



**National Renewable Energy Laboratory**

*Innovation for Our Energy Future*

# Integrated Deployment at NREL



## Renewable Resources

Alaska's oil and gas resources are well known, but equally prodigious is Alaska's renewable energy potential, including:

- Tidal and wave – over 90% of the United States' resource
- Wind – large areas of resource class 5-7 that could serve more than 100 remote Alaskan villages
- Biomass – Alaska's land mass, about 20% of the entire United States, includes huge wood resources
- Geothermal – situated on the Pacific Ring of Fire, Alaska has world-class geothermal potential

In recognition of Alaska's unique energy needs and potential, an **Emerging Energy Technologies Fund** has been established to support new technologies and deployment strategies that hold widespread promise for Alaska and export internationally. NREL is playing a leading role in the implementation of the Fund.

Alaska's abundant solar, water, and biomass resources provide numerous opportunities for renewable energy technology implementation.

## Alaska Initiative

The National Renewable Energy Laboratory (NREL) is helping to develop Alaska's renewable energy and energy efficiency potential by joining forces with the U.S. Department of Energy, developers, state government, and tribal and community leaders.

NREL helps government agencies, communities, facility managers, local planners, and businesses in Alaska make smart decisions about deploying sustainable energy technologies and preparing for a clean-energy driven economic transition. NREL's technical training, energy planning assistance, education, and outreach activities are providing the catalyst for transforming the way Alaska uses energy.

## Renewable Energy in Action

Alaska's remote and far northern location presents unique challenges and opportunities. With more than 200 isolated communities reliant on diesel generators for electricity, wind-diesel hybrid systems have become a major focus for diesel use reduction—as a result Alaska has become a world leader in pushing wind penetration rates ever higher. This technology has wide application throughout the developing world.

Using Organic Rankine Cycle technology, Chena Hot Springs, Alaska, is also home to the lowest temperature, electricity-producing geothermal resource in the world. This technology has now evolved to provide mobile heat and power from process water in oil fields.

The first community-owned hydrokinetic turbine in the United States was installed on the Yukon River in Ruby, Alaska, in 2008. This and related projects, including efforts to install tidal turbines in Cook Inlet, are creating new technologies, businesses, and alliances among



Morty Worthington/ PIX 16998

This 5kW vertical axis hydrokinetic turbine and debris diversion device is installed in the Yukon River, Alaska.

communities and industry. Additionally, robust technology adaptations are being developed for global application by incorporating local knowledge of icing, fisheries, and sedimentation in some of the most challenging environments on the planet.

Extremely high fossil fuel costs in Alaska's indigenous villages (exceeding \$8/gallon for gasoline and \$0.75/kWh for electricity) create an environment where many demonstration projects can be immediately cost-effective and provide a return on investment.

## For More Information

To learn more about NREL's efforts in Alaska and to get involved, contact Brian Hirsch, [brian.hirsch@nrel.gov](mailto:brian.hirsch@nrel.gov), or visit NREL's Applying Technologies Web site at [www.nrel.gov/applying\\_technologies](http://www.nrel.gov/applying_technologies).



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