KPMG

Economic impact of onshore wind in Ireland

Prepared for Wind Energy Ireland (WEI)

—

April 2021

WIND ENERGY IRELAND

Funded by Bord na Móna Naturally Driven, Brookfield, Coillte Grow. Transform. Sustain., Statkraft

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13 April 2021

Economic impact of onshore wind in Ireland

Dear David

In accordance with our engagement letter and its attachments dated 12 August 2020 (our "Engagement Letter"), we enclose our report detailing the findings of our research on the economic impact of onshore wind in Ireland.

This report contains:

1. A sector overview examining the onshore wind sector's value chain, role in sustainable development, and contribution to energy production;
2. A review of the sector's baseline impacts, across economic value add, employment, labour incomes, local authority rates, and taxation; and
3. An assessment of the sector's future impacts, if Government targets for increased generation capacity from onshore wind by 2030 are realised.

Our report has been prepared on the basis of information and data gathered from WEI members in the second half of 2020 and from WEI directly.

Yours sincerely,

Russell Smyth
Partner, KPMG

Head of Sustainable Futures

Foreword

Foreword by Noel Cunniffe, Acting CEO, Wind Energy Ireland

Irish wind farms create jobs. They bring investment to rural Ireland and help local businesses to grow. They support and strengthen sustainable communities.

The contribution wind energy is making to Ireland's fight against climate change is already well understood.

Wind farms provided almost 40 per cent of the country's electricity last year and cut our CO_2 emissions by around four million tonnes. They make our energy supply more secure because they reduce our dependence on imported fossil fuels.

But this analysis from KPMG shows that onshore wind energy is also an essential contributor to growing Ireland's economy.

More than 5,000 people work in our industry and, if we can achieve the targets set for onshore wind in the Climate Action Plan, this can rise to more than 7,000.

Our wind farms are already worth more than €400 million to the economy every year and we can expect this to rise to €550 million by the end of the decade.

We know we have the pipeline to deliver 4,000 MW of onshore wind by 2030 and this report shows that every time the blades of a wind turbine are turning it doesn't just mean less carbon emissions and cleaner air.

It means jobs, it means salaries, it means investment, it means growing local businesses and it means more funding for rural communities.

I would like to thank the team at KPMG for their hard work on this report, our members who provided enormous amounts of data to ensure it was based on actual spending in the Irish economy and particularly to Bord na Móna, Brookfield Renewable, Coillte and Statkraft who generously supported this research.

And we must not forget, this is just the economic contribution from onshore wind. Last year we published, *Harnessing Our Potential*, which sets out the multi-billion opportunity for our country and our coastal communities from the development of offshore wind energy.

Together, over the next ten years, we will build on two decades of experience to double our onshore wind capacity while applying that expertise to build an entirely new offshore energy industry.

We will deliver a zero-carbon Ireland while creating sustainable jobs, attracting green investment and building stronger communities.

This is what the just transition looks like.

We are ready to play our part.

Noel Cunniffe

Acting CEO

Wind Energy Ireland

Contents

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About this report

High-level scope

Impacts: Economic + Social + Environmental

1

Economic impact analysis: Estimate the current baseline economic impact of the onshore wind sector in terms of Gross Value Added (GVA), employment and exchequer impacts

Also consider social and environmental impacts, for example the impact on carbon emissions

2

Gap analysis: Top-down gap analysis of quantum of investment required to deliver projects to meet climate targets; bottom-up evaluation of required/likely composition of projects in known pipeline

Review additional MW required by 2030 to meet the Climate Action Plan's target of 8,200 MW

3

Forecasting the impact out to 2030: report on all benefits in the baseline and apply projections to 2030, informed by research, consultations, and known pipeline, to estimate the potential impact towards 2030

Quantify the sector's baseline impact using a bespoke model, based on our existing Input-Output (I-O) model

Key sources

Survey of WEI members which provided the research team information on WEI members':

- Footprint across all counties in Ireland
- Spend by type of spend across different wind farm types
- Employment at members' head offices and at sites
- Overall capacity by location and site
- Payments to local authorities in the form of rates
- Salary information for employees

Desktop research of third party papers and reports, including from:

- American Wind Energy Association
- Baringa
- Climate Action Plan 2019
- Cambridge Econometrics
- CSO
- Eurostat
- ESRI
- Everoze
- IEA
- KPMG
- Renewable UK
- SEAI
- Wind Europe

Conversations with the steering group of WEI, in particular with:

- Justin Moran
- David Connolly
- Yvonne O'Brien Bogdanovic
- Paul Blount
- John Lynch
- Peter Lynch
- David O'Sullivan
- Pat O'Sullivan

Executive summary

Onshore wind impacts in Ireland

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

2030

Government target of **8,200 MW** per Climate Action Plan

€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

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

Onshore wind impacts in Ireland

2020

€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

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

Potential of **~€100m** 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

Executive summary

Summary of our findings.

Sector overview

Theme	Key findings
Positioning the sector	• Onshore wind creates a range of economic, social, and environmental impacts for communities across Ireland. These primarily arise as economic value add, job creation, additional Exchequer returns, reduced emissions, and a rolling and sustainable pipeline of capital investment. • All of these impacts arise at each step of the sector's value chain: in project planning, manufacturing, transport, installation, grid connection, operations and maintenance, and decommissioning. The nature of the sector, especially its growth, generates a **circular flow of investment in new projects**, ensuring value is continuously renewed. • Onshore wind energy makes a vital contribution to enabling Ireland to meet its Paris Agreement commitment of a reduction of greenhouse gas emissions by at least 40% by 2030, compared to 1990 levels, by providing clean energy to communities across Ireland. • Onshore wind also contributes to Ireland meeting its **Sustainable Development Goals** commitments, especially in relation to **sustainable energy** (SDG 7), **combating climate change** (SDG 13) and **promoting economic growth** (SDG 8), amongst others. • Under the Renewable Energy Support Scheme (RESS), 40% of **community benefit funding** must be reserved for projects which support the SDGs. Assuming CAP targets are met by 2030, **annual payments of ~€10 million** would be made available for **SDG-related projects**.
Existing and future capacity	• Ireland has vast onshore wind energy resources, which presents an enormous opportunity to deliver large amounts of clean, reliable energy to the country's population centres. Harnessing Ireland's onshore wind resources creates thousands of jobs, draws new investment to Ireland, revitalises regional towns, and creates opportunities for Irish suppliers. • Under the **Climate Action Plan**, the Government is targeting **70% renewable energy** generation in Ireland by **2030**. The target is for **8,200 MW** to be generated by onshore wind, an almost doubling of existing capacity, from **4,200 MW**. • An early-2021 WEI survey of its members to determine the known and likely pipeline of projects over the following 8 years found that players in the sector are committed to increasing Ireland's overall onshore wind capacity and have a strong pipeline of projects going into planning to support this.

Executive summary

Summary of our findings.

Baseline impacts, 2020

Theme	Key findings
Economic value add	• This study analyses the onshore wind sector's contribution to Ireland's economy, to national employment, and to the Exchequer. These are analysed across two categories: 1. **Capital expenditure**: investment in the construction and development of new wind generation capacity 2. **Operational expenditure**: expenditure on the operations of existing generation capacity. • Capital and operational expenditure can be seen as the initial round of expenditure that creates further economic impacts. These direct expenditures create additional rounds of expenditure that circulate through the economy: **direct impacts** arising from expenditure by firms in the sector, **indirect impacts** generated by expenditure by firms and staff within the sector's supply chain, and **induced impacts**, generated by the spend of individuals and firms outside the sector as a result of increased incomes. • For the overall operational and capital investment expenditure, we consider the direct, indirect and induced impacts in terms of Gross Value Added (GVA), employment, labour income, and tax payments. • Through its operating activities and capital activities, the sector makes a valuable contribution to Ireland's economic output. **The sector's baseline economic value add is estimated to be ~€410 million in 2020**, with two-thirds of all value add arising from the sector's sustainable capital activities (€270 million). This level of value-add reflects an aggregate **multiplier on investment across operational and capital activities of 1.17**.
Employment and incomes	• The sector creates direct jobs through its direct activities, indirect employment in particular through capital activities, such as in legal and financial advisory roles and in firms involved in storage, electrical supply, related services, and induced employment, through spend by direct employees in local shops. **Throughout its supply chain, the sector currently supports ~5,130 jobs**, with a strong foothold in rural Ireland. This figure does not include employment in grid development by some players and is therefore a conservative estimate. • Currently, through its direct and indirect activities and employment, the sector supports **payment of labour incomes totalling €225 million**, with a significant share flowing to rural communities. The majority (62%) of labour income is generated in the sector's supply chain, highlighting how the sector can act as a catalyst for wider employment. • The sector contributes to the generation of a range of pay-related taxes, summing to **~€75 million**. Total payments through **Employer PRSI** are greater than **€25 million**, while **income-related payments** by workers throughout the supply chain sums to more than **€50 million** (€40 million in income tax and €10 million in Employee PRSI).

Executive summary

Summary of our findings.

Baseline impacts, 2020 (contd.)

Theme	Key findings
Key pillar for regional / rural economic activity in Ireland	• Wind farms in Ireland are predominantly focused in the regions, which results in the investment, economic activity and employment predominantly being based outside of the major urban areas. It is viewed as a critical component contributing to the current and long term economic development of regional and rural areas. • Baseline (2020) wind farm generation capacity influences regions' relative contribution to overall economic impact. Currently, as a share of the Gross Value Added (GVA) impacts of operating activities, the **Southern Region** generates the greatest capacity and national impacts (~**€83 million**), followed by the **Northern and Western Region** (~**€50 million**), and the **Eastern and Midlands Region** (~**€7 million**). The Baseline contribution highlights the spread of impacts across Ireland. • The sector provides a **stable source of revenue for many local authorities**, with total contributions of ~**€45 million annually**, and providing local authorities with a valuable source of revenue that can be reinvested in local communities. As the sector's footprint grows over the next decade to 2030, its financial contribution to many local authorities will also increase, and has the potential to reach **€100 million by 2030**. • Total **baseline local authority contributions are greater than €5 million in a number of counties** (e.g. Cork County and Tipperary). In some counties, contributions can also account for a strong share of local authorities' total commercial rates income (e.g. 22.0% and 15.5% of total income in Leitrim and Tipperary respectively).

Executive summary

Summary of our findings.

Future impacts, 2030

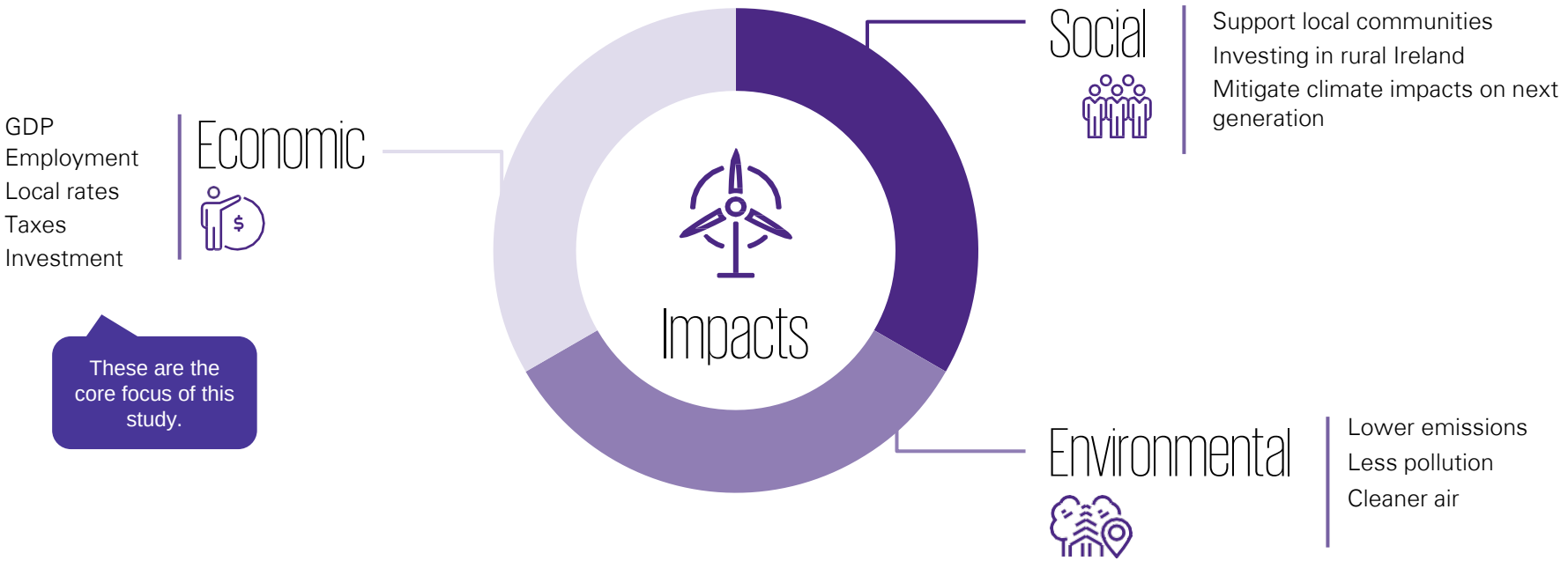
Theme	Key findings
Economic value add	• The sector can make a vital contribution to Ireland's economic performance over the next decade in direct, indirect, and induced impacts throughout its supply chain. The sector has a strong pipeline of projects in planning, with planning, and going into pipeline as of early 2021. If **CAP targets are reached in 2030, total economic impacts** arising from the required level of capital investments would be nearly **€2.7 billion through to 2030**. • Similarly, If **CAP targets are reached in 2030**, the onshore wind sector's value add could be ~**€550 million** in that year, across all of its operational and capital activities.
Employment and incomes	• Capital investment expenditure should not be seen as a once-off event: the need for additional capacity means capital investment will take place on an ongoing basis. Meeting the target of ~8,200 MW by 2030 will require a sustained annual investment of ~400 MW annually. The number of **cumulative construction job years** for capital expenditure (capex) could grow from 800 in 2020 to **8,800 by 2030**. This is likely a conservative figure, as it does it include a share of jobs in grid development, the systems operators, or regulators. • In addition to the anticipated growth in construction jobs, there will be further capital expenditure as some existing operational assets are repowered or invested in to provide a life extension to the project. • If CAP targets are reached, employment numbers throughout the supply chain will grow. **By 2030, total direct and indirect employment in that year could be ~7,020**, an increase of 35% on the baseline level of employment. • By 2030, assuming targets are reached **total labour income** in 2030 could be **€305 million**. • As the Irish economy recovers from the economic impact of the pandemic in the early 2020s, the onshore wind sector will provide stable employment to a growing number of workers in communities across Ireland.

Sector overview

The benefits of wind - diverse and tangible

The onshore wind energy sector generates a mix of benefits, both monetary and non-monetary. This study quantifies several of these in an Irish context.

Renewable energy impacts



The wind value chain - a sustainable model

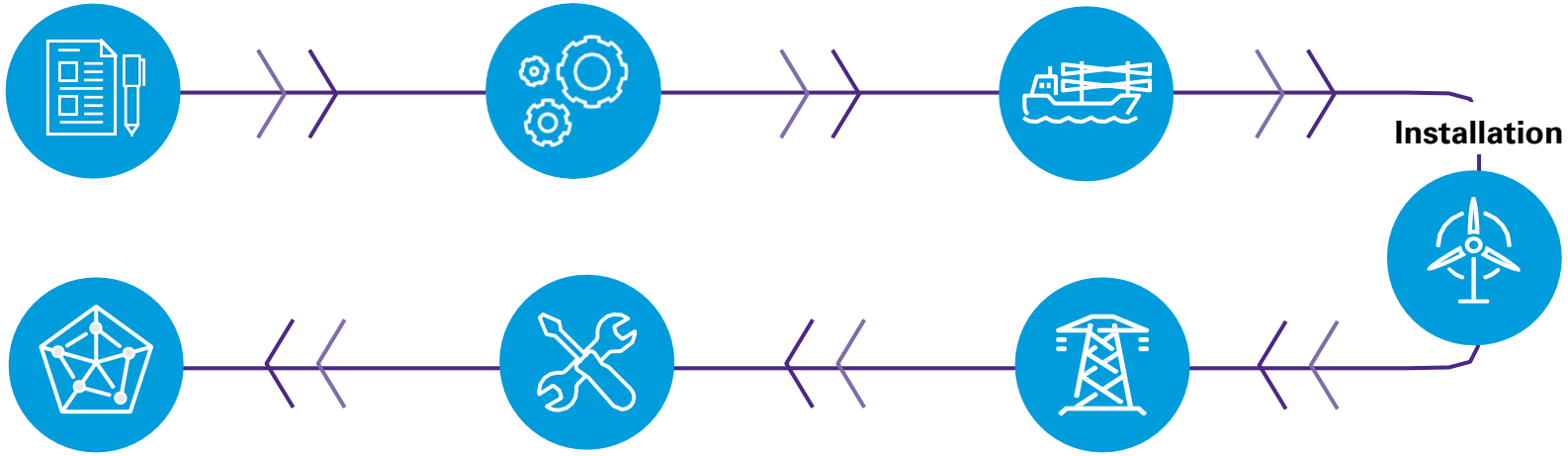
The sector's value chain connects a range of industries. In Ireland, major international players operate alongside, and support, a breadth of local developers and suppliers.

The wind value chain in Ireland

Planning guidelines are provided by central Government. Design, planning and environmental specialists, most of whom are based in Ireland, support developers to prepare applications.

Most turbines deployed in Ireland are imported; a small domestic market exists and may grow as the sector continues to increase in scale.

Given the size of turbines, transportation can be logistically complicated. A number of players in the Irish market provide these services, enabling construction in often remote locations.



Installation is a labour intensive activity. The process creates high-skilled construction employment, with the pipeline ensuring this rolls over to new sites and wind farms.

At the end of a farm's lifecycle, it can be repowered or decommissioned. Repowering ensures that investment in the sector continues.

Once operational, sites/farms require repair and maintenance, providing certainty of employment for skilled workers in communities across Ireland.

Integrating the variable power production from wind turbines into the electrical system requires distinct skills. Experienced engineers and technicians lead this work in Ireland.

The onshore wind energy sector in Ireland

Ireland's Climate Action Plan aims to achieve 70% renewable sourcing by 2030, with 8.2 GW earmarked for onshore wind capacity.

Overview of the Climate Action Plan

Ireland has vast onshore wind energy resources, with a current electricity generating capacity potential of more than 4,200 megawatts (MW). This presents an enormous opportunity to deliver large amounts of clean, reliable electricity to the country's largest population centres. Harnessing Ireland's onshore wind resources creates thousands of jobs, draws new investment to Ireland, revitalises regional towns, and create opportunities for Irish suppliers.

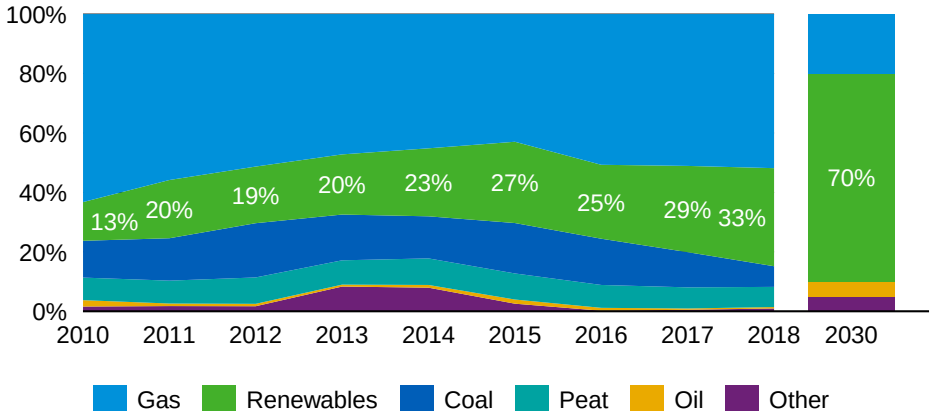
In March 2019, the Joint Oireachtas Committee on Climate Action published its cross party report entitled: Climate Change: A cross-party Consensus for Action, setting out 42 priority recommendations in the area of climate action: including a target for 70% renewable electricity in Ireland by 2030. Subsequently, the Government released its own Climate Action Plan, formally adopting the 70% target.

Policy targets

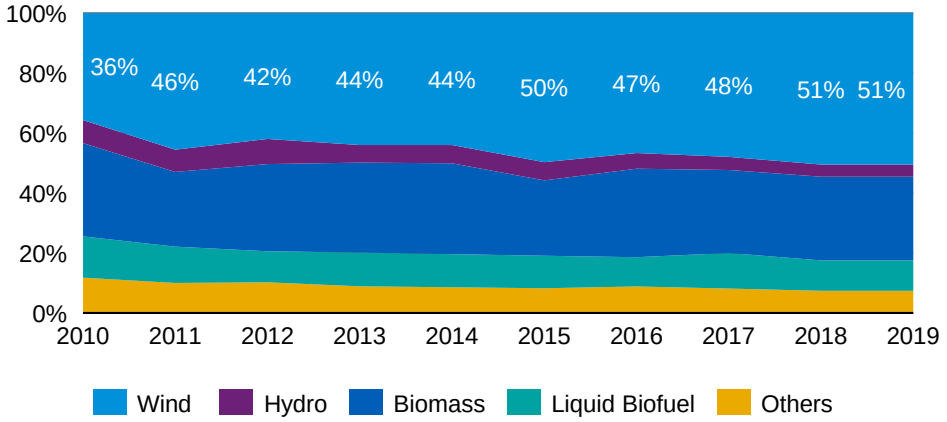
To meet the required level of emissions reduction, by 2030 Ireland will need to:

1. Reduce CO_2 eq. emissions from the electricity sector by 50–55% relative to 2030 Pre-NDP projections
2. Deliver an early and complete phase-out of coal- and peat-fired electricity generation
3. Increase electricity generated from renewable sources to 70%, indicatively comprised of:
   - at least 3.5 GW of offshore renewable energy
   - up to 1.5 GW of grid-scale solar energy
   - up to 8.2 GW total of increased onshore wind capacity.

Electricity generated by fuel type, including 2030 target



Renewable electricity by energy source (2030 not available)



Sources: Climate Action Plan, WEI, SEAI Energy Report

Pipeline to support CAP targets

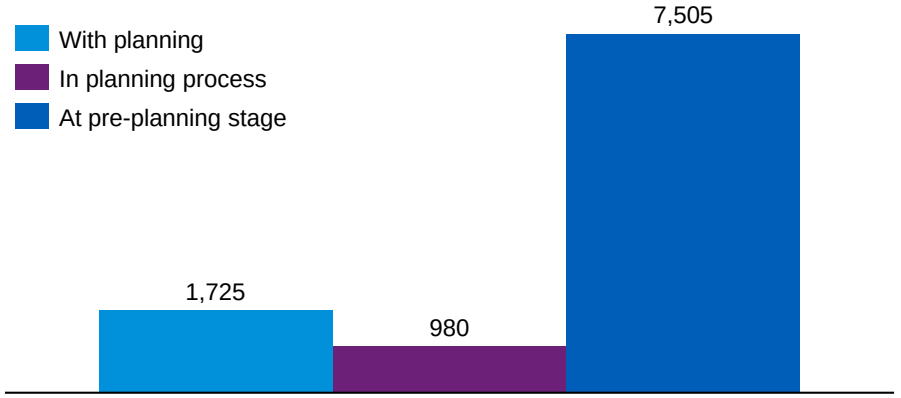
A strong pipeline of wind farms and sites is already in planning or at pre-planning stage. These projects can make a vital contribution to meeting overall CAP targets.

Sector capacity to expand

An additional 4,000 MW is required by 2030 to meet the Climate Action Plan's target of 8,200 MW. Early-2021 data from WEI shows that the sector has significant appetite to contribute to this capacity generation (see graph across).

The obvious challenge with a long-term pipeline is its uncertainty. If system operators wait until renewable projects have been consented, or have received a connection offer, before starting to design and consent grid reinforcement projects, then there will be insufficient network capacity to accommodate the volume of renewables needed for 2030.

Wind energy pipeline by stage, 2020-2027



Supporting policies

Taking account of the pipeline and the time needed to deliver transmission infrastructure, the traditional model will mean new generators are likely to be operational for several years before any grid reinforcement materialises. This may result in high constraints being incurred by new generators, affecting the commercial viability of projects entering the development pipeline. To address these risk, WEI put forward a number of policies in its 70x30 Implementation Plan:

1. Progress grid reinforcements based on the strength and certainty of the future renewables pipeline rather than waiting for projects to obtain planning consent and accept connection offers
2. Insufficient grid development capacity to accommodate the pipeline can be resolved through a new specific grid development strategy, which would be supported by a Grid Capacity Advisory Council
3. Investigate alternative network solutions (e.g. smart wires and storage).

Source: WEI

Contribution to sustainable development

Under RESS, the onshore wind sector funds community projects, 40% of which are related to SDGs. If CAP targets are reached, contributions would reach €10 million p.a. by 2030.

Sustainable Development Goals

The 2030 Agenda for Sustainable Development, adopted by all UN Member States in 2015, provides a shared blueprint for the prosperity of the planet. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.

The goals aim to end poverty and deprivation, improve health and education, reduce inequality, and spur economic growth – all while tackling climate change. Onshore wind can make a vital contribution to Ireland's effort to meet its 2030 Sustainable Development Goals. Under the Renewable Energy Support Scheme (RESS), 40% of community benefit funding must be reserved for projects which support the SDGs. Assuming CAP targets are met by 2030, annual payments of ~€10 million would be made available for SDG-related projects.

Key SDGs supported by onshore wind

- Providing access to affordable, reliable, and **sustainable energy** (SDG 7)
- Acting urgently to **combat climate change** (SDG 13)
- Supporting the achievement of socially-focused SDGs, such as **promoting economic growth** (SDG 8), and fostering **innovation** (SDG 9)
- Contributing to good **health and air quality** (SDG 3 and 11), access to **clean water** (SDG 6), and protecting **biodiversity** (SDG 15)

Sources: UN (2015), *Sustainable Development Goals* (source)

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Baseline impacts

Background: Economic impact analysis

Economic impact assessments consider the injection of income as a result of economic activity from a specific industry sector.

Definitions and viewpoint

Economic impact assessments consider the injection of income as a result of a specific event, policy choice or economic activity from a specific industry.

The onshore wind industry's economic activities can be classified into two broad categories:

1. **Capital expenditure**: investment in the construction and development of new wind generation capacity
2. **Operational expenditure**: expenditure on the operations of existing generation capacity

Capital and operational expenditure can be seen as the initial round of expenditure that creates further economic impacts. These direct expenditures create additional rounds of expenditure that circulate through the economy, based on the specific sectors in which the expenditure occurs and on the specific inter-industry linkages with the rest of the economy.

The geographic/spatial viewpoint assumed in the analysis will influence the extent of leakage of expenditure. For example, on a county or city level, more value chain inputs will be sourced from "outside" the focus area, resulting in leakage of expenditure out of the focus area. Similarly, on a national level, imported components will create a leakage of expenditure that lowers the overall economic impact.

Considering the national scale of the onshore wind industry, our analysis has been primarily based on a national viewpoint, estimating the economic impacts on a national level.

Definitions and viewpoint (continued)

This direct/primary expenditure from capital investment expenditure and operational expenditure is directed to various sectors in the economy and this creates additional rounds of expenditure in the value chain, also referred to as the multiplier impact.

The overall impact of direct/primary expenditure can be categorised in terms of three components:

1. **Direct**: impacts directly accruing from expenditure by firms in the sector (e.g. operations: wind farm maintenance costs, capital investment: turbine purchases)
2. **Indirect**: impacts generated by expenditure by firms and staff within the sector's supply chain (e.g. for operations: purchases by entities providing maintenance services, for capital investment: purchased made by equipment or service suppliers)
3. **Induced**: impacts generated by the spend of individuals and firms outside the sector as a result of increased incomes (e.g. additional household expenditure as a result of increased incomes)

For the overall operational and capital investment expenditure, we consider the direct, indirect and induced impacts in terms of Gross Value Added (GVA), employment and labour income.

Background: Economic impact analysis

The onshore wind sector's operational and capital investment expenditure provide an injection of income that flows throughout the sector's supply chain and the wider economy.

Operational expenditure and value chain impact

For the current **baseline** impact of operational expenditure, we considered the current level of onshore wind generation capacity of **~4,200 MW**.

We used this capacity and an estimate of the annual operational expenditure per MW to calculate the overall operational expenditure of the industry.

This expenditure is incurred to pay for goods and services provided by suppliers in the value chain. **From this direct or primary expenditure, we can identify the potential direct, indirect and induced impacts across the value chain**.

Capital investment expenditure and value chain impact

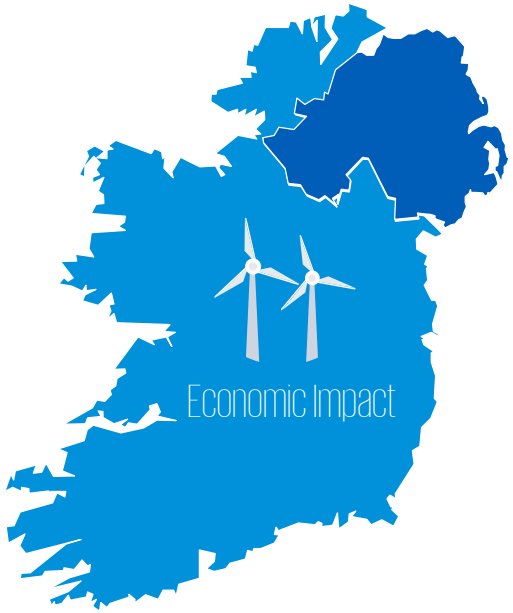
The disruptive impact of Covid-19 made 2020 a relative outlier year for considering capital investment expenditure:

- For the current **baseline (2020)** impact of capital expenditure, we considered the average level of capital investment for recent years in terms of capacity, namely a **400 MW** investment in new onshore wind generation capacity per annum
- We used this capacity and an estimate of the annual capital investment expenditure per MW (including grid connection costs) to calculate the corresponding capital expenditure of the industry

Note: capital investment is on a project basis, sustained over time.

Note on the nature of capital investment expenditure

- Capital investment expenditure: investment in the construction and development of new wind generation capacity
- This should not be seen as a once-off event, the need for additional capacity means capital investment will take place on an ongoing basis
- Reaching the wind energy target will require sustained annual capital investment in new generation capacity. This trend could continue beyond 2030 as wind's share in the energy mix increases in line with climate goals



Contribution to economic output (GVA) today

The onshore wind sector's baseline annual total economic value add is estimated to be ~€410 million, across operating and capital activities throughout its supply chain.

Operating activities		Capital investment activities (400 MW)*	
€120 million in direct impacts	This captures the direct impact of spending by players in the onshore wind sector on an ongoing basis	**€230 million** in direct impacts	This captures the direct impact of spending by players in the onshore wind sector to realise new development projects and pipeline
+		+	
€20 million in indirect and induced impacts	This captures impact of spending by suppliers within the supply chain, including on finance, legal, consultancy, etc.	**€40 million** in indirect and induced impacts	When direct capital flows into suppliers involved in developing projects, an additional €40 million is generated
=		=	
€140 million in total operational impacts	Together, the operational activities generate €140 million for the Irish economy, with a multiplier of 1.16	**€270 million** in total capital impacts	Together, capital activities generate a total value add of €270 million, with a multiplier on investment of 1.17

= **A total economic value add of €410 million, after an economic multiplier of ~1.17.**

Source: KPMG impact model; *400 MW capacity generation assumes straight line growth in capacity of 400 MW p.a. annually to 2030

Contribution to employment today

Employment directly in the sector and in its supply is ~5,130, with nearly 62% of this related to capital investment activities and an ongoing pipeline of development.

Operating activities		Capital investment activities (400 MW)	
1,800 direct jobs	The sector creates direct jobs through direct supply chain purchases, including direct maintenance	**2,970 direct jobs**	Through capital activities, employment is created in development and civil and electrical engineering, mainly outside major urban areas
+		+	
170 indirect and induced jobs	The sector creates indirect jobs through indirect supply chain purchases, including maintenance inputs, and the spend of employees in shops and local communities	**190 indirect and induced jobs**	Through these capital activities, jobs are created in legal and financial advisory roles, as well as in firms involved in storage, electrical supply, etc.
=		=	
~1,970 jobs created through operational activities	Approximately 1,970 value chain jobs are created through operating activities, reasonably split between urban and non-urban areas	**~3,160 jobs created through capital activities**	Together, approximately 3,160 value chain jobs are created through capital activities, a significant share of which are in non-urban areas

= **Total employment across the sector and owing to its activities is ~5,130, with a significant footprint in rural Ireland.**

Source: KPMG impact model

Note: The above jobs represent value chain jobs as a result of expenditure by the sector, creating jobs in the supplying industries

Contribution to incomes today

Through direct and indirect activities and employment, the sector supports annual payment of labour incomes totalling €225 million. A significant share flows to rural communities.

Operating activities		Capital activities	
€80 million in direct labour income	This is direct income created by firms operating directly in wind generation, in particular asset operators and asset owners	**€125 million in direct labour income**	Income generated for workers who directly contribute to the development of wind farms and sites, a significant share of which are located outside urban areas
+		+	
€10 million in indirect labour income	Through purchases in the supply chain and local spend, indirect labour income amounts to €10 million	**€10 million in indirect labour income**	As a result of direct capital activities, incomes of workers in the supply chain are supported
=		=	
€90 million in labour income through operational activities	Together, total labour income generated through operating activities is estimated to be €90 million	**€135 million in direct labour income**	Together, total labour income in the supply chain supported by capital activities is approximately €135 million

= **Aggregate support for direct and indirect employment throughout the supply chain equates to labour income support of up to €225 million.**

Source: KPMG impact model

Contribution to the Exchequer today

The sector makes contributions to local authorities (~€45 million) and pays employers' pay-related taxes (~€25 million). Workers' tax contributions are strong (~€50 million).

Local contributions

Across Ireland, the onshore wind sector contributes ~€45 million to local authorities tax take. This is a significant sum, supporting local employment, local services, and investments in communities. Without this, many local authorities could need to make savings on existing services or increase rates on local businesses.

Please see next page for local analysis.

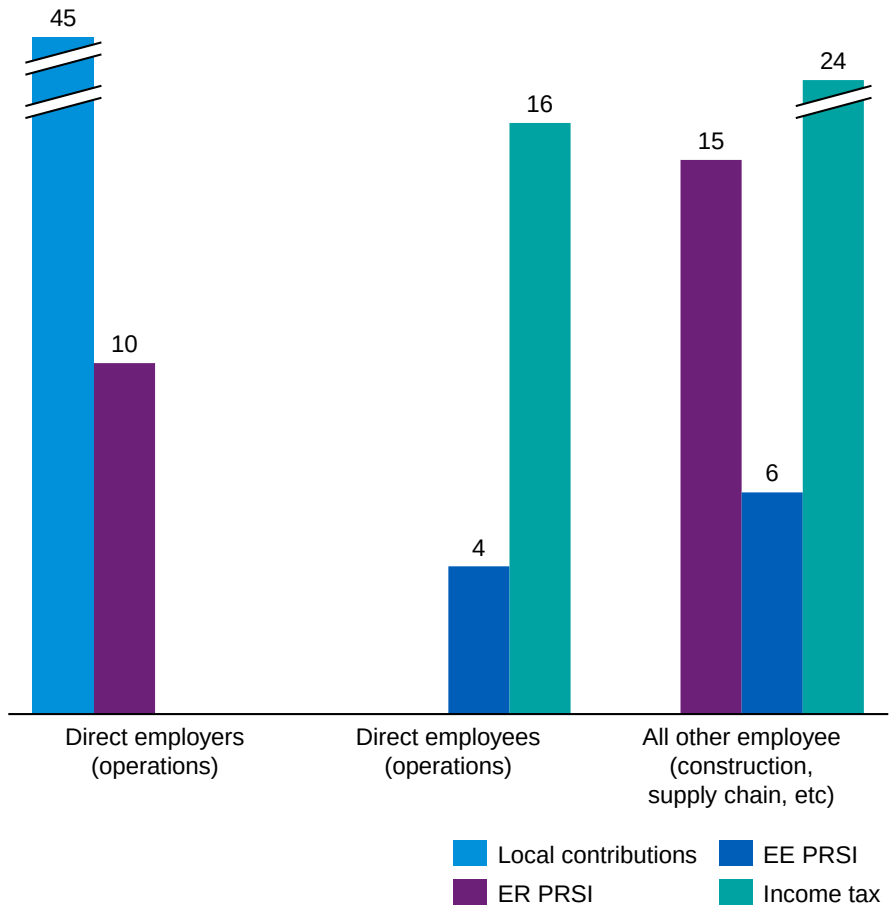
Pay-related taxes

Through its support for salaries totalling €225 million directly and in its wider supply chain, the sector makes significant contributions to pay-related taxes summing to approximately €75 million. Baseline contributions are shown below:

- Contributions through employer PRSI is estimated to sum to more than €25 million
- Contributions by employees in PRSI is approximately €10 million
- Income tax paid by direct employees and employees within the supply chain is estimated to be greater than €40 million.

These pay-related taxes – paid by employers and employees throughout the supply chain – contributes to the overall national tax take, enabling the Exchequer to reinvest in communities and services, as well as in climate adaption and mitigation strategies.

Local contributions and pay-related taxes, baseline, €m



Source: KPMG impact model; WEI 2020
Note: EE is employee, ER is employer

Regional contribution

Given the relative spread of wind farms across Ireland and the country's size, the sector contributes strongly to regional economies.

Regional contribution to national value add

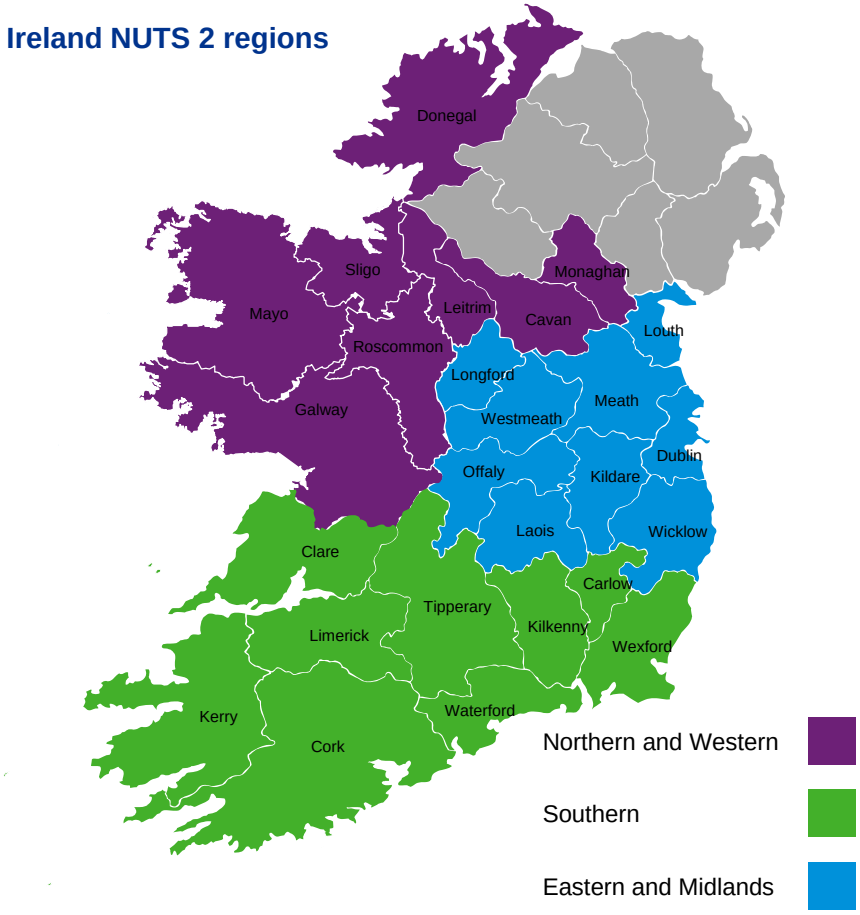
The sector makes a vital contribution to Gross Value Add (GVA) on a regional level. This take the form of spend on suppliers to maintain existing wind farms and turbines, and these suppliers' induced spend in local shops and on local services.

The table below summarises the regional contribution the sector makes to GVA solely from its operational spend. Nationally, total GVA from operational spend is ~€140 million. Currently, the Southern region makes the greatest contribution to national GVA (~€83 million), following by the Northern and Western region (~€50 million), and the Eastern and Midlands region (~€7 million). Given Ireland's relatively small land mass, the benefits of onshore wind are likely to flow between and across regions.

Region	MW	GVA
Northern and Western	~1,540	~€50 million
Southern	~2,450	~€83 million
Eastern and Midlands	~220	~€7 million

Source: WEI, 2020; KPMG analysis, KPMG impact model

Ireland NUTS 2 regions

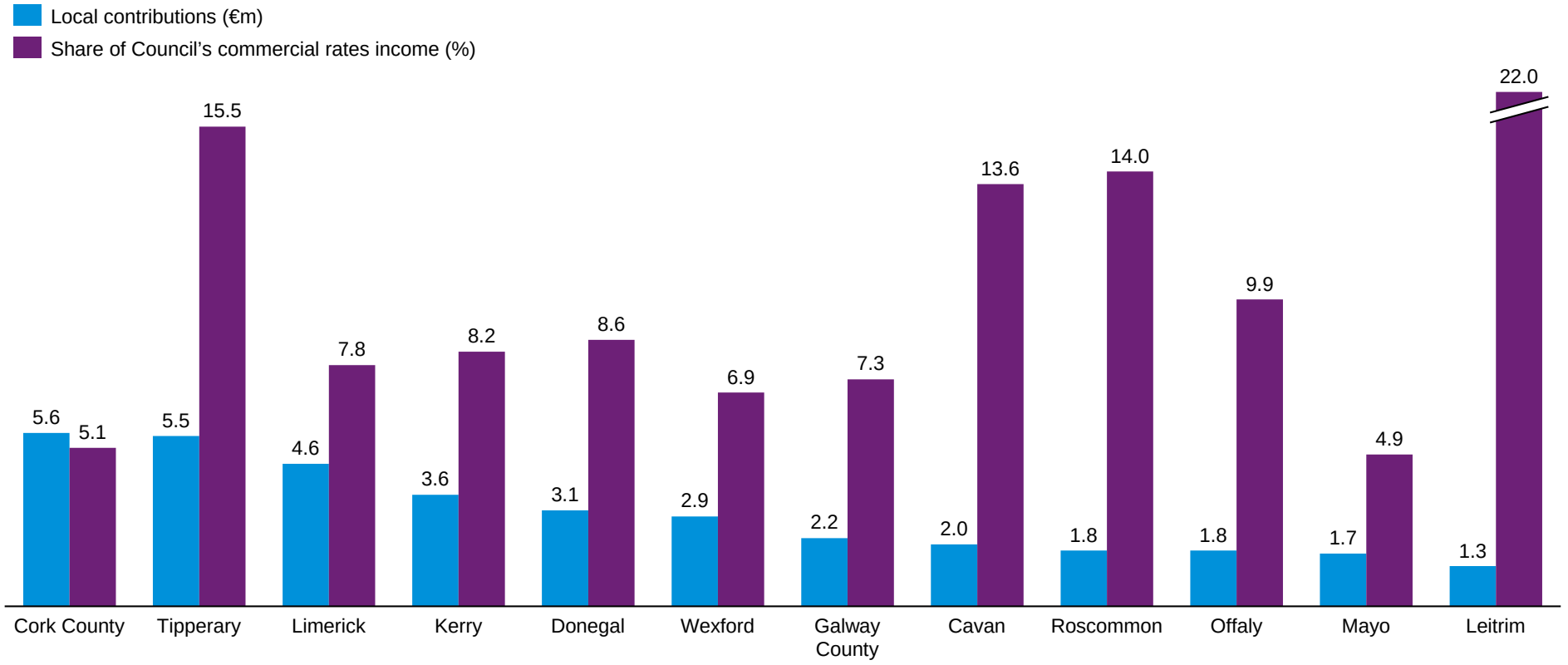


Note: Nomenclature of Territorial Units for Statistics (NUTS) are used to define territorial units to produce regional statistics across the European Union.

Contribution to local authorities today

Contributions to local authorities by the wind sector are strong. In some locations, they can represent more than 10% of a council's commercial rates income.

Wind sector contributions to local authorities, 2020, €m



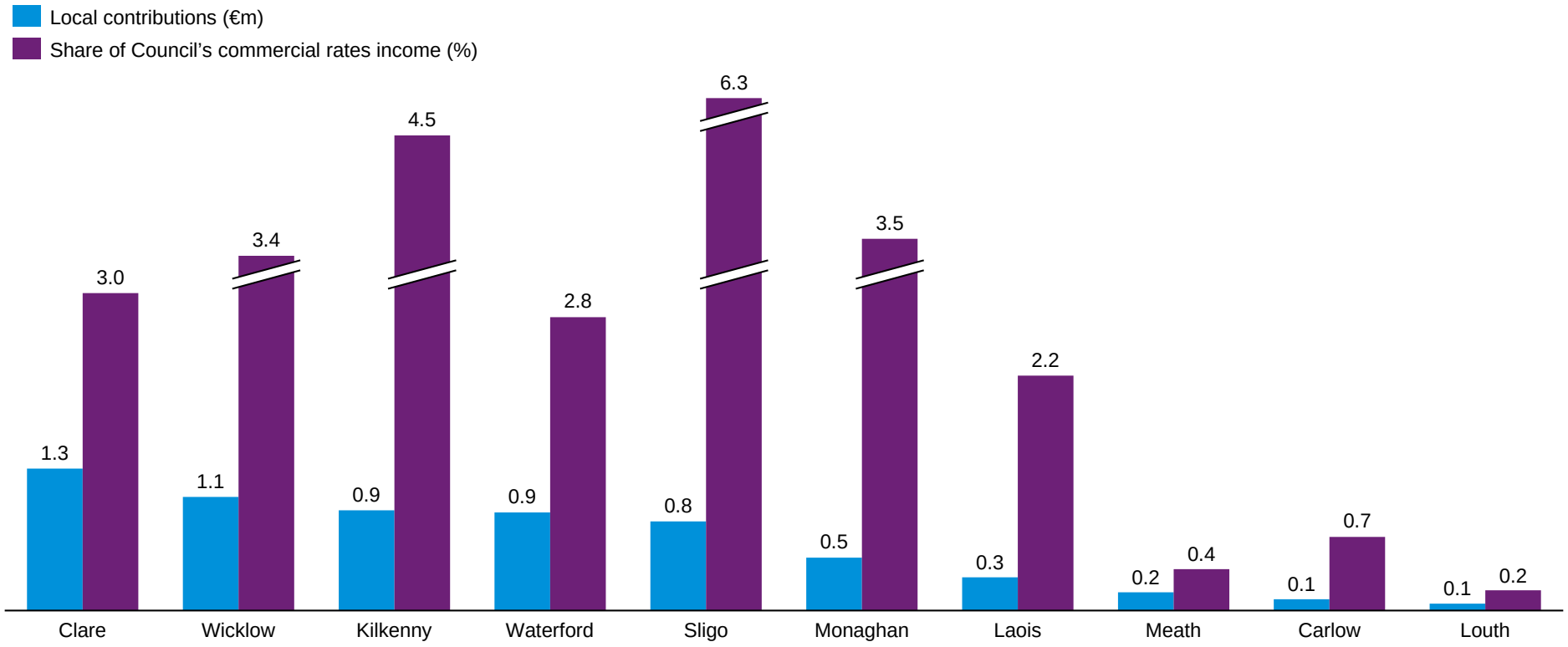
Source: Eamon Halpin & Co, 2020; KPMG analysis

Notes: The forthcoming re-evaluation of valuations and rates are likely to increase the above contributions

Contribution to local authorities today

The sector contributes to most councils' commercial rates income. In many smaller counties, this can be an important source of revenue.

Wind sector contributions to local authorities, 2020, €m



Source: Eamon Halpin & Co, 2020; KPMG analysis

Notes: The forthcoming re-evaluation of valuations and rates are likely to increase the above contributions

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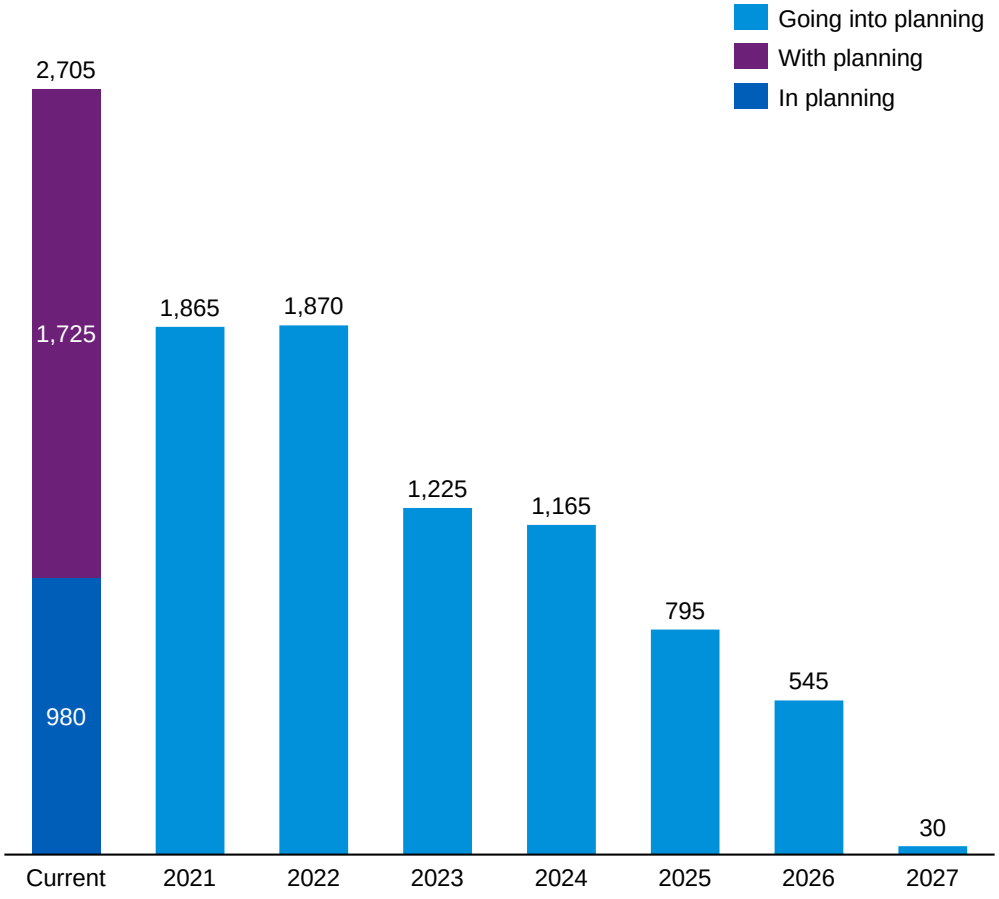
Future impacts

Achieving the CAP target by 2030

In addition to the pipeline, more projects are needed to reach the CAP target. If this is reached, the total economic impact of capital investments would be €2.7 billion over 2021-2030.

Project pipeline, by planning status



Economic benefits (GVA) of capex in 2021-2030 if CAP targets reached

Below we outline the estimated economic contribution of the capital spend required to reach 8,200 MW by 2030.

€2,350 million in direct impacts

+

€350 million in indirect and induced impacts

=

€2,700 million in total capital impacts over the period 2021-2030

Source: WEI pipeline survey; KPMG impact model

Sustainable employment from onshore wind capex

Onshore wind capex will be consistent and steady under the 70 by 30 Plan, generating sustainable employment in communities across Ireland.

Job years arising from 70 by 30 Implementation Plan

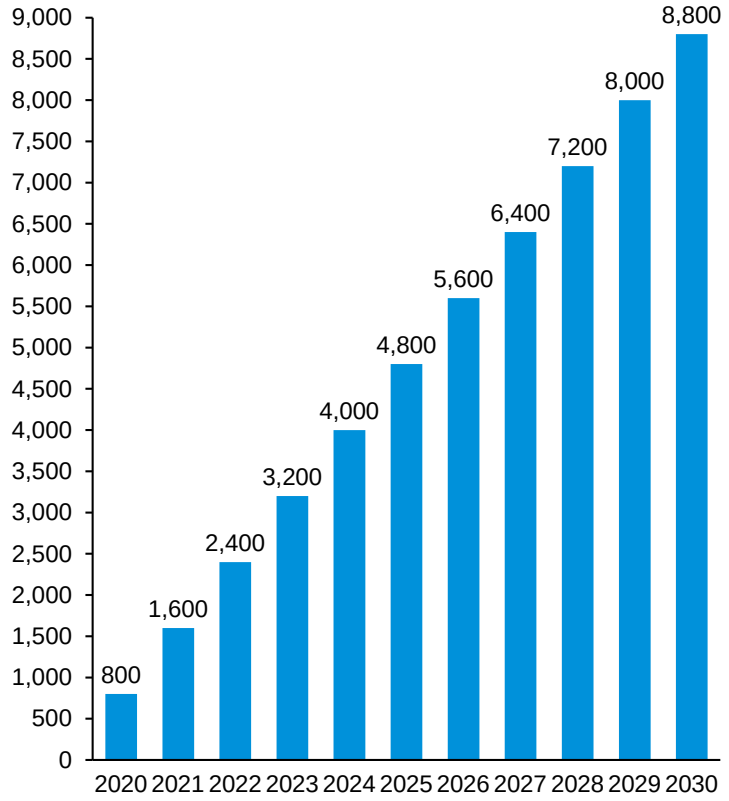
Sustainable jobs, guaranteed construction jobs in spite of any changes in flow of public capex

- Capital investment expenditure should not be seen as a once-off event, the need for additional capacity means capital investment will take place on an ongoing basis
- This translates into sustainable job creation
- Meeting the target of ~8,200 MW by 2030 will require a sustained investment of ~400 MW annually
- The potential cumulative construction job years for capital expenditure (capex) is calculated based on the assumption of 2 construction job years per MW

Reaching the wind energy target will require sustained annual capital investment in new generation capacity.

This trend could continue beyond 2030 as wind's share in the energy mix increases in line with climate goals.

Cumulative job years from capex



Source: WEI pipeline survey; KPMG impact model

Note: Calculations are based on an assumption of 2 construction job years per MW (survey, desktop research)

Contribution to economic output (GVA) - 2030

If CAP targets are reached in 2030, the onshore wind sector's value add could be ~€550 million in that year, across all of its operations and in its supply chain.

Operating activities, 2030		Capital investment activities, 2030 (400 MW)	
€240 million in direct impacts	This captures the direct impact of spending by players in the onshore wind sector on an ongoing basis	**€230 million** in direct impacts	This captures the direct impact of spending by players in the onshore wind sector to realise new development projects and pipeline
+		+	
€40 million in indirect and induced impacts	This captures impact of spending by suppliers within the supply chain, including on finance, legal, consultancy, etc.	**€40 million** in indirect and induced impacts	When direct capital flows into suppliers involved in developing projects, an additional €40 million is generated
=		=	
€280 million in total operational impacts	Together, the operational activities could generate €280 million for the Irish economy, with a multiplier of 1.17	**€270 million** in total capital impacts	Together, capital activities generate total output of €270 million, with a multiplier on investment of 1.17

= A total economic value add of **€550 million** in 2030, after an economic multiplier of **1.17.**

Source: KPMG impact model

Contribution to employment and incomes - 2030

If CAP targets are reached, employment in onshore wind and in its supply chains could be up to ~7,020 by 2030, with total labour income ~€305 million.

Total employment, 2030		Incomes, 2030	
6,500 direct jobs	These are direct jobs created by firms operating directly in wind generation, in particular asset operators and asset owners, construction	**€280 million in direct income**	This refers to income for jobs across operations and capital activities for 2030 only.
+		+	
520 indirect and induced jobs	The sector creates indirect jobs through direct supply chain purchases, including maintenance, and the spend of employees in shops and local communities	**€25 million indirect and induced job incomes**	This refers to incomes of staff within both the operations and capital supply chain in 2030, for that year only.
=		=	
~7,020 jobs created through operational and investment activities	Together, the sector could support approximately 7,020 through operating and capital activities by 2030, although this is uncertain as of Q1 2021	**€305 million in total income throughout supply chain**	Together, total incomes in 2030 could sum to €305 million across the supply chain.

At Q1 2021, the outturn for 2030 is inherently uncertain. The analysis here assumes that CAP targets are reached by 2030. Actual results will depend on policy and the pipeline of projects.

Source: KPMG impact model

Notes: For direct jobs, this assumes that capacity and direct employment grow at the same rate.

Appendix

Survey information

A survey of WEI members was completed in late 2020 to gather the data utilised to model the onshore wind energy sector's impacts.

Questions	Type of response
Q1. Please provide headline information on your firm and its activity in the onshore wind sector.	
1.1: Office locations in Ireland, county	- Drop down list of counties
1.2: Site locations in Ireland, county	- Drop down list of counties
1.3 Description of organisation product/service offering	- Free text, word answer
1.4 Year figures refer to	- Free text, numeric answer
Q2. Please provide information on your employment and indicative total salary costs for the latest period, by location.	
2.1 Location (county)	- Drop down list of counties
2.2 No. FTE employees explicitly working on activity for the onshore wind energy sector	- Free text, numeric answer
2.3 Total Salary Cost, €	- Free text, numeric answer
2.4 Human Resources (No. FTE)	- Free text, numeric answer
2.5 Sales (No. FTE)	- Free text, numeric answer
2.6 Administration (No. FTE)	- Free text, numeric answer
2.7 Technical (No. FTE)	- Free text, numeric answer
2.8 Other (No. FTE - please describe in the comments)	- Free text, numeric answer
Q3 Please provide information on your spend in the most recent year.	
3.1: Location (county)	- Drop down list of counties
3.2: Estimated % of spend related to the onshore wind energy sector	- Free text, numeric answer
3.3 Total running costs per annum, €	- Free text, numeric answer

Survey information

A survey of WEI members was completed in late 2020 to gather the data utilised to model the onshore wind energy sector's impacts.

Questions	Type of response
Q3 Please provide information on your spend in the most recent year.	
3.4 Utilities bill, €	- Free text, numeric answer
3.5 Employer taxes (ER PRSI), €	- Free text, numeric answer
3.6 Commercial rates, €	- Free text, numeric answer
3.7 Other taxes, €	- Free text, numeric answer
3.8 Repairs & Maintenance, €	- Drop down list of counties
3.9 Other, €	- Free text, numeric answer
3.10 Estimate of total spend going to non-RoI based organisations %	- Free text, numeric answer
3.11 What NUTS 3 region is each location in?	- Free text, numeric answer
3.12 Estimate of total spend remaining inside own region, %	- Free text, numeric answer
Q4. Please provide an indicative summary of project development costs for three project types.	
4.1 Total capital cost	- Free text, numeric answer
4.2 Land costs	- Free text, numeric answer
4.3 Turbine costs	- Free text, numeric answer
4.4 Other parts costs	- Free text, numeric answer
4.5 Direct salaries	- Free text, numeric answer
4.6 Consultancy	- Free text, numeric answer
4.7 Estimate of total spend remaining inside own region (from 3.10)	- Free text, numeric answer

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