ACEP

Alaska Center for Energy and Power

Fostering development of innovative solutions to Alaska's energy challenges.

Research Briefing

Stranded Renewable Energy Resources of Alaska: A Preliminary Overview of Opportunities and Challenges to Development

This report was prepared by the Alaska Center for Energy and Power for the National Renewable Energy Laboratory.

Project Overview

Alaska is home to significant renewable energy resources. Geothermal, wind, tidal, wave, hydro and even solar and biomass resources have the theoretical potential to not only meet the majority of Alaska's in-state energy needs, but also provide tremendous economic and strategic opportunities for the state and the nation. Despite the many opportunities for developing these resources, there are also significant barriers. Foremost among these challenges is the fact that many of Alaska's renewable energy resources are stranded.

Pathways to Development

Typically, the primary barriers to developing stranded resources are technical, logistical and economic, including the cost of fully assessing the resource, developing the resource into usable energy, maintaining and operating a facility or technology in a remote location, and transporting the energy or product to demand centers. In Alaska, these barriers are amplified by the sheer size and diversity of the land, varying climates, extreme weather and distance from global demand centers. Political and social barriers can also play a significant role when considering the development of stranded resources in Alaska. Land use restrictions, regulatory requirements, aesthetic and environmental concerns, and other similar barriers could preclude the development of certain resources or increase the overall cost of project development.

See the full report for information on stranded renewables that are export- or commercial-scale in size. The renewable energy resources considered to be relevant for this report include geothermal, wind, river (hydroelectric) and ocean (tidal and wave). Available at www.uaf.edu/acep/publications.

The challenges and opportunities associated with developing Alaska's stranded renewables are assessed via "pathways to development," that is, those methods or mechanisms that allow for access to and development of stranded energy resources.

Transportation to Market

One pathway to developing a stranded resource is to overcome the resource's isolation by transporting the site-produced energy to market. Practically all methods of transport-

What is a stranded renewable energy resource?

Stranded renewables are those renewable energy resources located in remote, distant or otherwise isolated areas "stranded" from integration into modern energy infrastructure and supply chains to local population and industry centers. Stranded renewables can be divided into two categories: (1) isolated or remote resources that are commercial- or export-scale in size, i.e., those energy resources that provide potential energy and economic value that justify remote development and have large potential markets, and (2) resources "stranded" from utilization not by isolation or remote location, but by issues such as economies of scale or "seasonality," e.g., abundant solar or hydro availability in the summer but not in the winter.

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