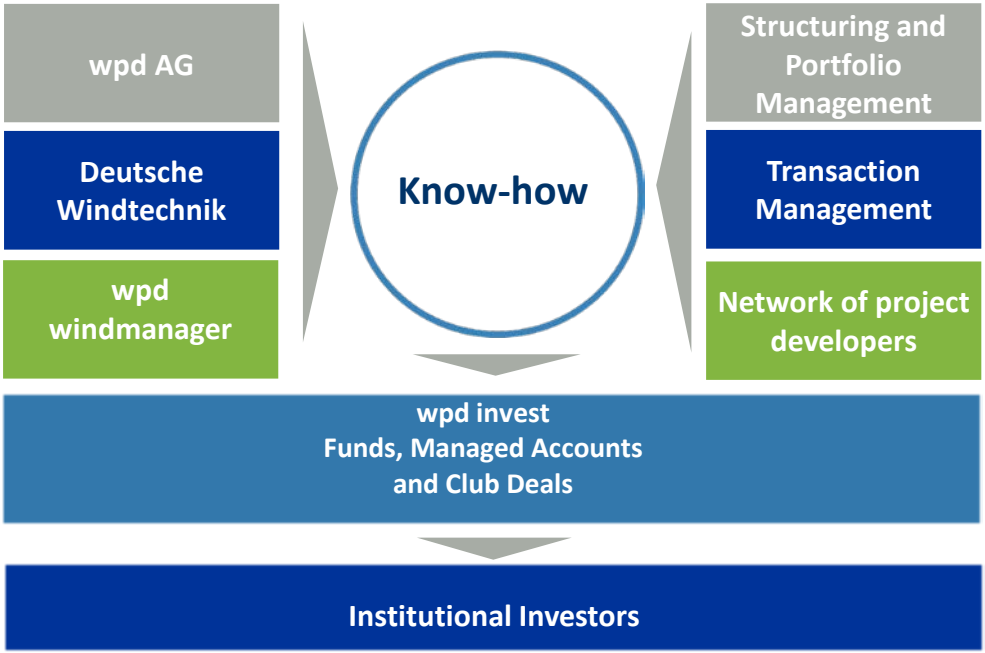
Investing in Offshore Wind – global trends and experiences from Europe

wpdinvest

Sustained investor services



Investment Solutions

Depending on the resources and investment volumes, different access ways can be explored within wpd invest services

Funds

Funds offer a full-service concept:

- **Little requirements on the resources of the client**
- **wpd invest covers the whole transaction management during the investment phase and the continuous asset management**
- **Client regularly receives reporting on the performance of the investments**

Managed Accounts

Larger volumes are mostly allocated via Managed Accounts:

- **Individual design of investment strategy, allocation and structure**
- **Ongoing involvement of the client customizable**
- **Full control up to the point of de-investment**
- **Individual reporting tailored to the client´s needs.**

Club deals

Experienced investors join together via a Club Deal to perform a portfolio-transaction:

- **wpd invest cover the transaction management, structuring, as well as the pooling of investors**
- **Individual client´s needs can be realized**
- **Requires a high level of expertise and resources on the client´s side**

Advisory

Some investors seek advise on a deal-by-deal basis

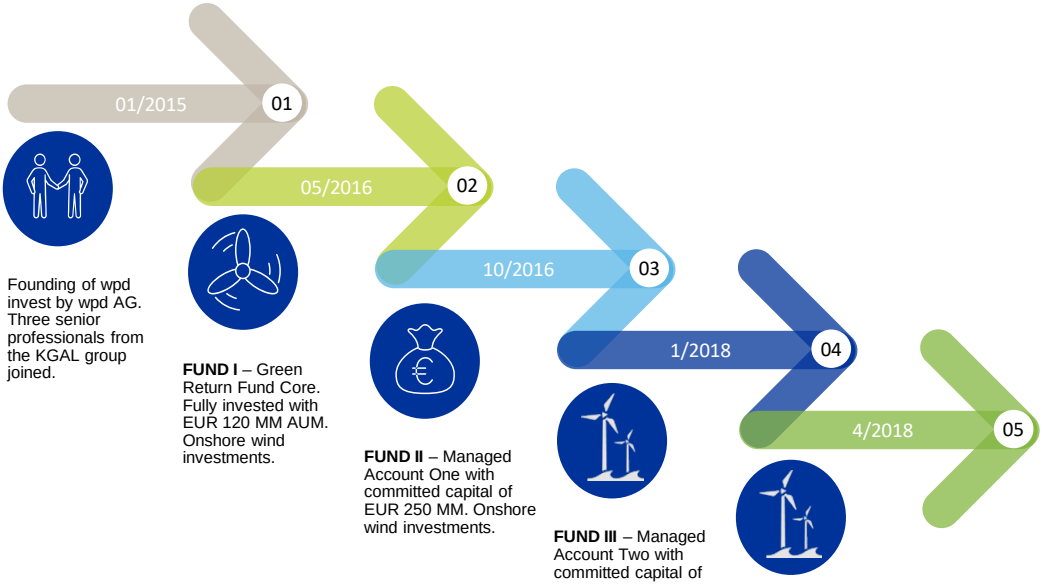
- **wpd invest offers support for renewable energy investors seeking to enter a specific market**

Services include:

- **deal sourcing and execution**
- **ongoing asset management services including tailor made reporting**

Fundraising and investment history of wpd invest

Historic timeline of wpd invest business development



Market overview

Current Trends

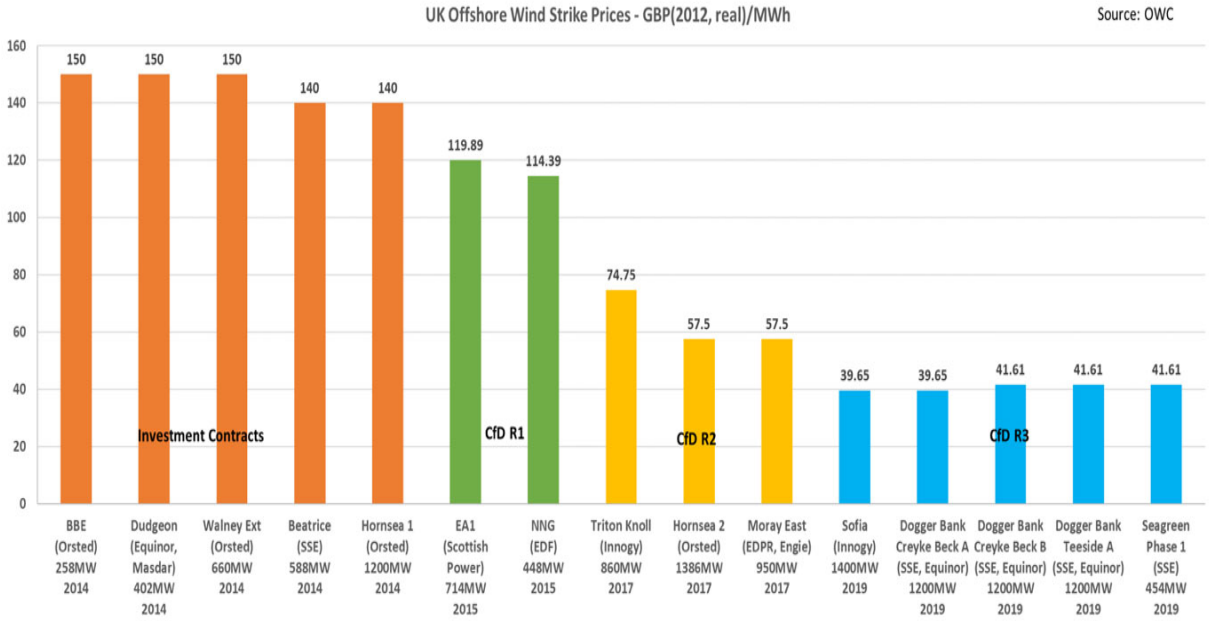
Renewable development trends in European markets

	FiT-regimes	PPA-markets
Advantages	▪ Proven policy mechanisms ▪ Low political risk ▪ FiT prices are now being tendered in most European countries	▪ Fixed volume PPA or As-produced PPA ▪ Creditworthiness of a PPA provider is crucial in an investment due diligence
Guarantor	▪ State guaranteed	▪ Counterparty risk
Credit - worthiness	▪ Strong ratings ranging from AAA to AA	▪ Solid corporate ratings available (e.g. Facebook, Google, IKEA)
Tenor	▪ 8 – 20 years	▪ 5 – 20 years
Countries	▪ Germany, France, Denmark, Belgium, Netherland, UK	▪ Recent results from zero bid Dutch and German but also the latest UK auctions
Return expectations	▪ Lower returns, investors tend to price it similar to fixed income	▪ Higher returns accounting for counterparty risk

Difference in auction/tender markets

	UK schemes – with interconnection (market led)	Most other markets – TSO led
Advantages	▪ Developers control planning and costs-> faster and more cost effective ▪ Opportunity to service the originally built asset via service contract with better incentives	▪ Developers get a set date with several obligations ▪ Compensation mechanisms if transmission operator does not perform
Risks	▪ Cost overruns and sell down risk borne by developer	▪ Less ongoing risks but also less chance to outperform
Financing	▪ Slightly more complex	▪ Very simple on this aspect

Auction Results (UK)

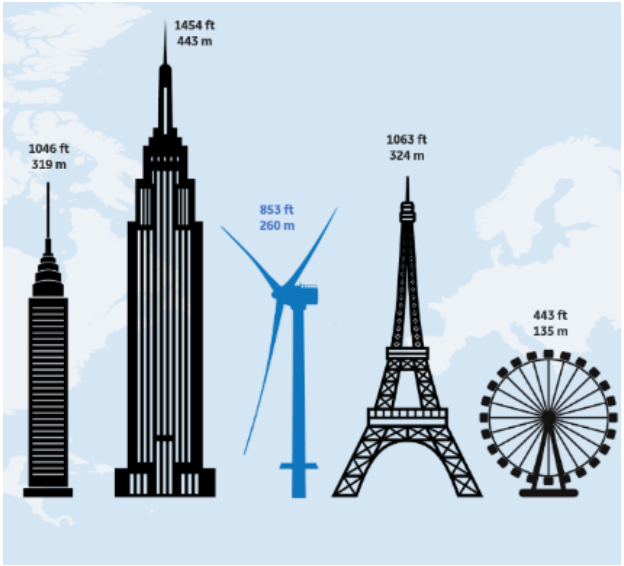


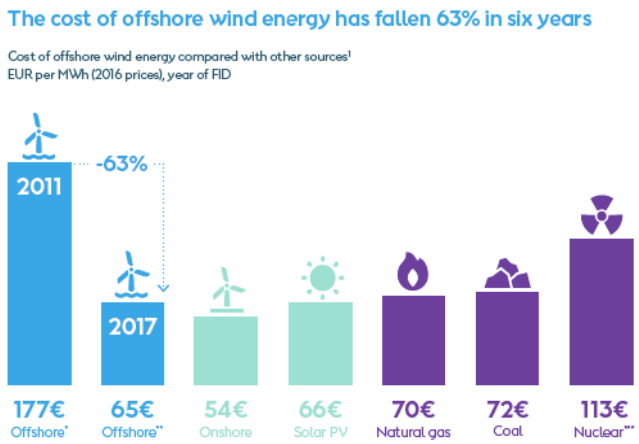
Technology and LCOE improvements

Factors:

- Scale
- Industrialisation
- Innovation

12 MW	capacity
220m	rotor
107m	long blades
260m	high
67 GWh	gross AEP
63%	capacity factor
38,000m2	swept area





Source: Danish Energy Agency * West Duddon Sands, UK ** Hornsea 2, UK *** Hinkley Point, UK

Asset Lifetime – technical and economic aspects

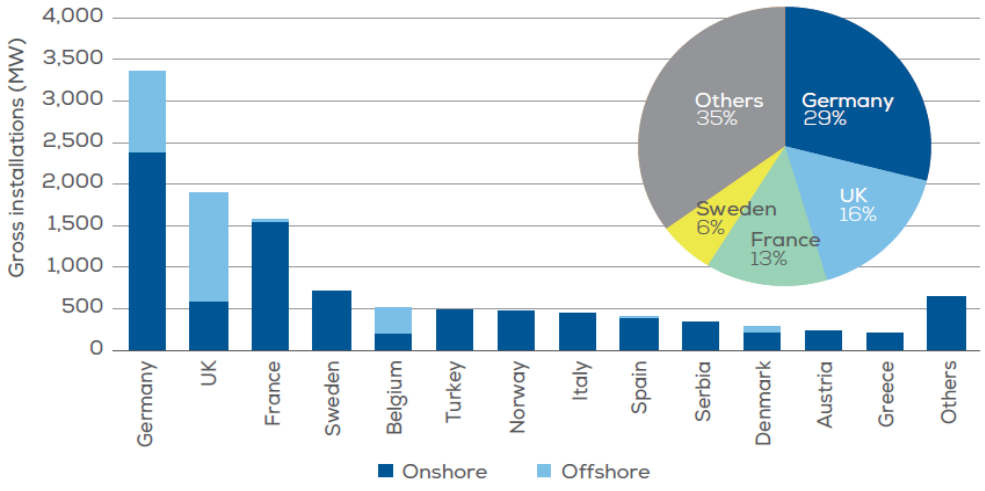
Technical certifications and economic assumptions moved from 20 years in the early 2000s to 25 years in the early 2010s to now 30 years

Challenges are product lifetime cycles and spare parts

Permitting is lagging the 30 year assumption in some places, but regulators are currently inclined to grant extentions

European gross annual onshore and offshore wind installations

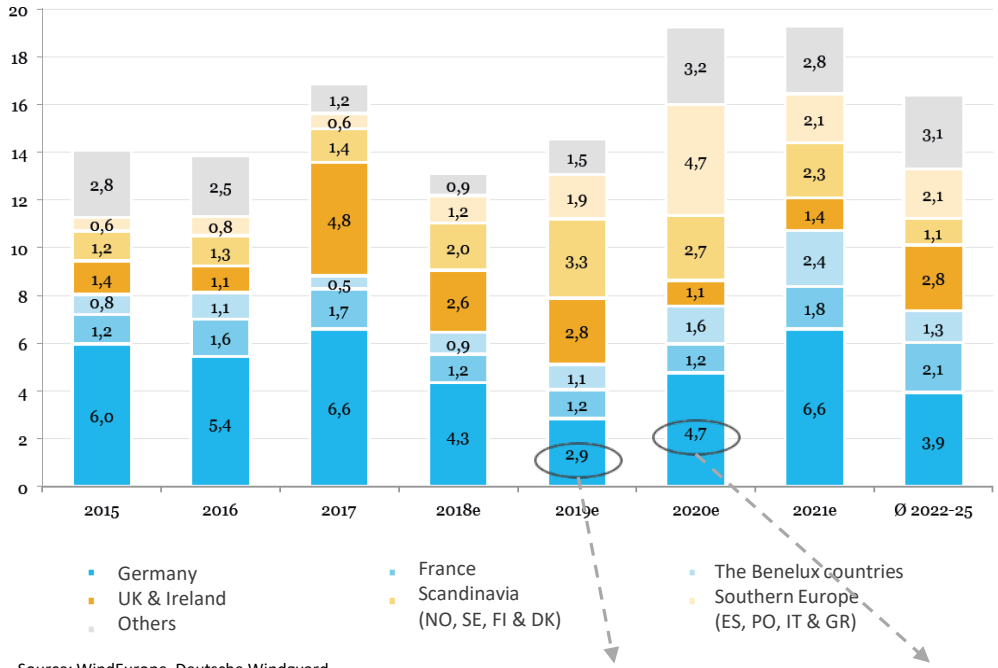
2018 gross annual onshore and offshore wind installations in Europe



	Germany	UK	France	Sweden	Belgium	Turkey	Norway	Italy	Spain	Serbia	Denmark	Austria	Greece	Others
Offshore	969	1,312	2	-	309	-	-	-	5	-	61	-	-	-
Onshore	2,402	589	1,563	717	204	497	480	452	392	356	220	230	207	706
Total	3,371	1,901	1,565	717	513	497	480	452	397	356	281	230	207	706

Source: WindEurope

Expected wind capacity increase (GW)

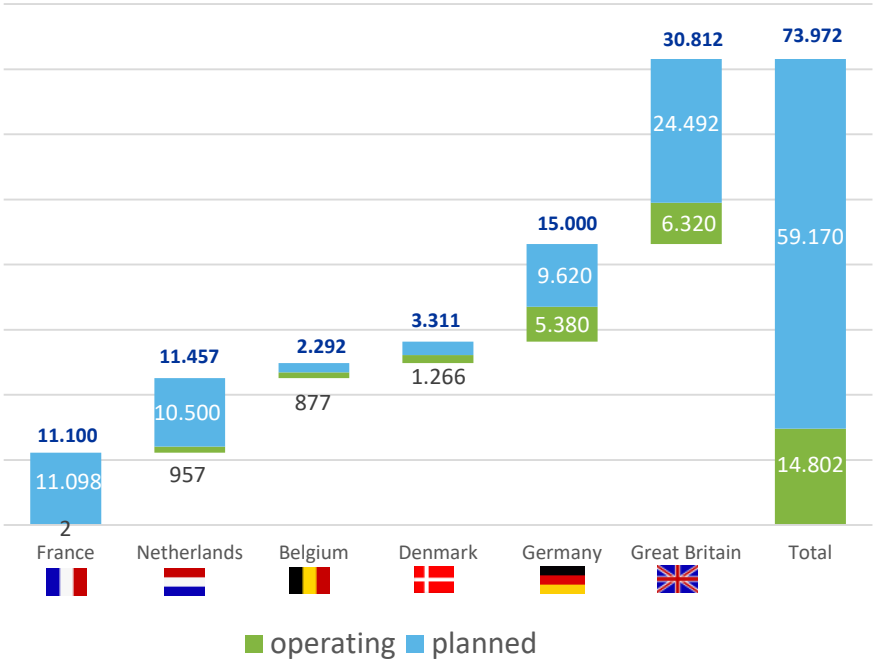


Source: WindEurope, Deutsche Windguard

Expected to be 1-1.5 GW

Expected to be <2 GW

Offshore market developments in Europe and beyond



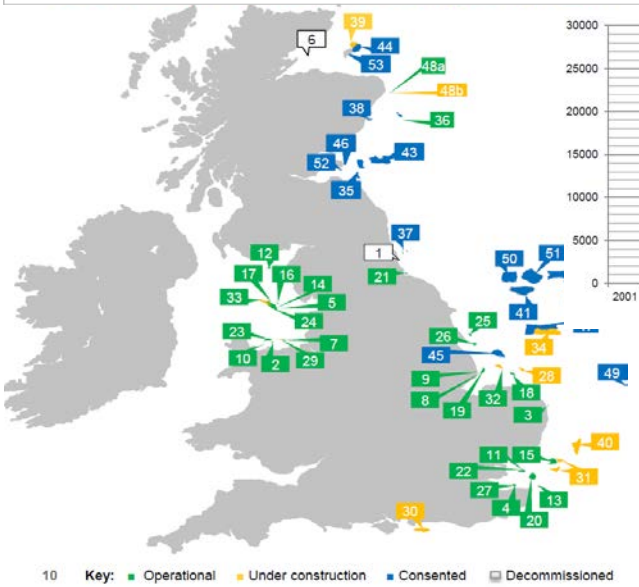
1 Source: PWC Analysis, "Unlocking Europe´s offshore wind potential", April 2018

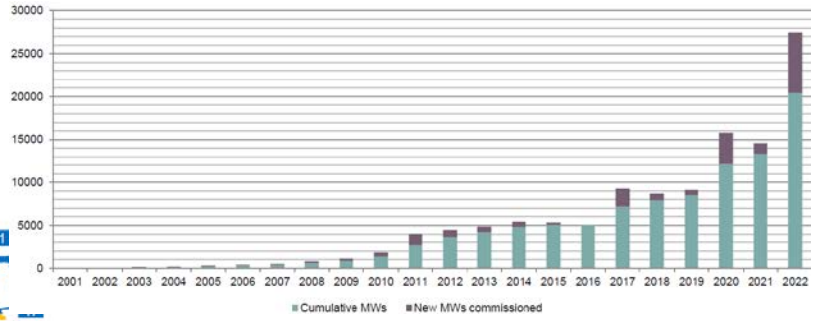
Clear goals by EU regulating bodies

- EU regulations provide for a target of 20% of gross energy consumption coming from renewable sources by 2020.
- Germany **just upgraded their offshore target** from 15 GW **to 20 GW** by 2030
- According estimates of the European Wind Energy Association 24 Gigawatt (GW) could be in operation by the year 2020 in Europe
- PWC estimates up to 73 GW installed in the year 2030
- Globally IEA forcasts 342 GW of offshore wind by 2040 up 15 time form current levels

European Investment Opportunities 1/3

UK: offshore wind projects

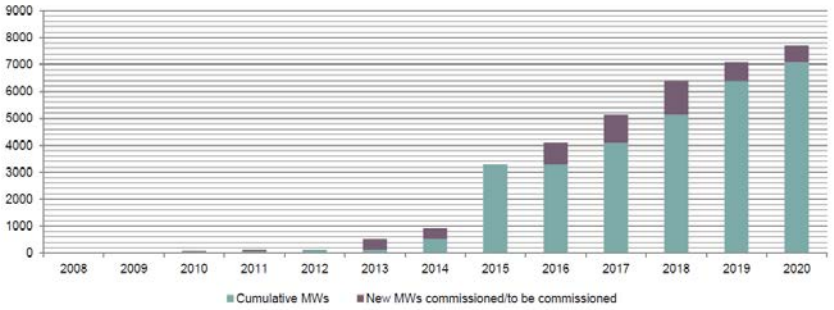




Source: Norton Rose Sept 2019

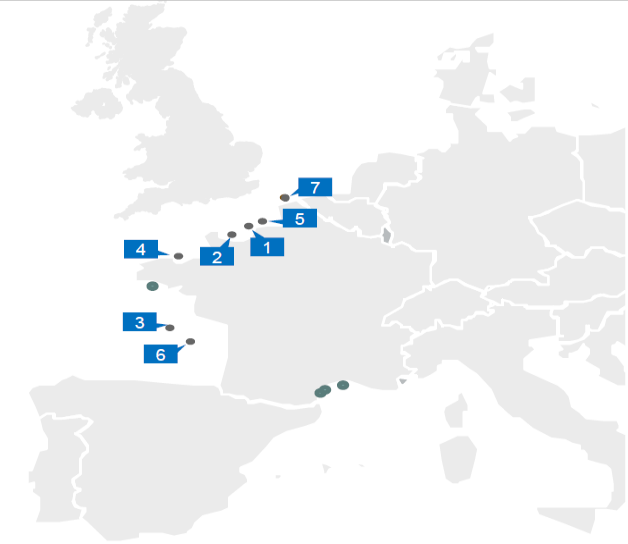
European Investment Opportunities 2/3 Germany

Key: ■ Operational ■ Under construction ■ Awarded in tender (April 2017 or April 2018) ■ Consented but unsuccessful in tender (April 2017 and 2018)
Sources: Stiftung Offshore-Windenergie and 4COffshore.com (August 2019)



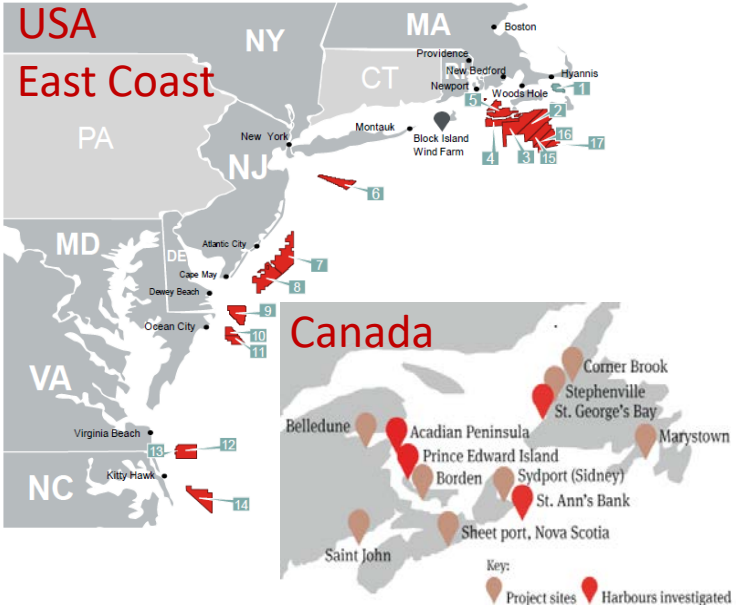
European Investment Opportunities 3/3 France

Fokus on: France



- **Round 1:** Four projects with 1.924 MW expected financial close 2020/2021
- **Round 2:** Two projects with 992 MW expected financial close as well 2020/2021
- **Round 3:** One Projects with 600 MW FC 2022
- **Plus:** Floating wind demonstrators

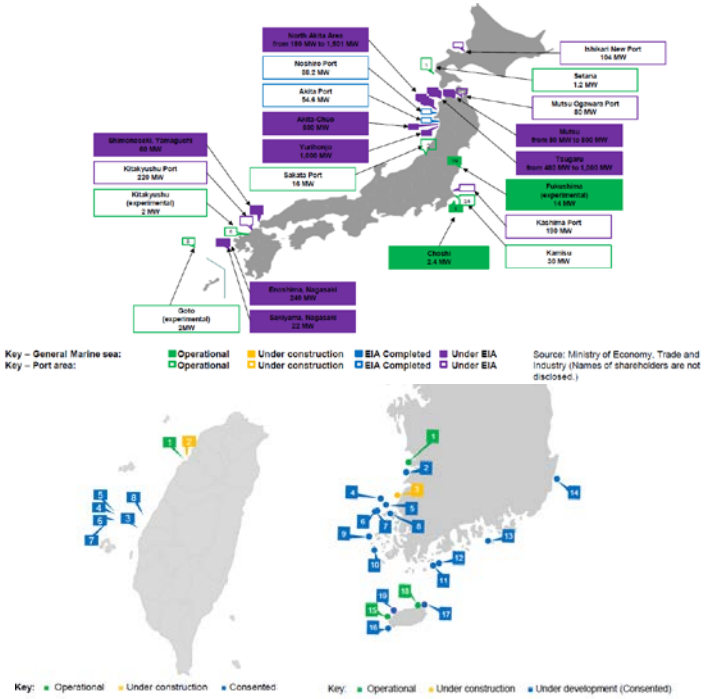
Offshore market developments in North America



The race to catch up is determined by…

- Production and Investment Tax Credits
- The Jones Act making installations more costly
- Several Permitting Challenges
- West Coast Projects predominantly require floating installations
- Canada lagging the required permitting (and remuneration) policies

And last but not least Asia – with Japan, Korea and Taiwan (clockwise)



A fast track process and many to follow

- Taiwan and Korea playing a leading role with rapid developments
- Japan with many opportunities as well
- Grid connections in many places key
- Development of a strong continous pipeline important, to enable local content

Which points to watch

The good, the challenges and the bright future

Offshore wind key investment points

- Europe has more than 20 years of offshore wind experience
- Offshore wind has become a lot less expensive as a result of large scale deployment and a great political push for renewables
- Growing fleets and proper logistics provide further cost saving potentials
- Appealing project sizes and a more stable energy production
- Limited but quickly growing competition – but as a result of size and complexity equity investment remains attractive with good returns

Offshore wind key investment points

- Risks are shifting from tariffs to PPAs and merchant
- Lifetime assumptions increase
- The importance of grid and power to X will increase
- Extrapolating the learning curve from Europe to Asia and the US might come at a risk as conditions are not equal
- Local content requirements only make limited sense for OEMs

Lessons Learned

- Access to the right (development) know-how is key, particularly for new markets, technology changes, logistic concepts
- A detailed analysis of wake (and blockage) is key
- Processes driven by consultants run the risk of being less focussed – specific guidance advisable
- Transaction complexity calls for a high amount of transaction security – these processes are costly for both sides
- The choice of consortium partners is key
- Foreign investor review board approvals increasingly important