

# Alaska Technology Analysis

**Ian Baring-Gould, NREL**

**Jennifer Bakisae**

**Don Cameron**

# Session Overview

An analysis to look at the use of renewable energy technologies for remote diesel power stations.

# Goal

Complete a basic analysis that would allow a community leader, helped by tools like the wind resource maps, to determine what renewable technologies may work for well in their community.

# Investigation Process

- Collected basic data to conduct analysis
  - Resource data
  - Community load data
  - Cost data
- Assessed how the data could be used throughout Alaska
- Conducted basic power system analysis using HOMER software
- Make recommendations

# Control Parameters

- Wind speed: Broken up by region with wind speed based by local information
- Load: Broken down into 5 different community sizes
- Fuel cost: What is the expected fuel cost for the community (not automated)

# Some Simplification Assumptions

- Diesel price  $\$2/\text{G} = \$.53/\text{L}$  though sensitivity was conducted
- Load model is correlated
  - Similar lifestyles regardless of region
  - 3 villages can be used to represent dozens
- Class 4-7 winds exist in all regions
- Wind Penetration modeled as fixed cost
- Simplified model for diesel allocation (only one diesel of each size range)

# Conclusions and Recommendations

- Regionalizing Alaska is valid
- At a diesel price of \$2/G hybrid systems start making sense for wind speeds above 5.5 m/s on average
- High penetration systems can result in significant savings over diesel at a wide range of wind speeds and diesel prices