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CLIMATE CHANGE & *RENEWABLE ENERGY*

What is climate change & what are the causes?

Climate is the average weather in a place over many years. Climate change is a shift in those average conditions. The Earth is now in a period of rapid climate change, with global temperatures rising. There have always been natural variations in the climate, but global temperatures are rising now, because of human activities.

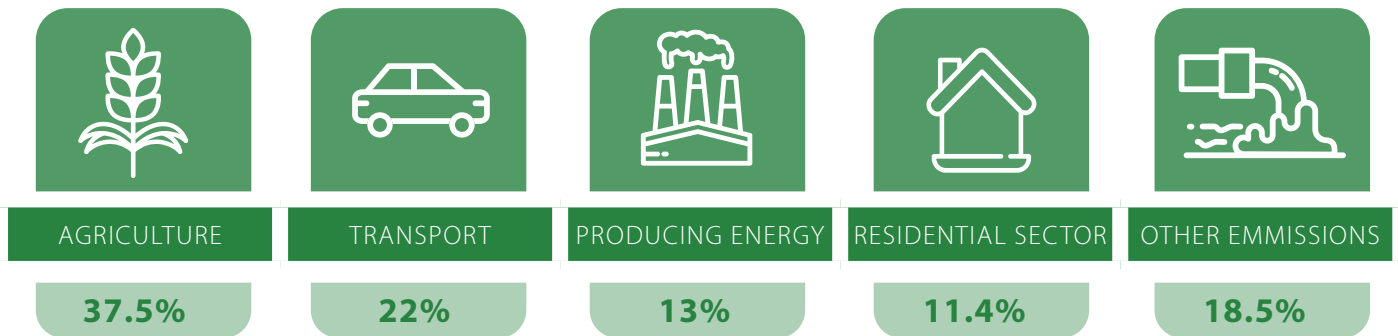
The world is about 1.44 degrees celsius (C) warmer than before people started using oil, gas and coal to power factories and transport, and to heat homes. The GHGs released by burning these fossil fuels trap the sun's energy. Met Éireann confirms 2024 was the first year where temperatures reached 1.5°C above pre-industrial levels. EPA reports Ireland has warmed ~0.8°C since 1900, in line with global trends.

Our influence

Humans are increasingly influencing the climate and the earth's temperature by burning fossil fuels, cutting down forests and farming livestock. This adds enormous amounts of GHGs to those naturally occurring in the atmosphere, increasing the greenhouse effect and global warming. The amount of one GHG in the atmosphere - carbon dioxide (CO₂) - has risen about 50% since the 19th century and 12% in the past two decades.

Ireland is already experiencing the impact of rising temperatures, with storms becoming more frequent, rainfall growing more intense (now around 7% heavier than it was 30 years ago). Irish sea levels have steadily increased by 2-3 mm each year since the 1990s. Another source of GHGs is deforestation. When trees are burned or chopped down, the carbon they normally store is released.

The Greenhouse Effect primary sources of GHG¹



Energy production of all types accounts for 72% of all emissions

The Greenhouse Effect is a natural occurrence that is essential to human life. Energy from the sun warms the Earth as it is trapped in the atmosphere. Not all the energy from the sun is trapped, some of it is reflected into space. This process of absorbing and reflecting energy warms the planet to an average of 15 degrees celsius, this ensures that life on earth is possible. Rapid changes to the amount of GHGs in the atmosphere is resulting in global warming, where more of the sun's energy is absorbed and less energy is reflected into space.

Changes to the composition of the atmosphere is a natural process. The Earth has gone through cycles of extreme cold, the Ice Age, and warmer eras, the Carboniferous period, where dense and swampy forests gave rise to large deposits of peat, which, over time transformed into coal. The growth of giant tropical forests removed huge amounts of CO₂ from the atmosphere and stored it as coal deposits, the same coal that we burn today.

The industrial revolution, saw the growth in coal consumption which gave rise to unprecedented levels of air pollution. This was followed by the production of industrial chemicals, increased production of consumer goods and intensification of agriculture. All these activities have something in common – they are energy intensive. Until recently most of our energy demands have been satisfied by our reliance on fossil fuels. In 2023, Ireland was still 82.7% dependent on fossil fuels for overall energy needs.



Government targets

The requirement for climate action and energy security has led to an increased focus on renewable energy generation in Ireland. The transition to a low carbon electricity system, based on renewable energy and storage, is a key pillar of Project Ireland 2040 - National Planning Framework².

Underpinning this, is our obligation to increase renewable electricity from 30% to 80% by 2030. It is recognised that wind energy is a viable option for Ireland's transition to renewable electricity, whilst strengthening our energy security and meeting EU climate Targets.

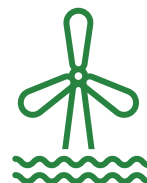
Onshore wind energy projects form a key part of the Government's plan to enhance clean electricity generation, meet Ireland's environmental targets and move to a more secure energy future. In Ireland, electricity generation is the 3rd largest fossil fuel expending sector, with CO₂ the primary GHG released. Wind turbines do not emit GHGs while operational. It takes a turbine just three to six months to produce the amount of energy that goes into its manufacture, installation, operation, maintenance and decommissioning after its 20–25-year lifetime³. Therefore, wind energy can play a major role in reducing GHGs.

Wind farms avoided 4.44 million tonnes of CO₂ in 2023. Economic benefits from wind energy include employment, community benefit schemes, lower bills arising from reduced reliance on imported fossil fuels, a stable income for landowners who lease their land for wind farm development, income for local authorities through rates, and increased competition in the energy market which helps to lower costs for end users⁴.

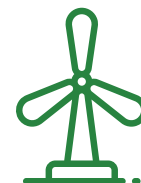
Key requirements to reach 2030 targets



8000 MW'S
**SOLAR
POWER**



5000 MW'S
**OFFSHORE
WIND**



9000 MW'S
**ONSHORE
WIND**

According to a report published by the SEAI in 2021, Ireland ranks second last out of 28 EU countries and has missed the 2020 targets, making it more difficult to meet 2030 and 2050 targets⁵.



Renewable energy and agreed targets for 2030⁵



51%

Reduction in
GHG emissions by
2030, relative to
2018 levels



70%

Renewable electricity



32.5%

Improvement in
energy efficiency

Table 2: Wind energy Impacts to 2030⁶

Wind Energy Impacts	2020	2030 Target
Capacity (MW's)	4,200	8,200
Total Industrial Output	€1.1bn	€1.5bn
Additional Gross Value Added from the sector's activities	€410m	€550m
Jobs throughout the sector and supply chain	5,130	7,020
Total payments in incomes to workers across the supply	€225m	€305m
Chain Contribution to local authority rates	€45m	€100m

1. EPA (2022) Greenhouse Gas emissions – Latest Emissions Data
2. Government of Ireland (2018) Project Ireland 2040 - National Planning Framework.
3. Bonou, Laurent, A., & Olsen, S. I. (2016). Life cycle assessment of onshore and offshore wind energy-from theory to application. Applied Energy, 180, 327–337.
4. Barringa (2021) Endgame -A Zero Carbon Electricity Plan for Ireland
5. SEAI (2020) Renewable Energy in Ireland
6. KPMG (2021) Economic Impact of Onshore Wind in Ireland

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