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State Regulatory Efforts

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State Regulatory Policy: Why It Matters

- Policy development is taking place at federal, state, and local (utility) levels, but leadership is at the state level

- What is the policy basis for storage?
  - Completely different kind of resource
  - Need for flexibility in the power system
  - "Fit" with traditional operating paradigm
  - Customer advocacy
  - Economic development and technology industry growth
  - Enabling technology for clean energy
  - Resiliency and grid independence
  - Natural next step for emerging delivery models

State Drivers for Storage

- New revolution in state regulatory engagement in energy storage
  - Closely connected to distribution system planning, resiliency, and grid modernization
  - Value stacking and co-optimization are essential, which do not fit traditional resource planning and modeling paradigms
  - Customers and stakeholder-driven agendas with legislation increasingly common
  - Cost declines make storage more competitive with alternatives
- Storage has the potential to fit the utility business model – an owned asset that meets the regulatory compact

State Regulatory Approach

- Equitable Regulatory Environment topic (OE Energy Storage Program strategy *Grid Energy Storage*, December 2013)
- Objectives
  - Expand the technical capacity of states interested in engaging with storage in ground-breaking ways
  - Share best practices and principles
  - Support more informed regulatory outcomes
- FY17 Projects
  1. Partnership with the Oregon Public Utilities Commission (Oregon PUC) and Washington Utilities and Transportation Commission (Washington UTC)
  2. Valuation Handbook (initiated FY17)
  3. Salt Lake Seminar (initiated FY17)

Oregon Overview

- Oregon energy storage requirement
  - Oregon legislature passed HB 2193 in 2015 session
  - Directs Oregon commission to create procurement guidelines for storage by 2017 and for utilities to propose projects that meet those guidelines.
  - Required to propose storage but not necessarily to build: Commission can determine that proposals are not acceptable
  - Capacity/energy terminology in law: projects should have “the capacity to store at least five megawatt-hours of energy” but constitute no greater than 1 percent of peak load (38 MW PGE; 26 MW PacifiCorp)
  - Oregon commission set procurement guidelines in March 2017 and draft project proposals are due by December 2017.
  - Utilities must also provide the commission with a ”system evaluation” to determine what storage is appropriate for the system. Utilities submitted draft evaluations in July 2017.

Oregon Use Cases for Benefit Stacking

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Category	Service	Value
Bulk Energy	Capacity or Resource Adequacy	The ESS is dispatched during peak demand events to supply energy and shave peak energy demand. The ESS reduces the need for new peaking power plants.
	Energy arbitrage	Trading in the wholesale energy markets by buying energy during low-price periods and selling it during high-price periods.
Ancillary Services	Regulation	An ESS operator responds to an area control error in order to provide a corrective response to all or a segment portion of a control area.
	Load Following	Regulation of the power output of an ESS within a prescribed area in response to changes in system frequency, tie line loading, or the relation of these to each other, so as to maintain the scheduled system frequency and/or established interchange with other areas within predetermined limits.
	Spin/Non-spin Reserve	Spinning reserve represents capacity that is online and capable of synchronizing to the grid within 10 minutes. Non-spin reserve is offline generation capable of being brought onto the grid and synchronized to it within 30 minutes.
	Voltage Support	Voltage support consists of providing reactive power onto the grid in order to maintain a desired voltage level.
	Black Start Service	Black start service is the ability of a generating unit to start without an outside electrical supply. Black start service is necessary to help ensure the reliable restoration of the grid following a blackout.
Transmission Services	Transmission Congestion Relief	Use of an ESS to store energy when the transmission system is uncongested and provide relief during hours of high congestion.
	Transmission Upgrade Deferral	Use of an ESS to reduce loading on a specific portion of the transmission system, thus delaying the need to upgrade the transmission system to accommodate load growth or regulate voltage or avoiding the purchase of additional transmission rights from third-party transmission providers.
Distribution Services	Distribution Upgrade Deferral	Use of an ESS to reduce loading on a specific portion of the distribution system, thus delaying the need to upgrade the distribution system to accommodate load growth or regulate voltage.
	Volt-VAR Control	In electric power transmission and distribution, volt-ampere reactive (VAR) is a unit used to measure reactive power in an AC electric power system. VAR control manages the reactive power, usually attempting to get a power factor near unity (1).
	Outage Mitigation	Outage mitigation refers to the use of an ESS to reduce or eliminate the costs associated with power outages to utilities.
	Distribution Congestion Relief	Use of an ESS to store energy when the distribution system is uncongested and provide relief during hours of high congestion.
Customer Energy Mgmt Services	Power Reliability	Power reliability refers to the use of an ESS to reduce or eliminate power outages to utility customers.
	Time-of-Use Charge Reduction	Reducing customer charges for electric energy when the price is specific to the time (season, day of week, time-of-day) when the energy is purchased.
	Demand Charge Reduction	Use of an ESS to reduce the maximum power draw by electric load in order to avoid peak demand charges.

Source: Modified from Akhil et al. 2015.

Partnership with the Oregon PUC

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- Memorandum of Understanding signed December 15, 2016
- Areas of Cooperation
  - Use cases and services derivation; calculation methodologies; review of system benefit analysis**.**
  - Technology capability validation.
  - Staff support, subject matter expert for sound policy development.
- **Key Results:** Informed multiple Staff memos, earning quick ALJ and Commission approvals; system evaluations and project proposals will drive storage modeling advances; Staff empowered to engage in secondary storage actions, e.g. planning and procurement guidelines
- **Docket Status (UM 1751)**
  - Staff Recommendations on Draft System Evaluations Submitted to Commission
  - Draft Project Proposals due January 1, 2018

Washington Overview

- Washington commission issued a draft policy statement in March 2017
- Built on years of utility analysis, staff white paper, and public workshops

Service Date: March 6, 2017

BEFORE THE WASHINGTON STATE
UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Washington Utilities and Transportation Commission's Investigation into Energy Storage Technologies.	DOCKETS UE-151069 AND U-161024 DRAFT REPORT AND POLICY STATEMENT ON TREATMENT OF ENERGY STORAGE TECHNOLOGIES IN INTEGRATED RESOURCE PLANNING AND RESOURCE ACQUISITION

I. INTRODUCTION AND PROCEDURAL BACKGROUND

1 On May 18, 2015, regulatory staff of the Washington Utilities and Transportation Commission (Commission) initiated a staff investigation into the role of energy storage in electric utility planning and procurement.[1] Commission Staff (Staff) initiated the investigation based on a Staff white paper that identified barriers to energy storage created by the way that Washington's investor-owned utilities modeled such technologies

UTC Draft Policy Statement Key Recommendations

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- **Establishes energy storage as Commission policy.** "It is the policy of this Commission that energy storage is a key enabling technology for utilities to comply with the state's energy policies, and that Washington's investor-owned utilities should be diligently working to identify and pursue cost-effective opportunities to incorporate energy storage into their systems."
- **Utilities must evaluate storage in order to make a major investment.** Utilities seeking a prudence determination (the usual pre-requisite for seeking rate recovery for an investment) "must be able to demonstrate that their analysis of resource options included a storage alternative."
- **Encourages transparency of data and for utilities to procure storage systems competitively.** This is a nod to third-party ownership and an interest in increasing visibility and creating more methodological consistency in estimating the value of ancillary services within vertically integrated utilities.
- **Directs utilities to consider a range of storage technologies, and to use learning curves, or reducing cost curves, when estimating storage in the future.**
- **Directs utilities to transition to sub-hourly models for future IRPs, and adopts a "net cost" approach in the interim.**

Partnership with the Washington UTC

- MOU signed March 4, 2017
- Areas of Cooperation
  - Record analysis and development.
  - Modeling approach
  - Drafting consultation and publication.
- **Key Results:** Timely and credible delivery of storage technology information; advisory role in weighing the merits of multiple approaches in a draft policy statement; continuous updates and engagement to facilitate final policy statement development.
- **Status**: Final Policy Statement anticipated in 2017.

Valuation Handbook

- Aggregates collection of work in FY17
  - National review of IRPs for cost estimates, modeling practices, and portfolio selection
  - Evolved practice of project, utility and system valuation
- Proposed publication in FY18
  - Supports a collective understanding of current practices and establishes principles for future practices
  - Instructive case studies and infographics
  - Broad review of state of practice in utility and market proceedings, including planning, procurement, and rate recovery

Salt Lake Seminar

- Scheduled for November 8, 2017 at the Western Electricity Coordinating Council's offices in Salt Lake City, Utah
- Eight states in the Western Interconnection confirmed, additional invitations pending.
- Purposes:
  - Stage an educational opportunity tailored to state regulatory commissions
  - Share the OE research program with independent lens
  - Offer states an opportunity to communicate with each other directly
- Active state dockets related to storage include:
  - Grid Modernization
  - Legislated Procurement Target
  - PURPA Avoided Cost
  - Exploring Capacity Needs
  - Distribution System Planning
  - Integrated Resource Planning

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Thank you

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