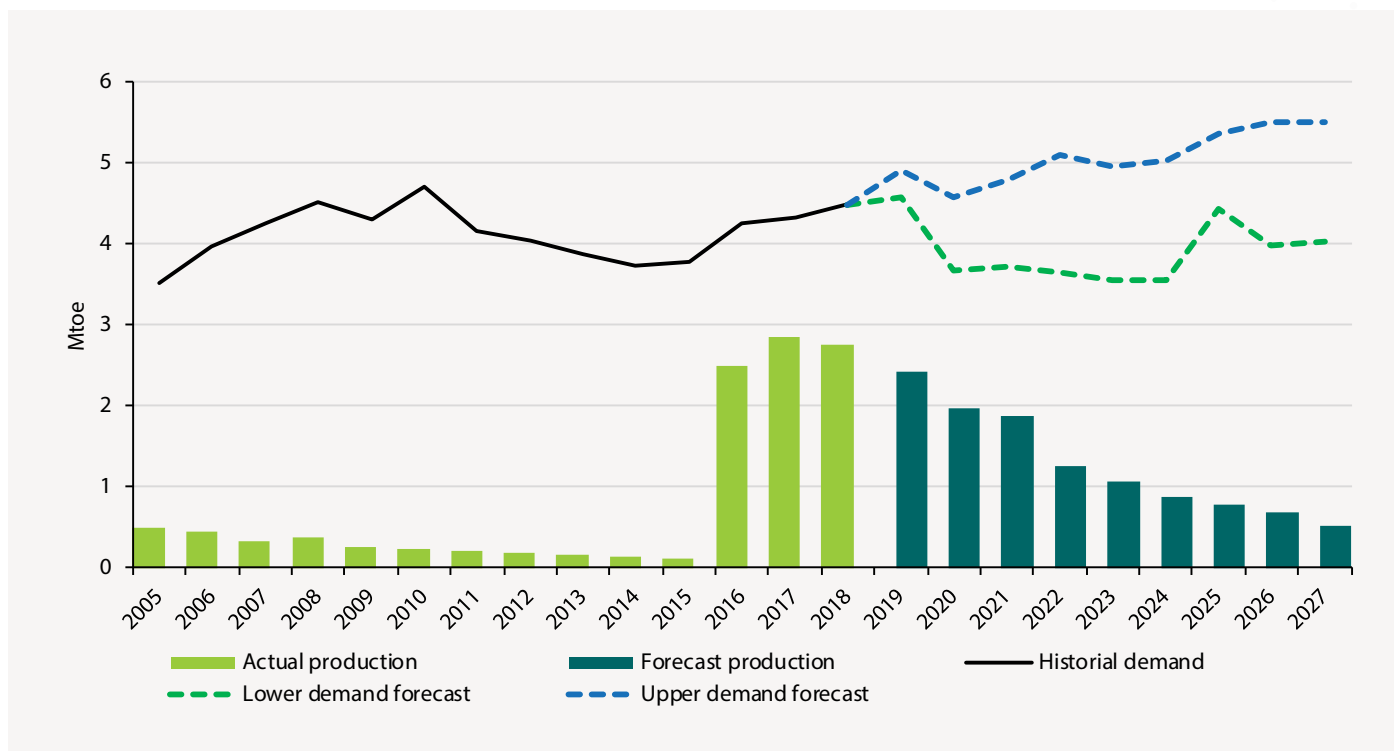


# CHALLENGES AND SOLUTIONS IN IRISH ENERGY SECURITY

**Energy security means having affordable and reliable access to various forms of energy. Countries which can satisfy all their energy demands with national resources are considered to have greater energy security, while countries which must import a large amount of their energy have less energy security.**

We use a significant amount of fossil fuels in Ireland, most of which we import from abroad. The combustion of these fuels generates carbon dioxide (CO<sub>2</sub>) and other greenhouse gases which contribute to global climate change. The Government of Ireland has stated they aim to reduce Ireland's emissions of greenhouse gases by 51% from 2018 figures by 2030. Nevertheless, energy security must be assured to avoid societal and economic disruption during the transition to cleaner energy sources.

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Historical and projected indigenous natural gas production 2005-2027. SEAI, 2020.

## Fuel usage in Ireland

Fossil fuels account for a significant percentage of the heat (94.8%), transport (95.7%) and electricity generation (63.6%) in Ireland (SEAI, 2023). This fossil fuel consumption consists predominantly of oil and natural gas but also includes coal and peat. In 2022 Ireland imported 74% of its natural gas supply alongside 100% of its oil supply. This high reliance on energy imports, particularly for natural gas, reduces Ireland's energy security. Natural gas arrives in Ireland via two subsea pipelines from the UK, which itself is also a net importer of natural gas.

Natural gas creates less pollution than oil and coal, which are being phased out of electricity generation by both Irish and international legislators. In 2022, Ireland's electricity grid operator Eirgrid announced plans to construct nine additional gas-fired power stations, indicating continued national reliance on natural gas as the foundation of electricity generation. From the 1970s Ireland sourced enough natural gas from the Kinsale Head gas field off the coast of Cork to meet 100% of demand, until imports from the UK began in 1995. The Corrib gas field offshore Mayo began producing gas in 2016 and supplied up to 75% of Irish natural gas demand at peak production, but the reserves of this gas field are now in decline.

Renewable energy generation has been growing in Ireland with the development of several onshore wind farm projects to generate electricity. In 2021, renewable energy made up 4.3%, 5.2% and 36.4% of the input into transport, heat, and electricity generation respectively.

Wind energy represents the vast majority of renewable energy generated in Ireland and is most productive during the winter and spring months. Wind energy only contributes to Ireland's electricity generation and does not impact heat or transport meaningfully. Fossil fuel use increases during the summer and autumn months as low wind energy generation fails to meet energy demands.

## Energy Security in Ireland

The increasing adoption of renewable energy sources of a variable nature, such as wind and solar creates a requirement for reliable and rapidly deployable back-up energy sources. At present natural gas provides this back-up supply with some additional input from oil and coal. Until a suitable alternative is developed, we will continue to rely on these fossil fuels for stable energy supply. Lack of supply diversification and over-reliance on single import routes for a large portion of our energy reduces our energy security. To enhance energy security, Ireland must pursue a multifaceted approach:

### DIVERSIFYING ENERGY SOURCES

Expanding renewable energy infrastructure, including offshore wind farms, solar power, wave energy, and geothermal energy, can mitigate dependence on fossil fuels.

### ENHANCING STORAGE CAPACITY

Investing in grid-scale electricity storage, such as large chemical batteries or hydrogen conversion facilities, will facilitate the integration of renewable energy into the grid.

### STRENGTHENING INFRASTRUCTURE

Projects like the Celtic Interconnector and proposed Liquefied Natural Gas (LNG) import facilities can bolster energy import capabilities, reducing vulnerabilities associated with single supply routes.

### GEOSCIENTIST INVOLVEMENT

Geoscientists play a crucial role in exploring geothermal resources, characterising subsurface storage sites, and conducting site assessments for energy infrastructure projects.

Several of these projects will require active participation from geoscientists, to explore for geothermal resources, characterise and engineer subsurface storage sites, and carry out detailed site characterisation for interconnector routing.