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Alaska rivers seen as potential energy solution

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Inc.



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FAIRBANKS — Interest is surging in the potential of Alaska's powerful river currents to generate electricity using underwater turbines, but some researchers and resource managers are cautioning against unintended consequences if interest too quickly turns into commercial development.

A small turbine is being tested now in the Yukon River at Ruby, while the Denali Commission is funding a trial project at Eagle next spring. And, a Texas company installing its first commercial turbine in a Minnesota river this fall holds federal permits to place river turbines at about 9 Alaska sites.

At the same time, some rural villages that could most benefit from an alternative to diesel-generated electricity are finding the rivers running beside their communities are already spoken for.

Energy made from the movement of river water is called hydrokinetic power. Turbines are typically anchored in river beds or suspended from barges and linked by underwater cables to onshore structures that transfer electricity to larger grids. Proponents say river-generated electricity reduces costs and environmental risks associated with burning diesel fuel. But the technology is relatively unproven, leading some to encourage restraint.

Hydrokinetics are new, and project designers have eyes on Alaska. The Federal Energy Regulatory Commission estimates these new technologies — including wave, river and tidal resources — could double the amount of U.S. hydropower production from 10 to 20 percent of the national supply.



Courtesy ABS Alaskan,
Inc.

David Lockard is Alaska Ocean and River Energy Program Manager for the state. He's excited about the potential of hydrokinetics, but said the rapid interest in Alaska's water is raising fresh questions, including how to develop projects to minimize environmental impacts.

“Energy was cheap. Now, energy is not cheap,” he said. “It (hydrokinetic power) isn't going to solve everybody's problems everywhere, but it has significant potential at sites around the state.”

The Alaska Energy Authority is including hydrokinetic power among alternative energy sources being evaluated by the state entity in development of a long-term energy plan.

Meanwhile, one experimental project is underwater.

Jim Norman of ABS Alaskan in Fairbanks sank a five kilowatt turbine into the Yukon at Ruby a week ago, sparking just a bit of juice — 500 to 600 watts — into the grid as a donation to the village of Ruby.

It's the first functional hydrokinetic installation in Alaska, Norman said.

In the next few weeks, Norman and his crew will revisit the site, tinker with the turbine and increase capacity, he said. He hopes to improve on the turbine's function and develop a plan for further study next year, analyzing production and impacts on fisheries and river systems with project partners.

Far upstream, an Alaska Power Company project funded in large part by the Denali Commission to install a turbine in the Yukon at Eagle this summer has been delayed until spring breakup (see related stories).

New terrain

At the forefront of commercial interest in Alaska waters is Hydro Green Energy, a Texas-based company that has cemented federal approval to design and test projects at nine points in the state.

“There's a lot of interest in this industry right now,” Hydro Green Vice President Mark Stover said, with companies “grabbing permits left and right” throughout the Lower 48. Hydro Green holds about 18 overall, 10 of which are in Alaska waters.

“We know Alaska has an abundance of rivers, it has fast-moving rivers,” Stover said. “And, one of the things that has certainly driven us to the state is the energy situation. We think we've got a product that is superior to the diesel generation approach, both from an environmental perspective and an economic perspective.”

Hydro Green expects to sink its first commercial turbine in a Minnesota River in October, marking the first federally licensed, commercially operational hydro kinetic project in the nation, Stover said. That project should generate data that the company will find useful in developing its Alaska interests, he said.

Company representatives traveled to Alaska for the first time in mid-August, meeting with state resource agencies and others. On Thursday, the company surrendered its permit for a project at Nuiqsut on the Ublutuooh River on the North Slope. The company has hired Alaska-based TerraSond for initial environmental and river data collection for the other projects, which should result in a full project analysis, Stover said.

“We have the exclusive authority to gather the data we need and decide whether we’re going to do the project,” he explained, adding that Hydro Green is not “site banking,” a practice by which companies secure permits for certain sites to take them off the market, then sell the development rights later on. “We fully intend to develop these sites, without question.”

Caught off-guard

Exclusive rights to Alaska waters doesn’t sound ideal to some, including Bear Ketzler, a representative of Tanana.

A group in Tanana was beginning an experimental project of its own, running turbine-generated power into the community grid. They were surprised to learn hydrokinetic rights to the Tanana just outside their community had already been permitted to Hydro Green.

“It caught everybody off guard,” Ketzler said. He’s upset that an outsider can lock up a resource Alaska river communities have relied on for years — and that may or may not ever be developed to the point where the villages benefit.

FERC publishes a legal notice before issuing a permit, but by the time Tanana folks caught wind, the project was already permitted.

“We wanted to have local public knowledge,” Ketzler said. “We wanted FERC to notify the tribe and the whole community, and we would hold a public meeting to help establish conditions on these permits.”

Ketzler and others are proceeding with plans to test small turbines in the Tanana as experimental projects, routing power to single buildings instead of the grid. Villages need to have all options on the table when it comes to solving problems fed by high energy costs, Ketzler said.

“But if you have somebody else holding those permits, you can’t do that,” he said. “You’re stuck.”

The consequences

With so many isolated communities located on waterways, hydrokinetics is full of potential, Gwen Holdmann said. She's the center organizational director for Alaska Center for Energy and Power. Still, she cautioned, the technology is noncommercial in most cases and no one really knows how the turbines might affect fish, river bottom channels, and water quality — not to mention how the turbines will hold up under ice and cold, major debris flows and even high levels of glacial silt.

“There are a lot of possibilities for unintended consequences,” Holdmann pointed out. The center is hoping for federal funding to develop a turbine site on the Tanana River at Nenana.

Even as basic studies are being proposed, companies that design turbines are picking up FERC approvals rapidly — occasionally by using a “cookie cutter permit” that marks turf by giving rights to a location but leaves open the potential for a company to sell the rights in the future, Holdmann said.

“There's a lot of concern about that because it's very simple to get those permits, it doesn't cost a lot of money, and they don't have to prove they have any intention to develop a process (beyond progress reports),” she said.

Meera Kohler, president and CEO of Alaska Village Electric Cooperative, also warns of the unknown.

“With hydrokinetic, you're talking about a moving river that is an entire Indian nation's lifeblood and is a very significant element of their subsistence,” she said. “You're wanting to put a large device in there that is going to cause some change. We don't know what kind of change.”

She said some company's plans are speculative and should be treated as such.

“It gives false hope to communities,” she said.

Still, the emerging technology holds promise, Kohler said, and she's looking forward to examining the results of Alaska Power and the Denali Commission's efforts at Eagle.

Under study

Of major concern up and down Alaska's waterways is how turbines beneath the surface might affect fish.

The Yukon River Drainage Fisheries Association filed as an intervenor with FERC, an action that gives the group standing in Hydro Green's permitting processes.

Policy director Becca Robbins Gisclair said the price of power is a serious issue for Yukon River

communities, and hydrokinetic projects could offer a clean solution.

“We’d love to see hydro developed as an alternative to the current system — we just want to make sure that there isn’t any harm to salmon populations and to fisheries,” Robbins Gisclair said. “This is a new technology. There is going to be a learning curve, and there are going to be challenges along the way.”

The association wants to make sure turbines are placed where salmon are least likely to be affected, among other things, she said.

The U.S. Fish and Wildlife Service has also filed as an intervenor, spokesman Larry Bell said.

The service is charged with protecting fisheries resources and wants to be involved in all stages, even experimental phases, he said. No permits are required for hydrokinetic projects directly from FWS, he said, unless refuge lands are involved.

“With any new technology, there are unknowns,” Bell said. “Engaging in the process early on gives us the best opportunity to work with industry to find solutions.”

Permits required

Along with the federal go-ahead, some state permits will probably be required to test in-river turbines, state resource managers said.

“The potential for hydro in Alaska is great,” said Wyn Menefee, deputy director for the Department of Natural Resources’ Division of Mining, Land and Water. “If they can work out effective means of running these turbines and powering villages and such, this could have a big impact in Alaska.”

DNR officials have decided that turbines qualify as diversions, which require state water use permits. And, if state land is involved — which, in most cases, includes river bottoms — another permit is required, Menefee said.

Water resource manager Gary Prokosch said anything commercial anchored to state submerged land must be authorized as well. Turbines that will be in place more than briefly will require a state permit and commercial applications will eventually require water rights.

During testing phases, even data collection tools like sonar stations and stream gauges often need state authorization, Menefee said. In addition, Fish and Game permits are required for projects that could disturb fish, they said.

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