**Seven years ago today: Eruption in Eyjafjallajökull, the volcano with the un-pronouncable name**

By [Staff](https://icelandmag.is/journalist/staff) |Apr 14 2017

Early morning April 14 2010 one of the most consequential eruptions of Icelandic history began, when the Eyjafjallajökull volcano, hidden beneath the glacier bearing its name, erupted. Although the eruption was relatively small it had profound consequences, shutting down air-traffic over much of Northern Europe and helping to jump-start the tourism boom which pulled Iceland out of the deep economic recession Iceland had found itself in following the 2008 financial crash.

The eruption in Eyjafjallajökull was preceded by growing seismic and volcanic activity in Eyjafjallajökull. In February the Icelandic Civil Protection Authority had increased monitoring of the area and on March 4 an Uncertainty phase was declared for the area, the lowest of three emergency phases.

On March 20 an eruption began in Fimmvörðuháls mountain pass, between the Eyjafjallajökull and Mýrdalsjökull glaciers. At the time the Civil Protection Emergency level was still at the uncertainty phase, reflecting the extreme difficulty of predicting volcanic eruptions with any certainty. The Fimmvörðuháls eruption took place next to a popular hiking trail. A large number of hikers were evacuated by helicopter from the area by the Coast Guard. Several farms in the foothills of Eyjafjöll mountain range were also evacuated.

**Eyjafjallajökull erupts**

**Lightning strikes and volcanic eruption**The ash plume of the Eyjafjallajökull eruption created conditions for massive lightning strikes, which are otherwise very rare in Iceland. Photo/Vilhelm Gunnarsson

The Fimmvörðuháls eruption stopped on April 13, but early next morning a new eruption began further west, beneath Eyjafjallajökull glacier. This eruption, which was far larger and more powerful than the Fimmvörðuháls eruption, took place along a 2 km long rift in the main crater of the volcano.

While the Fimmvörðuháls eruption was primarily an "effusive eruption", characterized by a steady flow of lava from the crater, the Eyjafjallajökull eruption was an "explosive eruption", where magma and ash is thrown into the air in a violent fashion. The Eyjafjallajökull eruption produced very little lava, but huge quantities of glass-rich ash which was ejected into the atmosphere.

**Read more:** [*TV Show "60 Minutes" Captures the Eruption of Eyjafjallajökull Volcano*](http://icelandmag.visir.is/article/tv-show-60-minutes-captures-eruption-eyjafjallajokull-volcano)

By seven in the morning the eruption had melted its way through the glacier ice cap, allowing the eruption to spew ash into the air. By 10:30 in the morning the ash plume had risen to an altitude of 22,000 feet. The ash cloud from the eruption covered farmland south of the glacier, causing significant disruption and hardship to farmers in the area. It's effects on air traffic in Europe was even larger.

**Dramatic impact on air traffic**

**The ash cloud** A composite map of the volcanic ash cloud from Eyjafjallajökull. Some 250 million cubic meters, 330 million cubic yards of tepthra and ash was ejected by the eruption. The ash plume rose to 9 km (5.6 miles). This ash spread all across Europe, causing delays to air traffic in many countries, especially in Northern and Western Europe.

On April 15 countries within the European airspace closed their airspace to commercial jet traffic. A total of 20 countries closed their airspace to commercial jet traffic, causing delays and canceled flights which affected as many as 10 million travellers. This was the largest disruption to air traffic since the Second World War.

**Jump-started the tourism boom**
At the time of the Eyjafjallajökull eruption many in Iceland feared that it's impact on air travel would cause the tourism industry in Iceland to collapse. The government responded by funding an advertising campaign "Inspired by Iceland" to encourage people to visit Iceland.

What people failed to realize was that the eruption was really free advertising, as newscasts around the world were dominated by stories about the eruption in the hard to pronounce volcano which managed to shut down air-traffic in Europe. The result was that the number of foreign travellers visiting Iceland grew by 15% in 2011 compared to 2010, by 19% in 2012 and 20% in 2013.

By 2016 Iceland, which had been visited by fewer than 500,000 people annually in 2008, was visited by 1,8 million foreign travellers.

**The big one has yet to come**
Eyjafjallajökull has erupted rather regularly since the end of the last Ice Age, the most recent eruptions were in 920, 1612 and 1821-23. Historically eruptions in Eyjafjallajökull have been followed by eruptions in its larger sister volcano, Katla.

<https://icelandmag.is/article/seven-years-ago-today-eruption-eyjafjallajokull-volcano-un-pronouncable-name>

**The Hidden Price of Iceland’s Green Energy**

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**Henner Busch**

**In times of runaway climate change, phasing out fossil fuels and increasing the share of renewables is imperative. But this transition is not without pitfalls as shown by a recent study of two large renewable projects in Iceland.**

The recent [**IPCC report**](http://www.ipcc.ch/report/sr15/) has made it clear that we need to change our energy supply from fossils to renewable energy if we want to avoid catastrophic climate change. This transition has to happen now and it has to happen fast.

The good news is: renewable energy is a wonderful thing. As countless studies have shown, it can be cheap, low-carbon, good for regional development, and bring about great benefits for [**local people**](http://sciencenordic.com/power-people-how-make-low-carbon-energy-transition-work)**.**

But, our new research cautions that these benefits are not inherent to renewable energy development and that each project needs to be carefully assessed on its merits.

Through a case study in Iceland, we show how the “green” image of renewable energy sometimes makes the public overlook the negative impacts of these technologies.

As a result, some of Iceland’s renewable energy resources have been misused to generate private profits for companies outside of the country. While, the benefits for the local population are, at best, questionable and large areas of unique nature have been lost forever.

**A developmental model based on heavy industry**

In the study, which was recently published in the journal Environment and Planning E: Nature and Space, we investigated the impacts of two large-scale power projects built recently in Iceland: the [**Kárahnjúkar hydropower project**](http://www.mannvit.com/projects/karahnjukar-hydroelectric-power-station/) in east Iceland, and the [**Hellisheiði geothermal plant**](http://www.onpower.is/about-us) in the southwest. They are the biggest power plants of their kind in the country.

For our investigation, we analysed scientific literature, and we looked at homepages, reports and statistics. Finally, we interviewed 18 actors from the Icelandic energy sector (5), politicians (5), and experts from NGOs (3) and academia (5).

We found that the two projects were the outcome of an aggressive industrialisation strategy driven by successive Icelandic governments over a number of decades, which have essentially used the country’s renewable energy sources to prop up other environmentally damaging industries.

This strategy entailed minimum environmental regulations, guaranteed low-energy prices, and an industry-friendly tax regime, designed to attract heavy industry, in particular power-intense aluminium smelters to Iceland.

As an incentive, the Icelandic government, together with the country’s publicly owned power company Landsvirkjun, promised to provide the required energy from renewable sources, namely hydro and geothermal, to companies that agreed to set up factories in the country.

This “clean” energy option was offered at very competitive rates and with a guarantee of supply for several years.



*In the study, we investigated the impacts of two large-scale power projects in Iceland: the Kárahnjúkar hydropower project in east Iceland, and the Hellisheiði geothermal plant in the southwest. They are the biggest power plants of their kind in the country. (Image: Forskerzonen / ScienceNordic. With graphics from* [*Vecteezy.com*](https://www.vecteezy.com)*)*

Let’s look at each project in turn to see what went wrong and what lessons can be learnt.

**1: A mammoth hydropower project in a small country**

In the early 2000s, large amounts of public money went into the energy sector to live up to the promises made to private sector investors.

One of the following projects is the Kárahnjúkar hydropower project. It consists of several reservoirs, tunnels, and the Fljótsdalur power station. It generates approximately 5,000 GWh per year, accounting for more than one fourth of all electricity produced in Iceland in 2016. All of this energy is used to power a big aluminium smelter built by the global company, Alcoa, on the east coast of the country.

The project serves as an illustrative case for two phenomena: First, it shows how the green label of renewable energy can be misused to justify a costly and arguably quite destructive industrialisation. Second, it shows what can go wrong if a small country makes deals with a big transnational company whose decisions are predominantly driven by the hunt for economic profits.

**Destruction in the name of progress**

The power plant and the power-intense aluminium smelter must be seen as interlinked projects, because Alcoa’s commitment to build the smelter was the precondition for the power project going ahead, and vice-versa.

The Icelandic government at that time hoped that the development would boost the regional economy in the East of the country. To support this goal, the minister of the environment overrode the environmental impact assessment that vetoed the hydro energy project because of its destructive impact on the local environment.

With the Kárahnjúkar project, unique geological formations and landscapes in and along the Hafrahvammagljúfur canyon were irredeemably lost and downstream ecosystems suffered negative impacts that are yet to be fully understood. For example, the local fish population in Lake Lagarfljót collapsed and Iceland’s wild reindeer population lost part of its grazing and breeding grounds.

**Who benefited from the projects?**

The contract between Landsvirkjun and Alcoa turned out to be unfavourable for the state-run energy company. The energy prices paid by Alcoa are extremely low and tied to the volatile global market prices for aluminium. This makes revenue for Landsvirkjun very low and unpredictable.

In addition, Alcoa practiced a model of transfer pricing in Iceland to avoid paying the dues taxes in Iceland. This means that the local operation owes a great deal of money to its parent company based in Luxembourg. And so far, the local smelter has not generated any taxable profits, as all revenues are used to pay off the immense debt.

As a result, Iceland has not yet benefited from tax revenue from the smelter. This is particularly scandalous, as Alcoa has described the smelter in its 2012 annual report as a “profit leader” due to the low local energy prices.

**2: Rapid expansion of geothermal power meets natural limits**

While the Kárahnjúkar hydropower project shows what can go wrong when the green label of renewables is uncritically accepted, the Hellisheiði geothermal plant shows what can happen when aggressive expansion ignores scientific concerns.

The plant is owned by a subsidiary of the publically owned power company Reykjavik Energy (OR) that operates in the capital region of Reykjavik. OR started constructing the plant in 2006. The plant was expanded to its full capacity of 303 MWe and 130 MWth by 2011 against scientific advice, which cautioned against excessive extraction rates.

Two years later, OR announced that the geothermal field decreased in activity due to excessive extraction of heat and that the plant would not be able to run at full capacity. In 2013, the plant ran at roughly 90 per cent of its capacity.

Output from the field is expected to decrease further by a few percent every year, resulting in big financial losses for OR.

**Was it all just hot air?**

Similar to the Kárahnjúkar project, the Hellisheiði plant was established to meet the needs of heavy industry and in this case short-sighted political interests forced its rapid expansion beyond its environmental limits.

Not only did the plant lead to a big financial loss for OR and thus the municipalities that owned it, it also caused environmental and health-related problems.

For example, when geothermal energy is harnessed, water is extracted from hot geological formations. When the hot water or steam come to the surface, it often carries contaminants with it, such as sulphur or nitrogen. These elements are then emitted into the atmosphere as gasses or find their way into the waterways.

Sulphuric acid, in particular, is known to cause damage to the local environment and worsen respiratory conditions among local inhabitants. [Studies](https://bmjopen.bmj.com/content/5/4/e007272) show that health problems in the capital region of Reykjavik can be traced back to the emission of these gases from geothermal sources, including the Hellisheiði geothermal plant.

**What can we learn from Iceland?**

To make it crystal-clear, we see a transition away from fossil fuels and towards renewable energy as the only acceptable way forward. But the success of renewables is also dependent on the political framework that we set.

These two cases show what can go wrong when short-sighted strategies to foster industrial development dictate a country’s political decision making.

The expected economic gain led to decisions that have degraded the natural landscape of Iceland, and have led to health hazards, with small economic benefits or even losses for the state in return.

Iceland demonstrates that renewable energy is not always beneficial and that we always need to ask questions about the purpose of our energy production.

In particular, there are two questions, which we should always keep in mind when assessing any new energy project: Who benefits from using a country’s natural resources? And who bears the burden if it doesn’t go to plan?

Asking these questions should help us to design the coming energy transition in a manner that really serves our societies as a whole.

<https://www.savingiceland.org/2018/11/the-hidden-price-of-icelands-green-energy/#more-12018>