



## **ICELAND: A LABORATORY FOR GREEN DRIVING**

**A Speech  
by  
the President of Iceland  
Ólafur Ragnar Grímsson  
at the Symposium  
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In recent years it has been encouraging to witness how increasing awareness of the global threat imposed by irreversible climate change has stimulated innovation and new technologies, created a challenging vision of how we must fundamentally alter our way of life, our energy systems and our economies.

Many people are asking: In all honesty, can it be done? How will each and every nation manage such a fundamental transformation? Can our countries achieve what is undoubtedly the most daunting challenge facing mankind in modern times?

In this respect, Iceland can serve both as an example and an inspiration, a proof of how it is possible, within the lifetime of one generation, to move from being predominantly dependent on fossil fuels to become one of the leading clean-energy countries in the world – and now developing ambitious plans to achieve even more: to base the traffic system and also the fishing fleet on clean energy sources, as has already done in the case of electricity production and space heating.

In the early years of my life, oil and coal provided over 80% of the energy consumed in Iceland. I was brought up in a fishing community in north-western Iceland where there was no other energy resource. Now, however, Iceland produces close to 100% of its electricity from clean energy resources, geothermal and hydro, and almost 90% of homes and workplaces are heated with geothermal hot water. The remaining challenge is the transport system and the fishing fleet: to switch our car fleet from combustible fuel to electric power and to keep looking for a sustainable way to power our fishing vessels.

This will be a major opportunity for the green energy industry in a country which ranks among the highest per-capita producers of electricity in the world. Since our production costs are among the lowest in the world, it makes perfect sense to embark on replacing most of the private car fleet with battery-powered vehicles. The electrical infrastructure is well developed; all producers share one national grid and delivery is reliable.

The latest developments in car manufacturing may help us to achieve this goal. Also, the current global financial and economic crisis might even provide a favourable framework for it, for example by encouraging the American car industry to base its revival on more forward-looking policies. This would echo the way the oil crisis in the 1970s gave impetus to the development of geothermal power in Iceland, making us explore alternative and profitable clean energy solutions.

It would indeed be of great advantage for my country if we could switch to electric cars on a large scale. One estimate indicates that the total annual energy cost of a small electric car in Iceland would be about the same as fueling a petrol-powered car two or three times — a cost reduction of 80-90%.

Although the cost of batteries is still very high, making the initial investment greater for the car-owner, the running cost will be very low. Also, we can reasonably expect the initial investment cost to drop rather sharply in the immediate future as the technology and the markets mature. Furthermore, a switch to electric cars in my country would immediately result in a substantial environmental gain, since our car fleet currently releases a very large amount of CO<sub>2</sub> , per head of population, compared to other European countries.

The power utility Reykjavík Energy envisages that 55% of cars in the capital could be powered by non-fossil fuels by the end of 2013. It has taken many steps to encourage this development, not only by offering free electricity for cars but also by actively participating in the international development of hydrogen cars. Users of electric cars now draw free electricity for their vehicles by plugging them into a specially designed post in Reykjavík's main shopping centres.

The city of Reykjavik has also decided, through this energy utility company, to sponsor research into the critical parameters involved in replacing a large part of the city car fleet with electric cars. One project aims at creating a model to assist in the relevant decision-making process, to define possible scenarios in implementing the general use of electric cars, and to study factors such as the environmental impact, the load on the electric infrastructure and the economic consequences for consumers, the business sector and the national economy. Another project aims to shed light on how both companies and municipal authorities could switch to electric cars, how car pooling using employer-sponsored green cars could work in practice and how electric cars would perform under the stress of heavy use in the sometimes tough climate of Iceland.

We have also followed with interest how several other nations are taking steps to enable electric car production to enter the market. To reduce CO<sub>2</sub> emissions, the United Kingdom will offer a subsidy of what amounts to 5,700 euros to anyone switching from fossil fuel to an electric car as from 2011. Similar consumer grants or subsidies have been decided in the United States and in China. In some other countries, purchases of green cars are supported by a discount of sales tax or other benefits.

The hydrogen project in which Reykjavík Energy has been a key player is aimed at demonstrating the feasibility of running hydrogen buses and private cars in a modern city. A hydrogen fuelling station, the first of its kind in the world, was opened some time ago in Reykjavík, and three buses using hydrogen were successfully operated for a number of years. Three well-known companies were the primary participants in this project: Daimler-Benz (later Chrysler), Hydro and Shell. Smaller fuel-cell cars from both Mercedes Benz and Toyota, powered by hydrogen, have been in use in the city since 2007, when the hydrogen fuel station was opened to the general public. It is now possible to rent a hydrogen-powered Hertz car in Reykjavík and travel around our magnificent country as a green-energy tourist.

The use of hydrogen cars in Iceland has highlighted some problems involved in using this energy carrier. These are mainly connected to considerations of scale. From the commercial point of view, it does not make sense to run a high-tech hydrogen fuelling station for only a handful of cars. But hydrogen has other problems as well: storage and production are expensive, as are the fuel cells, and the infrastructure is limited. The current assessment of the potential of hydrogen for fuelling cars is that it may be practicable under certain circumstances, but that it seems unlikely to become a mainstream energy carrier in the near future. In 10-20 years' time, however, hydrogen may have become a commercially viable option.

A new step has recently been taken within the Icelandic hydrogen project. A sightseeing vessel of 125 tons, used for whale-watching tours, is now running a hybrid hydrogen auxiliary engine for testing purposes. This is not the ship's main engine, but it generates all the electricity used on board. It remains to be seen how it will work in the rough and salty environment.

Iceland has also made an agreement with Mitsubishi Heavy Industries to do a feasibility study of the production of DME or di-methyl ester. This compound is thought to be a suitable fuel for ships. If it turns out to be so, it could revolutionize our fishing industry, reducing emissions dramatically, and it would get us out of the current trap of having to import roughly one kilogramme of expensive oil for every two kilogrammes of fish we catch.

Over recent decades Iceland has undergone a transforming experience in harnessing its natural energy resources. We have put a considerable part of our available hydropower into production but are now slowing the process down because of environmental concerns. In the meantime, we have built up strong technical know-how in geothermal energy and this is becoming a valuable contribution to energy developments in many other countries. The advances made in geothermal engineering will enable more nations – perhaps up to a hundred altogether – to make use of the enormous energy provided by the fireball inside the Earth. Together with hydropower and other sustainable energy resources, geothermal power may become a key factor in establishing a new paradigm shift in ground transportation, extending even to United States.

The vast distances on the North American continent and the discovery of oil wells in Texas around 1920 made it more sensible for the Ford Motor Company in its early days to start mass production of

gasoline-powered cars rather than to bet on the electric version. For decades, the car industry followed that lead, and concept of “the car” became almost synonymous with “the fossil-fuel-powered car”.

In the 1990s, however the state of California demanded that car-makers produce electric cars, and this stimulated the industry to some extent, but the time was not quite ripe for such a big step. The automobile industry- the manufacturers, the sellers, the fuel distributors and others - had too much at stake in the old system. Also, before making such a change, consumers needed to be prepared for it and the infrastructure and technical requirements had to be in place. The markets were not quite prepared to embrace the pure electric vehicle. People would shy away at the thought of being suddenly stranded with a flat battery, so having a combustion engine on the side was perceived as a necessity. Today this is changing, especially in the case of cars for urban driving.

In recent years we have observed how Japanese manufacturers have taken the lead in producing energy-efficient cars. We have also seen manufacturers in India enter the production of electric vehicles. It is important to have locations where the development of such a new traffic system can be tested. Iceland is well positioned to serve in this capacity in terms of our target of reducing dependence on fossil fuels, helped by sustainable energy production and our well-developed electricity infrastructure.

In fact, Mitsubishi Motors has already concluded that Iceland provides an excellent opportunity to test the commercial marketing of electric cars. In 2008, Mitsubishi signed an agreement with the Government of Iceland on the testing of a fleet of electric Mitsubishi i-MiEVs and the development of a service network and infrastructure for these cars. We are expecting to see Tesla cars arrive in Iceland later this

year, and the local car fleet also includes a new Ford Explorer which is a combined electric-battery and fuel-cell hydrogen-powered vehicle.

However, even the use of electric cars all over the world will not make a fundamental contribution to the battle against climate change if the electricity used is generated by fossil fuel. As has been said: “Electric cars are only as green as the electricity they run on.” The key question, if we want to focus on global warming, is therefore primary energy production. In this respect, Iceland may be a useful case to study since the efficiency of primary energy production and transmission over a national grid must be taken into consideration within the new global paradigm we need.

Although Iceland is now dealing with serious economic challenges following the collapse of the banking system, the energy sector is, and will remain, a major pillar both in our recovery and our contribution to the global clean energy revolution, a revolution which must take place in the next five to ten years if we are to succeed in preventing our children and grandchildren from inheriting a world of climate-related disasters.

Iceland is proud to present itself as a laboratory for the development of a green energy future, a laboratory where the transformation of an entire national energy system can be observed and the development of green driving, electric cars and other associated technologies can be tested. The Government, the Reykjavík City Council and other municipal authorities, the energy companies, universities and research institutions are all very supportive of this vision.

As regards green driving, Iceland also offers the combination of a cosmopolitan capital and long-distance driving to rural destinations, all connected into a national electric grid which enables the drivers to recharge their vehicles virtually anywhere in the country. The changing

weather, the volatility of the winter and the variety of the summer storms and heavy rains and the availability of rough roads as well as modern highways also help to make the testing of electric cars in Iceland realistic and effective.

It is a confirmation of our national ambition in this respect that for each of the past two years, Iceland has hosted international conferences on green driving. The next one will take place this coming September and is, like the others, entitled “Driving Sustainability”. At it, prominent experts and policymakers will be sharing the podium with city planners, technological visionaries and representatives of car companies and other relevant corporations.

It gives me great pleasure to invite you all to join us in Reykjavík in the autumn in order to continue the productive dialogue which has taken place in Stavanger. This offer is a small token of gratitude for having been invited to address you here today.

*The speech was delivered in the President's absence due to his attendance at the opening of the Parliament in Iceland.*