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Innovation For A Reliable Future

Store Up the Benefits: Leveraging Energy Storage
Tuesday, June 19, 2018 1:30 – 2:30 p.m.

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Who We Are

- City of Glendale, CA
 - Utility – Glendale Water & Power
 - Population: 200,000+
 - 32 Square Miles
 - 89,000+ electric meters, 33,000 + water meters
 - 496 miles of distribution lines
 - 14,816 power poles
 - 12 substations
 - Highest Peak 347 MW



Storage In Place

- 3.5 MW consisting of 2 MW of battery and 1.5 MW of ice storage.
- The Smart Electric Power Alliance 2018 Awards ranked GWP #5 In Annual Watts Per Customer
- Proposed expansion of storage for GWP.

Glendale's Battery Energy Storage System

- 2 MW battery energy storage system installed at the newly renovated Grandview Substation in July 2017
- Build a new 69kV transmission line to connect the BESS to the existing Kellogg switching substation.
- Instantaneously responds to shifts in systemic load, providing GWP with an unprecedented capacity to regulate its transmission.
- Beyond renewable integration, the BESS may serve as an emergency source of energy to start up other units, mitigating the impact of potential unplanned disruptions in service
- One of the fastest responding storage systems for any municipal utility in Southern California.



Project Benefit & Highlights

- Store energy during periods of low energy demand, and discharge it during periods of higher energy demand.
- Help with regulating the power flow at the Intertie lines to remain within certain thresholds of scheduled power.
- Mitigate intermittency of the renewable sources such as solar generation.
- Provide emergency power to start generators in case of a major system outage.



Project Design: Major Components

- 2MW Battery Storage
- 2MVA Power Converter System
- 2MVA, 69kV/373V Transformer
- 69kV Gas Insulated Circuit Breaker
- 69kV Transmission Line



History of the Grayson Power Plant

- **1909:** The City purchased an existing electric distribution system.
- **1937:** Glendale invested in the Hoover Dam.
- **1941:** Grayson Power Plant was established.

Grayson Today:

- Grayson can no longer meet demand.
- Reliability is of concern– Nearly 80 years old!
- Limited transmission access
- Environmental concerns--emissions
- CA renewable energy standards.

Perfect storm to drive change.



What We Need to Power Glendale

- Requirements for a Repowered Grayson Power Plant:
 - Provide reliable base load local generation
 - Free up transmission for renewable imports
 - Provide enough power to meet peak load demand and cover contingencies
 - Improved environmental footprint
 - Can supply at least 234 MW of power



More Battery Storage in Glendale's Future

Preferred Option—New configuration consisting of 4 gas fired generating units (2 simple cycle, 2 combined cycle) total 262 MW

Maintain existing Unit 9 (simple cycle LM6000 installed in 2004)

- Changing market conditions led to the consideration of including a battery storage option.
- Option 2--Install 3 gas fired units reducing thermal generation to 191 MW and incorporate 50 MW/200 MWh of battery storage utilizing 4 hour batteries meet all load and reliability requirements.
- Option 3—Install 2 gas fired units approximately 131 MW and incorporate 50 MW/200 MWh of battery storage and seek clean energy alternatives (renewable, additional transmission, etc.,) to close the N-1-1 contingency.
- CleanEnergy Request for Proposal Process.

Looking Ahead

- GWP is using its current 2 MW BESS system to gain experience in the use of battery storage and to eventually develop and incorporate a larger scale battery component into its energy system.
- A full scale BESS incorporated into the Grayson Repower Project will support the integration of renewable resources by assisting in mitigating the intermittent energy supplied by renewable resources such as photovoltaic and wind. Store the cheaper renewable energy during the non-peak period for use during peak.
- Potential to cover spinning reserve requirements.

Promoting Energy Storage

Innovation for a
RELIABLE FUTURE

INTRODUCING OUR NEW 2 MEGAWATT BATTERY ENERGY STORAGE SYSTEM

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Press Release
Jul 6, 2017 12:00 UTC

Skylar Completes Commissioning of Battery Energy Storage System in Glendale, CA



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How battery systems instantaneously respond to system load shifts

JANUARY 10, 2018 BY MICHELLE FROESE — LEAVE A COMMENT

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Glendale Pilots Battery Energy Storage

Through a small-scale pilot, GWP demonstrates how battery systems instantaneously respond to system load shifts.

UtiliTY DRIVE

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Glendale Water & Power installs battery energy storage system

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Completed Project

