COLD CALCULATION Components of a data center arrive by ship to Iceland, a country with abundant and inexpensive electricity.

VERNE GLOBAL

Iceland Exports Energy as Data

An arctic nation looks to large-scale computing for an economic boost.

By LUCAS LAURSEN

Iceland's main exports are aluminum and fish. Now it's hoping to offer the world a new commodity: a cheap, guiltless way to store its data. In February, a startup called Verne Global opened a large server farm on an old NATO base and began offering "100% renewable" computing services to the rest of the world.

Iceland produces more electricity per capita than any other country in the world. Nearly all its power is renewable, coming from glacier-fed rivers or steaming geothermal vents. And it's cheap: at 4.3 cents per kilowatt-hour, electrons on the island cost around half the rate in the United States.

About four-fifths of Iceland's electricity is used to smelt aluminum. Big companies like Alcoa set up facilities to take advantage of cheap power, then export the metal. According to the government's plan for hydropower and geothermal resources, Iceland could double its power generation. But environmentalists oppose expansion of the aluminum industry.

That has Iceland's government looking to attract new power-intensive industries. Data centers use up to 2 percent of electricity produced in the United States and are the fastest-growing source of electricity consumption globally. By 2020, according to some estimates, data centers could draw 1,300 terawatt-hours of electricity yearly, or four times 2007 levels.

Every decade or so, someone runs the numbers to see what it would cost to plug the country into Europe's electricity grid. Depending on where it made land, the cable would have to be around twice the length of the longest existing undersea power link, which stretches 580 kilometers between Norway and the Netherlands. Meanwhile, Iceland already has three fiber-optic links to North America, Scotland, and Denmark, and there are plans to lay a new 100-gigabit-per-second undersea cable stretching 6,700 kilometers from New York to Canada, with a branch to Iceland. "It's far more expensive to export energy than the data, and the data is more valuable," says John Pflueger, principal environmental strategist for Dell and a director of Green Grid, an industry group. "Iceland can be a net exporter of information and derive value from that."

Iceland won't work as a location for every application. Even moving at the speed of light, data takes 36 milliseconds to reach New York. That rules the island out as a site for certain time-sensitive computations: high-speed traders, for example, need to be within a few miles of stock exchanges.

But the renewable sources of Iceland's power could give the country an edge. Greenpeace last year published a report excoriating major tech firms, including Apple and Facebook, for relying on coal and nuclear energy to power server farms. "We see this infrastructure being quite critical to a low-carbon economy," says Gary Cook, senior information technology analyst for Greenpeace in San Francisco. "We need to put them in the right places." BI