New and Green Energy Opportunities

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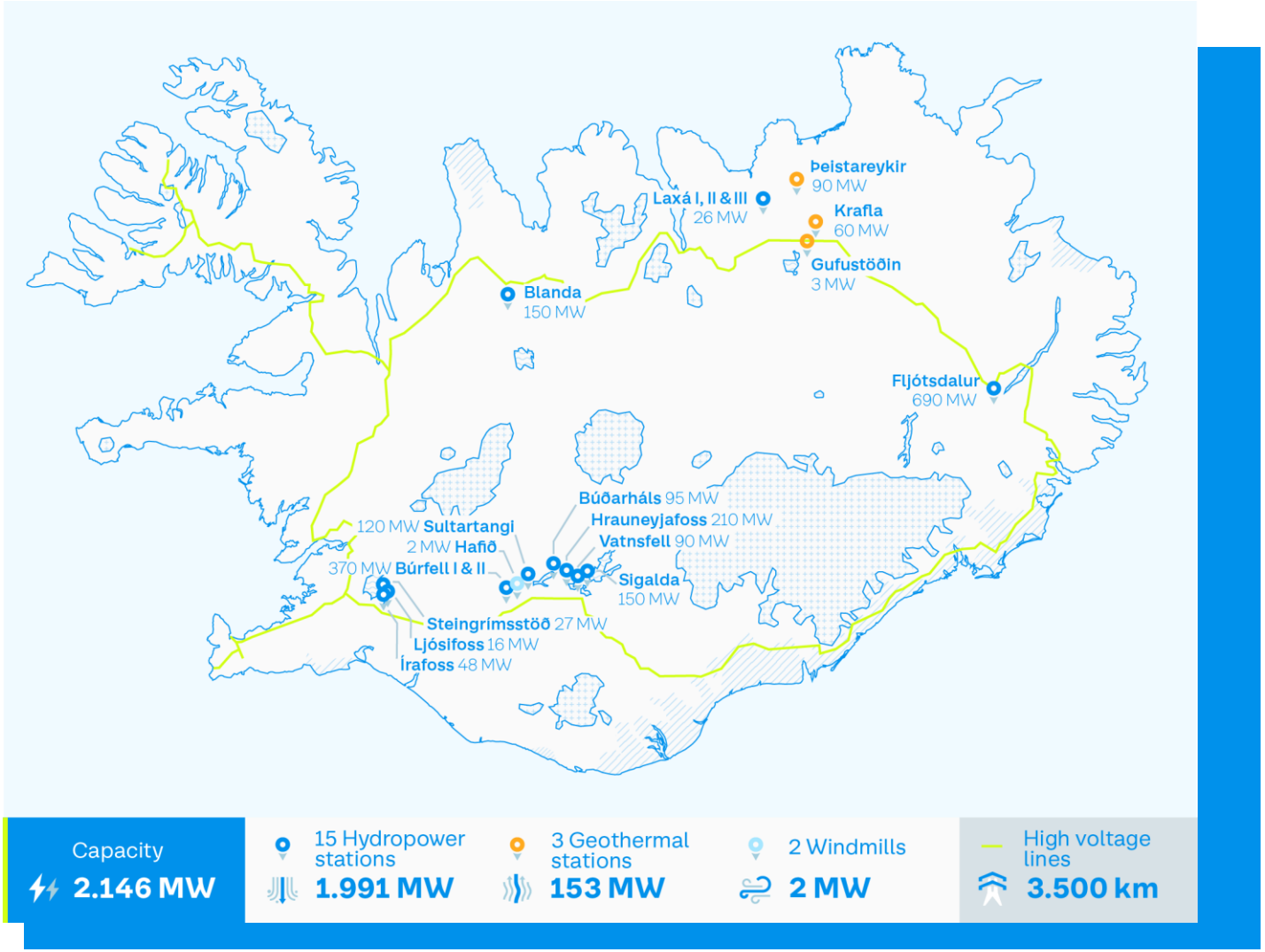
Landsvirkjun -
the National Power Company of Iceland

- Helping industrialize Iceland since 1965
- Largest power company in Iceland
- 100% state-owned - 100% green
- 2021 Key Figures
  - Assets USD $4.4 bn.
  - Operating Revenues USD $558 m.
- Power generation 15TWh p.a.
- Few power intensive customers:

REYKJAVÍK DC · VERNE GLOBAL · RioTinto · atnorth · Elkem · ALCOA ...and many more

Landsvirkjun’s power system

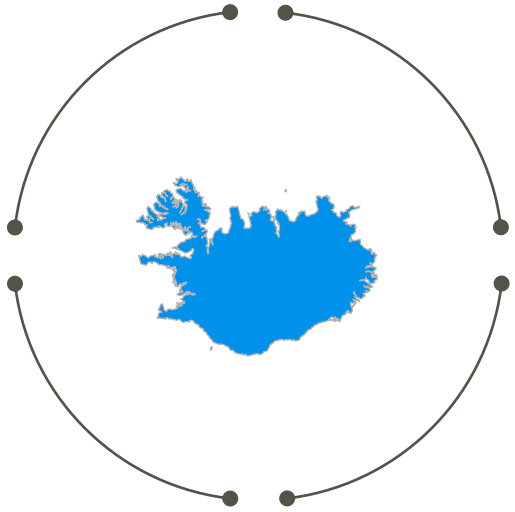


Four trends are fundamentally shaping Landsvirkjun‘s business environment

Opportunities

Global decarbonzation efforts are structurally increasing demand for renewable energy

High growth in new energy intensive industries offers new opportunities



Challenges

Temporary adversity is difficult for traditional energy intensive industries

Wind and solar energy narrows the competitive edge of hydro and geothermal energy

4 New Green Opportunities

	Importance	What's new
Hydrogen and electric fuel	Key to stop using fossil fuels	Plans for lowering costs, implementation plan, international investment
Data centres	Basis for automation and information technology	9% annual growth in USA and EU due to social changes
Batteries	Basis for electrification of transport and energy change	Over 30 million electric cars annually by 2030
Food innovation	Key to lowering carbon footprint, sustainability and food safety	Micro-algae, vertical farming, green manures, and innovation flourishes

Opportunities:
Hydrogen and e-fuel

Fossil fuel usage is expensive in Iceland

680

thousand tonnes fossil fuel

1.7

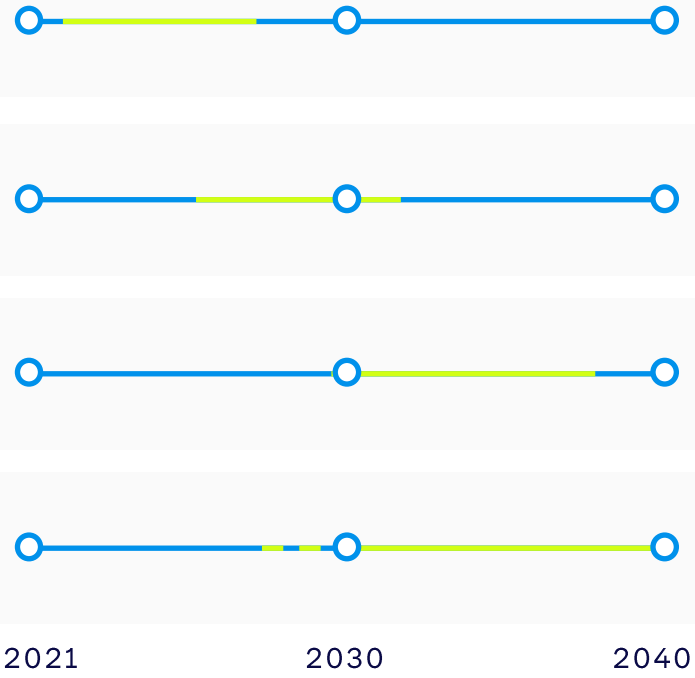
million tonnes CO_2

400

billion USD

The energy transition will occur in stages

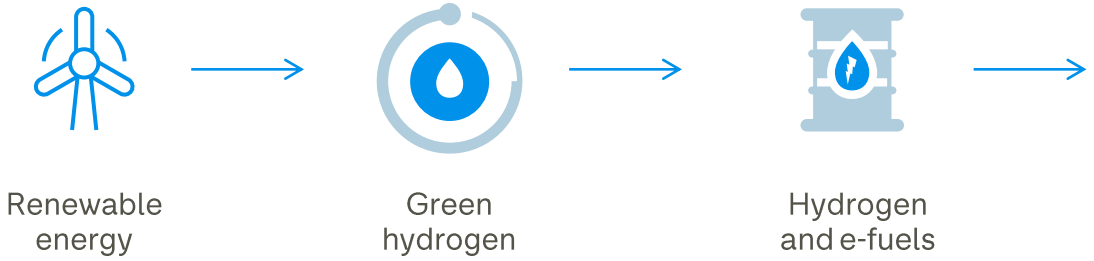
	Premise	When will energy change be economical?
Road transport	Heavy-duty vehicles i.e. lorries, buses, etc. powered by hydrogen or hydrogen products	
Fisheries	Fishery vessels powered by hydrogen or green ammonia	
Shipping	Container ports in Iceland to offer green ammonia	
Aviation	50% of jet fuel to be produced domestically	



Iceland can be among leaders in the global energy transition

- Landsvirkjun has set out to lead with others the **domestic energy transition** in Iceland
- **Hydrogen** „lighthouse projects“
- **International** collaboration and consulting
- e-fuel **export opportunities**

Green hydrogen will be used in different applications in different forms



Feedstock

Chemical industry

Steel

Fertilizer

Supporting renewable energy build up

Energy storage

Energy transportation

Energy balance and house heating

Mobility

Land freight

Shipping

Aviation

No “winning molecule” for e-fuels yet

- Different e-fuels are suitable for different sectors. Some examples:
  - Green hydrogen for heavy-duty vehicles, trains and boats.
  - Ammonia for shipping.
  - Methanol for shipping.
  - Methane for space heating.
  - e-kerosene for aviation.
- Green hydrogen and its derivatives can theoretically cover most energy demand.

Opportunities:
Food Production & Innovation

Global agriculture and food production is **unsustainable**

- **37%** of arable land used for food production
- **25-30%** of global emissions derive from food production
- **70%** of potable water used for food production
- **1/3** of produced food is wasted
- Global population is growing

Demand for sustainability is revolutionizing the system

- Lowering environmental cost and decrease production waste
- Renewable resources
- Technical revolution
- Demand for tracability and healthy value chains
- Increased emphasis on food safety

Iceland offers prime conditions for sustainable food production

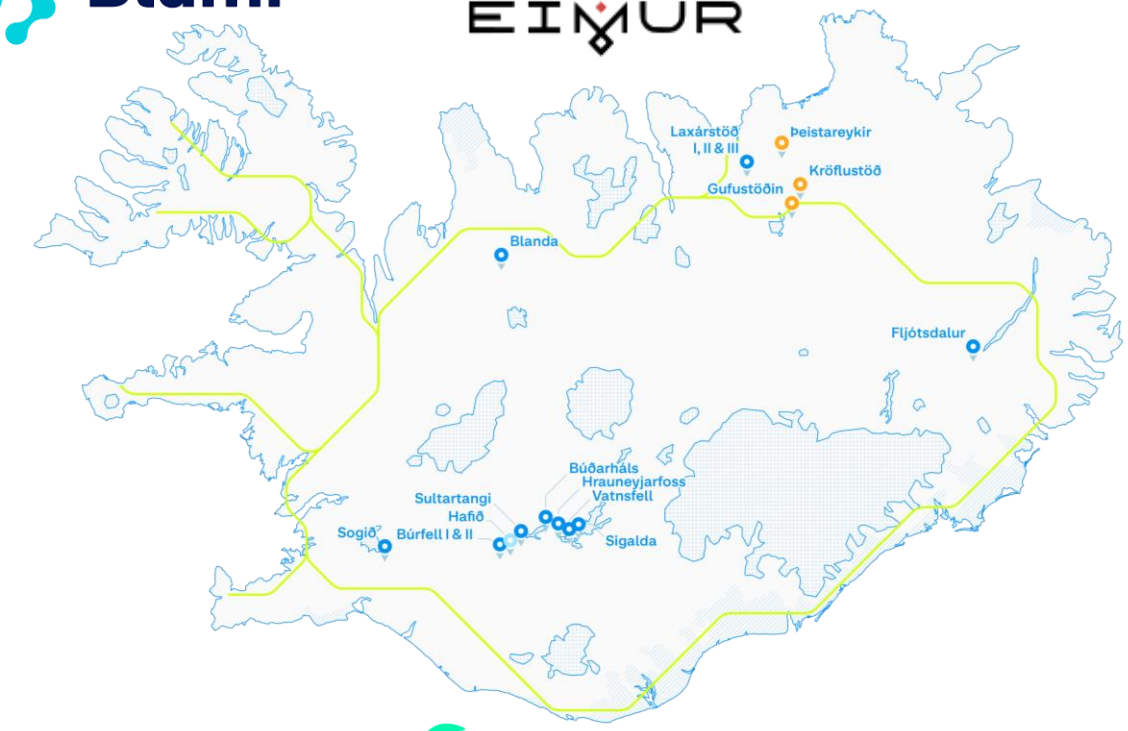
Food innovation is blooming all over the world

- High tech greenhouses
- Algae production
- Vertical farming
- Bio technology
- Alternative proteins
- New production methods

What are we doing in Icelands?
Supporting innovators and start-ups

Blámi

EIMUR



Orkídea

Thank you!