



Iceland data center energy storage

On the edge of the settlement is a complex of metal-clad buildings belonging to the IT company Advania, each structure roughly the size of an Olympic-size swimming pool. Less than three years ago there were three of them. By April 2018, there were eight. Today there are 10, and the foundations have been laid for an 11th.

Life on the North Atlantic island tends to be chilly, foggy, and windy, though hard frosts are not common. The annual average temperature in the capital, Reykjav?k, is around 41 ?F (5 ?C), and even when the summer warmth kicks in, the mercury rarely rises above 68. Iceland has realized that even though this climate may not be great for sunning yourself on the beach, it is very favorable to one particular industry: data.

Each one of those Advania buildings in Reykjanesskagi is a large data center, home to thousands of computers. They are constantly crunching away, processing instructions, transmitting data, and mining Bitcoin. Data centers like these generate large amounts of heat and need round-the-clock cooling, which would usually require considerable energy. In Iceland, however, data centers don't need to constantly run high-powered cooling systems for heat moderation: instead, they can just let in the brisk subarctic air. Natural cooling like this lowers ongoing costs.

The result is that Iceland's data center industry has expanded rapidly over the past few years, led by three companies that rule the local market. Advania primarily rents out space to Bitcoin miners. Verne Global, which was founded in 2012, mainly works to meet the supercomputing needs of enterprise clients such as BMW, which has used Icelandic processing power for complex calculations like crash simulations. The third company, Etix Everywhere Borealis, says it serves customers using blockchain technology, as well as supercomputing clients.

So how do you measure the growth of this industry? The rapid rate of construction is one way, but there are other indicators, such as how much energy it consumes. Data centers are hungry for power, and last year electricity use by large data centers in Iceland more than doubled. In 2019 it's expected to rise again, by nearly 50%.

Here"s another way to gauge things: the industry is already a considerable part of the Icelandic economy. A report from KPMG suggested that in 2016, before the current explosion really took hold, the data center sector already contributed close to 1% of the country"s gross domestic product. Although there are no clear numbers on its current status, recent expansion will have increased its role in the local economy.

A combination of factors is responsible for this lightning-fast growth, including the favorable climate, competitive electricity prices, and access to renewable energy sources, says Einar Hansen T?masson, project manager at Invest in Iceland, a public-private partnership set up to promote Iceland overseas.



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Natural cooling for data centers is not an Icelandic invention, though, and there is competition from other northern countries. Facebook, for instance, opened a naturally cooled data center in northern Sweden in 2013. Other tech giants, including Google and Apple, have also decided to build their own data centers elsewhere in the Nordic countries. The Danish Energy Agency predicts that in the period from 2017 to 2030, new data centers will account for 85% of the increase in electricity use in Denmark's business sector.

But Iceland"s image as a land of green energy has become more complicated in recent years. Under a European Union system that resembles carbon offset programs, Icelandic energy producers have been selling green energy certificates to energy customers elsewhere in Europe. This allows foreign customers to call their electricity renewable even if it"s not, because they are offsetting against Icelandic production.

However, a 2016 report commissioned by the Icelandic government warned that improperly monitored sales of energy certificates could eventually lead to double counting, with both foreign offsets and local companies laying claim to the same renewable energy. This would mean problems for Icelandic companies promoting their goods and services as 100% clean.

Advocates of the data center industry see it differently. Invest in Iceland's Einar Hansen T?masson emphasizes that despite the export of green certificates, the electricity produced in Iceland is still renewable. Iceland's energy grid has no connections to other countries, so when certificates are exported, he says, the energy "doesn"t go anywhere."

It's not just certification that is causing trouble, though. Recently, the industry has faced criticism from conservationists who view cryptocurrency mining as a wasteful use of Iceland's resources.

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