



Report 2021 **Ireland**

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While new records for wind energy output were set and significant new policies supporting wind energy were announced, 2021 was not an auspicious year for wind energy deployment in Ireland. Despite ambitious 2030 renewable energy targets, only 9.3MW of new capacity was installed.

THIS WAS DUE to a gap between the termination of the legacy REFIT support scheme and the commencement of installation of capacity under the new Renewable Electricity Support Scheme (RESS). There is a pipeline of fully consented onshore projects for the latter, and a surge in construction is expected in 2022 for wind farms awarded support under the 1st RESS auction. Significant progress was made on the consenting, leasing, grid connection, and support scheme for offshore wind

in 2022, the earliest date for commencement of operation of new offshore wind farms is 2027.

A significant number of wind energy research projects were successful in obtaining funding under SEAI's 2022 RD&D funding call. Irish entities were also successful partners in funding awards for EU wind energy research projects. Ireland also increased its participation in IEA Wind Tasks to an all-time high of 17 after a 2021 SEAI call for participants.

Table 1. Key National Statistics 2021: Ireland

Total (net) installed wind power capacity*	4.309 GW
Total offshore capacity	.025 GW
New wind power capacity installed	.009 GW
Decommissioned capacity (in 2021)	0 GW
Total electrical energy output from wind	9.723 TWh
Wind-generated electricity as percent of national electricity demand	29.4%
Average national capacity factor**	25%
Target	8.2GW onshore, 5GW offshore by 2030
National wind energy R&D budget	

Highlight(s)

- A new system record, of 3,591MW, for maximum wind energy output, was set in 2021 (1).
- New 2030 targets for renewable electricity from 70% to 80% and offshore wind from 3.5 to 5 GW.
- The surge of new capacity is expected for 2022-23 following the first onshore auction.
- Wind energy contributed 29.4% to national electricity demand with an output of 9.7TWh (3).

Market Development

Targets and Policy

The Irish Government published its updated Climate Action plan in October 2021 (2). The updated plan increased the 2030 renewable electricity target from 70% to 80% of electricity demand, with indicative targets of 8.2GW onshore wind energy and an increased offshore wind energy target of 5GW for 2030. The Government published a schedule

of RESS auctions and associated procurement volumes to deliver upon these targets, and this is shown in Table 2 below (4). The updated plan includes additional actions to support achieving these and other renewable energy targets.

The results of the first 2020 auction of the Renewable Electricity Support Scheme (RESS 1) comprised almost 0.5 GW of wind energy projects to yield close to 1.5 TWh/a generation (reported in the IEA Wind 2020 Annual Report (5)). Projects awarded support will commence commissioning in 2022. Updated terms and conditions for the 2nd RESS Auction were published in 2021, and this auction will be held in early 2022 (6).

Draft terms and conditions for the Offshore Renewable Electricity Support Scheme (ORESS) were also published for consultation in 2021, and the planned timeline for the first auction is the 4th quarter of 2022 (7). A notable proposed feature is that projects could compete in ORESS auctions without full permitting. The Maritime Area Planning Act was also passed by parliament on 23rd De-

cember 2021, which, inter alia, sets out the future legislative framework for offshore renewable energy leasing and consenting (8). The Act also creates the basis for a new Maritime Area Regulatory Authority to be dedicated to offshore permitting. The legislation paves the way for a transition to a more centralized approach to offshore consenting.

Progress and Operational Details

Only 9MW of new wind power capacity were installed in 2021 (9), (10). This was because commissioning of capacity under the prior REFIT 2 scheme ceased in 2020, and the first projects winning support under the replacement RESS scheme will be completed in 2022.

Wind energy met 29.4% of electricity demand in 2021, well below the 36% in 2020 (3). This was due to a combination of a low wind year and increased electricity demand, while little new capacity was added. The average capacity factor was 25%, down from 30% in 2020 (11). Dispatch down, or curtailment and constraint of wind energy output, decreased to 7.3% in

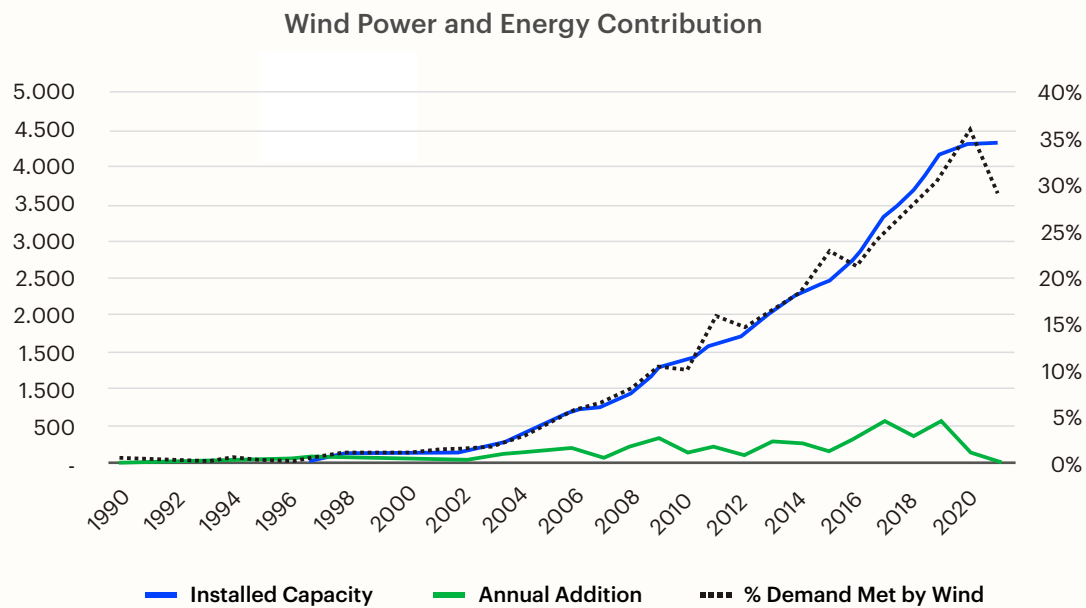


Figure 1: Wind Power Annual Capacity Additions, Cumulative Installed Capacity and Contribution to Electricity Demand 1990 – 2021.

2021, down from a peak of 11.4% in 2020, due to both low wind output and an increase in the grid System Non-Synchronous Penetration (SNSP) limit (11). The SNSP was increased to 70%, on a trial basis, in January 2021, this limit was made permanent in April 2021, and a trial 75% SNSP limit was also initialled in April 2021 (11).

The Irish Distribution Network Operator, ESB Networks, announced a new streamlined connection arrangement for mini-generation, defined as 6kW – 50kW in export power, to be piloted in 2022 (12). A consultation on a micro-generation support scheme was also published in 2021 (13). Additional measures to facilitate smaller-scale renewable electricity generation, including a Clean Export Guarantee for export for all renewable-self consumers, a micro-generation support scheme, and a support scheme for small-scale renewable electricity generation (6-50kW), are committed to in the Climate Action Plan (2).

Matters Affecting Growth and Work to Remove Barriers

The primary limiting factor to the growth of the wind energy sector

to meet 2030 renewable electricity targets is the available pipeline of fully permitted projects. For onshore wind, the number of planning applications falls well below the approximately 400MW/year of additional onshore wind required to fulfil the indicative 2030 sectoral target of 8.2GW onshore wind. While Wind Energy Ireland cites a healthy pipeline of onshore projects in development, developers appear slow to bring projects forward for permitting, perhaps because of continual changes in requirements due to legal challenges to the planning process. The average time for permitting projects has not changed significantly, but subsequent requests for judicial reviews of planning decisions, whether successful or unsuccessful, may more than double the time period until the final confirmation of valid planning permission.

For offshore wind, the development of seven projects formerly in stasis because of the absence of consenting and leasing arrangements can now proceed with the implementation of the Maritime Area Planning Act (8). The Department of Environment,

Climate Action, and Communications (DECC) have acknowledged that the earliest date for commencement of those projects, totalling approximately 3.5GW in capacity, is 2027.

RD&D Activities

National RD&D Priorities and Budget

SEAI initiated Technology Mapping in 2021 to inform national energy research prioritization. The results will be published in 2022.

Following on from SEAI's 2021 call for participants in IEA Tasks, Ireland increased the number of IEA Wind Tasks in which it participates to 17 (14).

National Research Initiatives and Results

SEAI funded 19 wind energy related R&D projects, with a total value of €8.98M, on foot of its 2021 RD&D call (15). The largest projects funded included:

- SPOTBlade - Strategies for erosion and fouling Protection of Offshore Turbine Blades. University of Limerick.

Table 2. RESS Future Auction Schedule

Auction Type	Indicative Auction Volume (GWh)	Indicative Auction Dates	Indicative Auction Commercial Operation Dates
Onshore RESS 2	1,000-3,500	Q2 2022	2024
Offshore RESS 1	7,500-10,000	Q4 2022	2027
Onshore RESS 3	2,000-5,500	Q2 2023	2025
Offshore RESS 2	15,000-25,000	2024-2025	2029
Onshore RESS 4	1,000-5,000	2024	2026

- CETUS – Cetacean, Elasmobranch, Turtle, and Seabird distributional modelling platform supporting the sustainable development of off-shore renewable energy. University College Cork.
- Frequency Control of Renewable Energy Sources in Low-Inertia Power Systems (FRESLIP). University College Dublin.
- A comprehensive decision support tool for end-of-life wind turbines of Ireland; Lifetime Extension, Decommissioning, Repowering, Repurposing (WindLEDERR). University College Dublin.
- Remote and autonomous inspection and maintenance of onshore and offshore wind turbines (REMOTEL-WIND). University College Dublin.
- Further developments of wind & solar resource analysis cloud application and open data platform. Brightwind Ltd.

The EU-SCORES wind energy research project with Irish partners received confirmation of EU funding in 2022. The project concerns mixing variable renewables sources offshore and has Irish companies Exceedence and Simplyblue as partners (16).

The EU-funded Hiperwind project also started on December 1st, 2020, with EPRI Ireland as a partner (17).

Test Facilities and Demonstration Projects

A proposed airborne wind energy test site in County Mayo received planning permission in 2021. The facility will be owned and operated by RWE (18).

Work continued extending the consent for the SEAI Atlantic Marine Energy Test Site (AMETS) to include floating offshore wind turbines (19), (20).

In December 2021, SEAI and Lir NOTF launched a call to provide free access to the test facilities of Lir-NOTF to Irish Offshore Renewable Energy device developers. This access programme to the Lir-NOTF is designed to enable the testing and progression of ORE technologies through the early development stages in advance of open sea testing. It is supported by SEAI and is open to any type of ORE technology (wave, wind, tidal, floating solar) that can be tested at the Lir NOTF (21).

Collaborative Research

After a 2021 SEAI call for participants in IEA TCP's, Ireland increased the number of IEA Wind Tasks it participates in to 17 (14). Ireland now partici-

pates in IEA Wind Tasks 11, 25, 28, 30, 34, 39, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51 and 53. In many cases, projects funded under the SEAI RD&D programme form the basis for Irish IEA Wind Task participation.

Impact of Wind Energy

Environmental Impact

The SEAI interim Energy Balance shows that the estimated amount of CO₂ avoided through the use of wind energy reached 3.9 Mt CO₂ in 2021, a decrease from the 4.4 MtCO₂ displaced in 2020 due to lower wind production in 2021 (3). The renewable energy share of electricity generation fell to 35% (down from 42% in 2020). The drop in renewable energy share of electricity was due to a combination of low-wind periods throughout the year and low-rain periods for hydro-generation. Due to a combination of this drop in renewable energy, an increase in electricity demand, and the use of coal and oil for electricity generation more than tripling in 2021, CO₂ emissions from electricity generation increased by 16.9% in 2021. The carbon intensity of electricity in 2021 was 333 gCO₂/kWh, up from 296 gCO₂/kWh in 2020.

Economic Benefits and Industry Development

The planned expansion of the



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offshore wind sector in Ireland may bring significant economic and industry development benefits, and a 2020 study by University College Cork sought to quantify these (22). This study used a value chain analysis to evaluate the economic and employment potential of the offshore wind sector in Ireland. The analysis is based on the expenditure on products and services required to develop an offshore wind farm, the planned capacity of projects in the pipeline, and the ability of Irish companies to supply the sector. Results suggest that by 2030, 2.5–4.5GW of domestic offshore wind development could create between 11,424 and 20,563 supply chain jobs and generate between €763 m and €1.4bn in gross value added. This is the first study to estimate domestic GVA potential for the sector.

The Irish government enterprise development agency, Enterprise Ireland, has been working with Irish SMEs to develop their capability in the offshore wind sector. It has devel-

oped an Irish Offshore Wind supply chain cluster (The Gael Offshore Network) which consists of over 65 Irish companies (23). These companies provide a range of products, services, and skillsets appropriate to the Offshore Wind Industry (Environmental and Geotechnical Consultancy, Seabed Surveys, Vessel support services, Harbour upgrades, Offshore Communications systems, Onshore Sub Station Construction and Operations, and Maintenance services).

Next Term

Growth in onshore wind energy deployment is expected to recommence in 2022, with 479 MW of wind energy projects contracted to commence operation before 31 December 2023, on foot of the RESS 1 auction. The RESS 2 auction scheduled for 2022 supports continuing capacity additions beyond 2023. The first offshore auction, ORESS 1, planned for later in 2022, will kick-start the offshore wind energy sector. This will

stimulate decisions on investments in ports to service the sector.

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