



Grid Energy

Energy Storage and Grid Modernization

**DC PSC 1130 Proceeding
MEDSIS WORKSHOP 28 APRIL 2016**

Grid Energy Proprietary Information

www.gridenergy.com

Overview

- ENERGY STORAGE
- DEPLOYMENT AND CONFIGURATION
- SCOPE OF REGULATORY OVERSIGHT
- REFORM PROPOSALS

Energy Storage



- Charge and discharge
- Net loss
- Not a generator asset

Deployment & Configuration

Key Elements



- Grid connected
- BTM isolated from distribution grid
- BTM, parallel operations

Deployment & Configuration

Building level power quality & local voltage support

- UPS functionality
- Island mode: building or group of buildings (one owner, private land/campus) become 'microgrid'



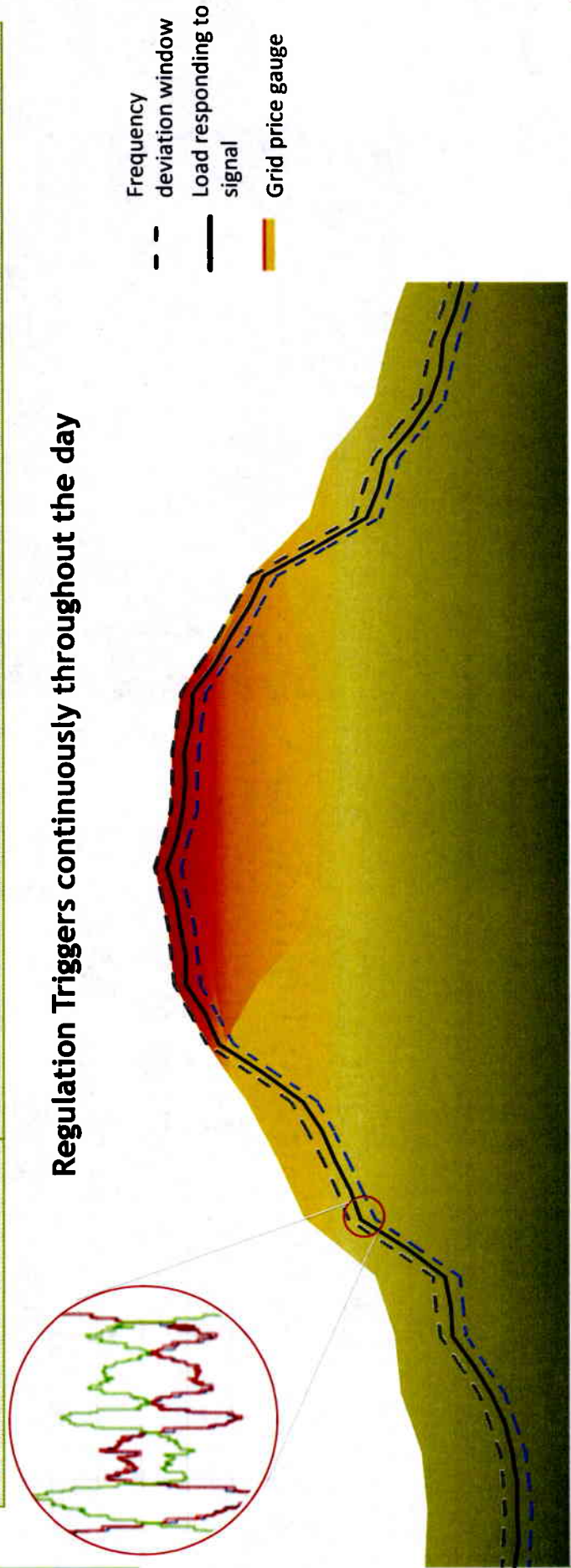
Deployment & Configuration

PJM Regulation D (Frequency Regulation)



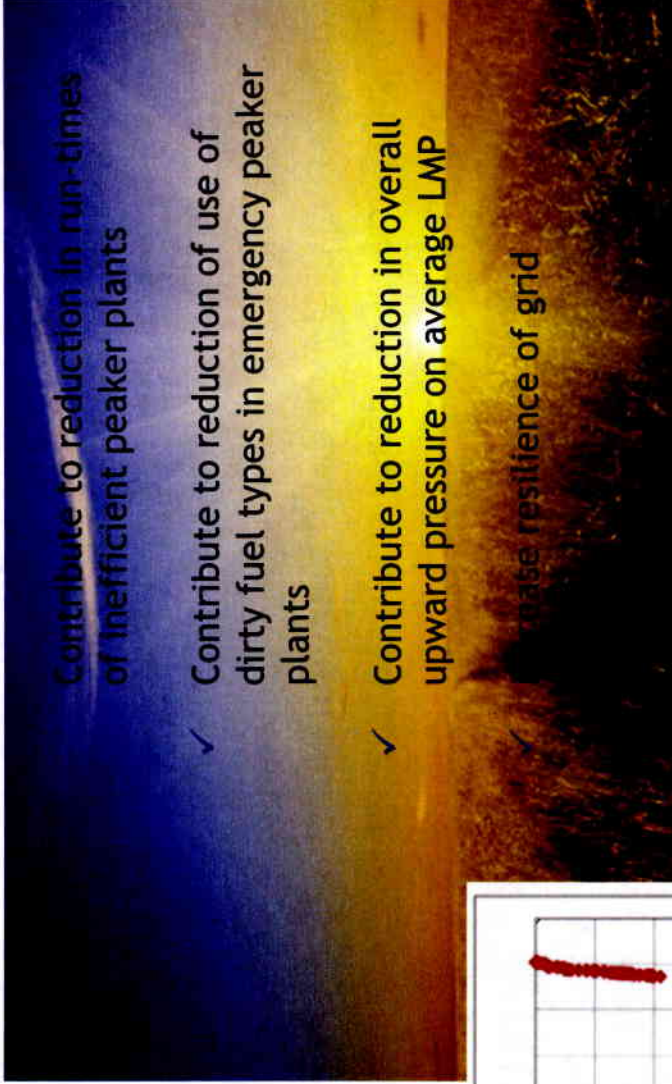
Successful Customer Type	Those with qualifying energy load or equipment that are able to reduce or increase power usage with little notification time
Program Trigger	Grid balance and reliability (continuous response to 2-4 second signal)
Program Frequency	Participation frequency based on voluntary bid. Continuous opportunities 24 hours a day
Payment Structure	Payments based on voluntary bid acceptance (with pay for performance based on speed of response)

Regulation Triggers continuously throughout the day

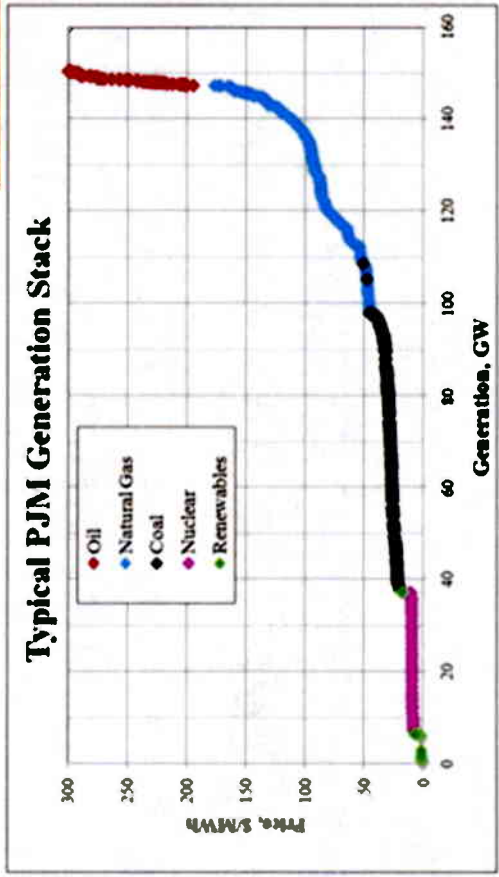


Deployment & Configuration

Sustainability



- ✓ Contribute to reduction in run-times of inefficient peaker plants
- ✓ Contribute to reduction of use of dirty fuel types in emergency peaker plants
- ✓ Contribute to reduction in overall upward pressure on average LMP
- ✓ Increase resilience of grid



Deployment & Configuration

Economic

- Economic dispatch
- LMP arbitrage
- Wholesale market participation

“Batteries that let large users lower their reliance on the most expensive electricity threaten to cripple sales for U.S. independent power producers and utilities...[T]echnological disruption and paradigm shift is precisely why states should avoid mandating capacity purchases by load, particularly on a three-year forward basis, as such governments-mandated forward procurements rob customers of the benefits and savings from innovation, and only aid incumbent industry participants. – Bloomberg, September 24, 2015

Regulatory Oversight Overview by Use and Configuration



- BTM Power Quality: Islanded from grid. No regulatory oversight required
- Ancillary Market/Reg D: Operated under federal jurisdiction. Public interest in local regulatory oversight limited to safety and reliability.
- Sustainability/Peak Load Reduction: Operated in response to UDM and PLC event predictions to effectively modulate load. Public interest in local regulatory oversight limited to safety and reliability.
- Economic Dispatch: Operated in response to wholesale markets. PJM Interconnection process.