

Environment

PROTECTING THE NATURAL ENVIRONMENT AS A KEY ASSET FOR ICELAND'S ECONOMIC GROWTH

- ▶ Iceland enjoys a well-preserved environment, with excellent water quality, low air pollution, a low-carbon energy mix and unique natural landscapes with glaciers, volcanoes and hot underground springs.
- ▶ Iceland is endowed with abundant hydro and geothermal energy resources. It has the highest share of renewables in primary energy supply in the OECD.
- ▶ Power generation has massively expanded to meet the needs of aluminium smelters and other energy-intensive industry, leading to environmental pressures and an economy four times more energy-intensive than the OECD average.
- ▶ Iceland now hosts three times its population in tourists every year, which brings economic benefits, but can result in environmental strains.
- ▶ The country is now facing a trade-off between the development of its energy capacity, the development of tourism and the preservation of its fragile environment.

What's the issue?

The rapid development of tourism and energy intensive industry is exerting increasing pressures on the environmental assets upon which much of Iceland's growth has been founded.

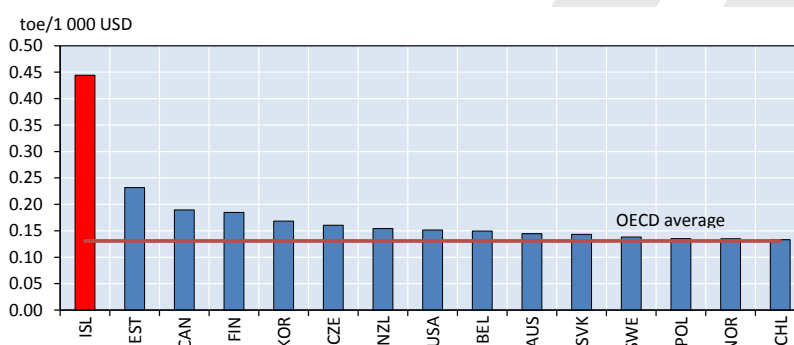
The country's electricity output has more than doubled since 2000 to nearly five times the amount needed by its population of 320,000, mainly to fuel three foreign-owned aluminium smelters. Energy-intensive industries benefit from low energy prices through long-term contracts.

The aluminium industry consumes 73% of Iceland's electricity and is the largest single source of greenhouse gas (GHG) emissions.

Iceland has the highest share of renewable energy in the OECD: all electricity and 95% of heat are generated from hydro and geothermal power. While these energy sources are generally considered clean and emit virtually no GHGs, they have potentially significant environmental impact.

Iceland is the most energy-intensive country in the OECD

Total primary energy supply per unit of GDP, top 15 OECD countries, 2013



Note: GDP at 2005 constant prices and purchasing power parities.
 Source: OECD (2014), Energy Balances of OECD Countries, OECD Publishing.

For example, flooding from hydropower reservoirs can lead to irreversible biodiversity, landscape and cultural loss. Geothermal power plants discharge wastewater containing chemicals and nutrients, and they emit hydrogen sulphide (H₂S), a foul-smelling gas with unknown long-term impacts on health and ecosystems.

Many areas with potential for hydropower or geothermal development are yet to be exploited. However, these areas are often sites of exceptional beauty and unique biodiversity, and are often major tourist attractions. Pipes, transmission lines, roads and other infrastructure affect a much wider area. To address some land-use conflicts and trade-offs, a Master Plan for hydro and geothermal energy resources was adopted in 2013, after more than a decade of debate and analysis. It classifies suitable areas for development, providing a valuable consensus model. The plan applies key elements of strategic environmental assessment, such as wide public consultation, scientific analysis and debate. Nevertheless, groundwater contamination from geothermal wastewater, the downstream impact of hydropower projects, the cumulative effects and the impact of power lines were insufficiently taken into account, in some instances due to methodological constraints and lack of data. The plan is to be reviewed and re-voted by Parliament in 2017.

Meanwhile, Iceland's tourism sector has grown rapidly over the past decades. The number of tourists has more than doubled since 2000, to around 1,000,000 visitors a year. This success is largely due to the country's environmental assets. According to an Icelandic Tourist Board survey, 80% of visitors decided to come because of Icelandic nature: for hiking, trekking, bird, whale, and seal watching, for the Northern lights and "white nights". But the arrival of growing numbers of tourists during the short summer season, mostly around Reykjavik, is putting a strain on fragile ecosystems and on infrastructure. In some areas, environmental damage has reached such a level that public access to hikers is banned or severely restricted, as half of the country has suffered from acute soil erosion. Visitors require additional accommodation, transport and environmental infrastructure, such as that for waste and wastewater treatment, which is designed for a much smaller population.

Iceland has taken some initiatives to protect vulnerable sites and improve the environmental records of tourist operators, such as the Tourist Site Protection Fund or the Vakinn certification system. But as visitor numbers have increased to 1 million per year, which had previously only been projected to occur by 2020, more is needed to ensure that this activity remains sustainable.

Why is this important for Iceland?

Better protecting Iceland's natural environment is crucial not only for its own sake, but also to ensure the sustainability of the tourism and renewable energy sectors, which are key drivers of the country's economic growth and prosperity. Tourism contributes around 6% of Iceland's GDP and while total employment fell by 6.3% during 2008 and 2011 as a result of the financial crisis, employment in the tourism sector increased by 13%. Abundant and cheap renewable

What should policy makers do?

- ▶ Reinforce scientific and economic analysis in the next phase of the Master Plan for hydro and geothermal energy resources, with cost-benefit analysis of all dimensions of power development: environment, tourism, social and regional development, and profitability.
- ▶ Reassess electricity prices to factor in the long-term costs of power generation infrastructure, including environmental and social costs.
- ▶ Consider consolidating the current initiatives for land protection and environmental certification into a simplified, better-coordinated, framework for sustainable tourism.
- ▶ Design appropriate funding mechanism for the development and maintenance of the infrastructure needed to allow access to tourist sites while protecting the surrounding environment.

energy has attracted foreign investment and strengthened the country's global position in advanced renewables technology.



Further reading

OECD (2015), "Iceland", in: *Environmental Indicators – Country Profiles*, OECD Publishing. www.oecd.org/site/envind/iceland.htm

OECD (2014), *Environmental Performance Reviews: Iceland*, OECD Publishing. www.oecd.org/environment/country-reviews/

OECD (2014), *Highlights: Environmental Performance Review of Iceland*, OECD Publishing. http://issuu.com/oecd.publishing/docs/iceland_highlights_web6

OECD (2014), *Green Growth Indicators*, OECD Publishing. <http://dx.doi.org/10.1787/9789264202030-en>