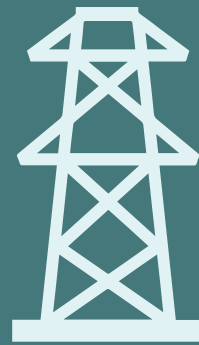




Annual Review 2024

Electricity



Annual Review 2024: Electricity

Submitted to the Minister for the Environment, Climate and
Communications on 9 May 2024

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Summary for All

In this first part of the 2024 Annual Review, the Climate Change Advisory Council outlines detailed observations and recommendations for the Electricity sector.^a Ireland needs to reduce and ultimately prevent emissions of greenhouse gases. To stay within the agreed carbon budget, the Electricity sector needs to achieve the largest reduction in sectoral emissions of all sectors: a 75% decrease by 2030 compared with 2018.

In 2023, emissions from the sector fell by just over a fifth from 2022 to the lowest level since records began in 1990. This was driven by a considerable decline in the use of coal for electricity generation, coupled with a notable rise in imported electricity.^b Generation from renewable sources increased slightly, primarily driven by solar power, but it remains significantly below the annual increase needed to meet growing demand and simultaneously satisfy 2030 targets for emission reductions. Delays and appeals in the planning process for onshore wind projects in particular are significantly hindering progress.

Key recommendations

- ▶ The Government urgently needs to complete the planning reform required to accelerate the installation of sufficient wind and solar power to achieve the annual average increase of 1.6 gigawatts of onshore renewable electricity that is needed to meet national targets.
- ▶ It is critical that the use of coal to generate electricity is stopped by 2025 and that the use of oil is phased out as soon as possible.
- ▶ The Government should ensure pricing incentives for data centres and other large energy users to shift electricity usage to times of low carbon emissions and to give the public access to data on their energy efficiency and sustainability performance.
- ▶ The Government urgently needs to adopt the plan for the roll-out of offshore wind power off the south coast to avoid further delays in offshore wind generation.
- ▶ The Government should publish a long-term strategy with timelines for the delivery of a reliable and zero-carbon electricity system well in advance of 2050 and ensure that publicly owned energy companies take full account of the Climate Act in setting their own objectives.
- ▶ Planning processes must ensure that new energy infrastructure is developed to withstand future projected climate impacts. Operators must act now to reduce known flood risks to critical infrastructure and take account of protecting and, where possible, enhancing biodiversity in new infrastructure developments. Government and operators need to enhance resilience to power outages and work closely with all communities to identify and develop the technologies required.

a Other sectors will be dealt with sequentially in subsequent publications.

b Imported electricity is not included in the Electricity sector emissions in the Irish greenhouse gas emissions inventory.



Abbreviations

CAP	Climate Action Plan
CRU	Commission for Regulation of Utilities
EED	Energy Efficiency Directive
LDES	long-duration energy storage
PV	photovoltaic
REDIII	revised Renewable Energy Directive
SEAI	Sustainable Energy Authority of Ireland

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Key observations

Electricity emissions and main trends

- ▶ Provisional data for 2023 indicate a 21% reduction in Electricity sector emissions.
- ▶ Lower emissions in 2023 were a result of a record low carbon intensity of 234 g CO₂/kWh of electricity generation, largely driven by coal-fired power generation reducing to 4% and net electricity imports increasing to 10% of supply, with emissions associated with imported electricity not included in Ireland's inventory.
- ▶ Electricity demand in Ireland increased by 3.0% in 2023, in contrast to the EU where demand fell by 3.4% over the same period. Ireland's 2023 per capita demand was 6.9 MWh, higher than the EU average of 6.1 MWh.

Renewable electricity

- ▶ Renewables accounted for 41% of electricity demand in 2023, up from 39% in 2022 and approaching the 2025 target of a 50% renewable energy share in electricity generation.
- ▶ By the end of 2023, the total renewable grid capacity in Ireland was 5.7 GW, with the majority (4.7 GW) from onshore wind turbine installations.
- ▶ In 2023, only 0.6 GW of new grid-scale solar (0.4 GW) and onshore wind (0.2 GW) generation was connected. This is significantly below the annual average increase of 1.6 GW of onshore renewables required to meet 2030 capacity targets.
- ▶ In 2023, 0.5 GW of wind and 0.8 GW of solar electricity projects received planning permission; however, no onshore wind projects were awarded permission before September. Appeals and judicial reviews, including for all of An Bord Pleanála's approved projects, continue to delay the development of projects.

Key recommendations

- ▶ To achieve Ireland's targets in this sector, the Government must urgently deliver the National Planning Framework Review so that Local Development Plans, County Development Plans and local authority climate action plans can be aligned with the mandated national and regional targets and with EU legal requirements. The Government should transpose the revised Renewable Energy Directive (REDIII; Directive (EU) 2023/2413) into Irish legislation by 1 July 2024. The Minister for Housing must mandate variations to County Development Plans to provide sufficient zoned areas.



- ▶ The burning of coal to generate electricity must cease at the earliest opportunity. The timeframe for the urgent phasing out of the use of oil must also be agreed, as the continued use of coal and oil for electricity generation risks exceeding the sectoral emissions ceiling.
- ▶ The Commission for Regulation of Utilities (CRU) should urgently implement an enhanced emissions reporting framework and price incentivisation for large energy users to encourage them to participate in flexible demand initiatives designed to shift electricity consumption to times when carbon emissions are low.
- ▶ To attract the necessary investment in long-term sustainable electricity, the Council is calling on the Government to finalise and adopt the South Coast Designated Maritime Area Plan by summer 2024. Any delay in its publication risks not achieving Ireland's 2030 offshore wind targets.
- ▶ The Government should publish a long-term strategy for the delivery of a reliable, resilient, decarbonised electricity system that also addresses the implications for decarbonising heating and transport. As part of this, the Government should immediately align the legal mandate for all public bodies to have regard to the Climate Action and Low Carbon Development (Amendment) Act 2021, particularly those operating in the energy sphere, such as the CRU, EirGrid, ESB Networks and Gas Networks Ireland.

Climate resilience and biodiversity

- ▶ Future climate projections and environmental criteria should be integrated into the planning, appraisal and prioritisation of future electricity projects. Infrastructure and necessary equipment must be designed and engineered to withstand the full range of climate impacts (high winds, floods, heatwaves, etc.). In the short term, EirGrid should ensure that flood prevention measures are implemented at the transmission stations identified as being at most risk of flooding.
- ▶ The Department of the Environment, Climate and Communications should commission an assessment of the implications for biodiversity of the expansion of renewable energy infrastructure on and off shore.
- ▶ To build consumer confidence in electrification, which is critical to meeting Ireland's mitigation ambitions, ESB Networks, Government and energy stakeholders should develop additional projects with rural communities to investigate renewable microgeneration and microgrid storage opportunities to improve resilience in the event of outages. The technical viability, safety, costs and benefits of microgeneration and battery storage across a range of scales in the event of grid outages should be assessed to improve resilience.



1. Introduction

The Electricity sector accounts for emissions from a total of 15 fossil fuel-fired generating stations, one peat briquetting plant, one waste-to-energy facility, one natural gas production platform and one natural gas refinery. It is the third largest sector by emissions in Ireland. Preliminary data for 2023 from the Sustainable Energy Authority of Ireland (SEAI) indicate that emissions from the Electricity sector in 2023 were 7.6 Mt CO₂ eq (SEAI, personal communication, 3 May 2024). This represents a significant (21%) reduction in Electricity sector emissions year on year^[1] and the lowest annual emissions for the sector since current official inventories began in 1990. EU Emissions Trading System data also indicate a reduction in emissions from electricity generation of almost 24% in 2023.^[2] This is largely due to a 50% reduction in the use of coal for electricity generation relative to 2022, paired with a 12-fold increase in net electricity imports from the UK driven by, among other things, a lower UK carbon price.^[3] Imported electricity, regardless of the generation fuel mix, is not included in the energy industry emissions in the Irish greenhouse gas emissions inventory. Emissions associated with electricity imported from the UK are included in the UK inventory.

The year 2024 is critical for the Electricity sector. To achieve the 2025 and 2030 targets and remain within the sectoral emissions ceiling, the following is required:

- ▶ The use of coal for electricity generation must cease at the earliest opportunity.
- ▶ Significant imports of electricity from the UK need to be maintained.
- ▶ The renewable share of electricity generation must significantly increase.
- ▶ The growth in demand for electricity will need to be limited.

2. Sectoral emissions ceiling and key Climate Action Plan targets

The Electricity sector has been set the steepest decline in emissions of all sectors: its emission ceilings are 40 Mt CO₂ eq for the first carbon budget period (CB1: 2021–2025; see Table 1) and 20 Mt CO₂ eq for the second carbon budget period (CB2: 2026–2030).^[4] A 75% reduction in emissions in the sector by 2030, compared with 2018 levels, is to be achieved by increasing the share of renewable electricity to 80%, encompassing 9 GW of onshore wind capacity, at least 5 GW of offshore wind capacity and 8 GW of solar photovoltaic (PV) capacity (Table 2) and supported by a range of actions set out in the Climate Action Plan 2023 (CAP23). Approximately 49% of the sectoral emissions ceiling has now been used in the first 2 years of the first carbon budget period (CB1: 2021–2025) (see Table 1). SEAI estimates that 68% of the sectoral emissions ceiling has now been used in the first 3 years of the first carbon budget period (CB1: 2021–2025).^[1]

Progress towards targets for onshore wind in 2023 was limited, with just 0.2 GW of new onshore wind connected to the grid, bringing the total connected onshore wind capacity to 4.7 GW (Table 2). Solar power became the country's fastest-growing renewable source in 2023, with record connections of small-scale rooftop solar installations by households and businesses as well as larger, grid-scale, solar installations. By the end of 2023 a total of 0.7 GW of solar power, comprising 0.4 GW grid-scale and 0.3 GW small-scale rooftop solar installations, was connected to the grid. However, despite the rapid growth in solar connections in 2023, Ireland is not on track to achieve the target of up to 5 GW solar power generation by 2025.



Table 1: Reported emissions for 2021–2022 in the context of the sectoral emissions ceiling (SEC) for the first carbon budget period, 2021–2025.

(Sources: 1, Sectoral Emissions Ceilings Summary Report.^[4] 2, Ireland’s Final Greenhouse Gas Emissions 1990–2022.^[5]) Provisional inventory data for 2023 are not yet available

Carbon budget period	SEC ¹	Reported emissions 2021–2022 ²	SEC used 2021–2022 (%)
2021–2025	40 Mt CO ₂ eq	19.7 Mt CO ₂ eq	49%

Table 2: Progress on key Climate Action Plan targets as at the end of 2023.

(Sources: 1, EirGrid System and Renewable Data Summary Report – April 2024.^[6] 2, ESB Networks, personal communication, April 2024, on small-scale renewable generation applications and connections at December 2023 – solar values include 0.3 GW distribution system operator rooftop and other small-scale/microgeneration capacity connected by end 2023. 3, Climate Action Plan 2023.^[7]) *Provisional value from SEAI Interim 2023 National Energy Balance^[1]

Year/target	Total installed capacity			Renewable electricity share
	Solar	Onshore wind	Offshore wind	
2021 ¹	< 0.1 GW	4.3 GW	<0.1 GW	35%
2022 ¹	< 0.1 GW	4.5 GW	<0.1 GW	39%
2023 ^{1,2}	0.7 GW	4.7 GW	<0.1 GW	41%*
2025 target ³	Up to 5 GW	6.0 GW	n/a	50%
2030 target ³	8.0 GW	9.0 GW	At least 5 GW	80%

3. Progress on previous Climate Change Advisory Council recommendations

Previous Climate Change Advisory Council Annual Reviews have provided recommendations to help progress emissions mitigation at a pace that will achieve national climate targets. The most relevant recommendations for the Electricity sector include implementing measures to increase the supply of renewables, closing high-emissions fossil fuel generators and managing demand.

In relation to increasing supply, the Council has called for sufficient resources for An Bord Pleanála, local authorities and other relevant Government agencies to efficiently process the required volume of onshore and offshore planning applications and associated grid infrastructure. In addition, the



Council has raised specific concerns^[8] that many of the older fleet of onshore wind farms are due to lose their planning consent and has recommended that barriers to the extension of these sites and repowering of sites should be removed. The Council notes that staffing levels are being increased at An Bord Pleanála and that a strategy is in development to increase resourcing in local authorities. However, the timeframe for decision-making in the planning system remains too long. Policy development also remains slow, with the Renewable Electricity Spatial Policy Framework and Electricity Storage Policy Framework still awaiting publication. Many local authority climate action plans contain limited or no spatial mapping or specific targets for the installation of renewable energy capacity, adding further uncertainty to the planning process. The Council has previously recommended^[9] that the Government publish the Renewable Electricity Spatial Policy Framework to provide further clarity on this. Despite this, the publication of the framework remains delayed and is now planned for inclusion in the National Planning Framework. Furthermore, facilitation of hybrid connections, a policy on private wires and publication of the revised wind energy guidelines, all previously identified as critical actions, have been consistently delayed.

The Council has also repeatedly called for the closure of peat and coal generators at Edenderry and Moneypoint. The cessation of peat burning at Edenderry in 2023 is welcomed, but the proposed development of a gas pipeline to this plant, together with the continued burning of coal at Moneypoint, remains problematic for the sector remaining within the sectoral emission ceilings. Measures to manage demand have also been repeatedly recommended by the Council, including the publication of the demand-side strategy, increasing the flexibility of electricity use and promoting energy efficiency. Although the demand-side strategy is still not published, CAP24 does contain actions aimed at reducing demand and increasing the flexibility of large energy users. The roll-out of smart meters is continuing at pace, with over 1.6 million installed; however, although the Commission for Regulation of Utilities (CRU) is progressing the delivery of the Smart Meter Data Access Code, the uptake of time-of-use tariffs remains low.

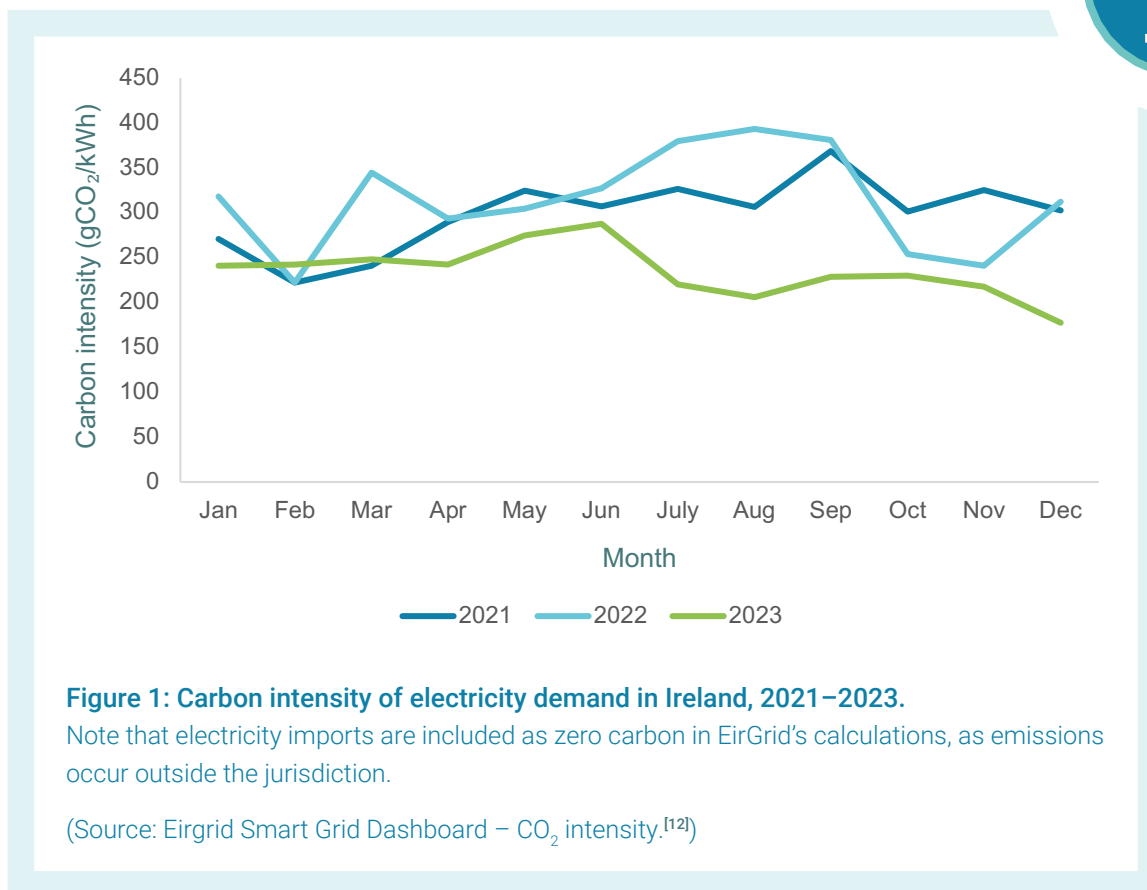
The Council recommends that the Government rapidly delivers outstanding actions from CAP23 and ensures the timely publication of relevant policies and strategies to facilitate the necessary long-term planning and investment across the sector.

4. Indicators

4.1. Electricity emissions and main trends

Ireland is one of only three EU countries in which electricity demand increased in 2023 – by 3.0% from 2022,^[1] which is in stark contrast to a reduction of 3.4% for the EU.^[9] This growth is on top of high overall demand, with Ireland's 2023 per capita demand of 6.9 MWh above the EU average of 6.1 MWh.^[9] Total net metered electricity generation declined by 7% from the previous year to 30.19 TWh,^[10] but it was supplemented by net imports of 3.27 TWh, constituting 10% of supply, up from 1% in 2022. Renewables accounted for 45% of metered electricity generation in 2023,^[10] with a provisional figure of 41% of electricity demand,^[1] similar to the average level of EU renewable electricity generation of 44%^[9] and approaching the national target of a 50% renewable energy share in electricity generation by 2025. Wind farms contributed a record 13.73 TWh in 2023, constituting 36% of metered electricity generation, second only to Denmark (58%) and significantly above the EU average of 19%.^[9] In 2023, coal still accounted for 4% of electricity generation, at 1.22 TWh,^[11] and, while this represented a significant 52% decrease from 2022, coal still generated 15% of emissions.^[11]

The significant 21% reduction in Electricity sector emissions in 2023 was partly a result of a record low carbon intensity for electricity demand, estimated at 234 g CO₂/kWh (Figure 1).^[12] This significant



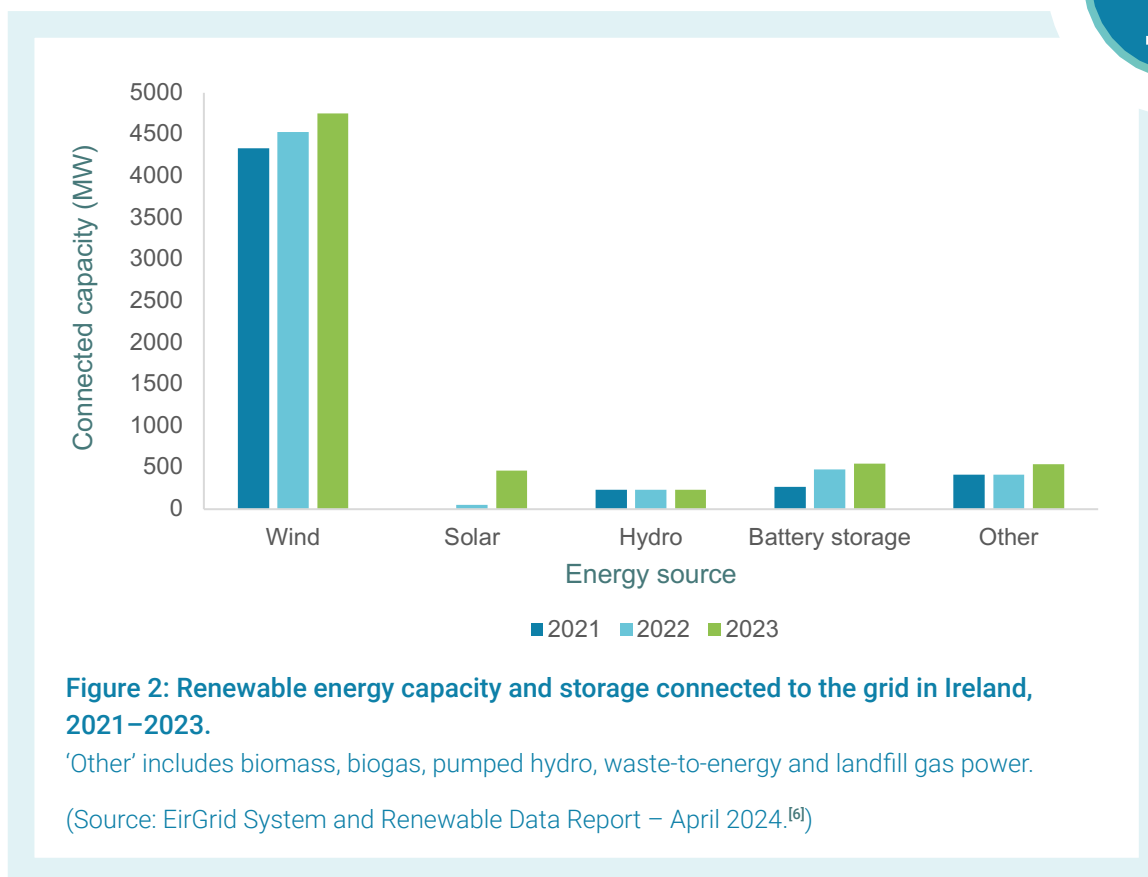
reduction from previous years was largely driven by the substantial increase in net electricity imports,^[9] the reduction in coal-fired power generation and the increased proportion of renewable energy supplied to the grid. While this reduction in the carbon intensity of electricity demand is welcome, the carbon intensity of power generation in Ireland in 2023 was 291 g CO₂/kWh, which is above the EU average of 242 g CO₂/kWh.^[9]

4.2. Renewable electricity: new connections and planning

By the end of 2023, the total grid-scale renewable capacity in Ireland was 5.7 GW, with wind power contributing the majority at 4.7 GW^[6] but with strong growth in solar power, albeit from a low base (Figure 2). During 2023, an additional 0.6 GW (0.2 GW wind and 0.4 GW solar) of new grid-scale renewable capacity was connected,^a representing an increase on the 0.2 GW connected in 2022.^[6] While a welcome increase, it is still significantly below the 1.6 GW annual average increase that is required to meet 2030 targets. The additional offshore wind target of 5 GW by 2030 can only start to be achieved with the construction of phase 1 wind farms after 2025.

In addition to the 0.4 GW of grid-scale solar capacity connected in 2023, there has been a significant increase in small-scale renewable generation, mainly comprising domestic rooftop solar PV panels, with a total of 0.32 GW small-scale renewable generation connected by the end of 2023 (ESB Networks, personal communication, April 2024). This includes 0.2 GW of small-scale renewable

^a In addition to this 0.6 GW capacity, the 0.1 GW Edenderry Power Station generator, formerly peat fired, gradually incorporated more biomass until 2024 when it became 100% biomass fired.



generation connected in 2023 alone. ESB Networks received 33,000 applications (146 MW of generation) for microgeneration installations of up to 6 or 11 kVA in 2023, typically domestic rooftop solar PV installations, representing a 90% increase in applications from 2022 and an average of 700 applications per week.

Mini-generation installations up to 50 kVA in size are typically the size of approximately four tennis courts and include installations on the rooftops of supermarkets, for example. In 2023, Ireland saw an 85% increase in applications from 2022 (1200 applications amounting to 36 MW of generation) for mini-generation. Small-scale generation came into operation at the end of 2022 and comprises larger installations of up to 200 kVA and includes, for example, solar investments made under the Targeted Agriculture Modernisation Schemes. ESB Networks received 190 applications (20 MW of generation) for small-scale generation in 2023.

Approximately 1.3 GW of wind (0.5 GW) and solar (0.8 GW) electricity projects received planning permission during 2023 (Table 3).^[13] If all these projects progress through to development, they could deliver 80% of the annual increase in onshore renewable capacity required to achieve the 2030 targets. However, delays remain prevalent in the planning process, especially for onshore wind projects. The first approval of an onshore wind project in 2023 was not granted until September, representing a hiatus of over 12 months. This first project, the only one to receive planning permission from a local authority, is now subject to an appeal. Of the four wind farms granted approval by An Bord Pleanála in late 2023 (0.3 GW), all are currently undergoing a judicial review. Five other projects (0.2 GW) were granted permission on conclusion of an appeals process following an original local authority decision. These appeals will add significant delays to the development of these projects, making 2030 targets increasingly difficult to achieve. Of those applications that received a decision, projects accounting for approximately 20% of wind capacity and 15% of solar capacity were refused.



Table 3: Number and capacity of wind and solar projects in the planning process for 2023.

(Source: Construction Information Services Database 2023^[13] – planning decisions.) *Many solar projects do not state capacity on planning submissions to allow design flexibility. Therefore, reported capacity is a Council Secretariat estimate, based on a combination of solar projects that do state their capacity and an estimate based on the reported project costs for those that do not state capacity, and is subject to change

Status	Number of projects		Reported capacity	
	Wind	Solar	Wind	Solar
Awaiting decision	9	28	460 MW	600 MW*
Plans granted permission	8	37	530 MW	780 MW*
Plans refused permission	5	7	130 MW	135 MW*

5. Analysis and discussion

5.1. Political leadership and ambition

Accelerated deployment of onshore wind and solar electricity generation is crucial if the Electricity sector is to meet its sectoral emissions ceiling for the first carbon budget period. However, the current connection rates observed for onshore wind and solar projects are significantly lower than what is required to reach the 2025 and 2030 Climate Action Plan targets. In addition, the volume of renewable electricity generation projects in the planning process is not sufficient to meet the national targets. As projects are required to have full planning permission to qualify for auction under the Renewable Electricity Support Scheme, this limited number of projects in the planning process will lead to a reduced number of qualifying projects for the 2024 auction.^[14] This will result in an increase in the average price of electricity because of a lack of competition and ultimately have a negatively financial impact on all citizens.

The revised EU Renewable Energy Directive (REDIII; Directive (EU) 2023/2413)^[15] introduces the designation of ‘renewables acceleration areas’ with shortened and simplified permitting processes by Member States. Article 16(f) of REDIII, which is required to be transposed into national legislation by 1 July 2024, provides for the presumption of overriding public interest for renewable projects through the restriction of the application of Article 6(4) of the Habitats Directive (Council Directive 92/43/EEC) in certain areas under specific circumstances. Strong implementation of this EU legislation will be a key influencing factor for An Bord Pleanála decision-making for the necessary grid development and for the expansion of onshore wind and solar capacity to meet the renewable targets. The Government must transpose REDIII^[15] into Irish legislation by 1 July 2024, including the designation of ‘renewables acceleration areas’, and give full effect to Article 16(f) concerning ‘overriding public interest for renewable projects (IROPI)’.

While renewable electricity projects are progressing through the planning system (see Section 4.2), even the full delivery of the capacity of these projects would not be sufficient to meet targets. A selection of ten local authority climate action plans published for consultation have been reviewed



by the Council for indicators relevant to the implementation of the National Planning Framework at local authority level in relation to renewable energy deployment. Limited or no spatial mapping or outlines of specific targets for renewable electricity were found in the selected plans. The Government must urgently deliver the National Planning Framework Review so that local authority climate action plans and county development plans can be aligned with the regional targets. The repeated delays to the policy framework that is crucial for the alignment of national targets and local development plans are unacceptable. To secure a sufficient supply of affordable electricity and further reduce emissions from the sector, the Government should ensure that at least 1.6 GW of renewable electricity is connected to the national grid annually. To achieve this, the Government must urgently deliver the National Planning Framework Review so that Local Development Plans, County Development Plans and local authority climate action plans can be aligned with the mandated national and regional targets and EU legal requirements. The Government must transpose REDIII^[15] into Irish legislation by 1 July 2024. The Minister for Housing must mandate variations in County Development Plans to provide sufficient zoned areas. In the event of failure to provide sufficient zoned areas, An Bord Pleanála must approve adequate planning applications to meet the 1.6 GW annual increase in capacity needed to achieve Ireland's 2030 targets.

New high-voltage grid infrastructure, such as underground cables, pylons and substations, is also necessary to match Ireland's grid capacity with its renewable energy ambitions. EirGrid's network delivery portfolio outlines the work required to connect significant volumes of offshore and onshore wind, solar and conventional generation while also reinforcing the power system. Quarterly reporting on the progress of the network delivery portfolio indicates that there are delays to grid upgrades of greater than 1 year on 52% of energy projects.^[16] Delays in the planning system are an ongoing issue. The Government must enact the Planning and Development Bill 2023 and adequately resource planning authorities if it is to tackle the challenge of delivering the high-voltage grid infrastructure required to match the grid capacity with the renewable electricity targets.

From a European perspective, Ireland is still far behind offshore wind development despite the first Offshore Renewable Energy Support Scheme auction results and the establishment of the Maritime Area Regulatory Authority in July 2023.^[17] It is crucial that successful projects from the scheme and supporting infrastructure progress swiftly and fairly through the planning system to enable the achievement of CAP24 targets for offshore wind. To assist with the assessment of offshore wind projects, the Council welcomes the establishment of the panel of marine and offshore renewable energy consultants at An Bord Pleanála. The Draft South Coast Designated Maritime Area Plan, published in May, is due for approval by the Oireachtas following a 6-week public consultation period.^[18] It is crucial that this timeline is met. To attract the necessary investment in sustainable electricity, the Government must finalise and adopt the South Coast Designated Maritime Area Plan by summer 2024. In addition, Belfast has been identified as the only port on the island of Ireland currently capable of servicing offshore renewable energy construction. Timely investment to support port infrastructure is essential for developing Ireland's offshore renewable energy potential. The Government should support the development of ports to service the offshore wind industry. The publication of the updated National Port Policy in 2025 is a crucial opportunity to accelerate the development of the national port infrastructure.

Ireland was one of ten EU Member States where the greenhouse gas emissions intensity of electricity generation was higher than the EU average in 2022.^[19] The high carbon intensity of Ireland's electricity generation is largely a result of the continued use of solid fossil fuels for electricity generation. For example, coal was used for 4% of electricity generation^[11] but accounted for 15% of the emissions associated with electricity generation in 2023.^[11] The cessation of peat burning at Edenderry in December 2023 is welcomed in this context. However, any future plan to switch Edenderry's generators from biomass to natural gas must prioritise enabling the electricity generators there to



run on biomethane and green hydrogen as soon as these fuel sources become available. Moneypoint will now burn oil beyond the 2025 deadline for ending the burning of coal at the plant, as EirGrid and ESB Networks have signed an agreement to make Moneypoint available as an out-of-market generator of last resort from 2025. The burning of coal to generate electricity must cease at the earliest opportunity, along with the urgent phasing out of the use of oil within a timeframe to be agreed, as the continued use of coal and oil for electricity generation risks the sector exceeding the sectoral emissions ceiling.

The Council has repeatedly called for the rapid decarbonisation of the electricity system. The Government should publish a long-term strategy for the delivery of a reliable, resilient, decarbonised electricity system that also addresses the implications for decarbonising heating and transport. The Council welcomes ESB Networks for Net Zero Strategy,^[20] which sets out ESB Networks' role in enabling the delivery of the Government's Climate Action Plan and supports the decarbonisation of the electricity system by 2040. Similarly, the Council welcomes the publication of the updated Shaping Our Electricity Future Roadmap by EirGrid and SONI, the system operator for Northern Ireland,^[21] and the recent consultation report Tomorrow's Energy Scenarios 2023,^[22] which outlines long-term energy scenarios for Ireland and Northern Ireland and considers how electricity demand and generation will develop from 2035 to 2050. Gas Networks Ireland should publish an outline climate strategy to 2050 that supports the achievement of the National Climate Objective. As an immediate step, the Government should align the legal mandate for all public bodies to have regard to the Climate Action and Low Carbon Development (Amendment) Act 2021,^[23] particularly those operating in the energy sphere such as the CRU, EirGrid, ESB Networks and Gas Networks Ireland.

5.2. Demand management and energy efficiency

The energy crisis reduced electricity demand in almost every country in Europe, but Ireland was one of only three countries in Europe to record an increase in electricity demand in 2023 compared with 2021.^[9] Much of the increase arose from data centres, which consumed 18% of Ireland's electricity in 2022, a four-fold rise since 2015.^[24] For context, electricity demand from data centres accounts for 1.5% of global electricity use^[25] and an estimated 1.8–2.6% of the total EU electricity demand.^[26,27] The Council has considered the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy, in which the Government states that 'islanded' data centre developments, i.e. those that are not connected to the electricity grid and are powered mainly by on-site fossil fuel generation, would not be in line with national policy. Islanded data centres run counter to emissions reduction objectives and would not increase the wider efficiency and decarbonisation of the energy system. The Council has previously recommended^[28,29] that CRU should direct Gas Networks Ireland not to sign any more contracts to connect data centres to the gas network if the data centre would be powered mainly by on-site fossil fuel generation. However, the current legal framework does not provide an adequate mechanism to mandate Gas Networks Ireland in this way. At present, the expansion in renewable electricity generation capacity is significantly outpaced by the growth in electricity demand, largely driven by data centres. It will be increasingly difficult to remain within the carbon budgets if data centres continue to be connected before the country has the renewable capacity to accommodate them. To remain within the carbon budgets and avoid the need for steeper sectoral emissions reductions in future, the Government must both increase the roll-out of renewables and manage the growth in electricity demand to ensure that it remains in line with renewable generation capacity.

Electricity demand management measures aimed at reducing peak demand and high-carbon-intensity fossil fuel electricity generation are equally important to remain within the sectoral emission ceilings. The Council has repeatedly called for the urgent publication of the demand-side strategy, which underpins several CAP24 actions specifically aimed at reducing demand and increasing the



flexibility of large energy users. The long-awaited demand-side strategy must contain measures to incentivise large energy users to increase their flexibility in managing their electricity demand. The Council welcomes new CAP24 actions on demand management to implement an enhanced emissions reporting framework for electricity emissions for large energy users and to incentivise large energy users to participate in flexible demand initiatives designed to shift electricity consumption to times of low carbon emissions. These actions must be implemented without delay and on time.

The CRU has recently consulted on incentivising the uptake of time-of-use tariffs^[30] and dynamic electricity price tariffs,^[31] and the imminent publication of these decisions will bring further welcome developments for demand management. The availability of dynamic tariffs can bring benefits for the overall electricity system by increasing flexibility, supporting Ireland's security of supply, reducing the overall cost of the electricity system and reducing the need for fossil fuels, as well as supporting more renewables in the system, which will help reduce emissions. Traditional electricity price tariffs have either the same unit rate throughout a 24-hour day or different rates for set periods of a 24-hour day, while a dynamic electricity price tariff varies hourly to reflect the wholesale electricity market price. Legislation enacted in 2022 entitles customers to enter into a dynamic price contract with any supplier that has more than 200,000 electricity customers. The Council welcomes the CRU proposal to require all suppliers with more than 200,000 electricity customers to offer a 'standard dynamic price contract'. While dynamic tariffs are not necessarily suitable for all customers, those that can avoid using electricity at times when prices are higher and use it during cheaper times of the day will be able to make real savings as well as supporting renewable energy and decarbonisation. The Council recommends that suppliers swiftly implement the regulatory policy on dynamic price contracts, following its publication by the CRU in Q2 2024, and make these dynamic price tariffs available to provide customers with a greater choice of potentially more cost-effective tariff offerings this year.

The EU has agreed an ambitious target to reduce final energy consumption by at least 11.7% compared with projections of its expected energy use by 2030.^[32] Under the revised Energy Efficiency Directive (EED; Directive (EU) 2023/1791), and as part of their energy efficiency obligation schemes, EU countries will be required to achieve an average annual energy savings rate of 1.49% from 2024 to 2030, up from the 2021–2023 requirement of 0.8%, driving energy savings in critical sectors such as Built Environment, Industry and Transport. By using energy more efficiently and consuming less, energy consumers can lower their energy bills, mitigate climate change, improve their quality of life, reduce reliance on external suppliers of oil and gas, and support the sustainable growth of the economy. The EED identifies the Information and Communications Technology (ICT) sector as one of increasing importance in this context, and the European Commission has adopted a new delegated regulation on the first phase of establishing an EU-wide scheme to rate the sustainability of EU data centres. As envisaged under the recast EED,^[33] the delegated regulation requires data centre operators to report key performance indicators to the EU database by 15 September 2024 and then by 15 May in 2025 and in subsequent years.^[34] The EED sets out the minimum requirements for monitoring and publishing the energy performance of data centres and the information and key performance indicators that should be reported and also defines the first sustainability indicators that will be used for the rating of data centres. The scheme is intended to increase transparency and potentially to promote new designs for and efficiency developments in data centres that could not only reduce energy and water consumption but also promote the use of renewable energy, increased grid efficiency or the reuse of waste heat in nearby facilities and heat networks.^[35] The Council recommends that the Government establishes a national reporting scheme to facilitate a publicly accessible reporting mechanism for the sustainability of data centres operating in Ireland.



The transition to a low-carbon economy will require significant changes to Ireland's power system. The combination of increasing demand, increasing intermittent renewable generation and a lower proportion of thermal generation will make it more challenging to balance supply and demand in real time. Energy storage is one type of flexible capacity that can provide a range of different services to the grid, including resilience, security of supply and congestion management services. While battery storage offers a low-carbon, fast-response form of flexibility, the length of time that batteries are able to provide power is limited, making them unsuitable for managing security of supply during prolonged periods of low renewable output. Long-duration energy storage (LDES; i.e. >4 hours) will therefore play a key role in Ireland meeting its decarbonisation targets while ensuring security of supply. EirGrid has assumed that 2.4 GW of the 3.8 GW storage capacity in the system would be LDES by 2030.^[21] There is currently an absence of support schemes, frameworks and markets to deliver the levels of LDES required in Ireland.^[36] The Electricity Storage Policy Framework for Ireland, which underwent consultation in 2023, is still awaiting publication, which is expected in 2024. The lack of a specific policy for LDES is inhibiting development, and there are no targets for LDES at Government level. The Council recommends that the Department for the Environment, Climate and Communications publishes the Electricity Storage Policy Framework without delay and before the end of June 2024. This must contain specific targets and implementation times if it is to be effective. Similarly, ESB Networks should consider LDES solutions for its demand flexibility product and complete procurement within 2024, while EirGrid must finalise the design of its LDES procurement strategy by the end of 2024 and include specific timelines for procurement and delivery to provide clarity for industry. Within the capacity market, significant de-rating factors are applied, which are a disincentive for the uptake of LDES, and EirGrid and CRU must review these to remove barriers to LDES expansion. Given the high capital costs of LDES, a clear support scheme must be developed and communicated to industry.

5.3. Consumer empowerment

The price of electricity has been a key issue of concern for households and businesses in Ireland in the past 2 years, and the recent announcements of price cuts by retail energy providers is a welcome development. The root cause of volatility in electricity prices is Ireland's dependence on fossil fuels for electricity generation and the resultant exposure to unstable gas prices. Ireland has a vast renewable resource in terms of wind and solar power and its oceans and land; however, the pace and urgency of unlocking the value of this resource is not sufficient to prevent increased costs to Irish society and the economy as well as long-term damage to the climate. Demand response is a key flexibility resource in power systems with increasing shares of variable renewable electricity generation.^[37] An important element of demand response is time-of-use tariffs that incentivise customers to adjust their electricity use voluntarily, either through automation or manually, to reduce their expenses. As the name suggests, the price varies depending on the time of day, reflecting the marginal network costs and/or generation costs of electricity in the wholesale market. To date, there have been over 1.6 million smart meters installed;^[38] however, since time-of-use tariffs became available in 2021, the uptake has remained relatively low, with only 330,000 households switched to a smart tariff in March 2024.^[39]

The limited access to smart metering data is a key barrier to the uptake of time-of-use tariffs. At present, customers with a smart meter can access their smart meter data directly from their ESB Networks online account and see a graphical representation of their usage and export the data to commonly used spreadsheet packages. However, the availability of this facility needs to be more widely communicated, and the information presented should be more accessible to assist customers to find the best smart tariff for their household or business. The CRU should urgently issue a final decision on the Smart Meter Data Access Code,^[40] setting out rules around access to smart metering



data and thus enabling suppliers and others to provide new smart services and tariffs to consumers. The Council recommends that the Energy Regulator, ESB Networks, electricity suppliers and price comparison websites identify and prioritise the implementation of evidence-based approaches to behaviour change^[41] on how smart meters can be used to interpret consumption patterns. This should allow customers to choose the most sustainable and/or cost-effective electricity price plan, including dynamic pricing plans, supported by more options on comparison websites. The Council supports and considers urgent the CRU's proposal, as part of its review of the Price Comparison Website Accreditation Framework, to include a mandatory element in the framework that allows consumers to upload their consumption data and receive a personalised price comparison.

The Council welcomes the new action in CAP24 to establish a national programme of consumer communications and educational and behavioural initiatives aiming to influence the times when electricity is consumed. The development of clear public information about the cost and carbon intensity of electricity use in real time and the promotion of opportunities to shift consumption to times when cost and carbon intensity are lower is needed to empower businesses and households to reduce the cost and carbon intensity of their electricity use. When presenting electricity consumption feedback, potential monetary savings and the potential for reducing emissions can be highlighted in simple and easy-to-understand ways.^[42] For example, complex energy use data, which are usually provided in units such as kilowatts, can be problematic.^[43] This information can be transformed into formats that are easier to understand such as how much money can be saved. Various communications can be simplified, including energy efficiency labels, energy audits, home energy reports, smartphone apps and electricity bills.

By the end of 2024, every home and business in Ireland will have a smart meter. It is crucial that smart metering functionality is enabled to provide customers with feedback on their electricity use in real time, i.e. when the electricity is used. In-home displays can allow people to monitor their energy use in real time^[44] and can communicate many types of feedback messages. A report by Users TCP and the International Energy Agency^[45] discusses many future directions for the application of behavioural insights using in-home displays and finds that simplification of information, provision of real-time information and social norm comparisons are the most impactful levers. Notifications can shift people's energy consumption from peak demand periods to off-peak times of the day. For example, a recent study^[46] showed that peak energy demand can be reduced by feedback and timely reminder notifications in university residences. Reminders can come in various forms such as reminder letters, smartphone notifications and labelling on appliances. Recent research has also suggested that collaboration with home appliance manufacturers is needed to incorporate simple peak-spreading mechanisms into their products and to add demand flexibility defaults to settings that avoid the use of electricity during peak times.^[47] In this regard, the Council welcomes the introduction of a new action in CAP24 to undertake a review of energy grant schemes to assess the level of smart-ready technology opportunities and to identify smart energy and technology integration solutions in homes and communities.

The Council welcomes the availability of electric vehicle-friendly pricing plans allowing customers to charge their electric vehicles overnight at reduced rates. For example, to charge a mid-size electric vehicle (with a 45 kWh usable battery), switching to a time-of-use tariff and charging the vehicle overnight will reduce the cost from €17.50 to €9.00.^[48] As the number of electric vehicles increases, facilitating their owners to also engage in energy storage is important. Vehicle charger technology has the potential to shift electric vehicle demand to off peak and times of high renewable electricity generation, thus positively impacting electricity prices. In addition, the roll-out of vehicle-to-grid charging has the potential to provide additional grid flexibility by allowing electric vehicles to act as storage or batteries and supply electricity to the grid at times of high electricity demand and low



levels of renewable energy generation. In the expectation that the availability of bidirectional charging capability will increase in future, the Council recommends that the government and ESB Networks introduce a 'vehicle-to-grid' pilot for bidirectional-capable vehicles.

The significant increase in small-scale renewable generation in 2023 (see *Section 4.2*) is a hugely welcome development. The majority of these installations comprise domestic rooftop solar PV systems, although there has also been an increase in larger non-domestic installations, including those at supermarkets, farms and schools. These customers are contributing to the decarbonisation of Ireland's electricity system while also reducing their electricity bills, with SEAI estimating the annual savings for a simple domestic solar PV system as €288 per year with an estimated 8-year payback period.^[49] However, installers are providing estimates of typical payback periods as low as 4–6 years. This demonstrates the significant potential for the further expansion of rooftop solar power on households and businesses across Ireland. The Government must continue funding for the installation of solar PV systems to ensure that electricity consumers are empowered to produce, store, use and sell sustainable electricity. The Council recommends a Government-led campaign to drive further uptake, particularly among non-domestic and business customers.

5.4. Climate resilience and biodiversity

Volume 3 of Ireland's Climate Change Assessment^[50] identifies the main vulnerabilities of the country's critical infrastructure to climate change impacts. For energy infrastructure, the key risks highlighted are extreme wind speeds, increased precipitation and saturated soils, given their impacts on the electricity distribution network, with flooding also of concern. The most vulnerable part of the energy infrastructure is the overhead electricity network.

Ireland's dependence on the electricity network is set to increase as the country moves towards increased electrification of transport and heating and further digitalisation of its economy and services, which are under increasing pressure from a growing population. The cascading impacts of electricity failures will pose a significant risk to critical infrastructure such as water supply and treatment, transport, telecommunications, healthcare, the built environment and industry. In this context, it is vital that the network and its various components are designed to be resilient to the impacts of climate change and that the vulnerabilities of the current system are addressed.

The Council has identified the climate resilience of critical energy infrastructure as a key concern and its Adaptation Committee held an all-island workshop on the topic in May 2023. The workshop focused on (i) current and planned critical energy infrastructure and its vulnerabilities and key interdependencies, (ii) information gaps presenting barriers to achieving climate resilience and (iii) governance, coordination and cross-cutting issues.

The workshop resulted in a report^[51] that captured a series of recommendations grouped according to governance and regulation, planning and future developments, and resources and information. It also identified the need for the next round of sectoral adaptation plans, which will start to be developed in 2024, to establish a coordination platform for planning for and ensuring the resilience of all critical infrastructure and for addressing interdependency risks and cascading impacts among the broader critical infrastructure. The Government should strengthen coordination to ensure the delivery of policy, regulatory, design and finance actions to improve the climate resilience of the electricity and gas infrastructure. In the short term, EirGrid should ensure that flood prevention measures are implemented at those transmission stations identified as being most at risk of flooding to ensure their resilience and reduce their vulnerability.

The transition to renewable energy sources, energy efficiency and decentralised systems offers the potential for enhanced climate resilience as well as reduced emissions. The risks from increasing



climate extremes to the large-scale integration of renewable energy sources into the grid need to be further understood and mitigated. Future climate projections and environmental criteria should be integrated into the planning, appraisal and prioritisation of future energy projects, and the infrastructure and necessary equipment must be designed and engineered to withstand various climate impacts. The new infrastructure guidelines,^[52] published by the Department of Expenditure, NDP Delivery and Reform in December 2023 to replace the Public Spending Code, require public sector projects to demonstrate how they will result in increased resilience to the impacts of climate change. This offers opportunities for improving the climate risk stress testing of critical infrastructure projects and identifying potential failure points, adaptation options and cascading risks. Important advances in grid-forming inverters, distributed energy storage systems, cross-sector interoperability and climate–energy integrated models are being made^[53] and should be considered in reshaping Ireland’s electricity grid to make it more climate resilient.

The implications for the biodiversity of the increasing areas of land and sea with renewable energy installations need to be assessed, including assessing the cumulative impacts of changes in land and sea areas on key habitats and species. This requires comprehensive long-term monitoring of the condition of habitats and species adjacent to renewable energy installations. Positive impacts on biodiversity should also be promoted in the evolving guidelines and frameworks for offshore renewable energy with an emphasis on the need for the nature-inclusive design of infrastructure, nature-focused initiatives such as restoration and conservation, and requirements for circularity and reuse of materials.

Increased microgeneration and microgrid storage of renewable energy, including at household level and through sustainable energy communities, is a further area of opportunity for the climate-resilient supply of electricity. In order to build consumer confidence in electrification, which is critical to meeting Ireland’s mitigation ambitions, ESB Networks, the Government and energy stakeholders should develop additional projects^[54,55] with rural communities to investigate renewable microgeneration and microgrid storage opportunities to improve resilience in the event of outages. The technical viability, safety, costs and benefits of microgeneration and battery storage at a range of scales in the event of grid outages should be assessed.



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