RESILIENTPOWER A project of CleanEnergyGroup

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State of the U.S. Energy Storage Industry: Q1-Q2 2016

August 3, 2016



Housekeeping



All participants are in "Listen-Only" mode. Select "Use Mic & Speakers" to avoid toll charges and use your computer's VOIP capabilities. Or select "Use Telephone" and enter your PIN onto your phone key pad.

Submit your questions at any time by typing in the Question Box and hitting Send.

This webinar is being recorded.

You will find a recording of this webinar, as well as previous Resilient Power Project webinars, online at:

www.resilient-power.org

Who We Are





www.resilient-power.org



SURDNA FOUNDATION

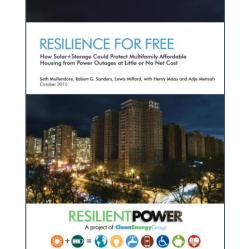
Fostering sustainable communities in the United States

Resilient Power Project

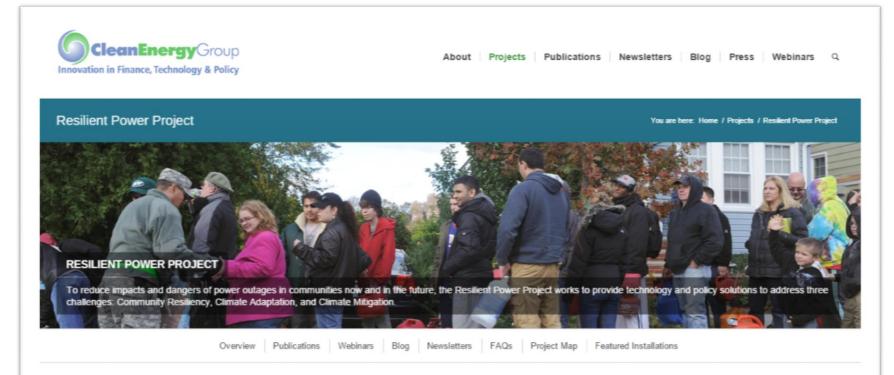
- Increase public/private investment in clean, resilient power systems
- Engage city officials to develop resilient power policies/programs
- Protect low-income and vulnerable communities
- Focus on affordable housing and critical public facilities
- Advocate for state and federal supportive policies and programs
- Technical assistance for pre-development costs to help agencies/project developers get deals done
- See <u>www.resilient-power.org</u> for reports, newsletters, webinar recordings







www.resilient-power.org





Sign Up for the Resilient Power Project Mailing List

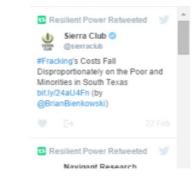


Seth Mullendore Project Manager seth@cleanegroup.org With the Resilient Power Project, Clean Energy Group and Meridian Institute are working to accelerate market development of clean energy technologies for resilient power applications that serve low-income communities and vulnerable populations during disasters and power disruptions, and to address climate adaptation and mitigation goals through expansion of reliable renewable energy deployment. To reduce impacts and dangers of power outages in communities now and in the future, the Resilient Power Project works to provide technology and policy solutions to address three challenges facing the country: Community Resiliency, Climate Adaptation, and Climate Mitigation.

Clean Energy Group's role in this process is to help inform, coordinate, and support federal, state, and local officials, policy makers and developers with the goal of deploying resilient power projects in communities across the country. In addition to providing program guidance to policy makers and limited technical assistance funding for excited developers.

Follow the Resilient Power Project on Twitter

Tweets by @Resilient_Power



Today's Speakers

- Brett Simon, Analyst, Energy Storage, GTM Research
- Ravi Manghani, Director, Energy Storage, GTM Research



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Prepared For:



Brett Simon - Analyst, Energy Storage Ravi Manghani - Director, Energy Storage

August 2016



About Greentech Media



News/Online

Greentech Media delivers business-to- business news, analysis and events at the forefront of the global energy transformation. Our coverage area extends across the clean energy industry with a focus on solar power and the electric utility market's evolution. Greentech Media's industry-leading coverage is provided by a team of analysts from our market intelligence arm, GTM Research, as well as our world-class journalists and global network of expert contributors.

Research

GTM Research is the market analysis and consulting arm of Greentech Media. GTM Research is comprised of analysts covering solar, grid edge, and energy storage markets. Our analysts combine diverse backgrounds in energy, environmental, emerging technology, information technology and strategic consulting sectors. This diverse team provides critical and timely market analysis in the form of research reports, consulting, and data subscription services.



Event

Greentech Media and GTM Research experts come together to produce all of Greentech Media's industry conferences throughout the year. These summits provide a platform for our latest market intelligence and draw together the industry influencers from organizations across the value chain.



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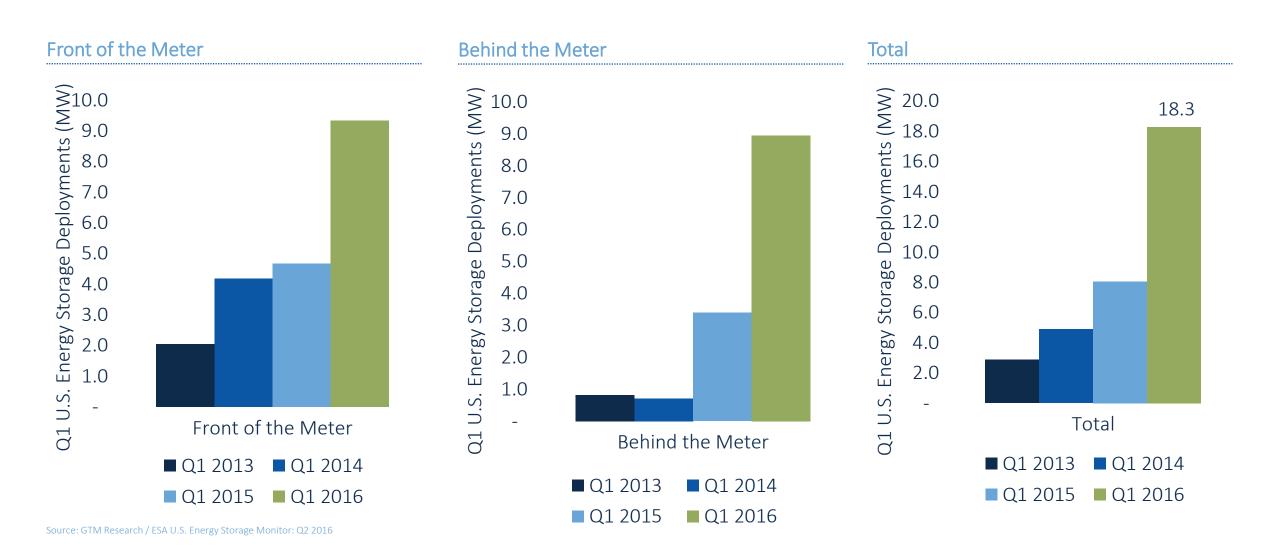
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State of the U.S. Energy Storage Industry: Q1-Q2 2016

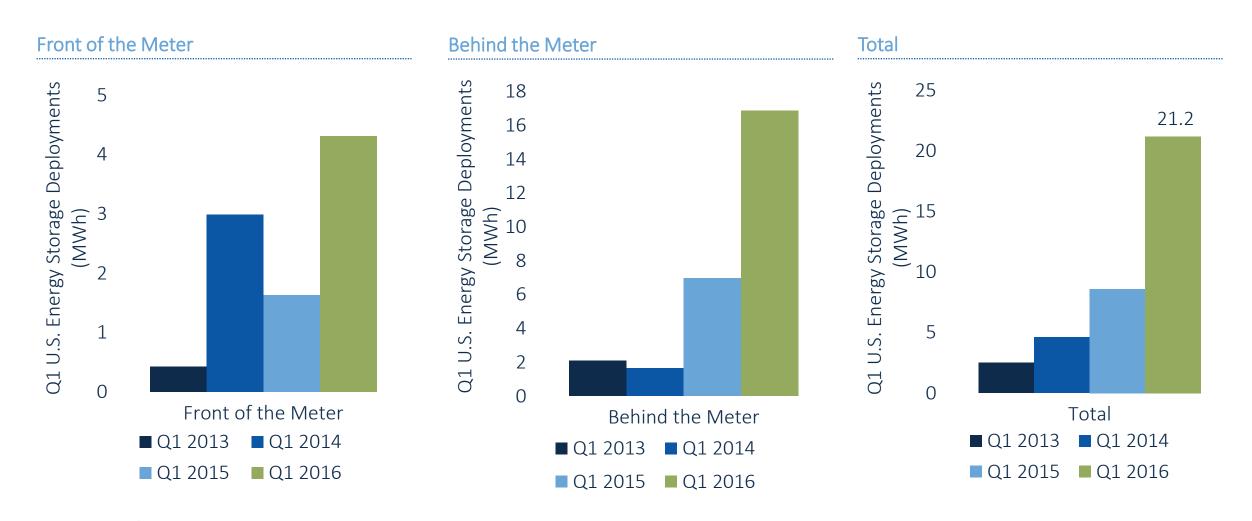
1. Deployment Trends

gtmresearch

Q1 2016 Deployments Grew 127 Percent Year-Over-Year to 18.3 MW



Behind-the-Meter Sector Continues 4-Quarter Trend of Deploying at Least 10 MWh in Q1 2016



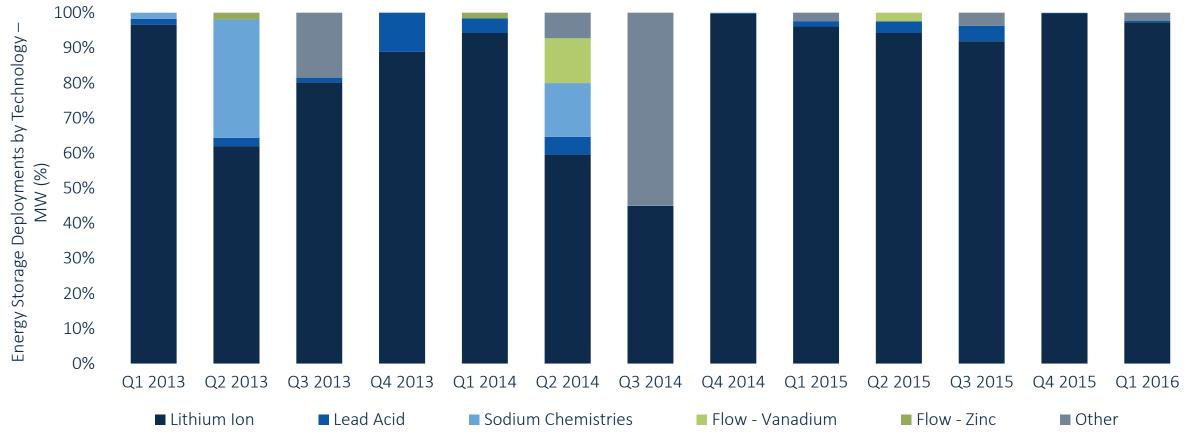
California and PJM (Excl. NJ) Account for 92 Percent of Deployments Since Q1 2013

Rank	Residential	Non-Residential	Utility
1	California	California	PJM (excl. NJ)
2	All Others*	All Others*	California
3	Hawaii	New Jersey	All Others*

*GTM Research is currently monitoring seven individual markets. Complete coverage of all markets is available in the full report.

Lithium-Ion Technology Comprised 97% Of Deployments in Q1 2016

Quarterly Energy Storage Deployment Share by Technology (MW %)



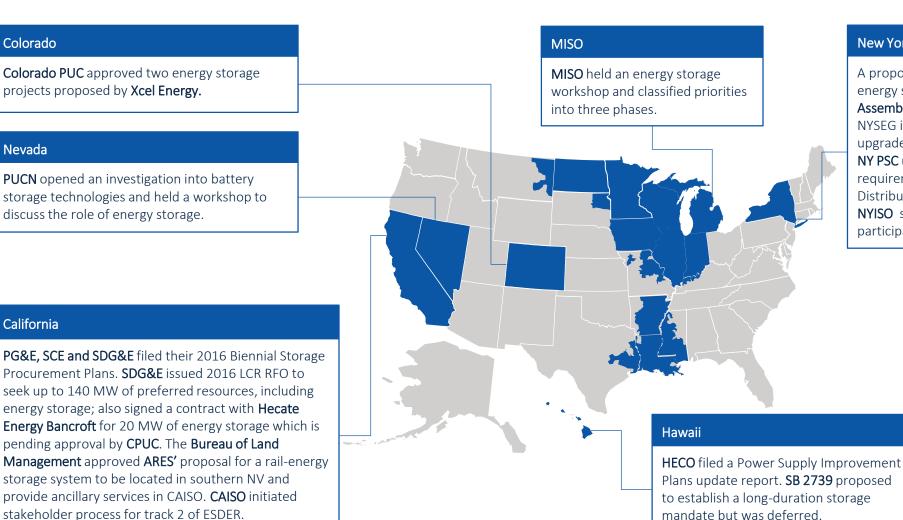
*"Other" includes flywheel and unidentified energy storage technologies

2. Market Drivers

State of the U.S. Energy Storage Industry: Q1-Q2 2016



Front-of-the-Meter Policy and Market Developments, Q1 2016



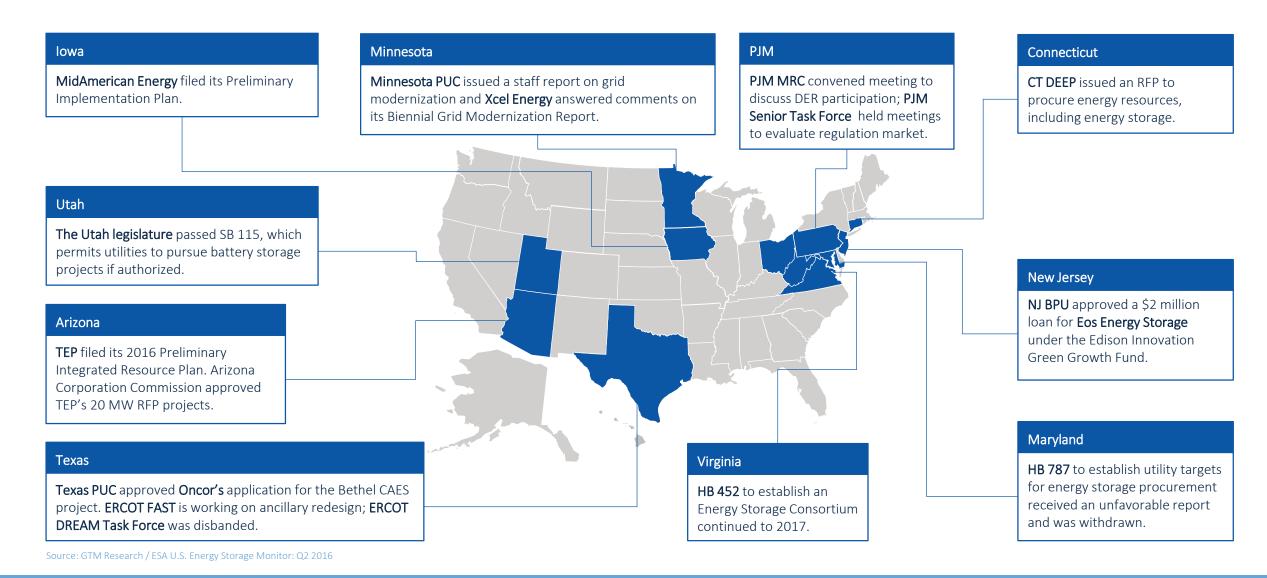
New York

A proposal to extend property tax exemptions to energy storage was amended and passed the State Assembly and was amended by the State Senate. NYSEG issued an REP for a non-wire alternative upgrade for the area served by the Java Substation. **NY PSC** updated NY's standardized interconnection requirements; also issued an Order Adopting Distributed System Implementation Plan Guidance. **NYISO** started initiative to evaluate energy storage participation in existing programs.

Federal

The U.S. Supreme Court granted a stay on the Clean Power Plan. The U.S. Senate passed Grid Modernization Act of 2016, though it still must be reconciled with HR 8. FERC issued a notice to hold a technical conference to discuss interconnection requirements; also initiated AD16-20 to allow ISOs the opportunity to provide data on energy storage participation in existing markets.

Front-of-the-Meter Policy and Market Developments, Q1 2016 (Cont.)



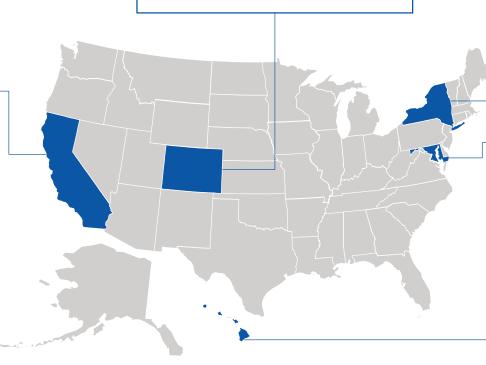
Behind-the-Meter Policy and Market Developments, Q1 2016

California

CPUC issued a final decision concerning NEM credit estimation methodology for small storage systems paired with NEM-eligible generation; additionally investigating how to deal with funding allocation issues resulting from February SGIP application process. **PG&E, SCE and SDG&E** filed their 2016 Biennial Storage Procurement Plans. **PG&E** filed an advice letter to outline its proposed time-of-use rate pilot plan, which **CPUC** conditionally approved. **SDG&E** issued 2016 LCR RFO to seek up to 140 MW of preferred resources, including energy storage. **California Energy Commission** approved \$9 million in grants for the installation of DC fast chargers.

Colorado

Colorado PUC approved two energy storage projects proposed by **Xcel Energy**.



New York

A proposal to extend property tax exemptions to energy storage was amended and passed the **State Assembly** and was amended by the **State Senate**. **NYSERDA** launched Phase II of NY Prize.

Maryland

The state legislature proposed a tax credit for behind-the-meter energy storage systems.

Hawaii

HB 2507 was introduced and recommended for deferral by Committee on Economic Development and Business. HB 2511 introduced and passed second reading in the state House. HECO and Greenlots initiated a behind-the-meter energy storage and DC fast-charging pilot for EVs. HECO filed a PSIPs update report. SB 2738/HD 2/SD 2 is undergoing discussion in state legislature.

Nevada **PUCN** opened an investigation into battery storage technologies and held a workshop to discuss the role of energy storage. Arizona ACC, UniSource Energy Services and several intervenors submitted documents concerning UniSource Energy Services' proposed rate changes. Guam Texas Guam PUC considering a rebate for residential energy storage systems paired **ERCOT** disbanded the DREAM Task Force.

with solar PV.

Source: GTM Research / ESA U.S. Energy Storage Monitor: Q2 2016

Federal

with HR 8.

The U.S. Senate passed Grid

Modernization Act of 2016,

though it still must be reconciled

Total Closed Acquisition of Saft

Completed \$1.1 Billion Deal Is the Largest in Energy Storage to Date



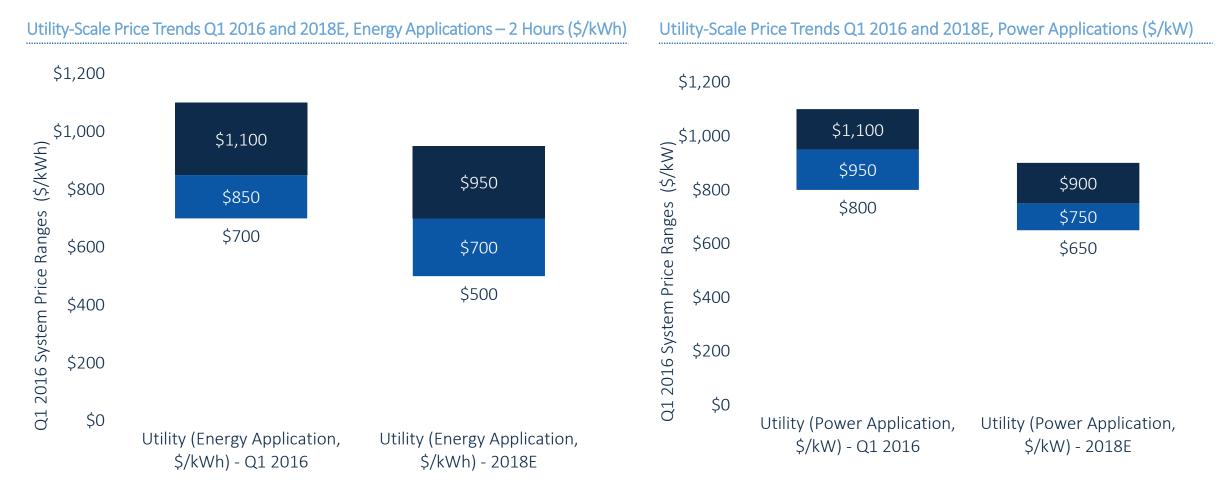


Goal to create vertically integrated clean energy company offering solutions across the value chain including energy storage, solar PV and electric vehicles





Front-of-Meter System Price Trends in Q1 2016



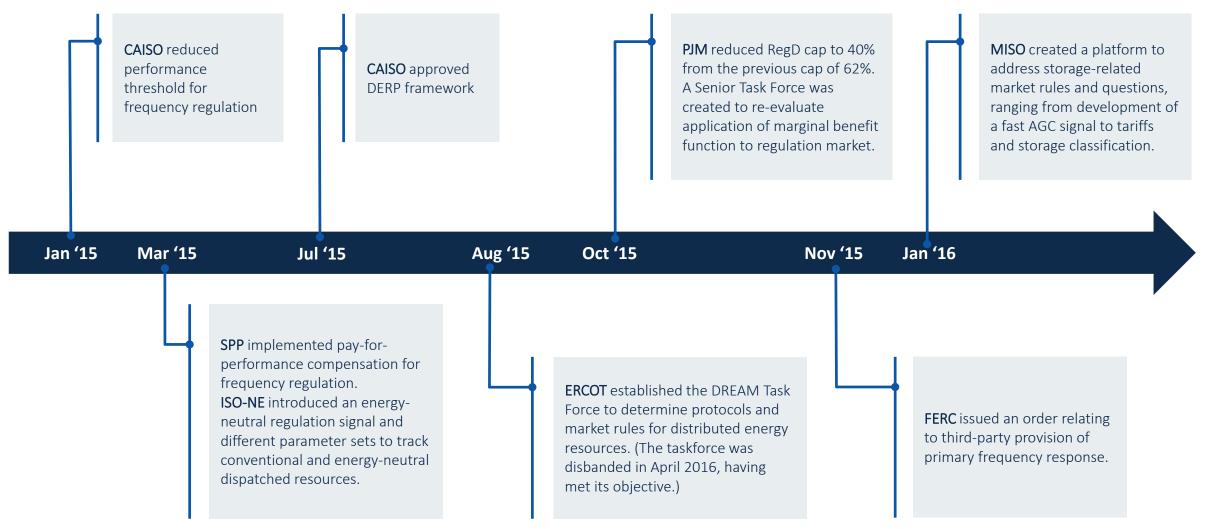
Source: GTM Research / ESA U.S. Energy Storage Monitor: Q2 2016

Behind-the-Meter Price Trends in Q1 2016

Behind-the-Meter Price Trends Q1 2016 (\$/kWh)



Wholesale Markets' Structures Evolving to Include Storage



Wholesale Markets' Structures Evolving to Include Storage (Cont.)

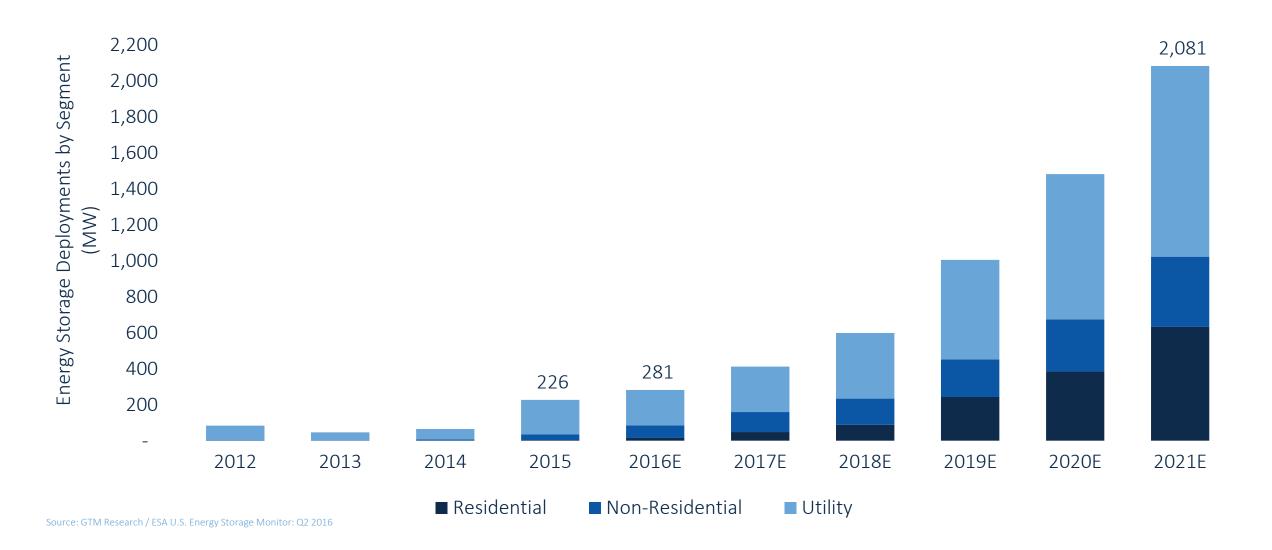
Gov cha gen	CAISO Board of rernors approved nges to the non- erator resource del under ESDER			ISO-NE release paper to outle storage partice requirements	ine energy		-	ned a special nine most effective ions to interconnect
Feb '16	Feb '16	Mar '16	Mar '16		Apr '16	Apr '16	Apr '16	
The ERCOT Future Ancillary Services Team resumed work on future ancillary services framework			-	o initiated an programs in can participate, term changes to		CAISO started work – Phase 2 initiative multiple-use applica NGR model enhanc station power and transmission access	to address ations, ements,	FERC issued AD16-20 to examine participation of energy storage in wholesale markets; announced a Technical Conference to explore interconnection issues

3. Outlook

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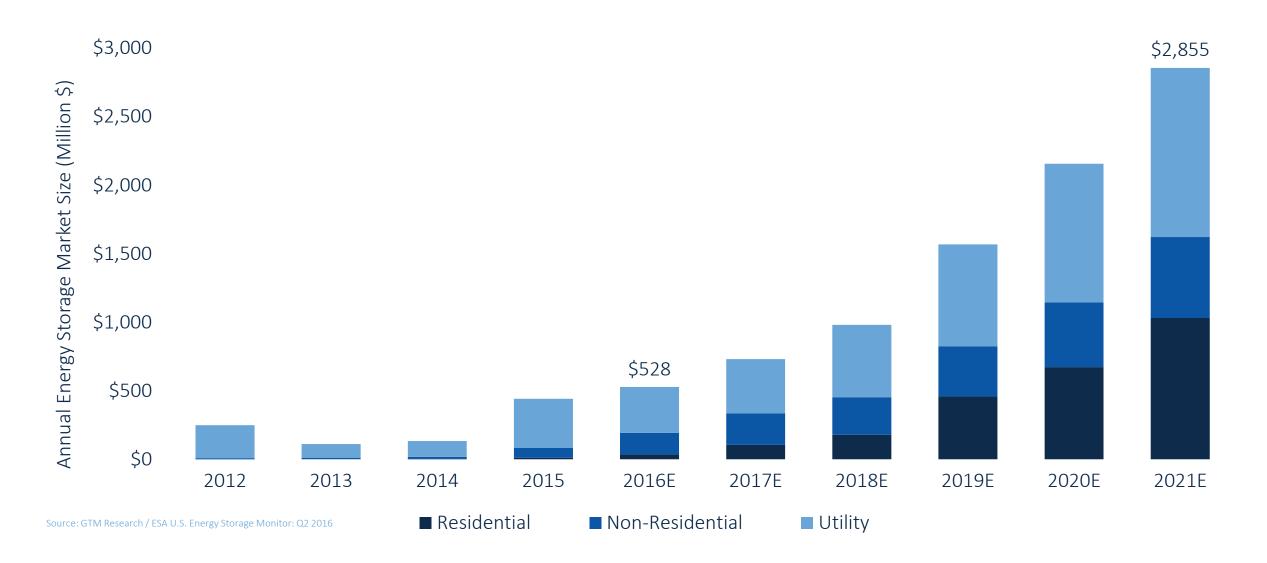


U.S. Energy Storage Market Will Exceed the 2 GW Threshold in 2021



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U.S. Energy Storage Market Will Be Worth \$2.9 Billion by 2021



Thank you!

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Thank you for attending our webinar

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