



Reykjavik Geothermal District Heating

A most sophisticated system

The origins of the Reykjavik district heating system date back some 80 years, to the 1930's, when visionaries realized the potential of the resource below their feet for space heating in Reykjavik. The idea took time to sink in and gave rise to some debate, thus starting off slowly, house by house, street by street. Today, the Reykjavik geothermal district heating is one of the most sophisticated in the world, using both high and low enthalpy geothermal resources, with an installed capacity of about 1 GW. According to the Icelandic National Energy Agency, geothermal district heating in Iceland has resulted in savings to the society of up to 7% of GDP per year, equivalent to 3.000 \$ per capita annually.

Since the 1960's Verkis has continually been involved in the engineering of the Reykjavik district heating system and its associated cogeneration power plants. As a result, Verkis has acquired tremendous know-how on how to develop economical yet sophisticated systems.

The Westman Islands

Where energy is scarce - an intriguing example of the flexibility of district heating

In January 1973, a volcano erupted out of a farmer's field in the Westman Islands. Despite the presence of volcanic activity, the Island did not have any specific geothermal resources available for direct use but once the eruption had settled, the warm lava was used as a heat source for a new district heating system for the island. This undertaking benefited from the knowledge and experience accumulated during the development of the Reykjavik geothermal district heating system on mainland Iceland. It was not until 20 years later, when the heat stored in the lava was exhausted that the utility needed to seek other sources of energy. These have included waste energy from the fish industry combined with energy from waste incineration and an electrical boiler, while current prospects focus on heat pumps. The Westman Islands' district heating system is thus a perfect example of how flexible such systems can be in the long term, a showcase in the spirit of the geothermal resource park initiated by Mr. Albert Albertsson at Svartsengi.

Verkis is proud to have been the main consulting partner of HS Veitur, the district heating operator, from the onset and to have contributed to finding technical solutions that made the most of the energy sources at hand.

Geothermal District Heating in China

An impressive rise

Geothermal district heating is high on the government's agenda in the People's Republic of China as it can contribute to reducing pollution in urban areas. Sinopec Green Energy Geothermal Development, a joint venture between Sinopec Star Petroleum and Arctic Green Energy Corporation from Iceland, began to develop the geothermal district heating systems in China over a decade ago. At present the heated area serviced amounts to over 33 million square meters and benefits 1 million people. It is estimated that by exploiting geothermal energy, the system operator has reduced greenhouse gases emissions by 4,5 million tons of carbon dioxide since the beginning of its operation.

Verkis has been involved in this project from the beginning, conducting feasibility studies, developing the conceptual design and sharing the firm's experience and knowledge on the subject.



Sveinn I. Olafsson

CEO

Since the establishment of Verkis, a large and constant part of the consultancy services provided have been devoted to geothermal utilization, its benefits and how it can contribute to the shift from fossil fuels strategies in the energy sector. Iceland is well-known for its exemplary utilization of geothermal resources, with over 90% of Icelandic households heated via utilization of geothermal resources as well as providing for 30% of the country's electricity consumption.

Verkis involvement in the geothermal sector dates back to 1960. Not a single year has since passed without Verkis being involved in a major geothermal development project, a unique position that has allowed the company to assess unprecedented knowledge and experience in the field of geothermal utilization. As a result, Verkis has become one of the world's major consulting engineering companies in the field of geothermal utilization.

Verkis has recently committed to upholding three of the UN's Sustainable Development Goals: Goal 5 on Gender Equality, Goal 7 on Affordable and Clean Energy for all and Goal 11 on Sustainable Cities and Communities. The cases presented here provide a mere glimpse into the various projects Verkis has been involved in, we consider them to provide insight into few of the many benefit that a successfully developed geothermal utilization project can provide operators, the environment and society with.

Sveinn Olafsson



Verkís is an Icelandic engineering consulting firm with over 350 staff. Decades of experience benefit our clients as we provide high quality, innovative, technically advanced and comprehensive services in all fields of engineering and related disciplines. Verkís always seeks to provide the best and most economical solutions, thus building long term relationships.

In your pursuit of a typical investment project, Verkís will assist you from the very beginning, taking you all the way from the conceptual design, environmental assessment and feasibility studies through detail engineering and design to commissioning and project closeout. We have experience of a wide variety of projects, such as geothermal and hydro power plants, infrastructure, commercial buildings and industrial facilities.



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