

Briefing paper on proposals to block fixed-bottom wind turbines

Introduction

The global climate crisis and the urgent need to decarbonise Ireland's energy supply by 2050 is the single greatest challenge we face.

The latest report from the Intergovernmental Panel for Climate Change makes clear that greenhouse gas emissions are destroying our planet and putting billions of people at risk.¹ A report from the Environmental Protection Agency, published at the start of August, makes it clear that Ireland is not immune and our country is getting hotter and wetter.²

To decarbonise we must develop offshore wind energy in large volumes and as quickly as possible. The original Climate Action Plan set a target for 3.5 GW of offshore wind – roughly 5-7 wind farms – by 2030 with the Programme for Government setting out an enhanced target of 5 GW.

The new Climate Action Bill sets out a pathway to a net-zero Irish energy system that can only be achieved with a thriving offshore wind energy industry. Our recent report, *Endgame: A zero-carbon electricity plan for Ireland* shows that a carbon-free electricity system is within reach.³

Delivering offshore wind will drastically cut our CO₂ emissions. It will make Ireland more energy independent. It will attract several billion euro in investment into Ireland and create thousands of long-term and sustainable jobs, particularly in our coastal communities.

Many offshore wind projects are already engaging with local communities along Ireland's east and south coasts. The response so far has generally been positive with communities welcoming the enormous economic benefit and the opportunity to contribute to decarbonising our energy supply.

However, proposals are being put forward, based on inaccurate information, to ban offshore wind energy development within 22km of Ireland's coast.

We have prepared this Q&A briefing paper to explain why this is, in effect, a proposal to abandon our renewable electricity targets and to undermine Ireland's efforts to tackle the climate crisis.

Ireland has a responsibility to address climate change. All of us have our own part to play. Banning offshore renewable energy development within 22km of our coastline frustrates our climate action response and will increase our reliance on imported fossil fuels

Why are most of Ireland's proposed wind farms located where they are?

The answer is, simply, seabed depth. As you move out from shore Ireland's seabed depth increases very quickly, compared to the North Sea, for example, which is relatively shallow and gently sloping.

Identifying the right location for an offshore wind farm requires a careful balance between numerous technical, environmental and economic factors. But one of the most critical is the seabed depth at any potential location.

¹ <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>

² <https://www.epa.ie/publications/research/climate-change/research-386.php>

³ <https://windenergyireland.com/images/files/20210629-baringa-endgame-final-version.pdf>

Most of Ireland’s proposed offshore wind farms will use a technology called ‘fixed-bottom wind turbines’. Put simply, the turbine is installed on a foundation which is connected to the seabed.

This proven technology has been used to develop 25 GW of offshore wind energy in Europe alone and is used all over the world. Individual offshore turbines are now available that provide 15 MW of power and the price of offshore wind energy has fallen 29 per cent since 2010.⁴

The key challenge with fixed-bottom turbines is that they can only be deployed in water depths of 50-60 metres or less and where the seabed conditions are suitable to secure the foundations.

This is why, for example, there is only one fixed-bottom offshore project planned for the west coast of Ireland despite the excellent wind conditions. There simply is not enough seabed available at 50-60 metres or less, as shown in the map below.

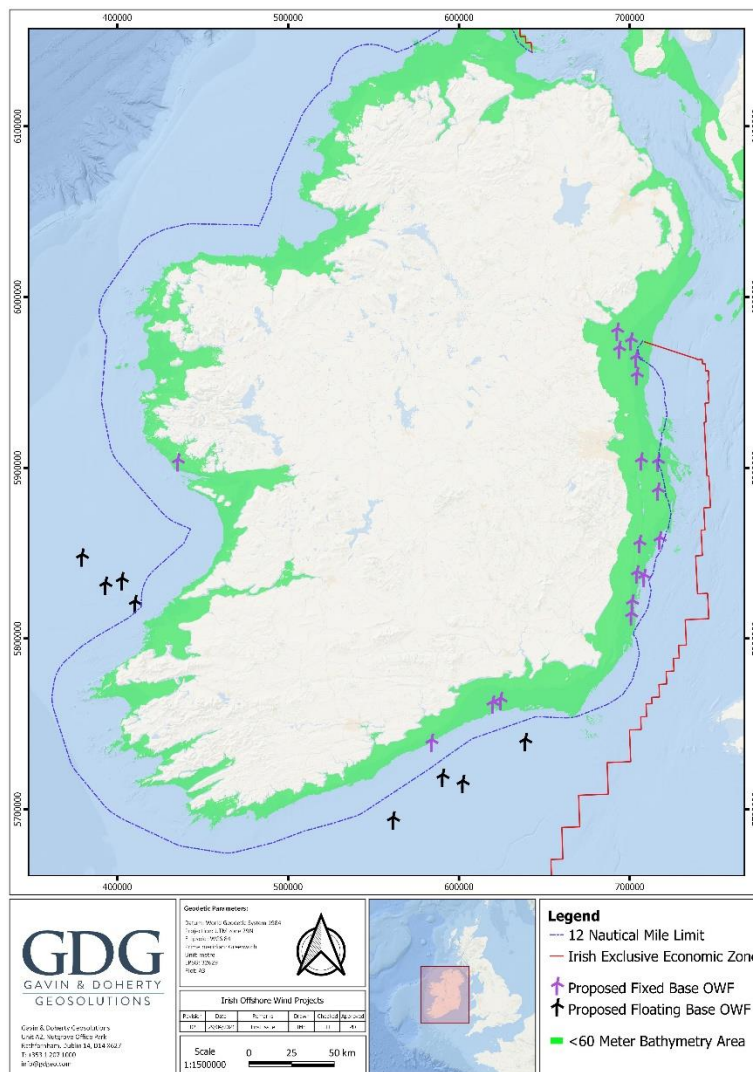


Figure 1: Map of proposed fixed-bottom and floating wind energy projects off the Irish coast in relation to seabed depth and the 12 nautical mile limit.– Source: GDG Geosolutions.

⁴ <https://www.evwind.es/2020/06/02/irena-costs-have-fallen-by-onshore-wind-energy-at-40-and-offshore-wind-power-at-29/74979>

Is it true that offshore wind farms closer to shore than 22 km are banned in Europe?

No, this is not true.

As of the end of 2020, there were 7.8 GW of offshore wind capacity installed in Europe from 65 offshore wind farms located closer than 22 km from the coastline. Another 16 GW of projects within that distance either have planning permission or have applied for it.

There are some countries that have put in place distance-to-shore restrictions, but it is important to understand that their water depths are much shallower. No country in Europe, or anywhere in the world, has proposed effectively blocking fixed-bottom offshore wind farms.

Britain, which is currently the largest offshore wind energy market in the world, has no distance-to-shore restriction on offshore wind farm development.

Denmark, the world's leader in wind energy development, likewise has no such restriction.

In Germany, individual states have authority over offshore wind energy planning up to the 12 nautical miles (22 km) limit. Of the three German coastal states only one, Schleswig-Holstein, has a restriction and this is currently under review. Neither of the other two states has a 22 km limit.

The state of Mecklenburg-Vorpommern, for example, has a 103 turbine offshore wind farm within 22 km of the coast which received planning permission in 2019 and two more wind farms within that distance are expected to go online in 2023 and 2025.

As you can see from the graph below fixed-bottom offshore wind farms can be – and are – located some considerable distance from shore but **only in places where the water depth is under 50 metres, and often under 40 metres**. A handful of small floating wind farms have been developed in deeper waters.



Figure 2: Existing offshore wind farms in Europe, showing the significant number within 22 km and the relevant seabed depths. – Source: Wind Europe.

Could we use floating wind farms instead?

A floating offshore wind turbine is not fixed to the seabed like a fixed-bottom wind turbine. Instead, the wind turbine is mounted on a floating platform which is then secured to the seabed by mooring cables and anchors.

One of the big advantages of floating wind turbine technology is that it can be deployed in much greater depths (see below).

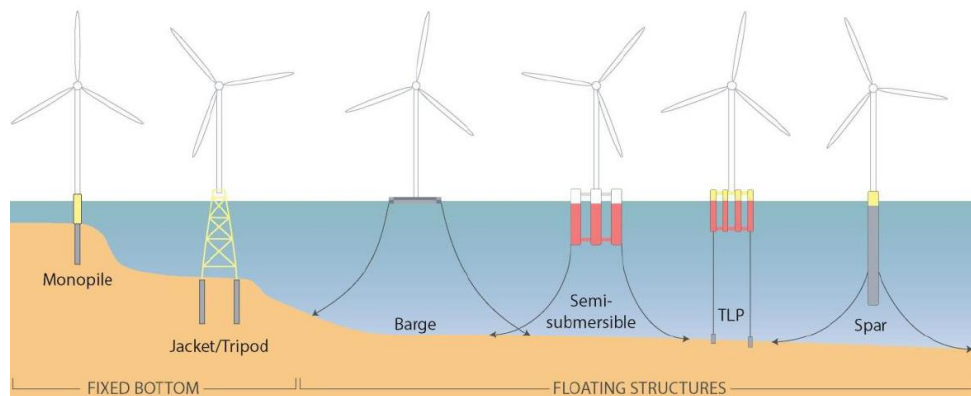


Figure 3: The four basic types of FLOW technology are the Barge, Semi-submersible platform, Tension Leg Platform (TLP), and the Spar Buoy, which between them can be deployed in circa 60- 1000m water depths – Source: EirWind.

Floating offshore wind can add to the benefits of traditional fixed-bottom wind by helping to make Ireland a world leader in producing renewable energy and fighting climate change. It can help to make us truly energy independent.

We are proud to represent floating wind energy and in July published *Revolution: A vision for floating wind energy*, which is a comprehensive analysis of the potential of floating wind energy to drive Ireland's Green Economy and to decarbonise our energy supply.⁵

However, it must be remembered that this is a relatively new technology. To date, there have been very few floating offshore wind projects delivered anywhere in the world – approximately 90 MW in total – and these are at a much smaller scale than fixed-bottom offshore wind projects. There is not a single commercial floating wind farm operating anywhere.

We expect this to change as commercial-scale projects begin to come online globally and lessons learned from this will significantly assist the development of floating wind projects in Ireland towards 2030 and into the future.

We are ambitious for floating wind energy and for driving the development of this exciting new technology. Many of our members are already at work developing floating wind energy projects off Ireland's coast and these include projects, with the right policy support from Government, will contribute to the 2030 target of 5 GW.

However, while we are confident that we could successfully develop some floating wind energy by 2030 we cannot develop and build enough of these projects to reach our 70 per cent renewable electricity target.

⁵ <https://windenergyireland.com/images/files/revolution-final-report-july-2021-revised.pdf>

Fixed-bottom offshore wind is an essential component of our energy generation mix if Ireland is to meet this ambitious objective. It has the **scale and deployment capacity** to meet these objectives **in full** right now.

Any proposed introduction of exclusion zones for fixed-bottom wind turbines will mean we will fail to reach our 2030 targets. We will fail to decarbonise Ireland's energy supply.

We will also fail to seize the long-term opportunity represented by floating wind energy because we will undermine investor confidence in Ireland as a place where projects can be delivered and floating wind energy needs fixed-bottom wind projects to kickstart our offshore supply chain.

In the coming years we plan to position Ireland as a leader in the development of floating wind energy. As well as the 5 GW target for the south and east coasts, the Programme for Government has committed to a longer-term plan to develop 30 GW of floating offshore wind off the west coast and this is absolutely achievable.

It is also correct that as a relatively new technology, which is located further out from shore, floating wind energy is currently significantly more expensive than fixed-bottom turbines. We expect that the price will fall rapidly as the technology matures and it could be cost-competitive with fixed-bottom offshore wind by the 2030s.

But achieving our 2030 targets, delivering 5 GW of offshore wind energy at the lowest possible price for the Irish electricity consumer, can only be done using fixed-bottom offshore wind.

Conclusion

Over the next ten years our members will work to develop the offshore wind farms Ireland needs to decarbonise our electricity supply. These projects must be developed in a way that is sensitive to our marine space and to those with whom we hope to share it.

When looking for a suitable location for an offshore wind farm a balance must be struck. A location must have the right water depths, seabed sediments, wind speeds, wave heights etc.

Environmentally sensitive areas, key fishing grounds and shipping routes need to be avoided. The visual impact of the wind farm must be considered.

Ensuring proposals take proper account of the impact on landscape and seascape is a critical part of sustainable development. All offshore wind projects are required to demonstrate how they can avoid, minimise or mitigate significant negative impacts on the seascape and landscape through an Environmental Impact Assessment.

The wind energy industry will develop offshore wind farms in a way that is sensitive to our marine space and all those who use it. Seabed surveys are underway. Bird, mammal and fish movements will be identified and tracked.

We are already listening to, and working with, our fishing communities and other stakeholders. All of this is key to ensuring development is carried out sensitively.

Fixed-bottom wind turbine technology is used successfully all over the world and it will lead Ireland's offshore wind energy revolution. It will create jobs, attract billions of euro in investment and revitalise our coastal communities. It will pave the way for the further deployment of floating wind energy.

Choosing to introduce exclusion zones, to block new offshore wind farms, means more carbon emissions, increases our dependency on expensive imported fossil fuels and undermines Ireland's contribution to dealing with the global climate crisis.

But we can choose instead to develop the offshore wind energy we need, to be a leader in the fight against climate change, to help shut down the fossil fuel industry and to make this a better country in which to grow old and in which to raise our families.

For our members, that is the choice we make.

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