Optimizing Remote Deployment Energy Systems

Pulse Micro Smart Grid

Bruce Cullen, Pulse Energy

Joint Service Power Expo, Myrtle Beach, SC

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Outline

- Remote Energy Problems

- Canadian Off Grid Test Site

- Demand Management Targets

- Demand, T&D and Supply Side Improvements

- Pulse Micro Smart Grid

- Peak Demand Data Management

- Demand Response

- Remote Energy Solutions

Energy Problems in Remote Locations

1. Fuel trips into remote deployments are hazardous
2. Diesel will continue to be the fuel of 'need'
3. Fuel costs are very high and unpredictable
4. Buildings do not operate very well
5. Demand data is not used to inform generation

Hartley Bay, BC - Canada's Pacific Coast
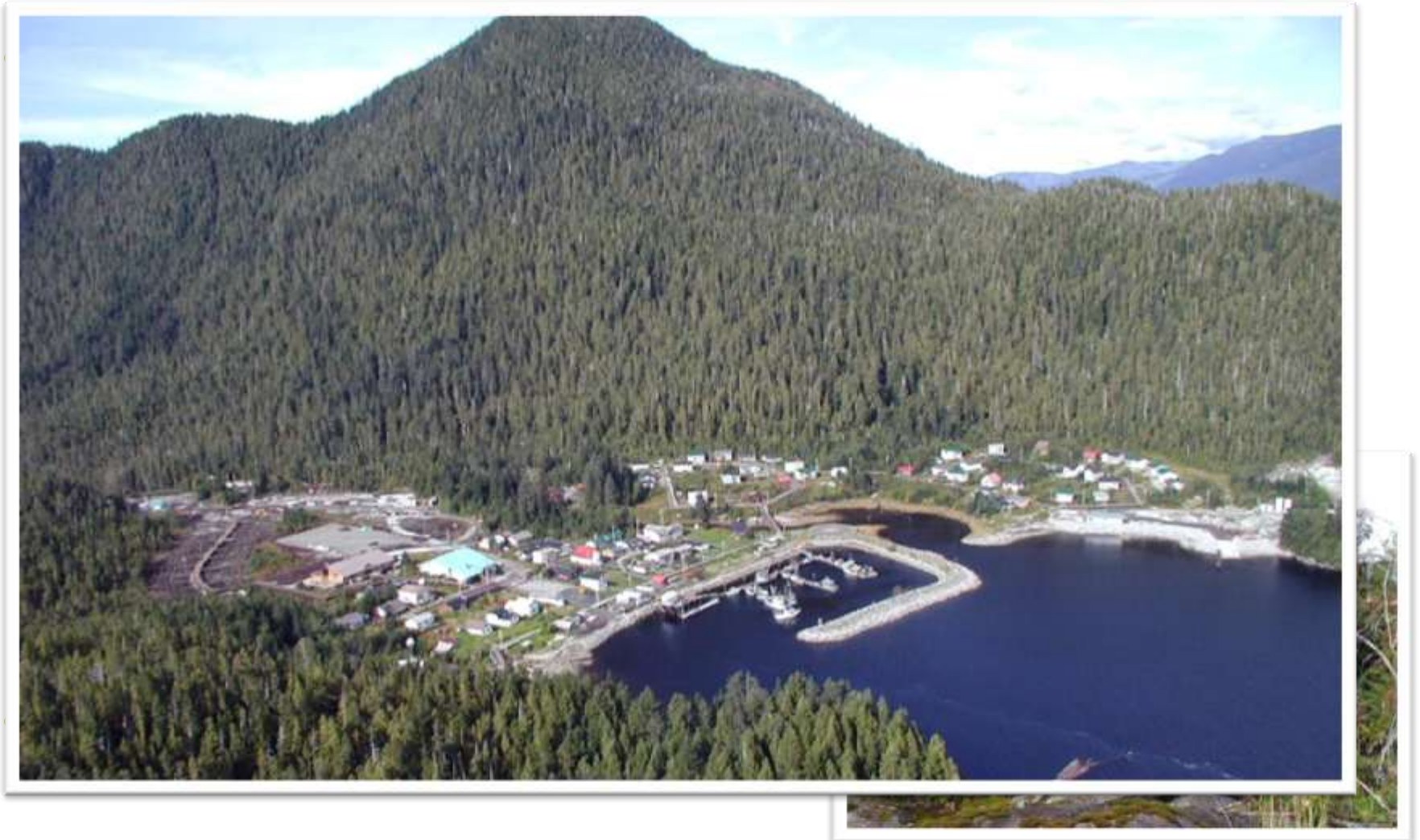
Demand Management Targets

- Smart Meters on every facility and Generator
- Targeted Retrofits
- Energy Anomalies – Email notification
- Peak Load Management, 6000 hours
- Power Quality Issues
- Distribution Losses, Generation Losses
- Pulse Data Analysis for entire micro smart grid - (4 million data records in 18 months)
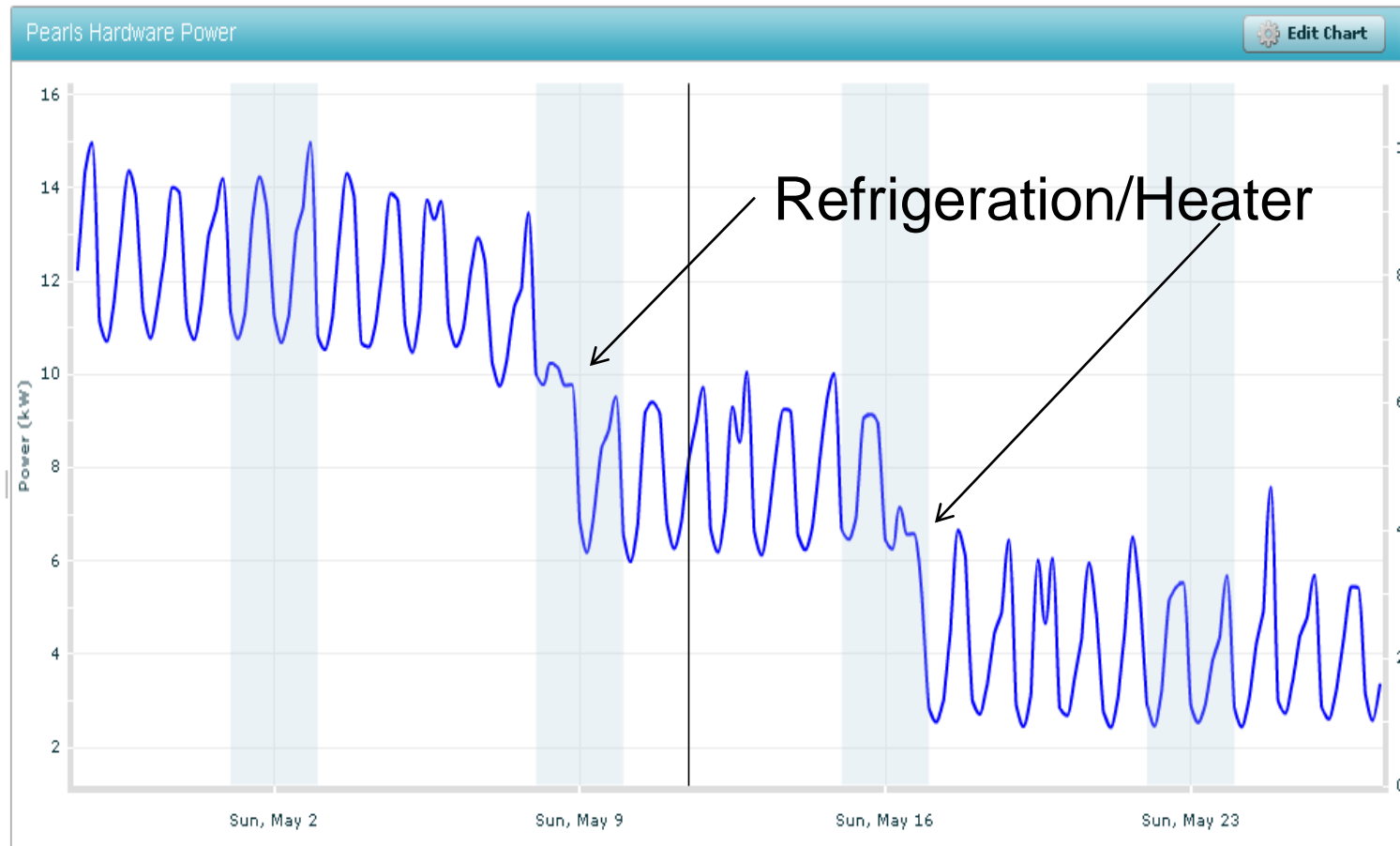- *Demand Response*

Energy Anomaly Repaired!
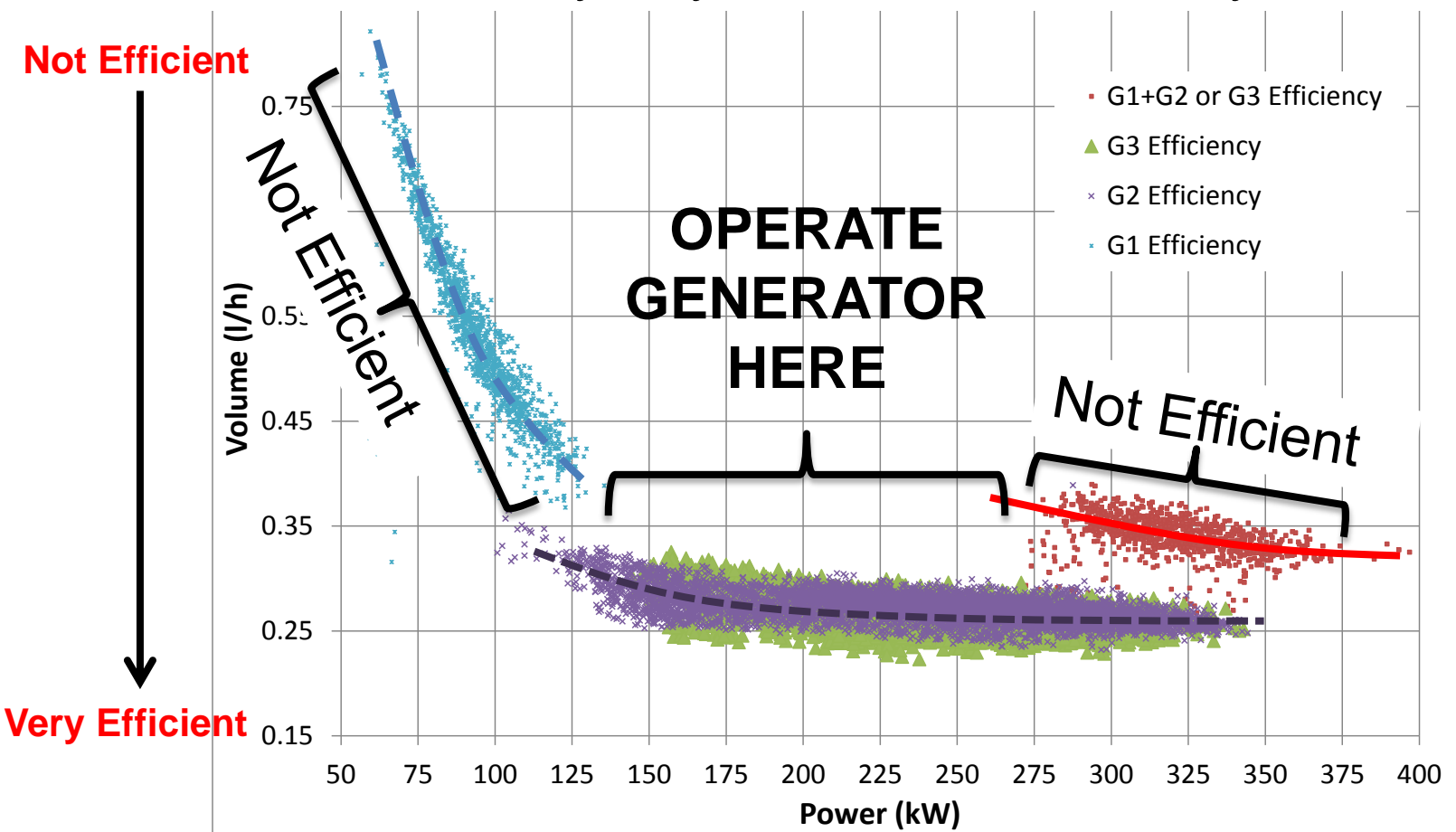# $ 35,000 savings per annum
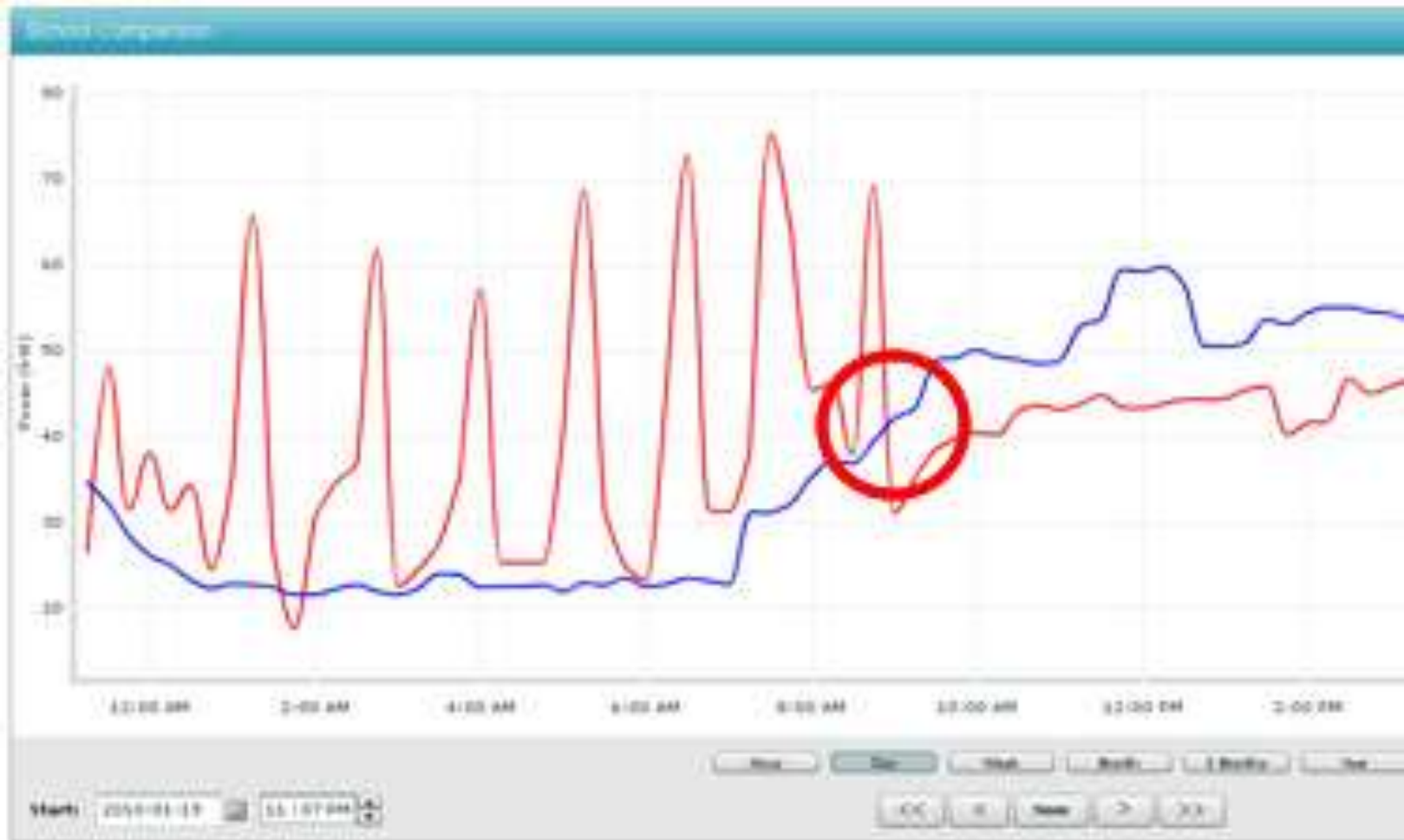
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Real Time Energy Management
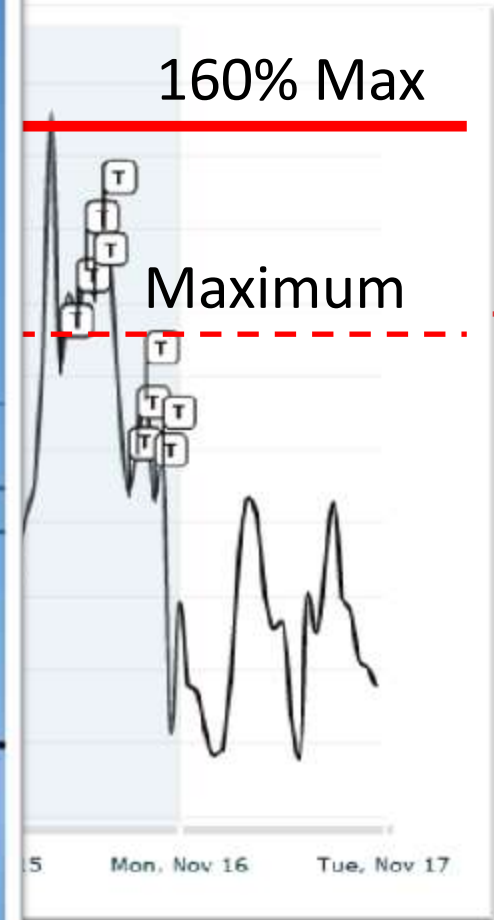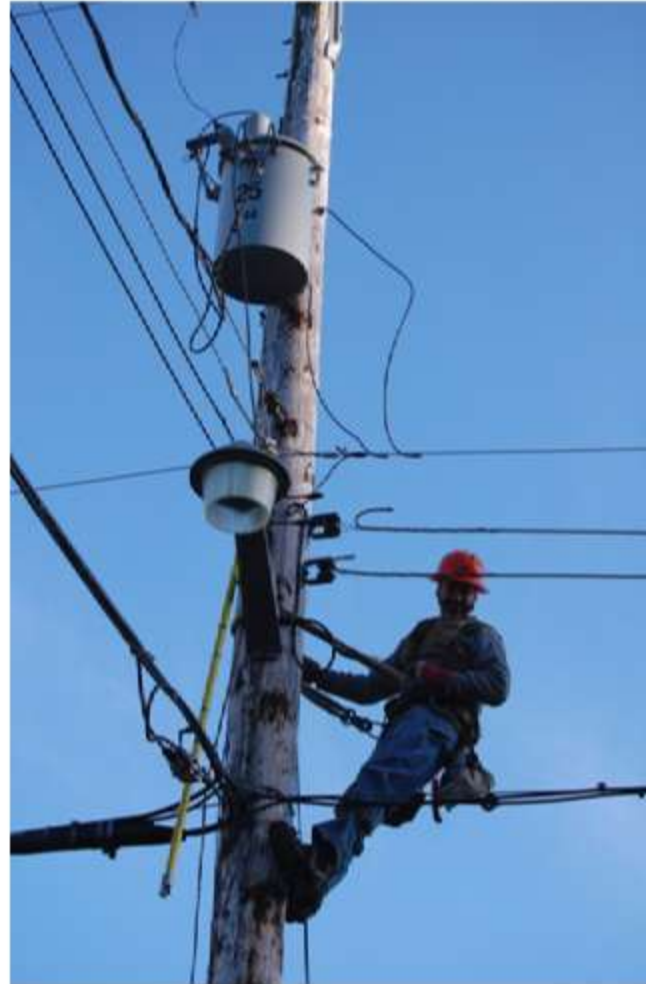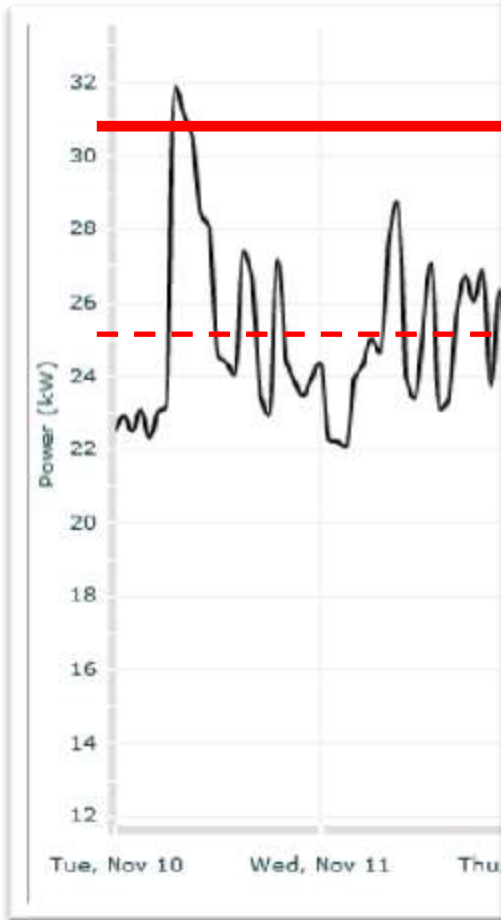
- Unnecessary Machines left on Waste Energy!

Supply Side Management

Hartley Bay Generator Efficiency

Real Time Asset Management

160% Max

Maximum

Pulse Micro Smart Grid - Architecture

Run of the River: Hartley Bay Original
0.9 MW   Diesel:1 MW

Pulse Energy Servers

Energy Monitoring, Alerts and

Demand-response dispatch Logic

Cooper / YUKON Demand Response Direct Control

Hartley Bay Admin Office Server

Data Aggregator and DR Dispatcher

G4   G1   G2   G3

Generator Demand: Cellular Modem

2012 Install

MODBUS Wireless Mesh

Internet

Pagenet Wireless Demand Response

25 kV,3ph

EKA Net Wireless Mesh Smart Meter Network
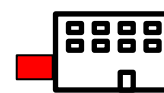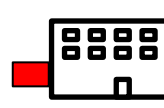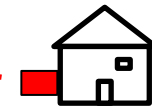
Residential

Commercial

View and Analyze Real Time Loads

Residential, Commercial and Total Power Vs Time (1 typical day)
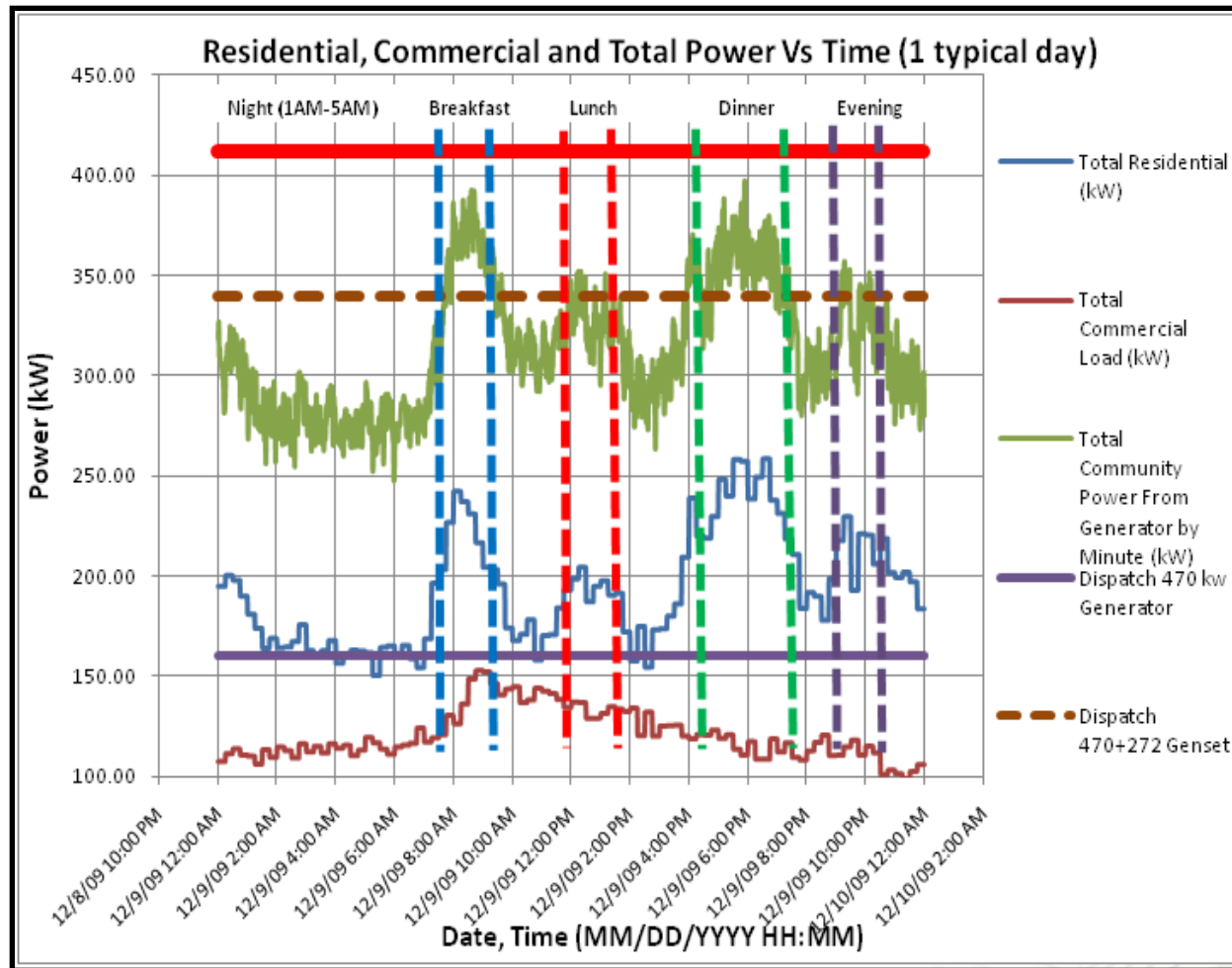
Demand Response

Peak Demand – 20% Peak Load Control

Breakfast

Load Control

Total >

Residential >
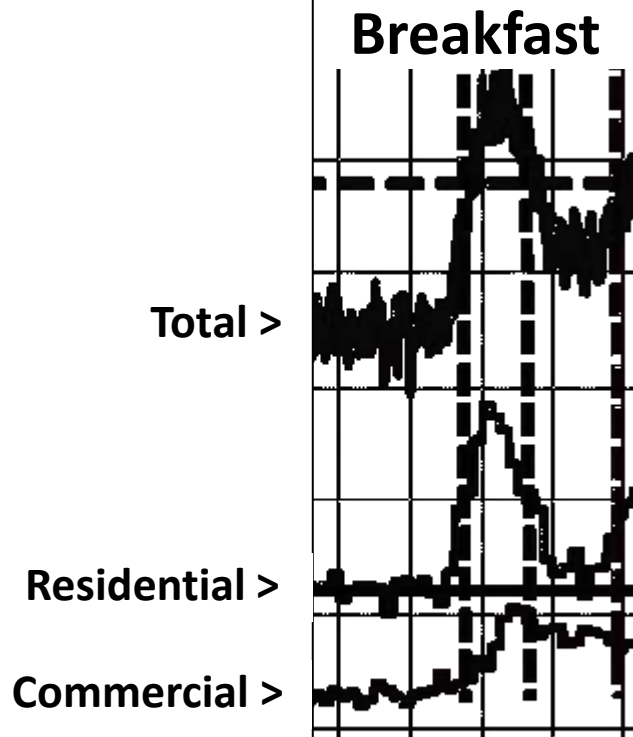
Commercial >

From Micro Grid to Micro <u>Smart</u> Grid

Renewable, Hybrid Integration

Targeted DSM/Demand Response

Data Analysis, Planning

Baseline Energy

Pulse Energy Manager

www.pulseenergy.com
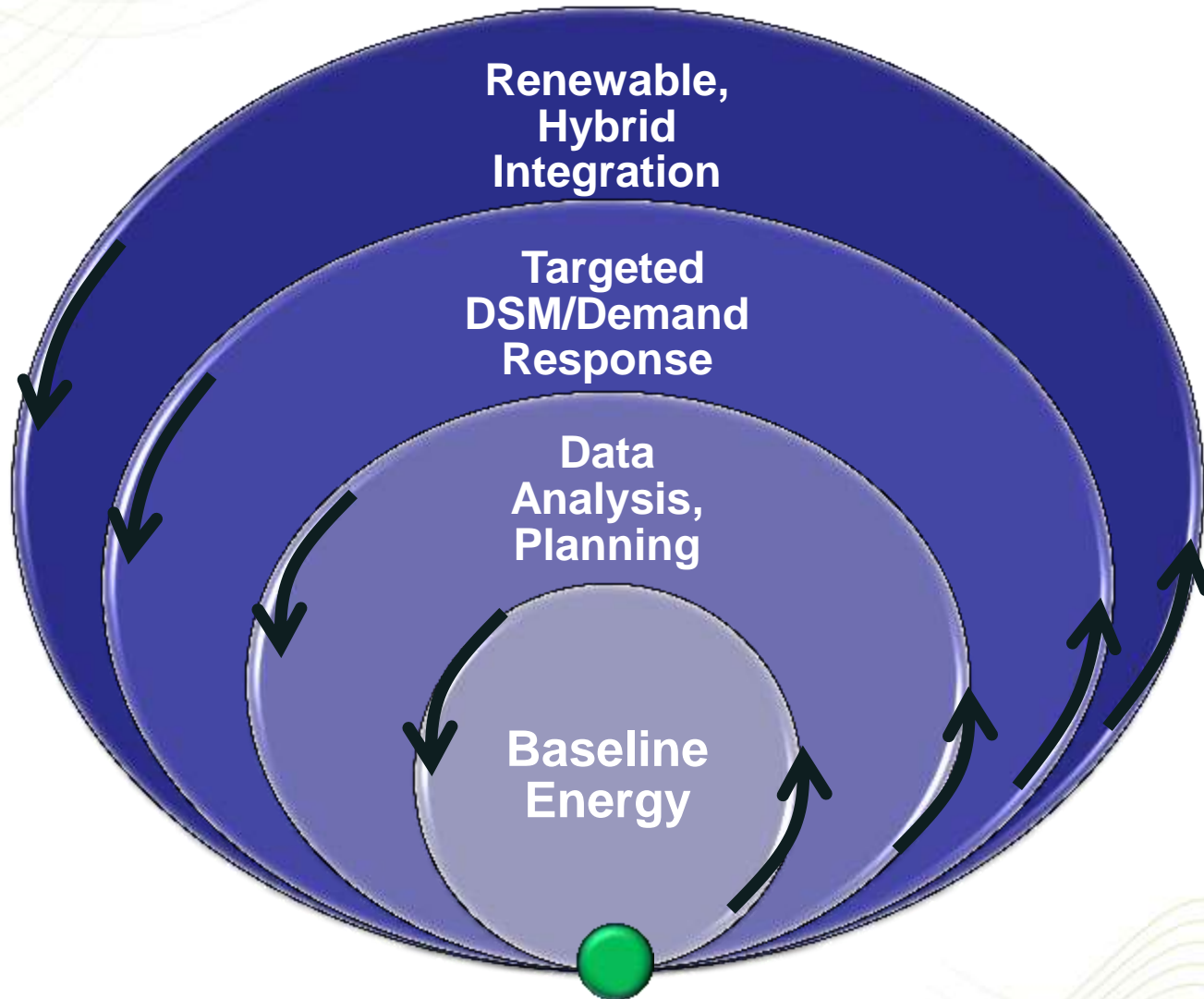
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Energy Solutions in Remote Locations

1. Reduce fuel trips by reducing consumption
   20% savings in Pulse Off Grid Pilot!

2. Invest in diesel electric technology solutions
   Don't wait for a renewable solution!

3. Reduce fuel consumption by knowing not just where but also <u>when</u> power is consumed.

4. Target highest consuming facilities for retrofits, demand response and staff training.
   Take Basic Steps Immediately!

5. Use Facility Demand data to inform Generation.

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