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As chair of Arctic Council, US could help the North replace costly, unhealthy diesel

David J. Hayes | August 24, 2014

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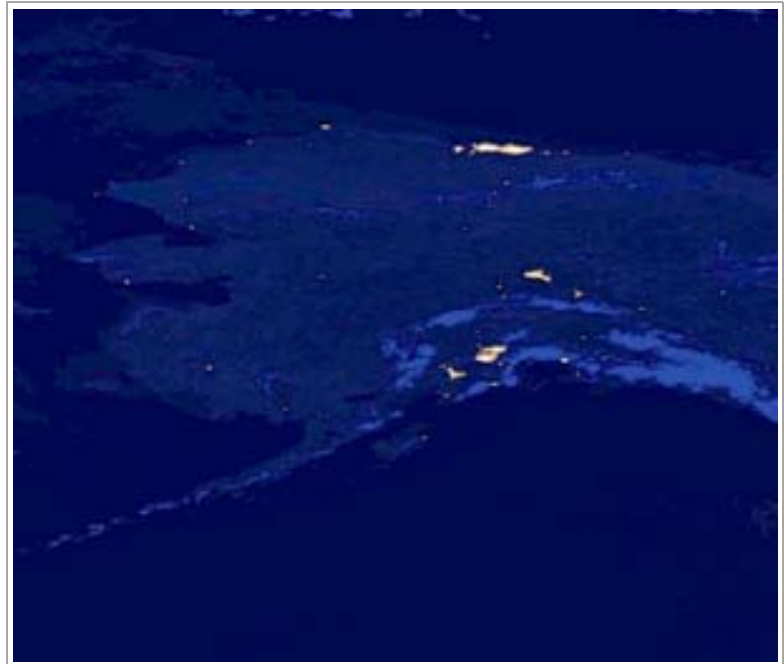
After years of hype, renewable energy has gone mainstream in much of the United States and, increasingly, around the world.

Enormous wind projects are moving ahead in oil- and gas-rich Wyoming, utility-scale solar projects are sprouting up in California and Nevada, and tens of thousands of homeowners nationwide are installing affordable solar panels on their rooftops.

But many communities that need small-scale renewable energy remain out in the cold -- literally and figuratively.

In Alaska, for instance, the vast majority of the more than 200 small, isolated communities populated primarily by Alaska Natives rely on dirty, expensive diesel fuel to generate their electricity and heat. As in other remote communities throughout the world that have no grid to fall back on, diesel generators now provide the only reliable option for these desperately poor towns to meet their essential energy needs.

These villages buy and burn several hundred thousand gallons of diesel fuel per year in inefficient generators at costs that can approach \$10 per gallon while spewing unhealthy fumes and soot. To ease their diesel dependence, some Alaska villages have been able to secure financing to construct wind projects and small-scale, centralized electricity systems, known as micro grids. But the challenges of sizing and engineering these systems have slowed their development and installation. Even with generous support from the state and others, only about 25 of these systems have been installed over the past 20 years.



OPINION: The U.S. government could help make a difference in people's lives and move forward on goals to foster clean energy by encouraging new technology across the Circumpolar North. Pictured: A satellite image of Alaska at night.

NASA's "Earth at Night" video

We can do better. In collaboration with government labs, the state of Alaska, private companies and investors, the United States is developing modular wind and solar energy systems that will work in isolated communities in Alaska, on island nations, in the African bush and elsewhere.

These systems are remarkably compact. Consider one that would provide enough renewable power for electricity, heating and cooling for a village of 100 to 200 people. It would include a refrigerator-size control center and a similarly sized container for storage batteries. The power would come either from one to five wind turbines, each about 100 feet tall with 20-foot-long blades, or from a solar panel array covering 700 square feet or more. Modern diesel generators would kick in when the wind wasn't blowing or the sun wasn't shining.

Bigger villages would simply scale up by adding on more modules. With standardized specifications, costs would drop as production ramped up and as the modular operations replaced the old headache-causing systems and their one-of-a-kind maintenance problems.



The Department of Energy's National Renewable Energy Laboratory has been working with the Department of Interior and industry on the Remote Community Renewable Energy Partnership to make this happen. Drawing from the Department of Defense's successful deployment of small, renewable energy-based systems to support forward-stationed troops, the lab is developing design specifications for a modular renewable energy system that aims to produce much cleaner energy at half of today's costs. This would be accomplished by replacing 75 percent of diesel use for electricity and heat in the Arctic villages (relying primarily on wind power) and for electricity and cooling in the tropics (relying primarily on solar power).

On a parallel track, Energy Secretary Ernest J. Moniz recently announced a public-private collaboration called Beyond the Grid to leverage \$1 billion in investments over five years to bring small-scale solutions to communities in sub-Saharan Africa. Both initiatives address the huge, debilitating energy deficit faced by millions around the world.

The potential payoff for cracking the code of providing smaller scale clean energy is huge. Diesel generators running around the clock in the tiny city of Wainwright, and in many other similarly sized communities elsewhere in Alaska and in Africa and Asia, produce up to 22 pounds of carbon dioxide emissions for every gallon of diesel fuel consumed. In the Arctic, the climate impacts are magnified by added emissions of fine particulates known as "black carbon" — a powerful, short-lived warming agent that exacerbates the region's already-rapid temperature rises.

The economic and quality-of-life benefits that flow when cash-strapped communities have access to affordable and healthier clean energy are transformative. Just as the public-private partnership that developed and deployed cleaner-burning, efficient cook stoves has changed the lives of millions in Africa and Asia for the better, so also will these renewable energy systems.

Let's not leave these ideas on the drawing board. The United States will take its turn next April as the chair of the eight-nation Arctic Council, a forum of the nations that border the Arctic. In setting the council's agenda, the United States can make it a priority to bring practical and clean energy options to isolated northern communities.

Such an effort would put a humanitarian face on the country's commitment to address climate change. We would directly help our most energy-needy citizens while opening up a new global market for American businesses and showing the world what innovative clean energy technology can do for the human condition and our planet.

David J. Hayes is a visiting lecturer at Stanford Law School, and was deputy secretary of the Department of Interior from 2009 to 2013. This commentary first appeared in *The New York Times* and is republished here with the author's permission.

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Comment



Jack Keane · Top Commenter · Anchorage, Alaska

I'm with him on getting away from burning fossil fuels in devices that waste 75% of the BTU's in the oil, but the wind resource is poor in most of Alaska.

<http://en.openei.org/wiki/File:NREL-50m-Alaska-Wind-Map.pdf>

So likely a different mix in different towns. For space heating the "low hanging fruit" is a LOT more insulation. For homes in cold areas using oil (or wood) one foot thick walls, triple glass windows and R-60 in the attic is not over-doing it.

Solar is becoming cheap enough to produce a lot of the electricity and we already have the diesel back up.

"Funny thing" that not even the exorbitant cost of oil is spurring much creativity in Alaska.

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Paul Fuhs

Kookoo. This guy obviously wasn't in one of Stanford's excellent science programs. Lets start with the claim that a gallon of diesel produces 22 pounds of carbon. A gallon of diesel weighs 7.15 pounds. So unless this guy has invented cold fusion to create new atoms, this claim is ridiculous. Wind power in Alaska has been paid for basically 100% by grants and still has not resulted in any reduction in energy costs. If you want cleaner fuel, try bringing in propane from the North Slope.

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Donn Liston · Top Commenter · Teacher at Ninestar Education & Employment

Good point, Paul, but wind power is also being subsidized by ratepayers...

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Jack Keane · Top Commenter · Anchorage, Alaska

Paul.. Hayes is right, diesels consume a lot of air, like 15 parts air to one of fuel. It's the "dioxide" that adds molecules.

<http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11>

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Jack Keane · Top Commenter · Anchorage, Alaska

Donn Liston In Anchorage where we've cheap gas and heavily subsidized hydropower (the State paid for Bradley Lake and the transmission lines) but where they're burning \$7 oil in diesels that waste 70% of the energy the equation would be a lot different.

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Paul Fuhs

Oh yes, and I forgot to mention that this guy came in with Obama as the #2 man at Interior. And you wonder why they can't figure out the King Cove road? Fruit cake economics.

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Jack Keane · Top Commenter · Anchorage, Alaska

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