ARCTIC INVESTMENT 2025

Superhot and other exciting opportunities in Iceland

Dr. Bjarni Pálsson
Executive Vice President Wind & Geothermal
President International Geothermal Association

Landsvirkjun

Iceland – Local and Global Leader in Geothermal

...and we are working very hard to help others becoming bigger:



Visiting Minister of energy and the leader of the geothermal community of **Kenya**, October 2025

Kenya currently generates 48% of it's power with geothermal



The Vision of Iceland‘s Geothermal

- Power, 28%
- Heat, 90%
- „Other“ (greenhouses, swimming pools, “blue lagoons”, biotech, minerals etc.)
- Added sociological benefits - Improves quality of lives
- The greatest public acceptance of energy resources in Iceland
- Part of Iceland’s foreign policy
- **Please, in my backyard!**



BBC

Soaking in Iceland’s social scene

12 December 2011

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Catherine Bodry

Features correspondent

Icelandâ€™s Blue Lagoon is a manmade pool heated by the neighbouring geothermal electricity plant. (Martin Moos/LPI)

Landsvirkjun at a glance

We are the national energy company of Iceland. We generate energy exclusively from renewable sources: hydropower, geothermal power and wind power. We generate over 70% of Iceland's electricity.

We operate 19 power stations, fifteen hydropower stations, three geothermal stations and two windmills.

Around 85% of the energy generated by Landsvirkjun are sold to large power industry users and 15% on wholesale markets.



Landsvirkjun -
the National Power Company of Iceland

- 2024 Key Financial Figures
  - Assets USD $3.5 bn
  - Revenues USD $561mm
  - EBITDA $410m
  - Credit rating A- (S&P)

- Serving local communities and international power intensive customers since 1965

VERNE GLOBAL RioTinto atnorth Elkem ALCOA ...and many more





Ljosafossstod 1937

Hydro
16 MW
105 GWh/year



Laxarstod I 1939

Hydro
5 MW
3 GWh/year



Laxarstod II 1953

Hydro
9 MW
78 GWh/year



Irafossstod 1953

Hydro
48 MW
236 GWh/year



Steingrimsstod 1959

Hydro
27 MW
122 GWh/year



Gufustodin 1969

Geothermal
5 MW
42 GWh/year



Burfellsstod 1972

Hydro
270 MW
2.300 GWh/year



Laxarstod III 1973

Hydro
13,5 MW
92 GWh/year



Kroflustod 1977

Geothermal
60 MW
500 GWh/year



Sigoldustod 1978

Hydro
150 MW
920 GWh/year



Hrauneyjafossst. 1981

Hydro
210 MW
1.300 GWh/year



Blondustod 1991

Hydro
150 MW
990 GWh/year



Sultartangastod 1999

Hydro
125 MW
1.020 GWh/year



Vatnsfellsstod 2001

Hydro
90 MW
490 GWh/year



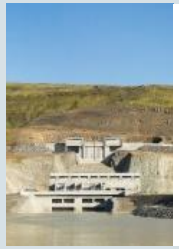
Fljotsdalsstod 2007

Hydro
690 MW
5.000 GWh/year



Hafid 2013

Wind
1,9 MW
6,7 GWh/year



Buðarhalsstod 2014

Hydro
95 MW
585 GWh/year



Theistareykjastod 2017

Geothermal
90 MW
738 GWh/year



Burfellsstod II 2018

Hydro
100 MW
700 GWh/year

Landsvirkjun Power stations

15 Hydropower stations
3 Geothermal stations
1 Windmill farm (2 windmills)


Vadolduver wind farm
120 MW, 430 GWh


Hvammsvirkjun
95 MW, 720 GWh


Expansion of Sigalda
65 MW, 10 GWh


Expansion of Theistareykir geothermal
70 MW, 590 GWh

Landsvirkjun has participated in over 40 projects internationally in 15 countries over the last 17 years

- Our list of customer and partner companies includes Nukissiorfiit, NunaGreen, NL Hydro/Nalcor, SN Power, Snowy Hydro and Queensland Hydro

- We have worked in both developed and developing markets

- New policy on international operations approved in 2024 with **primary focus on arctic region**



Magma Energy - Pushing the limits of Geothermal

Background:

- Geothermal fluid > 200°C is considered high enthalpy
- Geothermal fluid >400°C is considered superhot

Few known cases of unusually hot geothermal wells:

- Nesjavellir, Iceland (1985): >380°C (abandoned)
- IDDP-2, Reykjanes, Iceland (2017): 427°C (measured)
- Venelle-2, Lardarello, Italy (2017): >500°C (measured)

IDDP-1 in Krafla, Iceland (2009)

- Hit 950°C magma at only 2100 m depth
- Estimated downhole temperature 550°C
- Produced 450°C fluid for 2 years
- Up to 10x average power of wells in Krafla

BBC

'It's our moonshot': Why scientists are drilling into volcanos

17 October 2024

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Adrienne Murray

Reporter, Northeast Iceland



Iceland is one of the world's most volcanically active places

Krafla Magma Testbed –
Volcanologists and geothermal experts join forces

A volcanological journey:

- Transform volcanic monitoring, improving early warning systems for nearly one billion people living < 100 km from an active volcano
- Driving breakthroughs in geoscience, risk reduction, and extreme-environment technologies

The energy mission:

- Scalable near-magma and superhot geothermal energy for a clean-energy future.



Why Magma Energy? – The big picture

- **Just 1% of superhot rock** could generate 63 TW**—~8× current global electricity demand** (Clean Air Task Force, 2024)
- **High Output:** Produces 5–10× more energy per well than conventional geothermal (IDDP-1, 2009)
- **Globally Accessible:** Supercritical resources exist worldwide at 5–8 km depth, with potential over 550 TW (IEA, 2021)
- **Future Contribution:** Could supply up to 15% of electricity demand growth by 2050, with 800 GW capacity (IEA, 2024)



Opportunities for investors?

The technology

- Well construction (casing, cementing, measurements, tools, materials and methods)
- Energy conversion

Proof of concept – the testbed

- Drill 2-3 wells, test equipment, materials, methods
- Test new technology

Development and commercialisation

- Expand the concept for various geological and geographical scenarios
- Permits and cooperations globally
- Economy of scale and repetition

Current partners:

- Government of Iceland
- Icelandic power companies and industry
- Research institutions in Iceland and globally
- Oil & gas / geothermal service companies
- Equipment and material providers
- International research funds
- International governments?
- Philanthropy funds?
- Other?


A disruptive technology for a cost efficient reliable, renewable baseload power
- Who wants to join?
Thank you!
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