OFFSHORE WIND AN IRISH PERSPECTIVE

INTRODUCTION

- Presentation is approximately 45 minutes
- Time at the end for Q&A via the questions box on your screen
- Caroline Donnelly will be mediator for todays presentation
- The presentation is being recorded
- My details will be displayed at the end – Please contact me with any additional queries of for any working opportunities

PRESENTER

Job Role
- Currently employed by Jennings O'Donovan & Partners - Consulting Engineers
- Company EHS Manager
- PSDP Co-Ordinator & Project Manager
- Main focus area is onshore and offshore renewables projects

Work Experience
- Skanska UK – UK Environmental Advisor & Trainer
- Adams Environmental – Environmental Analyst

Qualifications
- Currently undertaking a Master's in Environmental, Health & Safety Management
- Chartered to the Society for the Environment
- IEMA Full Member
- Degree in Environmental Management
- Certificate in Occupational Safety and Health
- Certificate Award in Education and Training

JENNINGS O'DONOVAN & PARTNERS

- Multidisciplinary consulting engineering firm
- Specialising in renewable energy, water supply, wastewater treatment and in the provision of planning and environmental services
- Based in County Sligo on the west coast of Ireland – A great place to live and work!
- 70 years in business in 2020

JENNINGS O'DONOVAN
& PARTNERS LIMITED
CONSULTING ENGINEERS

IWEA

- The Irish Wind Energy Association is committed to the promotion and education of wind energy issues
- Plays a leading role in the areas of conference organisation, lobbying and policy development on the island of Ireland.
- IWEA is committed to promoting the use of wind energy in Ireland and beyond as an economically viable and environmentally sound alternative to thermal or nuclear generation.
- Contact Ross McNally ross@iwea.com

IWEA
Irish Wind Energy Association

AGENDA

- Background and history of wind energy in Ireland
- Global wind market
- Why offshore
- Offshore wind history
- Irelands offshore wind market
- Current offshore turbine types and structures
- Irelands targets, pipeline and projects
- Policy pillars
- Video & conclusion

BACKGROUND

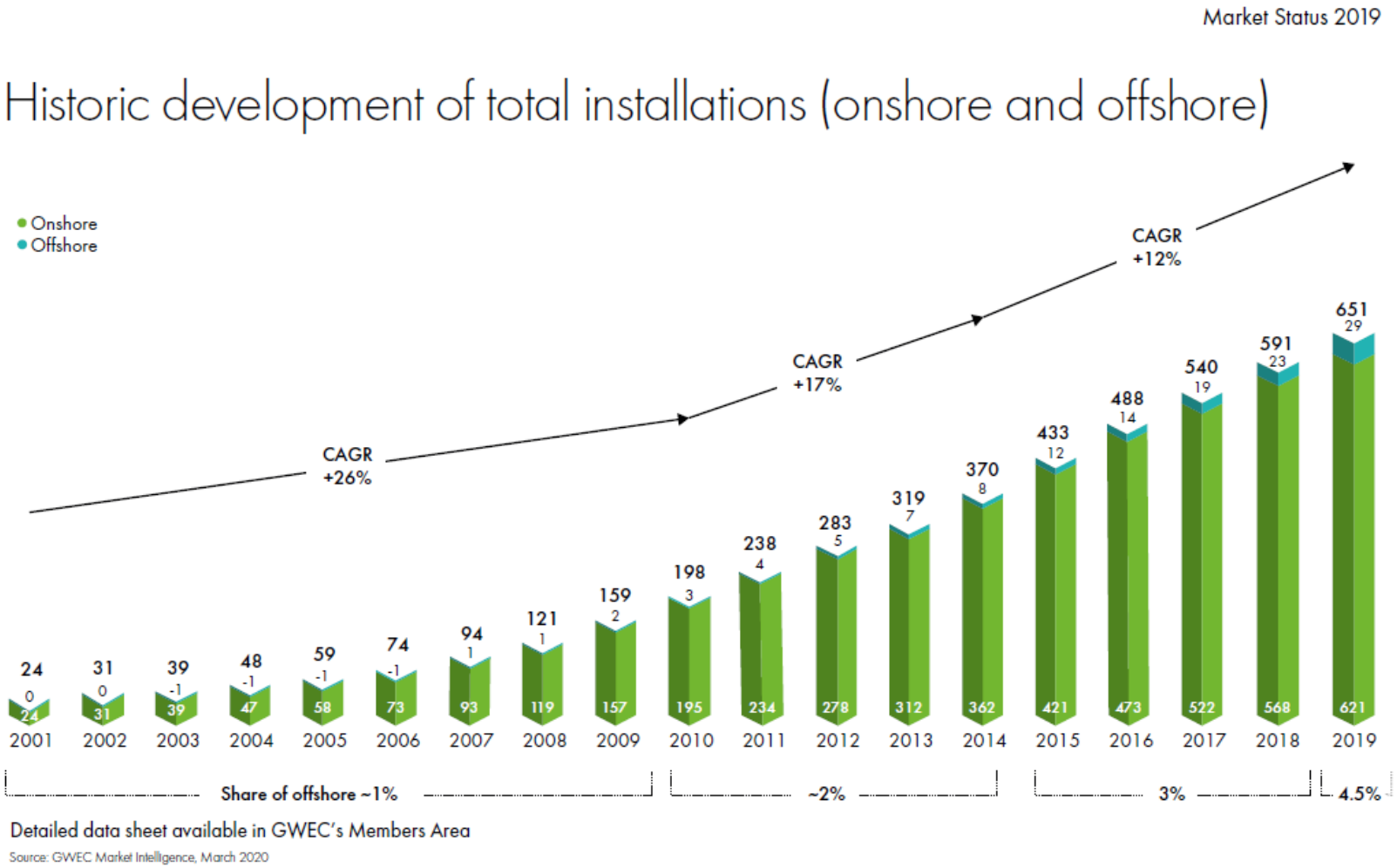
- Wind turbines as we know them have seen a meteoric rise over the past thirty or so years. This has generally been driven by energy security and environmental issues surrounding carbon emissions
- The modern wind energy market that most of us are familiar with today began in the late 1970s as part of a response to the oil crises of this time-frame.
- Ireland entered the commercial wind farm sector back in 1992 with a 6.45 MW wind farm in Bellacorrick, Co. Mayo

ONSHORE WIND DEVELOPMENT

- There is now more than 4,100 MW of installed wind energy capacity in the Republic of Ireland.
- In 2019 almost 33% of Irelands electricity demand was met by the wind energy market making it the highest European onshore wind contribution for a country.
- Onshore wind turbines are now being installed in the region of 3 – 3.5 MW per turbine
- This is enough to power approximately 3000 homes per year per turbine.

GLOBAL WIND MARKET

- At the end of 2019 the global wind market had a total installed capacity of 651 GW.
- This comprises of 622 GW onshore and 29 GW offshore.



WHY OFFSHORE

- Generally higher unrestricted wind speeds
- Reduced impacts on the public compared to onshore
- Able to use higher capacity turbines
- General increase in scale compared with onshore

OFFSHORE WIND HISTORY

1991

- First offshore wind farm constructed off the coast of Denmark.
- 11 x 450kW turbines
- Located just 1 mile off the coastline.
- Hub height of 35m
- Modern technology of its time

IRELANDS OFFSHORE WIND HISTORY

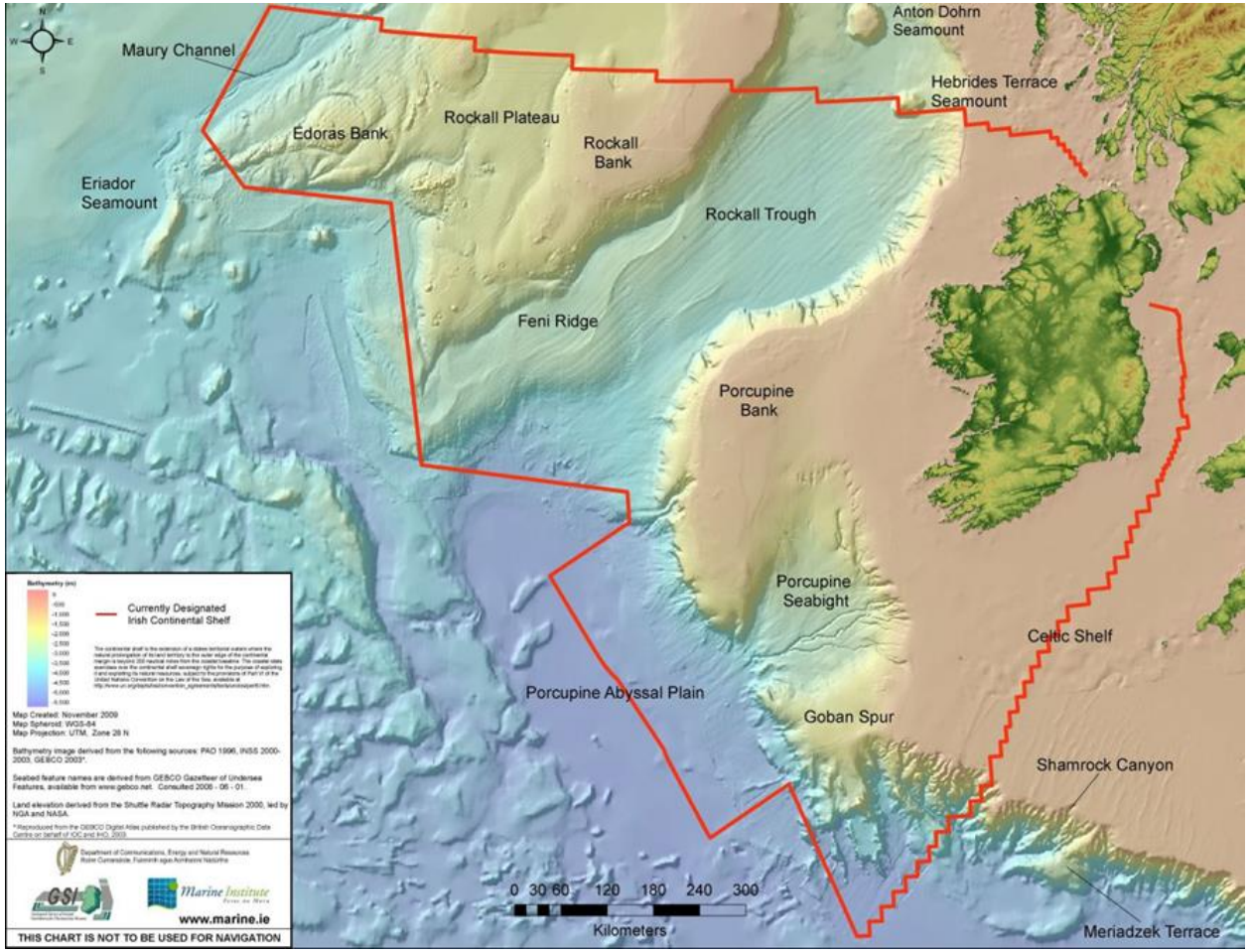
2002

- Commencement of Arklow Bank Wind Park
- Irelands first offshore wind farm
- 7 x 3.6 MW GE turbines
- Largest turbines of their time
- Located around 10 kilometres off the coast of Arklow

IRELANDS OFFSHORE WIND MARKET

Unfortunately, since then Ireland has not constructed any offshore wind farms and remains far behind many of our European counter parts.

Irelands marine shelve is more than 10 times that of the land mass at an area of 220 million acres



CONTEXT

- Europe is the global leader in offshore wind, with approximately 80% of the global current capacity installed in 2018.
- The Atlantic Ocean has much greater wind potential than other European country.
- Ireland needs not only to catch up but exceed offshore deployment at a rate not yet seen.
- The main trends dominating the market are the size increase of wind turbine generators, overall efficiency improvement and improved operational and maintenance programs.

WIND

Siemens Gamesa Launches 14MW Offshore Wind Turbine, World's Largest

The new machine can be dialed up to 15 megawatts, and an even larger version is in the works, says Siemens Gamesa's head of offshore technology.

JOHN PARNELL | MAY 19, 2020

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CURRENT OFFSHORE WIND TURBINES

TYPES OF OFFSHORE TURBINE STRUCTURES

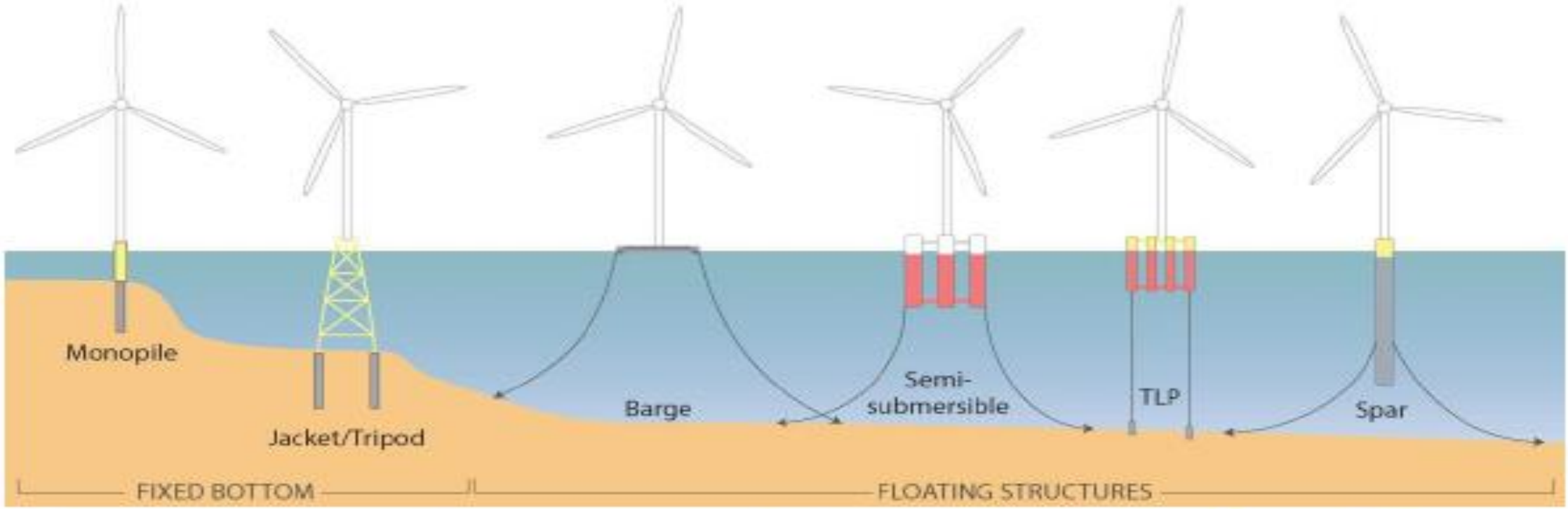


Figure 1.1: Common types of support structure technologies for bottom fixed and floating offshore wind turbines. [Source: Adapted from Principle Power]

TARGETS

- Original target in the Climate Action Plan was 3.5GW by 2030
- New programme for Government has increased this to 5GW by 2030
- Also targeting 30GW of floating offshore wind turbines to take advantage of the Atlantic coastline
- Europe is targeting 450GW of offshore wind by 2050

IRELANDS PIPELINE

- Irish Wind Energy Association (IWEA) have identified15GW pipeline of offshore wind projects at some stage of development.
- This is up recently from 12GW due to rapid advancements in the likelihood of floating offshore wind.
- *"With the right planning systems, on land and offshore, and the right policies there is no reason why most of Ireland's electricity should not be coming from wind energy in the second half of this decade"* - David Connolly IWEA.

PROJECTS

- Ireland's offshore wind pipeline
- This list is growing

Wind Farm	Capacity (MW)	Developer	Foundation
Arklow Banks 2, Wicklow	520	SSE Renewables	Fixed
Codling Wind Park, Wicklow	1100	Fred Olsen, EDF	Fixed
Oriel, Louth	330	Oriel, Parkwind, ESB	Fixed
Codling Wind Park Extension, Wicklow	1000	Fred Olsen, EDF	Fixed
Dublin Array, Dublin	600	Innogy, Saorgus	Fixed
Skerd Rocks, Galway	400	Fuinneamh Sceirde Teoranta	Fixed
Braymore Point, Louth	800	SSE Renewables	Fixed
Celtic Sea Array, Waterford	800	SSE Renewables	Fixed/ Floating
Clogherhead, Louth	500	ESB, Parkwind	Fixed
Cooley Point, Louth	500	ESB	Fixed
Helvick Head, Waterford	1000	Energia	Fixed
Kilmichael Point, Wexford	500	ESB	Fixed
NISA, Louth/Meath	750	Statkraft	Fixed
Inis Ealga, Cork	700	DP Energy	Floating
Clare Offshore Wind Farm	700	DP Energy	Floating
Sligo Offshore Wind Farm	500	DP Energy	Floating
South Irish Sea	1000	Energia	Fixed
Block 30 (Off Shore Wind), Clare	600	Lightfield Limited	Floating

Table 2: Ireland's offshore wind pipeline[19]

POLICY PILLARS TO ACHIEVE

1) Consenting Process
2) Grid Model
3) Auction Scheme
4) Supply Chain
5) Floating Technology Deployment

CONSENTING PROCESS

- Marine Spatial Planning (MSP) is a new way of looking at how we use the marine area and planning how best to use it into the future.
- The Marine Planning and Development Management (MPDM) Bill has evolved from the Maritime Area and Foreshore Amendment Bill.
- The MPDM Bill incorporates a forward planning model, with decisions to be taken in a manner that secures the objectives of the National Marine Planning Framework (NMPF) which provides the spatial and policy context for decisions about the maritime area.
- Draft National Marine Planning Framework (NMPF) has been published and public consolation carried out with stakeholders.
- There are a number of work streams feeding into this. Delays have been encountered and these have been exacerbated by Covid-19
- The National Marine Spatial Plan is due to be submitted to the EU by March 2021.

GRID MODEL

- There is consultation ongoing in relation to the grid model for offshore wind.
- Option 1 – Decentralised, developer lead approach similar to UK model. This is quicker and can be achieved in the shorter term.
- Option 2 – Centralised, industry lead approach similar to Netherlands model. This model is more long term (15 years) so is currently not a viable option to meet 2030 targets.
- Eir Grid and the Commission for Regulation of Utilities (CRU) are leading and need to process the grid applications
- IWEA consider the decentralised approach suitable for the east and south east developments which the centralised model may be suited to the longer term offshore floating projects along the west coast.

GRID MODEL

- Currently Irelands transmission system is limiting the amount renewable energy it can accept due to limited capability of the grid in certain parts of the country to transport the electricity and curtailment which limits renewables to 65% of demand to ensure system stability.
- *"We need a stronger transmission system to ensure that we are not wasting electricity and, if we are to achieve our 2030 targets, and beyond them to 2040 and 2050, then we are going to need a plan to build a stronger electricity grid."*

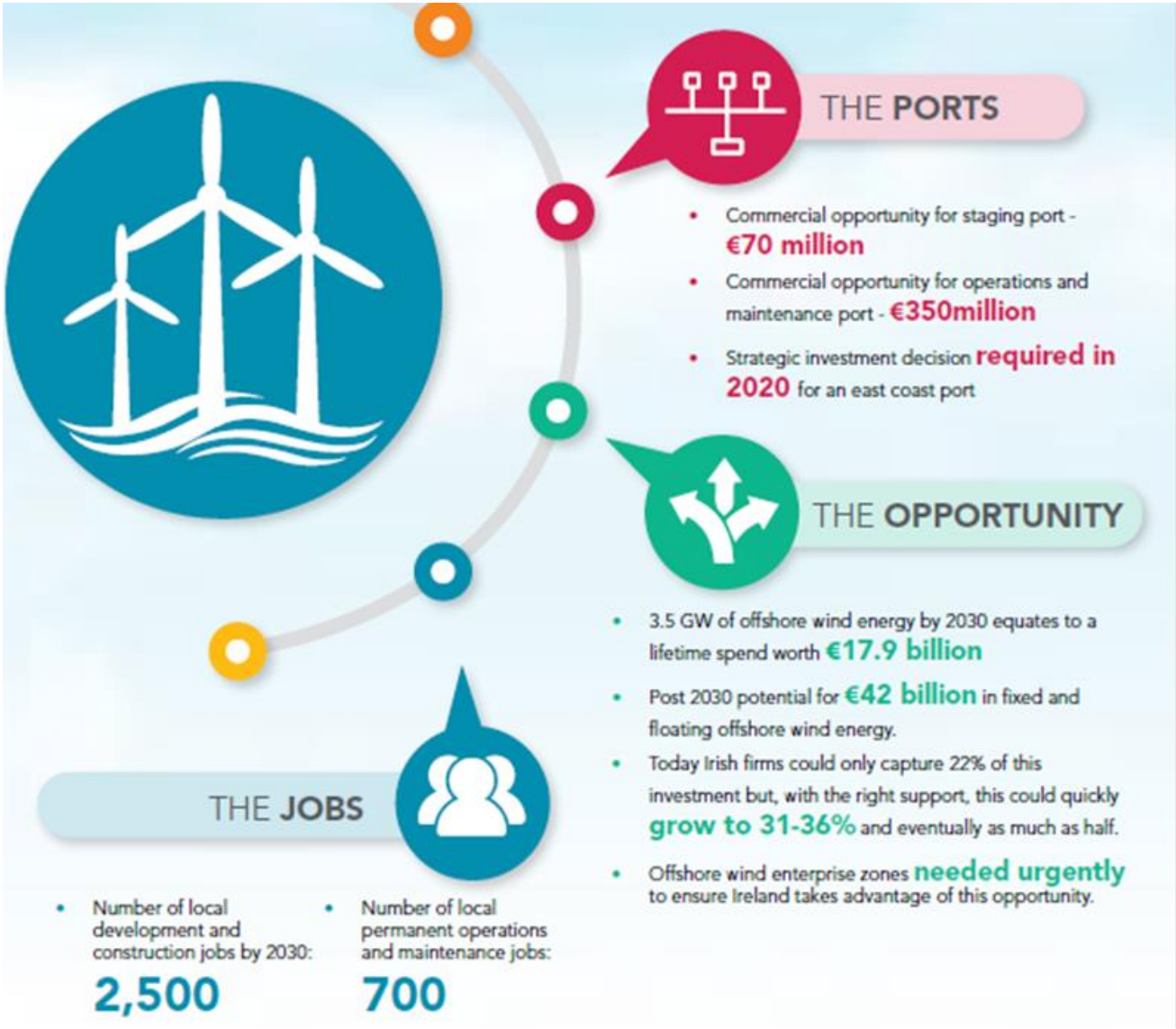
AUCTION SCHEME

- Needs to be a renewable electricity support scheme (RESS) fit for the offshore sector
- Differs from the onshore model as much greater scale
- The scheme needs to align to the developers timeframes and key deliverables
- These timeframes need to be reasonable and achievable
- They need to consider constraint and curtailment compensation
- IWEA are continuing engagement with department and government bodies
- A indexation model will likely result in lower costs to the consumer leading to support for offshore wind

SUPPLY CHAIN

Ireland has the potential however in order to maximise is we need to:

- Upskill our industry
- Create new companies to service offshore
- Develop enterprise hubs
- Develop construction ports capable of supporting these wind farms – If we don't Belfast or UK ports will be utilised and the associated local supply chain will not be maximised



EXAMPLE OF PORTS

FLOATING TECHNOLOGY DEPLOYMENT

- The current programme of government are the first to set a floating wind target
- Europe is targeting 450 GW by 2050
- Ireland has the potential to supply 80GW of this
- We need to contribute and fund more demo projects
- Currently a €31 million euro project “AFLOWT” in the pipeline for the coast of Belmullet

AFLOWT PROJECT

- Ambitious four-year floating offshore wind projectin the region which has some of the strongest wind and ocean resources in the world.
- Land space and access to shallow offshore sites (less than 50m water depth) are limited
- Subject to consenting, it is planned that a full-scale floating wind turbine be deployed for testing off the west coast of Ireland at a Sustainable Energy Authority of Ireland (SEAI) test site near Belmullet, Co. Mayo, by 2022.
- The project is led by the European Marine Energy Centre (EMEC) working in partnership with SEAI, SAIPEM and other organisations in France, Germany, Ireland, the Netherlands, and the UK.
- The floating turbine will be tested for a year at SEAI's Atlantic Marine Energy Test Site (AMETS) off the west coast of Ireland. Deployment is currently planned for 2022.

AFLOWT PROJECT

Widespread market uptake of wind energy in deep water sites requires 4 elements;

- Demonstration of high survivability cost competitive Floating Offshore Wind (FOW) technology
- Raise awareness with and provide confidence to investors and project developers regarding technology investability
- Creation of supportive policy environment
- Develop an active supply chain

- The deployment of FOW platform in depths of over 50m, average wind resource of 10m/s and extreme waves of over 30m that will generate 13,140 MWh/y.

VIDEO

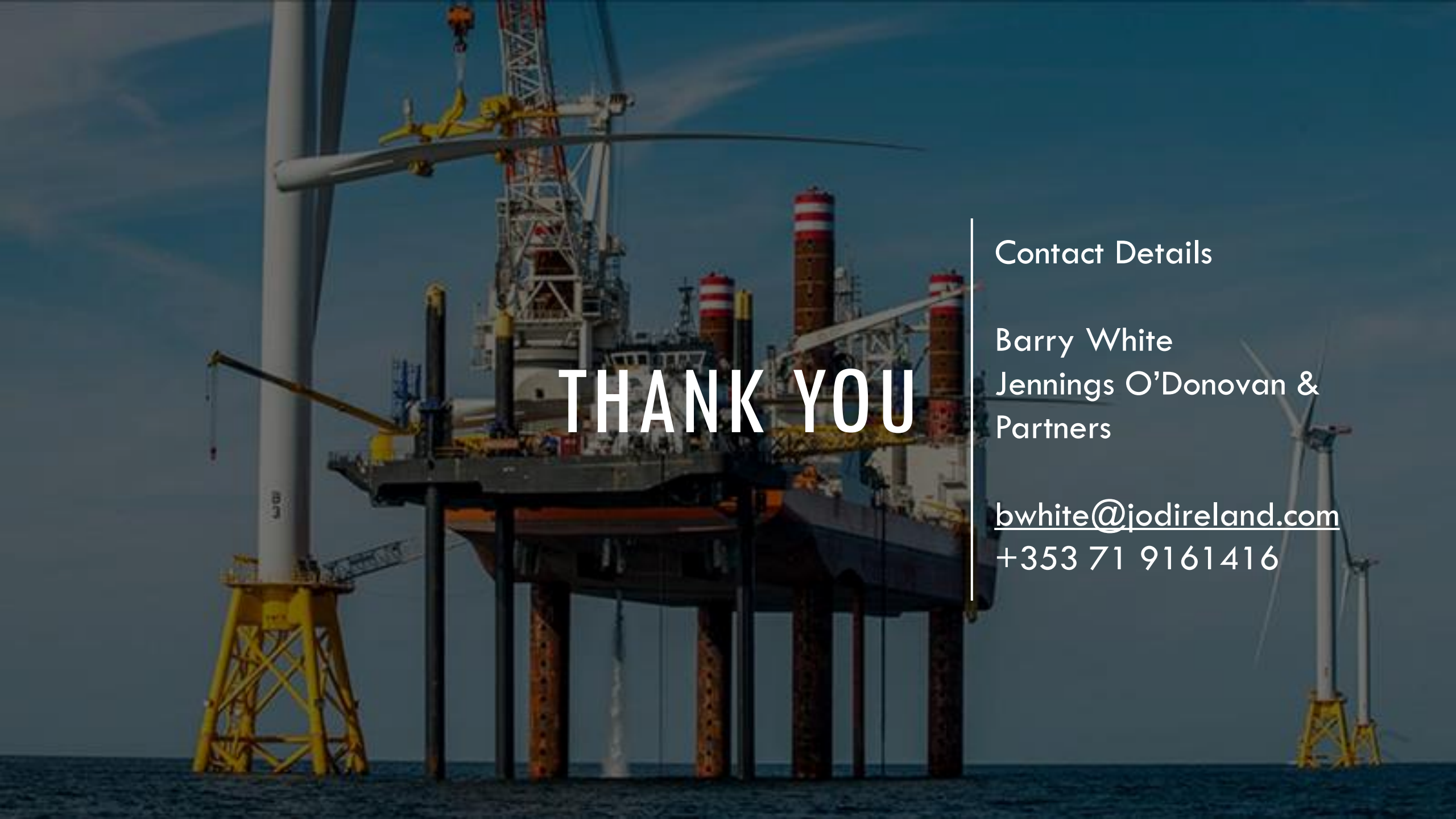
We have the power to power ourselves

https://www.youtube.com/watch?v=oW_kaUL_JFk

CONCLUSION

- We have the opportunity to be a key contributor to a global renewable energy future

- This sector creates sustainable jobs, economic investment and renewable energy to power or homes and businesses



THANK YOU

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