Applications That Reduce The Use Of Diesel Gensets

PARTNERS: DOE-SANDIA-ACEP-CEC; SAFT/ABB PACKAGE
Crater Lake Dam Storage may offset 25% Diesel consumption

Orca Power Plant
10.8 MW Diesel Control Center, CEC

Humpback Creek Hydroelectric Plant
1250kW (2 x 500 kW + 1 x 250 kW)
17,000 foot UG and submarine transmission line

City of Cordova
1,566 customers, 18MW
One Substation
78mi UG distribution lines

Power Creek Hydroelectric
6278kW (2 x 3124 kW)
25 kV transmission ties to Eyak Substation, Inflatable dam

Orca Power Plant
10.8 MW Diesel Control Center, CEC

Crater Lake Dam Storage may offset 25% Diesel consumption
Power Creek
Hydroelectric Intake
The Problem

- No Storage - use it or lose it
- Spill 3-4 gWh per year often while burning diesel
- Winter freezing leads to significant reduction in hydro output, sometimes 0%
- Spinning Reserve
- Bus cost of hydro is $.06/ kWh, Diesel as high as $.60/ kWh
The Spinning Reserve Problem

- Deflect 500 kW of water around turbines
- Once spinning reserve is needed, a diesel engine starts and 400 kW is removed from the hydro unit and used to base load the diesel
CEC Controls System Frequency by Deflecting 500kW of water, a waste of energy (orange), and there is excess in summer (green), and not enough in winter (black/diesel).
Battery Benefits

- Spinning Reserve
  - Eliminate Diesel
  - Reduce Diesel
  - Diesel Efficiency
- Diesel Efficiency
  - Diesel-off
  - Diesel shut-off
  - Diesel Efficiency
- Resiliency
  - Natural Disasters- Earthquakes, Tsunamis, Avalanches
- Arbitrage
  - Charge with $.06 hydro
Total Potential Battery Savings thru 2017

- Eliminate Diesel
- Reduce Diesel
- Diesel Efficiency
Summary

- A BESS is the best fit for Cordova Electric Cooperative.
- Not possible without partners; DOE, Sandia, ACEP
- Swiss Army Knife
  - Storage, Spinning Reserve, Black Start Capabilities, UPS for Critical Loads, Sectionalizing our Local Microgrid
- Opens the door for solar
Questions?