

# Ireland's transformation to a clean and sustainable energy system: Why and how?

## Purpose

Ireland's legally-binding carbon budgets require a rapid reduction in fossil fuel use, which accounts for around 60% of greenhouse gas emissions. This briefing note **describes the main measures necessary to cut fossil fuel use in line with carbon budgets by 2030**, and focuses on the **five measures that deliver 90% of the GHG savings from the energy system by 2030**, required by the Climate Action Plan.

**The most important factor for Ireland to meet its climate commitments this decade is to immediately accelerate the pace and scale of delivering these five measures.**

These five solutions are available now, scalable, well understood, and have international precedent. Accelerating their deployment, while also cutting the use of fossil fuels and managing energy demand, is essential.

Political leadership is crucial to sustain public support for these essential measures. Both traditional and modern ways of selling messages should be used to further this.

## The urgency of action

**The legacy of leaders depends on how they act now:** The decisions that leaders across politics, society, industry and government take now will determine the prosperity and wellbeing of current and future generations. According to projections of greenhouse gases, Ireland will breach legally-binding carbon budgets and international obligations unless **an urgent and significant course correction is taken to align with these commitments.**

Time, not technology, is the main barrier. No miracles are necessary: the vast majority of emissions savings required in the energy system this decade can come from **wind, solar and the electricity grid, electric vehicles, heat pumps and reducing car demand.** Any further delay to these measures will cause an overshoot in carbon budgets, which will be costly, and potentially impossible, to make up for. Transformative changes are necessary to achieve the rapid, extensive emissions cuts. While these changes may be disruptive, if carefully planned they can bring about many benefits across society, and will provide Ireland with learnings that would be of value globally.

## The cost of inaction

Failing to cut emissions now will lead to fossil fuel lock-in, that will become increasingly difficult and costly to undo.

The status quo of fossil fuel dependence comes at a high price. **The costs of inaction far exceed the cost of the energy transition.** A rapid sustainable energy transition will bring wide-ranging benefits, including economic opportunities, improved well-being, greater equity and the environment. Further, it will avoid the need for significant compliance costs and fines resulting from failing to meet legally-binding EU targets and more costly mitigation measures required to address the overshoot of carbon budgets..

A step-change in policy development, implementation and Government investment is urgently needed.

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# How to cut fossil fuels rapidly

## These 5 measures take us 90% of the way to our 2030 objective

### 1 Wind, solar & grid

- Renewable electricity is the backbone of the sustainable energy transition, as fossil fuels are replaced by power from wind & solar.
- Investment in the power grid – new transmission & distribution capacity, distributed energy storage, flexibility, long-duration strategic storage – is also needed.
- Both rooftop and large-scale solar farms bring benefits.
- Onshore wind capacity should double by 2030, but many barriers remain – speeding up & resourcing the planning system & grid connections is necessary.

34%

### 2 Electrify transport

- EV adoption must accelerate, by removing barriers and offering greater incentives.
- The higher upfront cost of EVs is generally offset by significant savings from using an EV.
- Growth in fossil fuel car sales is still greater than growth in EVs; petrol & diesel use is not falling.
- Policy options include regulating fossil fuelled car marketing, escalating motor taxes, rolling out rapid & neighbourhood public charging, zero emission city centres & incentivising used EV imports.
- EVs could store energy for a house and complement wind & solar if vehicle-to-grid & bi-directional charging technology is incentivised.

22%

### 3 Reduce unnecessary car use

- Measures to cut car use include:
- Improve the availability, accessibility, affordability & reliability of public transport & accelerate delivery of major infrastructure.
  - Ensure new housing developments are dense & have public transport access.
  - Greatly expand park & ride.
  - Ensure sustainable school transport options – school buses & safe routes to schools for all.
  - Disincentivise urban & workplace parking – reward sustainable commuting instead.
  - Reallocate road space to sustainable transport & the urban realm.
  - Congestion charging.

10%

### 4 Retrofit, heat pumps & district heat

- High heat loss and fossil fuel dependence in buildings are linked to energy poverty, poor health, air pollution, high energy bills, low comfort, & high greenhouse gas emissions.
- Providing clean and affordable heating and retrofitting the housing stock can address these problems simultaneously. Heat pump deployment is critical.
- District heating can serve around half of buildings and be integrated with the electricity system with heat storage. Spatial heat plans and targeted policy can capitalise on this opportunity.

12%

### 5 Decarbonise industry

- Most emissions from the industrial sector come from burning fossil gas and oil to produce heat. Over half of these can be replaced by electricity.
- Significant energy savings can be achieved through efficiency measures, like heat recovery.
- Electricity and renewable fuels must be used to replace fossil fuels for high temperature heat.
- Sustainable bioenergy resources are constrained and may conflict with other land uses.
- Green hydrogen may be developed the 2030s, when there is a surplus of renewable energy.
- Support for industry to explore new technological options for decarbonising cement is required.

10%

## A safer climate

- Decarbonisation is an imperative: National carbon budgets, EU Directives, and the Paris Agreement are all legally binding on Ireland.
- Failing to cut emissions quickly in the short-term and overshooting carbon budgets will make it more difficult to meet obligations in the long run, requiring costly and uncertain carbon removal technologies, which are unlikely to bring the same benefits for energy security, nature and wellbeing.
- Irish people are threatened by climate change: we need the world to take greater action. Even though Ireland's emissions are small in a global context, we are the second highest per-capita emitter in Europe. By meeting our own decarbonisation targets we can advocate for stronger climate action globally, helping to protect ourselves and future generations.
- As a high-emitting country with significant capacity, Ireland has a moral responsibility to act. Leadership and solidarity shown through the pandemic shows we have the capacity for acting for the greater good.



## Health, wellbeing & equality

- Fossil fuel dependence causes ill health, inequity and hardship, which can be addressed through a transformation to a sustainable energy system.
- Clean energy can cut air pollution, which causes >1000 premature deaths annually, heart disease and respiratory illness, including asthma. Air pollution is mainly caused by burning coal, peat and wood in homes and diesel in cars, trucks and boilers.
- Retrofitted homes are warmer, drier, and more comfortable. Warmer homes improve wellness and health, especially for the young and the elderly.
- Walking and cycling bring many benefits for health and wellness, by increasing exercise and reducing car dependence and traffic.
- Improved active and public transport enhances social equity by improving access, lowering dependence on cars & their associated cost.
- Lower energy demand and careful planning reduces potential conflicts between renewable energy and biodiversity.



## Security

- Around 90% of Ireland's primary energy demand is imported, leaving us vulnerable to geopolitical disruption, both from oil and gas supply shocks, and price volatility.
- Ireland is one of the most fossil fuel dependent countries in Europe. This is hugely costly, and was the main reason for hardship, inflation, energy poverty and economic damage experienced through the cost-of-living crisis. Energy credits for households cost the budget €1 billion in 2024 alone.
- According to the Energy Security Review, energy security will be improved mainly through reducing dependence on fossil, by rolling out renewable energy sources and improving efficiency.
- Climate change is a profound systemic risk to national security.
- Lowering energy demand and energy waste improves energy security and resilience and reduces dependence on supply chains and critical minerals.



## Financial & economic benefits

- Addressing climate change and cutting fossil fuel dependence is essential for long-term prosperity. Imported fossil fuels cost Ireland €5-8 billion annually. Fossil fuel prices are volatile, which hurts homes and businesses.
- Many energy transition measures have a high upfront cost, but reduce bills and bring financial savings in the long-term.
- A cleaner energy system reduces both private and State healthcare costs.
- Generating energy domestically is a huge economic opportunity, including for job creation. Irish industry can drive innovation, by manufacturing and providing services for a renewable and efficient energy system.
- Climate change is a major threat to prosperity and growth. Taking action to cut emissions as part of a global effort reduces this threat.
- Active travel supports local businesses, increases property values and lowers infrastructure cost.
- Ireland is at risk of being left behind the green transition, and suffering from reputational damage unless commitments are met.





Energy Efficiency  
& Renewables

## Accelerate clean energy measures

**Accelerating the deployment of the measures listed above can bring significant benefits for cutting cumulative GHG emissions and keeping within carbon budgets.** Rather than seeking new solutions to decarbonise energy, bringing forward the adoption of these measures that are already mainstream, are scalable and bring broader benefits is essential for remaining within carbon budgets.



## Cut fossil fuels

### **Carbon budgets constrain total fossil fuel use.**

Targeting decarbonisation measures to replace the most polluting fuels - coal and peat, then oil and gas - brings greater carbon savings. While natural gas is required in the short-term, mainly for electricity, its use must fall substantially by 2030 to meet carbon budgets.



## Cut energy demand

### **Cutting energy demand alongside rolling out clean energy technologies is critical to meet carbon budgets and the EU Energy Efficiency Directive.**

Strong demand growth is currently outpacing gains from technological change, like running up a down-moving escalator. Examples include data centres, the growing size of cars, and dispersed settlement patterns, which drive greater car use and make the construction of low-carbon infrastructure, like district heating networks and public transport, less viable.