

SEPA 2019 Energy Storage Outlook



Smart Electric
Power Alliance



501(c)3 Vision & Mission

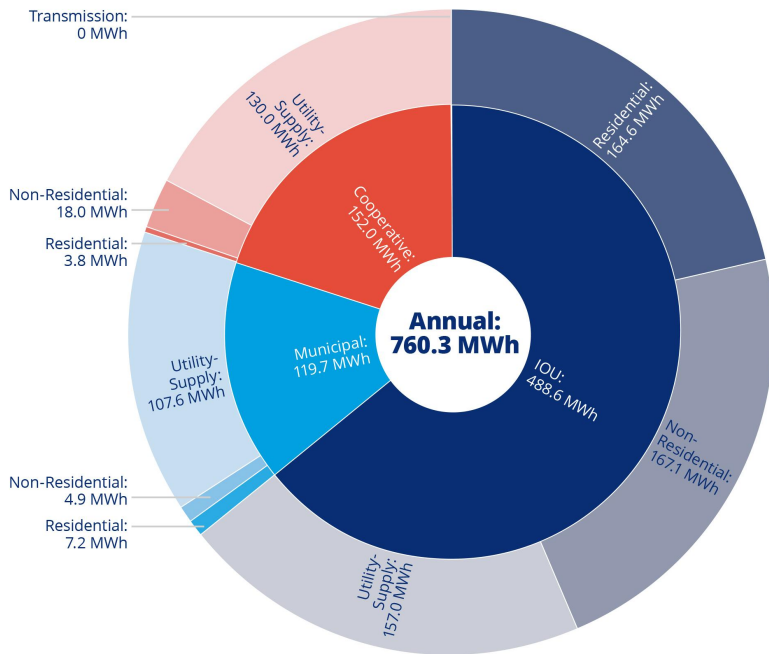
SEPA envisions: A carbon-free future by 2050.

SEPA is one of many entities needed to make the vision a reality.

**SEPA's mission is: To facilitate the electric power industry's
smart transition
to a clean and modern energy future
through education, research, standards and collaboration.**

This is the specific role SEPA plays in making the vision a reality.

National storage market primed for growth



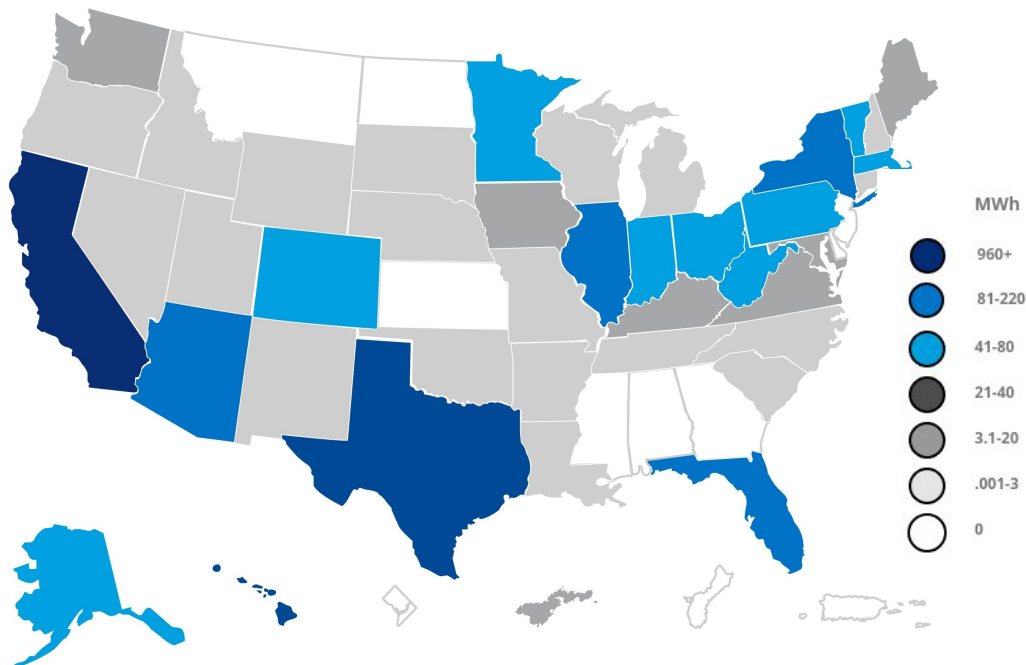
Source: Smart Electric Power Alliance, 2019

2017 to 2018 Added Capacity Changes by Sector

- Residential: +500%
- Non-residential: +35%
- Utility-supply: +11%

Total Cumulative Storage Interconnected to the Grid by 2018:
1,966 MWh

National Market Overview



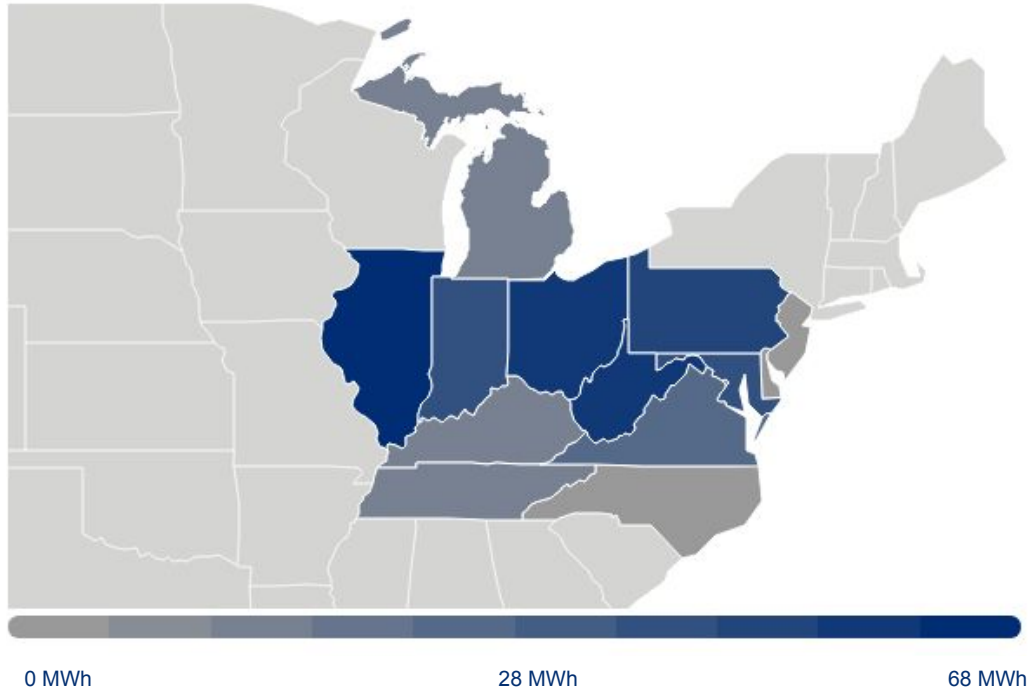
56% of all customer accounts surveyed

ENERGY STORAGE BY SECTOR

	MWh
Residential	225
Non-Residential	415
Utility-Supply	1326
Total	1966

Source: Smart Electric Power Alliance, 2019

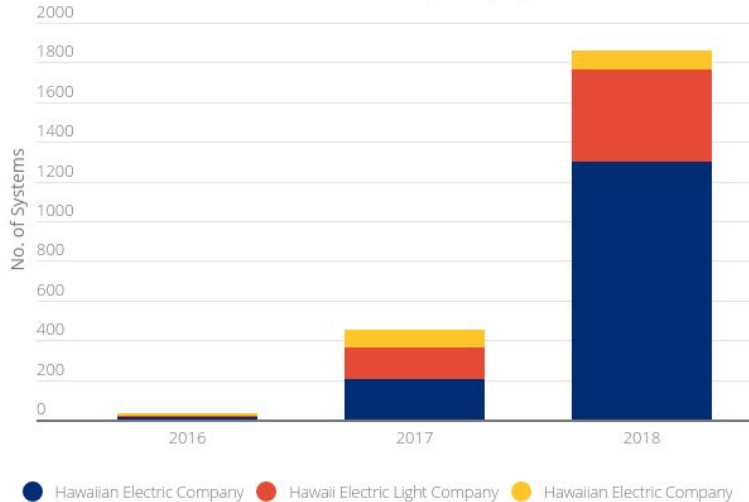
PJM Market Overview



- 176 MWh interconnected cumulatively
- 83.6% of PJM customer accounts surveyed

Residential Market - Policy Impacts

2016-2018 Annual HECO Customer-Owned
Residential Battery Deployment



Source: Smart Electric Power Alliance, 2019

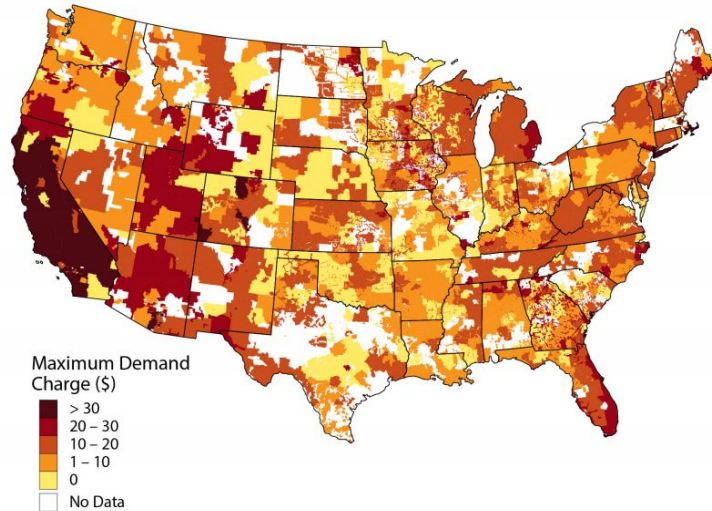
HECO's New Residential Battery Programs

- Smart Export Program
- NEM Plus Program

California's Self-Generation Incentive Program (SGIP)

Demand Charge Avoidance

Maximum demand charges by utility territory



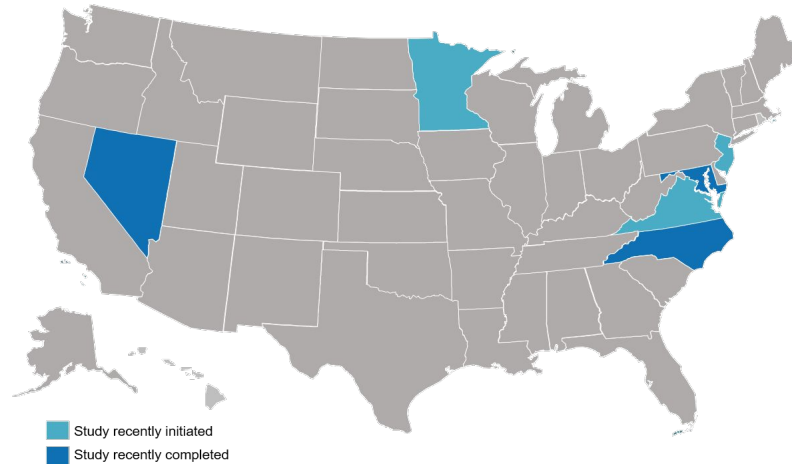
Source: National Renewable Energy Laboratory, 2017

- 25% of C&I customers face demand charges of \$15/kW or higher
- Storage offers an opportunity to cost-effectively reduce demand thereby reducing demand charges

Energy Storage Studies

- Public Utilities Commission of Nevada (S.B. 204, 2017)
- Minnesota Commissioner of Commerce (H.B. 2, 2019)
- North Carolina Policy Collaboratory (H.B. 589, 2017)

EXAMPLES OF STATES INITIATING OR COMPLETING ENERGY STORAGE STUDIES IN 2018 OR 2019



Source: DSIRE Insight, NC Clean Energy Technology Center

- New Jersey Board of Public Utilities (A.B. 3723, 2018)
- Maryland Power Plant Research Program (H.B. 773, 2017)
- Virginia Dept. of Mines, Minerals, & Energy (H.B. 5002, 2018)

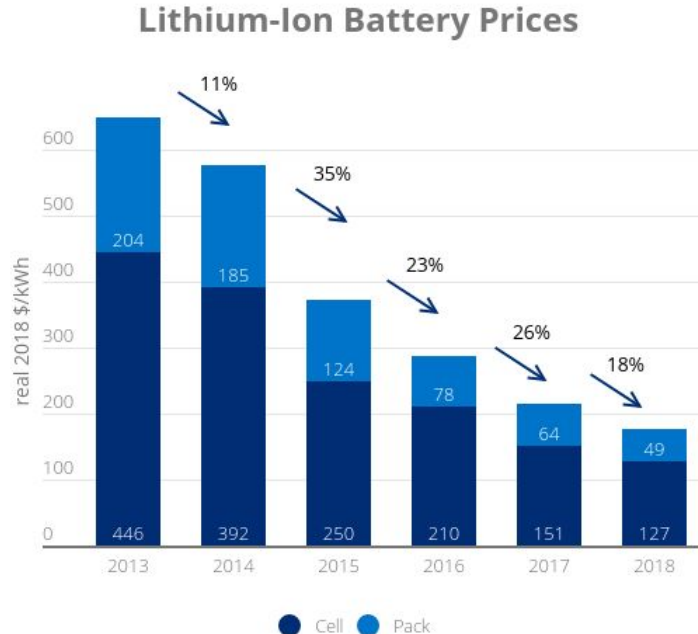
State Energy Storage Targets



State	Target
California	In 2010, California became the first state to establish an energy storage target, calling for 1,325 MW by 2020. In 2016, the state added a 500 MW behind-the-meter energy storage target to be split between its three IOUs.
Massachusetts	The Massachusetts legislature signed a bill in 2018, extending their storage target from 200 MWh by 2020 to 1,000 MWh by 2025.
New Jersey	New Jersey's governor signed a bill in December of 2018, establishing a 2,000 MW energy storage target by 2030
New York	The New York PSC approved an initiative, which set an energy storage goal of 3,000 MW by 2030 with an interim goal of 1,500 MW by 2025.
Oregon	In 2015, the Oregon PUC passed a law requiring the state's two IOUs to have a minimum of 5 MWh of energy storage in service by January 1, 2020.

Source: DSIRE Insight, NC Clean Energy Technology Center

Falling Battery Prices



Bloomberg New Energy Finance, 2019

- Lithium-ion accounts for ~90% of stationary storage
- Costs have declined by 72.9% since 2013
- Technology Lock-In

Questions?

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