

Applications That Reduce The Use Of Diesel Gensets, Scott Newlun #101

PARTNERS: DOE-SANDIA-ACEP-CEC;
SAFT/ABB PACKAGE



Office of
ELECTRICITY



HITACHI
ABB



Sandia
National
Laboratories



ACEP
Alaska Center for Energy and Power



Cordova Alaska Aerial View

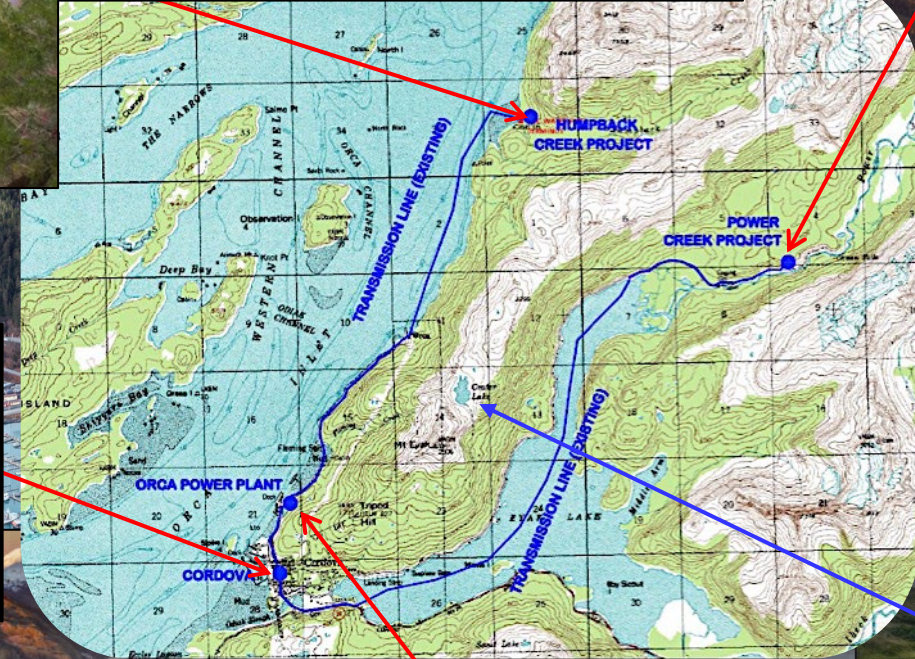




Humpback Creek Hydroelectric Plant
 1250kW (2 x 500 kW + 1 x 250 kW)
 17,000 foot UG and submarine transmission line



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



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



Orca Power Plant
 10.8 MW Diesel
 Control Center,
 CEC



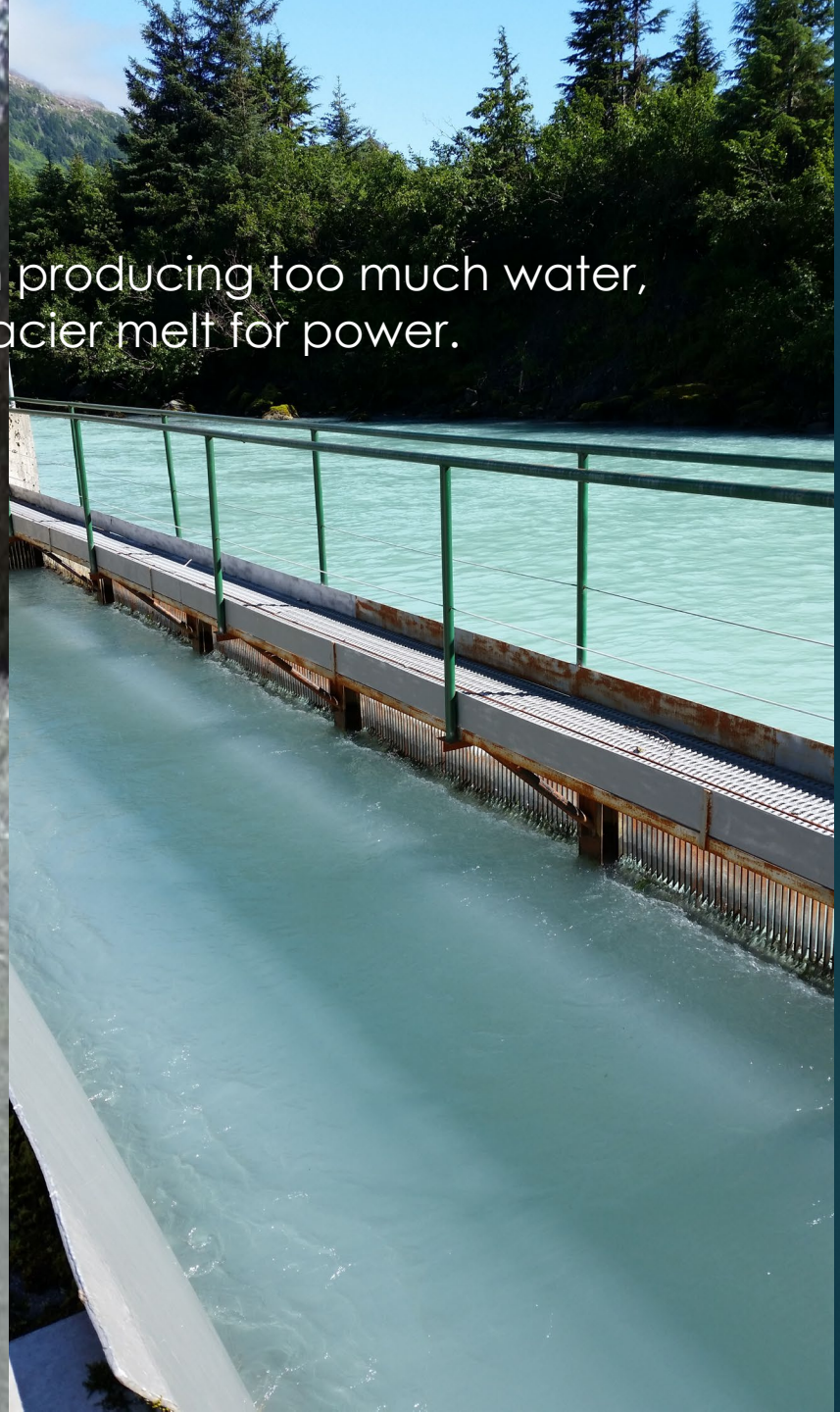
Crater Lake Dam Storage
 may offset 25% Diesel consumption

An aerial photograph of a hydroelectric intake structure on a river. The river is turbulent and white with foam. A concrete dam with a spillway is visible, along with a small building and a tall chimney. A road runs along the left bank, and a bridge crosses the river to the right. The surrounding landscape is a mix of green grass, brown shrubs, and evergreen trees.

Power Creek Hydroelectric Intake



Sometimes there is excess rain producing too much water, and sometimes we use the glacier melt for power.

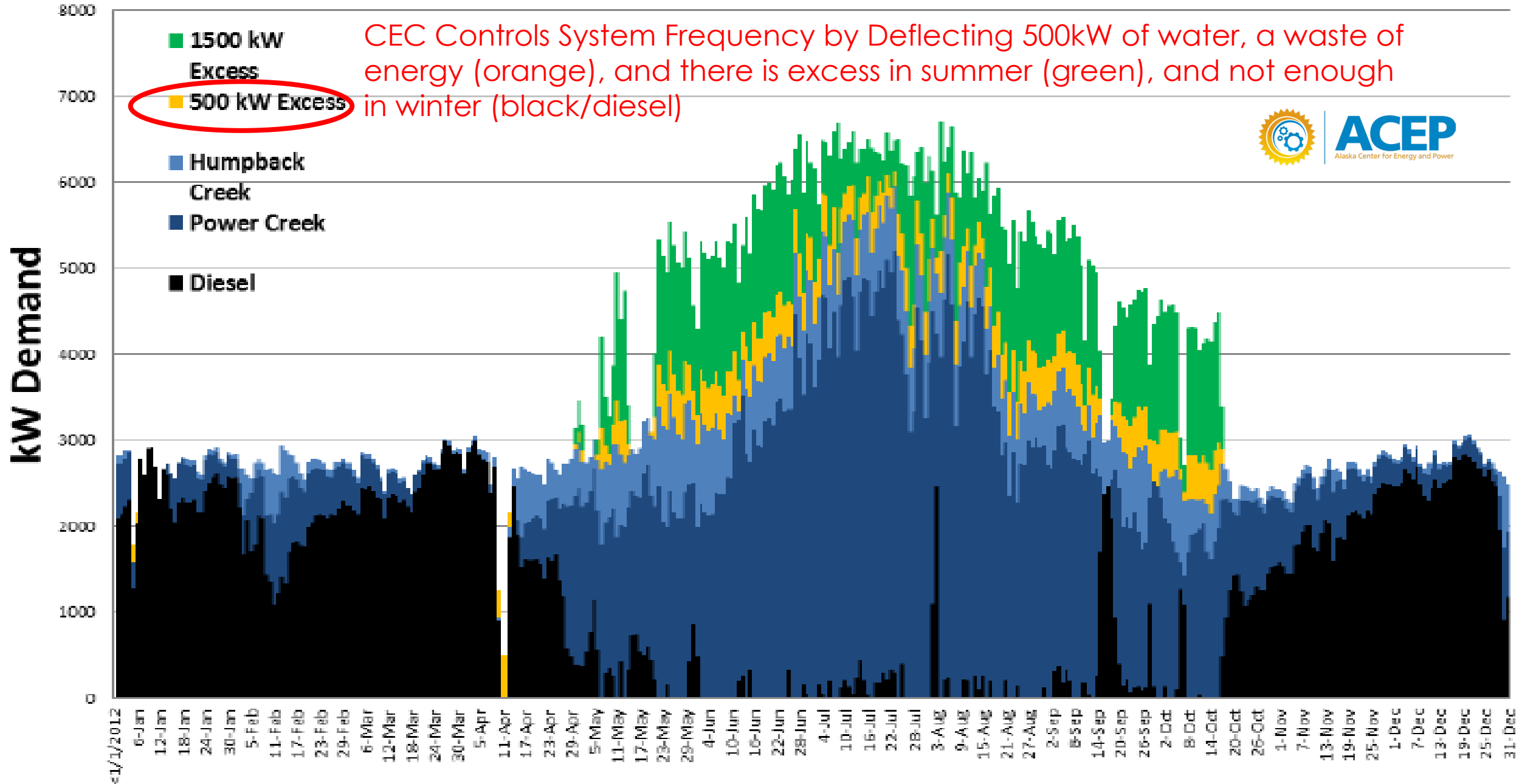






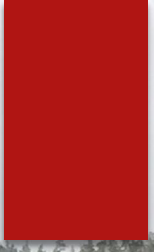
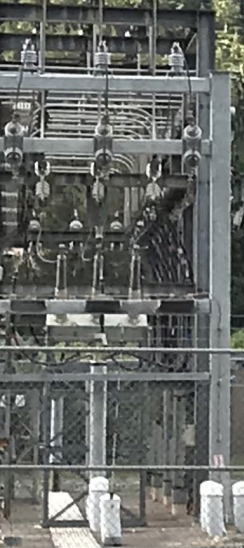
Deflector Control

Avg Daily kW Load 2012 w/ Excess Hydro











BURNHAM COMMERCIAL

WARNING
1. Read and understand the instructions and warnings before using this product.
2. Do not use this product if the instructions and warnings are not followed.
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WARNING
Keep boiler covered during construction. Electrical components must be kept dry and free from dust.



FWA



TIMELINES

- ▶ 2007 – CEC System Loads Exceed Hydro Capacity and diesel peaking creates a “valley of death”
- ▶ 2012 – CEC partners with ACEP and recognizes the benefits of energy storage to CEC Grid
- ▶ 2015-16 ACEP Approaches Dr. Gyuk with CEC use case/opportunity and rich CEC data set
- ▶ 2016 Dr. Gyuk initiates phase 1 modelling of CEC energy storage via Sandia Laboratories
- ▶ 2017 Modelling and analysis indicates a right-sized, right-located Lithium Ion solution for CEC
- ▶ 2018 Dr. Gyuk sponsors phase 2 specification and procurement of BESS
- ▶ October 2018 CEC BESS Ordered
- ▶ May 2019 BESS arrives on site
- ▶ June 2019 BESS Installed
- ▶ July 2019 BESS Operational
- ▶ November 2019 Fully integrated and automated, saves \$10,000 over 2-day Thanksgiving Holiday
- ▶ November CEC achieves 94% hydro crushing all previous records
- ▶ December 2019 CEC achieves 86% hydro crushing all previous records
- ▶ April 2020 CEC goes 100% hydro 3 weeks early and starts automated electric boiler heating
- ▶ 2021: Saved 50,000 gallons of diesel directly with BESS, 14,000 gallons indirectly with e-boiler
- ▶ 2022: Delivering more hydro, upgraded diesel heat loops to save 25,000 gallons with e-boiler
- ▶ 2022: New valves unleashed more hydro; extending heat loops and EV charging with excess hydro

Summary

- ▶ Energy Storage Systems are the Key to removing diesel from our generation scheme and moving it to Backup only status
- ▶ As we continue to improve our understanding of the BESS, we are saving \$150-\$200,000+ per year in fuel and maintenance costs
- ▶ A BESS is the best fit for Cordova Electric Cooperative for Energy Storage at this time
- ▶ This project would not be possible without partners
- ▶ Swiss Army Knife - frequency control, spinning reserve, and arbitrage all at the same time
- ▶ Opens the door for solar and other renewables
- ▶ Stored Hydro would be an excellent ESS option for Cordova to make it a self-sufficient energy system
- ▶ Our Goal is to provide Safe, Reliable Power at the best price possible

Thank You

