Alaska

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Rural Alaska population: 76,000, communities: 200, utilities: 100

Alaska's Renewable Energy Program

MWh(s) sold	363,783
% Diesel generation	98%
Gallons of diesel fuel	27,540,292
State subsidy	about US$18 million

General: no roads or interties, bulk fuel storage

Purpose of renewables programs: cost-effectiveness

Developments programs:

- Small Hydro
- Wind:
  - Turbine performance (AOC 15-50 in Kotzebue)
  - High penetration wind-diesel system development

Wales High-Penetration Wind-Diesel System

- High-Penetration, Wind-Diesel System
- Begin first phase of installation in the Fall of 1998
- Wales is a remote Inupiat Eskimo village of about 160 people
- Primary funding by EPA Environmental Technology Initiative and Alaska Science and Technology Foundation
- Estimated $600,000 to retrofit the existing diesel plant with two AOC 50-kW wind turbines, distributed dump load, system controller, and energy-storage subsystem
- Partners are National Renewable Energy Laboratory, Alaska Department of Community and Regional Affairs, Kotzebue Electric Association, and Alaska Village Electric Cooperatives.

KEA Wind Farm

- Wind-diesel system
- Three AOC 50-kW turbines installed, seven additional turbines to be installed beginning in the fall of 1998
- Kotzebue is a predominately Inupiat Eskimo village of about 3000 people
- Initial funding by State of Alaska, additional funding by DOE
- Project goal to eventually include up to 2 MW of wind power and to become a center of excellence for wind power in Alaska
- Kotzebue Electric Association (KEA).

Tazimina Hydroelectric Project

- The 800-kW Tazimina hydroelectric project, completed in 1998, serves the Iliamna region in rural Alaska. There are no roads or transmission lines connecting the region and its 600 residents with the outside world.
- Tazimina is a run-of-river project—there is no dam or impoundment.
- Water is diverted around Tazimina Falls—a small fraction of the available flow is diverted in summer and most of the flow in winter. Because the falls are a natural barrier to fish migration in summer and are frozen in winter, the diversion does not affect fish populations.
- Project capacity exceeds peak demand. As a result, the utility's diesel generators can be completely idled most of the year.
- The project cost US$11.7 million to construct. State and federal grants totaling US$8.4 million accounted for 72% of the cost, supplemented by US $3.3 million of low interest debt. Initially, the cost of power from the hydro project is about the same as the avoided cost of diesel power generation
- The utility's average residential rate is about US$0.46/kWh.

Tazimina River in August of 1996