



**WORLD ENERGY COUNCIL
EXECUTIVE ASSEMBLY**

ICELAND ENERGY DAY

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**Speech by
the President of Iceland
Ólafur Ragnar Grímsson**

Your Excellencies,
Ladies and Gentlemen,

It is a privilege and an honour for Iceland to host the Executive Assembly of the World Energy Council, and in a way it is symbolic that we are gathering in a capital which owes its name to energy resources.

When the first Vikings came ashore and decided to settle here on the Atlantic coast more than a thousand years ago, they were inspired by the white steam which arose from the ground, day and night, in an never-ending flow. They named the location Reykjavík, which means the bay of smoke or steam, and centuries later the settlement grew into the capital of our country.

All over Iceland, other Viking explorers had similar experience and consequently the Reykja-element can be found in the names of valleys and hills, farmsteads and water resources in all parts of the country where hot springs were discovered. The energy created by the magma inside the earth became a strong influence on our history and culture, in the naming of the landscape and the customs of the people, and has remained so for more than a millennium.

I doubt if there are many countries where a primary energy resource has had such an over-all effect on a nation and therefore it is indeed appropriate to welcome the World Energy Council to Iceland.

Although our ancestors were fascinated by the white “smoke”, the steam and the bubbling water, for centuries the resource was of limited use. Even in the younger years of my mother’s and father’s generation, exploitation of our geothermal reserves was still restricted to washing clothes and linen. It has been a fascinating experience to witness how scientific progress and technological advances, visionary policies and public determination, have transformed our use of energy during my lifetime.

Now Iceland has become a leading global centre for geothermal power, using it to produce electricity for an aluminium smelter, to provide district heating for towns and cities, and to offer hot water for spas and greenhouse cultivation. Geothermal has even contributed to our production and marketing of cosmetics and pharmaceuticals. All this enables our economy to pursue many different lines of profitable activity in this new century.

One of the main reasons for the transformation of Iceland in the last fifty years or so, from having for centuries been one of the poorest countries in Europe to joining other welfare societies in the world, has been the energy revolution that has taken place during this time.

When I was growing up in the Western Fjords, over 80% of the energy used came from imported coal and oil. Now all our electricity is produced by domestic hydro and geothermal power plants and most of our houses are heated by geothermal water. Only cars, shipping and aviation remain to be brought into our clean energy economy. When we have succeeded in doing so, especially with respect to the cars, Iceland could become the first 100% clean-energy country in the world for land-based activities. And we are working on this: last year, for example, we signed a memorandum with Mitsubishi to make our country a testing ground for its new fleet of electric cars.

The extensive geothermal experience which has been gathered here in Iceland, together with our outstanding community of geologists, geophysicists, engineers, drilling experts, managers and others, has enabled us in recent years to become a partner in energy developments in countries all over the world, in Europe and the Americas, in China and India, in Africa and the Middle East.

In the last 30 years, we have within the United Nations Geothermal Training Programme, located here in Iceland, trained hundreds of young experts from different continents, many of whom are now leaders in the energy sector of their respective countries. Recently, our universities have established two international energy schools, one in Akureyri and one in

Reykjavík, aimed at training people from all over the world in every form of clean energy application.

We are now also helping cities in China to replace coal plants with geothermal to provide urban heating. We have cooperated with Djibouti to formulate plans which could make it the first clean-energy country in Africa. We have engaged in extensive discussions with the US Administration, the Department of Energy, members of the US Senate and the House of Representatives, governors and mayors, to map out the role which geothermal power could play in the transformation of the US energy economy.

Thus, our small country is involved in many different types of international collaborative work in the energy field. To me, perhaps the most fascinating one is with Abu Dhabi, in which we have been privileged to contribute to the building of Masdar City, the first zero-emission and zero-waste city in the world, and to support Abu Dhabi in successfully seeking to host the new headquarters of IRENA. Only a few years ago, such extensive cooperation between Iceland and Abu Dhabi would have been unthinkable, but now I believe it demonstrates a vision of the future: how we all can, and indeed must, work together.

It sometimes seems as if the geothermal is the forgotten energy resource in the present global debate. Most leaders tend to ignore it or don't remember what they learned in primary school: that inside the earth there is a huge fire-ball and we are living on a thin crust which we can drill down into. Or, if those leaders are aware of these possibilities, then many of them erroneously believe that only a few countries can benefit from this geothermal potential.

The truth of the matter is that there are more than 100 countries in the world that could use modern drilling technologies and engineering to follow Iceland's example in the field of geothermal energy, and allow this resource to make a major contribution to their energy systems. Where low and medium-temperature areas can be tapped, the energy can be used for heating houses and driving air-conditioning; where high-temperature fields are available, it can also be used to generate electricity.

We are now, for example, cooperating with several foreign partners on the Iceland Deep Drilling Project, which is aimed at going as far down as 5 or 6 km to examine how to harness water at temperatures of 400 – 600°. The technological potential in this area is enormous and we are only at the early stages of its development.

The hydro sector in our country has also seen similar advances from a few experiments around 1900, when our first hydro powered turbine

was started up and the first street lit on the 12th of December 1904 by a carpenter in Hafnarfjörður, a town close to Reykjavik. After that, other municipalities acquired their power stations and following the Second World War the development of the electrical grid all over the country was accelerated by a special government programme.

In recent decades we have built a number of large and highly sophisticated hydropower stations, the most recent being the 690 MW Kárahnúkar plant in Eastern Iceland, which supplies electricity to the new Alcoa aluminium smelter.

In June this year we were honoured to host the assembly of the International Hydropower Association where the potential of global hydropower developments was systematically examined.

Hydropower constitutes approximately 17% of the world's electricity production, and is equivalent to about 3,000 TWh per annum. Untapped hydropower resources worldwide which are likely to meet the criteria for sustainability have been estimated to be of the order of a further 6,000 TWh per annum. If properly prepared, constructed, operated and managed, global electricity production from hydropower could reach three times its present level; thus, it alone could produce half of the electricity consumed by mankind at its present size.

Looking at the world map, it is estimated that approximately 75% of the hydropower resources of Europe have already been harnessed, about 70% in North America, some 35% in South America and 25% in Asia, but only about 8% in Africa. This is particularly striking, since Africa is the continent that suffers most from a shortage of power, hampering economic, social and health developments.

Let us also keep in mind that at present some 2.5 billion of the world's population do not have access to electricity. The TERI institute in Delhi, India, has developed a small and inexpensive solar lamp that could bring light to a billion people at a total cost of only about \$15 billion. This is a small sum if we compare it with expenditure in many other fields and bear in mind the gains that would be made by eliminating disastrous polluting practices. Development in this direction would make a major contribution to the battle against irreversible climate change.

As we all know, the debate about global warming is, in fact, primarily about the use of energy. I have often reflected that it would have been more correct, wiser and politically more productive, if instead of the label "Climate Change" we had named this challenge: "The Future of Energy" – because it is fundamentally about how we can change our energy systems so as to prevent climate change from happening; how we

can move from non-sustainable to sustainable practices, from fossil fuel to green energy such as wind, solar and hydro and geothermal resources.

Iceland is in many respects an ideal place to examine this challenge. Just like our neighbours in Greenland, we are able to observe the unnervingly rapid retreat of the glaciers. As you may know, the Icelandic glaciers are the largest in Europe, but our scientists have concluded after decades of study that even at just the present rate of climate change, they will have almost completely disappeared by the beginning of the next century.

Every year we also observe new species of insects and birds arriving in Iceland due to these fundamental changes. Although many of them might be welcome they are, however, a startling warning that things are not normal. But above all, the system of ocean currents driven by the Gulf Stream which has for centuries, even thousands of years, been sent to us by the courtesy of Mexico, could be slowing down or even stopping, a development which would have disastrous consequences for the economical well-being and the standard of living not only here in Iceland but for people everywhere in the world.

The melting of the ice in the Arctic and the Northern Regions could raise the global sea levels to such an extent that cities and urban areas in every continent of the world would be dramatically affected, but perhaps the most neglected aspects of this transformation is that changes similar to those that are happening here in the north are also taking place in the Himalayan regions. It is worth reflecting why it is that until quite recently most of mankind, and certainly India and China, have not recognized sufficiently that at the present rate of climate change, the 15,000 or so glaciers in the Himalayas will probably have completely disappeared within the next thirty years.

When I discovered that glacier research in India is not very advanced, I decided to instigate cooperation between Icelandic, Indian and American scientists to start working on what is happening to the Himalayan glaciers. Their disappearance within the next thirty years could be the most disastrous environmental aspect of climate change, jeopardizing the position of over a billion people in India, China, and Bangladesh, for the most part destroying the great rivers that drive the agricultural production and the food resources of the two largest populations in the world and affecting fundamentally the economic and energy basis of India and China.

Although the leaders of those two great countries might argue that climate change is the responsibility of Western Europe and the United

States, theirs are perhaps the countries that will be most dramatically affected by what could happen within the next twenty or thirty years.

But Iceland is not only a location where we come face to face with climate change; it is also a country which proves that entire national energy systems can be fundamentally transformed in a relatively short time and that such transformation brings with it enormous economic benefits.

The relatively cheap electricity and urban heating produced in Iceland has enabled families and companies, entrepreneurs and individuals, to fare better in times of crisis. The major reason for our ability to move out of the present economic and financial downturn more quickly than most foreign observers expected is the fact that the hydro and geothermal transformation of our energy system has since the 1970s been a national priority.

In addition, our clean energy production has become a major magnet for foreign investments, not only for aluminium and other industrial production, but also now for digital data centres. Owing to our clean energy production and the trans-Atlantic cables that link Iceland to Europe and America, it is now an attractive prospect to locate data-storage centres in Iceland. These could harbour all kinds of data, from American telephone calls and health records to insurance companies' databases and the valuable geological data collections which the oil industry treasures so highly.

Thus, our energy sector has not only become a key pillar of our prosperity and investment potential, but also a fascinating example of how a small country can significantly contribute to the global battle against climate change by providing others with experience and technology, with the inspiration of what can, in fact, be done.

I believe it is the moral obligation of the Icelandic people to share this success with others, to provide access to our knowledge and abilities, and it is in that spirit of international cooperation that I welcome you all to our country and hope that your discussion and deliberation will bring further success to us all.