ENERGY FOR EVERYONE?

PHOTOS BY **PÁLL STEFÁNSSON.**

A 60-year debate on whether a submarine power cable could be built from Iceland to the UK to export renewable energy at an optimal price was recently reignited. ***Zoë Robert*** *explores the issue.*

The construction of a 1,200-kilometer-long submarine power cable, or interconnector, from Iceland to Scotland has been discussed on and off since the 1950s. Called IceLink, the proposed cable would be the longest of its kind in the world and would deliver a volume of up to five Terawatt-hours (TWh) of electricity per annum, providing up to 1.6 million homes in the UK with renewable energy from Iceland, and allowing Iceland to sell electricity at a higher price abroad. In 2014, KPMG named IceLink one of the world's top 100 inspirational and innovative infrastructure projects.

SECURING ENERGY SUPPLIES

The idea was first proposed 60 years ago and according to Landsvirkjun, the National Power Company, its feasibility has been regularly assessed over the last 30 years. The debate on whether it should be built was reignited during UK Prime Minister David Cameron's visit to Iceland for the Northern Future Forum in October. During Cameron's visit, the first of a British prime minister to Reykjavík since Winston Churchill in 1941, a task force to examine the feasibility of the project was announced. The task force will report back within six months and, should the project go ahead, it is expected to take at least five to six years to complete.

According to Björgvin Skúli Sigurðsson, head of marketing and business development at Landsvirkjun, renewed discussion of the project is primarily a result of events abroad rather than at home. "Specifically the increasing demand for power, the security of supply question—where is our energy going to come from in the future?—and the fact that these countries are closing down nuclear, coal-fired and gas power plants for climate change reasons. So it is events outside of Iceland that are bringing these opportunities to Iceland and why it is a much more relevant project now than it was in the past," he says.

Björgvin says that the decommissioning of plants in the UK, aimed at cutting emissions, will result in a drop in existing power generation, leaving a gap which needs to be filled. The British media have regularly reported that homeowners in the UK face a continuing threat of blackouts because of power shortages and also face higher energy bills because of power station closures. "Even if the demand stays flat, where are they going to get new power? It is one of the top priorities ... The EU is asking: 'Do you want to continue buying gas from Putin? Do you want to continue buying coal or oil from the rest of the world, or do you want to look closer to home and ask 'well, can we be more diversified in our supply and perhaps more self-sufficient?'"

Isobel Rowley, senior press officer at the National Grid in the UK, says that while existing electricity generation capacity is stretched, should IceLink go ahead, it will be many years before the project is realized. "While it is true that electricity margins are tight, National Grid has put in place some additional services to help with the peak winter demands. With these extra services, the situation is manageable. A link with Iceland would be some years in the future and not of immediate help with today's tight margins," she commented via email, later adding: "While old coal-fired power stations are coming to the end of their life, new renewable energy is joining the system."

Another potential benefit of the interconnector is that, by definition, it will connect the two countries' transmission systems, offering bi-directional flows and allowing the UK to 'store' any excess energy in Iceland. Storing electricity on a large scale is extremely challenging, even with today's technologies, but is possible using hydropower, says Björgvin. He points out that wind power plants in the UK sometimes produce more energy than is needed. IceLink could move the power from the UK to Iceland where it could be used domestically while conserving water in the Icelandic hydropower reservoirs. When the wind stops blowing in the UK the Icelandic hydropower plants could operate at twice their normal capacity, thus exporting the power back to the UK.

DEMAND FOR RENEWABLES

The increasing demand for renewable energy abroad has also been a primary reason for the revived discussion, Björgvin says. "Iceland's energy production is already [nearly] 100 percent renewable. In contrast, the rest of the world is struggling to get to 20 or 30 percent ... Iceland has more resources for power than you and I need for living here," he said, later adding: "If Iceland would replace some of the UK's coal energy production, the resulting reduction in CO_2 emissions would be greater than all of Iceland's current emissions. There are perhaps few opportunities where Iceland could make a greater impact in the ongoing climate discussions."

Rowley confirms that interest in the UK certainly exists. "There is a lot of interest in delivering low carbon energy and a focus on energy prices, so Iceland's natural resources could provide a great opportunity to deliver cost effective low carbon energy."

The suggestion that Iceland can help other countries reach their emissions targets by exporting energy has its critics. Chair of the Iceland Nature Conservation Association, Árni Finnsson, argues that the proportion of the UK's energy that could be provided from Iceland is almost negligible. "I think we are talking about 1.5 percent of the energy needs of the UK. It's not a whole lot," he says.

Guðmundur Ingi Ásmundsson, director of Landsnet, which owns and operates all major electricity transmission lines in Iceland, pointed out in an interview with television station Stöð 2 in mid-November that although the proportion of energy Iceland can provide Europe with may be small, the country still has an important part to play. "Foreign parties don't think we will solve the problems of Europe; it is part of a larger picture ... to increase renewable energy sources in the entire system."

Guðrún Pétursdóttir, director of the University of Iceland's Institute for Sustainability Studies agrees with Árni. "It is not going to have a major impact on the emissions, but for us here it is important because it is one of our major resources." Guðrún also stresses that the notion that Iceland has practically infinite renewable energy is a misconception. "We do *not* have endless energy ... and let us be clear that geothermal energy is not renewable in a human lifetime, only in a geological lifetime."

Árni is also concerned that the focus on selling green energy will provide the Icelandic government with a disincentive to improve Iceland's environmental record in other areas. "The more politicians praise Iceland's clean energy, the less they will be interested in cutting emissions from transport, fisheries, farming etc. Iceland, of course, is tiny, but per capita emissions are very high—15 tons per person per year," Árni argues.

ASSESSING THE RISKS

Unlike in the past, the project might now be commercially viable, Björgvin says, in part due to increasing taxes on non-renewable electricity abroad implemented as part of efforts to move away from carbon-based fuels. With Iceland's energy production being clean, the country's power prices are therefore more favorable than before. "The market structure in Europe has all of a sudden made this an option which is probably commercially feasible."

According to Björgvin, there are three risks surrounding the commercial feasibility of the project. "The first one is the construction risk: who is financially responsible if the project is never completed? The second thing is operational risk: who is responsible if the interconnector breaks down? The third thing is the market risk: does it pay for itself? We don't have answers to these questions yet," he explains. "The UK-Iceland task force will be assessing those risks, and the UK government might eventually decide to pay for the cable if that turns out to be sensible," he adds.

As for the technical feasibility, Björgvin believes the evidence suggests it is possible. "The likes of the National Grid, which has been involved in several interconnectors, say it is technically doable." Norway has also built similar subsea cables to Denmark, the Netherlands and Germany and is currently working on an over-700-kilometer long cable to the UK, due for completion in 2020.

Björgvin emphasizes that the project is still in the analysis stage. "I don't think anyone in Iceland knows whether this ultimately makes sense or not. However, we believe it is really worthwhile to do further research into the project, given the opportunities this might bring Iceland as a country."

Árni says he understands Landsvirkjun's interest in the project due to the higher price they could be getting for energy. However, it cannot come at the cost of environmental destruction, he argues. "If a cable means continuation of building new power plants on top of everything else currently going on [there are many energy intensive projects currently under consideration], I don't think anyone will see the cable as an option. It will be difficult to find energy for everyone."

THE IMPORTANCE OF PRICE

Árni suggests that there has been a change in policy on selling energy in Iceland. "The old one of building up Iceland by providing cheap energy to everyone here, and the new one where we can get a better price for energy if we export it or sell it to foreign companies in Iceland." Árni says it's useful to compare energy with fish in this regard. "Fish is not subsidized in Iceland. When I was a kid I ate fish three or four times a week, but today it is almost a luxury. We can get a better price for it abroad so we export it."

Árni is among those who believe that, like fish, domestic energy prices will increase once the resource is exported. "I'm convinced that prices will go up if the interconnector is built," he says. In an interview with *Iceland Review* at the Northern Future Forum, Prime Minister Sigmundur Davíð Gunnlaugsson stressed the importance of avoiding energy price increases. "It is very important to us here in Iceland that we are in a position to offer households electricity at reasonable prices," he said, adding that it was also essential that IceLink not negatively influence the potential for any new investment in Iceland.

If prices were to go up, Árni says Iceland would be less attractive for energy intensive industries such as the aluminum industry—which environmentalists in Iceland have long fought against—and may leave Iceland as a result. "However, an interconnector will likely call for new hydro- and geothermal power stations, thus destroying valuable nature areas."

ENVIRONMENTAL CONSIDERATIONS

Guðmundur Ingi Guðbrandsson, director of Landvernd, the Icelandic Environment Association, warns that the environmental impacts of the project need to be seriously considered. "We believe that a sea cable would put more pressure on building more power plants and we know that it would definitely call for a stronger infrastructure for the electricity transport system."

Björgvin acknowledges that new power plants would need to be built. "We certainly expect some further power plants to be built in Iceland but to a much lesser degree than a lot of people think, and nowhere near to another Kárahnjúkar," he says in reference to Iceland's largest, and most controversial, power plant. The construction of the East Iceland plant, which was completed in 2009, involved the damming of two rivers, creating three reservoirs. It is operated by Landsvirkjun and serves Alcoa's Fjarðaál aluminum smelter with 4,600 GWh annually.

It is not yet clear where the new plants would be built, Björgvin adds: "We have not identified exactly which these might be, because the cable would only be operational in eight or more years ... Before a final decision is made we will have to know how we are going to supply the power."

Some of the required power could come from existing surplus, Björgvin insists. "We believe that quite a lot of the power [required for IceLink], perhaps 30 to 40 percent, could come from the existing infrastructure that we have." Due to Iceland's isolated electricity system, it is currently necessary to keep emergency reserves, which would no longer be required with the interconnector, and could therefore be used or exported, he explains. In other words, an interconnector would allow for less waste in the energy system in Iceland, he argues.

Environmentalists are generally united in their opposition to the construction of more power plants in the highlands, and to a potential new power line across the highlands. They are worried about the number of prospective projects—the sea cable being just one of the projects Landsvirkjun and other energy companies would like to fuel; including silicon plants, data centers and other medium-to-high power intensive energy users currently being considered, as Guðmundur says. "There are a lot of ideas floating around and as long as we don't have any base on how much energy we are willing to utilize or how much there is a consensus on utilizing, it is really difficult to answer precisely what you think about a project like that. But at the moment the cons definitely overrule because it gives incentives to dig deeper into the places we have and also because of the transmission system."

PROTECTING THE HIGHLANDS

Iceland's highlands are considered one of the last remaining wildernesses in Europe. What makes the area particularly unique, Guðmundur says, is the contrast in nature found in the highlands. "You have vegetated oases in the midst of deserts, you have glaciers and volcanoes scattered around, you have really unique geological features." Guðmundur highlights that according to surveys, over 80 percent of tourists mention nature as the reason for visiting Iceland and over 90 percent of visitors to the highlands say that manmade structures such as power plants, power lines, reservoirs and hotels do not fit into their idea of wilderness. "I think we need to listen to this because this is very valuable data on how we present our country, both for ourselves ... but also for tourism, which is one of our biggest industries now, and especially for our image. We have a saying in Icelandic: 'Don't slaughter the milking cow.'"

Guðrún agrees. "What I fear is that we would increase the pressure to harness a natural resource whose value we are just beginning to fathom. We have to understand that we have no idea of the value of untouched wilderness in the next decades, let alone in coming centuries. It is only going to increase because it is going to be more and more rare. We are playing with a resource which we owe to future generations." She says that only a generation or two ago, wilderness was considered threatening or intimidating and not something that had any monetary value.

At a press conference during the Iceland Airwaves music festival in November, author Andri Snær Magnason and musician Björk emphasized the potential environmental impacts of the IceLink project. "When we see headlines like this: 'Iceland has lots of volcano power, free and environmentally-friendly,' we get a bit scared because we've seen the hype before and we've seen the damage that has to be done to harness all this energy," he said. "We are kind of worried if the world thinks they are getting 'volcano energy' from Iceland, unattached to any place, or any heritage, or any natural consequences." Björk said that international media attention on the subject has been important to help push the issue in Iceland. "It's often in a small country like Iceland if you get foreigners supporting our views, it kind of mirrors back here to the people in power and they listen to the crazy artists of their own island."

Environmentalists want to see the whole of the highlands protected as a national park. "Then we can start managing the area, taking into account the wishes of different groups, but with nature conservation as number one. A national park means a place for people to enjoy, but also creates a holistic management plan including how we're going to manage tourism," Guðmundur says.

Björgvin agrees that the environmental aspect needs to be further discussed. "This is certainly a major topic and part of the political discussion as to what do we want to do with the energy resources here and perhaps do we just not want to use the energy resources—and that's a view that a lot of people have."

ALTERNATIVE OPTIONS

Björgvin, however, stresses that, financially, Iceland might benefit greatly from such a project. "The Icelandic nation happens to own Landsvirkjun, so with more value generation that's more money that we would pay to the coffers of the Icelandic government and that money could come to good use, be it hospitals, the education system, or other government services we depend upon."

Like Árni, Björgvin says that it helps to compare the fisheries industry in Iceland to the energy industry. "The fisheries industry wants to have access to as many markets as it can, that's the mantra there because they want to sell to the highest paying markets ... The interconnector is, simply put, access to a new market for Icelandic power, just like Icelandic cod is sold all over the world, we want Icelandic power to be sold all over the world, too. This is how we make the most of our energy resources by having access to more markets. Iceland is a resource-based economy. Our economy is based on fishing, tourism and energy—that is how we have to make our living here so we have to make the most of these resources in order to buy all the rest of the things we need."

David Cameron described the project during his visit to Iceland as a potential "win-win situation" which could provide Iceland with "important export earnings while providing clean and green energy to the United Kingdom as part of building a strong relationship."

Guðrún, however, is concerned about discussions that Landsvirkjun could be privatized. "I'm just worried that once we start exporting, we will lose control of our resource."

The Prime Minister of Iceland has said prerequisites for the project going ahead include that jobs are created in Iceland, in particular in the regional areas. Guðrún says the argument that we need to invest in power plants to provide economic growth is nonsense. "How many jobs did Kárahnjúkar create? The workforce was mostly imported. We will not create many jobs by harnessing energy for export. We need a diversified economy."

Björgvin emphasizes that there is an increasing demand for energy within Iceland and should the interconnector not go ahead, there would still be plenty of other opportunities for energy projects domestically. "There are still a lot of power intensive companies who want to come to Iceland and build their factories here, so we don't particularly worry about there not being a build out [of the interconnector]," he said.

Guðrún is among those to argue that before Iceland starts exporting its energy, it should use it for important domestic projects such as getting the country's overland transport and fishing fleet off fossil fuels. "Let's not assume the highest value for this resource is to export it, let's assume that its highest value might be in keeping it here ... I would say hold your horses, don't open the faucet and let our resources flow over to Europe while we have the potential to use them for something much more valuable here in Iceland." ★