

**A Speech**  
**by**  
**The President of Iceland**  
**Olafur Ragnar Grimsson**  
**at the**  
**World Geothermal Congress**  
**Bali**  
**26 April 2010**

Your Excellency, Dr. Susilo Bambang Yudhoyono, President of the Republic of  
Indonesia  
Ministers, your Excellencies,  
Distinguished delegates,  
Ladies and gentlemen,

The fire inside the Earth has recently through the eruption in my country reminded the world of its enormous power and destructive potential. Generally the power is hidden under the surface, but every now and then it breaks out, creating a spectacle in gaining immediate prominence in global media.

The volcano, under the Eyjafjalla Glacier in southern Iceland, thrust magma up through the 200-metre-thick ice-cap and consequently enormous clouds of ash moved to Europe, bringing air traffic to a standstill for days in the United Kingdom, France, Germany, Italy, Poland; in all over twenty European countries. Half of the scheduled flights on US-Europe routes were cancelled; millions of people had their plans dramatically altered and thousands of businesses faced an unexpected challenge.

Suddenly, due to a volcanic eruption in Iceland, most of the world, and particularly Europe and the United States, were reminded that there are indeed forces inside the Earth that can sweep away crucial foundations of global communication and bring large and important sections of even the most advanced modern economies to a halt.

The good news, however, for your gathering here today at the World Geothermal Congress, is that the glacial volcano in Iceland has given the world a unique demonstration of geopower which will not be forgotten. Now it is up to this distinguished assembly of scientists, engineers, experts and policy-makers to explain, to an attentive global audience, how these forces of nature can be harnessed for the benefit of humankind: harnessed to combat climate change and provide clean energy to homes and industrial regions and thus enhance the prosperity of people in Asia and the Americas, Oceania, Europe and Africa.

As the second decade of the 21st century opens, we enjoy a great opportunity to highlight the importance of geothermal production, not merely because of the spectacle of the Icelandic eruption, but above all as a result of endeavours, projects, innovations, technological breakthroughs and other achievements which in recent years have brought the geothermal sector to the forefront.

I come from a country where the capital city gained its name, Reykjavik, from the

geothermal steam which took the early settlers by surprise; a phenomenon which was completely foreign to the Nordic Vikings who settled on the island more than a thousand years ago.

For ten centuries, our only use of geothermal power was for washing clothes and relaxing by sitting in the warm springs created by natural conditions. Even up to the early years of my parents' life, these were the only benefits we derived from our geothermal resources.

Then, between the World Wars, and especially in the second half of the 20<sup>th</sup> century, new technologies and engineering endeavours enabled Iceland first to replace coal and oil with geothermal space heating, and then to power turbines and ultimately sell geothermally-generated electricity to aluminium smelters. Thanks also to hydropower, Iceland thus became the paramount clean-energy country in the world, with all our electricity and space heating provided by green energy resources. In addition the geothermal sector has been the foundation of extensive greenhouse cultivation and fish farming, of world-famous tourist locations like the Blue Lagoon, of spas and healthier styles, of the production of cosmetics and snow melting installations in driveways, in streets and urban centres.

The economic benefits derived from geothermal development have been enormous, helping to transform a country of farmers and fishermen, which the UNDP classified as a developing country down to the 1970s, to one of the most prosperous welfare economies in the world, despite the recent financial crisis.

Yes, indeed, geothermal energy has helped Iceland to survive the recent banking shock, especially because the cost of heating and electricity for ordinary people, families, homes and business companies was only a small proportion of what it is in other European countries. But also because our geothermal resources make Iceland a very attractive location for industrial investment, and will do so even more in the coming years: for aluminium smelters, data-storage centres, high-tech industries and other profitable enterprises.

The scale of the national savings resulting from geothermal space heating alone is demonstrated by the fact that every ten years, Iceland saves what amounts to the entire GNP of one year by not having to import oil and coal to heat the houses.

This has indeed been a revolutionary transformation, not only allowing us to build an economy with an inherent long-term strength but also to make significant contributions to the rest of the world. The geothermal sector has become one of the major pillars of Iceland's global position, of our foreign policy and our diplomatic efforts.

The United Nations University Geothermal Training Programme, founded three decades ago in Iceland, has strengthened the capabilities of more than 40 developing countries and we are proud to see so many of our UNU Fellows present at this congress. The program has also held short courses in Kenya (for African countries), in El Salvador (for Central American countries), in China (for Asian countries) as well as here in Indonesia.

In recent years, Icelandic power companies and engineering firms have participated in geothermal projects, for example in China and India, in East Africa and Central America, in Western and Eastern Europe, in the Middle East, Russia and the United States.

It has become an important part of my Presidency to promote such cooperation, especially since the threat of irreversible climate change makes it our moral duty to help others to move towards a more sustainable future.

The climate crisis constitutes a call for a fundamental energy revolution, a comprehensive transformation from fossil fuel to green energy sources such as geothermal, solar, wind, hydro-power and others.

In all of these categories, the nations of the South enjoy a richer potential than those of the North. Thus, a green energy era could be a time of renaissance, a progressive century for the developing world.

One of the great advantages of geothermal, solar and wind is that the scale of investments can be tailored to the need. The excess capacity and huge initial costs inherent in big coal and nuclear-power plants are absent from the equation. The tapping of geothermal, wind and solar sources can be adjusted to the needs of a small village, a few households, a growing town or emerging industrial projects. It can then be scaled upwards with each stage of successful development.

A few decades ago this important dimension was entirely absent from the formulation of energy strategies, simply because green technologies were still in their infancy. Now, however, developing countries can base their prosperity on proven practices that can be tailored to the needs of different regions.

The beauty of geothermal power for economic and social development is that it is not just an energy resource. It can also be used for greenhouse cultivation and other types of productive farming to help rural areas to grow products for high-priced markets. It can provide warm water and clay chemicals for spas and other tourist locations, for urban and rural recreational and health centres, bringing lifestyle benefits to the local population. Geothermal fluid is also rich in chemicals needed in pharmaceutical production, and advanced experiments have indicated a possibility of extracting rare minerals from the fluid.

All of this provides developing countries with new openings to use geothermal energy in formulating successful economic strategies. Also, the recent financial crisis has shown that a green-energy transformation can serve as a defence against serious economic damage in turbulent times.

It is encouraging, especially for those of us who have tried for years in meetings with leaders of Congress, Governors and American energy officials to move the United States in the geothermal direction, to see how, with the new emphasis of the Obama Administration, the United States is now waking up to its great geothermal potential.

This is demonstrated, for example, by the Global Geothermal Forum which will take place in Washington next month.

Similarly, the European Union is now examining how the geothermal potential of many member states can help the EU to reach its 2020 target of CO<sub>2</sub> reduction.

Thus, as the World Geothermal Congress assembles here in Bali, we are witnessing a truly global transformation. It is therefore of the utmost importance to acknowledge that the next 5-15 years could see a fundamental breakthrough for the global geothermal community, galvanising scientists, engineers, experts, policy-makers and government leaders to move their countries forward, to a new and more sustainable clean energy future.

Never before in the history of geothermal power have we faced such a challenge: How to ensure that the next 5-15 years will indeed become such an era, an epoch or fundamental transformation.

Although in previous years we have seen significant technological progress, I firmly believe that we are still in the early stages of geothermal know-how and that together we can aim in the coming years for wide-ranging technological breakthroughs in the following fields:

- Deep drilling technology, aimed at tapping supercritical temperatures close to magma chambers, as illustrated by the international Icelandic Deep Drilling Project, going down 5-6 kilometres, examining how to harness temperatures of 400-600 degrees.
- The examination of the seafloor, of continental shelves, for submarine geothermal generation, particularly where high-temperature fluids can be found in fracture zones along mid-ocean ridges; examining whether, and if so, how, these could become a significant part of our energy future.
- Enhanced Geothermal Systems and their contribution to a new energy era.
- The development of smaller turbines, like Kaldara in Iceland has done in cooperation with the Indian Hindustan Turbo Machinery, furthering small-scale geothermal harnessing by adding one container system to another.
- Employing geothermal boreholes in basalt regions for carbon recycling and storage, as is now being tested in a collaborative venture by Reykjavik Energy and universities in the US and Europe.
- Increasing the efficiency of existing geothermal technology, advancing higher energy recovery, longer field times, well-drilling technologies, casing, data management and reservoir simulation.
- Promotion all over the world of space-heating systems to replace coal and oil and thus meet a large proportion of the energy demand in both developed and

developing countries.

- And also air-conditioning and cooling systems for use in warmer countries as Reykjavik Geothermal is developing in Abu Dhabi, potentially a game changer in the Middle East and other hot regions.

These and many other developments are fast making the geothermal sector a crucial part of the global energy future. The creation of IRENA, aimed at rallying all nations in the strife to adopt renewable energy solutions, and the establishment of the REN Alliance indicate that a new vision is now inspiring global plans for action.

The World Geothermal Congress is a significant platform for mapping out such a journey, for enhancing our cooperation and making sure that the next 5-15 years will indeed be a breakthrough era.

It is both an honour and a privilege to be with you here today, to learn from your dialogue and deliberations.

Now, when the world faces the most significant global challenge of our times, history has placed you at the forefront and thus your endeavours are of the utmost importance.