VistOrka

the backbone of a new energy era

Creating the World's First Hydrogen Economy

While the establishment of VistOrka in 1999 marks the real beginning of the hydrogen economy in Iceland, the possibility of using hydrogen as a fuel had been under investigation at the University of Iceland for over two decades. When the original idea was presented by Prof. Bragi Arnason around 1970, he argued that the use of hydrogen as a fuel in Iceland could begin around the turn of this century. In that forecast he was correct.

The current success of the Icelandic hydrogen project is largely due to the unique composition of VistOrka as a company. From an early stage, it was clear that, in order to successfully implement a project as ambitious as the creation of a hydrogen society, it would be necessary for all the key players to work closely together.

Acting under the leadership of the New Business Venture Fund, it was therefore decided to group all the project's main Icelandic participants into Icelandic New Energy Ltd, a company created specifically to implement the initial hydrogen project. The purpose of VistOrka is to act as a holding company for the Icelandic shares in that company. A watershed development, the creation of VistOrka represents a unique business set-up as energy companies, private industry, research institutions, the academia and government have been brought together in a single company with only one aim;

Creating the World's First Hydrogen Economy

Broad-based as it is, the Icelandic group alone would not have been able to execute such an ambitious plan. To enable it do so, VistOrka joined forces with three global players in the field of hydrogen fuel technology, DaimlerChrysler, Norsk Hydro and Shell Hydrogen, to form Icelandic New Energy Ltd.

The Future

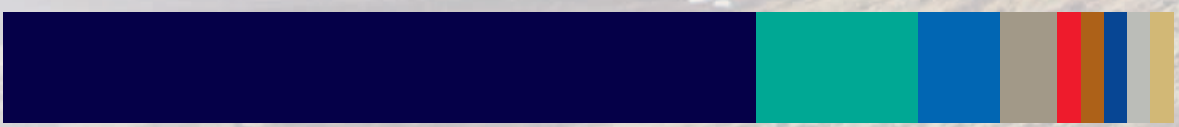
Until now, Icelandic New Energy has focused its energies on taking the first steps towards the utilisation of hydrogen as a fuel in Iceland. This initiative has been welcomed elsewhere in the world, and the company along with VistOrka have received several ideas for development projects and possibilities for wider collaboration from a variety of organisations, many of them far beyond Iceland's shores.

As a result, VistOrka has decided to expand its operations and welcome international participation in the company's activities. In the future, its strategic focus will be on the following areas:

- All aspects of the production, distribution and use of hydrogen as a future energy carrier.
- Technology and solutions that support the production, distribution and use of renewable energy. This could include software for operational management, as well as the optimisation and control of energy production.

While VistOrka plans to work on an international scale, the company intends to continue in its primary role as the backbone of the first hydrogen society to be created in the world – in Iceland.

The Owners of VistOrka



NÝSKÖPUNARSJÓÐUR
New Business Venture Fund

Reykjavik Energy

IceTec
Technological Institute of Iceland

Ministry of Industry and Commerce

Hitaveita Suðurnesja

Landsvirkjun
The National Power Company

Reykjavik Resources

Sustainable Energy

As a nation, Icelanders enjoy a rich abundance of clean, relatively inexpensive hydro-power and geothermal energy. The only western country to produce all its electricity from renewable natural resources, almost 90% of all its heating is derived from geothermal technology. Furthermore, 72% of Iceland's total gross energy usage is derived from renewable energy sources, the highest utilisation rate found anywhere in the world. This success is the result of a long-standing prioritisation of renewable energy technology, coupled to ready access to massive reserves of sustainable energy in the form of non-polluting, emission-free hydroelectric and geothermal power.

By attracting foreign investment in power-intensive industries, utilisation of these renewable energy resources has also served as one of the driving forces behind the nation's growing prosperity over the past few decades. According to the Kyoto Protocol, emissions from Iceland may increase by 10% from 1990 to the end of the Protocol's first period in 2008-2010. Due to the impact of power-intensive industry on the economies of small nations, a special provision was approved in November 2001 permitting those that utilise renewable energy resources to develop such projects. As a result, Iceland will be able to utilise its clean energy resources to an even greater extent during the coming decade.

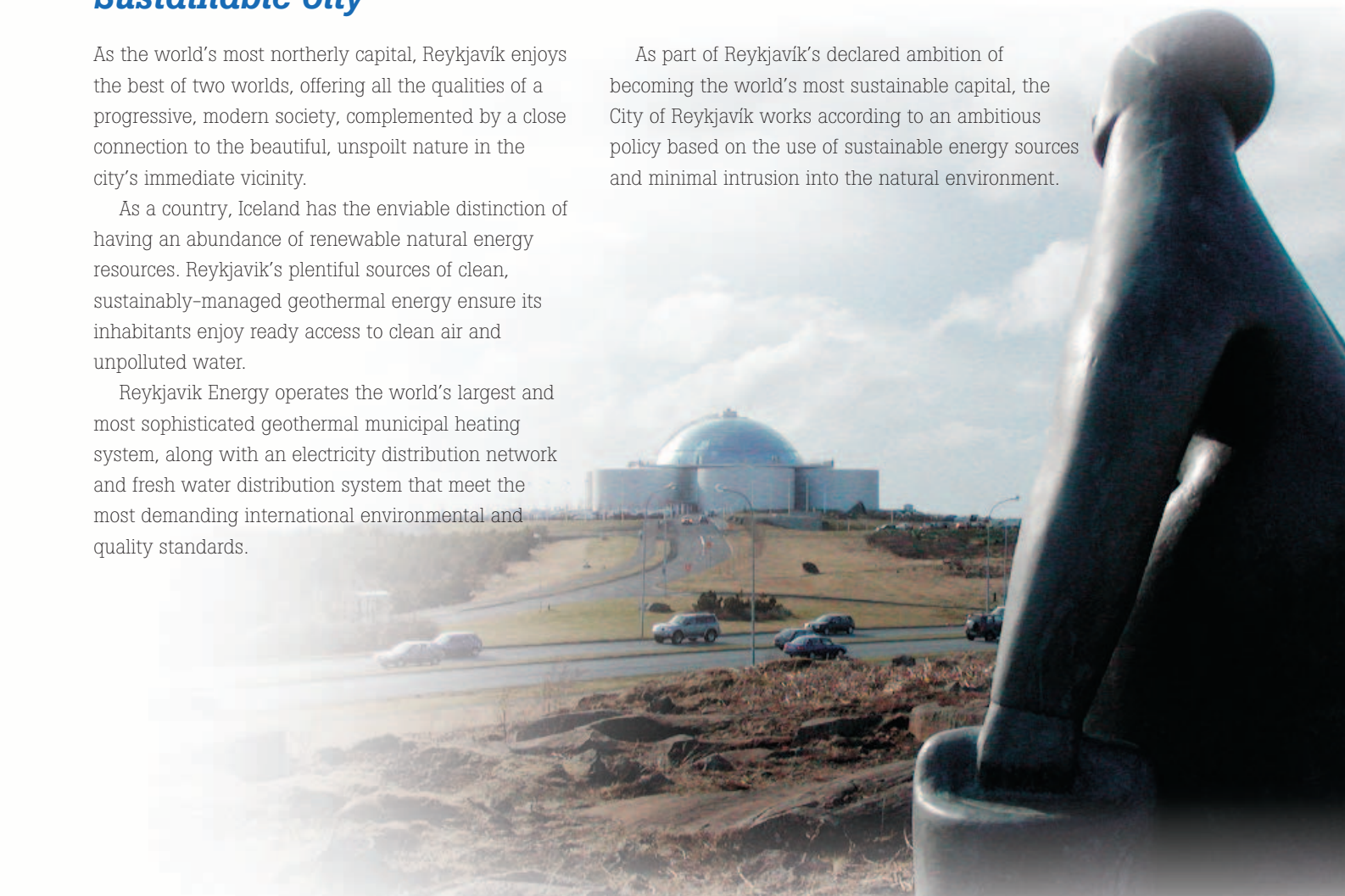
Sustainable City

As the world's most northerly capital, Reykjavík enjoys the best of two worlds, offering all the qualities of a progressive, modern society, complemented by a close connection to the beautiful, unspoilt nature in the city's immediate vicinity.

As a country, Iceland has the enviable distinction of having an abundance of renewable natural energy resources. Reykjavik's plentiful sources of clean, sustainably-managed geothermal energy ensure its inhabitants enjoy ready access to clean air and unpolluted water.

Reykjavik Energy operates the world's largest and most sophisticated geothermal municipal heating system, along with an electricity distribution network and fresh water distribution system that meet the most demanding international environmental and quality standards.

As part of Reykjavík's declared ambition of becoming the world's most sustainable capital, the City of Reykjavík works according to an ambitious policy based on the use of sustainable energy sources and minimal intrusion into the natural environment.



VistOrka Owners

The New Business Venture Fund

www.nsa.is

Since its inception, the New Business Venture Fund has sought to make an active contribution towards interesting and innovative business ideas that can be expected to result in a good return for the Fund. Its interest in VistOrka, and through it Icelandic New Energy, is a good example of the active role it plays in Iceland's economic development.

The unpredictable nature of investment in business ideas during their initial stages is a risk factor inherent in the Fund's operations. Overcoming initial obstacles and attracting the interest of other parties in such projects can be a daunting task, demanding a great deal of patience, as well as hard work.

One of the most positive aspects in the case of VistOrka is the participation of an organisation on the scale of European Union, along with major global players on a par with Shell, DaimlerChrysler and Norsk Hydro, who have all expressed their interest in Iceland's hydrogenisation and will be fully involved in turning this project into reality in the coming years.

Research and testing conducted so far indicate that hydrogen will become a cost-efficient energy option within a few years. Anticipation is strong in Iceland that, as the country's hydrogen economy develops; the dream of a fully hydrogenised domestic fishing fleet may soon become a reality.

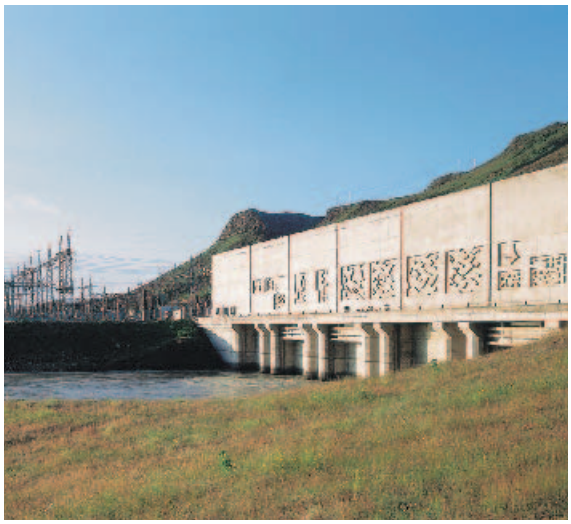
Ministry of Industry and Commerce

www.idnadarraduneyti.is

Icelanders enjoy one of the world's highest standards of living in one of the world's most advanced societies, a modern and thriving economy in which a combination of liberal rules on foreign investment, recent legislation on international trading companies, little red tape, a friendly public administration and a well-educated, flexible workforce all combine to welcome the foreign investor. The main objective of the Ministry of Industry and Commerce is to improve entrepreneurship and competitiveness in growth and jobs, based on a solid, competitive framework of conditions for companies and individuals alike.

Under its auspices, the Department of Energy and Environmental Affairs monitors and formulates policy relating to the development of new energy sources and providers. At present, one of its main projects centres on research into the development of clean fuels such as hydrogen, which can be produced with the help of Iceland's rich natural energy resources when the technology for doing so becomes both available and economical.

The Icelandic Government's priorities on hydrogen are part of a long-standing policy aimed at increasing the utilisation of renewable energy in harmony with the environment. As a result, the establishment of Icelandic New Energy enjoys full government support. The opening of the first hydrogen refuelling station in Reykjavik, which is also the world's first hydrogen station to be built at a conventional petrol station, is a major step in bringing hydrogen closer to the public and in full concordance with Icelandic Government policy of creating a hydrogen society.



Landsvirkjun – The National Power Company

www.landsvirkjun.com

The largest electricity producer in Iceland, the National Power Company is owned by the Icelandic State (50%) and two of the country's largest municipalities, Reykjavík (45%) and Akureyri (5%). Its electricity generation is totally based on hydro and geothermal energy, and the company sells its production wholesale to local utilities and directly to power-intensive industries. At the same time, it also owns and operates the national grid, and offers a range of consulting services.

The National Power Company's mission is to provide its customers with the best energy solutions to create the basis for a modern quality of life.

Iceland has now reached the stage where over 70% of its primary energy consumption is met by domestically produced, renewable energy sources, with the remainder coming from imported fossil fuels used to drive motor vehicles and the fishing fleet. The country's abundant untapped hydro and geothermal energy reserves could be utilised in future to produce hydrogen as a fuel for its transport system. The National Power Company sees this as an important opportunity for future development, and for that reason is an enthusiastic participant in the Icelandic hydrogen project.

Reykjavík Energy

www.or.is

Reykjavík Energy operates the world's largest domestic heating system, using clean natural geothermal energy. The company provides hot water to the homes of more than half of Iceland's population, and also generates electricity using turbines powered by natural steam.

Iceland already derives most of its primary energy consumption from sustainable energy resources. Reykjavik Energy is also involved in exporting know-how to nations with similar resources but a less developed energy infrastructure. Utilising geothermal heat does not necessarily demand high temperature fields, and the potential for further development often goes unnoticed. The concept of combining heat and electricity to produce and manage hydrogen as a fuel may also have important implications in the future.

Iceland is at the forefront of research in this field, and Reykjavik Energy is proud to be a part of this effort, by contributing towards developing an energy source of the future, and continuing our search for new and environmentally safe means of providing future generations with clean energy.

Hitaveita Suðurnesja

www.hs.is

Hitaveita Suðurnesja hf operates an innovative sustainable resource park on the Reykjanes peninsula, just southwest of Iceland's capital. The core of the resource park is the Svartsengi co-generation geothermal power plant, the first of its kind in the world to generate both electrical power and potable district heating water.

The resource park consists of a number of different but related components. These include the harnessing of ground water and high temperature geothermal fields, electricity generation, production of degassed potable district heating water, and processing of geothermal fluids for the Blue Lagoon, which serves as a health spa, biotech company and producer of cosmetic and skin care products.

Over the years, Hitaveita Suðurnesja has developed a series of ingenious tools and working procedures designed to harness high-temperature geothermal fields for industrial applications. Among its activities, the company is an active participant in an international deep drilling project. Based in Iceland and involving more than 160 senior scientists from all over the world, one of its main goals is to harness supercritical geothermal fluid (400–600 °C) in a sustainable and economical way for, among other things, the production of power and hydrogen.

The long-term goal of Hitaveita Suðurnesja is to harness in a holistic, economical way ground fluid resources and sub- and supercritical geothermal resources embedded in the boundaries of the tectonic plates which pass through Iceland. This prime geothermal high-temperature energy could then be converted to hydrogen and other environmentally benign forms of energy for the transport sectors.

IceTec – Technological Institute of Iceland

www.iti.is.

IceTec's role in environmental issues is becoming an increasingly important part of the company's operations. By participating in the hydrogen fuel cell bus research and demonstration project "ECTOS", it has become an active partner in developing and introducing tomorrow's fuel today. These environmental issues are fully compatible with Ice Tec's other activities in the fields of biotechnology, food science, materials technology and chemicals, in which environment is an important factor in all present-day solutions.

Innovation in the field of clean fuel is of great importance in today's world. Hydrogen fuel is an attractive option, contributing to a cleaner environment, healthier society and a sustainable fuel economy.

Through its cooperation with Icelandic New Energy, a good example of cooperative entrepreneurship working to create a better future, IceTec is playing a key role in introducing hydrogen as a replacement for fossil fuels.

New ideas take time to enter mainstream thinking. Hydrogen fuel is an idea whose time has come, and this introduction to a clean, renewable fuel source is part of IceTec's efforts to awaken the world to a new future – a future much more in harmony with nature.

University of Iceland

www.hi.is

As the main objectives of the University of Iceland are to conduct research and provide education. It is constantly engaged in re-evaluating the future in order to prepare its students for the technologically altered society that awaits them.

Through its pioneering work on hydrogen as a fuel and participation in the first steps towards establishing a hydrogen society of the future, the University of Iceland is challenging the dominance of rapidly depleting fossil fuel resources. At the same time, it provides research opportunities and education designed to support Iceland's vision of creating a sustainable society providing for its own fuel needs, so giving young researchers the opportunity to becoming leaders in the field of energy technology.

Hydrogen is the cleanest form of energy carrier available today. Produced in Iceland and elsewhere in the future using a CO_2-free energy chain, it will fulfil the twin criteria of environmental and natural sustainability.

The goal of the University of Iceland is to be a leader in future research work on renewable energy and its utilisation, creating a cleaner and better society for future generations.

The Fertilizer Plant

www.aburdur.is

Established in 1952, The Fertilizer Plant was Iceland's first large-scale industrial development. Formed to import and sell ready-made fertilizer and other agricultural products. It was nationalised in 1969 but re-privatised in 1994. Through its operation, hydrogen electrolyser technology has become a familiar process in Iceland.

Reykjavik Resources

reykjavikresources.com

An inward investment agency representing Iceland's capital, Reykjavik Resources is jointly owned by the City of Reykjavik, Reykjavik Energy and the Reykjavik Harbour Trust.

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