

### Energy Storage Technology Advancement Partnership (ESTAP) Webinar:

# State of the U.S. Energy Storage Industry: 2016 Year in Review

January 27, 2017

Hosted by Todd Olinsky-Paul ESTAP Project Director Clean Energy States Alliance





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# State & Federal Energy Storage Technology Advancement Partnership (ESTAP)

## Todd Olinsky-Paul Project Director Clean Energy States Alliance (CESA)







# **Thank You:**

# Dr. Imre Gyuk U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability

# **Dan Borneo** Sandia National Laboratories







# ESTAP is a project of CESA

**Clean Energy States Alliance (CESA)** is a non-profit organization providing a forum for states to work together to implement effective clean energy policies & programs:

State & Federal Energy Storage Technology Advancement Partnership (ESTAP) is conducted under contract with Sandia National Laboratories, with funding from US DOE.

Sandia

National Laboratories

### **ESTAP Key Activities:**

- 1. Disseminate information to stakeholders
  - ESTAP listserv >3,000 members
  - Webinars, conferences, information updates, surveys.
- 2. Facilitate public/private partnerships to support joint federal/state energy storage demonstration project deployment
- 3. Support state energy storage efforts with technical, policy and program assistance









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### ESTAP

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PROJECTS

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The Energy Storage Technology Advancement Partnership (ESTAP) is a federal-state funding and information sharing project, managed by CESA, that aims to accelerate the deployment of electrical energy storage technologies in the U.S.

The project's objective is to accelerate the pace of deployment of energy storage technologies in the United States through the creation of technical assistance and co-funding partnerships between states and the U.S. Department of Energy.

ESTAP conducts two key activities:

1) Disseminate information to stakeholders through:

- The ESTAP listserv (>2,000 members)
- Webinars conferences information undates



### NEW RESOURCES

October 14, 2015 Resilience for Free: How Solar+Storage Could Protect Multifamily Affordable Housing from Power Outages at Little or No Net Cost By Clean Energy Group

September 30, 2015 Webinar Slides: Energy Storage Market Updates, 9.30.15

### **UPCOMING EVENTS**

December 16, 2015 ESTAP Webinar: State of the U.S. Energy Storage Industry,

#### **More Events**

### LATEST NEWS

November 30, 2015 Massachusetts Takes the Lead on Resilient

# Panelists

**Brett Simon**, Analyst, Energy Storage, GTM Research

**Dan Finn-Foley**, Senior Analyst, Energy Storage, GTM Research

**Todd Olinsky-Paul**, Project Director, Clean Energy States Alliance (Moderator)





## State of the U.S. Energy Storage Industry: 2016 Year-in-Review

Prepared For:



Brett Simon - Analyst, Energy Storage Daniel Finn-Foley – Senior Analyst, Energy Storage





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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.



## 1. Deployment Trends

### 2. Market Drivers and Developments

## 3. Outlook

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State of the U.S. Energy Storage Industry: 2016 Year in Review

# 1. Deployment Trends

### The U.S. Deployed 16.4 MW of Energy Storage in Q3 2016



### The U.S. Deployed 31.4 MWh of Energy Storage in Q3 2016



### California and PJM (Excl. NJ) Account for 81 Percent of Deployments Since Q1 2013

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

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

### Lithium-Ion Technology Continues the Trend of More Than 90% Share for the Eighth Consecutive Quarter



Source: GTM Research

\*"Other" includes flywheel and unidentified energy storage technologies

## 2. Market Drivers and Developments



### 2016 Experienced Significant M&A Activity



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

### Behind-the-Meter Policy and Market Developments, Q4 2016

#### California

SCE announced winners of the second round of the PRP program. AB 1637 doubled the SGIP budget. AB 2861 created rules for expedited grid interconnection dispute resolution. AB 2868 added an additional 500 MW to the Calif. energy storage mandate, with up to 125 MW of the total from behind-the-meter storage. CPUC required PG&E to procure additional contracts under DRAM. SoCalGas filed an SGIP advice letter regarding new programs rules on behalf of PG&E, SCE and CSE.

#### Nevada

**PUCN** issued two orders soliciting comments for the state's Energy Storage Initiative.

### Washington

Washington Department of Commerce announced funding winners under Clean Energy Fund 2.

### New York

New York City announced an energy storage target of 100 MWh by 2020. New York State Department of Public Service issued a Value of DER Straw Proposal.

#### Massachusetts

MA DOER issued the *State of Charge* study in collaboration with independent consultants; also proposed adding provisions to the MA Solar Initiative to incentivize pairing solar PV and energy storage. Budget approved for ACES storage RFP with publication expected in November 2016.

#### New Jersey

NJ Board of Public Utilities issued a draft for the Town Center Distributed Energy Resource Microgrid Feasibility Study Incentive Program, with up to \$200,000 available for microgrid feasibility studies.

Source: GTM Research

### Front-of-the-Meter Policy and Market Developments, Q4 2016

#### Oregon

The Public Utility Commission of Oregon submitted UM 1751 in August, requesting comments on draft guidelines in response to HB 2193's 5 MWh energy storage mandate

#### California

FERC approves CAISO tariff revisions further recognizing energy storage, California State Legislature passes AB 33, directing the CPUC to examine energy storage for renewable integration, and AB 2868, potentially increasing the energy storage mandate by 500 MW, SCE and SDG&E move forward with Aliso Canyon energy storage procurements, with several going on-line in Q4 2016 and others scheduled for Q1 2017 totaling 84.5 MW.

#### Nevada

The Nevada Public Utilities Commission may move toward investigating energy storage following the passage of a ballot measure on electric choice in the state

Source: GTM Research

#### Washington

Energy storage appeared as a solution in several proposals for the \$10.6 million earmarked for **clean** energy fund grants

#### Massachusetts

The **Massachusetts DOER** has until the end of the year to decide whether to implement an energy storage mandate following the passage of H 4568. A study team that's part of the **Energy Storage Initiative** published the *State of Charge* report, recommending a 600 MW storage target by 2025 to capture what the report calculates as more than \$2.2 billion in potential value for ratepayers.

#### New York

New York City implemented the first city-wide energy storage mandate in the country, a 100 MWh target by 2020; NYISO released a Distributed Energy Roadmap for New York's Wholesale Electric Market; and Reforming the Energy Vision proceedings continued discussing the value of distributed energy, including energy storage, and its potential to be aggregated at the utility or ISO level.

#### Federal

**FERC** held a technical conference on November 9 to examine the role of storage as a grid asset and obtain a baseline understanding of transmission and distribution grid applications. On November 17, it issued a notice for proposed rulemaking (NOPR) to open up wholesale markets for energy storage and aggregation.

### Aliso Canyon Expedited Energy Storage Procurement Totals 84.5 Megawatts



CA County Map Source: California Elections Website http://www.sos.ca.gov/elections/map/

#### Source: GTM Research

### SCE Aliso Canyon Awarded Procurements

- 1. Western Grid Santa Paula, 5 MW/20 MWh On-line target Q1 2017
- 2. AltaGas-Greensmith Pomona, 20 MW/80 MWh On-line target Q4 2016
- 3. Tesla Ontario, 20 MW/80 MWh On-line target Q4 2016
- 4. Powin Energy Irvine, 2 MW/8 MWh On-line target Q1 2017

#### SDG&E Aliso Canyon Awarded Procurements

- 1. AES Escondido 30 MW/120 MWh On-line target Q1 2017
- 2. AES El Cajon 7.5 MW/30 MWh On-line target Q1 2017

SCE Procurement	SDG&E Procurement	
47 MW/4-hr. duration	37.5 MW/4-hr. duration	
Multiple RFP winners	Single awardee	
On-line 2016/2017	On-line 2017	
New procurements ordered from CPUC	Procurements expedited from ongoing LCR program	

GTM Research Based on SCE and SDG&E announcements and procurement websites

### FERC NOPR Has Potential to Expedite Energy Storage Participation

### **Proposed FERC Requirements**



Source: FERC Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, Dockets AD16-20 and AD16-23

## 3. Outlook

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### U.S. Energy Storage Annual Deployments Will Exceed 2 GW by 2021



Source: GTM Research

### Energy Storage Will Be a \$2.8 Billion Market in the U.S. by 2021



Source: GTM Research

## Thank you!

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