



Industrial Energy Storage Policy

Challenges and Opportunities

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Energy Storage for Manufacturing
and Industrial Decarbonization Workshop



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Agenda

- ▶ **Policy and Industrial Energy Storage**
- ▶ **Industrial Rate Design**
- ▶ **The Investment Tax Credit**
- ▶ **Distributed Storage Programs**
- ▶ **Federal Energy Regulatory Commission (FERC) Order 2222**
- ▶ **Public Utilities Regulatory Policy Act (PURPA)**

Policy and Industrial Energy Storage

- ▶ How industrial customers acquire and use energy storage is shaped by policy
- ▶ Policies are not uniform; industrial customers face different options and constraints depending on their location
- ▶ This presentation will summarize five policies and regulations that facilitate the deployment and operation of customer-sited energy storage technologies and the strengths and weaknesses of each.
- ▶ These policies affect how industrial customers:
 - ▶ Purchase energy storage,
 - ▶ Use energy storage, and
 - ▶ Are compensated for their energy storage assets

Industrial Rate Design

- ▶ Commercial and industrial customers pay demand charges, which represent a sizeable portion of their energy costs
- ▶ Deploying storage for demand charge management can reduce energy costs and energy emissions
 - ▶ Emissions reduction dependent on charging energy; may be limited if charging from the grid
- ▶ High demand charges can create a price signal for using storage to reduce load and emissions
 - ▶ Fairness concern: Not all customers may be able to respond
 - ▶ Cost recovery concern: Aggressive signals that drive large, rapid reductions in peak load may jeopardize a utility's ability to recover its investments to serve that load
 - ▶ Sustainability concern: Over time, peak reductions will result in lower demand charges, which could reduce the financial benefit

Case Study: Arizona Public Service

Issue: In a 2017 rate case, APS proposed a ratchet for large commercial customers

- Ratchets create a lag between when demand is reduced and when demand charges decrease
- Create increased stability for utility
- Unpopular with customers; hotly contested in this proceeding

Outcome: The Arizona Corporation Commission approved a settlement between APS and customers.

- Created a \$6M, 3-year program to assist customers in deploying storage for demand charge reduction
- Grew into a “bring your own storage” tariff for commercial customers

Investment Tax Credit

- ▶ The Investment Tax Credit (ITC) provides federal tax credits for solar electricity generation assets
- ▶ The Internal Revenue Service has determined that energy storage assets may also be eligible for the credit if they are attached to an eligible solar generator and charged by it at least 75% of the time
 - ▶ Reduces the costs of deploying energy storage when paired with solar and, since it is paired with solar, increases the decarbonization contribution of the storage
 - ▶ Not applicable (yet) to standalone energy storage assets

The ITC was scheduled to begin winding down in 2021 but was extended for two additional years in the Consolidated Appropriations Act of 2021:

	2021	2022	2023	2024 & On
Original schedule	22%	Commercial & Utility: 10%		
		Residential: 0%		
New schedule	26%	26%	22%	Commercial & Utility: 10%
				Residential: 0%

Distributed Energy Storage Models

- ▶ In 2016, Green Mountain Power (VT) launched a first-of-its-kind program in which the utility engaged in joint ownership of customer-sited storage assets
 - ▶ Utility incentives enabled customers to buy a Tesla PowerWall for \$1,500 or \$15/month (~75% discount)
 - ▶ In exchange, utility has operational control of the asset, which it operates for peak reduction
 - ▶ Host customers receive time-of-use rate reduction and backup power in an outage
- ▶ In first full year (2018), program shaved 3.5 MW off the utility's annual peak, saving all customers \$500k
- ▶ Program has since evolved into a bring-your-own storage program tariff open to all residential customers
- ▶ Distributed storage programs can be designed to benefit all utility customers
 - ▶ Have generally only been applicable to residential customers; may need some adjustment for industrial loads

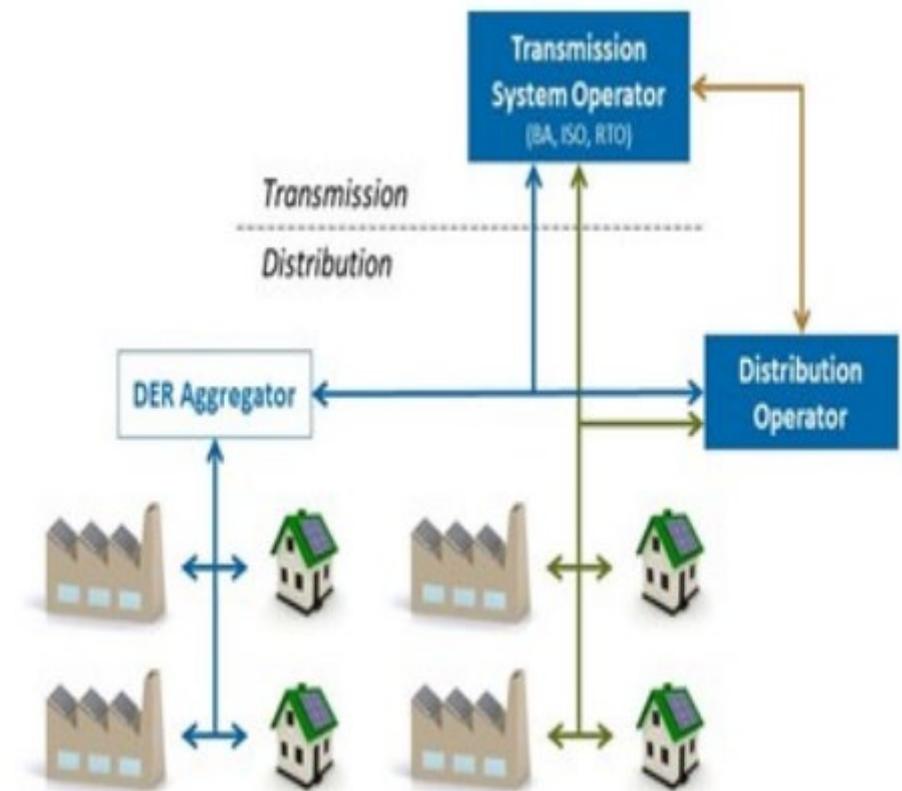


Green Mountain Power

Federal Energy Regulatory Commission (FERC) – Order 2222

- ▶ FERC issued Order 2222 in Sept. 2020, directing regional market operators to enable distributed energy resource participation in energy markets
 - ▶ Creates a significant new revenue stream for private owners of energy storage and other distributed energy resources
 - ▶ Participation in various market products (capacity, energy, demand response) may achieve dual objectives of revenue generation for the owner and emissions reduction for the grid (subject to charging energy and dispatch orders)
 - ▶ Only applicable to assets located within the footprint of an independent system operator (ISO) or regional transmission operator (RTO)
- ▶ Still undergoing implementation; full realization of Order 2222's objectives still likely years away in most regions
- ▶ Raises complex questions regarding coordination between transmission and distribution system operators

DER Aggregation through Order 2222



Source: Jeffrey Taft (PNNL) and Paul de Martini (Newport Consulting)

Public Utilities Regulatory Policy Act (PURPA)

- ▶ The Public Utilities Regulatory Policy Act (PURPA) requires utilities to purchase the output of small, independently owned electric generators at their avoided cost (what the utility would have paid to generate the electricity itself)
 - ▶ Generators can sell all output to the utility at agreed-upon pricing or sell only excess generation at index prices
 - ▶ Most utility PURPA rates are flat; lack of strong daily/seasonal cycles creates little incentive for storage or for selling during peak periods, which in turn reduces ability to reduce emissions
 - ▶ Generally applicable only in vertically integrated (non-ISO) regions, as generation owners in ISO regions can access market
- ▶ Not an ideal mechanism for industrial decarbonization, but for a customer in a vertically integrated region, it may be the only means of monetizing onsite energy production
 - ▶ Creation of dynamic PURPA rates can send price signals that improve value of independent generation and enable contributions to decarbonization
 - ▶ Duke Energy: PURPA rates vary by time of day, season, point of interconnection, and type of generator; a PURPA customer may face 30+ different rates throughout the year



Thank you

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