Rural micro-grids
Cady Lister, Lead Economist, Alaska Energy Authority
NASEO, Washington DC
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Photo by Chuck Berray
Alaska Energy Authority investments in rural Alaska

- $259 million in Renewable Energy Fund, resulting in 200 projects (54 in operation)
  - Displacing 20 million gallons of diesel equivalent annually
  - Overall cost benefit 2.5
- $11 million in Emerging Energy Technology Fund (Denali Commission partner)
Alaska Energy Authority investments in rural Alaska

- Nearly $350 million in bulk fuel upgrades since 2000
- $245 million in Rural Power Plants construction since 2000
Now a little about Alaska

Population: 735,000

Area: 660,000 sq. miles

200 remote microgrids spread over large area
Railbelt
72% of Pop
76% of Energy
Natural Gas

Southeast
10% of Pop
13% of Energy

Rest of AK
18% of Pop
11% of Energy
Rural infrastructure
Rural infrastructure
Diesel is primary power in 90% of rural Alaska
Energy costs vary

Alaska Electricity Prices by Community

Heating Costs

- Nome
- Anchorage

$ per kWh

Dollars per Gallon of Heating Fuel

Dollars per Mcf of Natural Gas
Energy burden by region

Energy Burden by Region
% of household income used for heat and electric

North Slope, Railbelt, Southeast, Aleutians, Kodiak, Copper River/Chugach, Bristol Bay, Northwest Arctic, Lower Yukon-Kuskokwim, Yukon-Koyukuk/Upper... Bering Straits
Integrating renewables
Three primary lessons

1. Start with efficiency.

2. Integration of multiple generation resources in small systems has challenges.

3. Regulations, policies and programs designed for the continental US are not always appropriate for truly remote rural communities.
Start with efficiency!

Supply side efficiency
- Diesel efficiency
- Heat recovery

Demand side efficiency
- Typical 30% energy use reduction with economic measures
- Addresses heat energy use, important in the Arctic
- Biggest cost savings directly to people in communities we serve
Integration has challenges

- Reduced diesel generation efficiency
- Instability/power quality issues
- Operating complexity
Regulations, policies and programs designed for the continental US are not always appropriate in remote markets
AKEnergyAuthority.org