Drivers for Energy Storage System (ESS) - Grid

The U.S. utility grid has existed for more than 100 years with minor incremental changes in architecture, technology and business models.

Continuing growth in electricity demand and the increase of renewable energy generation require grid expansion – energy storage provides a solution to grid expansion.
Drivers for ESS - Growth of Renewables

- U.S. installed 6,201 megawatts (MW) of solar photovoltaics (PV) in 2014
- 32% of new electric generating capacity came from solar in 2014
- Growth is fueled by Solar Investment Tax Credit (ITC)
- CA – Gov. Jerry Brown, proposed to expand California’s renewable energy goals, from one-third by 2020 to 50% by 2030
Drivers for ESS - State Regulations & Legislation

- Oregon: Department of Energy sought comments to assist with development of storage demonstration RFP
- California: CPUC mandating 1.3 GW of storage by 2020; SCE, PG&E and SDG&E issued relevant RFOs; SCE also procured 100.5 MW through LCR and SDG&E issued LCR RFOs (which count toward the mandate), capacity requirements driving more procurements than the mandate so far; PG&E and SCE issued RPS RFOs for utility-scale renewables paired with storage; CPUC proceeding to improve utility distribution resource planning in 2015
- Washington: Department of Energy awarded $15 million to three utilities for storage demonstration projects
- U.S.: DOE announced a $2.5 billion solicitation (with additional funding up to $4 billion) in loan guarantees toward renewable energy and energy efficiency projects including energy storage
- New York: Con Edison and PSEG Long Island procuring storage for T&D deferral, NYSERDA providing funding for storage technology startups in addition to microgrid projects; New York PSC reforming regulation to facilitate planning, operations and market-based deployment of DERs, including storage
- PJM: Seeing consistent deployments for ancillary services; developing new capacity performance requirements for resources including storage
- Arizona: APS to procure upward of 10 MW of storage; TEP to procure up to 10 MW
- ERCOT: Undertaking comprehensive redesign of ancillary service market to allow participation in the market and appropriately value fast acting resources such as storage within 3 years; Oncor sponsored study showing value of utility-controlled distributed energy storage in Texas
- Hawaii: HECO considering three battery storage projects from RFP soliciting projects of 60 MW to 200 MW
Energy storage is accomplished by devices or physical media that store energy to perform useful processes at a later time. — Wikipedia

An Energy Storage System (ESS) uses forms of energy such as chemical, kinetic, or potential energy to store energy that will later be converted to electricity. — CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC)
The Different types of Energy Storage?

- Pumped Hydro
- Compressed Air Energy Storage (CAES)
- Flywheels
- Batteries
- Super-Capacitors (SuperCaps)
- Superconducting Magnetics
- Thermal Storage
- Fuel Cells
- Hydrogen Storage
Storage Technologies

Not all Energy Storage Technologies are Created Equal
Benefits of Energy Storage

Peak shaving is the tip of the energy storage iceberg. CODA’s distributed storage systems are optimized for peak shaving and demand response today.
Benefits: Peak Shaving

Commercial and Industrial business customers spend $80B per year on Demand Charges, representing 50% of their electric bill cost. Storage reduces peak demand (kW) by 10-20%.
Onsite PV generation reduces utility energy (kWh) charges, but often has little effect on peak demand (kW) charges. Adding storage reduces peak demand (kW) creates more economic value for installed PV.
Benefits: UPS & Reliability

- Storage provides high power quality or uninterruptible power supply (UPS)
  - Data center/telecom, emergency response, medical, industrial
  - No direct monetary return
  - Prevents productivity losses from outages
  - Most common type of facility energy storage

Electric grid outages result in an estimated $100 billion of economic losses annually, nearly three quarters of those losses occurring in the commercial sector.

Source: Forbes
Introducing The CODA Core™ Energy Storage System

- **ESS Energy Characteristics**
  - 52kWh Energy
  - 30kW Power
  - Scalable in 52kWh / 30kW increments

- **ESS Safety Standards**
  - UL Listed (2016 Standards)
  - ISO 9001 & 14001 Certified
  - 10-year maintenance & warranty

- **ESS Technical Specifications**
  - Lithium-Iron Phosphate (LiFEP04) cell chemistry
  - Battery and thermal management systems
  - Demand management algorithm
  - Tower footprint (24W x 27D x 71H inches)

50kWh CODA Core Tower
Dimensions: **24W x 27D x 71H inches**
Weight: **1,171 lbs. (531 kg)**
Materials: **Lithium-ion Batteries; 98% Recyclable**

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The CODA Energy Difference

**EXPERTISE:**
15+ Years Experience Designing & Deploying Battery Systems

**SAFETY & STANDARDS:**
First Company to Certify Products to UL 1973 Standards for 2016

**RISK-FREE MODEL:**
Customer Financing Model - $0 Down and Shared Savings

**ONGOING INNOVATION:**
Dedicated On-Site Battery Testing Facility for Ongoing Research & Development

**RELIABLE SERVICE:**
10-Year Warranty of Storage Assets (Ongoing O&M)

**PROVEN TRACK RECORD:**
Proven Product & IP Efficacy, Over 3MW Installed in California

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Over 3MW of Installations in California

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Primary Application – Peak Demand Reduction in California

- WETSUIT MANUFACTURER, HUNTINGTON BEACH
- DISTRIBUTION WAREHOUSE, LOS ANGELES
- BOUTIQUE HOTEL, LOS ANGELES
- LARGE RESTAURANT, LOS ANGELES
- MANUFACTURING DIE-CAST, LOS ANGELES
- SMALL RESTAURANT, STOCKTON

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“Over the past year we cut costs by making energy upgrades to our manufacturing facility, including LED lighting. Adding a single CODA energy storage system has saved us $300 a month so far and Summer rates are coming, so we’re looking forward to a bump in monthly savings.”

- Marc Spitaleri, Victory Wetsuits
Questions?

Q&A