



FERC Action on Energy Storage: Where We've Come From, Where We're Going

Jason Burwen, VP of Policy
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www.energystorage.org

1

Energy storage is flexibility

Supplying the precise amount of electricity exactly when and where you need it

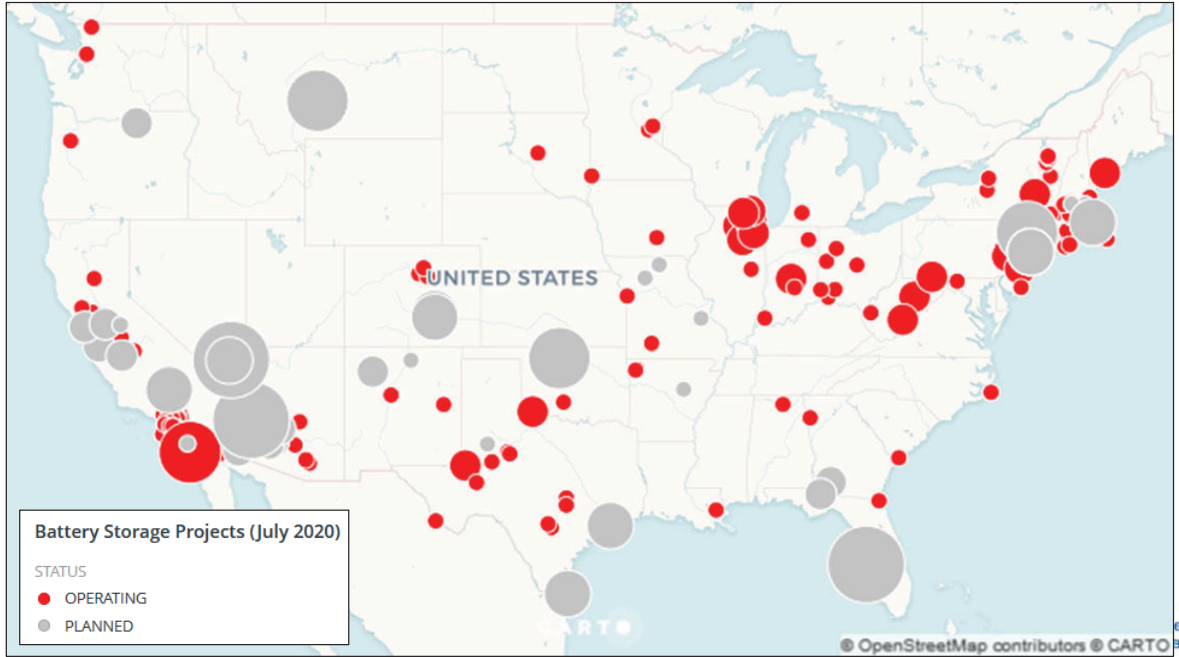
Optimize the electric grid & enable system transformation

1. **Efficiency** // save households & businesses money
2. **Resilience** // make service more disruption-proof
3. **Adaptability** // integrate diverse, changing resource mix

2

Grid Battery Projects

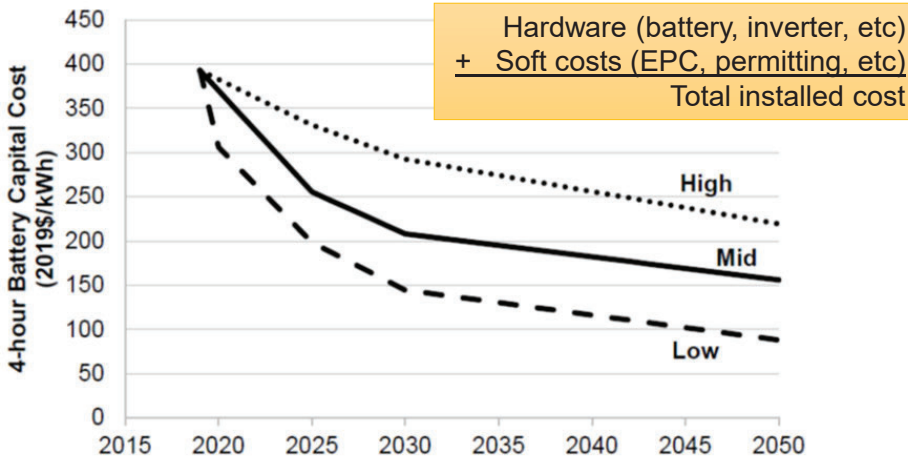
EIA 860m Series - July 2020



3

Trend: Battery storage installed costs continue to decrease

Bulk-scale 4-hour lithium-ion grid battery installed cost (\$/kWh)



Annual Cost Decline Rates from 2018

	2025	2030	2040
Low Cost	-10%	-9%	-6%
Mid Cost	-6%	-5%	-3%
High Cost	-1%	-1%	-1%

Source: Bloomberg New Energy Finance (2018) and NREL (2019b) with Brattle analysis.

SOURCE: NREL 2020



4

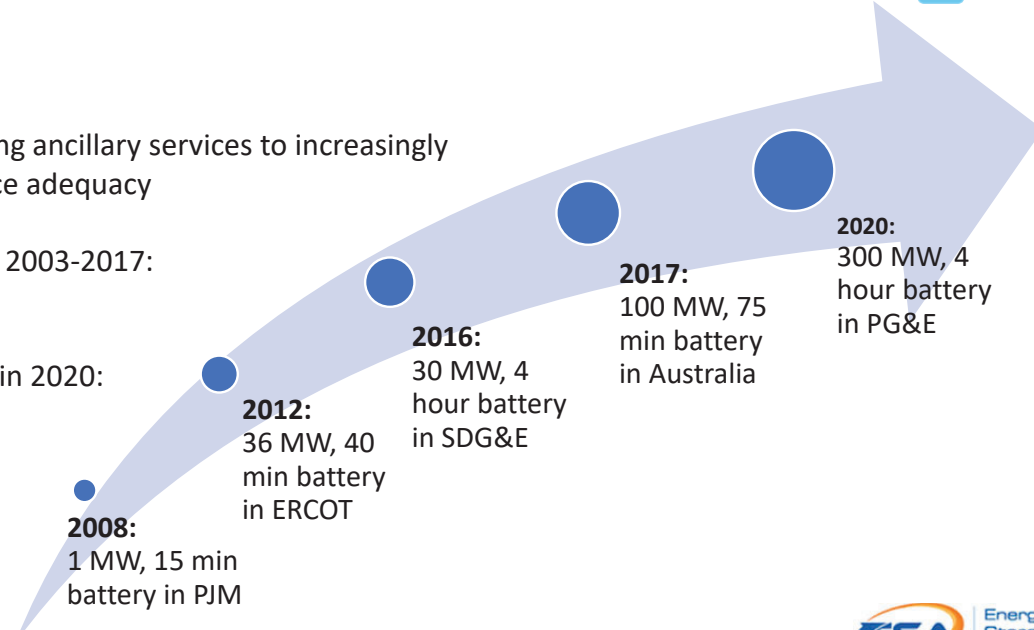
Sizes and durations rising

Shift from primarily providing ancillary services to increasingly providing capacity / resource adequacy

All battery storage installed 2003-2017:
800 MW / 1200 MWh

Single PG&E battery online in 2020:
300 MW / 1200 MWh

DER storage aggregations
Will follow
(largest today ~20 MW)



2008:
1 MW, 15 min
battery in PJM

2012:
36 MW, 40
min battery
in ERCOT

2016:
30 MW, 4
hour battery
in SDG&E

2017:
100 MW, 75
min battery
in Australia

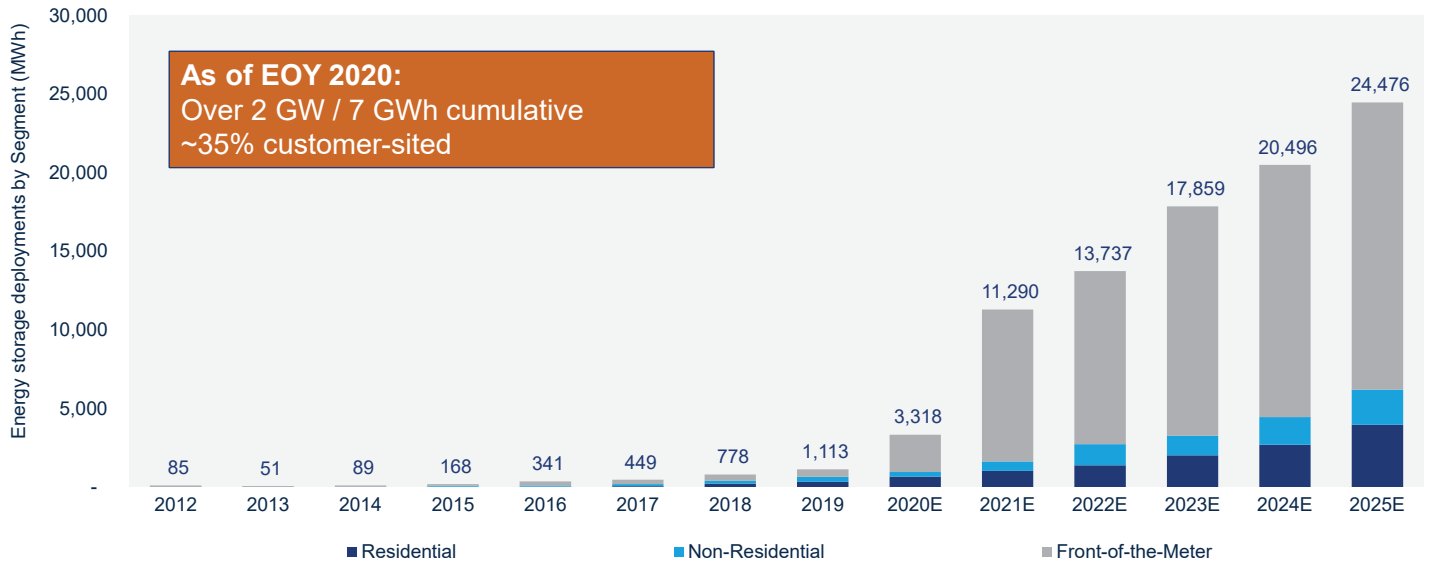
2020:
300 MW, 4
hour battery
in PG&E



U.S. market will reach 24 GWh annually by 2025

Longer durations for standalone and solar-paired projects will drive 7x market growth compared to 2020

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



As of EOY 2020:
Over 2 GW / 7 GWh cumulative
~35% customer-sited

Source: Wood Mackenzie Power & Renewables

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