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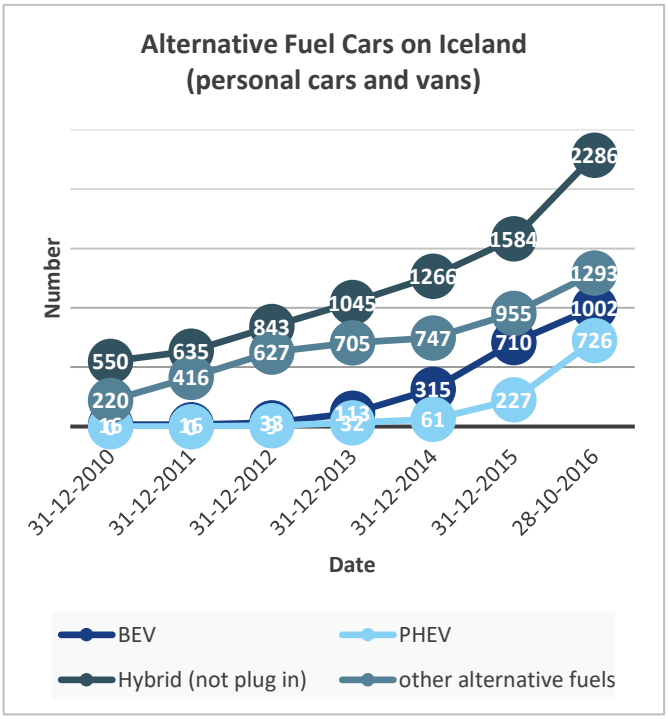
SCHOOL OF BUSINESS AND SOCIAL SCIENCES
DEPARTMENT OF BUSINESS DEVELOPMENT AND TECHNOLOGY

RECONSIDERING THE FUTURE OF ELECTRIC VEHICLES ON ICELAND

Summary

With its unique energy geography Iceland is ideally situated to transition one of its last remaining carbon emitting sectors: transport. With an estimated 85.3% of its total energy and virtually all of its electricity production coming from renewable sources,[1] a transition to electric mobility seems assured. For many the question is not if, but how quickly. EVs are in fact stated to kill two birds with one stone: they cut emissions and reduce the dependency on fossil fuels. Challenges are brought up as well, however, not all of them are recognized by everybody involved. Well-known barriers include the purchasing price, the available charging infrastructure, and lack of consumer knowledge, which was often concluded to be the main barrier. Surprisingly, the state of the transmission grid was mentioned only a number of times as being in need of modernization, and only once was it stated that EVs and more geographically dispersed charging would add to this stress.



Data: Samgöngustofa (http://www.icetra.is/)

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About this project:
This policy brief summarizes initial reflections on the status of EVs in Iceland after three weeks of fieldwork in Reykjavik and Akureyri, supported by the Danish Council for Independent Research (DFF) Sapere Aude Grant 4182-00033B "Societal Implications of a Vehicle-to-Grid Transition in Northern Europe"

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Transport challenges

Drawing from our original interview data, there seemed to be general agreement on the challenges faced by the transport and energy sectors. On the one hand, transport on Iceland is characterized by its fuel imports.[2] This makes transport, together with the other fossil fuel sectors (fishing, air flight and agriculture), one of the last remaining carbon emitting sectors on Iceland. Fossil fuels also come with undesirable foreign capital costs for such a small island.

At the same time, the road system is seen as stretched and under constant pressure from the weather and complex landscape. Large rural distances, low population density and a widespread urban centre around Reykjavik, make not only the road system a challenge but public transportation as well. Cars are seen as a necessity and are said to be ingrained in the Icelandic society, with many favouring 4x4 and SUV types of vehicles for the countryside.

Mentioned as well in this respect is the increasing number of tourists that adds to the infrastructure stress. Picking up after the financial crisis, this industry is driving the expansion of the car rental business while demanding a radically different travel pattern compared to local inhabitants. For EVs this is said to result in large scale charging stations near tourist attractions and along the tourist routes. The infrastructure challenges from Iceland's geography and tourism are closely connected to an occasionally mentioned need to rethink taxation policy in the shift from ICEs to EVs beyond simple incentives (taxation on EVs and tourism) in order to sustain the road system.

LITTLE MENTIONED BUT HIGH IMPACT CHALLENGE: TRANSMISSION GRID

Energy challenges

With its abundance of hydro and geothermal, Iceland is seen by many of the interviewees as perfectly situated for a rapid transition to electric vehicles. However, it is a transition that needs to account for and potentially benefit from some unique characteristics, including the regularly mentioned 80% electricity consumption by heavy industry.[3]

In terms of the transmission, the system is said to be struggling with additional loads as many of the cables have little capacity left.[4] Even though many agree that the expected increased load of EVs is relatively small and should not pose an issue on its own, it adds to the already expected increase in consumer electricity demand, which itself requires additional production and a modernization of the transmission grid. A modernization that is currently facing environmental pushback.

On the production side, the additional expected demand for the coming decades is not seen as hurdle but as a sales opportunity, with many more opportunities available for hydro, geothermal and potentially wind. However, social and environmental acceptance of new production is expected to become more demanding here as well.

In terms of distribution, the networks are expected to cope with an increasing electrification as issues are more locally dispersed and are expected to occur gradually. Investments will be made in both cables and smart grid technology.

Lastly, the low consumer electricity price and lack of awareness among Icelanders about their energy use (do you waste energy if it is green?), is seen as an issue, but not as a problem. A main expected effect is that any shift of consumer demand and EV charging will have to occur through education, initially, and central control mechanisms when they become available, rather than through price mechanisms.

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Expectations

The shared (hopeful) expectation is that the market for both EVs and PHEVs continues to increase, exponentially. The number of chargers is increasing, with plans to connect the ring road in the very immediate future. This will reduce a repeatedly mentioned mental barrier for consumers – the distance between Reykjavik and Akureyri.

Other challenges remain and new ones are coming up in line with an expanding market: the need to increase apartment block and office charging opportunities, to continue the development of public charging infrastructure (geographically and at existing charging sites), and at one point – 'sufficient market share' – to rethink taxation structures beyond incentives.

While these are all related to Icelandic policy and investment choices, other things were not seen as controlled by Iceland: especially the more business and investment oriented experts noted that the Icelandic car market does not automatically receive all available electric models and that for car companies and their supply chain the life-cycle revenue of electric cars is lower than for combustion engines.

Key suggested recommendations

- Stable incentive programs
- A sector wide understanding of co-dependence
- Attention to transmission grid
- Develop initiatives to address social barriers

WHILE TECHNICAL BARRIERS WERE MENTIONED FIRST, SOCIAL BARRIERS – KNOWLEDGE, EXPERIENCE, FINANCE – DROVE THE DISCUSSIONS

Offered suggestions

Based on the interviews, our initial observations suggests that Iceland can help accelerate the transition to EVs by working on the following three things.

First, the incentive structures need to be extended from a year-on-year to a predictable medium term system based on clear end criteria (e.g. x market share or x number of years or cars). While the capital costs of EVs are reducing, they are not on par yet with ICEVs and this remains a barrier for an uptake as long as there are consumers who are unaware of the difference in lifecycle costs. A predictable and technology neutral incentive program allows consumers and market parties to invest with a certain degree of trust.

Related, it might be an option to extend the incentive programs to company and car rental markets for whom the net capital costs of EVs are still higher than ICEVs in order to rapidly introduce alternative vehicles in the car fleet. This would help further other investment decisions in charging infrastructure, distribution, transmission and production, and also build up a second-hand market.

Second, for a successful further electrification of Icelandic society (including further electric mobility) a strong transmission grid is vital. The general reflection is that investments will need to be made on distributions grids as well. Iceland cannot phase out fossil fuels without a network to support its future electrification.

Lastly, the mental image of electric vehicles is considered to be low on Iceland. Besides information, many people mentioned the value of word of mouth and the actual experience of driving an EV. It follows that a sector wide support for initiatives that allow consumers to gain real-life experience with EVs has merit.

[1] Orkustofnun (2016). OS-2016-T002-01: Primary energy use in Iceland 1940-2015 [data file] and Orkustofnun. 2016. *Energy Statistics in Iceland 2015* available at http://os.is/gogn/os-onnur-rit/orkutolur_2015-enska.pdf
2 About 250 kilotons of oil and gasoline. See Orkustofnun. 2016. *Energy Statistics in Iceland 2015*.
3 Orkustofnun mentions 76,4% for heavy industry, with 5,3% for the electricity system itself (losses and use) and 18,3% for public use. See Orkustofnun. 2016. *Energy Statistics in Iceland 2015*.
4 See for more detail: Landsnet. 2016. *Annual Report 2015: An Electrified Future – in tune with society*, p5-6 and 67-68, available at http://2015.landsnet.is/wp-content/uploads/2016/06/Landsnet_AnnualReport2015_PDF_ENGLISH.pdf.