KPMG

Act Now

Accelerating onshore renewable energy in Ireland

An industry stakeholder consultation on behalf of Wind Energy Ireland

KPMG Ireland

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Table of Contents

Foreword

Wind Energy Ireland welcomes this consultation report conducted by KPMG. We believe it is a valuable piece of industry research with important findings which come at a critical time for our industry.

The targets set out in the Climate Action Plan – that 80 per cent of our electricity should come from wind and solar power by the end of 2030 – requires an unprecedented effort across the private sector, regulators and the organs of the state, to deploy renewables in a short number of years. Unfortunately, as this report sets out, as a country we are simply not doing enough.

This report finds that more than 95 per cent of the top experts in the Irish renewable energy industry consulted by KPMG do not believe that the Climate Action Plan targets will be achieved.

This is not for the want of a pipeline of renewable energy projects, or indeed capital. The challenges we face are systematic. We lack the processes, policy, organisation, and dedicated resources necessary to decarbonise our electricity system.

This year has seen the most onshore wind energy capacity enter the planning system than any year previous. Industry is answering Ireland's call to deliver for the 2030 climate action targets, achieved by our members tirelessly working with landowners and communities across the country. However, they are entering a planning system which is unable to meet applications with efficient and timely processing.

Our planning authorities, at local and national level, lack the resources, expertise and capacity to do the job required of them. Meanwhile, the Government and local authorities are out of sync. National efforts to accelerate the delivery of renewable energy are being impeded by county councils across Ireland amending County Development Plans, which can increase the risk of prolonging Ireland's dependence on fossil fuels.

Furthermore, projects that do receive planning permission often face an indefinite amount of time in the courts system where judicial reviews are now so common that they are routinely built into project timelines. Amongst European countries, the length of this process is unique to Ireland.

The arduous planning process is faced by another potential bottleneck: grid connections. We simply do not have an electricity grid strong enough to accommodate the pipeline of wind and solar projects that will achieve our renewable electricity targets. To build a grid fit for the 21st century, EirGrid now has a new strategy, Shaping Our Electricity Future 1.1. It must be given the support – from our elected representatives, our media, our business community and all those committed to climate action – that was not provided to Grid25. It is critical that the development of grid is supported and ultimately is a success.

There are people in the Oireachtas, in Government departments, State agencies, the system operators and the regulator who are trying to fix these problems. Their commitment to Irish energy independence, to responding to the climate emergency, matches our own. However, they too are under-resourced and are poorly coordinated across the critical areas of planning, grid development, route-to-market, and development.

The lack of joined-up thinking across these areas, of a commitment to a shared set of goals, to support the delivery of onshore renewable energy in Ireland is a major impediment to solving these problems.

We are now seven years – 84 months – away from the deadline for our target in the Climate Action Plan and we are connecting onshore wind farms at less than half the annual rate required.

Notwithstanding the above, I am personally of the belief that the 2030 target of 80 per cent renewable electricity is – just about – achievable. This report by KPMG, and the recommendations it contains, represents the best thinking in our industry of what we can do to achieve that. We do not claim it is perfect nor that we have a monopoly on good ideas. However, we have reached the point where hope and wishful thinking cannot substitute for action and determination.

Our industry is ready to deliver. It is time that Ireland creates a planning system that can build a zero-carbon society. It is time to actively campaign for a strong electricity grid, to lead the fight for Irish energy independence and to take our place globally as a climate action leader.

Noel Cunniffe
CEO, Wind Energy Ireland

Introduction

KPMG was engaged by Wind Energy Ireland to carry out a consultation with key stakeholders across the renewable energy industry in Ireland to identify what these stakeholders regard as the key issues, that if addressed would result in greater and more speedy deployment of renewable energy generation assets in Ireland to help deliver the national decarbonisation ambition. Stakeholders generally felt that most issues could be addressed by way of government policy, targeted capital investment, increased resources, or by other measures laid out in this report.

The consultations took place during the first half of 2023 which was a period of policy evolution on a number of fronts in the energy sector which has continued to evolve in the second half of the year. The range of stakeholders interviewed by KPMG included developers, investors, professional advisors, state agencies, policymakers, and community actors.

This report seeks to summarise the findings of the consultation, the issues identified and consultees' recommendations as to how they might be addressed. This report seeks to broadly categorise the issues across the following themes: Ireland's delivery model for renewables (which includes resourcing and the policy development matters); matters regarding the planning system; securing adequate grid infrastructure for projects; securing land for renewable energy assets; and route to market.

Timing of consultation

It is acknowledged that a consultation exercise takes views of stakeholders at a point in time, and that there are multiple industry actors, such as policymakers and regulators, actively working on many of the issues identified in this report. In particular, during Q2 2023 there was a significant number of policy announcements such as the National Hydrogen Strategy[1], EirGrid's updated Shaping Our Electricity Future Roadmap Version 1.1[2] and the Interconnection Policy Statement[3]. This is encouraging as it demonstrates that Government is listening and responding to calls from industry. While any consultation exercise has the potential to be out of date shortly after print, notwithstanding this KPMG has sought to capture feedback from all consultees as accurately as possible.

Scope of consultation

The scope of the consultation focused primarily on onshore renewable electricity generation assets. Whilst offshore wind is clearly a critical component to achieving Ireland's decarbonisation objectives, at the time of the consultation, offshore wind policy was evolving and there was a number of significant announcements in relation to the policy for ORESS 2 and Phase 2 offshore wind projects.

It is also recognised that the scale and complexity of offshore wind is such that a lot of the generation forecasted from offshore wind is unlikely to be delivered until 2030 or later which means that it is critical that there is an acceleration in the rate of deployment of onshore renewable energy projects over the remaining years of this decade, and indeed beyond.

Ireland's ambition

There was unanimity across stakeholders that Ireland can and should be a leader in Europe's energy transition. Realising Ireland's potential to generate abundant renewable energy to decarbonise our economy will require a huge national effort involving all arms of the State, the private sector, and the wider community: Achieving the Climate Action Plan 2023's targets of 8 GW solar PV and 9 GW onshore wind requires Ireland to install on average 1.8 GW onshore renewables each year for the remainder of the decade – significantly more than has been deployed to date.

James Delahunt
Partner, KPMG Sustainable Futures

1. https://www.gov.ie/en/publication/624ab-national-hydrogen-strategy/
2. https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping-Our-Electricity-Future-Roadmap_Version-1.1_07.23.pdf
3. National Policy Statement – Electricity Interconnection https://www.gov.ie/pdf/?file=https://assets.gov.ie/265251/7b3080d8-fa48-4011-9a77-1580abf8a9ff.pdf#page=null0

Consultation Feedback at a Glance

Stakeholders involved in the renewable energy industry in Ireland were interviewed about their views on challenges and potential solutions for accelerating the rate of deployment. A snapshot of some of the key responses are set out below:

Ireland's delivery model – policy and resources

- Consultees agree that resourcing is a major issue in Ireland's renewable energy sector. Many parts of the renewable energy ecosystem are already operating at capacity. There is a need for an analysis of the long term skills need and resource requirement for the sector and a joined up all of Government approach across the Department of Education, Department of Higher Education, Department of the Environment, Climate and Communications, and the Department of Taoiseach to plan for both the near and long term needs for the sector.
- All of the key public and private bodies involved in the deployment of renewable energy should establish clear peer-reviewed resource requirement plans out to 2030 and 2040 to identify those resources that are needed and by which organisation and when. This will identify and make it clear to all stakeholders where shortfalls exist, so that plans can be developed collaboratively to address these needs over the medium to long term.
- Whilst many stakeholders commended Government for the volume of policy that they have been working on in recent times, there is more required and a need for greater industry participation in the decision-making process to ensure this policy is joined up and to ensure it can enable the practical delivery of projects.

Grid

- Stakeholders broadly agreed that the grid is in need of rapid expansion and increased flexibility to support renewables. Several respondents highlighted that clear leadership and political support is necessary to ensure that communities and external stakeholders understand the importance of grid developments and are supportive of their development.
- Some stakeholders were of the opinion that transmission projects including Grid Link, Grid West and the North South Interconnector have struggled to progress due to a lack of political and public support.
- A range of stakeholders expressed concern that the grid is not being developed optimally or at sufficient speed.
- Several stakeholders identified that the 2030 targets can act as a distraction to achieving decarbonisation and net zero, and that there needs to be a greater emphasis now on planning for a 2040 grid and how the multiplicity of new technologies will be managed.

Planning

- Consultees widely reported that the Irish planning systems continues to be a major hurdle to renewable energy development and see this as a critical area for improvement. The length of and uncertainty in decision timelines combined with prevalence of judicial reviews adds project risk and can deter possible developments or investments.
- There are concerns that the planning system in particular suffers from insufficient resourcing and that this has a disproportionate effect on the ability of industry to achieve results.
- Respondents repeatedly called for increased resourcing of the planning system, increased use of private sector expertise and improvements in planning processes to address commonly encountered bottlenecks.
- While many of the objectives and reforms contained within the Planning and Development Bill 2023 were welcomed by industry, multiple stakeholders had low expectations that, as drafted, the Bill will have a significant positive impact on the development of onshore renewable energy.
- There is a need to marry national policy with County Development Plans. Over the last twelve months a significant amount of renewable energy projects that have been in the planning system are at risk due to subsequent changes in County Development Plans.

Land

- It is becoming increasingly challenging for developers to identify high quality sites with proximity to available grid for developing renewable energy projects at scale.
- Securing land for grid development remains one of the most challenging aspects in relation to land procurement for the acceleration of renewables.

Route to Market

- Stakeholders are generally satisfied with the route to market options available, listing REFIT and RESS as successful incentives.
- Many of the consultees suggested a range of changes to the current route to market system including firming of connection cost, pro-forma PPA terms, and the introduction of private wire legislation.
- The industry called for more specific policy guidance, for instance on hydrogen, private wires, and battery storage. Several of these have been published in the months after the interviews took place, demonstrating alignment and willingness to listen between industry and statutory bodies.
- In devising route to market policy, policymakers should work to ensure it is designed to attract investment from low cost of capital investors such as pension funds. Lower cost of capital means lower cost of construction, which should result in a lower cost of electricity for consumers.

Targets

- Whilst renewable energy targets are important in motivating a sector, a number of stakeholders expressed frustration at regularly changing targets which can put additional pressure on an already constrained system. Feedback from industry stated that targets appear to be announced without any thought given to whether they are practical or indeed, the best route to a net zero energy system.
- There is a perception that current targets lack sufficient supporting evidence bases and that future target setting should be conducted in a more collaborative and transparent manner so that they are realistically achievable. This would establish which key actions are needed across the industry as well as how policy should change in order to achieve those targets.
- Over 95% of industry expert stakeholders interviewed did not expect the 2030 target of 80% renewable electricity to be achieved.
- A strong message from industry was the high degree of commitment to deliver as much renewable energy by 2030 as possible. Rather than revising near term targets more consideration needs to be given to developing and achieving post 2030 targets.

A selection of key actions at a glance

Set out below is a non-exhaustive selection of key asks from the consultation which industry believe will assist in the acceleration of renewable energy development.

	Category	Action
01	**Delivery Model – Resourcing**	Prioritise an increase in resources to key statutory agencies such as the Commission for the Regulation of Utilities, EirGrid, ESB Networks, DECC, An Bord Pleanála / An Coimisiún Pleanála etc.
02	**Delivery Model – Resourcing**	Establish peer-reviewed plans of resource requirements to 2030 and 2040 for all key renewable energy agencies so that industry can support the identification and mitigation of potential resource shortfalls.
03	**Delivery Model – Resourcing**	Establish a cross-departmental working group to establish the long-term skills and resource requirements for the sector out to 2040 and beyond e.g. Government departments focussed on education, DECC, etc.
04	**Delivery Model – Policy**	Increase industry participation in the decision-making process.
05	**Delivery Model – Policy**	Improve the level of "joined-up thinking" and collaboration across key agencies.
06	**Delivery Model – Policy**	Introducing statutory time limits on decisions (for key agencies) with meaningful consequences in order to accelerate the planning and grid process.
07	**Planning**	Sufficiently resource key planning agencies including An Bord Pleanála / An Coimisiún Pleanála.
08	**Planning**	Establish a dedicated renewable energy section within An Bord Pleanála / An Coimisiún Pleanála.
09	**Planning**	Make it possible to resolve planning issues whilst in the judicial review process.
10	**Planning**	Establish "renewable acceleration areas" as set out in REPowerEU.
11	**Planning**	A direction from Government to An Bord Pleanála / An Coimisiún Pleanála and to local planning authorities recommending that national and European climate objectives are prioritised over County Development Plans.
12	**Grid**	Significantly increase the development, investment and deployment of grid infrastructure.
13	**Grid**	Further enhance the collaboration and programme co-ordination between Eirgrid and ESBN.
14	**Grid**	Increase the level of political leadership to support grid development.
15	**Grid**	Enable concurrent grid connection application processes and planning application processes.
16	**Land**	Align County Development Plans with national policy for renewable energy development areas.
17	**Route to Market**	Perform a review of the cost of developing renewable energy assets and the performance of the RESS. Use lessons learnt to improve the success rate of projects while reducing consumer cost.
18	**Route to Market**	Fully develop the regulatory framework needed to deliver a net zero power system including policy guidance on areas such as hydrogen, energy storage, interconnection and export, renewable hubs etc.
19	**Route to Market**	Complete the industry consultation and introduce effective private wire legislation as soon as possible.
20	**Targets**	Ensure any future target announcements are fully thought through with adequate industry consultation to ensure that it is understood what is required to be done in order for the targets to be achieved.

Onshore Wind Energy Pipeline 2023

Set out below is the status of the onshore wind renewable energy development pipeline as surveyed by Wind Energy Ireland as at April 2023. It illustrates that significant progress is required on the in development assets if Ireland is to reach its target of 9,000MW of onshore wind by 2030.

Where we are now

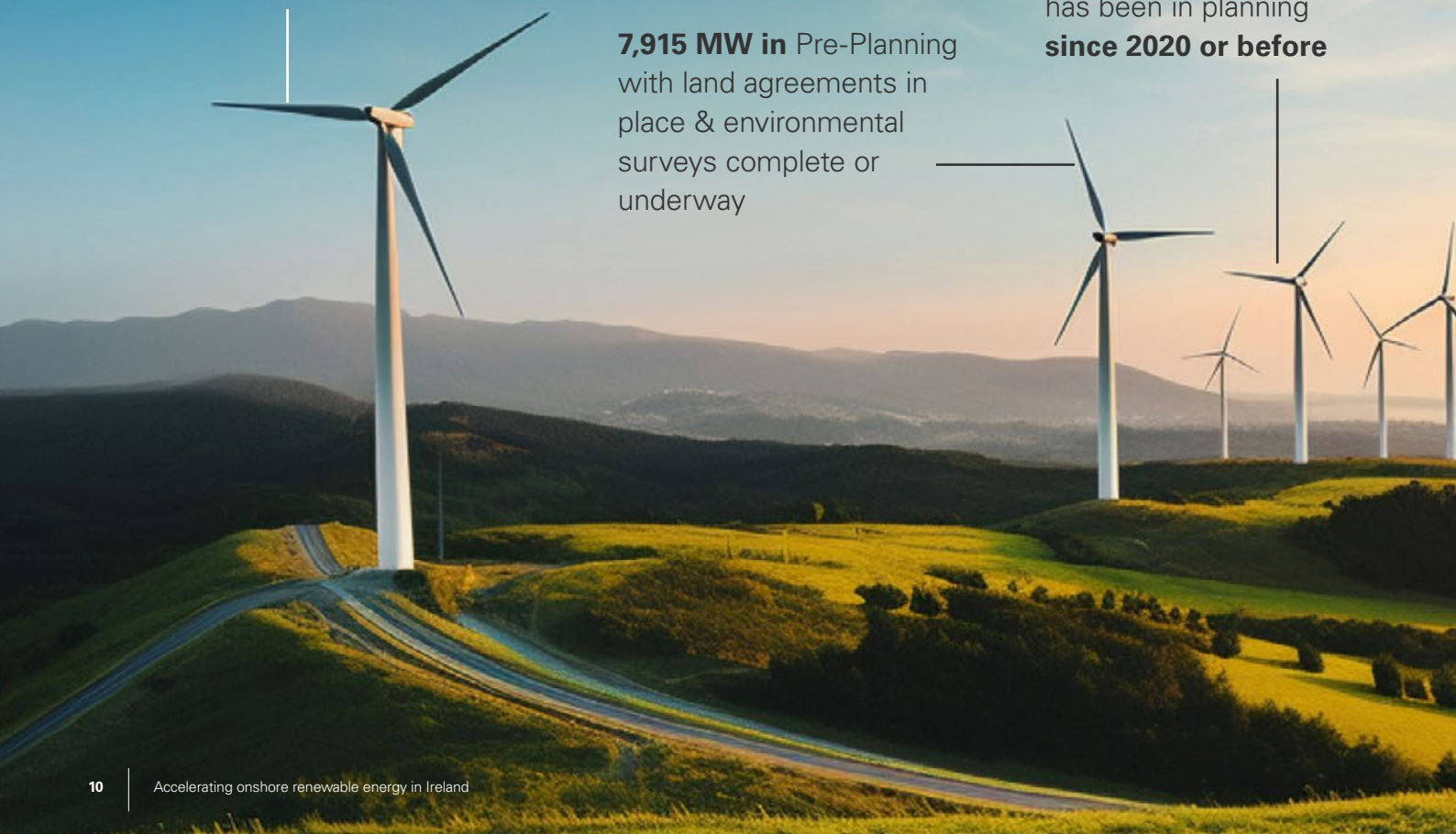
Installed capacity (as of April 2023)

4,671 MW

7,915 MW in Pre-Planning with land agreements in place & environmental surveys complete or underway

Over 1,925 MW in the planning process today.

Over **350 MW** of that has been in planning **since 2020 or before**



Key takeaways

- **Over 11 GW in development competing for 2030 delivery.**
- **Planning system is the main bottleneck - over 350 MW in the system since 2020 and over 1 GW+ has gone in for planning in 2023.**
- **Grid upgrades and reinforcements need to be delivered urgently.**
- **Acceleration of delivery is key - Onshore wind energy will save more carbon emissions this decade than any other technology in the entire Climate Action Plan.**

Where we want to get

2030 Target

9,000 MW

1,070 MW of that have secured a route to market (RESS or CPPA) and are progressing to construction

Over 1,905 MW have planning permission and have secured grid connections

Context

Energy is at the centre of several of the most pressing issues that Ireland is facing today. Climate change, security of supply, and energy prices are making headlines on a daily basis and their effects are felt by individuals, businesses, and the national economy alike.

The urgency of accelerating renewables deployment and limiting greenhouse gas (GHG) emissions has been given a further imperative in recent times by the need to mitigate the impact of Europe's dependence on Russian natural gas imports and to improve security of supply following the War in Ukraine.

The key elements of Ireland's efforts to tackle climate change are the actions and targets contained within the Climate Action Plan 2023 (CAP 23). The energy decarbonisation targets included in the plan are ambitious and reliant on electrifying large parts of the economy, which gives rise to a two-part challenge: Firstly, electricity production needs to increase significantly to support the decarbonisation of other sectors of the economy such as heating and transport through electrification. Simultaneously, total emissions from the electricity sector must decrease in order to achieve the carbon budgets and the to remain below electricity sector emissions ceiling. Delivering on these targets requires a rapid expansion of the supply of indigenous zero emission energy across all pathways available to us.

Ireland therefore finds itself in a position with broad consensus across stakeholder communities that we need to find ways to deliver renewable energy assets more quickly and at greater scale. The need to ensure that the necessary resources and processes are in place to enable the deployment of these assets is more important than ever.

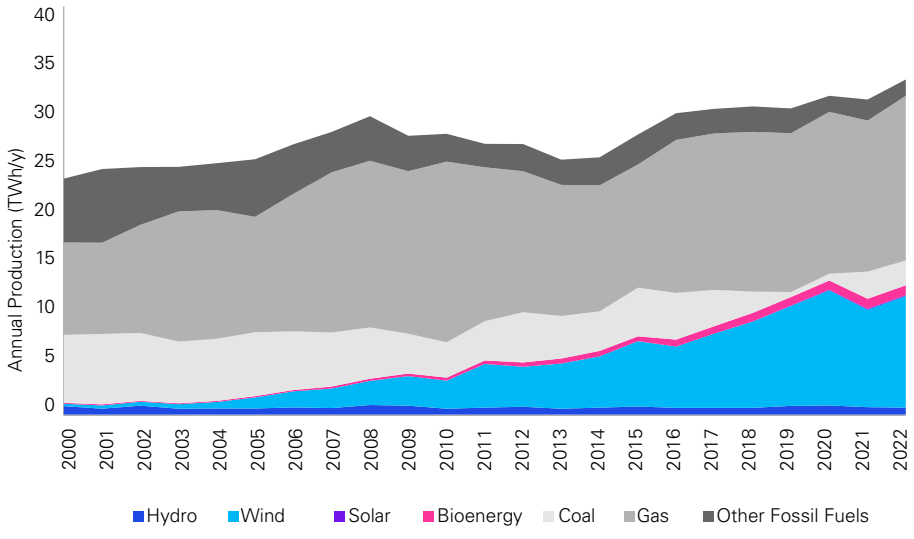
Renewable Success – The Economic Impact of Wind Generation

In addition to reducing GHG emissions and improving security of supply, the economic benefits from a supply of indigenous renewable energy is an additional societal incentive to increase renewable energy deployment. To understand the effects renewable energy can have on Ireland's future, it is helpful to consider the impacts to date. From a modest starting point, domestic renewable energy has emerged as a true Irish success story over the last two decades. Owing primarily to onshore wind development, Ireland has seen its share of renewable electricity grow from 5% in 2005 to 39% in 2022, a period of just 17 years. As a result, the carbon intensity of Ireland's electricity network has almost halved from 635 gCO_2/kWh in 2005 to 347 gCO_2/kWh in 2021[4]. Previous analysis revealed that a total of 14.3 terawatt hours (TWh) of wind generation at the day ahead stage was able to displace a total of almost €2.6 billion worth of fossil gas and carbon credits from the wholesale market in 2022[5].

Emission reductions was not the only benefit renewable energy has delivered. In 2020, Ireland's onshore wind generation industry is estimated to have resulted in an additional €1.1bn of total industrial output across operating and capital activities and supported over 5,000 jobs[6].

Estimates for 2030 show even more promising potential. The targets to deliver 8 GW of solar PV, 9 GW of onshore wind generation capacity, 7 GW of offshore wind generation capacity and 5.7 TWh of biomethane will result in more jobs and greater returns to the exchequer from the renewables industry.

Renewable electricity has displaced fossil fuel generation



4. Electricity | Energy Statistics In Ireland | SEAI
5. Baringa Wind Savings 2022 (windenergyireland.com)
6. Economic impact of onshore wind in Ireland (windenergyireland.com)

Onshore wind impacts in Ireland

Set out below is a selection of historic* and forecasted economic benefits of onshore wind in Ireland, based on a 2021 study by KPMG.

2020

4,200 MW
Installed capacity in communities across Ireland

€1.1bn
The total industrial output across operating and capital activities

€410m
Additional Gross Value Added (GVA) for the Irish economy arising from the sector's activities

5,130
Jobs throughout the sector and its supply chain

€225m
Total payments in incomes to workers across the supply chain

~€45m
Contribution to local authority rates

~€75m
Total employee and employer PRSI and employee income tax paid to the Exchequer

2030

8,200 MW
Government target (per 2021) for onshore wind generation capacity

€1.5bn
The total industrial output across operating and capital activities

€550m
Additional Gross Value Added (GVA) for the Irish economy if Government target is reached

7,020
Potential to grow jobs throughout the sector and its supply chain

€305m
Total payments in incomes to workers across the supply chain if Government target is reached

~€100m
Potential of contribution to local authority rates

~€2.7bn
Potential Gross Value Add (GVA) arising from the capital activities required to meet Climate Action Plan targets by 2030

* The forecasts for 2030 are likely to be conservative as the Government has since revised the target for onshore wind generation capacity to 9,000 MW which will require an increased level of investment.

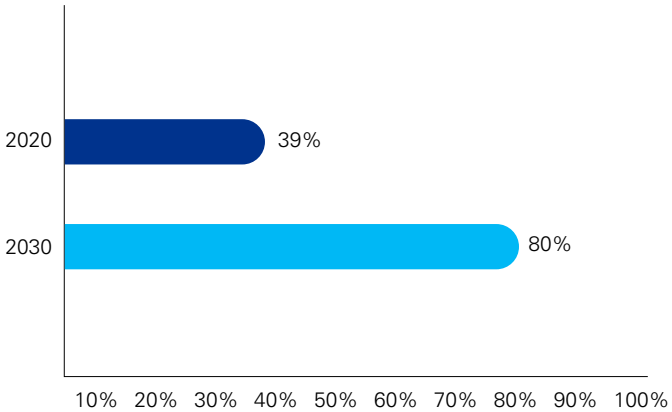
Ireland's Targets

Throughout the industry consultation there was a broad consensus among consultees that renewable electricity generation is the way of the future and support for the Government setting ambitious targets for greater deployment.

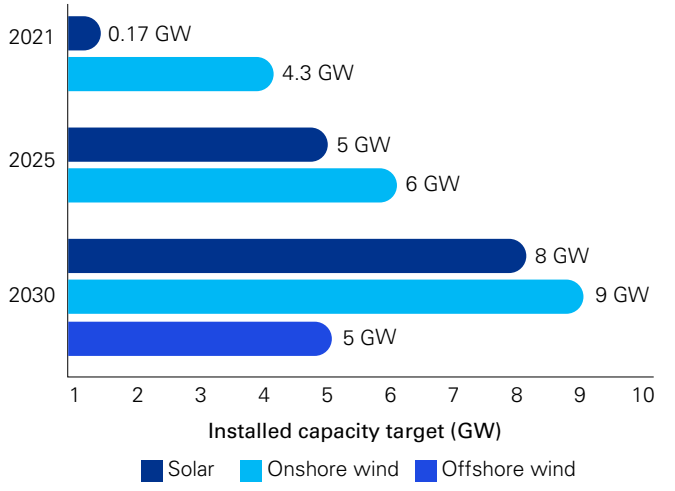
The 2030 targets for renewables development set out in the most recent update to Climate Action Plan (CAP 23)[7] are intended to enable the electricity sector to stay within the cumulative 60 Mt CO_2 sector emissions ceiling for the carbon budget periods governing 2021 to 2030. The result of this is that by the end of the decade, the proportion of electricity from renewable sources needs to double and renewable generation capacity needs to more than quadruple while significate supply of biomethane is required to decarbonise high-temperate heat. This will be achieved through continuous growth in onshore wind generation capacity, building out the currently modest solar PV capacity, constructing several large-scale offshore wind parks and delivering up to 200 anaerobic digestion facilities. To support the development of intermittent renewables, CAP 23 also mandates build-out of 2 GW of new flexible gas-fired plant generation and delivering significant demand side flexibility. Increased electricity interconnection capacity to more countries is needed as is the System Services Future Arrangements to enable the grid to operate at ultra-high levels of renewable electricity supply.

The earlier in the decade we can deploy additional renewable generation, the lower Ireland's cumulative carbon emissions will be which is likely to reduce cost and the contribution to climate change. Failure to meet Ireland's carbon budgets to 2030 will result in the need for implementing stricter carbon budgets in the period after 2030, which will be more challenging and costly to achieve. WEI have previously examined the challenge in the Bridging the Gap - Towards a zero-carbon power grid report[8].

CAP 23: Renewable electricity targets

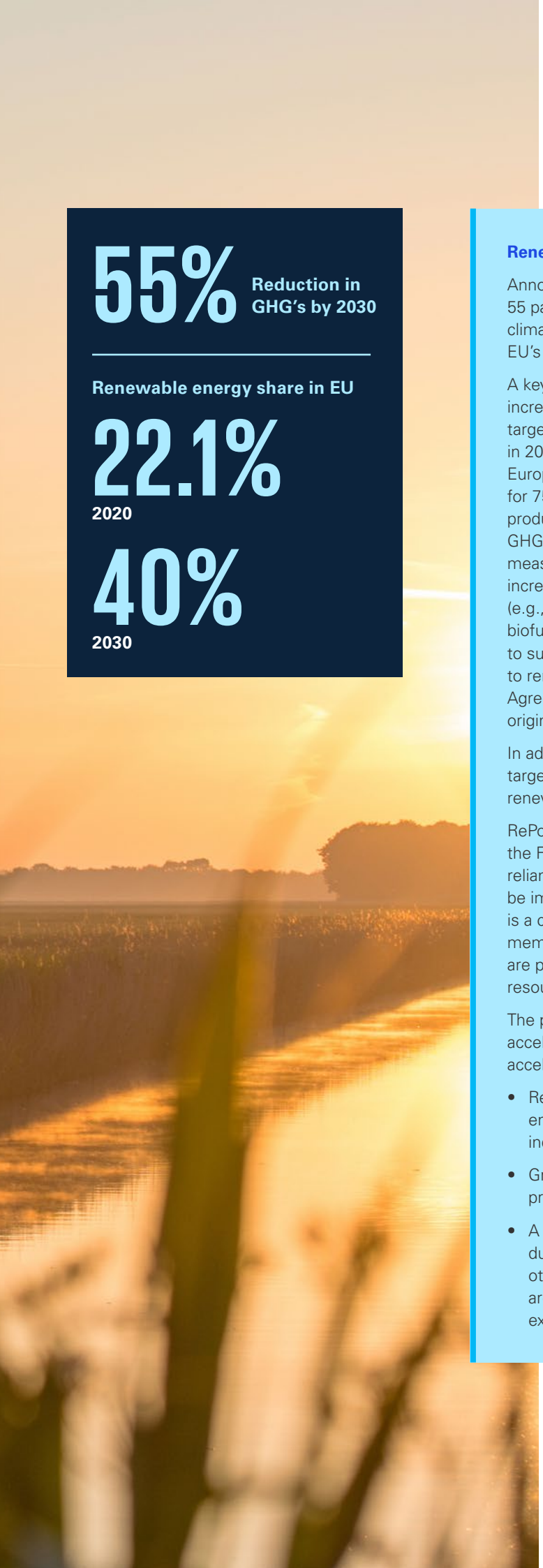


CAP 23: Renewable capacity targets



The EU's ambition to be the first net zero economy and its ambitious renewable energy targets also puts pressure on Ireland to accelerate the deployment of renewables. In the wake of the Energy Crisis, the European Commission has developed significant policy initiatives and crafted legislation to enable the rapid expansion of renewable resources. Key outputs from Brussels include the Fit for 55 package, REPowerEU (which aims to tackle the EU's dependence on supplies of Russian natural gas), as well as the European Green Deal, which was approved in 2020 prior to the Energy Crisis.

7. Climate Action Plan 23 (gov.ie)
8. https://windenergyireland.com/images/files/bridging-the-gap-a4-report-final.pdf



55% Reduction in GHG's by 2030

Renewable energy share in EU

22.1%
2020

40%
2030

Renewable Energy Directive Revision

Announced in July 2021 and prior to the war in Ukraine, the Fit for 55 package is the EU's plan for a Green Transition. The European climate law makes reaching the EU's climate goal of reducing the EU's emissions by at least 55% by 2030 a legal obligation.

A key proposal contained within the Fit for 55 package is to increase the Renewable Energy Directive's (RED) renewables target to at least 40% by 2030, up from the target of 32% set in 2018 and to revise the Energy Efficiency Directive (EED). The European Commission states that energy production accounts for 75% of EU emissions and increasing the renewable energy production target in the RED can enable the reduction of EU GHG emissions and achieve the Fit for 55 objectives. Innovative measures to be introduced as part of the recast RED include increasing focus away from classic renewable energy sources (e.g., solar PV and wind) to new types of energy such as hydrogen, biofuels and other renewable fuels. The recast directive also aims to support renewables deployment by requiring member states to remove barriers to permitting procedures and Power Purchase Agreements (PPAs) and to further develop work on guarantees of origin.

In addition to the key GHG reduction target and various other targets, Fit for 55 also aims to almost double the amount of renewable produced in Europe by the end of the decade.

RePowerEU is the European Commission's proposed revision to the Fit for 55 package for its stated objective of ending the bloc's reliance on Russian fossil fuels before 2030 and is scheduled to be implemented by July 2025. Increased clean energy production is a central action of the REPowerEU plan. The plan requires member states to nominate 'renewable acceleration areas' that are particularly suitable for the development of renewable energy resources and which pose lower environmental risk.

The plan calls for the removal and reduction of barriers and to accelerate renewable energy development in these 'renewable acceleration areas':

- Renewable acceleration areas will undergo one simplified environmental impacts assessment eliminating the need for individual project assessments.
- Grounds for legal objections will be limited as the projects are presumed to be of overriding public interest.
- A faster permit-granting process is envisaged with a maximum duration of 1 year in renewable acceleration areas and 2 years in other onshore areas. An additional 1 year will apply to offshore areas while a duration of 6 months will apply to repowering existing renewable generation sites.

A complex European and domestic policy landscape

Ireland's reasoning for and commitment to accelerating renewable deployment is clear and well-founded. However, with such a transformative change in the energy system there is a long and complex pathway from ambition and target-setting to results. Deploying renewable generation capacity requires concerted efforts and transformation in the sectors supporting electricity supply. Grids must be planned, strengthened and extended, land agreements put in place for renewable resources, supporting policies developed and implemented, additional skills and resources acquired, and an unprecedented number of planning permits assessed and granted in a short period of time.

Through a range of stakeholder consultations, KPMG have identified five pillars that will determine the speed of renewable generation deployment, these are:

- Ireland's Delivery model for Renewable energy;
- Land;
- Planning;
- Grid; and
- Route to market.

Each of these pillars will now be explored in more detail based on consultee responses. At the outset it is worth being mindful of the significant array of commitments, policy and legislation that has been announced, or published to date. For this, public bodies, regulators, policymakers and legislators should be commended. That said, stakeholders did raise concerns over the implementation of some initiatives such as the Renewable Electricity Corporate Power Purchase Agreements Roadmap. As set out in the following section, there remains a need for significant further policy development, as well as ensuring that this policy works practically when it is sought to be implemented and does not conflict each other.

A selection of what is still to come...

2023/24

Department of Housing, Local Government and Heritage: Marine Protected Areas Bill 2023

Department of Housing, Local Government and Heritage: Road Map for the First Revision of the National Planning Framework (NPF)

Department of the Environment, Climate and Communications: Outcome of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems Consultation

Department of the Environment, Climate and Communications: Independent Review - Security of Electricity Supply

2024

Department of Enterprise, Trade and Employment & Enterprise Ireland: Industrial Strategy for Offshore Wind

Department of the Environment, Climate and Communications: Future Framework for offshore wind energy

TBC

Commission for Regulation of Utilities: Energy Demand Strategy

EirGrid and ESB Networks: Renewable Energy Hubs Decision

Department of the Environment, Climate and Communications: Offshore Transmission Strategy

SEM Committee: System Services Future Arrangements Detailed Design

Department of Agriculture, Food and the Marine (DAFM) in partnership with the Department of Environment, Climate Action and Communications (DECC): Ireland's National Biomethane Strategy

Ireland's Delivery Model for Renewable Energy – Resourcing & Policy

Two key aspects of Ireland's delivery model for renewable energy identified by stakeholders which is impeding the pace of deployment of renewables are the level of resources in the ecosystem and specific areas requiring policy development.

Key successes to date

- Ireland has fostered a vibrant renewable energy sector with excellent talent and experience.
- Policy developed in the 2000's and 2010's helped set the foundation for achieving 40% renewable electricity supply by 2020 on an all-island basis.
- Recent focus on a wide range of policy development is encouraging and demonstrates that Government understands the challenges and urgency of the issues and is working to address them, albeit consultees felt more needs to be done.

The scale of Ireland's ambition for renewable energy, the large variety of technologies and the complexity of projects has resulted in the total resources in the ecosystem being stretched to capacity.

The delivery model for renewables encompasses a range of overarching themes which impacts renewable asset deployment from project conception to commercial operation. Such topics include sectoral skills and resources, policy development, cross-sector collaboration, and ways of working, and are required to ensure that the key development areas of securing land, grid, planning, and route-to-market work together to facilitate renewable deployment.

Whilst Ireland has had its successes in delivering significant amounts of renewables over the last decades it is facing challenges to continue to accelerate this trend.

Stakeholder consultations revealed to KPMG that the industry is concerned about a lack of resources and the need for a greater level of "joined up thinking" between key institutions such as policymakers, network operators and regulators. There was broad consensus that resourcing plans and policy have not kept up with the rapidly increasing variety and complexity of renewable technologies and projects.

The level of deployment of renewable energy generation assets to date has resulted in a vibrant industry of skilled and experienced professionals across disciplines – developers, professional advisers, planners, environmental specialists, financiers, etc. In a world where the majority of countries are on a decarbonisation transition journey, this resource is a key national asset. However, the scale of Ireland's ambition for renewable energy, the large variety of technologies, and the complexity of projects has resulted in the total resources in the ecosystem being stretched to capacity.

What are the challenges?

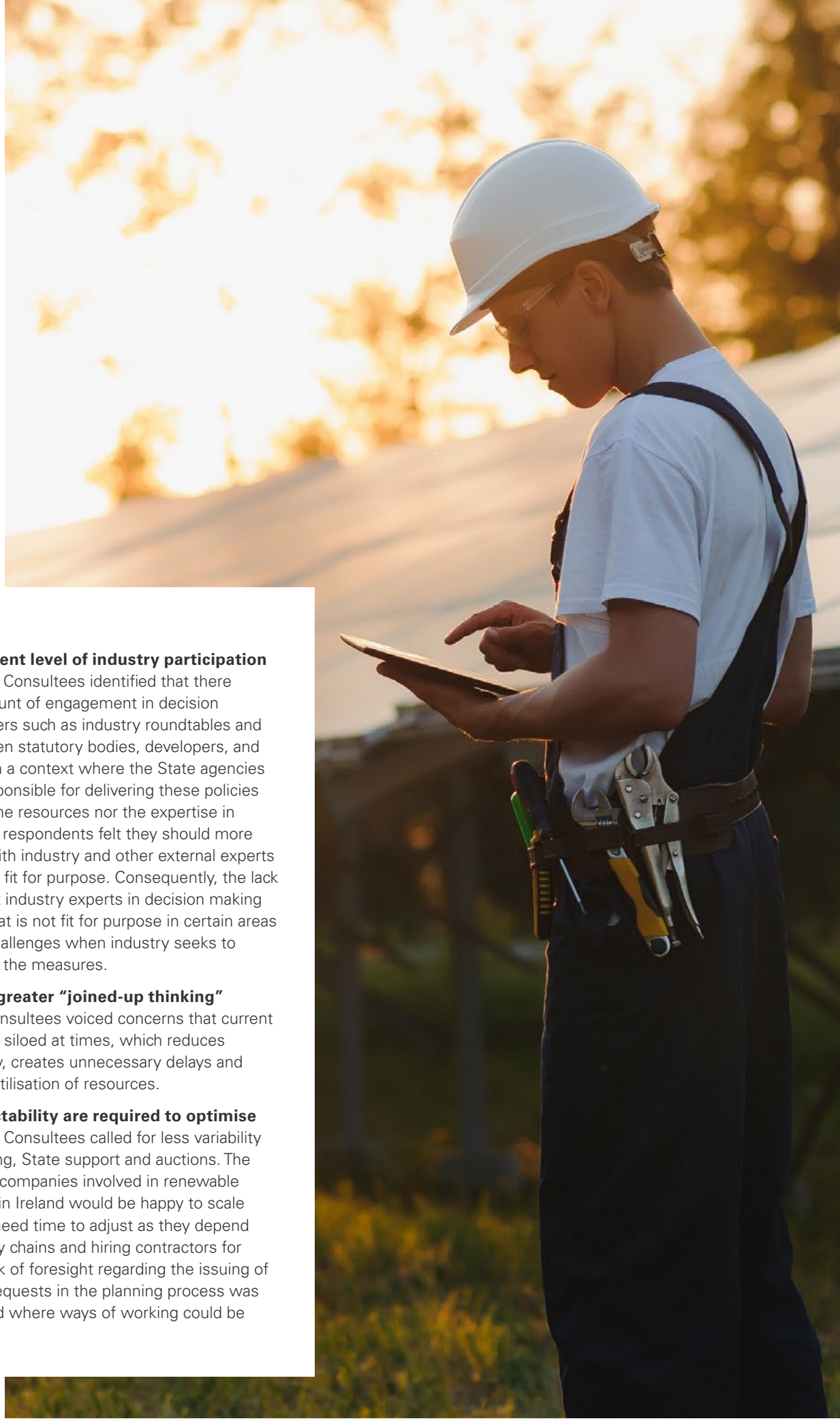
Resources:

- Key agencies include An Bord Pleanála (ABP), EirGrid, ESB Networks, DECC, CRU, MARA and the National Parks and Wildlife Service (NPWS) as well as the availability of professional advisors such as planners, grid experts, environmental specialists and ornithologist as well as the developers themselves.

- **The pool of resources needs to expand:** As a result of a limited amount of skills within the ecosystem, there is a high degree of lateral hiring which is contributing to the industry resource constraint. For example, one State Body observed that they hired 100 people in a year but had 80 retirements or resignations with the majority joining the private sector. Similarly, industry hiring talent from system operators in large numbers reduces their capacity and limits their ability to develop a future-proof grid. Several stakeholders consulted expressed concerns that domestic talent is also being targeted by foreign jurisdictions which further depletes the resource pool.

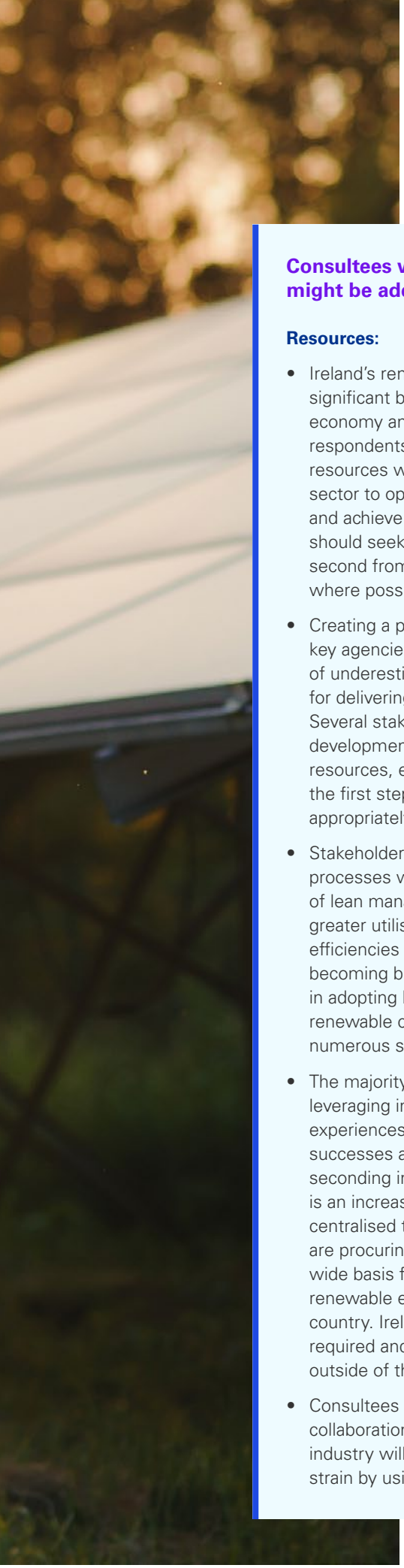
Further policy development:

- The development of policy takes time and expertise. Whilst there has been some encouraging policy announcements during 2023, a recurring concern from consultees was that in order for Ireland to achieve its renewable electricity ambitions, it needs significant policy development on a number of fronts: The electrification of Irish industry and commercial sector, as well as domestic heating, alongside greater electrification of the transport sector; battery energy storage; private wire; floating offshore wind; and repowering of existing onshore wind assets are all in need of dedicated policies. In addition, there is a need for these policies to not conflict with each other and for them to work in harmony with the national grid infrastructure strategy, The scale of developing this policy in a manner that is "joined up" should not be underestimated.



Ways of working:

- **There is an insufficient level of industry participation in decision making:** Consultees identified that there is an insufficient amount of engagement in decision making by policymakers such as industry roundtables and conversations between statutory bodies, developers, and other stakeholders. In a context where the State agencies and departments responsible for delivering these policies simply have neither the resources nor the expertise in many cases to do so, respondents felt they should more proactively engage with industry and other external experts to ensure policies are fit for purpose. Consequently, the lack of input from relevant industry experts in decision making can result in policy that is not fit for purpose in certain areas which can result in challenges when industry seeks to practically implement the measures.
- **There is a need for greater "joined-up thinking" across agencies:** Consultees voiced concerns that current processes can be too siloed at times, which reduces the sector's efficiency, creates unnecessary delays and contributes to underutilisation of resources.
- **Stability and predictability are required to optimise working processes:** Consultees called for less variability in for instance planning, State support and auctions. The large institutions and companies involved in renewable energy development in Ireland would be happy to scale up their outputs but need time to adjust as they depend on establishing supply chains and hiring contractors for their projects. The lack of foresight regarding the issuing of Further Information requests in the planning process was one example provided where ways of working could be improved.



Consultees were asked for recommendations as to how these challenges might be addressed:

Resources:

- Ireland's renewable industry provides significant benefits to the State, the economy and communities and many respondents called for increasing the resources within State Bodies to support the sector to operate the necessary processes and achieve mandatory timelines. Agencies should seek to hire more people and/or second from industry and other agencies where possible.
- Creating a peer-reviewed resource plan for key agencies to mitigate the current trend of underestimating the resources required for delivering on the various ambitions. Several stakeholders highlighted that the development of good policy takes time, resources, expertise, and hard work, with the first step being planning resources appropriately.
- Stakeholders recommended streamlining processes with for example the introduction of lean management techniques and/or greater utilisation of technology to increase efficiencies and prevent processes from becoming blocked. ESB Network's success in adopting lean management to deliver renewable connections was noted by numerous stakeholders.
- The majority of consultees suggested leveraging international expertise and experiences by understanding both successes and lessons learnt along with seconding in experts. It is notable that there is an increasing number of European Union centralised tenders where members states are procuring skilled resources on an EU wide basis for the further deployment of renewable energy generation in their own country. Ireland should be mindful of what is required and when to procure resource from outside of the country.
- Consultees were of the view that increasing collaboration across all functions of the industry will mitigate some of the resource strain by using expertise more efficiently.
- Some consultees called for long-term planning within our educational system to ensure that the appropriate resourcing and skills are in place as we strive for a net zero power system post 2030. Initiatives aimed at preparing a future workforce should be considered at all stages of education and career development. A joined up approach by the Department of Education and Department of Higher Education would be welcome in this regard.

Policy:

- As set out earlier in this report, dedicated resources for the development of policy and engagement with industry stakeholders in the development of that policy will be critical for a more joined up approach to assist in greater project delivery that can successfully integrate on to the grid.
- Introducing statutory time limits on decisions (for key agencies) in order to accelerate planning and grid will create more predictable timelines and set clear, enforceable goals.

Ways of working:

- A greater leveraging of industry knowledge and third-party engagement by key agencies is a primary ask from the industry.
- A range of consultees called for establishing the Renewable Energy / Net Zero deployment commission with appropriate representation (including international experts) to be responsible for resource planning reviews across agencies, recommendations, and publicly tracking policy development (for example to prevent capacity auction failure) and to co-ordinate the efforts of related bodies and taskforces .
- Many consultees called for increased predictability and transparency between both institutions and stakeholders.

International Example

British Energy Security Strategy – Offshore Wind

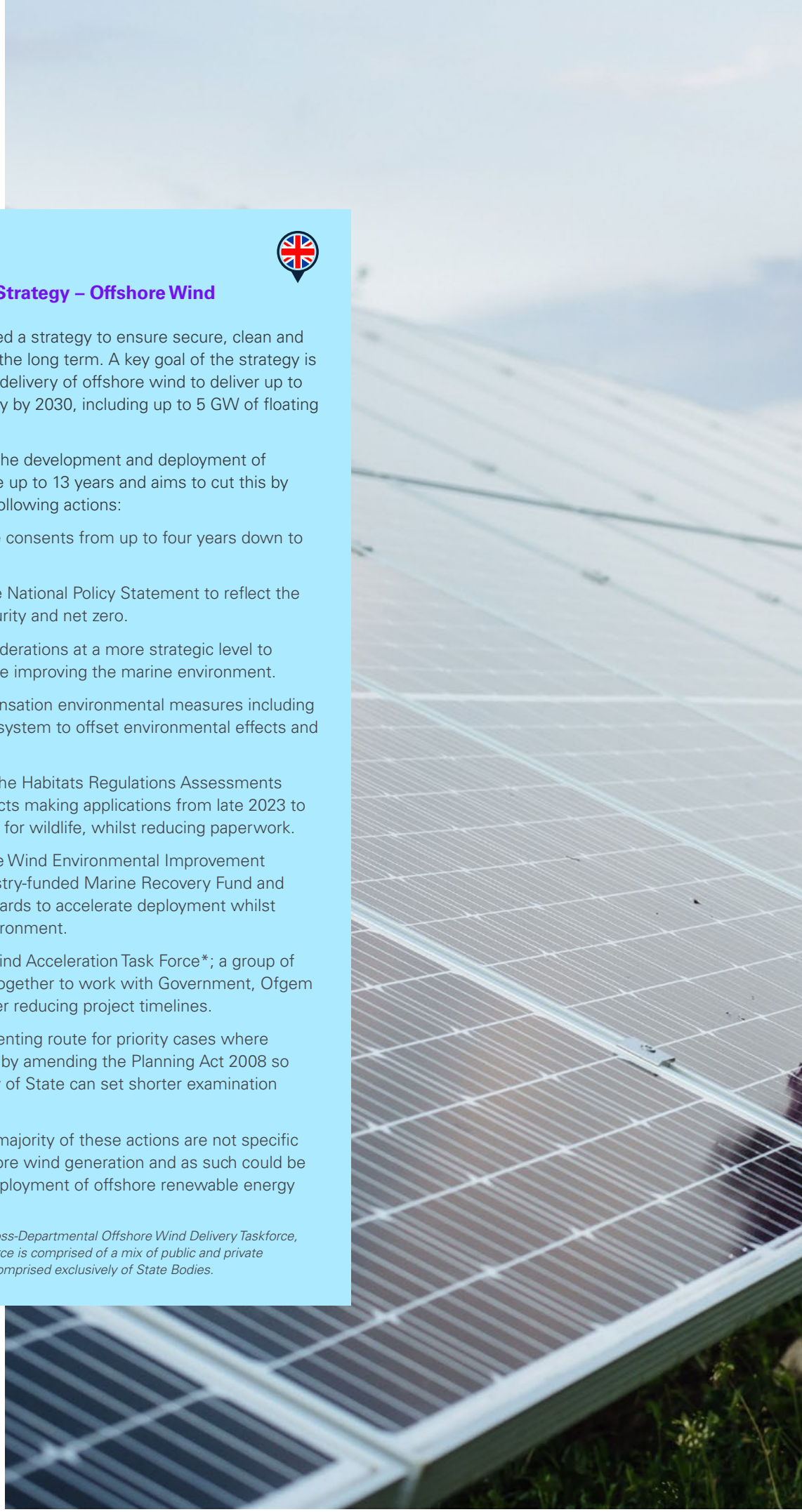
In April 2022 the UK[9] launched a strategy to ensure secure, clean and affordable British energy for the long term. A key goal of the strategy is the ambition to scale up the delivery of offshore wind to deliver up to 50 GW of generation capacity by 2030, including up to 5 GW of floating offshore wind.

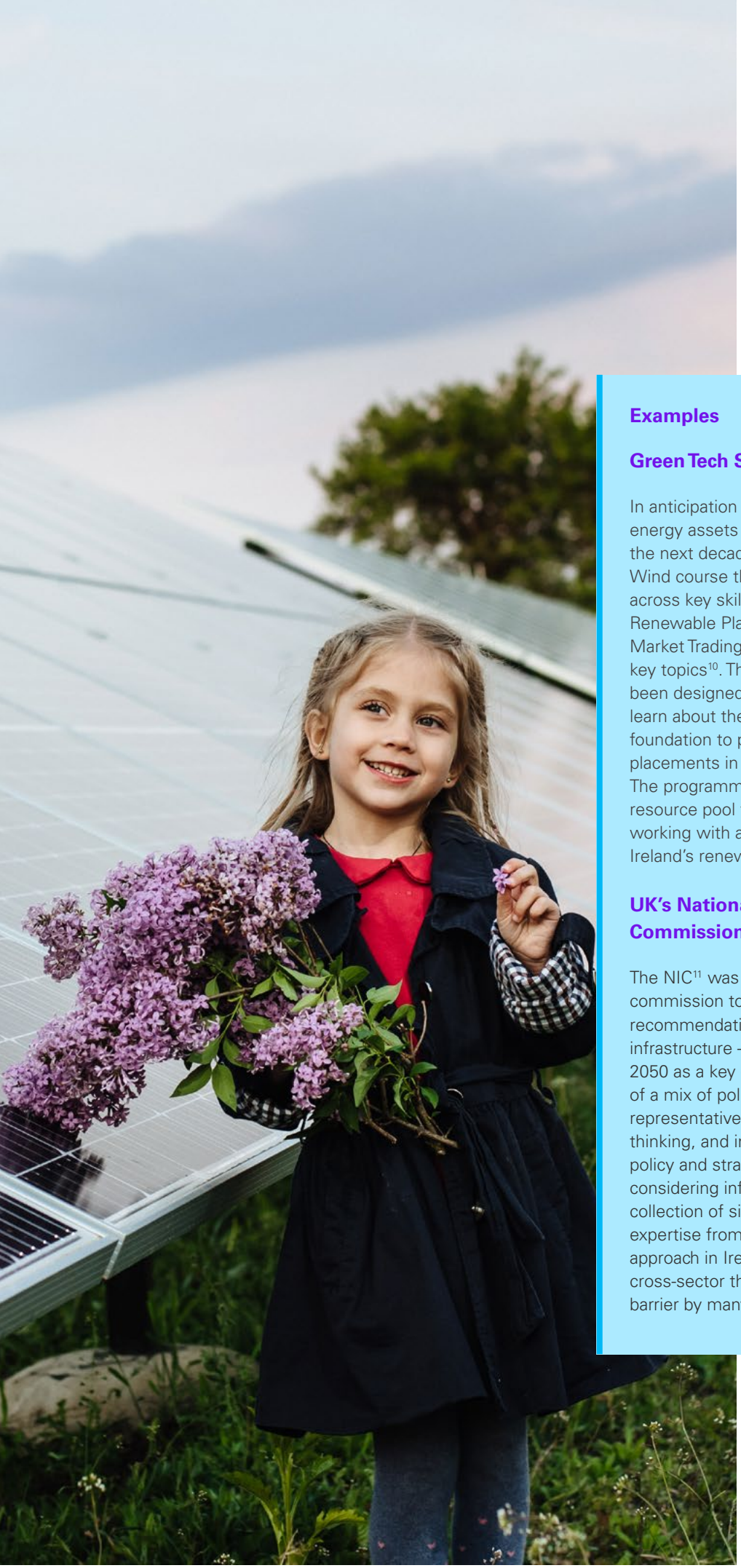
The strategy highlights that the development and deployment of offshore wind farms can take up to 13 years and aims to cut this by more than half through the following actions:

- Reduce the time to secure consents from up to four years down to one year.
- Strengthen the Renewable National Policy Statement to reflect the importance of energy security and net zero.
- Make environmental considerations at a more strategic level to speed up the process while improving the marine environment.
- Introduce strategic compensation environmental measures including for projects already in the system to offset environmental effects and reduce delays to projects
- Review the way in which the Habitats Regulations Assessments are carried out for all projects making applications from late 2023 to maintain valued protection for wildlife, whilst reducing paperwork.
- Implement a new Offshore Wind Environmental Improvement Package including an industry-funded Marine Recovery Fund and nature-based design standards to accelerate deployment whilst enhancing the marine environment.
- Work with the Offshore Wind Acceleration Task Force*; a group of industry experts brought together to work with Government, Ofgem and National Grid on further reducing project timelines.
- Establish a fast-track consenting route for priority cases where quality standards are met, by amending the Planning Act 2008 so that the relevant Secretary of State can set shorter examination timescales.

The strategy noted that the majority of these actions are not specific to the development of offshore wind generation and as such could be adapted to accelerate the deployment of offshore renewable energy assets.

**Ireland has established a similar cross-Departmental Offshore Wind Delivery Taskforce, however, whereas the British taskforce is comprised of a mix of public and private stakeholders, the Irish taskforce is comprised exclusively of State Bodies.*





Examples

Green Tech Skillnet – Work in Wind

In anticipation of the substantial volume of renewable energy assets that will connect to the Irish grid over the next decade, Green Tech Skillnet offers a Work in Wind course that provides with participants training across key skills areas including Renewable Policy, Renewable Planning, Grid Transmission and Energy Market Trading, Community Engagement, and other key topics[10]. The Work in Wind skills initiative has been designed to help people who are looking to learn about the wind energy industry in general as a foundation to prepare participants for relevant work placements in projects in the renewable energy sector. The programme contributes to growing Ireland's resource pool to accelerate renewable deployment by working with a range of esteemed industry partners in Ireland's renewable energy sector.

UK's National Infrastructure Commission (NIC)

The NIC[11] was established in 2017 as an impartial commission to make independent expert recommendations to the UK Government on economic infrastructure – including supporting net zero by 2050 as a key objective. The commission consists of a mix of policymakers, academics, and industry representatives and aims to be a credible, forward-thinking, and influential voice on UK infrastructure policy and strategy. Central to the NIC's mission is considering infrastructure as a system rather than a collection of silos and engaging closely with leading expertise from a variety of backgrounds. A similar approach in Ireland could help mitigate the lack of cross-sector thinking, which was identified as a key barrier by many industry consultees.

9. British energy security strategy - GOV.UK (www.gov.uk)
10. Work in Wind (gtsskillsconnect.ie)
11. Updated_framework_document_v.final2.pdf (publishing.service.gov.uk)

Planning

Ireland's planning and consenting system is operating at capacity and is in need of greater resourcing. Uncertainty and long timelines in the decision-making process – including the high likelihood of lengthy judicial review appeals – add risk and delays to renewable energy projects achieving a final determination on a planning permission application.

"The Irish planning system is the single biggest barrier to the development of onshore renewable energy and the greatest threat to the Climate Action Plan.

Renewable energy assets are significant constructions that have an impact on the environment, biospheres, and the local communities in which they are located. Utility-scale renewable generation assets are therefore correctly required to undergo a rigorous planning process to ensure proper consideration of a range of factors, including proximity to residential properties, visual impact, land-zoning plans, and the local ecology. Guidelines and requirements for these are set out through various pieces of legislation, policy documents, spatial strategies, and development plans.

Stakeholder consultations revealed that industry actors are in agreement on the need for a correct and proper planning process, including the right of appropriate and relevant stakeholders to participate, contribute and where relevant submit objections to particular planning applications. That said, the process around these contributions should be more streamlined, and with guidelines and policy in place to allow developers to have a clear timeline for the delivery of planning. While the Planning and Development Bill 2023 has been welcomed in many quarters there remains considerable concern whether it will address the issues present in the planning system.

Timelines

The current status of planning in Ireland is widely recognised as underresourced and in urgent need of improvement given its pivotal position in renewable energy asset development. Lengthy timelines for decisions and the prevalence of judicial review processes were frequently highlighted by consultees as common hurdles impeding the speedy development of renewable generation capacity. The bottlenecks in the planning process are by now widely reported and have been recognised by policymakers and the Government. This includes Minister Eamon Ryan TD who recently called out the delays in An Bord Pleanála ("ABP") decisions as "the greatest constraint facing the country"[12]. The discrepancy between ABP's statutory obligation of a maximum 18 weeks and the average time over of 90 weeks to decide on appeals for wind generation projects as communicated to KPMG is a major impediment to the speedy deployment of a greater number of renewable energy projects in Ireland.

A number of consultees noted concerns that certain appeals have awaited decisions for close to 3 years and that both the length and variability of these decision timelines could deter potential renewable energy developers from the Irish market.

Draft Planning and Development Bill 2023

The recently announced Planning and Development Bill[13] is a source of encouragement that reform of the planning system is in progress and reflects policymakers' recognition of the need and urgency for this reform. Some of the Bill's key proposals include changing the nature of judicial review applications, sweeping changes to An Bord Pleanála – including a re-naming to An Coimisiún Pleanála – and statutory mandatory timelines for all consent processes are all encouraging.

European Commission

It was noted by consultees operating internationally that planning issues are not unique to Ireland. Indeed, the European Commission has taken action to accelerate the consenting and planning processes for renewable energy projects on an EU-wide basis: Firstly, REPowerEU[14] from May 2022 included a proposal for Member States to designate 'renewable acceleration areas' for renewables with shortened and simplified permitting processes to increase member state's security of energy supply. Consultees highlighted that a number of countries are now benefitting from faster permitting processes by moving to implement aspects of REPowerEU quickly.

Secondly, Council Regulation (EU) 2022/2577[15] from December 2022 set out to impose maximum deadlines on the permit-granting processes for renewable energy projects designating them as in the "overriding public interest", which often provides priority over local environmental or nature concerns. These directives were mentioned by a few consultees, who were hopeful that these will come into effect in Ireland and improve the planning and permission processes. These national and EU-wide announcements are encouraging but are just the first step towards a streamlined and efficient planning sector.

Resources

Many respondents stressed that resourcing is the central challenge in the planning system and reformed legislation will mean little if the expertise is not there to implement it. There is significant concern that An Bord Pleanála, NPWS and local authorities do not fully understand the scale of what will be asked of them and, consequently, significant capacity gaps, particularly in legal and environmental assessment roles, will simply not be addressed. Even though the Draft Planning and Development Bill 2023 commits to addressing this, consultees frequently raised concerns that there is a lack of experienced planners who can conduct these processes even if the appetite and financial resource or budget is in place. This challenge is compounded by the increasing complexity of renewable technologies requiring even more experienced and knowledgeable planners who are operating in an internationally competitive environment for skilled people, where the whole English-speaking market is competing for the same planning resources. Several consultees mentioned the whole pipeline of skilled resources from natural sciences in school to a seat in ABP must increase its output to sustainably solve the under-resourcing issue over the long term.

12. Planning delays are 'greatest constraint facing Ireland', says Eamon Ryan | Independent.ie
13. gov.ie - Improved planning regime takes step closer with publication of Draft Planning and Development Bill 2022 (www.gov.ie)
14. REPowerEU (europa.eu)
15. EUR-Lex - 32022R2577 - EN - EUR-Lex (europa.eu)

What are the challenges?

Resources:

- There was broad consensus from consultees that under-resourcing is a significant issue for the planning sector: ABP has in recent times only had five board members out of a standard ten, and while this has been addressed with temporary members and restructuring, the issue of a limited pool of planners to draw on remains a concern.
- While industry acknowledged, and welcomed, the significant recent investment in key planning agencies, the widely held perception is that the agencies themselves still do not understand the level of resources they are going to need which means they are not seeking this funding from Government.
- Some stakeholders highlighted that underestimating the complexity of technologies in planning has increased the resources gap today. Increasing complexity and diversity of renewable technologies requires a significant increase in expertise and resources compared to a decade ago and the planning resource system is not adequately set up to deal with these technological complexities.
- A few consultees mentioned that the focus on security of supply in the wake of Ireland's energy security concerns to avoid repetition following the commencement of the War in Ukraine has taken resources away from granting of planning permission for renewable projects to prioritise the consenting of gas turbine projects. These were of the view that this has left some renewable energy projects in limbo.

Judicial Review:

- Whilst appreciating the importance of people's right to pursue judicial review cases, there was consensus amongst consultees that the judicial review processes as currently devised adds significant delays to renewable energy projects. The fact that application issues cannot be mitigated while a judicial review process is ongoing compounds the backlog in accelerating the deployment of renewable energy. This adds risk and uncertainty, which both delays the projects in development and can act as a deterrent for future projects. International consultees noted that in other European countries a judicial review challenge would be the exception as opposed to the expectation as is often the case in Ireland.

Timelines:

- Several consultees identified that a lack of consequences for planning bodies failing to make decisions on time results in a lack of incentives to change this practice.
- Consultees reported that the speed of the planning system and rules around zoning in county development plans are undermining our ability to meet 2030 targets and finding a solution to this must be a priority for the Government. Stakeholders reported four instances in 2023 where wind farm projects were refused planning permission from as a result of the relevant County Development Plan re-zoning locations for wind farm development after the projects had submitted their planning application.
- Each of the projects had applied for planning within locations deemed suitable for wind farm development at the time the planning applications were submitted. An Bord Pleanála subsequently refused planning permission for the projects as the locations of the projects now lie outside of areas deemed "open-to-consideration" for wind development as the plans were updated after the applications were submitted. Consultees felt that planning permission would likely have been granted had An Bord Pleanála met the statutory guideline decision timeframe of 18 weeks as the projects were permissible under the development plans applicable at the time.

Streamlining Procedures:

- Article 16 of the Renewable Energy Directive mandates a single point of contact to facilitate the entire administrative permit application and granting process. At present an application in Ireland may need to interact with nine separate consenting authorities during a single application. A single point of contact would have responsibility for the efficient workflows between the current collection of relevant entities.
- Digitisation and where possible automation of the application process, it was highlighted that Denmark is currently working with tech companies, many of which have a major presence in Ireland, to achieve this.[16]

Prioritising renewable developments:

- Challenges with Local County Councils and Local County Development Plans were highlighted by several consultees with some particularly identifying some Local County Development Plans being less supportive to the development of renewable energy projects and indeed can sometimes be in conflict with regional plans. There was a call from consultees for greater clarity and finality regarding land dedicated for renewable energy developments.

16. https://windeurope.org/newsroom/news/amazon-web-services-accenture-and-windeurope-launch-digital-tool-to-accelerate-permitting/

Consultees were asked for recommendations as to how planning challenges might be addressed:

Resources:

- There was broad consensus among consultees that resource planning is an absolute necessity to handle the volume and complexity of work that the acceleration of renewables deployment requires.
- Several consultees suggested that a dedicated renewable energy section within ABP will ensure availability of resources to progress renewable projects even in the event of other crises arising where resources may need to be diverted.
- Many respondents expressed the view that there is great willingness from the industry to assist planners with advice and resources, but that state agencies can at times appear reluctant to engage. Establishing a model whereby the private sector and professional advisors can provide resource assistance to the planning agencies should be considered.

Judicial Review:

- Consultees mentioned that making it possible to resolve planning issues whilst in the judicial review process has the potential to significantly increase efficiency and reduce consenting timelines currently affecting a large range of projects.
- Several consultees called for a review of the judicial review process: Once a site has been designated for renewable energy development, that decision should generally be final with limited scope for appeal. Some suggested looking to Scotland, where the discussion and decision about site selections takes place in the development plan. The public, developers, and Government are aware of this, and developers therefore have greater confidence that they are considering the most suitable areas in which to invest and develop projects in.

Timelines:

- Some consultees suggested that implementation of meaningful consequences for failing to meet statutory targets could increase the speed of decision making.
- One solution proposed by consultees included setting the default decision for planning application to "granted" – i.e., approved if not objected to within a certain deadline - would incentivise planners to act on time if they have strong reasons to deny permission such as the Rule of Positive Silence implemented in Spain (see separate call out box).

Prioritising renewable developments:

- Some consultees called for a review of the powers of Local Authorities to limit renewable energy development and suggested that there is a distinct need to adopt a regional approach and to clarify an interacting policy hierarchy. Most notably is harmonisation with the Regional Spatial and Economic Strategies published by Ireland's three Regional Assemblies and the draft Renewable Electricity Policy and Development Framework.
- Consultees recognised that this would be a change to current planning policy but, without it, achieving Irish energy independence appears next to impossible. These consultees called for national or regional support to ensure a stop to these limits and ensure that the decisions with respect to areas approved for renewable energy development in the national plans are adhered to. This is in line with the EU Directive which considers these developments of "overriding public interest" thus granting them priority status. Several stakeholders expressed an eagerness for this Directive to be implemented speedily by the Irish Government.
- A number of consultees mentioned the 'renewable acceleration areas' proposed in REPowerEU and called for this to be implemented rapidly in Ireland. This would help identify areas of greater likelihood of planning success.
- A direction/circular from Government to ABP & local planning authorities recommending the prioritisation of national and European climate objectives in recent County Development Plans would be welcome.
- Several individual consultees again pointed to Scotland as a role-model: Scotland has been very clear about its commitment to net zero and prioritising actions to reach their targets. As such, external stakeholders such as the nature and park services strive to make way for renewable energy developments where possible rather than being active objectors to projects.

International Examples

Spain's Rule of "Positive Silence"

The exceptional rule of "positive silence" was implemented during the energy crisis of 2022 to accelerate renewable developments and mitigate security of supply concerns. Under the rule projects under a certain de minimis threshold (150 MW for Solar PV and 75 MW for wind) can bypass certain planning assessment criteria if the relevant authorities do not object within a two-month timeframe. As such, this rule incentivises projects to be submitted and potentially consented more speedily where consenting authorities may already be comfortable or have assessed an area from a technical or environmental perspective.

Sweden's Box-Model Permits for Renewables Development

Renewable technology development evolves quickly. For example, in the 5-10 years it can take between permitting and commercial operation of a wind farm, turbine technology and sizes have usually improved significantly. Sweden has therefore introduced a "box-model permits" approach, this allows flexibility in technology selection for the wind developer whereby they are not tied to a specific model or size of wind turbine. This enables the developer to select the most modern and most efficient turbine model at any time (within certain parameters) thus enabling maximum capacity and output from the wind farm.

Grid

Ireland's electricity grid poses several challenges to increased renewable deployment at the scale necessary to meet climate and energy policy ambitions. Feedback from consultees suggests that political leaders and State Bodies must focus on addressing issues that restrict timely delivery of much needed infrastructure including political support for grid projects, meaningful stakeholder engagement and the use of a wider range of grid technologies.

Key successes to date

- EirGrid's DS3 (Delivering a Secure Sustainable Electricity System) Programme is viewed as a key success which enabled the achievement of 40% RES-E by 2020.
- The Enduring Connection Policy (ECP) has been a successful grid connection policy and a significant factor in clearing the backlog of grid connection applications.
- The East-West Interconnector is a critical piece of infrastructure that integrates the Irish energy system to neighbouring energy markets, improves security of supply, reduces costs to the consumer, and helps to achieve our climate objectives. In addition, the progress made in the development of the Greenlink and Celtic Interconnectors is also welcome.

> **Grid 25 and its large reinforcements that fell away due to a lack of political support was one of the major setbacks of the last 15 years and made us lag far behind where we could have been.**

The electricity grid plays a vital role in transferring electricity from where it is generated to demand customers in all parts of Ireland. This network of overhead lines, underground cables and substation equipment has supported Ireland's economic growth over many decades and helped to achieve Ireland's high renewable energy penetration to date. To continue delivering renewable generation capacity in locations all across Ireland, continuous investment, improvement, upgrades, and expansion of the grid will be vital.

Ireland's emergence as a wind energy leader on the global stage would not have been possible without the support of the grid. However, if our ambitious targets for up to 80% renewable electricity by 2030 and a net zero economy by 2050 are to be achieved, the grid must be redesigned and expanded. Current levels of grid constraints are increasing on a system that lacks the capacity to transfer the scale of renewable electricity needed. The system operators have responded with plans[17] to deliver significant infrastructure over the period to 2030. Numerous respondents commended EirGrid on the evolution in their approach to public engagement in support of this goal.

The grid planning model is shifting from reacting to grid connection applications to a more strategic anticipatory model based on projected pipelines of connections and directing developments to parts of the grid with available grid capacity. This is evidenced in the Government's Framework for *Phase Two Offshore Wind*[18] and proposals relating to onshore renewable hubs[19]. Although a strategic grid planning model seems logical, there is uncertainty relating to charging mechanisms and no evidence of regulatory support for anticipatory funding. It is vital that these new policies are progressed in parallel to ensure delivery of already committed grid developments in a timely manner, and to ensure that the grid caters for all viable renewable developments irrespective of where they are located.

Although the publication of the Network Delivery Portfolio (NDP)[20] is a welcome development in terms of project pipeline visibility, history suggests delivering against this plan on time will be challenging. Political will is required to highlight the importance of grid development, in particular high-voltage linear developments that are traditionally faced with stiff community-based and societal opposition. Strong political leadership is required to communicate the message that the energy transition relies on electricity transmission and that this will not happen without more grid development all over the country.

What are the challenges?

Expansion of the grid

- The grid must expand significantly if net zero ambitions are to be met. Underestimating the scale and complexity of the grid required can hamper renewable energy integration as there will simply not be enough capacity to transfer renewable power from where it is generated to where it is used.
- Resourcing the necessary evolution of the grid was a key feedback theme. Consultees highlighted that specialist technical knowledge is required to plan, build, operate, and maintain the electricity grid. Resource shortages and inability to retain and/or attract the necessary people is already impacting grid connection and infrastructure delivery efforts. This is particularly acute for State Bodies.
- Feedback from industry expressed concerns regarding grid connection timelines received by projects and the likely impact on their ability to meet RESS timelines.
- The ability to manage outages on the grid was communicated as a concern impeding the ability to connect renewable assets, and more generally enable the expansion of the grid.

Flexible grid development solutions

- Several consultees highlighted that grid flexibility must increase as more variable renewable energy sources connect to maximise the use of available grid capacity. It was mentioned that part of the challenge is that the system operator has not

17. https://www.eirgridgroup.com/the-grid/shaping-our-electricity-f/
18. https://www.gov.ie/en/publication/f3bb6-policy-statement-on-the-framework-for-phase-two-offshore-wind/
19. https://www.cru.ie/publications/27522/
20. https://www.eirgridgroup.com/customer-and-industry/general-customer-information/network-delivery-portfoli/

adopted available grid technologies that can reduce constraints and that this impedes the use of larger, more efficient wind turbines. Consultees voiced the view that the system operator and system owner must work collaboratively to realise the potential of such grid technologies which are in use in many systems around the world.

Political leadership to support further grid development

- Some stakeholders cited a lack of political leadership and direction as having restricted grid development with grid delivery falling behind targets. It was suggested that leaders must support grid development efforts by highlighting the important role that the grid, including overhead and underground developments, must play in the energy transition. Feedback received suggests that a lack of formal acknowledgement of grid development projects as strategic infrastructure exposes them to opposition and delays.

Community and stakeholder engagement

- Several consultees highlighted stakeholder engagement as critical to delivery of grid. This includes ensuring that communities and relevant parties are engaged from the outset and all the way throughout the development process. Citizens and communities that are not consulted are more likely to oppose developments thereby reducing the pace of renewable integration. To accelerate grid development, stakeholders also voiced the need to better communicate available benefits and supports for affected communities and landowners.

Planning for a net zero grid

- Some respondents expressed concern that grid development plans currently span a ten-year horizon, which limits opportunity to identify strategic developments for the longer term. Stakeholders highlighted that excessive focus on 2030 targets could potentially cause misalignments with the ultimate net zero goal, which is not far away in terms of grid delivery timelines.
- Many consultees felt that grid connection processes are too lengthy and sequential in nature requiring interaction with various parties. Customers seeking connections to the grid are exposed to potential delays at many points during the process. It was also suggested that RES developers should have an opportunity to apply for a grid connection whilst their planning consents are being processed and for these activities to happen in parallel. Some consultees have mentioned that connection processes have recently been overhauled and that positive results should be seen next year and in the next RESS auction.
- Several respondents outlined that policy development relating to grid is slow, including policies for private wire and hybrid connections. This adversely affects the ability of developers to accurately assess the viability of renewable energy projects.

Consultees were asked for recommendations as to how grid challenges might be addressed:

Consultees proposed that strategic grid planning should consider the pipeline of connections required for net zero and employ an anticipatory planning approach, which should include a charging mechanism that incentivises renewable development across the life of the grid asset. This requires regulatory support for system operator preferred grid developments that strategically deliver the capacity required over the long-term. Effective alleviation of grid constraints should incentivise the use of larger, more efficient generation technologies that can achieve higher capacity factors and thereby maximise the value of grid investments.

Resource Plan

- Consultees agreed that there is an urgent need to create a peer-reviewed resource plan for grid development to support the increased volumes of grid connections reinforcements required over the coming decades. They expressed the need for the plan to cover all phases of the project lifecycle from grid planning and the processing of connection applications through to grid construction encompassing both EirGrid and ESB Networks. This resource plan could be integrated with the wider resource plan called for to enable the national renewable energy ecosystem delivery model.
- While the increased coordination between EirGrid and ESB Networks was recognised by industry there was also calls for further enhancements to collaboration and programme coordination.

Political Leadership

- Respondents proposed increasing levels of political leadership, stating that showing support for grid projects, rather than undermining them, is essential to fostering societal acceptance of grid as a key element of the energy transition. Some highlighted that this must include support for grid developments that have traditionally faced stiff political and societal opposition. Politicians calling for a cleaner, more secure, energy independent Ireland have a responsibility to vocally support the strong electricity grid needed to make this possible.

System improvements

- Several consultees suggested that system operators and asset owners fast track delivery of flexible grid reinforcement technologies, such as dynamic line rating and power flow controllers, to maximise the use of existing capacity. They outlined that these technologies have shorter deployment times compared to traditional grid solutions and can help to alleviate grid constraints while, new grid capacity is developed and beyond.
- Some consultees brought up that adequate funding and timely policy development for hybrid connections and Low Carbon Inertia Services (LCIS) will speed up renewable integration. Respondents agreed that there needs to be a mindset change from "saving" to "growth" in the grid sector.
- Some stakeholders suggested creating locational signals for congestion management services to increase renewable energy yields in constrained areas of the grid.

Policy

- Multiple consultees expressed the view that policy facilitating contestably built renewable energy hubs should be introduced as a way of securing grid connections efficiently and strategically utilising available grid capacity.
- Respondents stated the system operators should facilitate meaningful early engagement to progress grid connection in parallel with planning applications to reduce processing times for renewable energy project connections by several years. Further, provision of firm grid connection costs early in the process will support better informed bid prices in renewable energy auctions.

International Examples:

Japan – Decarbonisation fund and smart grid technology

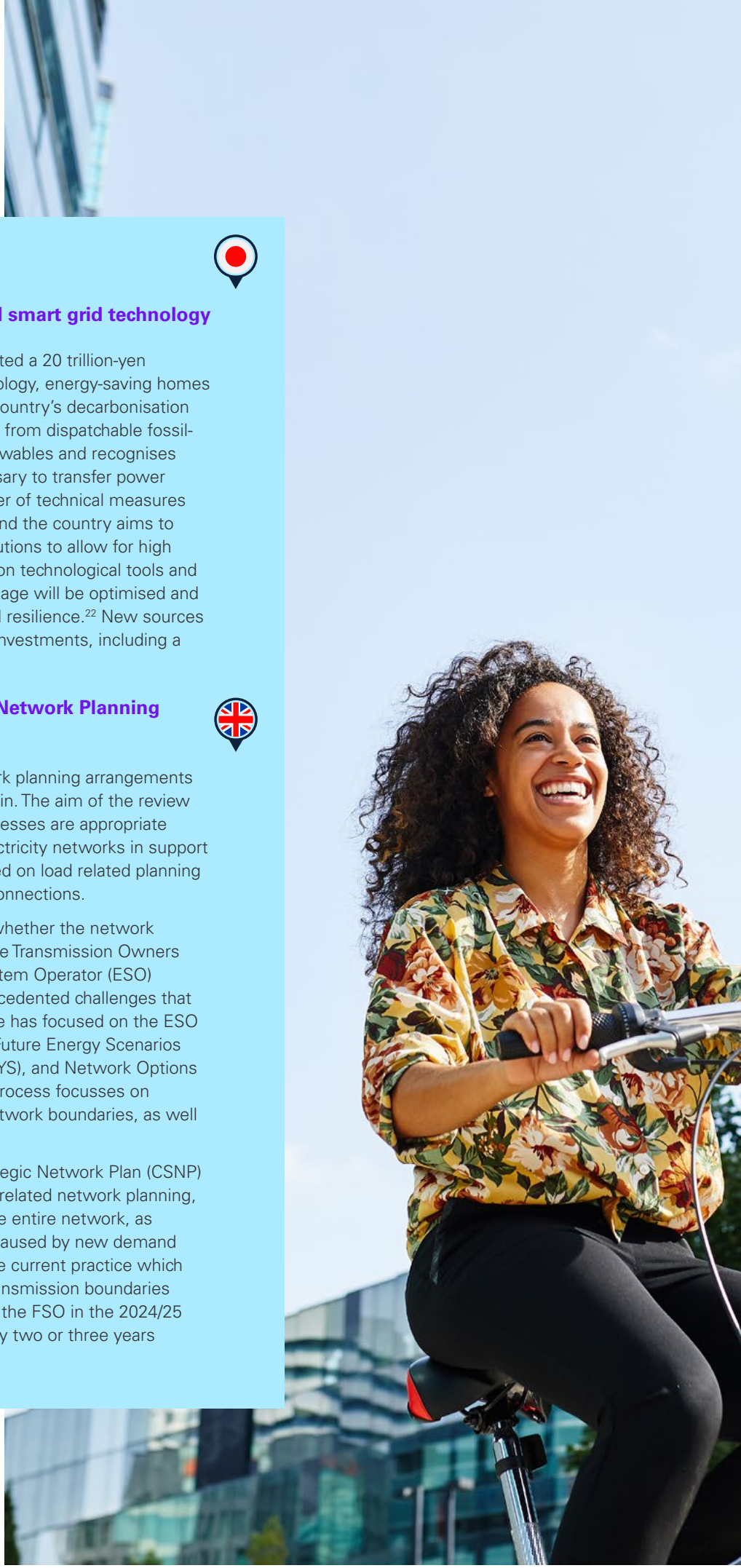
In 2022, the Japanese Government created a 20 trillion-yen (€129bn) fund for new power grid technology, energy-saving homes and other technology to accelerate the country's decarbonisation journey. Japan faces a monumental shift from dispatchable fossil-powered generation to intermittent renewables and recognises that large investments in grid are necessary to transfer power from generators to consumers. A number of technical measures to improve grid stability already exists, and the country aims to continue investing in state-of-the-art solutions to allow for high penetration of renewables.[21] The focus on technological tools and smart grid solutions ensures that grid usage will be optimised and aims to guarantee the grid's stability and resilience.[22] New sources of revenue are sought to finance these investments, including a carbon tax and utility charges.[23, 24]

OFGEMs Electricity Transmission Network Planning Review (ETNPR)

OFGEM conducted a review into network planning arrangements for electricity transmission in Great Britain. The aim of the review was to make sure that the planning processes are appropriate given the level of change required in electricity networks in support of net zero ambitions. The review focused on load related planning covering both demand and generation connections.

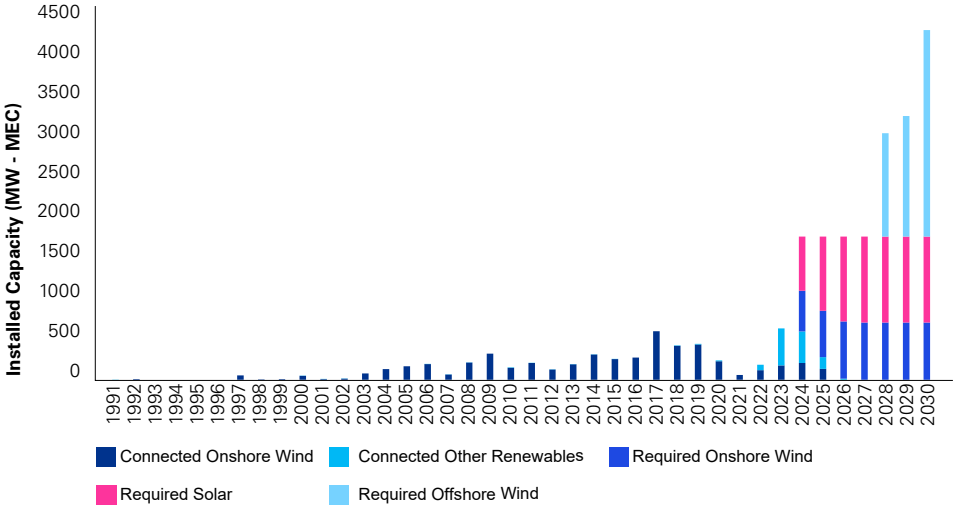
OFGEM's review aimed to understand whether the network planning processes and tools used by the Transmission Owners (TOs) and those used by the Energy System Operator (ESO) could be improved to address the unprecedented challenges that decarbonisation pose. The review to date has focused on the ESO planning processes which includes the Future Energy Scenarios (FES), Electricity Ten Year Statement (ETYS), and Network Options Assessment (NOA) cycle. This existing process focusses on thermal constraints and transmission network boundaries, as well as fault current.

OFGEM has decided that a Central Strategic Network Plan (CSNP) must be produced incorporating all load related network planning, looking at capacity constraints across the entire network, as well as operational constraints that are caused by new demand and generation. This is a change from the current practice which identifies thermal constraint needs at transmission boundaries only. The first CSNP will be produced by the FSO in the 2024/25 regulatory year and will be updated every two or three years thereafter.



21. REI_Agora_Japan_grid_study_FullReport_EN_WEB.pdf (renewable-ei.org)
22. Smart Grid & Smart City | EU-Japan
23. Chairman's Message - The Institute of Energy Economics, Japan - IEEJ
24. Japan plans $155bn decarbonization fund for grid, factory investments - Nikkei Asia

On average 1.8 GW onshore renewables must be connected to the grid each year until 2030[25, 26]



The above graphic displays grid connections per year since 2000 by technology type along with contracted connections with a set future date (data from EirGrid and ESBN)[27]. These are compared with the average of grid connections required for solar, onshore wind, and offshore wind to reach the renewable electricity generation targets set out in CAP 23. The volume of connections to the grid will need to increase significantly over the coming years for policy targets to be met – this will include an increase in the diversity of renewable technologies connecting. A step change in the total MW capacities per year are also required placing ever more demand on resources, supply chain, network outages and prompt processing of grid connection applications.

25. Generator Statistics (esbnetworks.ie)
26. Connected and Contracted Generators (eirgridgroup.com)
27. Note that the graphic does not include c. 1,500MW Wind and c. 2,800MW other renewables that have received contracts for future connection by EirGrid or ESBN as these have historically been prone to non-completion.

Land

Access to good quality suitable sites for renewable energy generation is becoming increasingly challenging for developers as the most "optimum" sites are already secured. That said, communities are increasingly accepting of renewable energy projects due to various perceived social, community and economic benefits of projects which makes securing land for projects more achievable, albeit greater challenges still exist when securing land for grid development.

Key successes to date

- Strong community and landowner relationships have developed as communities see the successes of other renewable projects that have been delivered.
- Developers' community engagement approach has become very professionalised.

Stakeholders considered that the renewable energy industry has established a strong and effective working relationship with landowners across the country.

Securing land, either by way of purchase or typically by way of land lease option is often the first key milestone in the development of a renewable energy project. Throughout the consultation, the majority of consultees were of the view that the renewable energy industry has established a very good working relationship with landowners across the country and that communities are increasingly accepting of renewable energy projects due to various perceived social, community and economic benefits of projects. Amongst the hierarchy of challenges facing developers, land was therefore not considered the highest priority item.

However, several challenges with land exists that also pertain to other areas of developing a renewable energy project – in particular, obtaining planning permission for a project. These include zoning issues with land dedicated to renewable energy project developments, concerns regarding securing land for grid development, and objections to planning permits originating from considerations in the immediate geography. The issues most relevant to land are discussed further in this section while issues that mainly consider grid development or planning are laid out in further detail in separate sections of this report.

What are the challenges?

Access to quality land

- The primary challenge with land is the availability of suitable, good quality sites for developing renewable energy projects. While the industry has navigated this challenge effectively to date, consultees viewed it as an ongoing challenge compounded by stricter wind energy development guidelines and the increased designation of land as Special Protection Areas (SPAs). Whilst SPAs are appropriate in many instances, the fact is they do decrease the total developable area for renewable energy projects.
- A more recent development challenge which was highlighted is the area of land restricted from wind farm development by the Air Corps and which constitutes a significant amount of the land mass of the country.

Repowering

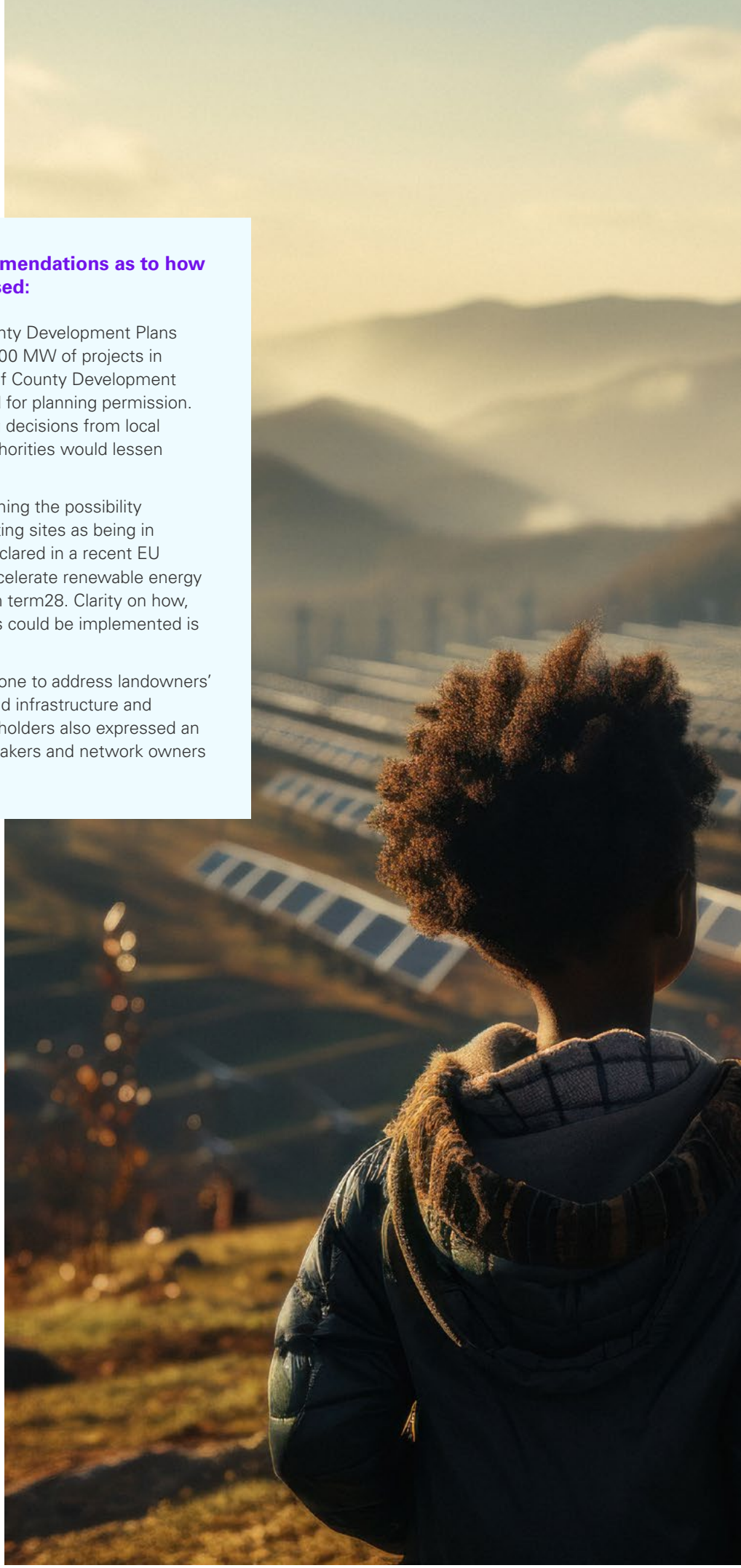
- Some consultees voiced concerns about the ability to repower wind farms as a significant portion are located in Special Protection Areas (SPAs). Wind farms are not necessarily prohibited from being developed in SPAs, but are subject to special assessment procedures, which can act as a major deterrent for their repowering. Analysis by Wind Energy Ireland shows that by 2025, almost 1,500 MW of today's operational onshore wind generation capacity will be aged 15 years or more and asset owners are likely to be actively considering repowering or renewal. An inability to repower currently operational sites further raises the challenges to deliver on our decarbonisation ambitions.

Land for Grid

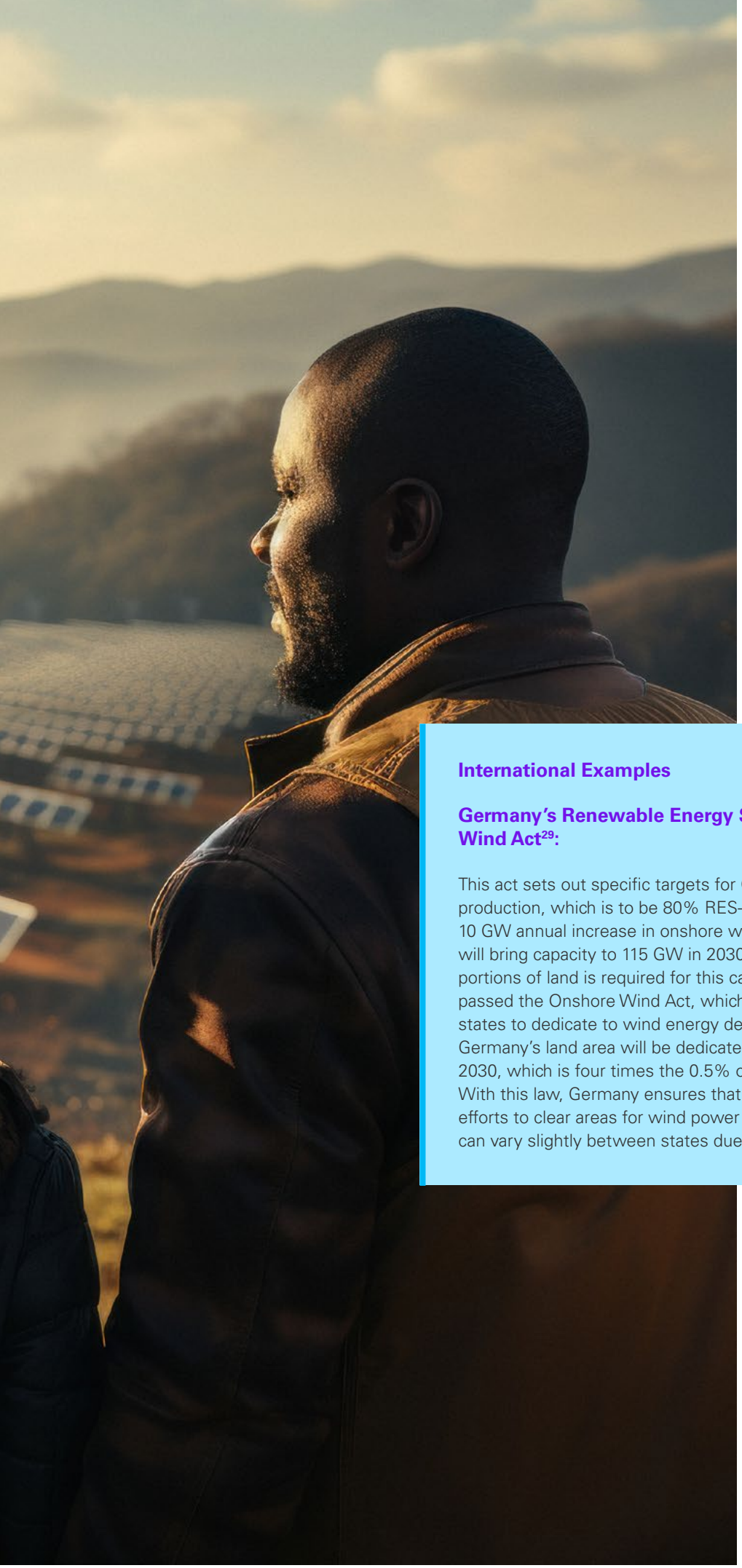
- Whilst consultees generally observed that securing land is not the primary challenge for developers of renewable energy projects, it is a far more significant issue for grid development.
- Some consultees were of the view that ESB Networks have a preference not to use private land due to access issues, which can restrict or delay the development of new grid infrastructure.
- A number of consultees were of the view that the increased, or default use of underground cables - whilst a more expensive solution - will enable the delivery of more grid connections. One stakeholder proposed "hops and skips" of underground cables and overhead lines to overcome land challenges for grid development.
- A number of developers were supportive of the ambition within CAP 23 to utilise public road and railways for grid corridors and are keen to see progress on this front.
- Consultees also expressed a preference for using private land for grid corridors to minimise distances and cost while recognising that this requires solutions to secure the consent of landowners.

Consultees were asked for recommendations as to how land challenges might be addressed:

- There is an urgent need to align County Development Plans with national policy. Approximately 500 MW of projects in planning are at risk due to rezoning of County Development Plans since the projects have applied for planning permission. It was suggested that moving zoning decisions from local authorities to regional or national authorities would lessen restrictions in this regard.
- Multiple consultees proposed examining the possibility of classifying the repowering of existing sites as being in the "overriding public interest" as declared in a recent EU Emergency Council Regulation to accelerate renewable energy deployment in the short and medium term28. Clarity on how, when and under what conditions this could be implemented is needed.
- Consultees felt that more could be done to address landowners' concerns regarding the hosting of grid infrastructure and incentives to accommodate it. Stakeholders also expressed an interest in collaborating with policymakers and network owners on solutions to address this issue.



28. Accelerate the rollout of renewable energy (europa.eu)



International Examples

Germany's Renewable Energy Sources Act and Onshore Wind Act[29]:

This act sets out specific targets for Germany's renewable energy production, which is to be 80% RES-E by 2030. Reaching the target involves 10 GW annual increase in onshore wind in the next seven years, which will bring capacity to 115 GW in 2030 and 160 GW in 2040. Significant portions of land is required for this capacity, and as such Germany has passed the Onshore Wind Act, which sets binding area targets for federal states to dedicate to wind energy developments. Consequently, 1.4% of Germany's land area will be dedicated to onshore wind by 2027 and 2% by 2030, which is four times the 0.5% of land that is actually available today. With this law, Germany ensures that all its constituent federal states make efforts to clear areas for wind power developments though exact targets can vary slightly between states due to for instance geographical factors.

29. SMARD | Changes to the laws affecting wind power

Route to Market

There was broad consensus from respondents that route to market is not the most significant challenge for the delivery of renewable energy projects in Ireland. Stakeholder feedback generally aligned that whilst there are aspects of RESS that they may wish to change, it provides a workable framework to develop renewable energy projects. There is some concern, however, regarding the volume of renewable energy which will be successfully delivered under recent RESS auctions in light of inflationary pressures along with planning and grid delivery timeline issues. In addition, the corporate PPA landscape is beginning to evolve and increasingly provides a viable alternative route to market for projects.

Key successes to date

- The Renewable Energy Feed-in Tariff (REFIT) schemes were launched to help increase Ireland's share of renewable electricity supply to 40% by 2020. REFIT was announced in 2006, closed in 2015, and was in large parts successful in its aim.
- The Renewable Electricity Support Scheme (RESS) replaced REFIT in 2020. It primarily targets cost effectiveness while also supporting technology diversification, delivering a high share of RES-E by 2030, and increasing sustainability. Widely considered a success, the first round of the scheme, RESS 1, contracted 2,237 GWh of renewable energy while RESS 2 contracted 2,748 GWh. RESS 3 was launched by Minister Eamon Ryan in April 2023 with auction results published by EirGrid in October 2023 In contrast to previous auctions, RESS 3 fell short of expectations contrasting only 934 GWh which was less than half of the 2,000 – 3,500 GWh targeted.

There are few projects not progressing for want of a route to market.

The deployment of renewable energy assets are substantial projects requiring considerable investment over a multi-year period. To attract developers and offer reassurance of return on their investments, it is essential that Ireland provide renewables energy projects with appropriate routes to market.

The common routes to market for renewable electricity projects in Ireland over the last number of years has been the Renewable Electricity Support Scheme (RESS) and Corporate Power Purchase Agreements (CPPAs). The RESS schemes, and REFIT before that have been successful in incentivising the large-scale deployment of renewable electricity generation projects over the last years.

What are the challenges?

Market exposures

- Dispatch down was raised as a significant issue as it reduces the volume of renewable energy from which projects can earn revenue, thereby raising the price needed to pay for the project. One respondent commented that developers need to assume the worst-case scenario when bidding into RESS which has the knock-on effect of raising bid prices. While some stakeholders welcomed the change in RESS 3 whereby dispatch down risk is now limited to constraint events, others highlighted that CPPAs remain exposed to constraint, curtailment and oversupply dispatch down risks.
- A number of stakeholders were of the view that balancing redispatch costs could be reduced to the benefit of both consumers and renewable generators if sufficient resources were able to develop and deliver policy. One consultee was of the view that such an investment would result in a positive payback within one year.
- Industry stakeholders raised the lack of route to market for batteries and long duration energy storage as a barrier to accelerating renewable development. The industry considers long duration energy storage vital for a decarbonised grid as it will enable greater consumption of renewable energy by aligning supply and demand and enable the grid manage congestion.
- Respondents were of the view that contract for difference (CfD) schemes such as RESS work well and protect the consumer, however wholesale market exposures compounds counterparty risk for CPPAs based on CfDs which is mandatory for market registered renewable generators in Ireland.
- Some stakeholders criticised the lack of indexation in RESS 1 and RESS 2 as a deterrent for auction participants. Partial indexation has been introduced in RESS 3, which will apply to 30% of the strike price and function on an annual basis in line with the Harmonised Index of Consumer Prices. Some respondents provided feedback that CPPAs may provide a more robust route to market for some projects when favourable indexation terms are available.
- Stakeholders called out the need for a national hydrogen strategy to define its role in Ireland's future energy system and attract domestic development of hydrogen solutions. This has been somewhat answered by DECC who published the National Hydrogen Strategy in July of 2023[30], however greater clarity is sought on potential routes to market – either by way of direct injection to the gas grid or alternatively to the transport and industry sectors.
- It is noted that whilst RESS 1 and 2 have been regarded as successes in auction format, the final outcome of these auctions remains to be determined in terms of projects delivered. A number of RESS 1 projects have not delivered – in many cases due to underbidding or unforeseen challenges with grid connections, planning permissions, supply chain or cost of finance issues. It now appears that there will similarly be significant attrition for RESS 2 projects, predominantly due to inflationary pressures in the past 12 months and slow grid connection timelines. It would be an interesting analysis for DECC to determine the realised volume and realised price of RESS 1 for example – volumes would be substantially lower and the price could be far higher than €72/MWh.

30. gov.ie - National Hydrogen Strategy (www.gov.ie)

Consultees were asked for recommendations as to how route to market challenges might be addressed:

'Cost of Renewables' Government Task Force

- The impact of the current inflationary environment on both consumer prices and renewable energy projects was repeatedly raised as a key concern. Analysis commissioned by Wind Energy Ireland has quantified the positive impact renewable energy has on energy prices in Ireland31. However it was felt that more could be done to help the renewable energy sector reduce costs and thereby reduce energy prices. Stakeholders called for the Government to respond to Wind Energy Ireland's request to establish a 'Cost of Renewables' Government Task Force to assess how to reduce the cost of renewable energy in Ireland.

Changes to the RESS framework

- It was suggested in interviews that removing or adding greater flexibility to the long-stop date in RESS could attract more renewables projects. This would come with a drawback of reduced certainty in developer timelines, but ultimately encourage projects to enter the auction process earlier and have them on-line as soon as possible.
- Consultees suggested removing the rule which bars projects withdrawn from the RESS 3[32] (and future) auctions from participating in any future auction. This rule is seen as deterring potential entrants to the auctions from participating therefore delaying additional renewable capacity by up to several years.

Corporate PPAs

- Respondents acknowledged the constraints the I-SEM rules places on the corporate PPA framework in Ireland. Some stakeholders felt that the Government could adopt a guarantor role to reduce counterparty risk when contracting with indigenous Irish corporates which would grow the market for CPPAs.
- Consultees felt that a market standard pro-forma CPPA contract could increase uptake by reducing legal advisory costs and increasing standardisation, however it was acknowledged that the established buyer of CPPAs will continue to use their own templates and terms.

Firm grid connection cost

- Consultees were of differing opinions with regards to firm grid connection costs. On one hand, firming the cost early on would support better informed auction bids, but it was also argued that flexible and non-firm solutions are necessary to speed up grid connections for renewable energy projects. A forum for communication between the stakeholders would be useful to find the most beneficial solution for all parties.
- Several respondents would like to see clearer communication and stronger commitments to future rounds of support schemes such as RESS 4 and RESS 5. As required by the EU Renewable Energy Directive, DECC annually publishes a schedule of future renewable electricity support schemes auctions[33]. However, some stakeholders still voiced concerns between these being redacted in the future.

Battery Energy Storage

- Battery energy storage solutions offer great potential to increase the penetration of renewable energy on the grid however stakeholders felt their route to market remains challenging due to the continuing uncertainty regarding the system services future arrangements, the absence of energy arbitrage mechanisms in Ireland and the change in capacity market derating factors. Respondents called for greater clarity and speed of implementation for system services and energy arbitrage frameworks.
- Some consultees called for progress on hybrid connection and hybrid unit policies and rules to support the development of battery energy storage projects.
- Some respondents were of the view that an energy storage services product is required to provide the route to market certainty for long duration energy storage solutions.

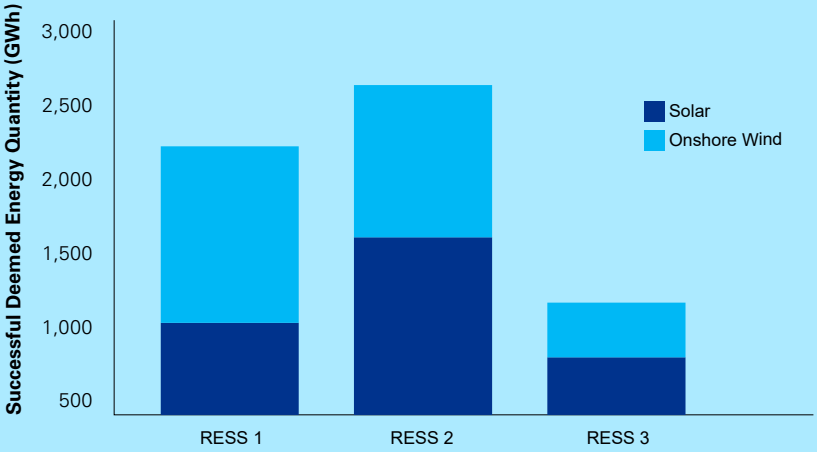
Hydrogen

- Respondents were cautiously optimistic with respect to potential green hydrogen opportunities and there was broad consensus that more research and policy is needed in this space.
- Some stakeholders called for policy and investment signals in gas storage, infrastructure, and electrolyser capacity to aid developers to mobility and to the development of the sector in Ireland.
- Respondents called for the commencement of strategic enablement works to match what other EU member states have begun in ports and gas transmission pipes.

31. New August record set for electricity generated by wind (windenergyireland.com)
32. gov.ie - Renewable Electricity Support Scheme (RESS) (www.gov.ie) (May 2023)
33. gov.ie - Renewable Electricity Support Scheme - Schedule of Future Auctions (www.gov.ie)

RESS 3 failed to deliver on auction model

Whilst it is welcome that annual auctions are now a recurring feature of the renewable electricity market, unfortunately, RESS 3 has ultimately failed to deliver what was hoped for by industry, with contracts awarded to only three wind farms amounting to a total capacity of 148 MW, along with just under 500 MW of solar PV.[34] The total annual generation from this capacity is expected to be 934 GWh, which is significantly short of the indicative auction volume of 2,000 – 3,500 GWh targeted by the Department of the Environment, Climate and Communications (DECC) to meet Ireland's 2030 80% RES-E target. The volume contracted in RESS 3 is much lower than the two previous auctions and suggests the need to carry out a review of the first three auctions to discover lessons learnt and areas for development.



International Example(s):

Private Wire Legislation

Private wire PPAs feature prominently in the energy landscape in the UK and many in EU countries. As the name implies, this route to market concerns power transferred directly from a generator to a customer across a private transmission circuit or network. This avoids network charges from grid usage for both parties and also reduces loads and congestion on the grid. The popularity of private wire agreements has grown in recent years with increasing concerns about energy prices, security of supply along with a growing appetite for renewable electricity. Currently not an option in Ireland, the topic of updated private wire policy is often brought up, particularly with regards to covering the ever-increasing demand of the many datacentres operating in Ireland. A clear private wire policy and associated legislation will be a key enabler to the decarbonisation of industry in Ireland and the increased enablement of CPPAs. The publication of the private wire consultation by DECC in August 2023 is a welcome development with industry calling for the swift implementation of decisions, albeit some noted concerns that with 170 questions outlined in the consultation it will require a focused effort to review and address these efficiently.

34. RESS-3-Provisional-Auction-Results-(R3PAR).pdf (eirgridgroup.com)

2030 Targets

2030 Targets

The 80% RES-E target was a frequent topic of discussion during stakeholder interviews with many stakeholders highlighting that Ireland's carbon budget and sector ceilings (60 Mt of cumulative CO2 emissions from the electricity sector between 2021 and 2030) are the most important targets to be achieved. Most consultees appreciate the Government's ambition, but there were also a number of questions and concerns regarding the topic. These included the risk that the 2030 renewable generation target takes focus away from the end-goal of net-zero with 80% RES-E being viewed as an arbitrary number in some quarters, with the potential to overshadow the carbon budget targets, which some respondents felt should be of overarching importance.

While acknowledging that the ambition will be dependent on the timeline of offshore wind delivery(which was not the focus of this report and consultation), over 95% of industry experts believed that the 80% RES-E target for 2030 will not be achieved and is out of reach as c.6 years to deliver this is too short a timeframe. Certain voices were more optimistic and thought the target more likely, though highlighting that reaching the target is dependent on offshore wind parks being consented, constructed and energised within this period. Notwithstanding this, there was broad consensus that there is willingness across industry and Government to achieve this as quickly as possible and with continued collaboration, efforts, and taking on board some of the feedback of this consultation that Ireland would be positioned to achieve it as close to that timeline as possible.

Glossary

SPAs	Special Protection Areas
CAP	Climate Action Plan
LCIS	Low Carbon Inertia Services
GW	Gigawatt
MW	Megawatt
TWh	Terawatt Hour
GWh	Gigawatt Hour
LA	Local Authority
ESBN	ESB Networks
CRU	Commission for Regulation of Utilities
ABP	An Bord Pleanála
DS3	Delivering a Secure Sustainable Electricity System
RES-E	Renewable Energy Share in Electricity
ECP	Enduring Connection Policy
NIC	National Infrastructure Commission
RESS	Renewable Electricity Support Scheme
CPPA	Corporate Power Purchase Agreement
ORESS	Offshore Renewable Electricity Support Scheme
SNSP	System Non-Synchronous Penetration
OREDP	Offshore Renewable Energy Development Plan

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The findings in this report are given in good faith but, in the preparation of this report, we have relied upon and assumed, without independent verification, the accuracy, reliability and completeness of the information made available to us in the course of our work and have not sought to establish the reliability of the information by reference to other evidence.

Any findings contained within this report are based upon our reasonable professional judgement based on the information that was available as of 1 October and we cannot provide any guarantee of assurance that it will continue to be accurate in the future.

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