Good for your Pocket

How renewable energy helps Irish electricity consumers

January 2025

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Commissioned by

WIND ENERGY IRELAND

Contents

Foreword from Wind Energy Ireland

Since 2000 renewable energy has saved Irish electricity consumers nearly one billion euros.

Every single wind turbine we build, every set of solar panels we install, helps Irish families and businesses.

Baringa's report, *Good for your Pocket*, shows that, even with the most conservative approach they could adopt, the financial benefit to consumers of developing renewable energy has significantly outweighed all the possible costs.

Every single Irish electricity consumer is better off today because our members – supported by the commitment of successive governments to policies that enable the development of renewable energy – built wind and solar farms.

But it doesn't necessarily feel that way. When our electricity bills are among the highest in Europe it can be hard for families or small businesses, struggling to pay their bills, to feel the benefit of these savings.

The reality is our bills will remain too high for exactly as long as we choose – and it is a choice – to maintain our dependency on imported gas, to allow the CEOs of fossil fuel companies to decide how much a family in Roscrea should pay to charge their car or how much it costs a farm in Monaghan to run a milking parlour.

We are living through a global energy crisis where those countries, like Ireland, most exposed to volatile international fossil fuel markets pay the price, where a million euros an hour leave this country to import the oil and gas which is accelerating the climate emergency.

There is an alternative, one proving itself every day.

We can produce our own power, clean power, affordable power. We can rely on our enormous renewable energy resources to decarbonise our energy system and to drive our economy forward.

***Good for your Pocket* shows that if we reach the *Climate Action Plan*'s target of 80% renewable electricity it would reduce annual consumer bills by an additional €610 million. That's cash in the pocket of every Irish bill-payer.**

Doing this will not be easy. We need to build new wind farms – onshore and offshore – and solar farms, we must reinforce our electricity grid, electrify our heating and transport systems and work in Europe to help design a reformed electricity market that truly delivers for consumers.

The first step is to reject the false choice that we must decide between a strong, growing, economy and a clean, sustainable, environment. We can, and we absolutely must, do both.

It is time to stand up for Irish electricity consumers, to ensure that we have a clean, secure and affordable source of power to attract investment, to grow our economy and to support small businesses.

We will cut our carbon emissions.

We will grow our economy.

We will cut your electricity bills.

That is the reward for successfully delivering an energy independent Ireland and it is one we are determined to achieve.

Noel Cunniffe

CEO, Wind Energy Ireland

Executive summary

The development of wind and solar farms has reduced the cost burden on Irish consumers by €840 million between 2000 and 2023.

This saving, equivalent to €165 per person, has been realised on the power bills of all consumers by the low cost of renewable electricity. Wind and solar farms have no fuel cost, and undercut more expensive gas- and coal-fired generators, displacing them from the wholesale power market.

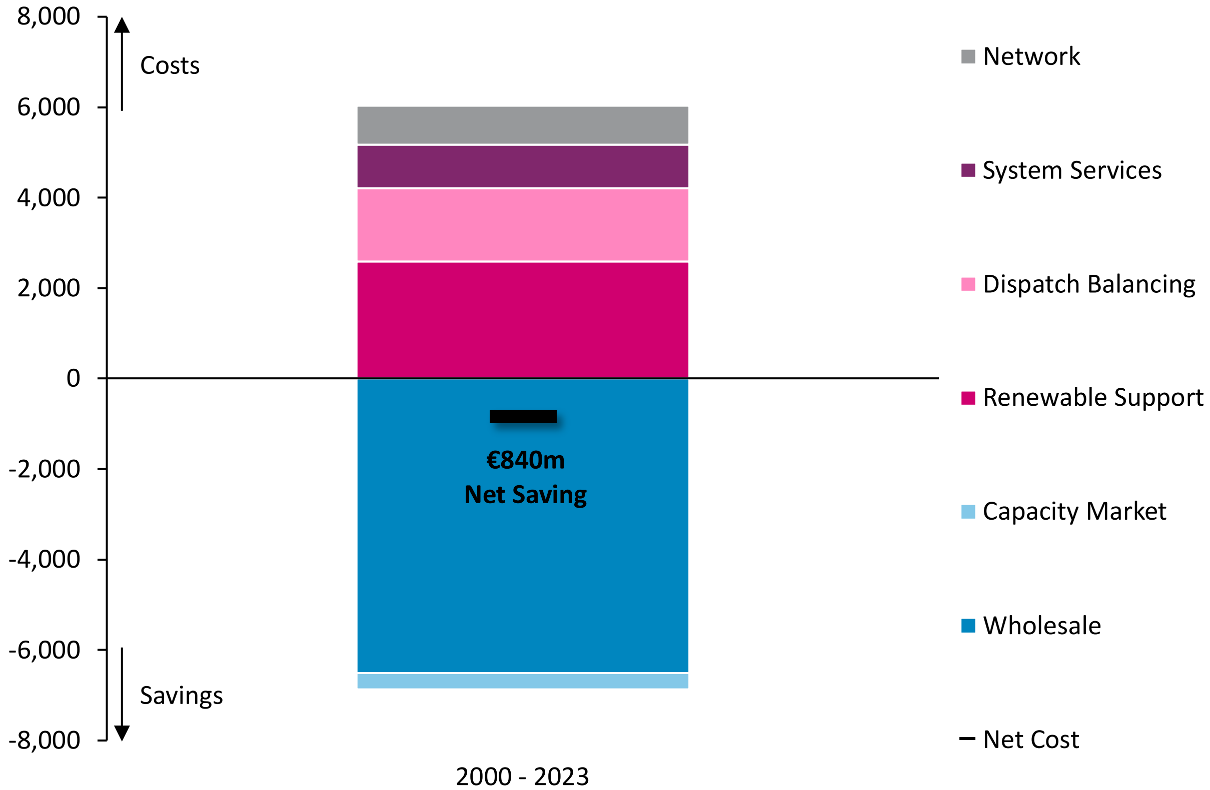
As presented in Figure 1 below, savings in the wholesale market (€6.5 billion), as well as in the capacity market (€360 million), have outweighed the net costs incurred to integrate renewables onto the system, including the AER, REFIT and RESS subsidies (€2.6 billion), balancing of generators (€1.6 billion), system services (€970 million), and network costs (€860 million).

Homegrown renewables have insulated consumers from recent spiralling fuel costs, cutting bills by an average of €320 per person between 2020 and 2023.

While the cost of power across Europe was driven to record levels, intensified by extreme gas prices following the Russian invasion of Ukraine, wind and solar farms in Ireland reduced power prices by up to €40 per megawatt-hour (MWh), and cut €1.7 billion from consumer bills over four years.

Heightened power prices, and the 'two-way' design of the RESS support scheme, allowed wind and solar farms to pay back €2 million to consumers in 2023, before any other savings.

Figure 1: Total consumer costs and savings in Ireland from 2000 to 2023, million euros (real 2024)



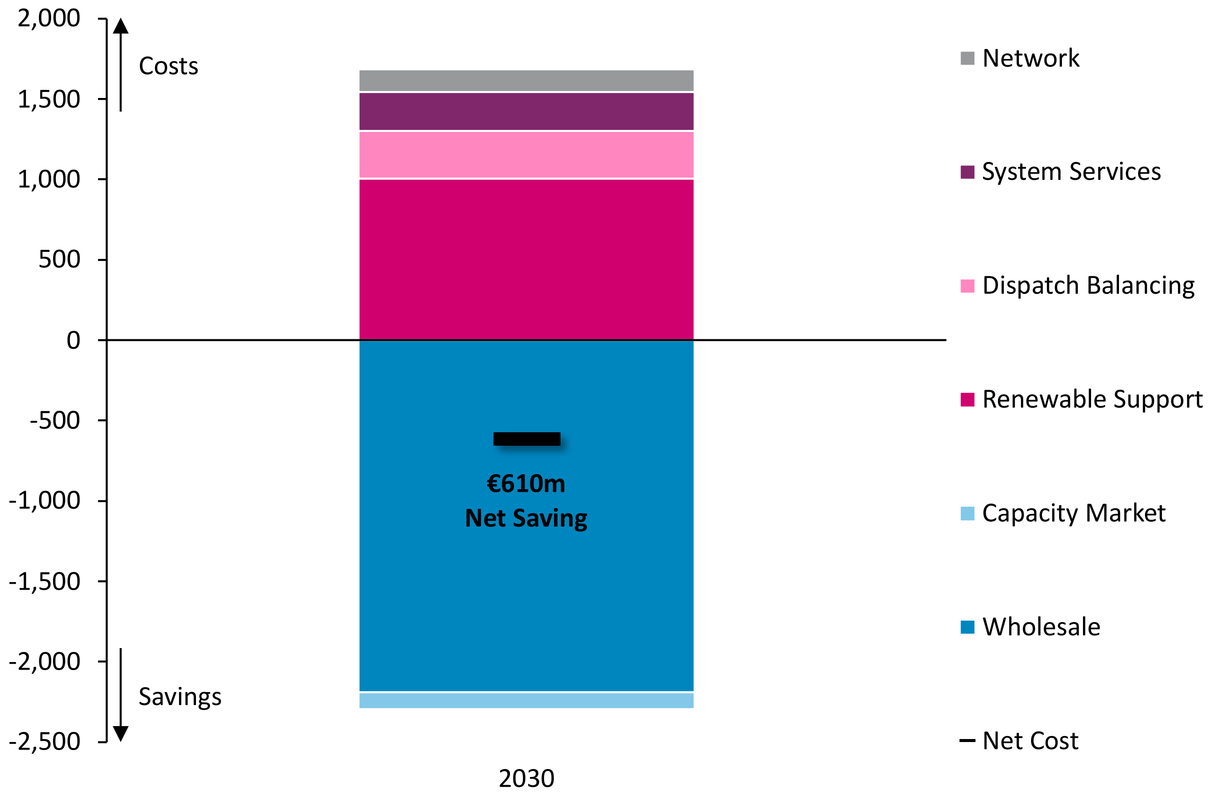
If Ireland continues to invest in wind and solar projects, and achieves the national target of 80% renewable electricity, annual consumer bills could be reduced by €610 million per year.

Our analysis suggests that additional net savings could be conferred to consumers if Ireland continues to invest in the renewable transition. We project further annual savings, realised on the electricity bills of all consumers, equivalent to almost €120 per person once the target of 80% renewable electricity is realised, modelled in our study as 2030.

Rising demand, including the electrification of heat and transport, and an increased impact at higher renewable penetration levels, allow new renewables to reduce the wholesale cost of power by €2.2 billion, outweighing the annual cost of achieving 80% renewable electricity (€1.7 billion). By contributing to security of supply in peak demand periods, new wind and solar projects could also reduce the need to support new fossil fuel-fired power stations in the capacity market, saving €105 million.

These costs and savings, presented in Figure 2 below, have been calculated relative to a baseline with no further development of renewables after the end of 2023. The €610 million net saving is therefore additional to any continued net benefit from existing renewables, which averaged €205 million per year between 2018 and 2023.

Figure 2: Additional consumer costs and savings in Ireland in 2030, million euros (real 2024)



The displacement of fossil fuels has avoided the need to burn €7.4 billion worth of gas and coal between 2000 and 2023, including almost €4 billion since 2021.

Generation from zero-carbon wind and solar projects has reduced Ireland's exposure to volatile fuel prices. Renewables have enabled 3 million tonnes of coal to be in the ground, and have displaced enough gas to heat every home in Ireland for nine years. In 2022 alone, the value of avoided gas and coal totalled more than €1.8 billion.

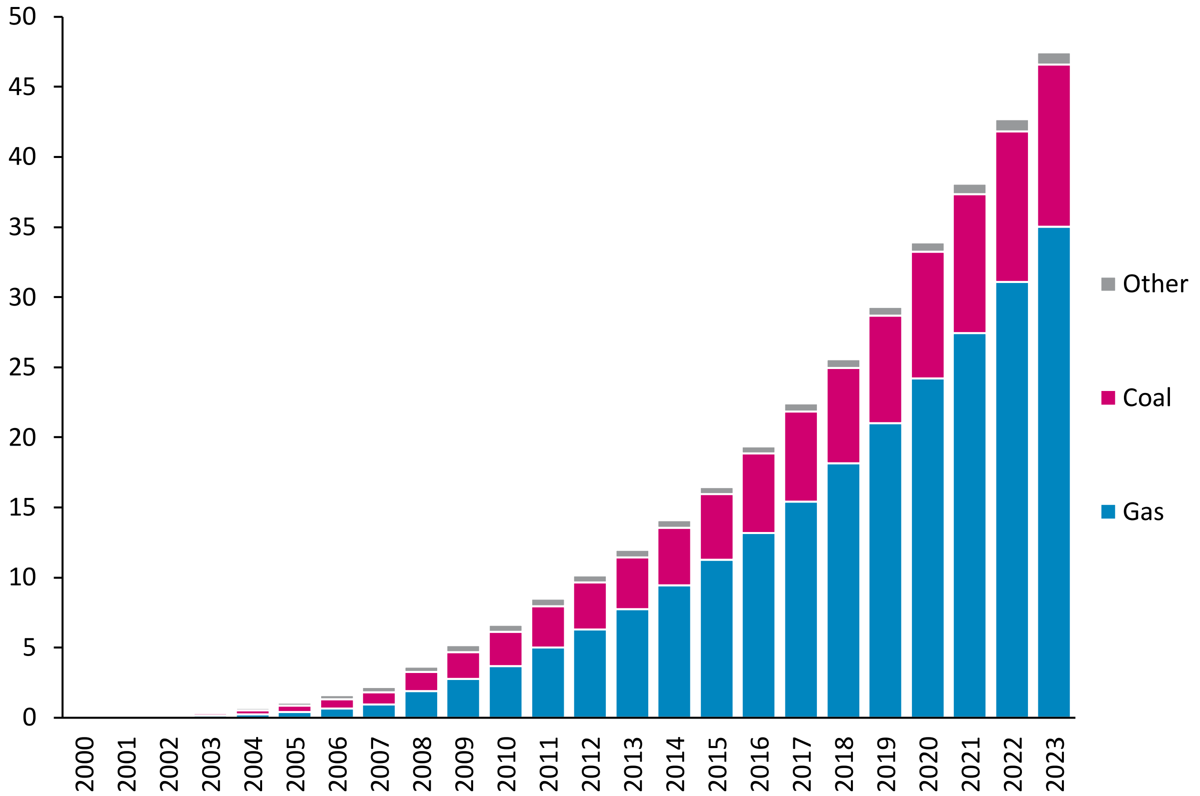
Our analysis suggests that Ireland would avoid burning €1.7 billion worth of gas in 2030, if the national target of 80% renewable electricity is achieved.

The renewable transition has avoided more than 47 million tonnes of CO_2 between 2000 and 2023, equal to the lifetime emissions of 1.1 million mid-sized cars, 40% of the total vehicles in Ireland.

Irish renewables have prevented an average of 4.2 million tonnes of carbon dioxide (CO_2) from being emitted into the atmosphere each year between 2018 and 2023, with 20% being from carbon-intense coal-fired generation. The cumulative carbon savings presented in Figure 3 below are equivalent to more than six times the total emissions from the Irish power sector in 2023.

Continued investment in renewables could reduce power-sector CO_2 emissions by more than 8 million tonnes in 2030, if the 80% renewable electricity target is realised.

Figure 3: Cumulative avoided CO_2 emissions in Ireland from 2000 to 2023, million tonnes



1 Introduction

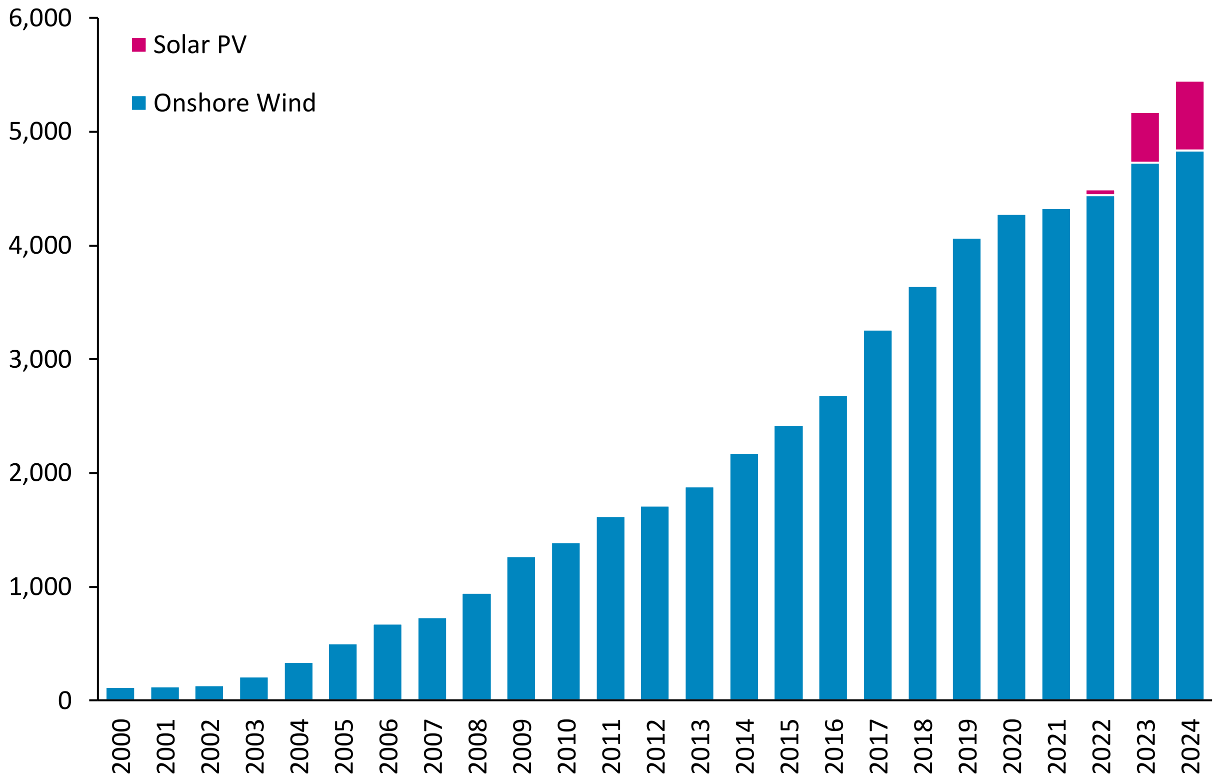
1.1 Renewable power in Ireland

1.1.1 The growth in renewables to date

Since the start of the millennium, renewable electricity sources in Ireland have grown from a near-zero starting point to make up more than 40% of domestic electricity consumption[1]. Around 4,840 and 610 megawatts (MW) of onshore wind and solar photovoltaics (PV) capacity respectively is currently installed in Ireland. Figure 4 below presents an approximate view of the growth in installed onshore wind and solar capacity across Ireland[2]. A single offshore wind site, the 25 MW Arklow Bank Phase 1 project, has been in operation since 2004.

The integration of wind and solar capacity onto the system has resulted in both costs and savings being passed on to end consumers in Ireland, as detailed below in Sections 1.2 and 1.3.

Figure 4: Installed capacity of onshore wind and solar PV generators in Ireland, MW



[1] **System and Renewable Data Reports**, EirGrid

[2] The values presented are end-of-year for 2000 to 2023. Values presented for 2024 are as of August. Rooftop solar capacity is not included in the total.

1.1.2 The outlook for the future

Looking forward, the penetration of renewables in the Irish generation mix is expected to increase significantly, driven by a government ambition to decarbonise the power sector. The *Climate Action Plan 2021*[3], a flagship climate strategy document published by the Irish Department of the Environment, Climate and Communications (DECC), set a legally binding requirement for 80% of electricity consumption to be met by renewable sources by 2030[4]. An aligned ambition has since been set in Northern Ireland through the *Climate Change Act*[5], which passed in 2022.

Corresponding targets for installed wind and solar capacity for 2030 have been iterated by DECC since the announcement of the '80 by 30' ambition. As of the *Climate Action Plan 2024*[6], these targets stand at 9,000 MW of onshore wind, 8,000 MW of solar PV, and 'at least' 5,000 MW of offshore wind capacity.

1.2 The savings offered by renewables

In addition to the climate benefits that renewable technologies offer in their ability to produce electricity without emitting carbon dioxide (CO_2), wind and solar generation can also lower some of the costs of operating a power system, savings that are in turn passed on to end consumers:

- **Reduced cost of wholesale power:** Ireland operates a combined, harmonised set of power market arrangements with Northern Ireland, known as the Single Electricity Market (SEM). Under the wholesale, or 'day-ahead', power market rules of the SEM, demand for electricity is served by the available generators with the lowest running cost, or cost per megawatt-hour (MWh) of electricity. Wind and solar assets have zero associated 'fuel cost' and are therefore significantly less expensive to run relative to gas- or coal-fired alternatives, once they have been built[7]. Renewable generation can therefore displace more expensive generation options, and lower the wholesale cost of electricity. This results in a saving to consumers in the 'wholesale' component of their power bills.

- **Reduced costs in the capacity market:** In order to ensure that there is enough available capacity to meet peak demand levels, the Capacity Remuneration Mechanism (CRM) provides an additional revenue stream to support the continued operation of existing power stations, and the development of new ones. Although the output of wind and solar farms is intermittent, i.e., it fluctuates rather than being steady, under the CRM rules they are assumed to partially contribute to security of supply. Having more renewables on the system therefore reduces the need to develop other capacity, the cost of which would be passed on to consumers in the 'capacity' component of their bills.

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[3] **Climate Action Plan 2021**, DECC

[4] The impact of achieving 80% renewable electricity by 2030 in Ireland and Northern Ireland had first been explored in Baringa's ***Endgame*** and ***Achieving Zero*** studies respectively.

[5] **Climate Change Act (Northern Ireland) 2022**, Northern Ireland Assembly

[6] **Climate Action Plan 2024**, DECC

[7] Wind and solar farms can have relatively small, but non-zero, 'running costs' per MWh. These typically include maintenance costs, local business rates, community benefit fund contributions, and insurance costs.

1.3 The costs of deploying renewables

Along with the savings offered by renewables on certain tariffs of consumer power bills, developing renewable projects and integrating them onto the system can result in costs to consumers in other line items of their bills:

- **Renewable support costs:** To enable the growth in renewable capacity seen to date, the Irish Government has supported projects through three subsidy mechanisms. Two of these support schemes, the Alternative Energy Requirement (AER) and Renewable Energy Feed-in Tariff (REFIT), which began supporting renewables in 1995 and 2006 respectively, are now closed to applicants. Five auctions of their replacement initiative, the Renewable Electricity Support Scheme (RESS), have taken place since 2020, including four open to onshore wind and solar PV (and other 'onshore' technologies), and one dedicated Offshore RESS (ORESS) auction for offshore wind. Each of these support schemes was designed to provide revenue certainty to renewable projects, typically by providing a guaranteed minimum price for each MWh of electricity produced; an agreement known as a Contract for Difference (CfD), which can be either 'one-way'[8] or 'two-way'[9] in design. The cost of supporting renewable projects through these schemes is passed on to consumers through the Public Service Obligation (PSO) levy, included on their bills.

- **Dispatch balancing costs:** To maintain stable operation of the SEM power grid, a number of 'operational constraints' must be maintained at all times. These constraints include a cap on the proportion of renewable generation and imports through interconnectors, the System Non-Synchronous Penetration (SNSP) limit, and a minimum number of thermal generation units that must be active in each jurisdiction, the 'min gen' or 'min set' constraints. If the day-ahead market results in a combination of generators that breaches any of these constraints, then adjustments must be made to 're-dispatch' some of them. The required volume of re-dispatch typically increases in line with renewable penetration on the system, and so integration of wind and solar farms results in additional costs, passed on to consumers as part of the 'imperfections' component of their bills[10].

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[8] Under a one-way CfD, such as REFIT, a generator receives a set minimum value per MWh produced, known as the 'strike price'. When the market price falls below the strike price, the generator receives a top-up payment to supplement their market revenue. When the market price exceeds the strike price, the generator does not have to pay back the difference, and secures additional revenue.

[9] Under a two-way CfD, such as AER or RESS, a generator receives a set value per MWh produced; the 'strike price'. When the market price falls below the strike price, the generator receives a top-up payment to supplement their market income. When the market price exceeds the strike price, the generator must pay back the difference.

[10] We have not included the potential cost of remunerating renewables for lost market revenue or state support due to re-dispatch actions made to address operational constraints, as would be compliant with the European Union (EU) Clean Energy Package. Such compensation is not part of current market policy in Ireland. We have quantified the cost of this potential change to policy, which is presented in Appendix A.2. Compensation for lost market revenue is currently available for some assets, deemed as 'firm', for re-dispatch necessitated by network congestion. We have conservatively assumed that all renewables, both 'firm' and 'non-firm', are remunerated for lost state support.

- **System service costs:** In addition to the operational constraints, another tool used by the transmission system operators (TSOs), EirGrid and System Operator Northern Ireland (SONI), to keep the system stable is a suite of 'system services'. The current framework, titled 'Delivering a Secure Sustainable Electricity System (DS3)'[11], includes the procurement of up to 14 system services[12]. Services are procured through non-competitive fixed-term contracts, and include voltage control, inertial response, reserve, and ramping products. These arrangements are expected to be superseded by the end of 2026, by a new set of competitive arrangements, holistically referred to as the 'Future Arrangements for System Services (FASS)'. A key driver for the increasing need for these services is the integration of renewables onto the system. The cost of procuring system services under either framework is recovered through the 'imperfections' component of end consumer bills.

- **Network costs:** Renewable projects require access to the power grid to export the electricity they produce. As their output is intermittent, and because the areas of the best resource (high wind speed or solar irradiance) are often in more remote regions with limited development to date, it has been necessary to invest in additional network infrastructure to allow renewables to connect. This is expected to continue in the future, as more renewable connections will be needed to achieve national targets. The cost of building out, upgrading, and maintaining the network is recovered from end consumers via the 'transmission' and 'distribution' components of their bills[13].

[11] The procurement of system services makes up part of a wider 'DS3 programme', which also includes changes to the Grid Code, relaxation of certain operational constraints, and updates to control centre tools.

[12] Two of the services, Dynamic Reactive Response (DRR) and Fast Post-Fault Active Power Recovery (FPFAPR), are not currently procured.

[13] In addition to the cost components that are impacted by renewables, a typical power bill in Ireland will include a 'supplier' line item, the regulated margin earned by the electricity supplier, as well as several small 'system' charges, levied to recover other minor costs of operating the power system.

1.4 Our study

In 2019, we published *Wind for a Euro*[14], a report exploring the costs and savings passed on to end consumers in Ireland since 2000 due to the development of wind power. The study, commissioned by Wind Energy Ireland, then the Irish Wind Energy Association (IWEA), was grounded in a modelling exercise in which we simulated the Irish power system between 2000 and 2020, with and without wind capacity. The years 2008 to 2017 were evaluated using a 'backcast' process, in which available historical data was used to ensure the model closely reflected historical reality, with 2018 to 2020 being projected using a combination of forecast data and Baringa assumptions.

In this study, we have brought the results of *Wind for a Euro* up to date, by running a backcast for 2018 to 2023, and including the impact of solar PV in our analysis. The last few years have seen an unprecedented range of power prices in Ireland, and throughout Europe. A sustained period of low prices, driven in part by depressed demand for power during the COVID-19 pandemic, was followed by spiralling prices intensified by a surge in the cost of gas at the onset of the Russian invasion of Ukraine. The heightened cost of electricity since 2021, and the ongoing 'cost-of-living crisis' in Ireland, has made the potential savings offered by renewables more important than ever.

We have also turned our attention forward, and simulated the SEM power system in 2030, to analyse the impact that future growth in renewables could have on end consumers if the 80% renewable electricity target is achieved. In this forward-looking analysis we have aligned key assumptions, such as the level of electricity demand and the price of gas, with publicly available sources. Although we have configured our market model to represent the year 2030, the consumer costs and savings evaluated are representative of those in whichever year the 80% ambition is met.

The findings of *Wind for a Euro* included an additional benefit from the avoidance of a non-compliance cost, which would otherwise be imposed at the EU level for failing to meet Ireland's binding renewable energy consumption target for 2020. We have conservatively excluded this saving from our updated study, and so any realised cost reduction of the non-compliance fee would result in additional savings to consumers.

Looking forward, renewable electricity could also help to reduce Ireland's exposure to further non-compliance costs in 2030, projected to exceed €8 billion[15], potentially up to as much as €20 billion[16]. Although the power sector is expected to make up a relatively small portion of the economy-wide CO_2 emissions in 2030, the deployment of wind and solar technologies could also help to decarbonise other sectors, such as heat and transport, through electrification.

This report also serves as a companion piece to *Renewable Rewards*[17], a study published by RenewableNI in September 2024, which explored the consumer cost impact of renewables in Northern Ireland using the same models and assumptions. Throughout each study we have been in contact with industry and consumer experts, providing them with visibility of our assumptions and methodologies to help validate our findings.

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[14] **Wind for a Euro**, Baringa

[15] **Annual Review 2024: Cross-sectoral Review**, Climate Change Advisory Council

[16] **Ireland's bounty**, Irish Fiscal Advisory Council

[17] **Renewable Rewards**, Baringa

The remainder of our report is structured as follows:

- **Section 2** presents the results of each phase of our study.
- **Section 3** provides an overview of the methodology behind our results.
- **Section 4** summarises our key findings.
- **Appendix A** provides additional detail on our analysis.
- **Appendix B** presents key input assumption data.
- **Appendix C** introduces Baringa, and some of our other relevant publications.

All monetary values are presented in real 1st of January 2024 euros (EUR) unless otherwise stated[18].

[18] Nominal currency figures were provided in *Wind for a Euro*; any values referenced in this report have been inflated to real 1st January 2024 currency.

2 Results and implications

2.1 Costs and savings of renewables

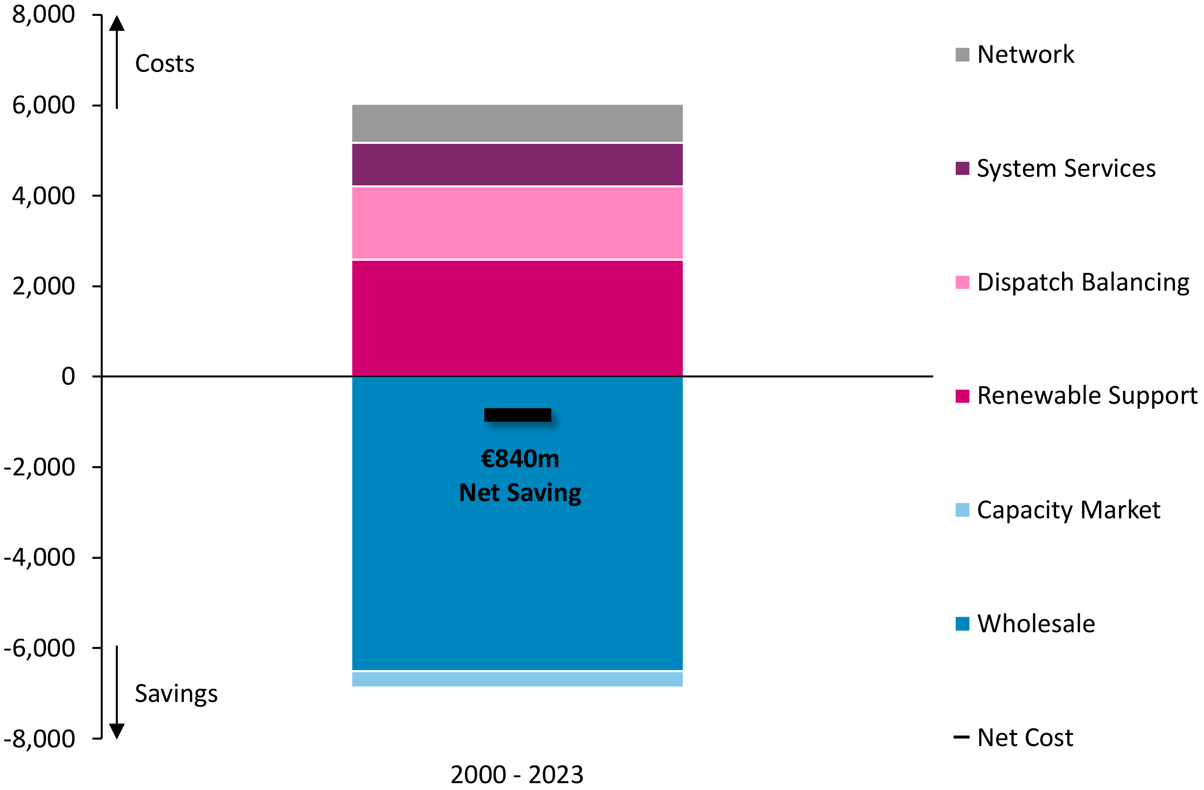
2.1.1 The consumer impact to date

Our analysis reveals that the adoption of wind and solar generation technologies in Ireland has saved end consumers a total of €840 million between 2000 and 2023.

This saving has been realised on the electricity bills of all consumers – every household in Ireland, and all businesses across the commercial, agricultural and industrial sectors – and equates to an average saving[19] of almost €165 per person[20].

Each of the cumulative costs and savings offered by renewables, presented in Figure 5 below, has been evaluated using the results of *Wind for a Euro* between 2000 and 2017, and our updated backward-looking analysis for 2018 to 2023.

Figure 5: Cumulative consumer costs and savings in Ireland from 2000 to 2023, million euros



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[19] We have calculated this figure by dividing the total net saving by the population of Ireland. It therefore considers that savings conferred to businesses are ultimately passed on to individuals, rather than just the savings on domestic electricity bills.

[20] **Census of Population 2022**, Central Statistics Office (CSO)

The majority of the saving, around 95%, has been driven by a reduction in the wholesale cost of power; in total more than €6.5 billion has been saved by the displacement of more expensive, and more carbon-intense, generation technologies, such as gas- and coal-fired power stations. The contribution of wind and solar generation to security of supply has lowered the cost of procuring capacity in the CRM by around €360 million in Ireland since the first capacity auction in 2017.

These savings have outweighed the net costs incurred, including support of renewable projects through the AER, REFIT and RESS schemes (€2.6 billion), dispatch balancing to maintain operational constraints (€1.6 billion), increased procurement of system services (€970 million), and a need to upgrade the transmission and distribution networks (€860 million).

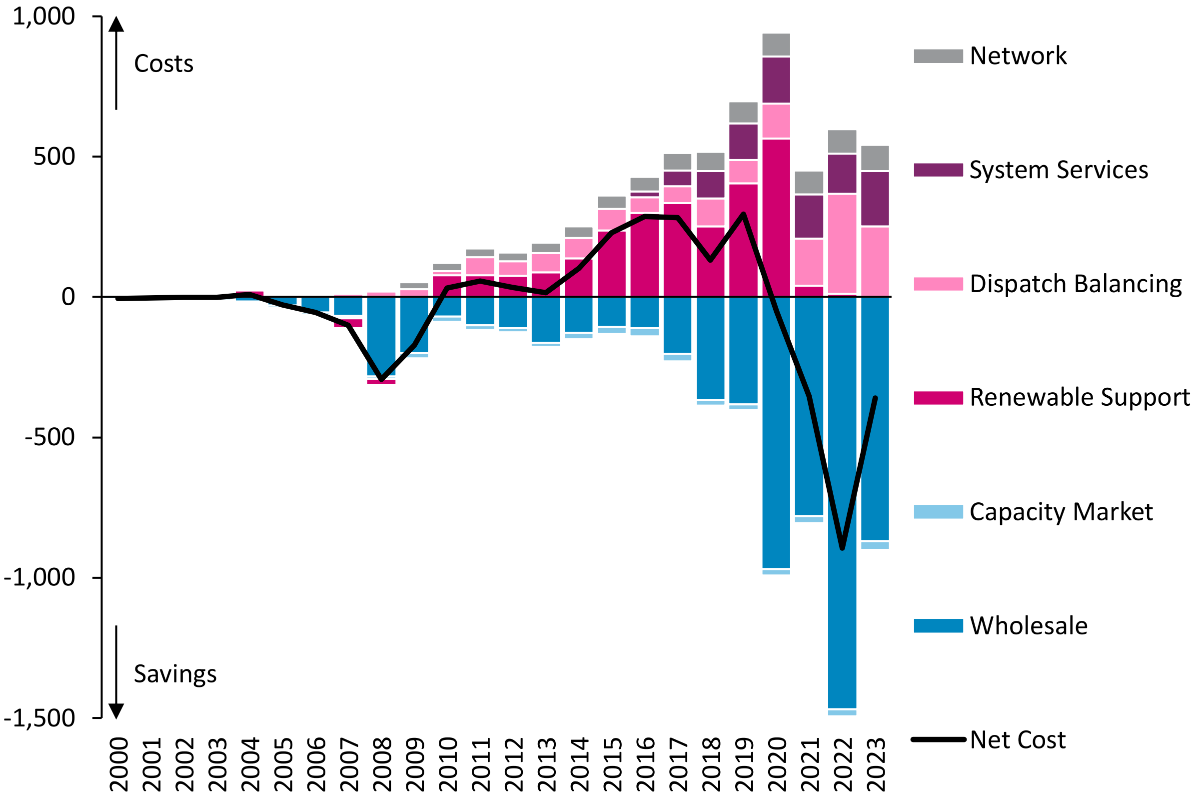
Figure 6 below illustrates the change in each cost and benefit over time. The cost of supporting renewables, primarily through the REFIT scheme, and balancing a system with increased volatility, was enough to outweigh the wholesale cost savings over the first two decades of the millennium.

Elevated commodity prices in 2008 and 2009 led to a period of net savings to consumers, before rising support costs, and relatively low fuel prices, resulted in a net cost during the 2010s. Between 2000 and 2019, renewables had conferred a net cost of around €820 million to Irish consumers.

Since 2020 however, renewables have paid dividends far in excess of the initial net cost, by helping to insulate Irish consumers during a period of spiralling costs.

Our analysis shows that wind and solar farms have reduced consumer power bills in Ireland by almost €1.7 billion since 2020, unlocking a net saving equivalent to €320 per person conferred to consumers across all sectors.

Figure 6: Annual consumer costs and savings in Ireland from 2000 to 2023, million euros



This saving, and the individual costs and benefits underlying it, are presented below in Figure 7.

In 2018 and 2019, the cost of integrating renewables, driven by REFIT support costs and an increasing cost for system services through the DS3 scheme, outweighed the savings conferred in the wholesale market for the final time.

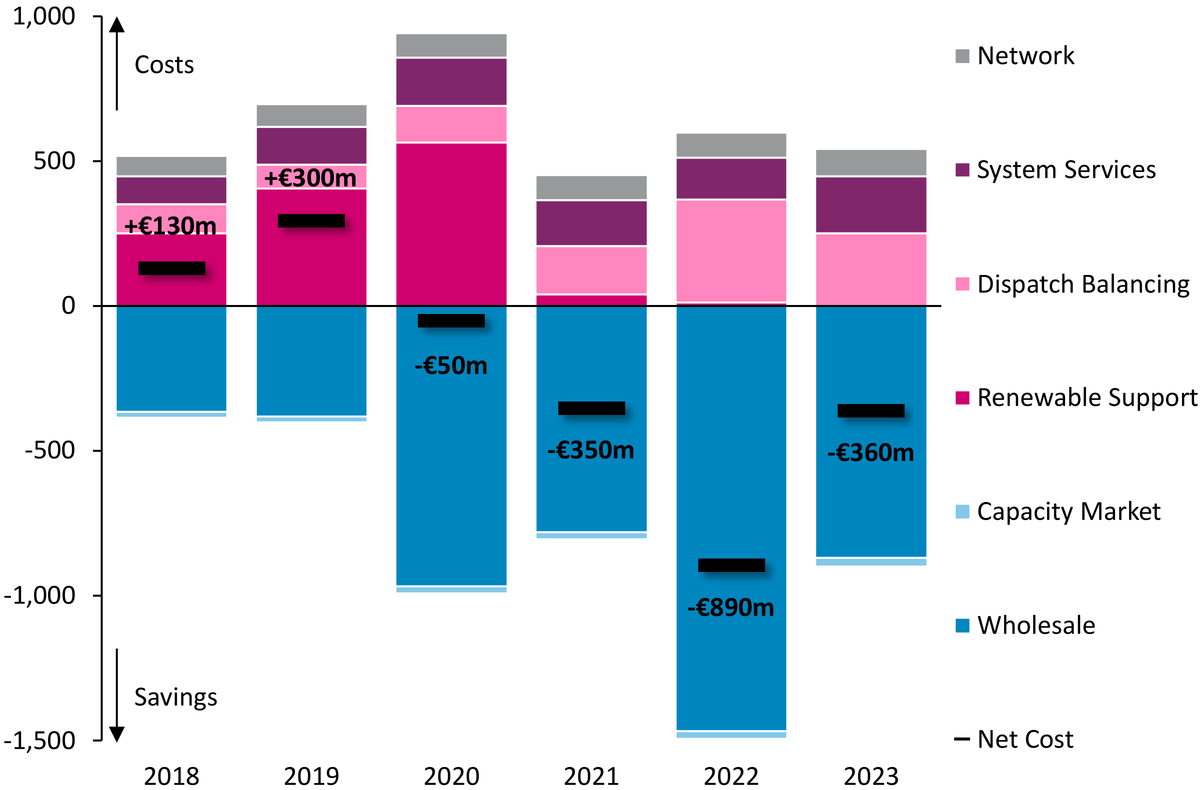
Relatively high wind speeds in 2020 drove significant savings in the wholesale market, with low-cost renewable energy decreasing day-ahead prices by almost 30 €/MWh. The resulting €970 million saving conferred to consumer bills, along with a €25 million benefit in the CRM, outweighed the cost of renewable support (€560 million), dispatch balancing (€125 million), system services (€170 million) and network development (€85 million). A net saving of €50 million was realised on consumer bills, outside of the period of elevated commodity costs that followed.

Rising commodity prices through 2021, driven to extremes by the Russian invasion of Ukraine in February 2022, pushed the cost of electricity, closely coupled to the cost of gas, to record levels throughout Europe.

By displacing expensive gas-fired generation from the all-island power market, wind and solar projects reduced power prices by up to 40 €/MWh annually, wiping a total of €3.1 billion of wholesale power cost from Irish power bills between 2021 and 2023.

Payments made by wind and solar projects supported by the RESS scheme, which pay back some of their revenue to consumers during periods of heightened power prices, outweighed the cost of supporting wind farms under REFIT in 2023. A 'negative support cost' of €2 million was paid to consumers, before any other savings are accounted for.

Figure 7: Annual consumer costs and savings in Ireland from 2018 to 2023, million euros



2.1.2 The potential impact of 80% renewable electricity

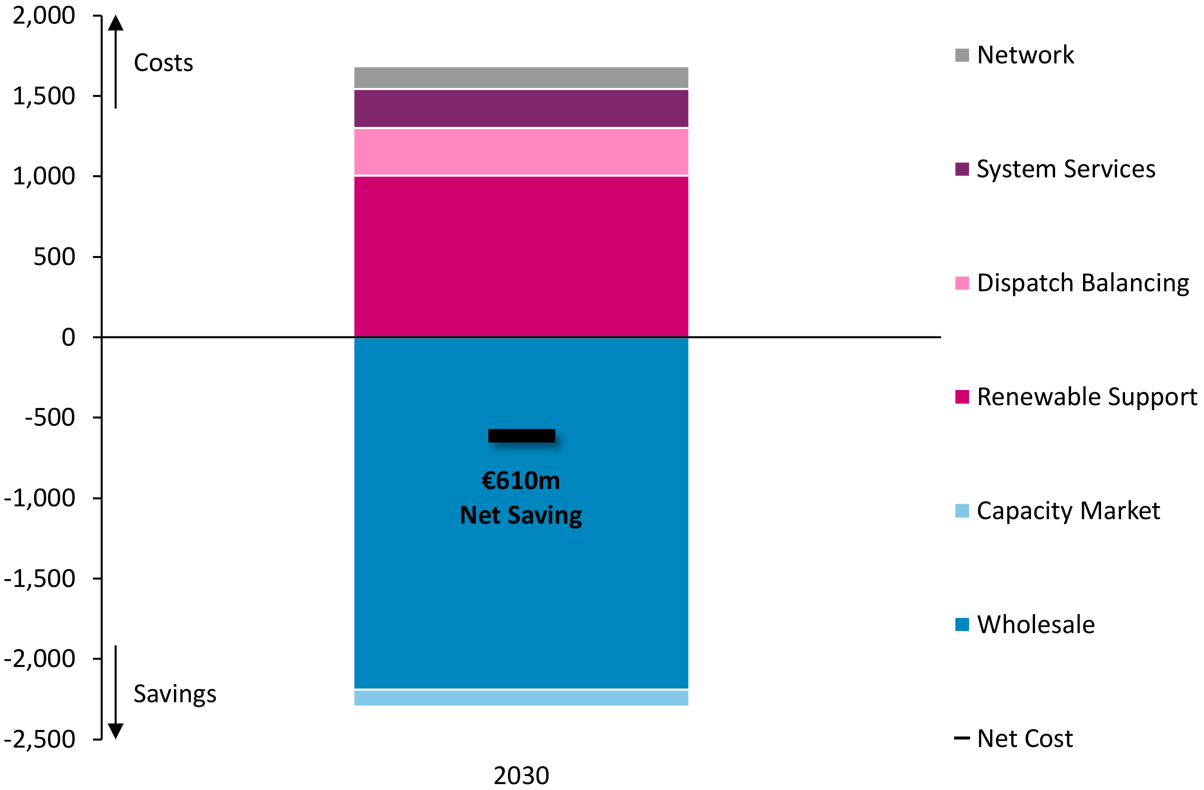
Continued investment in wind and solar generation could offer a further annual net saving of €610 million in 2030, if the 80% renewable electricity target is achieved.

This saving, realised on the bills of all consumers, does not include any of the sustained benefit offered by existing renewables. Wind farms would continue to produce low-cost power after their REFIT contracts expire, without support from consumers. We have calculated our results, presented in Figure 8 below, relative to a baseline with no renewable capacity growth after the end of 2023.

The cost of providing support through RESS and ORESS contracts to the assumed 2,800 MW of new-build onshore wind, 3,100 MW of offshore wind, and 4,800 MW of solar PV, totals €1 billion in 2030. New projects drive dispatch balancing costs up by around €300 million annually, with pressure from increased renewable generation at the day-ahead stage partially offset by progress made in unwinding key operational constraints, such as achieving a 95% SNSP limit. An additional €240 million is required to procure system services, under the assumption that the nominal budget increases by a factor of three from today. A final €140 million is incurred to upgrade network infrastructure.

The total cost above (€1.7 billion) is outweighed by the €2.2 billion saving conferred by reduced wholesale prices. This scale of this benefit, larger than any historically, results in part from a near 50% increase in power demand assumed by the TSOs, driven by growth in data centre loads and electrification of heat and transport. Greater impact is seen as renewable penetration increases, driving low prices for sustained periods. Market prices are reduced by 50 €/MWh on average, almost 40%. A saving of €105 million is made in the CRM, due to a reduced need for new thermal capacity.

Figure 8: Additional consumer costs and savings in Ireland in 2030, million euros



2.2 Carbon savings and other benefits

2.2.1 Reduced reliance on fossil fuels

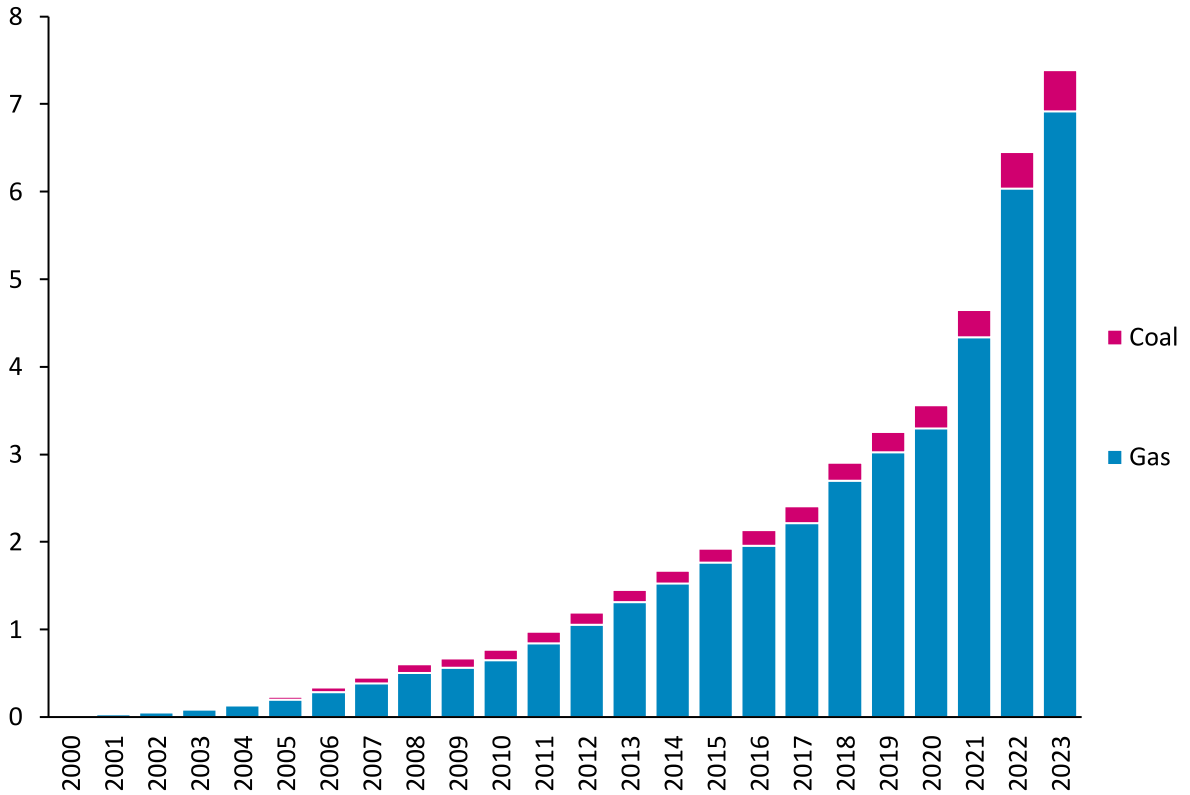
As well as lowering the cost of electricity for end consumers, the displacement of fossil fuel-fired generation by renewables has also reduced Ireland's reliance on carbon-intense fuels, and exposure to volatility in their prices. The cumulative avoided cost of gas and coal between 2000 and 2023 is presented below in Figure 9.

We calculate renewable generation to have displaced more than 19 billion cubic meters (bcm) of gas, and more than 3 million tonnes of coal, from the Irish power sector between 2000 and 2023, equivalent to around 190 and 25 terawatt-hours (TWh) respectively. The volume of displaced gas alone is enough to heat every household in Ireland for nine years[21].

The combined value of avoided fossil fuels totals €7.4 billion, with €3.8 billion saved in three years between 2021 and 2023. Renewable generation avoided the need to burn €1.8 billion worth of gas and coal in 2022 alone.

Although we have assumed that the cost of gas decreases from the elevated prices seen over the last few years, our analysis suggests that achieving 80% renewable electricity would displace a further €1.7 billion worth of gas, compared to a scenario with no development of renewables after 2023.

Figure 9: Cumulative avoided cost of gas and coal in Ireland from 2000 to 2023, billion euros



[21] **CRU Approves Gas Network Tariffs for 2024/25**, Commission for Regulation of Utilities (CRU)

2.2.2 Avoided CO_2 emissions

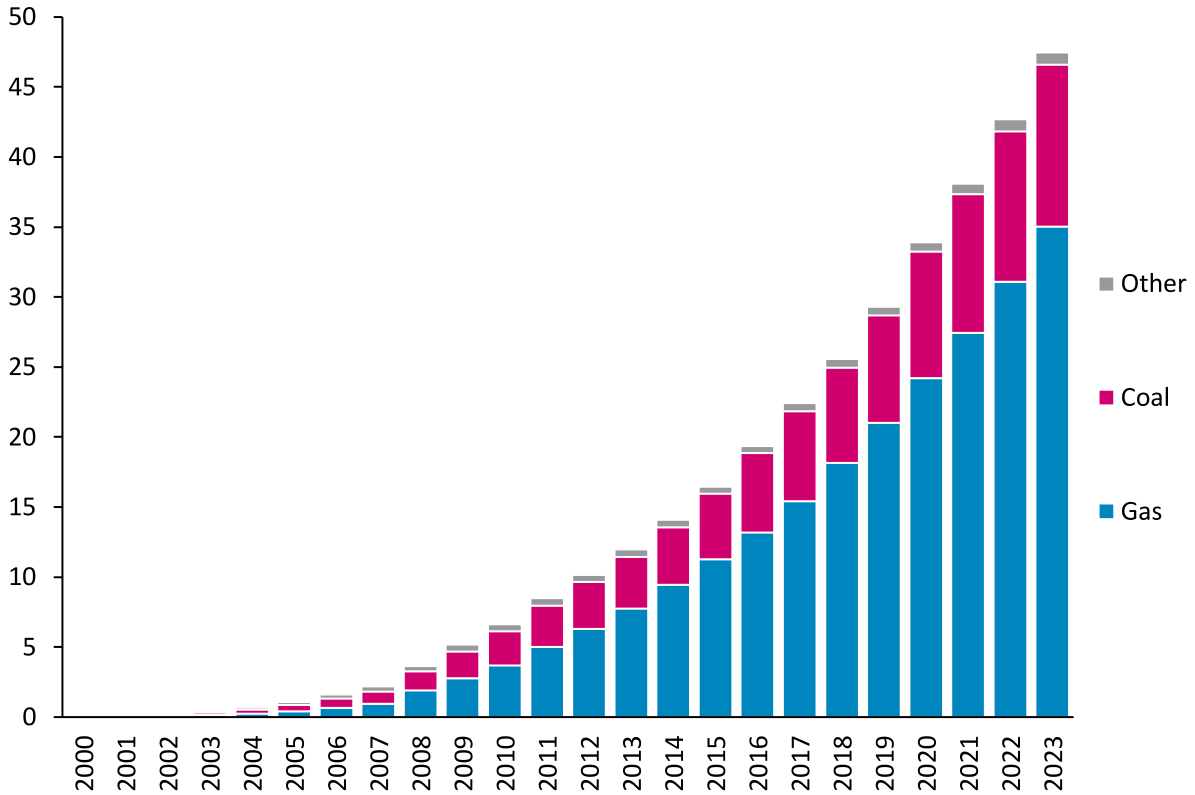
The displacement of fossil fuels from the Irish generation mix has reduced not just consumer costs, but also emissions of CO_2. The cumulative volume of CO_2 emissions displaced from the Irish power sector since 2000 is presented below in Figure 10.

Our analysis shows that renewables have displaced more than 47 million tonnes of CO_2 from the power sector between 2000 and 2023, more than six times the sectoral total in 2023[22]. This volume of avoided CO_2 is equivalent to the lifetime emissions of more than 1.1 million mid-sized cars[23], 40% of the total vehicle fleet in Ireland[24].

Avoided CO_2 emissions have increased with the penetration of renewables. An average of 4.2 million tonnes has been avoided from the power sector each year between 2018 and 2023, with 20% of these being from carbon-intense coal-fired generation.

Our analysis suggests that new renewables can continue to drive down CO_2 emissions going forward; achieving 80% renewable electricity would reduce power-sector emissions by an additional 8 million tonnes in 2030, compared to a scenario in which no further investment is made into wind and solar capacity after 2023.

Figure 10: Cumulative avoided CO_2 emissions in Ireland from 2000 to 2023, million tonnes



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[22] **Energy in Ireland 2024 Report**, Sustainable Energy Authority of Ireland (SEAI)

[23] **Comparative life-cycle emissions of a mid-size BEV and ICE vehicle**, International Energy Agency (IEA)

[24] **Road Traffic Volumes**, CSO

3 Methodology overview

3.1 Calculating end consumer savings

3.1.1 Reduced cost of wholesale power

The absence of a 'fuel cost' for wind and solar generators results in their being inexpensive to generate, once commissioned. A near-zero running cost places them around the bottom of the 'merit order' in each hour, the hierarchy of available generators ordered from lowest cost per MWh (bottom) to highest (top). The hourly day-ahead price, paid to all generators, is set by the generating unit with the highest running cost. By generating in the day-ahead power market of the SEM, renewables displace more expensive plant higher in the merit order, and lower the day-ahead price for wholesale electricity.

We have used our in-house representation of the power markets across Europe to simulate this effect and quantify the impact on end consumer costs in Ireland. Further detail on this model is provided in Appendix A.1.

To assess the potential saving between 2018 and 2023, we first configured our model with available outturn data, including demand, commodity prices, installed capacity by technology, and renewable generation. Key input assumptions are presented in Appendix B.

With the inputs aligned to historical outturn, we have modelled two simulations recreating the all-island day-ahead market, one with renewable generation from wind and solar farms included, and a second 'counterfactual' run, without. To maintain security of supply in the counterfactual, we have assumed that the equivalent de-rated capacity margin is reached by the commission of open-cycle gas turbine (OCGT) assets[25]. De-rating factors by technology have been aligned with the values used in the latest T-4 CRM auction at the time of the analysis[26].

An analogous approach was taken for our forward-looking analysis, with projections for key assumptions built up from public data sources, and Baringa assumptions. One run was simulated with wind and solar capacities optimised to meet the 80% renewable electricity targets in both jurisdictions[27], and a second with no additional build of wind or solar assumed from the end of 2023.

We have calculated the savings passed on to Irish consumers from reduced wholesale power prices in each time horizon, by multiplying the hourly change in price by the hourly end-user demand in Ireland.

[25] We have also constrained the hourly interconnector flows in the counterfactual to their optimised positions from the simulation with renewables, to ensure that imports from Great Britain (GB) did not obscure the results of the study.

[26] **2028/29 T-4 Capacity Auction Initial Auction Information Pack**, Single Electricity Market Operator (SEM-O)

[27] We have assumed a capacity overbuild of approximately 5% to account for renewable generation lost to 'constraint', dispatch down induced by congestion on the network. The network reinforcements included in our cost assumptions are assumed to maintain constraint at a similar level to that seen in Ireland today.

3.1.2 Reduced costs in the capacity market

By contributing to the de-rated capacity margin of the SEM, wind and solar generators reduce the need to procure additional thermal capacity to maintain security of supply.

We have calculated the avoided cost in the CRM by comparing the cost incurred to contract the OCGTs in the counterfactual scenarios, assuming contract prices of 120 €/kW and de-rating factors of 83%, against the payments that would be made to renewables.

Wind and solar projects supported by CfD contracts in both jurisdictions are assumed to not incur a cost to consumers, with any revenue in the CRM being netted off from support payments. This assumption is aligned with the contract rules of the REFIT and RESS schemes in Ireland, and is assumed to apply to any equivalent future mechanism in Northern Ireland. Capacity supported by the legacy Northern Ireland Renewable Obligation (NIRO) scheme, under which support payments are not reduced, are conservatively assumed to incur a net cost in the CRM at the same 120 €/kW contract price as the OCGTs. De-rating factors of around 6% and 4% have been assumed for wind and solar respectively.

The net saving offered by renewables has been apportioned to each jurisdiction using the split of end-user demand.

3.2 Calculating end consumer costs

3.2.1 Renewable support costs

The build-out of wind and solar to date in Ireland has been supported through three government-backed routes-to-market; the legacy AER and REFIT schemes, and the RESS scheme, for which contracts are still available through auction rounds.

Ireland's first support mechanism, AER, provided support to renewable projects successful in any of six competition rounds between 1995 and 2003. Support for the last remaining AER-backed onshore wind project ended at the close of 2021.

We have assumed that the cost of supporting renewables through AER aligns with the figures published in the PSO Levy Decision Papers[28], which set out estimates for the cost conferred to consumers through the PSO levy for the upcoming year. Where published costs are ultimately over- or underestimates, an 'R-factor' is applied to consumer bills. We have assumed that the R-factors do not include any correction to the cost of supporting assets through AER between 2018 and 2023, due to the low cost of the scheme relative to other components of the PSO levy.

Under the REFIT scheme, which provided contracts to renewables through three procurement rounds between 2006 and 2015, generators receive a guaranteed minimum strike price for each MWh of electricity produced. Contracts for onshore wind, available through REFIT 1 and REFIT 2, provide top-up payments through a one-way CfD mechanism; providing additional revenue if the annual revenue of a project (the 'market payment') is below the strike price.

[28] **PSO Levy Decision Paper 2024/25**, CRU

Under a REFIT 1 contract, a project will receive a 'balancing payment', which is indexed to the Irish Consumer Price Index (CPI), for every MWh of generation[29]. These payments are additional to those received under the one-way CfD, with a strike price set by a technology-specific 'reference price', also indexed to CPI. The terms of REFIT 2 differ in that a nominal 9.9 €/MWh balancing payment is added to the technology-specific, and CPI-indexed, reference price to make up the strike price of each project[30]. If the market payment exceeds the reference price, then some or all of the balancing payment is held back from the project. The market payment in each support round consists of the lower of the day-ahead market price, and a blend of the day-ahead price and the imbalance price in the balancing market (BM)[31].

To calculate the PSO cost conferred to Irish consumers to support wind farms under REFIT 1 and REFIT 2 contracts, we have compared the day-ahead market revenue earned by the assets in our model runs to their respective strike prices[32]. To reflect the potential for increased payments if the imbalance price falls below the day-ahead price, we have set the market payment for onshore wind farms at 90% of their day-ahead market revenue in our modelling. Finally, we have compared the support costs for assets under each round of the scheme between the two scenarios of each time horizon, to determine the additional cost conferred to consumers.

The RESS scheme has been providing two-way CfDs to onshore wind, offshore wind, and solar PV assets successful in five auctions since 2020; four onshore ('RESS') and one offshore ('ORESS'). Under a RESS contract, a generator receives a fixed strike price for each MWh of production, whether their day-ahead revenue is below or above it. The contract rules under each auction contain minor differences, particularly around strike price indexation and compensation for dispatch down. The strike prices of RESS 1 and RESS 2 are not linked to inflation, with partial indexation[33] provided in RESS 3, RESS 4, and ORESS 1 contracts. Compensation for oversupply[34] and curtailment[35] is also provided for capacity supported by RESS 3, RESS 4, and ORESS 1 contracts. Contracts do not pay out during hours of negative day-ahead price, with those of ORESS 1 being an exception.

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[29] **REFIT 1 Terms and Conditions**, DECC

[30] **Electricity Support Schemes I-SEM Arrangements Decision Paper**, DECC

[31] This blend between day-ahead and imbalance prices is 80:20 for onshore wind farms larger than 5 MW, and 70:30 for smaller wind projects.

[32] **Reference Prices for REFIT Schemes 2024**, DECC

[33] Strike prices in RESS 3, RESS 4, and ORESS 1 contracts are 30% indexed to Irish CPI.

[34] 'Oversupply' refers to dispatch down at the day-ahead stage, resulting from an excess of available renewable generation relative to demand.

[35] 'Curtailment' refers to dispatch down resulting from a need to maintain operational constraints, such as the SNSP limit, at the system level.

We have assumed that all onshore wind and solar PV capacity commissioned in 2022 and 2023 is backed by RESS 1[36] contracts, and that 100% of the contracted capacity of RESS 2[37], RESS 3[38], RESS 4[39], and ORESS 1[40] is delivered by 2030. All additional renewable capacity modelled in our 2030 scenario is assumed to be supported through future renewable auctions, equivalent in design to the RESS scheme, and at strike prices roughly aligned to those of the RESS 4 auction:

- 85 €/MWh for onshore wind (around 91 €/MWh in nominal currency).
- 95 €/MWh for solar PV (around 105 €/MWh in nominal currency).

We have then compared the day-ahead market revenue of projects backed by RESS contracts (or an equivalent future scheme) to their strike prices, and calculated the difference in compensation between the two scenarios of each time horizon.

Any renewable capacity, either existing today or to be developed by 2030, supported instead by Corporate Power Purchase Agreements (CPPAs)[41] would lower the renewable support costs passed on to consumers relative to the figures calculated in this study. We have conservatively excluded the significant number of CPPAs inked this decade for new-build renewables.

3.2.2 Dispatch balancing costs

In addition to simulating day-ahead market arrangements, as detailed in Section 3.1.1, our model of the all-island power market has been configured with the operational constraints that are maintained by the TSOs, including the SNSP limit, min gen limits, rate-of-change-of-frequency (RoCoF) limit, regional voltage requirements, and minimum levels of inertia.

For each of the scenarios and time horizons modelled, we have performed a two-step process:

1. The model first simulates the day-ahead schedule in the SEM, in which plant are dispatched on a purely economic basis.
2. Plant are then re-dispatched in a 'constrained run', which layers on consideration of operational constraints. This simulation more closely resembles the physical operation of generation assets in the SEM.

We have calculated the cost of these re-dispatch actions, for which assets are typically remunerated at their incremental operating cost, in each model simulation. We have then compared the 'dispatch balancing costs' in the model runs with and without renewable generation, to estimate the additional cost induced by wind and solar generators. This incremental cost has been divided between jurisdictions according to the ratio of end-user demand in each.

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[36] **RESS 1 Final Auction Results**, EirGrid

[37] **RESS 2 Final Auction Results**, EirGrid

[38] **RESS 3 Final Auction Results**, EirGrid

[39] **RESS 4 Final Auction Results**, EirGrid

[40] **ORESS 1 Final Auction Results**, EirGrid

[41] A CPPA is a contract between a (typically renewable) generation asset, and a company that agrees to purchase the produced electricity (the 'offtaker'). CPPAs offer an alternative 'route-to-market' for renewable projects, outside of government-backed support schemes.

3.2.3 System service costs

The continued integration of renewables onto the SEM system has increased the need to procure system services to ensure stable operation. The total cost of system service products under the current DS3 regime is capped according to a regulated budget, which has ramped up from a nominal figure of €75 million in 2016, to €235 million by 2020[42]. In 2023 the budget was breached, with the total all-island spend reaching almost €307 million[43] over the calendar year.

We have conservatively assumed that any increase to the budget from the nominal €54 million spent in 2015 through the preceding Harmonised Ancillary Services (HAS) framework has been induced by a need to integrate wind and solar capacity onto the system, including the heightened spend in 2023.

Although the upcoming FASS scheme includes more competitive arrangements for system services procurement, the TSOs have indicated that the budget may need to increase to enable the aligned 80% ambition to be achieved by 2030[44]. We have conservatively assumed that the budget reaches €700 million in nominal terms by 2030, in line with the proposal from EirGrid and SONI, which has not been approved by the Regulatory Authorities (RAs) as of this study.

We have apportioned system service costs between jurisdictions according to end-user demand, in line with current policy.

3.2.4 Network costs

In order to integrate renewables onto the network, Electricity Supply Board (ESB) Networks have incurred costs to build, upgrade, and maintain transmission and distribution network infrastructure.

For 2030, we have based our network cost assumptions on the values published by the TSOs in their *Shaping our Electricity Future Technical Report*[45]. We have scaled the projected network costs for Ireland under their developer-led scenario, in line with the volume of renewable generation in our analysis, and annuitised the cost over an economic life of 40 years at a weighted-average cost of capital (WACC) of 4.95%. We have conservatively aligned this WACC value with the regulated return set out in Price Review 4 (PR4)[46], which applied between 2016 and 2020, rather than the lower value of 3.80% set out in PR5[47] (2021 to 2025).

We have then used a calculated € per MWh cost figure, for capital investment required to integrate renewable generation, from the 2030 analysis to inform the network costs incurred between 2018 and 2023. This figure reflects an inflated cost of network development expected between now and 2030, and conservatively assumes that new infrastructure has been required to integrate renewables over the last few years, i.e., that the low-cost option of using existing 'headroom' on the network has not been possible. We have annuitised this cost at a WACC of 4.95% and an economic life of 40 years.

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[42] **SEM-17-080 DS3 System Services Tariffs and Scalars**, SEM Committee

[43] **DS3 System Services Tariffs Consultation Document**, EirGrid and SONI

[44] **Implementation Proposal: DS3 System Services Tariff Rate Adjustment**, EirGrid and SONI

[45] **Shaping our Electricity Future Technical Report**, EirGrid and SONI

[46] **PR4 Determination**, ESB Networks

[47] **PR5 Determination**, ESB Networks

4 Conclusion

The development of wind and solar farms has reduced the cost burden on Irish consumers by €840 million between 2000 and 2023. This saving – equivalent to almost €165 per person – has been realised by the benefits of renewables outweighing their costs, and has been conferred to all consumers across the domestic, commercial, agricultural and industrial sectors.

Homegrown renewables have insulated consumers from recent spiralling fuel costs, cutting bills by an average of €320 per person between 2020 and 2023. Low-cost renewable electricity reduced the annual wholesale power price by up to 40 €/MWh, wiping almost €1.7 billion from consumer bills over four years, and easing pressure in a time of cost-of-living challenges.

If Ireland continues to invest in wind and solar projects, and achieves the national target of 80% renewable electricity, annual consumer bills could be reduced by €610 million per year. This saving has been calculated relative to a case with no investment in wind and solar farms after 2023, and so excludes any sustained savings from renewables on the grid today.

The displacement of fossil fuels has avoided the need to burn €7.4 billion worth of gas and coal between 2000 and 2023, including almost €4 billion since 2021. Renewables have reduced Ireland's exposure to volatile fuel prices by displacing 3 million tonnes of coal, and enough gas to heat every home in Ireland for nine years.

The renewable transition has avoided more than 47 million tonnes of CO_2 between 2000 and 2023, equal to the lifetime emissions of 1.1 million mid-sized cars, 40% of the total vehicles in Ireland. Our study suggests that continued investment in renewables can cut emissions further, with new renewables able to reduce power-sector emissions by more than 8 million tonnes of CO_2 in 2030.

Appendix A Further methodology detail

A.1 Baringa's power market model

Baringa has developed an in-house pan-European wholesale power market model covering the Island of Ireland, Great Britain, and mainland Europe for the purpose of power market studies. The model sits within PLEXOS[48], a third-party commercial software that is widely used in the power and utilities industry for market price projections, asset dispatch modelling, network analysis, and other purposes. Our 'Pan-EU' model is configured with key inputs and scenario assumptions such as commodity prices, plant build and retirement, and hourly demand, wind, and solar profiles, and has detailed representations of generator technical parameters and interconnection between markets.

The model engine carries out a least-cost optimisation across more than 40 interconnected European markets to project hourly generator dispatch and market prices.

The hourly demand shape and renewable resource profiles, both in the SEM and other European markets, are based on real-world outturn from a 'base weather year' of 2017, representative of a broadly 'P50' year, with limited extreme weather or demand events throughout Europe.

Wind and solar assets are modelled as aggregated units in our PLEXOS model, with load factors and output profiles characteristic of averages over multiple site locations in each region. Where support schemes incentivise variation in bidding behaviour between assets, we model several 'objects' in PLEXOS per market that reflect this behaviour. A second distinction is made according to the vintage of wind assets, with newer projects assumed to have higher load factors. We consider repowering of legacy wind plant towards the tail-end of their economic lifetimes.

The modelled representation of the all-island system closely replicates the way in which the market operates under the framework in place since the I-SEM process[49]. Generators are dispatched based on their short-run marginal costs, taking start fuel offtake, ramp rate, availability, minimum up and down times, heat rate profiles, and other technical attributes into account.

Two simulations take place in the model. In the first 'unconstrained' run, no system-level constraints are in place and plant are dispatched on a merit-order basis, representative of the day-ahead schedule. In a second 'constrained' run, the system is re-optimised taking operational constraints, such as the SNSP and RoCoF limits, into account. Generators and interconnectors are re-dispatched from their day-ahead positions in accordance with these system-level constraints. A comprehensive set of reserve requirements is also modelled in this run.

The impact of transmission constraints, beyond the constrained capacity of the network between Ireland and Northern Ireland, is not considered in either market model run.

[48] **PLEXOS**, Energy Exemplar

[49] **Developing the I-SEM**, SEM-O

A.2 Compensation for curtailment

The Clean Energy Package[50], adopted by the EU in 2019, includes a series of legislative acts and initiatives designed to facilitate the renewable energy transition across Europe. The acts of the package apply to energy markets throughout the EU, including the SEM.

Under the passed legislation, compensation should be provided to renewable projects to remunerate them for lost revenue during re-dispatch actions. Under the market rules of the SEM, a degree of compensation is available for some assets, deemed as 'firm', for constraint actions (made due to congestion on the transmission network), but no compensation is currently available for curtailment actions (made to manage system-level operational constraints). This policy has resulted in legal challenge from some market participants, who view it as being in violation of the Clean Energy Package.

The TSOs have estimated the backdated cost of remunerating all wind and solar projects in the SEM to 'market level', i.e., to recover their lost revenue excluding any state support, for both curtailment and constraint. This figure, which applies for the January 2020 to September 2025 period, stands at €158 million across both jurisdictions in nominal money[51].

Based on historical dispatch down volumes in each jurisdiction, and assumptions around the proportion of projects that are 'firm', we have estimated that 72% of this cost would be incurred to support renewables in Ireland.

Using this figure, we have estimated the cost of compensation to market level for curtailment[52] for all assets, firm and non-firm, to total around €60 million in real 2024 money between 2020 and 2023. This potential policy change would not result in a net cost being incurred by consumers in any of these four years.

If remuneration was to be made up to the 'state level', i.e., to include compensation for lost revenue through the REFIT and RESS schemes, we estimate a total cost of €180 million over the four years, compared to the total net saving of €1.7 billion found over this period in Section 2.1.

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[50] **Clean energy for all Europeans package**, European Commission

[51] **SEM-24-048 Imperfections Charges and Reforecast Report**, SEM Committee

[52] Compensation to state level for constraint actions for all renewables, firm and non-firm, has been conservatively assumed throughout our results in Section 2.1.

Appendix B Tabulated assumptions

In this Appendix we present a selection of the key input data used within the power market modelling exercise of our study:

- Table 1 presents assumed commodity prices, constraints, and interconnection capacity.
- Table 2 presents demand and capacity assumptions for Ireland.
- Table 3 presents demand and capacity assumptions for Northern Ireland.

Table 1: All-island power market modelling assumptions

All-Island	Units	2018	2019	2020	2021	2022	2023	2030
Commodity & Carbon Prices								
Crude Oil Brent	*$/bbl*	87	77	51	80	104	83	90
Coal CIF ARA	*$/tonne*	112	74	60	134	303	129	74
Gas NBP	*€/MWh*	29	17	12	53	87	39	29
Carbon EUA	*€/tCO$_2$*	19	29	29	61	85	86	108
DS3 Limits								
SNSP limit	*%*	65%	65%	65%	70%	75%	75%	95%
RoCoF limit	*Hz/s*	0.5	0.5	0.5	1.0	1.0	1.0	1.0
Minimum inertia	*MWs*	23,000	23,000	23,000	23,000	23,000	23,000	20,000
System stability - SEM	*#*	-	-	-	-	-	-	4
System stability - ROI	*#*	5	5	5	5	5	5	-
System stability - NI 1	*#*	3	3	3	3	3	3	-
System stability - NI 2	*#*	1	1	1	1	1	1	-
Interconnection[53]								
NI to ROI	*MW*	450	450	450	450	450	450	1,950
ROI to NI	*MW*	400	400	400	400	400	400	1,900
Import from GB	*MW*	950	950	950	950	950	950	1,450
Export to GB	*MW*	580	580	805	750	900	900	1,500
Import from France	*MW*	0	0	0	0	0	0	700
Export to France	*MW*	0	0	0	0	0	0	700

[53] We have restricted day-ahead interconnector flows to zero after the 1st of January 2021 in our backcast analysis, to reflect the decoupling of the SEM and GB markets at the day-ahead stage following Brexit.

Table 2: Key market modelling assumptions for Ireland

Ireland	Units	2018	2019	2020	2021	2022	2023	2030
Demand								
Annual demand	*TWh*	33	31	32	32	34	34	45
Peak demand	*GW*	5.4	5.5	5.6	6.0	6.0	5.9	6.8
Generation Capacity - with Renewables								
Onshore Wind	*MW*	3,570	3,740	4,035	4,290	4,400	4,675	7,495
Offshore Wind	*MW*	25	25	25	25	25	25	3,095
Solar	*MW*	0	0	0	0	50	375	5,240
Gas	*MW*	4,330	3,985	3,880	3,925	3,940	4,065	4,765
Generation Capacity - without Renewables								
Onshore Wind	*MW*	0	0	0	0	0	0	4,690
Offshore Wind	*MW*	0	0	0	0	0	0	25
Solar	*MW*	0	0	0	0	0	0	445
Gas	*MW*	4,585	4,245	4,170	4,230	4,260	4,445	5,835
Other Generation Capacity								
Oil	*MW*	1,425	1,455	1,485	1,455	1,170	965	870
Coal	*MW*	855	855	855	855	820	750	0
Peat	*MW*	310	310	295	70	70	0	0
Hydro	*MW*	240	240	240	240	240	240	240
Biomass	*MW*	70	90	105	105	105	170	55
Waste	*MW*	80	80	80	80	80	80	80
Energy Storage Capacity								
Battery storage	*MW*	0	0	10	240	400	475	3,225
Pumped storage	*MW*	290	290	290	290	290	290	600

Table 3: Key market modelling assumptions for Northern Ireland

Northern Ireland	Units	2018	2019	2020	2021	2022	2023	2030
Demand								
Annual demand	*TWh*	7.3	7.8	7.8	8.5	8.1	7.8	11
Peak demand	*GW*	1.3	1.4	1.4	1.5	1.5	1.5	2.3
Generation Capacity - with Renewables								
Onshore Wind	*MW*	1,255	1,260	1,260	1,340	1,345	1,365	3,125
Offshore Wind	*MW*	0	0	0	0	0	0	0
Solar	*MW*	255	265	265	270	280	280	990
Gas	*MW*	1,270	1,020	1,020	1,020	1,020	1,020	1,725
Generation Capacity - without Renewables								
Onshore Wind	*MW*	0	0	0	0	0	0	1,365
Offshore Wind	*MW*	0	0	0	0	0	0	0
Solar	*MW*	0	0	0	0	0	0	280
Gas	*MW*	1,375	1,125	1,125	1,130	1,130	1,135	1,910
Other Generation Capacity								
Oil	*MW*	485	485	535	510	535	525	545
Coal	*MW*	475	475	475	475	475	475	0
Peat	*MW*	0	0	0	0	0	0	0
Hydro	*MW*	5	5	5	5	5	5	5
Biomass	*MW*	0	0	0	0	0	0	0
Waste	*MW*	30	30	30	30	30	30	30
Energy Storage Capacity								
Battery storage	*MW*	10	10	10	110	160	210	625
Pumped storage	*MW*	0	0	0	0	0	0	0

Appendix C About Baringa

Founded in the UK in 2000, Baringa is now a leading advisory business working with global clients from hubs across the UK, North America, Europe, Asia, and Australia.

We set out to build the world's most trusted consulting firm – creating lasting impact for clients and pioneering a positive, people-first way of working. We work with everyone from FTSE 100 names to bright new start-ups, in every sector. The largest management consultancy in the UK to attain B corporation status, putting people first and creating impact that lasts is the ethos underpinning everything we do at Baringa.

At Baringa we want to be the first choice for talent, clients and communities who share our ambition to solve the toughest challenges. We help our clients by working with them to analyse and design markets and policy, determine strategy and investment decisions, identify new commercial opportunities, and manage risk and structure and run more effective organisations. All underpinned by a depth of energy market modelling which is as strong as any in the world.

We've been voted a 'Great Place to Work' 15 years running and recognised for our commitments to women and well-being in the workplace. Our original focus on energy and utilities has been retained as Baringa has grown and in 2024 for the seventh consecutive year, we achieved Gold.

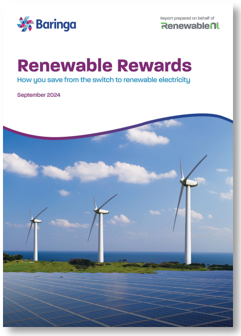
Find out more at baringa.com or on LinkedIn and Twitter/X.

More from Baringa

Renewable Rewards

In this study, commissioned by RenewableNI, we quantify the savings that renewables have conferred to the power bills of end consumers in Northern Ireland since 2000. We then turn our attention forward to the potential further savings if Northern Ireland's renewable ambition for 2030 is achieved.

Read our report



The Corporate Catalyst

In this study, commissioned by Amazon, we explore the impact of enabling cross-border procurement of renewable electricity by corporates. Our analysis suggests that this single change to carbon accounting rules could unlock a faster, cheaper, and more equitable global energy transition.

Read our report