

Reaping the Harvest

Industrial Development Potential of Offshore Wind in Ireland



Technical by nature

A question...

What economic development opportunities does offshore wind development hold for Ireland assuming different levels of domestic build?

- Contents:**
1. Results of GL GH study
 2. Co-operation mechanisms and export
 3. European supply chain context

Results of the Study

Findings – drivers and barriers

Drivers

- 2020 RES-E targets plus reduction in fuel imports
- Potential employment and industrial development benefits
- ‘First-mover’ advantage
- Hedge against delivery of onshore wind – public acceptance can be easier

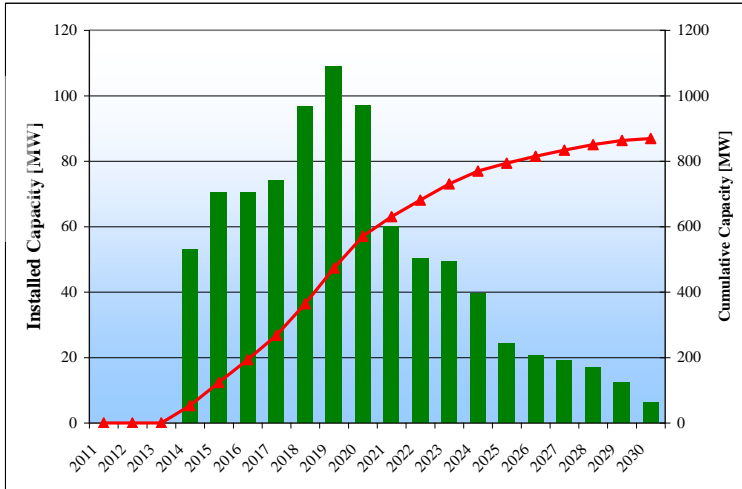
Barriers

- Lack of clear policy direction and political will to remove barriers
- Project economics, grid connection process and consenting not tied-up
- Little major established heavy engineering, ship building or offshore oil and gas industries

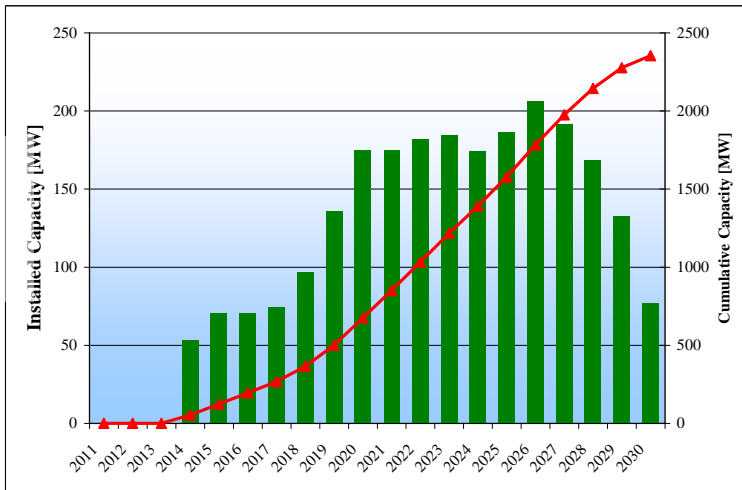
- Offshore resource is very large
- Lack of political will could be result of possibility of meeting targets from onshore only – although there is significant uncertainty associated with many onshore projects
- Strong political will urgently required if offshore wind is to be part of the ‘2020’ solution
- If seen purely as post-2020, economic development opportunities will be more limited

Scenarios to 2020/2030

Low –
2020 ~NREAP;
2030 Gate 3

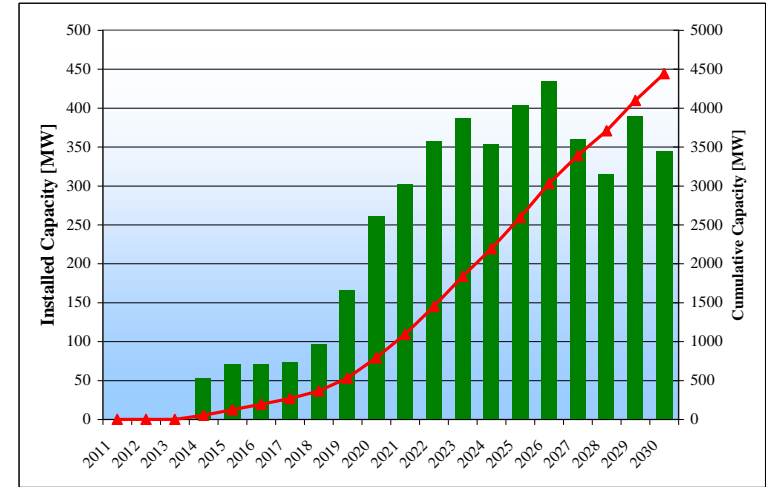


Medium –
2020 ~700 MW;
2030 ~ 2.3 GW



High –

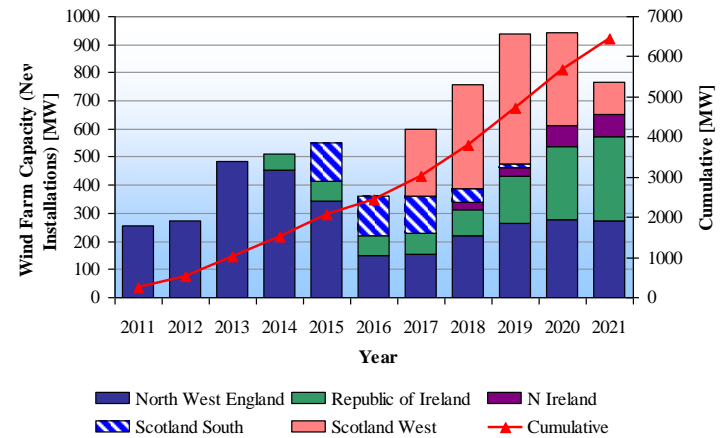
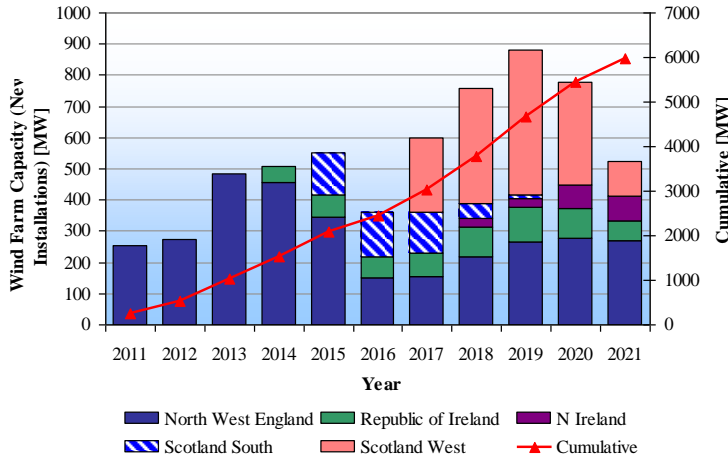
2020 ~800 MW;
2030 ~ 4.5 GW



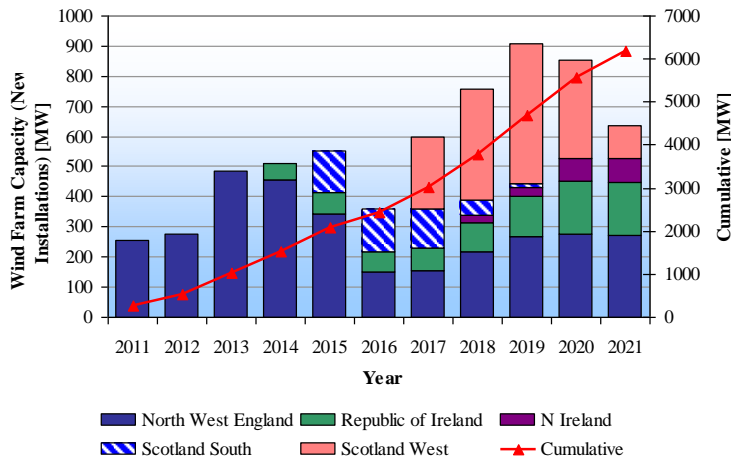
Scenarios assessed in terms of demand for key components and services

Scenarios to 2020/2030 with adjacent waters

Low



Medium



High

Market driven by adjacent waters – but opportunities play both ways

Opportunities

Development

- Ranges from maximum spend on ROI projects of €3million/annum in low to €19million/annum in high
- Requirement for knowledge of consenting process and legal and policy background will encourage work to be done in ROI under all scenarios

Construction

- Assessing ROI market alone, only high scenario would justify establishment of small tower, foundation and/or transition piece facility with capacity of ~50 units/annum
- Under high scenario at least one installation vessel would likely be Irish-based
- However entrants likely to look at **“Adjacent Waters”** markets in conjunction with ROI – a 6GW and €20 billion CapEx market to 2020 creating sufficient demand under all scenarios for above listed facilities; but competition is strong
- Advance investment in Irish ports for serving UK Round 3 is a possible, albeit risky, strategy

Operations

- Under high scenario additional repair vessel required creating total of 3 Irish-based jack-ups – a significant market
- Under Low market Irish market rises to €36million/annum, under high €125million/annum.
- From 2015 onwards O&M opportunities under all scenarios on project-specific basis. Some potential to serve multiple projects from centralised locations - including those in UK waters - although UK ports already have first mover advantage.

Recommendations 1

Infrastructure:

- Investment is likely to follow projects
- Round 3 may be an exception where advance investment could assist first-mover advantage
- This should be investigated before committing to expenditure.



Supporting supply chain:

- Concerted effort by Irish Industrial Development Agencies to promote Irish facilities similar to Invest NI and DETI in UK
- Foundation and tower manufacturing for ROI and Western UK
- Providing home and support services for installation vessels
- Provision of O&M bases (although no immediate support measures rec.)

Recommendations 2

Policy:

- Develop streamlined regulatory framework
- Pursue RE trading options in Europe
- Harmonise transmission system rules and regulations
- Build key interconnectors



R&D:

- Foundation demonstrations optimised for harsh conditions of Irish sites
- Provision of turbine T&D sites
- Investigation of floating turbine demonstrations in extreme west coast climate – possible co-op with Norway/Portugal/Scotland
- Demand-side management measures for facilitating wind onto network
- Collaboration on market opening and interconnection with neighbours

Updates since study

Project Economics

- Offshore wind tariff has been shelved
- Focus on co-operation mechanisms with the UK

Consenting

- Pre-application and streamlining introduced with introduction of timescales for prescribed bodies placed on statutory footing
- Process currently suspended for new applicant commercial scale developments while OREDP is under review
- Proposed changes include integration with Strategic Infrastructure Act – allowing alignment with onshore aspects

Grid Connection

- Perception that process was too ambitious and pre-qualification not tight enough
- Expectation some interim measures allowing for introduction of capacity outside process
- Curtailment policy remains a point of uncertainty

Co-operation Mechanisms

Cold-hearted partners: evaluating key costs and benefits

- **Size of penalty is unknown**
- **Willingness to avoid penalty and pursue mechanisms may depend on economic climate**
- **Further – target is on RE – 3 degrees removed from wind’s contribution, adding uncertainty**
- **Together these issues could encourage a “wait and see” attitude**

Benefits

Avoid a penalty
Saving on domestic support costs
Energy Policy Cooperation
<i>Market for potential exports</i>
<i>Avoided public opposition to dev.</i>
<i>Enhancement of grid interconnections</i>

Costs

Financial transfer
<i>Public acceptance</i>
<i>Loss of domestic industry</i>

What does this mean for wind?

- Uncertainty could largely reduce activity to an illiquid “balancing market” in final year
- Post 2020 framework is likely required to create a market capable of instigating deployment driven solely by opportunity for statistical transfer

OFFSHORE WIND JOINT PROJECTS UNIQUELY POSITIONED TO TAKE ADVANTAGE

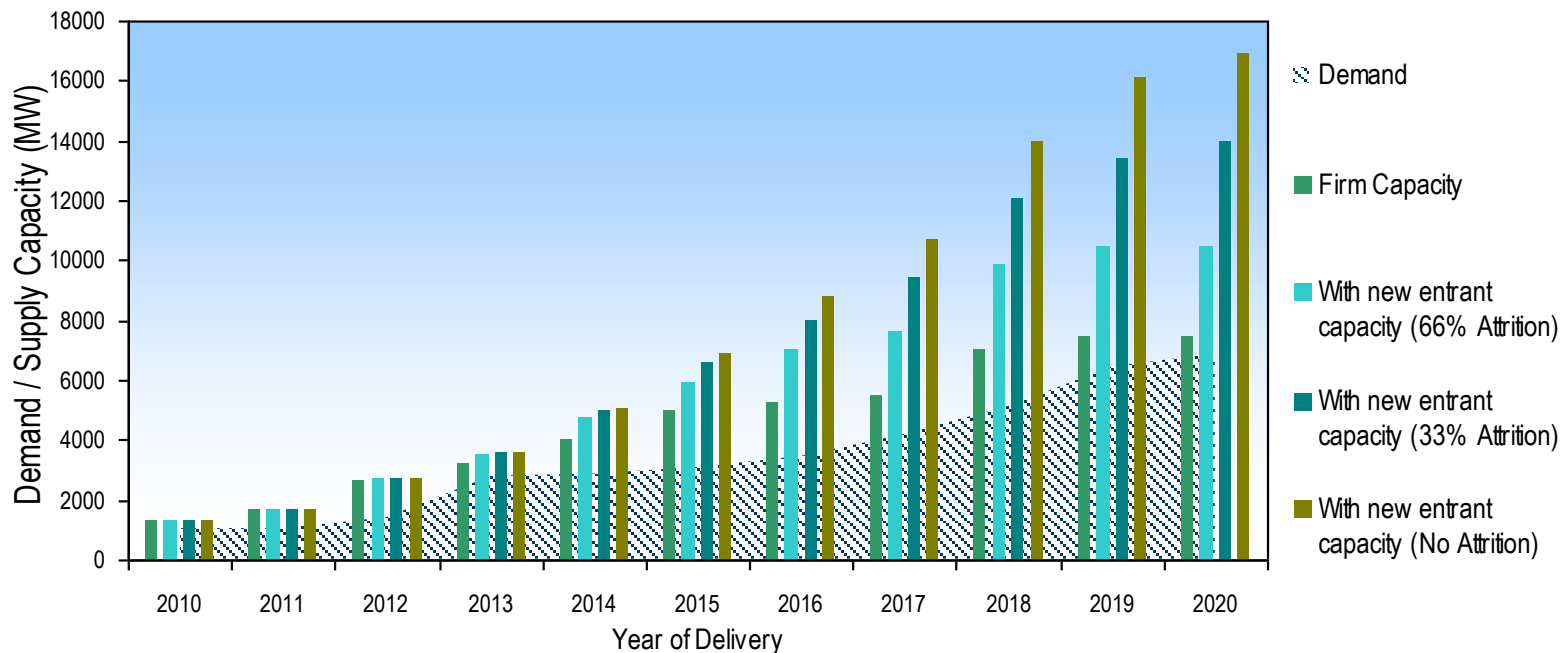
action - 2020 targets are only one potential driver for action

- Most promising opportunities likely to be between neighbouring countries looking to:
 - deepen energy policy cooperation;
 - strengthen grid interconnections;
 - improve and expand electricity markets; and
 - leverage benefits of expanded markets

European Context

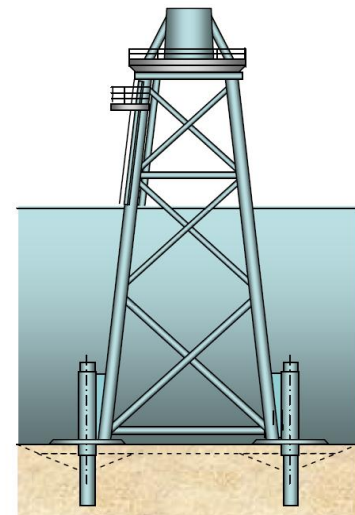
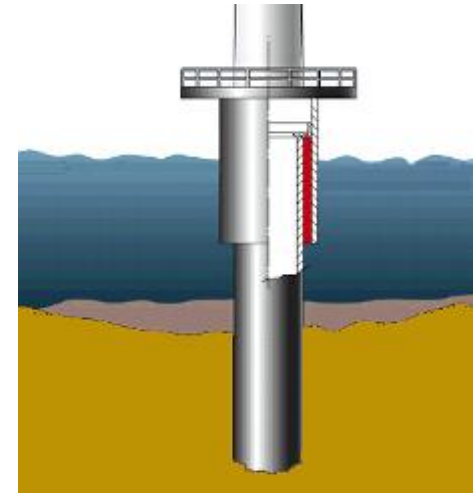
Wind Turbine Generators

- Supply chain dynamics
 - Incumbent OEMs are vertically integrating
 - New entrants relying on strategic partnerships
 - Bigger parts = coastal investment
- Supply chain outlook: healthy to fierce competition for market share



Foundations

- Low hanging fruit for domestic investment
 - Low technical barriers to entry
 - Opportunity for diversification for shipyards / tower manufacturers
- Elastic supply base, lowers bottleneck risk
 - Existing maritime / O&G capacity in Europe
 - Attractive diversification for maritime fabricators
- Future trends in deeper waters:
 - Space-frames expected to take increased share
 - Improved fabrication / installation capabilities of monopiles may push envelope towards 30m / 7MW
 - Longer-term prospects for floating structures



Electrical Infrastructure

- Limited range of HV subsea cables
 - High investment costs
 - Long lead times for new capacity
- Technological trends
 - Higher voltage array cabling
 - Established suppliers developing competing HVDC technologies with potential for multi-terminal capability
- Supply chain outlook
 - Without investment, shortage of HV subsea cables is looming !
 - Other equipment is drawn largely from much larger T&D industries – relatively unconstrained with exception of HV transformers.



Vessels

- Specialisation...
 -of vessels, to offshore wind
 -of vessels, to specific tasks
 - Jack-ups still expected to dominate
- Strategic investment by developers
 - RWE, Fred Olsen
 - “Ultimate” vertical integration
- Supply chain outlook
 - Several new builds contracted
 - Increasing competition
 - Supply meeting demand to 2015
 - Beyond that increasing pressure on supply if no new investment comes forward



Ports

- More manufacturing, less logistics
 - Reduced use of Marshalling Harbours
 - Direct export models
- Cluster-building
 - Opportunity for regeneration of depressed coastal regions
 - Public - private initiatives
 - Tied to manufacturing investment
 - E.g. Bremerhaven, NE England, Scotland
- Supply chain outlook
 - Investment in Western Europe – strong capacity
 - Eastern Europe – high potential for future



Employment

- Steep rise in numbers
 - Prediction of wind industry direct and indirect employment more than doubling by 2020
 - Offshore is a key driver for this – possibly 60% by 2030
- A need for skills
 - Renewables have higher proportion of jobs classified as “high-skilled”
 - Often ignored but attention required to prevent shortage in these areas



Thank you !

For more information please see:

1.

http://www.seai.ie/Renewables/Ocean_Energy/Ocean_Energy_Information_Research/Ocean_Energy_Publications/

2.

http://www.seai.ie/Renewables/Ocean_Energy/Ocean_Energy_Information_Research/Ocean_Energy_Publications/Offshore_Wind_Study.pdf

3.

http://www.gl-garradhassan.com/assets/downloads/Love_Thy_Neighbour_-_Sharing_the_2020_Targets.pdf

