20 Years of Offshore Wind

Celebrating two decades of delivering our offshore wind revolution

sse Renewables

Foreword

20 years ago, we embarked into offshore wind with the development of our first project at Arklow Bank. Two decades on, we're not just building more offshore wind than any other company in the world, we're celebrating 20 years of SSE Renewables' contributions to delivering an offshore wind revolution and building a global offshore wind sector.

In that time, we have made massive strides in the industry and now, 20 years later, we're leading the construction of £12bn in new offshore wind farms in UK waters, and we have the largest secured offshore wind development pipeline in the UK and Ireland at over 9GW. This unrivalled development pipeline is at the heart of SSE's overall Net Zero Acceleration Programme Plus which will see the company invest £18bn to 2027, the equivalent of £10 million each day, in the UK and Ireland. This plan will be crucial in turning UK and Irish Goverment targets from ambition into reality.

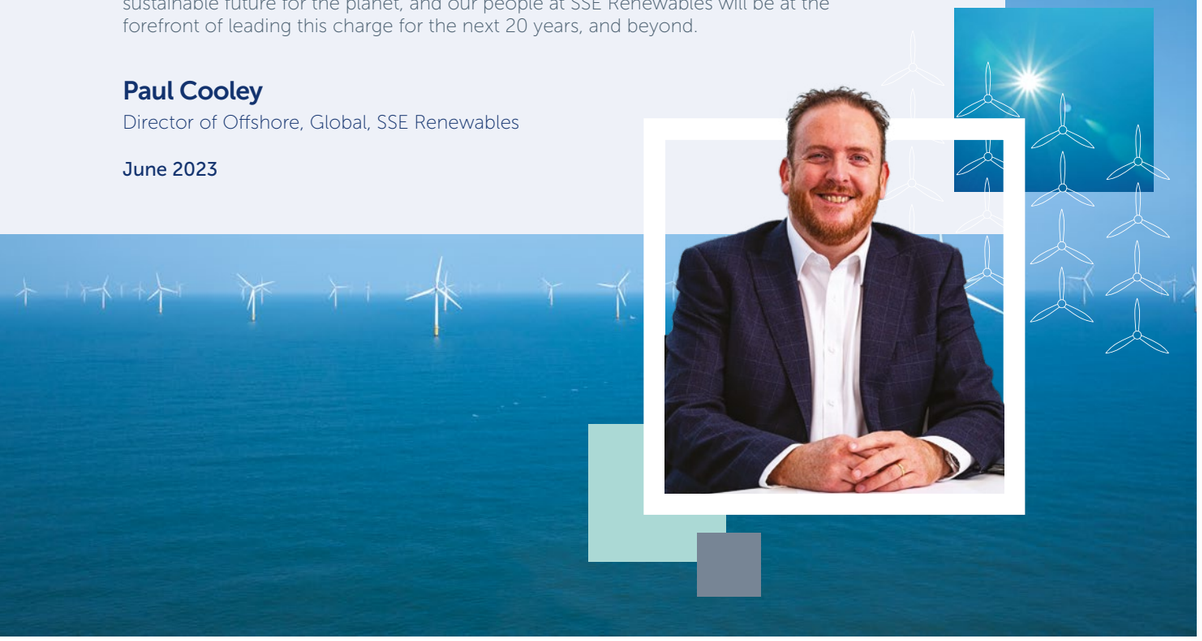
We are leading the way in addressing problems like the climate emergency by delivering offshore projects on a global scale. We are using our 20 years of experience in our core UK and Ireland markets to expand into other international markets where we know the offshore wind opportunity is immense and critical to achieving significant emissions reductions.

We are on the cutting edge of development and construction and being the first to deploy the newest technologies available. Our innovative build pipeline includes Seagreen, currently Scotland's largest and the world's deepest fixed bottom offshore wind farm, and Dogger Bank, the world's largest offshore wind farm currently in construction, using the world's largest turbines operating in an offshore wind farm when they are installed later this summer. Our flagship development projects such as Ossian, our first global-scale venture into using floating technologies (the next revolution in offshore wind), and Berwick Bank, the largest single offshore wind farm currently being developed in the UK, are pushing new frontiers in technological and sustainable delivery.

We are dealing in actions, not words. The world needs action at scale to deliver a sustainable future for the planet, and our people at SSE Renewables will be at the forefront of leading this charge for the next 20 years, and beyond.

Paul Cooley
Director of Offshore, Global, SSE Renewables

June 2023



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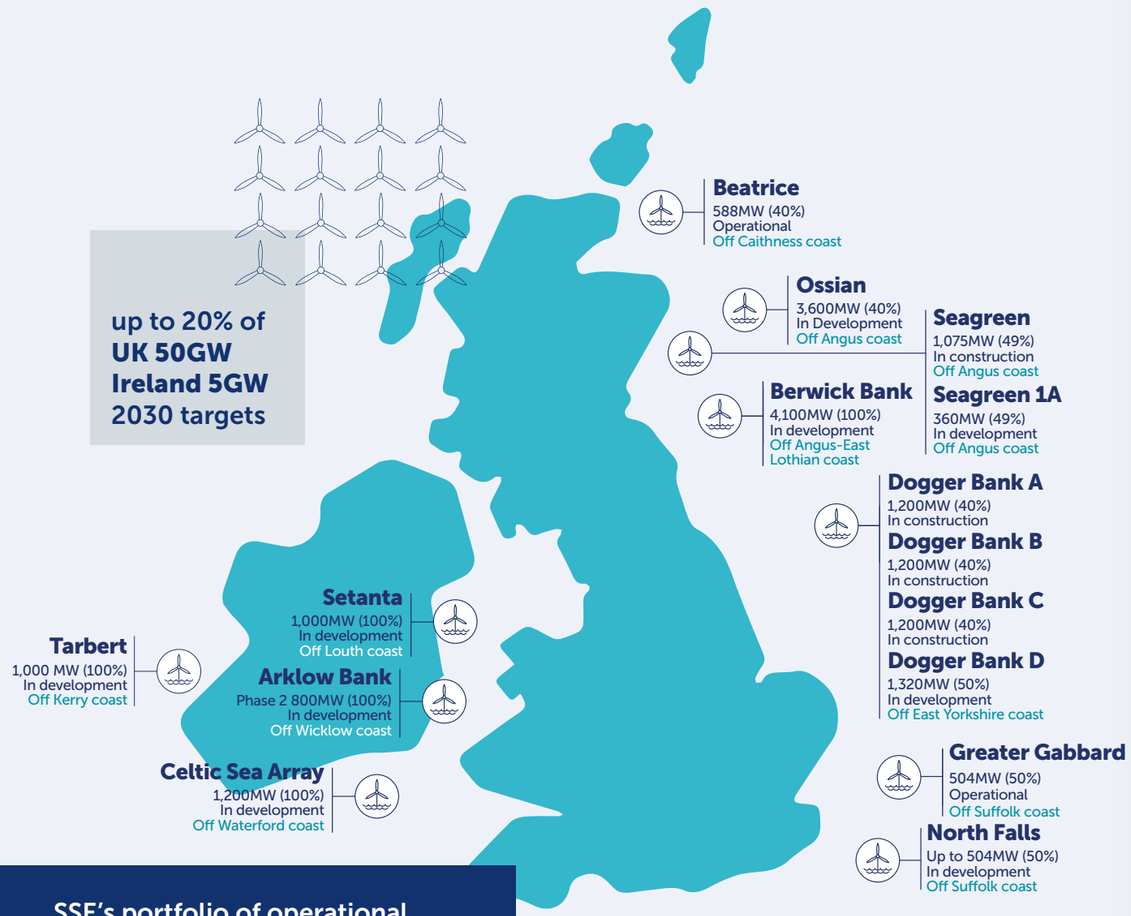
An unrivalled offshore portfolio in the UK and Ireland
Ready to deliver for 2030



SSE's portfolio of operational assets and secured pipeline of in-development projects can deliver up to 20% of the UK's 50GW and Ireland's 5GW target of installed offshore wind by 2030

Numbers in brackets indicate SSE ownership percentage

20 Years of Offshore Delivery
A timeline

2003 **SSE (Airtricity) co-developed Arklow Bank Phase 1**
25MW, 7 turbine wind farm, owned by GE Renewable Energy, enters operation to become the world's largest

2007 **Beatrice Demonstrator (50%)**
10MW, 2 turbine deep water demonstrator is installed

2009 **Walney (25%)**
SSE (Airtricity) acquires stake in 376MW, 102 turbine wind farm project in construction

2012 **Greater Gabbard (50%)**
SSE completes construction of 504MW, 140 turbine offshore wind farm, becoming the world's largest in operation

2019 **Beatrice (40%)**
SSE completes construction of 588 MW, 84 turbine offshore wind farm, becoming Scotland's largest and world's deepest fixed bottom

2020 **Seagreen (49%)**
SSE starts construction on 1.1 GW, 114 turbine offshore wind farm which will be world's deepest fixed bottom wind farm when complete in 2023

2021 **Dogger Bank (40%)**
SSE starts construction on 3.6GW, 277 turbine project, which will be the world's largest offshore wind farm when complete in 2026

2023 **SSE Renewables is leading construction of almost 5GW of new offshore wind, with 9GW of secured pipeline in development and almost 5GW of future prospects**

Late Stage Development	Early Stage Development	Future Prospects
Seagreen 1 A	Arklow Bank 2	Dogger Bank D
	Berwick Bank	Celtic Sea Array
	Ossian	Setanta Wind Park
	North Falls	Tarbert

Built on the shoulders of operating giants

The world-leading projects we are developing and constructing today are only possible due to our long standing history in the renewables industry. We have gained our operational knowledge and expertise during these years operating two of the UK's leading offshore wind farms.

Greater Gabbard

Greater Gabbard Offshore Wind Farm is a 504MW, 140 turbine asset project that was completed in 2012. It's a 50/50 joint venture between SSE Renewables and RWE Renewables. The site can provide enough electricity to power around 360,000 homes in the UK annually^. The project saw a £1.6bn investment and over 8 million hours were worked on the project during construction. At the time of its completion it was the world's largest offshore wind farm in operation.

Since completion in 2012, the site has been operated by SSE. Several major component replacements have taken place including gearboxes, generators, transformers and main bearings. Blade inspections and repairs have been carried out making use of innovative solutions, such as UV light blade repairs and transition piece based camera inspections, along with traditional rope access method.

Last year marked a huge milestone of 10 years of Greater Gabbard being an operational site. Its legacy continues to thrive as together with RWE Renewables we now develop our plans to construct its sister project, North Falls.

Beatrice Offshore Wind Farm

Beatrice Offshore Windfarm Limited (BOWL) is a joint venture partnership between SSE Renewables (40%), Red Rock Power Limited (25%), The Renewables Infrastructure Group (17.5%) and Equitix (17.5%). With 84, 7MW Siemens Gamesa turbines, Beatrice is capable of providing power for up to 450,000 homes annually^.

Built at a cost of £2.6bn, Beatrice still represents one of the largest private investments in Scottish infrastructure, and provided a significant boost to both the UK economy and supply chain during construction. The wind farm is an exemplar of delivering a fair and just transition with over 70% of employees in the Beatrice Control Room having transitioned from oil and gas to work in renewables.

One of the most prominent examples of the local community benefiting from BOWL was through the construction of our operations and maintenance base in Wick. Two historic derelict Thomas Telford buildings on Wick's harbour front were purchased by BOWL for restoration and development into the operational headquarters. The approximate £20m investment has transformed the buildings and seen them returned to maritime use.

Building more offshore wind than any other company in the world

We are currently building more offshore wind than any other company, anywhere in the world right now. Our construction pipeline is one of ambition and scale. It includes Dogger Bank Wind Farm, the world's largest offshore wind farm currently in construction and Seagreen, which will be Scotland's largest and the world's deepest fixed bottom offshore wind farm when complete in Summer 2023.

Dogger Bank

Dogger Bank Wind Farm is currently being built in three phases and when complete, will be capable of powering over 6 million homes annually^. It is a joint venture development between SSE Renewables (40%), Equinor (40%) and Vårgrønn (20%). Each phase of the project has an installed generation capacity of 1.2GW. The windfarm will connect to national grid infrastructure in East Riding, Yorkshire for Dogger Bank phases A&B and at Lackenby Substation, Teeside for Dogger Bank C

2023 marks a milestone year for the project as we continue our offshore construction programme. We have already installed the world's first uncrewed HVDC offshore platform at the site and we will be installing turbines and achieving first power in Summer 2023.

We are also exploring the potential of a new fourth phase Dogger Bank D with 50/50 co-developer Equinor. If the project is consented and approved for delivery, it could add up to approximately 1.3GW of additional capacity.

Seagreen

Seagreen Wind Farm, a joint venture between SSE Renewables (49%) and TotalEnergies (51%), will be Scotland's largest offshore wind farm once operational. Due for completion during Summer 2023, Seagreen is a 1.1GW site that is on the cutting edge of technology being used in the industry today. Installation of the world's deepest fixed bottom turbine took place during April this year at a depth of just over 58m.

Currently a 114 turbine site, Seagreen will provide enough green energy to power more than 1.6 million homes annually and will displace over 2 million tonnes of carbon dioxide from electricity generated by fossil fuels every year. With first power achieved in August 2022, the intention is to be fully operational during Summer 2023.

With seabed originally awarded to SSE Renewables in 2010, the development, construction and imminent full power of Seagreen will represent a real landmark moment for SSE Renewables and Scotland as we continue to build at scale across the UK to address the climate emergency.

^ Homes powered per annum quoted based on Typical Domestic Consumption Values (Medium Electricity Profile Class 1, 2,900kWh per household; OFGEM, January 2021), typical wind load factors, and projected installed capacities. Quoted t/CO2 reductions per annum based on expected annual output against average 440 t/CO2 per GWh for all non-renewable fuels (BEIS Digest of UK Energy Statistics (DUKES) estimated carbon dioxide emissions from electricity supplied), August 2021).

Building an industry-leading pipeline for a net zero power system

20 years on from when we began the offshore revolution, we now have an industry-leading 9GW offshore pipeline in the UK and Ireland that will be at heart of a future net zero power system in both markets. This pipeline includes secured projects such as the 4.1GW Berwick Bank offshore wind super project off the coast of Scotland, the 3.6GW Ossian (ScotWind) floating offshore wind lease site in the North Sea, 0.5GW extensions at Seagreen 1A and North Falls, and the 0.8GW Arklow Bank offshore wind project in Ireland. We also have an unrivalled future pipeline of prospects including a potential fourth phase for the world's largest offshore wind farm, Dogger Bank, as well as over 3GW of new capacity around Ireland at Celtic Sea Array, Setanta and Tarbert.

Projects in the making

Berwick Bank Wind Farm

Berwick Bank Wind Farm is a 4.1GW Project currently in the development stage. We submitted a planning application to Scottish Ministers in 2022 for our offshore array, which could see up to 307 turbines constructed, capable of powering all of Scotland's homes each year, twice over.

If consented, Berwick Bank Wind Farm would represent achieving approximately 30% of the Scottish Government's 2030 offshore wind targets. Furthermore, early socio-economic reports indicate that the project could represent a boost of upto £8bn to the UK economy and see upto 9,000 potential jobs created in the UK.

Ossian

Our Ossian Project, being brought forward as a joint venture between SSE Renewables, Copenhagen Infrastructure Partners and Marubeni represents our first involvement in the deployment of floating wind technologies. At up to 3.6GW, it is one of the largest single sites being developed as part of the ScotWind leasing round and we aim to submit a consent application in 2024.

North Falls

North Falls is being developed by a 50/50 joint venture company owned equally by SSE Renewables and RWE Renewables. North Falls Offshore Wind Farm is being developed in the southern North Sea more than 20km off the UK coast and covers a total area of 150km^2. It is an extension project to the existing 504MW Greater Gabbard Offshore Wind Farm.

Arklow Bank Wind Park 2

Arklow Bank Wind Park 2 is SSE Renewables' flagship project in the Republic of Ireland. The project is situated 6-15km off the coast of Arklow, Co. Wicklow and will have a maximum export capacity of 800MW. The project is targeting first power in 2028.

Arklow Bank Wind Park 2 is Ireland's most advanced offshore wind project with consent secured for the onshore grid infrastructure and operations and maintenance facility. The offshore consent application will be submitted towards the end of 2023.

Seagreen 1A

The Seagreen 1A project is an extension to our Seagreen Wind Farm (currently in construction). A joint venture with TotalEnergies, Seagreen 1A is consented to construct and connect 36 turbines, generating 500MW of energy from the existing Seagreen array to the existing Cockenzie power station in East Lothian. In August 2021, planning permission in principle for substation and onshore cable infrastructure was unanimously approved by East Lothian Council, while in December 2021, Scottish Government Ministers consented the Marine Licence application.

Future Prospects

Dogger Bank D

Dogger Bank D is a potential new fourth phase of Dogger Bank Wind Farm. A 50/50 co-development with Equinor, additional capacity of up to 1.3GW could be constructed in the eastern part of the Dogger Bank C site. The project is subject to agreement with The Crown Estate.

Celtic Sea Array

Celtic Sea Array is a 1.2GW project off located around 25km off the coast of Waterford.

Setanta Wind Park

SSE Renewables has a Foreshore Licence to survey seabed for a 1GW Setanta project off the northeast coast of Ireland in the Irish Sea.

Tarbert

SSE Renewables has applied to the Irish Government for an investigative foreshore licence to facilitate survey work for a possible new 1GW floating offshore wind farm in the Atlantic Ocean off the coast of Kerry.

Our sustainable approach

With our accelerated growth in offshore wind, it is vital that sustainability and biodiversity is a core aspect of our approach. We are building the offshore wind needed to deliver the transition to net zero and we already have a number of initiatives in place to support greater sustainability in development.

Our partnership with Microsoft, Avanade and NatureScot uses artificial intelligence to monitor a number of species to ensure our offshore developments don't have any adverse effects on the local wildlife.

We believe in having ecology as part of the offshore bidding process which we have already included in previous bids. This gives engineers the opportunity to integrate nature-based solutions in their offshore designs such as understanding how the use of holes in monopiles can benefit both marine life and engineering problems. These solutions can allow ecosystems to flourish and can encourage developers to understand the environment in which their projects operate in which we believe is essential for the future of the offshore sector.

Our detailed work in this area recently allowed us to reduce our overall site of the Berwick Bank Wind Farm by approximately a third, meaning we can maintain our 4.1GW site, whilst crucially avoiding sensitive areas of feeding grounds for Scotland's important Seabird population. We've also put forward an ambitious package of environmental compensation measures, including the further restriction of sandeel fishing, which we believe will allow Berwick Bank to tackle the twin crises of climate and nature.

SSE Renewables has teamed up with the University of Strathclyde, the National Manufacturing Institute Scotland (NMIS) and Renewable Parts Ltd to launch the new Coalition for Wind Industry Circularity (CWIC) which aims to drive the creation of a circular supply chain for renewables in the UK.

We also have our industry leading principles for co-existence with fisheries document that shares our vision on how we can minimise negative impacts and maximise shared benefits with other key stakeholders within the marine environment.

Our partnership approach

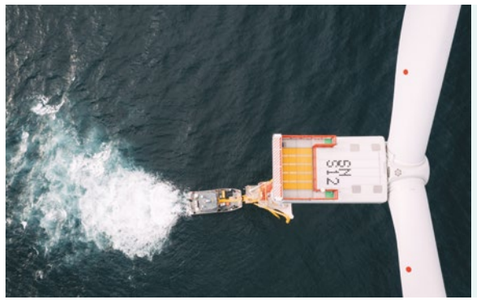
Our strategic partnerships are key to the delivery of our offshore projects. Working with complementary partners is crucial for competitiveness and value. These trusted relationships with our partners range from joint ventures on projects, to supply chain partnerships to working with financial investors.

Project Partners

	Status	SSE Renewables Role	Cross Capacity	SSE Renewables Ownership	Partners
Greater Gabbard	Operational	Led Development Led Construction Leading Operations	0.5W	50%	RWE Renewables
Beatrice	Operational	Led Development Led Construction Leading Operations	0.6GW	40%	Red Rock Power TRIG Equitix
Seagreen 1	In Construction	Led Development Leading Construction Leading Operations	0.5GW	49%	TotalEnergies
Dogger Bank	In Construction	Leading Development Leading Construction	3.6GW	40%	Equinor Vårgrønn
Seagreen 1A	In Development	Leading Development Construction Lead Operations Lead	1.1GW	49%	TotalEnergies
Ossian	In Development	Leading Development	2.6GW	40%	Copenhagen Infrastructure Partners Marubeni
North Falls	In Development	Development Partner	0.5GW	50%	RWE Renewables

Supply Chain

Vessels	Turbines	Foundations	Substation	Subsea Cabling
Jan De Nul Seaway7 DEME	Vestas GE Vernova SiemensGamesa Nordex	Subsea7 Smulders SIF	ABB Siemens Energy Hitachi Energy Aibel Petrofac	Nexans Deme Biem



Global Offshore Wind Alliance (GOWA)

We recently announced that we have joined the Global Offshore Wind Alliance. This alliance brings together governments, the offshore wind industry, international organisations, and other stakeholders to accelerate the deployment of offshore wind power. This is in addition to already having a long standing history of involvement and membership of the Scottish Offshore Wind Energy Council (SOWEC) and UK wide Offshore Wind Energy Council (OWEC)

Delivering an economic power boost

Through our construction pipeline we're leading the delivery of £12bn in new offshore wind farms in UK waters.

The economic impact of this investment is seeing around 2,500 jobs being created and is contributing to the improvement of the supply chain infrastructure for the offshore wind industry in the UK. Crucially, our secured offshore wind pipeline has helped create confidence in the wider industry that the UK has the incoming portfolio of world leading projects to further develop our ports and manufacturing industries.

Over the past 20 years, our projects have given the UK significant socio-economic boosts. Beatrice Offshore Wind Farm contributed £460 million to the Scottish economy during its 10-year development and construction which was part of a wider £1.3bn boost to the UK economy. Over its 25-year operational life, Beatrice will contribute a total of £72 million on average per year to the UK economy.

Similarly to Beatrice, Seagreen has boosted the UK and Scottish economies throughout its construction with over £1bn in economic benefit to Scotland alone^ as well as creating approximately 400 construction jobs and 80 operational jobs in Scotland.

This period has seen the rejuvenation of the port of Nigg in Scotland's Cromarty Firth, where we have supported hundreds of jobs during the construction phases of both Beatrice and Seagreen. The facility has played a key role in the growth of our offshore operations and we continue to work closely with Nigg's owners, Global Energy Group, on how they can support the next chapter in our offshore journey.

Dogger Bank's construction so far has created over 2,000 UK jobs and will continue to deliver significant socio-economic benefits to the UK throughout it's lifetime.

^ Based on independent GDP analysis by PwC, published September 2022.

The Future is offshore

20 years since we first began pioneering the offshore wind revolution, we are now turning our attention to the next generation of offshore wind and to new horizons.

Building an international offshore wind pipeline in selected countries where we believe our track record and expertise can help accelerate deployment is a core part of our strategy. So too is pioneering the use of floating offshore wind technology.

In pushing these new frontiers, we want to help lead a just and fair transition to net zero. That's why we've joined the Global Offshore Wind Alliance (GOWA) which brings together a growing list of countries, international organisations and developers to collaborate and share knowledge on how best to deploy offshore wind and deliver wider societal benefits.

Bids

We are actively developing ambitious bid plans for future areas of seabed in our core UK and Ireland markets. We are also taking our 20 years of experience in these markets to successfully bid into new offshore markets internationally. In doing so, we're targeting future growth through expansion of our offshore pipeline across the UK, Ireland, Europe and beyond.

Floating

Actions, not ambitions, are what we need now. That's why, as the world-leading developer of deep-water fixed offshore wind, we're already embarking into floating technology by developing one of the world's largest floating offshore wind farms, our Ossian project off Scotland. In this way we're using our unrivalled experience and know-how to power the next generation of commercial-scale floating wind technology. Our pioneering people aim to put floating offshore wind at the forefront of global efforts to fight climate change. In doing so, our promise is to deliver a fair and just transition to net zero.

Asia Pacific

In Japan our joint ownership company, SSE Pacifico (SSEP), is working on a 6GW portfolio of early stage development opportunities in multiple locations including fixed bottom and floating sites. Japan has huge potential to be a leading offshore wind market and SSEP is working with government and stakeholders to unlock that potential.

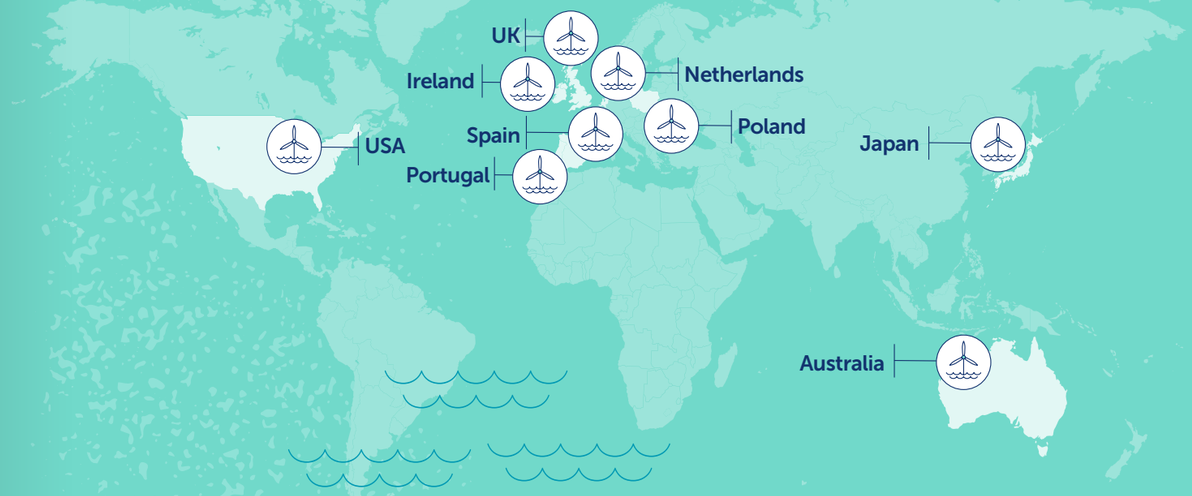
In Australia, we have formed a 50/50 joint venture with Equis to bid for a feasibility license for an offshore wind farm project in Australia's first Federal Government declared offshore wind zone of Gippsland, near the state of Victoria. The outcome of the bid is expected by the end of 2023.

Europe

The Netherlands is one of the most ambitious offshore wind markets in Europe with a 21GW target by 2030. SSE Renewables has partnered with APG, acting on behalf of Dutch pension fund ABP (the Netherlands' largest), to participate in the upcoming Ijmuiden Ver zone tenders.

We are also working with Acciona Energia to look at upcoming offshore wind opportunities in Spain and Portugal which are looking to deploy their first projects this decade.

Building an offshore wind pipeline in selected countries



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Published June 2023

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