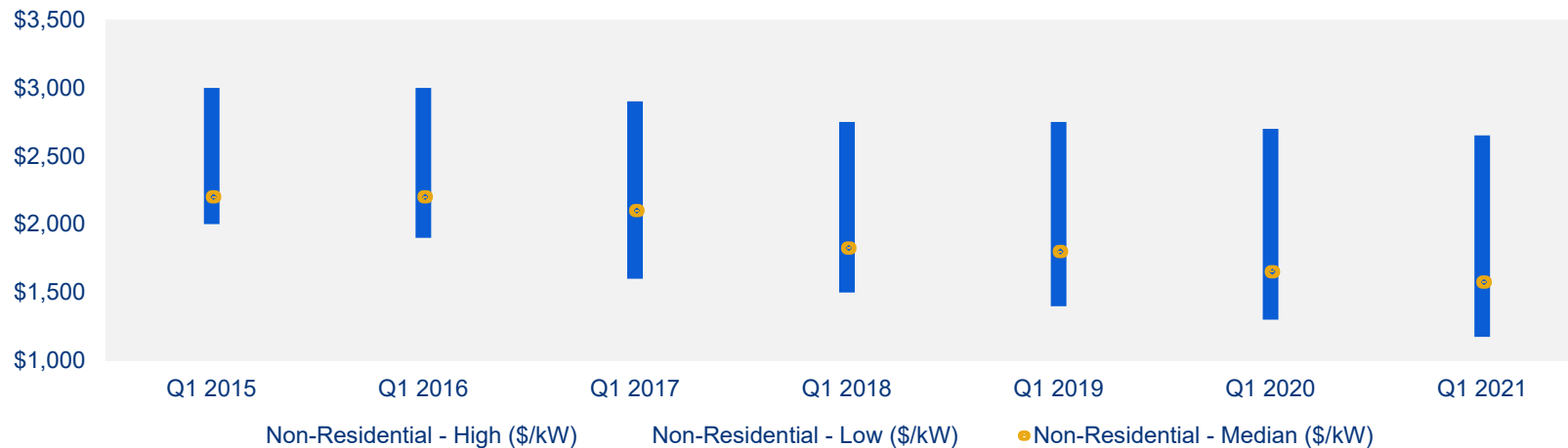
Connecticut

In January, **CT's Public Utilities Regulatory Authority** issued a proposal to support residential and C&I storage through a combined incentive and demand response performance payment, as part of its ongoing grid modernization docket. A decision on the proposal is expected by the end of March after a comment period. The incentive would last nine years, with the upfront incentive starting at \$280/kWh and stepping down to approximately \$130/kWh. The DR program, which was already available to certain CT customers as ConnectedSolutions, rewards customers statewide who make their batteries eligible to be dispatched during demand response events. The proposal allows for third-party ownership of the storage systems. If all goes as expected, the program will go into effect January 2021.

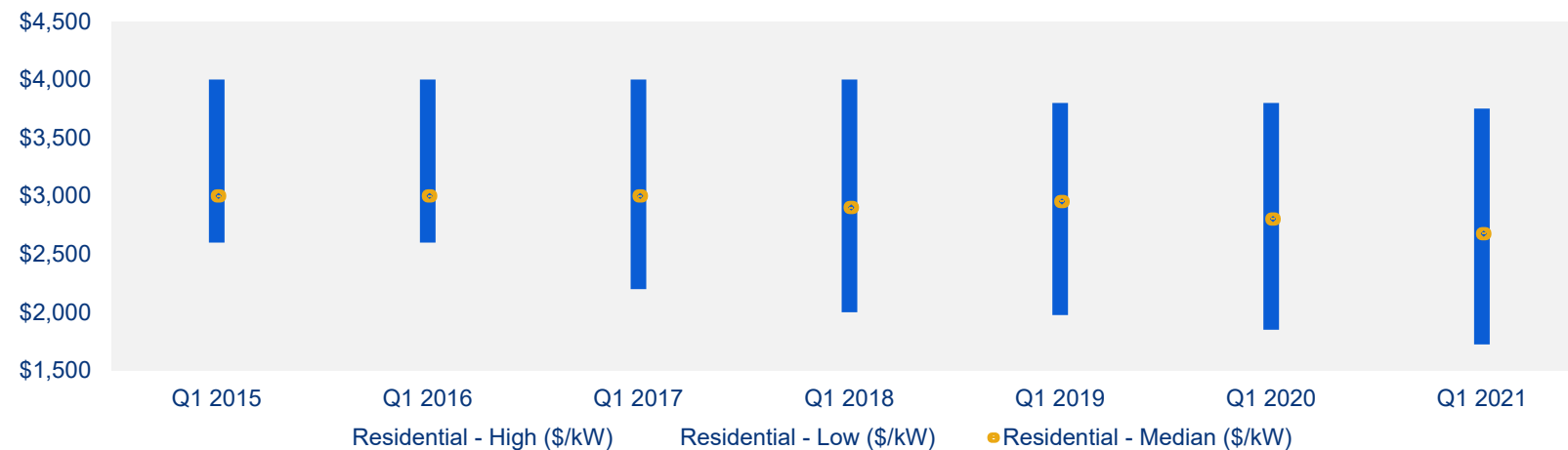


Median prices for BTM systems are declining QOQ

Historical fully installed system-price trends: Non-residential (\$/kW)



Historical fully installed system-price trends: Residential (\$/kW)

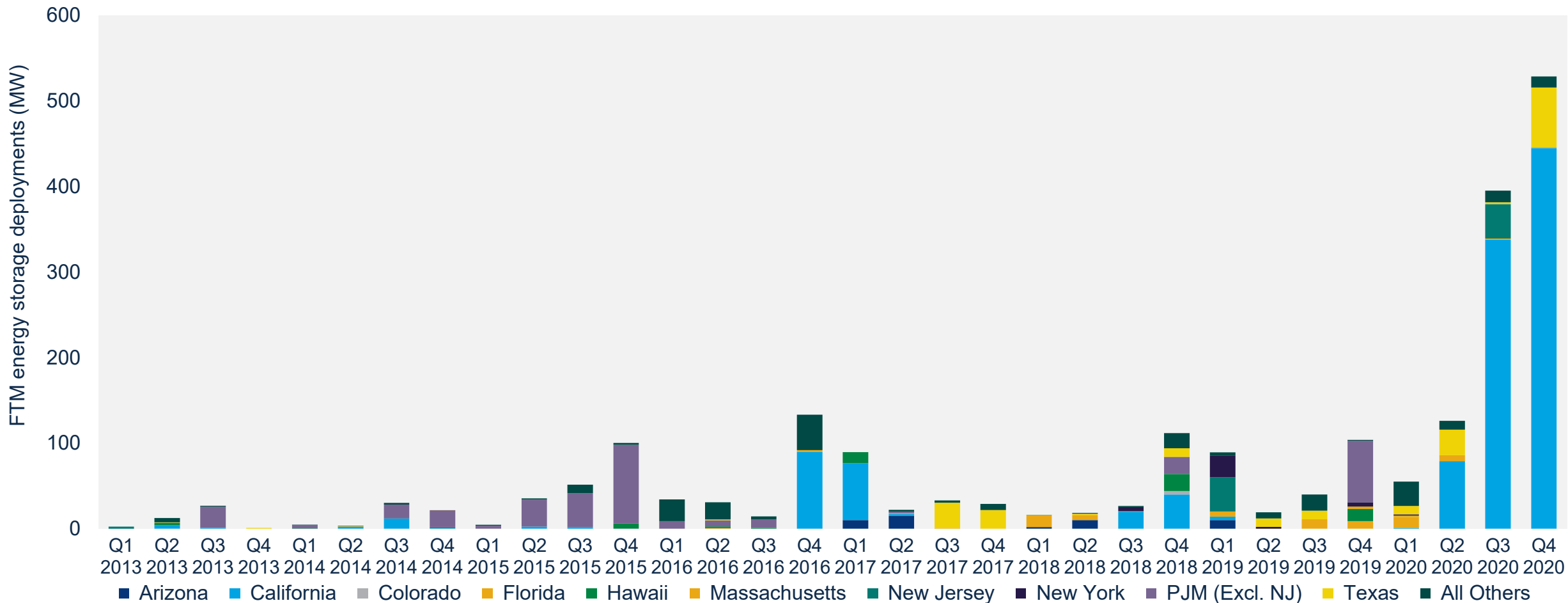


- Prices for both residential and non-residential energy storage systems have declined by 1%-2% on a QOQ basis since Q4 2020
- On a YoY basis median prices declined by 4%-5% for residential and non-residential systems respectively.
- BTM system vendors are increasingly exploring LFP batteries, particularly for large non-residential system installations.
- As manufacturing ramps-up in China, this increased interest in LFP will continue particularly in light of changing fire safety requirements and the need to bring down system costs.

FTM megawatt deployments surge to new highs

528 MW of storage was installed in Q4 2020, up 34% from the previous quarter's record

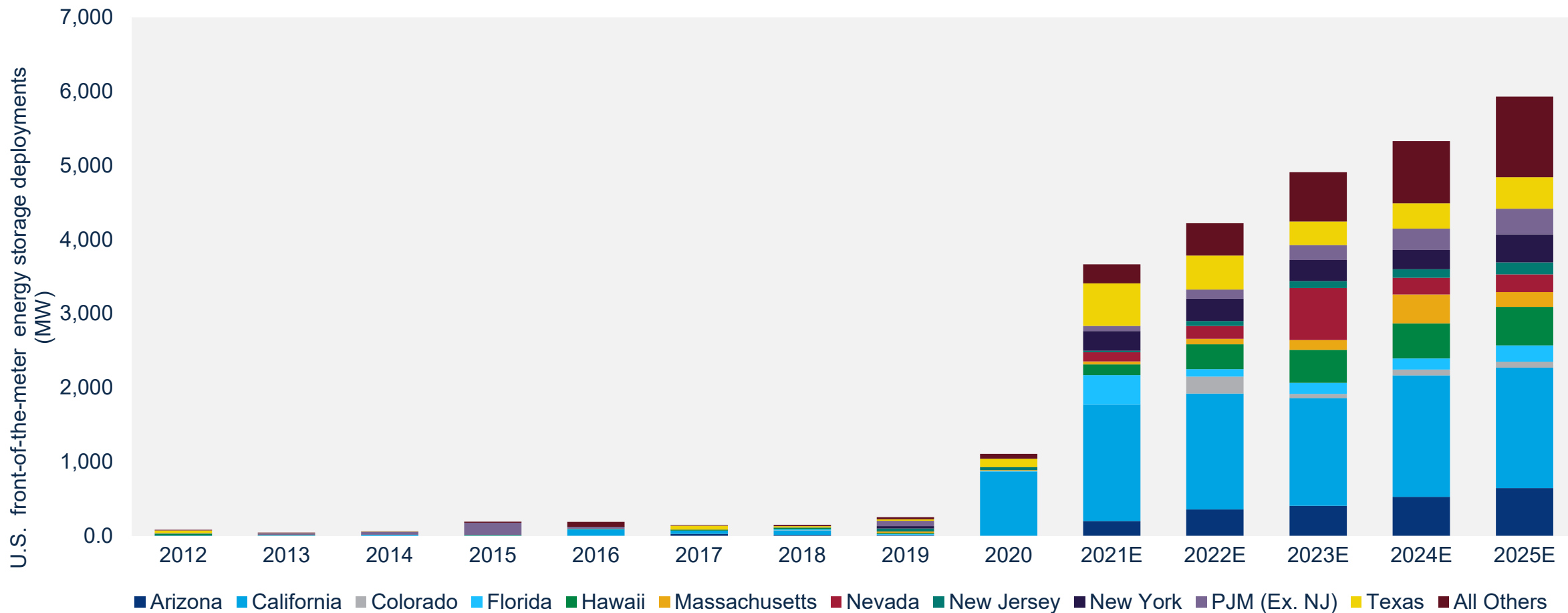
U.S. quarterly front-of-the-meter energy storage deployments (MW)



Front-of-the-meter market outlook (MW)

U.S. FTM deployments to reach 3.6 GW annually in 2021, nearly 6 GW in 2025

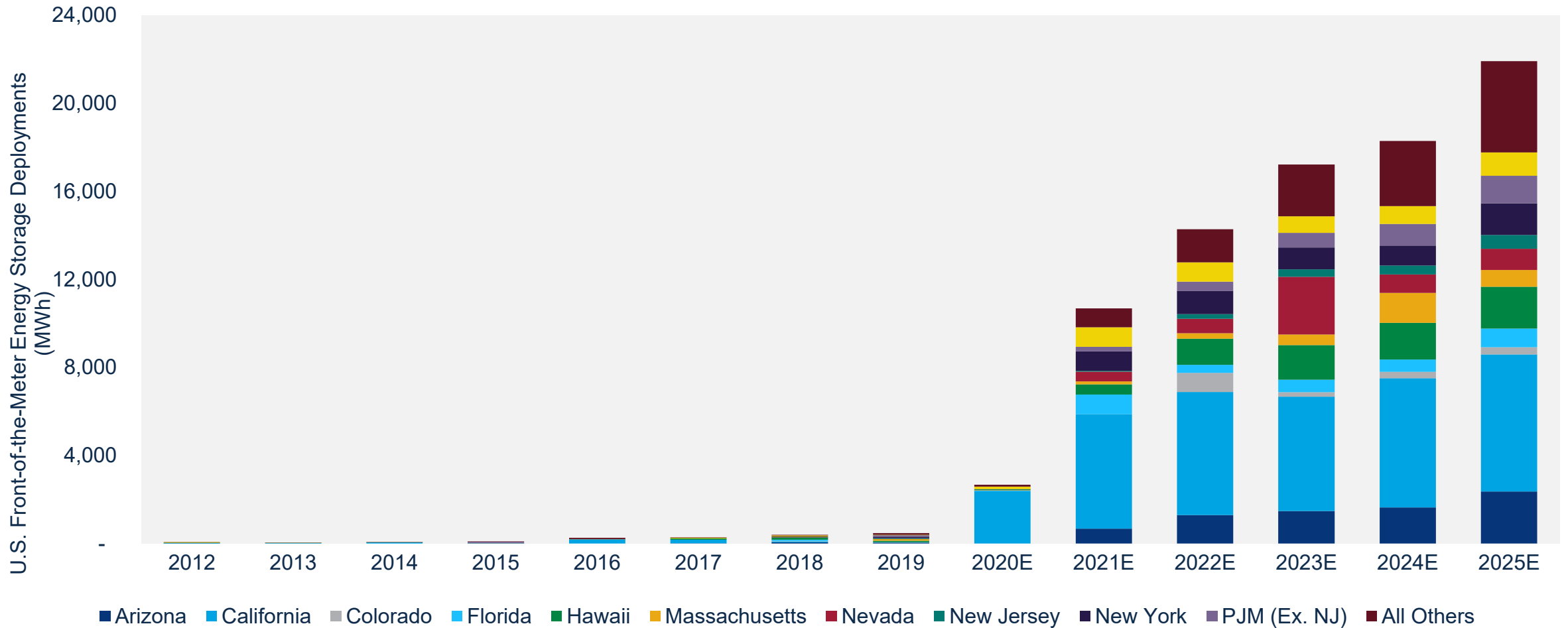
U.S. annual front-of-the-meter energy storage deployment forecast, 2012-2025E (MW)



Front-of-the-meter market outlook (MWh)

Longer-duration storage will drive MWh totals, but near-term systems will rarely exceed four-hour capacities

U.S. annual front-of-the-meter energy storage deployment forecast, 2012-2025E (MWh)



Front-of-the-meter policy and market developments, Q4 2020

Utah

In February 2021 **FERC** awarded a preliminary permit to a 2.2 GW pumped hydro project on the U.S. Bureau of Reclamation's Lake Powell Reservoir in Utah.

PJM

In February 2021 **PJM** released their updated proposed effective load-carrying capacity study values which could frame storage's value in the market. The new ELCC for 4-hour storage, 79%, is almost twice the status-quo of 40%.

Hawaii

Kauai Island Utility Cooperative (KIUC) propose a solar / battery / pumped hydro system, the first of its kind in the country and a sign that the utility has no plans to slow its nation-leading renewable planning.

MISO

In August, 2020 **FERC** approved MISO's storage-as-a-transmission framework, with MISO holding stakeholder discussions on dual-use storage in 2021 potentially setting precedent or baseline for other markets

Puerto Rico

Negociado de Energía de Puerto Rico (NEPR) ordered **The Puerto Rico Electric Power Authority (PREPA)** to issue an RFP for 500 MW / 2,000 GWh of energy storage.

Massachusetts

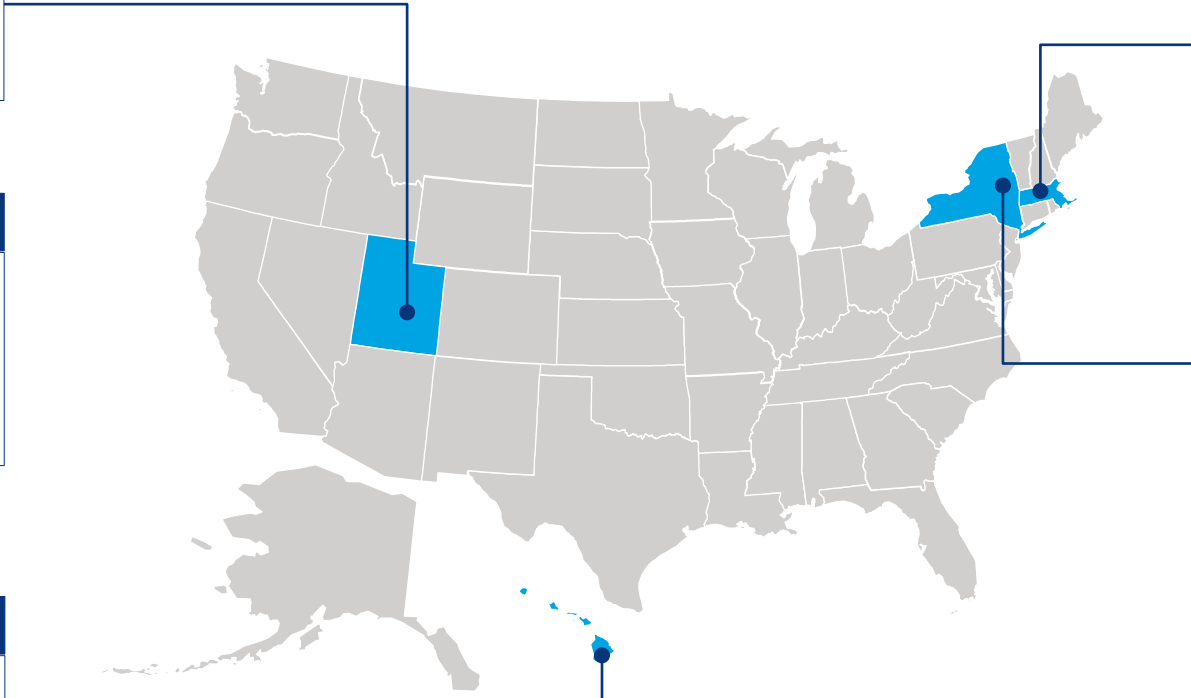
Two large-scale energy storage systems clear in the latest **ISO-NE** capacity market, the first of their kind of the market and a sign of increased interest in wholesale market applications.

New York

The **New York Public Utilities Commission (PUC)** approved revenue sharing tariff revisions filed by the state's six investor-owned utilities which would incentivize utilities to maximize wholesale revenue by awarding them 30% of the value earned in excess of contract costs.

Virginia

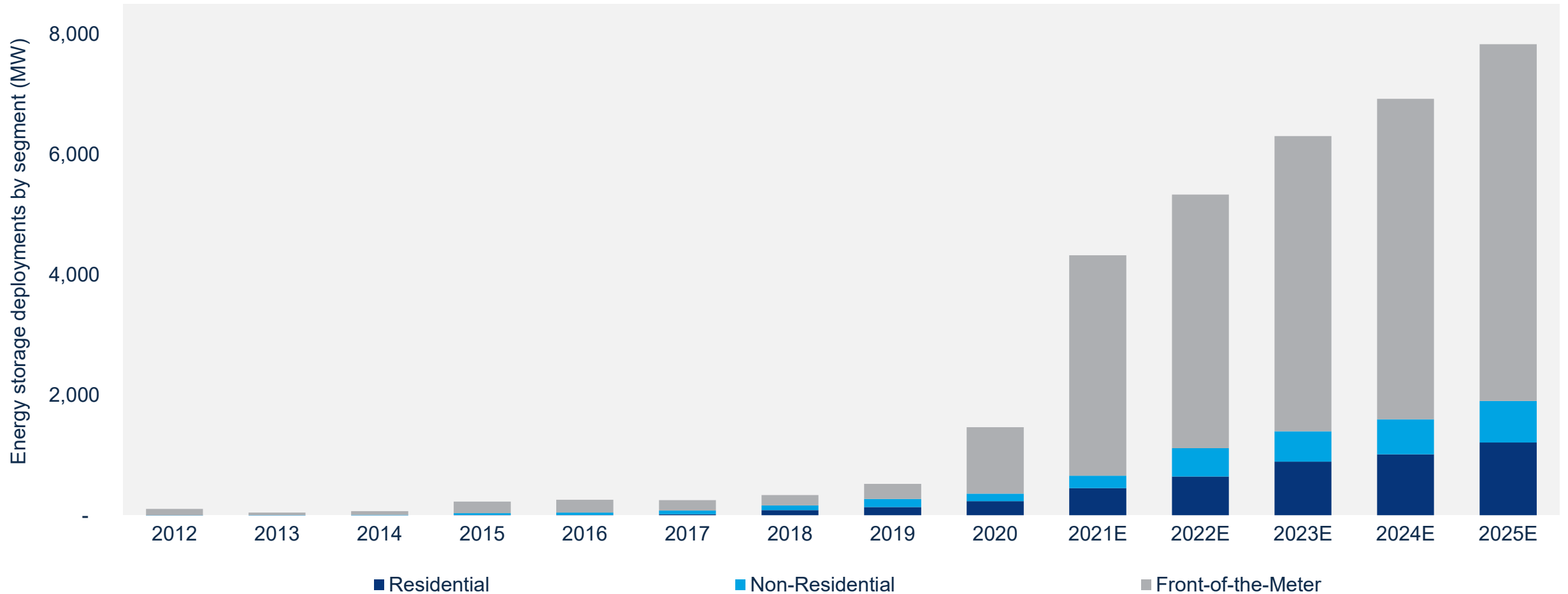
The **Virginia state legislature** is poised to sign legislation (HB 2148) in March, 2021 which would create a local tax exemption for energy storage and add battery storage to permit-by-rule.



U.S. energy storage deployments will reach 7.8 GW annually in 2025

Annual front-of-the-meter systems will make up approximately three quarters of annual deployments in 2025

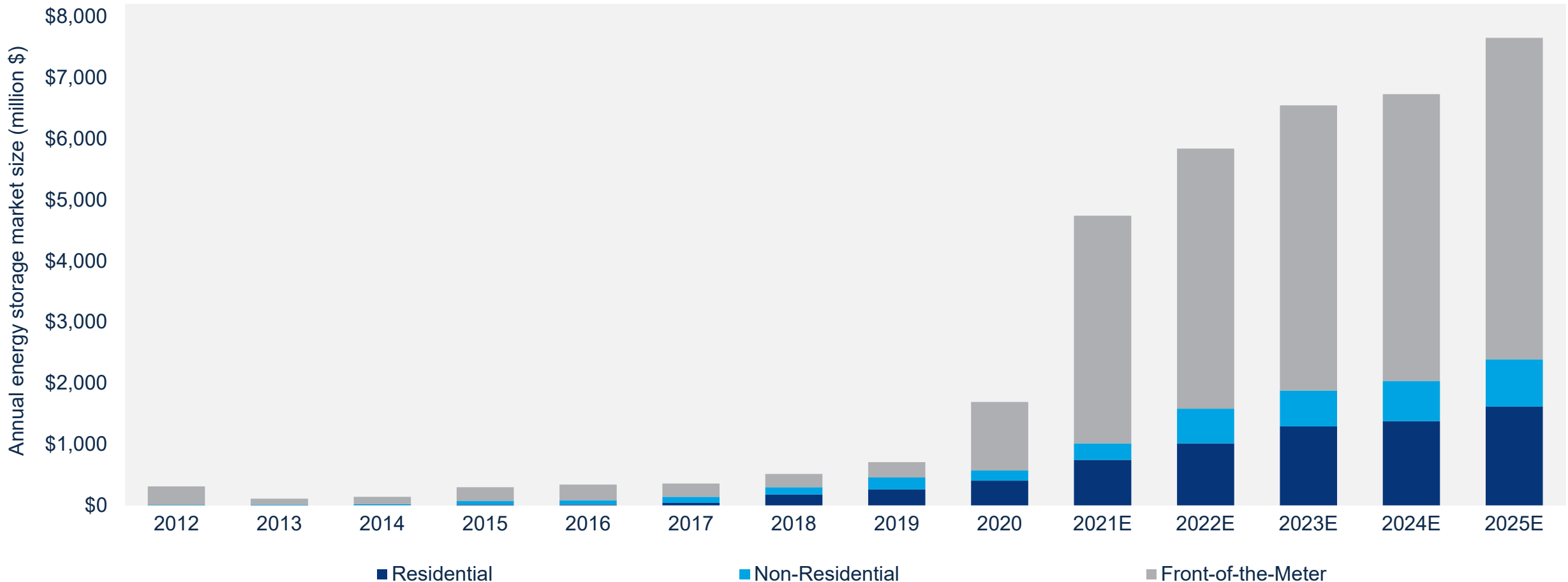
U.S. energy storage annual deployment forecast, 2012-2025E (MW)



U.S. energy storage will be a \$7.6 billion annual market in 2025

Market crossed \$1.5 billion annual threshold in 2020

U.S. annual energy storage market size, 2012-2025E (million \$)



Source: Wood Mackenzie Power & Renewables. Note: Market size is reported as energy storage system deployment revenue (product of deployments and installed system prices).



Q & A

**Questions can be submitted through
the chat box in your browser.**

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April 21-22, 2021
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The banner features a background image of a solar farm with rows of solar panels in the foreground and white energy storage containers in the background under a blue sky with clouds. The text is overlaid in various colors and fonts, including a large yellow banner for the dates and a blue banner for the virtual event name.

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Thank you!

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