Clarksons Platou Renewables

Market Fundamentals: Outlook for Global Offshore Wind Projects

Energy & Transport Summit IV digital - panel 5

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Global powerhouse focusing on capital intensive industries

Significant focus towards renewable energy

Clarkson PLC

Clarksons Platou Securities

Equity/Credit Research	Investment Banking	Capital Markets / Sales
• Highly reputable research team world-wide • Covering 100+ companies, with increasing focus on renewable names	• Leading corporate finance advisory team within maritime & energy sectors • 20x professionals providing a wide range of financial services	• Highly experienced sales force • Raised >USD 40 bn in debt and equity capital since 2010

80x professionals | **$40 bn.** Equity & Debt | **$20 bn.** Advisory trans. | **~38 avg** Transactions p.a.

Recent and ongoing project exposure within renewables:

Offshore Wind	Wind Vessels	Solar	Carbon Capture	Hydropower
EUR [25-35]m Capital Raising	Several recent and ongoing initiatives	Development platform and operating platform	2x carbon capture equity transactions	USD 50m private placement
Joint Lead Manager	Joint Lead Manager	Sole Arranger	Sole Arranger	Joint Arranger

Clarksons Platou Offshore

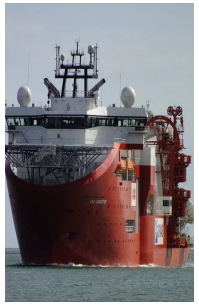
Newbuilding	Sale&Purchase	Conversions	Chartering	Valuations

- *Over 150 years heritage as a provider of insight and execution in the maritime industry*
- *A focal part of offshore wind since its early days*
- *Constant dialogue with developers and supply chain players*
- *Dedicated research professionals with databases and in-depth analysis on offshore wind*
- *Unparallel intel throughout the OW value chain*

25k Asset valuations | **15** Years of offshore wind | **~100** Asset transactions p.a. | **1,500** Charter fixtures p.a.

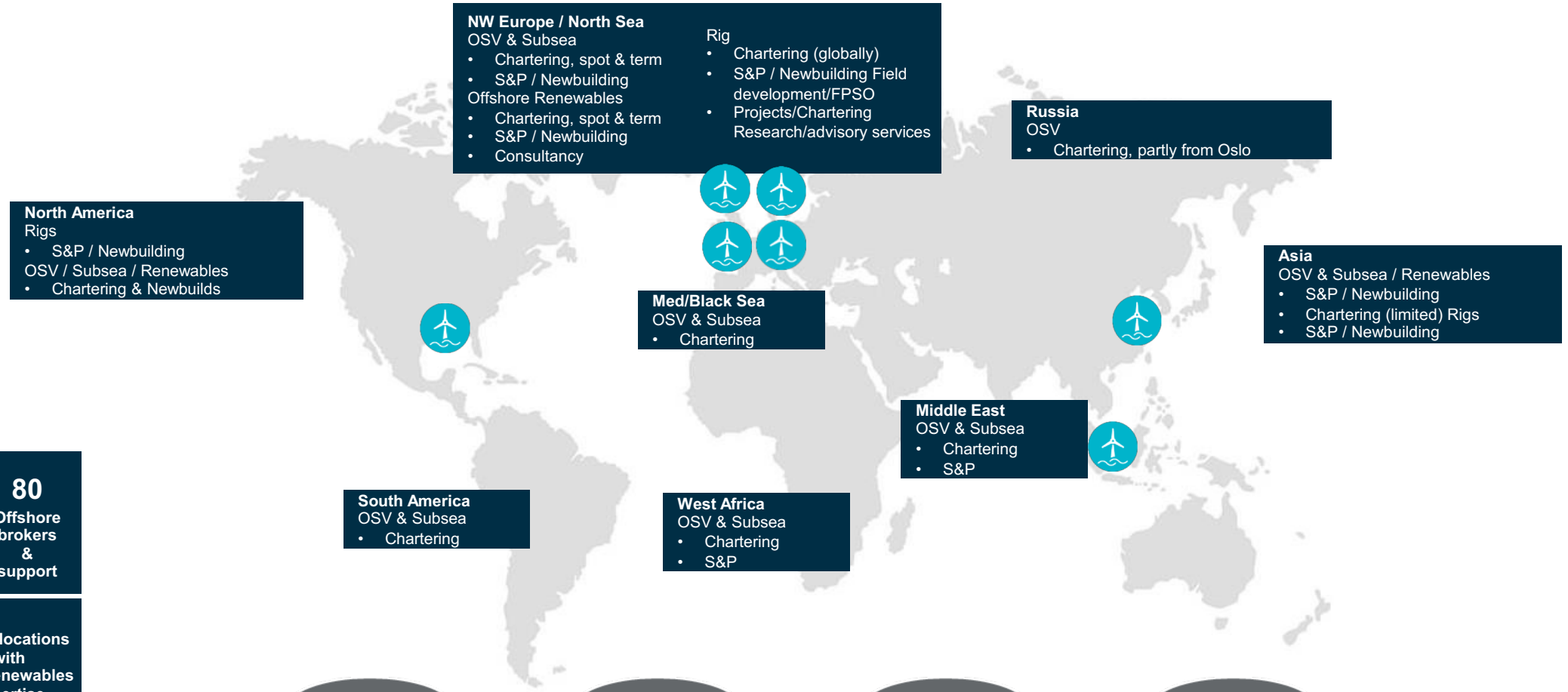
Example Segment coverage:




The Offshore Brokerage Division of Clarksons Platou

Geographic coverage – The world's leading integrated offshore services group



11 Offshore offices

80 Offshore brokers & support

Office locations with wind/renewables expertise

168	~1,700	23	~ 50
years	employees	countries	offices

Clarksons Platou Renewables team, what do we do?

40 years in O&G – 10 years in offshore wind | Some reference projects

- Newbuilds
- Sale & Purchase
- Chartering
- Project and Concept dev.
- Financial solutions w/CPS



Accommodation vessel to Centrica at Lynn and Inner Dowsing Array wind farm



Accommodation vessel to Vattenfall / VBMS for Sandbank OWF



Normand Jarl (23m) + Normand Jarstein (7m) to Ørsted



Multiple support vessels at Wikinger OWF



Boa Sub C / GT1 / Adwen



Viking Neptune at Wikinger OWF



CTV fleet to Greater Gabbard OWF



Charter of Seajacks Leviathan and Kraken for Greater Gabbard



Field support vessel for Forewind at Doggerbank



Barge, tow out vessels and CTV for Hywind OWF



First support vessel charters for OWF Taiwan



East Anglia 1 – full logistics support



Hywind CTV contracts

2003 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019



2 x WTIV Newbuilds at DSME for account RWE



Sale of Windcat Workboats to Seacor (advisor Seacor)



Sale of vessel to C-Bed for conversion into SOV



2 x Newbuilding SX195 design comissioning vessel for Acta Marine at Ulstein



Further growth in Hamburg



Export cable vessel newbuilding for Nexans



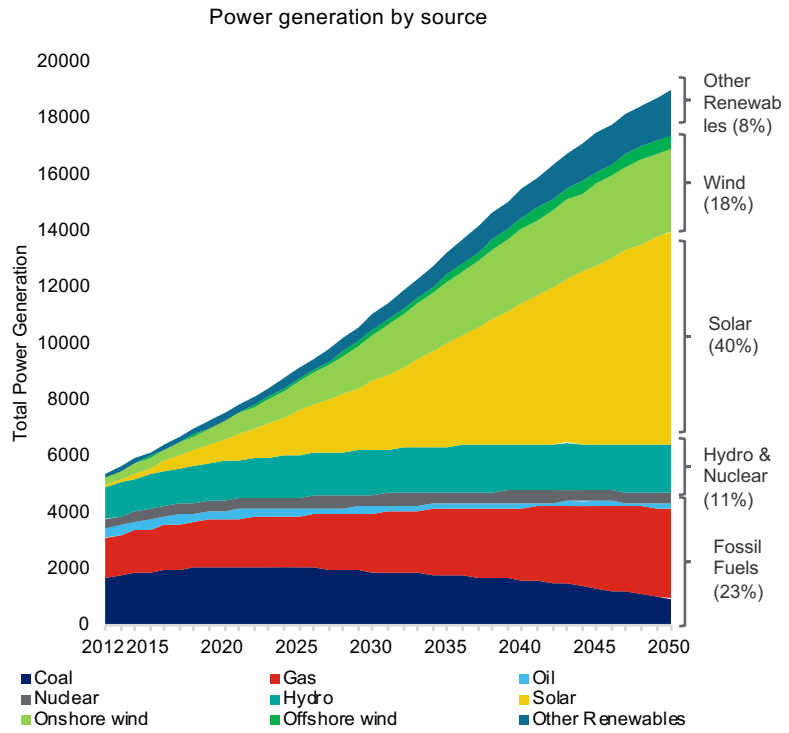
Sale of 51% of Seafox 5 to Fred Olsen Windcarrier

In 2020,2 x WTIV N/B, sale of 2 x WTIV and 3 x SOV newbuildings with long term charters, in addition to various W2W and CTV charters.

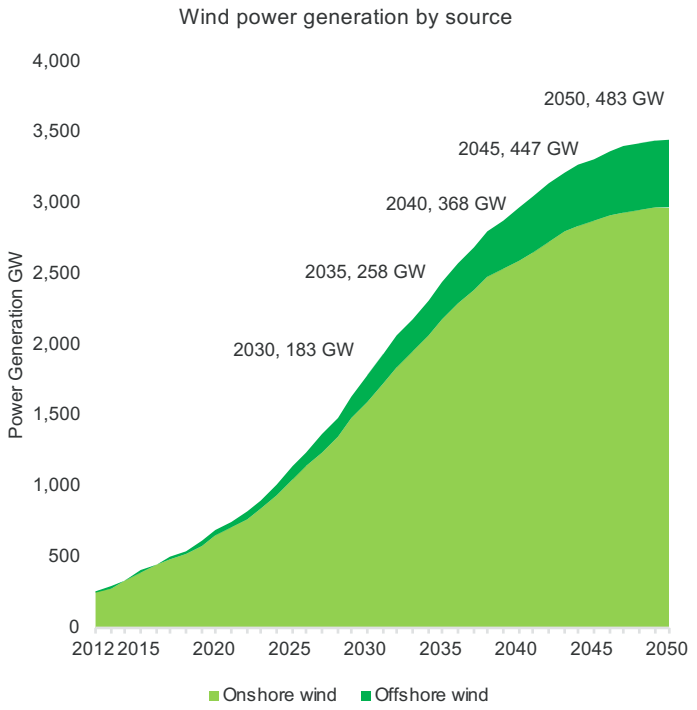
Renewables growing sharply towards 2050

Onshore and offshore wind to produce 15.6% and 2.54% of power generation respectively in 2050

Power generation outlook



Increasing wind power generation



Comments

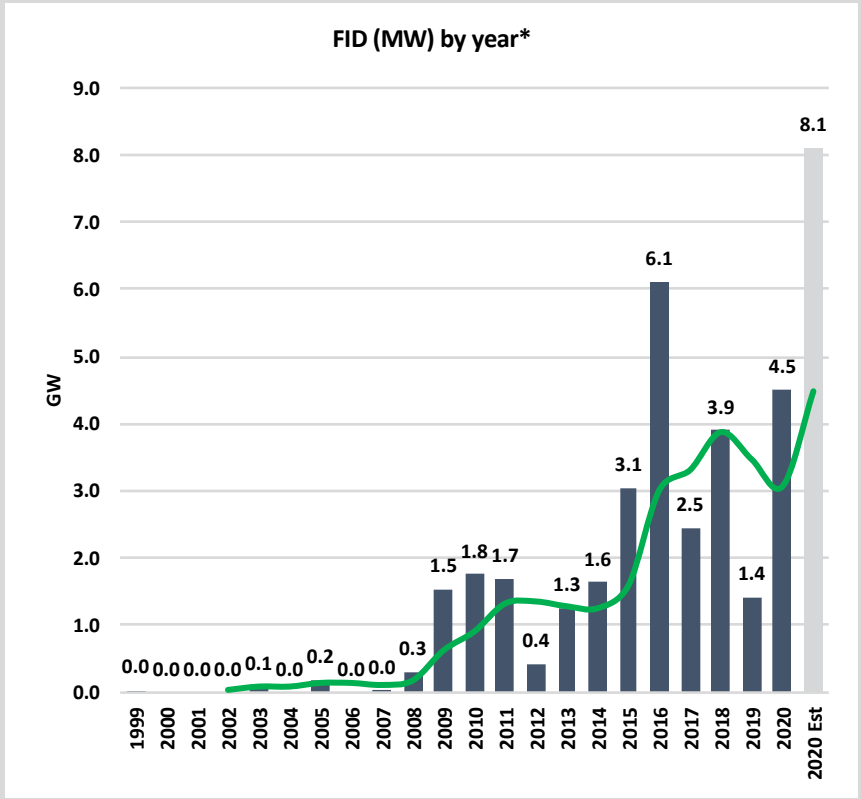
- Solar and wind growing rapidly, combined accounting for 58% of total power generation in 2050
- Meanwhile, coal is expected to decline from 30% today to just 5% in 2050
- Natural gas to contribute 17% in 2050
- Solar to constitute 40% in 2050
- Wind (onshore and offshore) 18% by 2050
  - Wind total of 3,500 GW
  - Offshore wind 483 GW
    - 2.54% of total power mix
    - 14% of wind mix
- Offshore wind likely underestimated, due to rapid cost decrease and onshore protests (NIMBY)

Other includes biomass, Geothermal, battery technology etc.
Source: BNEF; Clarksons Platou

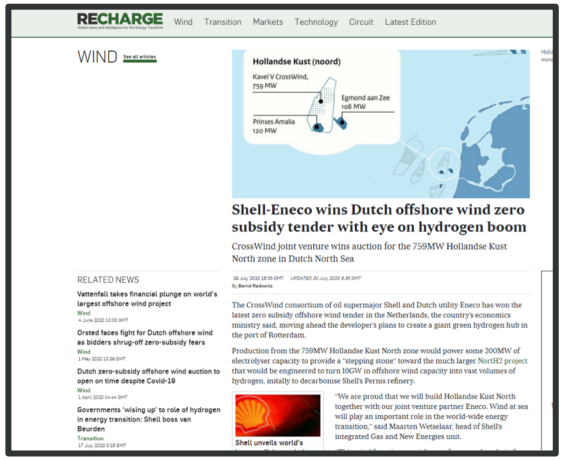
Offshore wind interest at new high this last quarter

Oil majors and conventional shipping players upping their interest

Covid-19/Pandemic resilient



Offshore wind FIDs at record levels


RECHARGE

WIND

Hollandse Kust (noord)

Kavel V CrossWind, 759 MW

Egmond aan Zee 108 MW

Prinses Amalia 120 MW

Shell-Eneco wins Dutch offshore wind zero subsidy tender with eye on hydrogen boom

CrossWind joint venture wins auction for the 759MW Hollandse Kust North zone in Dutch North Sea

RELATED NEWS

Vattenfall takes financial plunge on world's largest offshore wind project

Orsted faces fight for Dutch offshore wind as bidders shrug-off zero-subsidy fears

Dutch zero-subsidy offshore wind auction to open on time despite Covid-19

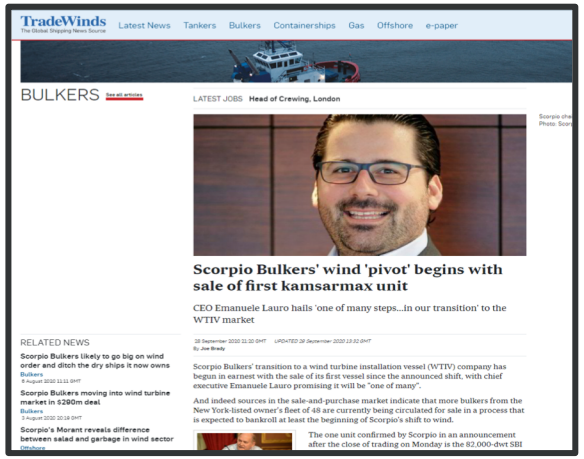
Governments 'wising up' to role of hydrogen in energy transition: Shell boss van Beurden

The CrossWind consortium of oil supermajor Shell and Dutch utility Eneco has won the latest zero subsidy offshore wind tender in the Netherlands, the country's economics ministry said, moving ahead the developer's plans to create a giant green hydrogen hub in the port of Rotterdam.

Production from the 759MW Hollandse Kust North zone would power some 200MW of electrolyser capacity to provide a "stepping stone" toward the much larger NortH2 project that would be engineered to turn 10GW in offshore wind capacity into vast volumes of hydrogen, initally to decarbonise Shell's Pernis refinery.

"We are proud that we will build Hollandse Kust North together with our joint venture partner Eneco. Wind at sea will play an important role in the world-wide energy transition," said Maarten Wetselaar, head of Shell's integrated Gas and New Energies unit.

Shell unveils world's


TradeWinds

BULKERS

LATEST JOBS Head of Crewing, London

Scorpio Bulkers' wind 'pivot' begins with sale of first kamsarmax unit

CEO Emanuele Lauro hails 'one of many steps...in our transition' to the WTIV market

RELATED NEWS

Scorpio Bulkers likely to go big on wind order and ditch the dry ships it now owns

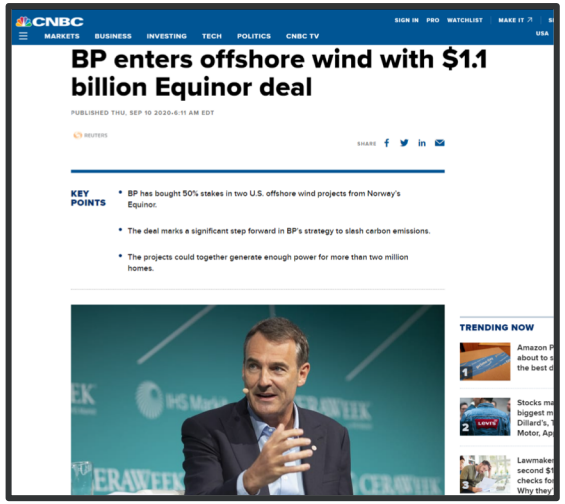
Scorpio Bulkers moving into wind turbine market in $290m deal

Scorpio's Morant reveals difference between salad and garbage in wind sector

Scorpio Bulkers' transition to a wind turbine installation vessel (WTIV) company has begun in earnest with the sale of its first vessel since the announced shift, with chief executive Emanuele Lauro promising it will be "one of many".

And indeed sources in the sale-and-purchase market indicate that more bulkers from the New York-listed owner's fleet of 48 are currently being circulated for sale in a process that is expected to bankroll at least the beginning of Scorpio's shift to wind.

The one unit confirmed by Scorpio in an announcement after the close of trading on Monday is the 82,000-dwt SBI


CNBC

MARKETS BUSINESS INVESTING TECH POLITICS CNBC TV

BP enters offshore wind with $1.1 billion Equinor deal

PUBLISHED THU, SEP 10 2020-6:11 AM EDT

KEY POINTS

- BP has bought 50% stakes in two U.S. offshore wind projects from Norway's Equinor.
- The deal marks a significant step forward in BP's strategy to slash carbon emissions.
- The projects could together generate enough power for more than two million homes.

TRENDING NOW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OHT admitted to trading

28/09/2020

Oslo, 28 September 2020 – The specialized heavy transport and installation contractor OHT has today been admitted to trading on Merkur Market (ticker code: OHT-ME).

OHT focuses on offshore wind installation, and recently raised NOK 542 million through a private placement to finance new custom-built semi-submersible offshore wind foundation installation vessels. The placement attracted strong interest.

About OHT

OHT is a Norwegian based supplier of special heavy transportation services to the ship transportation/cargo industry, the oil service industry and the offshore wind industry, such as drilling rigs, offshore modules and offshore windfarm foundations. Through its wholly-owned subsidiaries, the group owns five HTVs and will take delivery of a custom-built semi-submersible offshore wind foundation installation vessel at the end of 2021. www.oht.no

OSLO BØRS

OHT

MERKUR MA

Clarksons Platou
Renewables

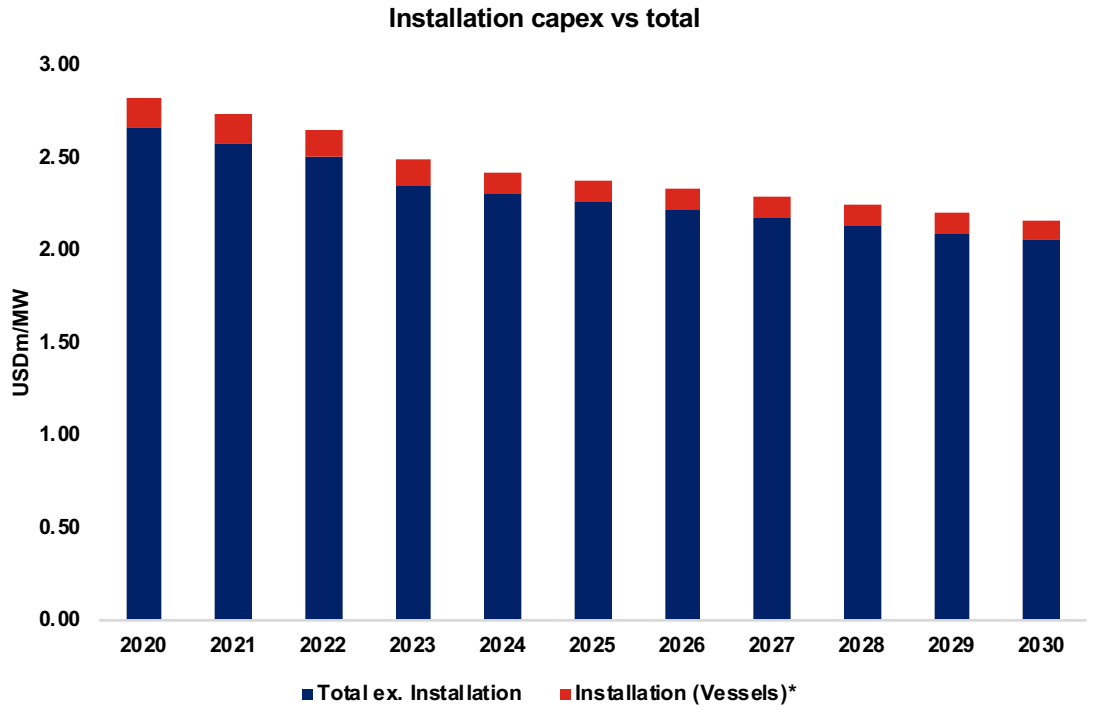
Ships, ships and more ships – what is needed when and what is the Capex requirements



Installation limited part of capex

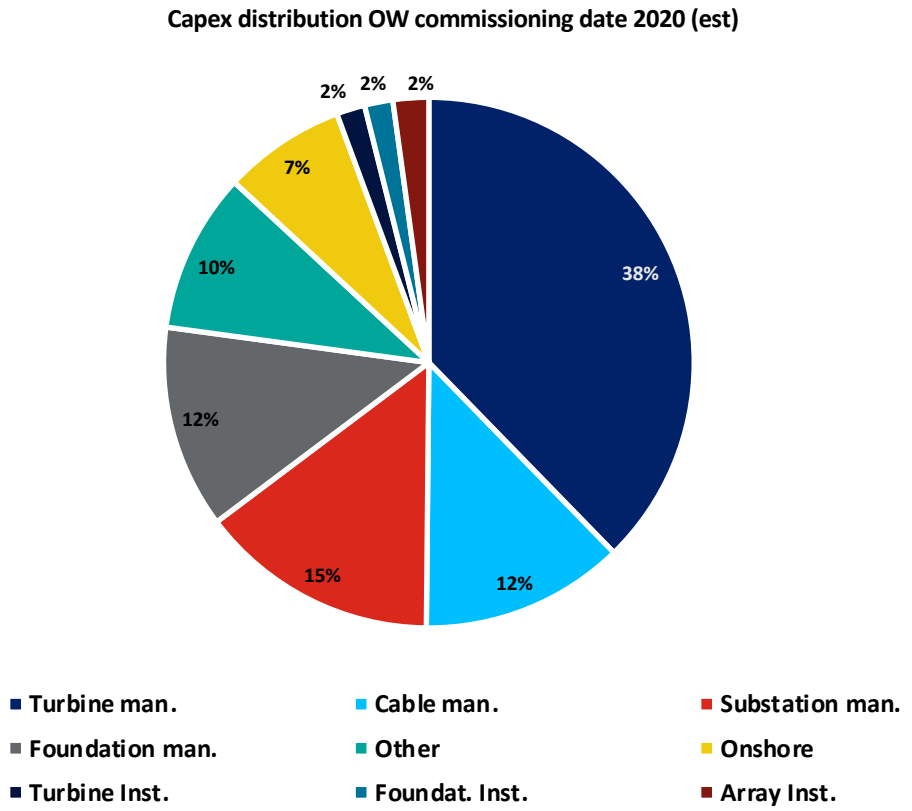
Increasing vessel capex not a killer for projects, as proven willingness to pay for higher efficiency

Installation capex vs total per MW



The industry set to spend USDbn 400 over the next 10 years in capex alone

What is the capex spent on



*Turbine, foundation and cable installation
Source: BNEF

Introduction to key vessels in offshore wind (I)

Different vessels used depending on scope of work and distance from shore

Survey Vessel

Fleet: 30-40

Orderbook: 0

Orderbook %: 0%

Newbuild cost: €30-70m

Dayrates: 25-50

Opex: 10-15

Contracts: Turnkey contracts

Key players: MMT, Reach, Fugro, Horizon, Guardline, Geoquip, Bibby



HLV – Heavy Lift Vessel

Fleet: 149

Orderbook: 10

Orderbook %: 7%

Newbuild cost: €30-220m

Dayrates: ~€20-45k/day

Opex: €8-15k/day

Contracts: Voyage contracts months

Key players: Boskalis, OHT, SAL, Jumbo, COSCO



FIV – Foundations Installation Vessel

Fleet: 18

Orderbook: 6

Orderbook %: 33%

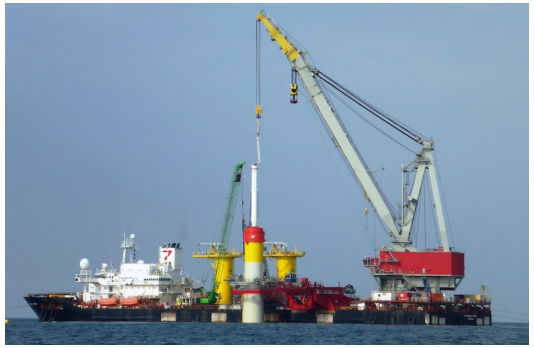
Newbuild cost: €200-320m

Dayrates: ~€100-350k/day

Opex: ~€25-50k/day

Contracts: 3 months-seasons/Turnkey

Key players: DEME, Heerema, Saipem, Boskalis, Jan de Nul, Seaway 7, OHT



Introduction to key vessels in offshore wind (II)

Different vessels used depending on scope of work and distance from shore

CLV – Cable Lay Vessel

Fleet: 20

Orderbook: 3

Orderbook %: 15%

Newbuild cost: €40-110m

Dayrates: €30-70k/day

Opex: €25-50+k/day

Contracts: 3-18 months

Key players: DEME, Boskalis, Jan de Nul, Seaway 7, GMG, Nexans, Prysmian



WTIV – Wind Turbine Installation Vessel

Fleet: 16

Orderbook: 4 (3 x LOIs)

Orderbook %: 25% (44%)

Newbuild cost: €200-320m

Dayrates: €100-200+k/day

Opex: €30k/day

Contracts: 3-15 months/T&I dayrate

Key players: Fred Olsen, Seajacks, Swire Blue Ocean, JDN, Van Oord, Deme, OHT, Scorpio, Ocean Installer



CTV* – Crew Transfer Vessel

Fleet: 350

Orderbook: 38

Orderbook %: 11%

Newbuild cost: €3-5m

Dayrates: €3-5+k/day

Opex: €0.8-1.5 k/day

Contracts: spot to 5 years

Key players: Windcat, NOS, CWind, Njord Offshore, Seacat, WMO



*LOA above 20m

Source: Clarksons Research Services, Clarksons Platou Offshore

CTV, SOV and WTIV market looks undersupplied going forward

Platform for complex marine operations and in high demand going forward

	Crew Transfer Vessel (CTV)	SOV
		
Description	• Service technicians transferred to turbines from shore • Mostly suited for scheduled activity and less suited for unexpected power outage	• Combined on-site location and offshore service support • Have sufficient space to store maintenance spare parts • Technicians transferred to turbines with W2W gangway
Feasibility	• Low capex and opex • Lower risk related to accomodation • Carries significant no. Of technicians • Poor response time on offshore projects far from shore • Limited accessability in rough sea	• Response time not affected by distance from shore • Better accessibility in rough sea • Gangway require dynamic vessel position – time consuming with high fuel consumption • Higher opex vs CTV / platform • Resistance to on-site location
Distance from shore and no. of turbines	Close — Distance from shore — Far Few — No. of turbines — Many	Close — Distance from shore — Far Close — No. of turbines — Many

W2W / CSOV



x30 DEMAND USD1,3Bn.

- Gangways
- Cranes operating with 3D motion compensation
- Complex DP operation
- Advanced operational modes to achieve short cycle times (Turbine to turbine)
- Helicopter operations
- Interaction with Crew Transfer Vessels and Daughter Crafts
- Client management with operating a large hotel service onboard
- Cruise standard

CTV, SOV and WTIV market looks undersupplied going forward

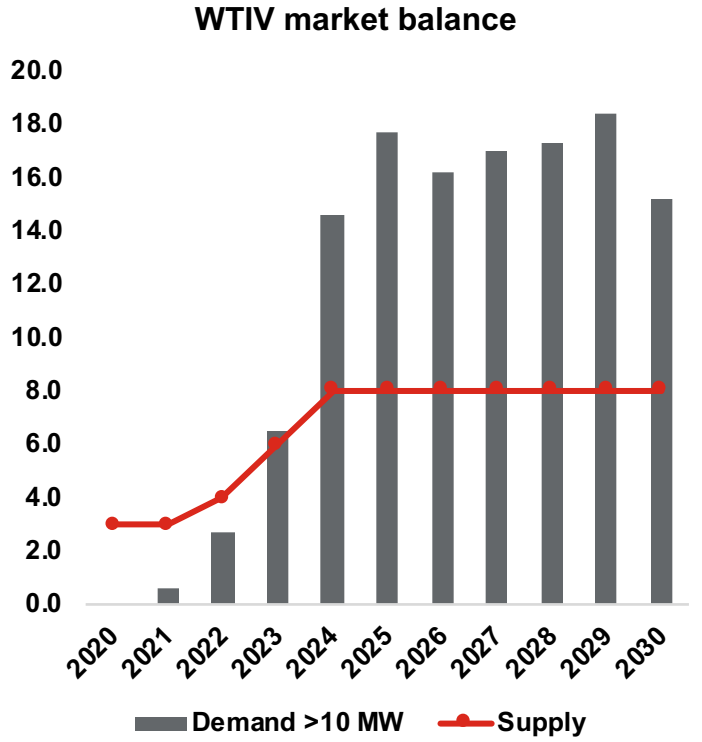
Platform for complex marine operations and in high demand going forward

WIND TURBINE INSTALLATION VESSEL (WTIV)



1. Lifting legs that provide a stable base for heavy lifts
2. Large crane to lift turbine masts, blades and nacelles
3. Large deck areas for transporting turbine components

WTIV demand is expected to outpace fleet growth by a wide margin



DEME Dredging, Environmental & Marine Engineering
Van Oord
Jan De Nul Group
Fred. Olsen Windcarrier
CADELER
seajacks
OHT Offshore Heavy Transport
Scorpio Bulkers Inc.
NOIL Ocean Installer Est/ Oil
OIM Wind Ltd.
?
Dominion Energy
Shimizu Corporation SHMZ
五洋建設 Fintaocean Construction

Opportunities in offshore wind

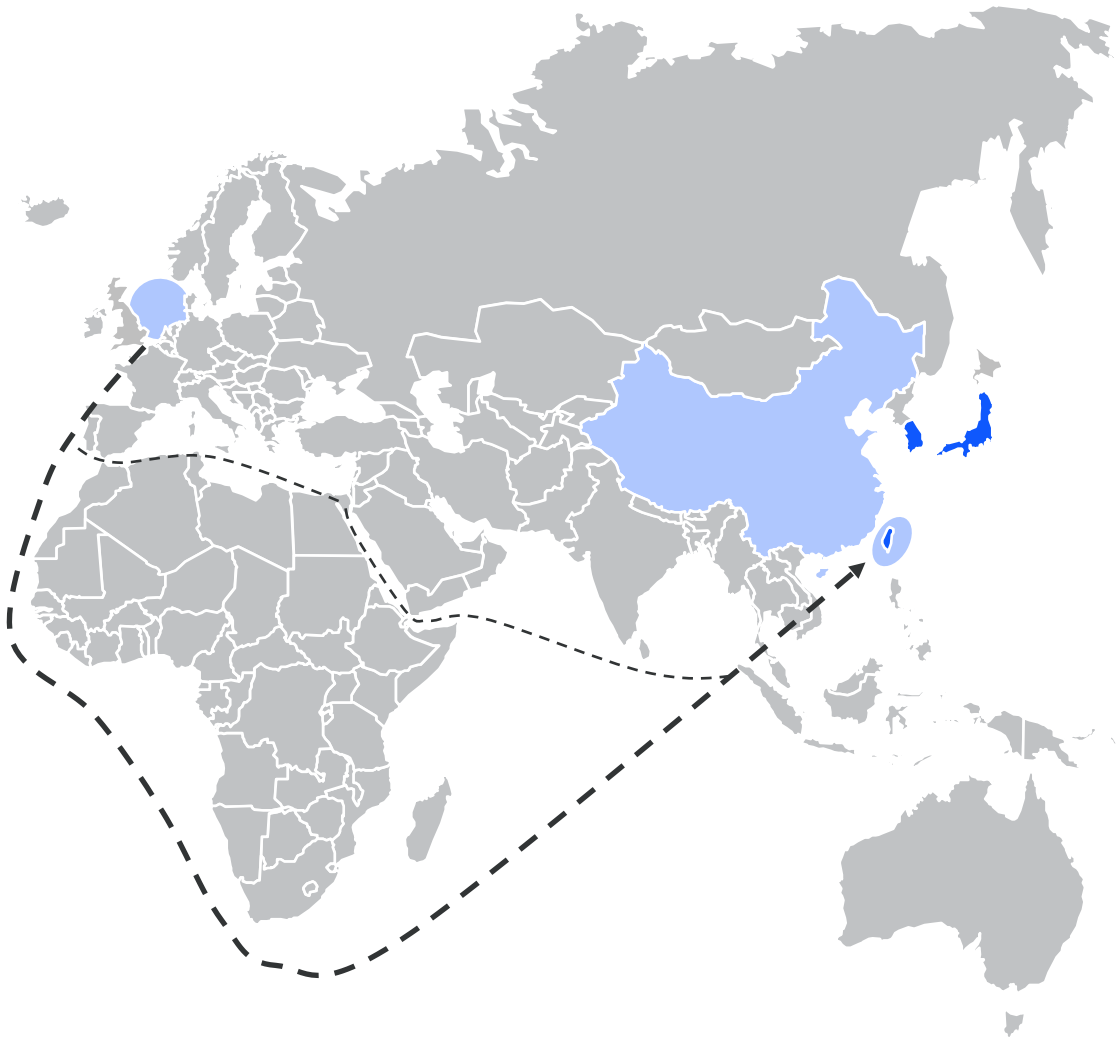
Substantial fleet renewal/replacement program needed



What happens when frontier markets matures?

International supply chain first in line for the work for Taiwan

Taiwan
~1,5GW



Cable Lay


Living Stone


Nexus


Willem de Vlamingh


Seaway Aimery


Cable Retriever


Topaz Installer

Foundations installation/HLV


Aegir


Seaway Yudin


Saipem 3000


Bokalift 2

W2W/SOV


Seaway Moxie


Grand Canyon II


Normand Jarl/Baltic


MOL SOV

WTIV


Seajacks Zaratan


Seajacks Scylla


Taillevent


Brave Tern

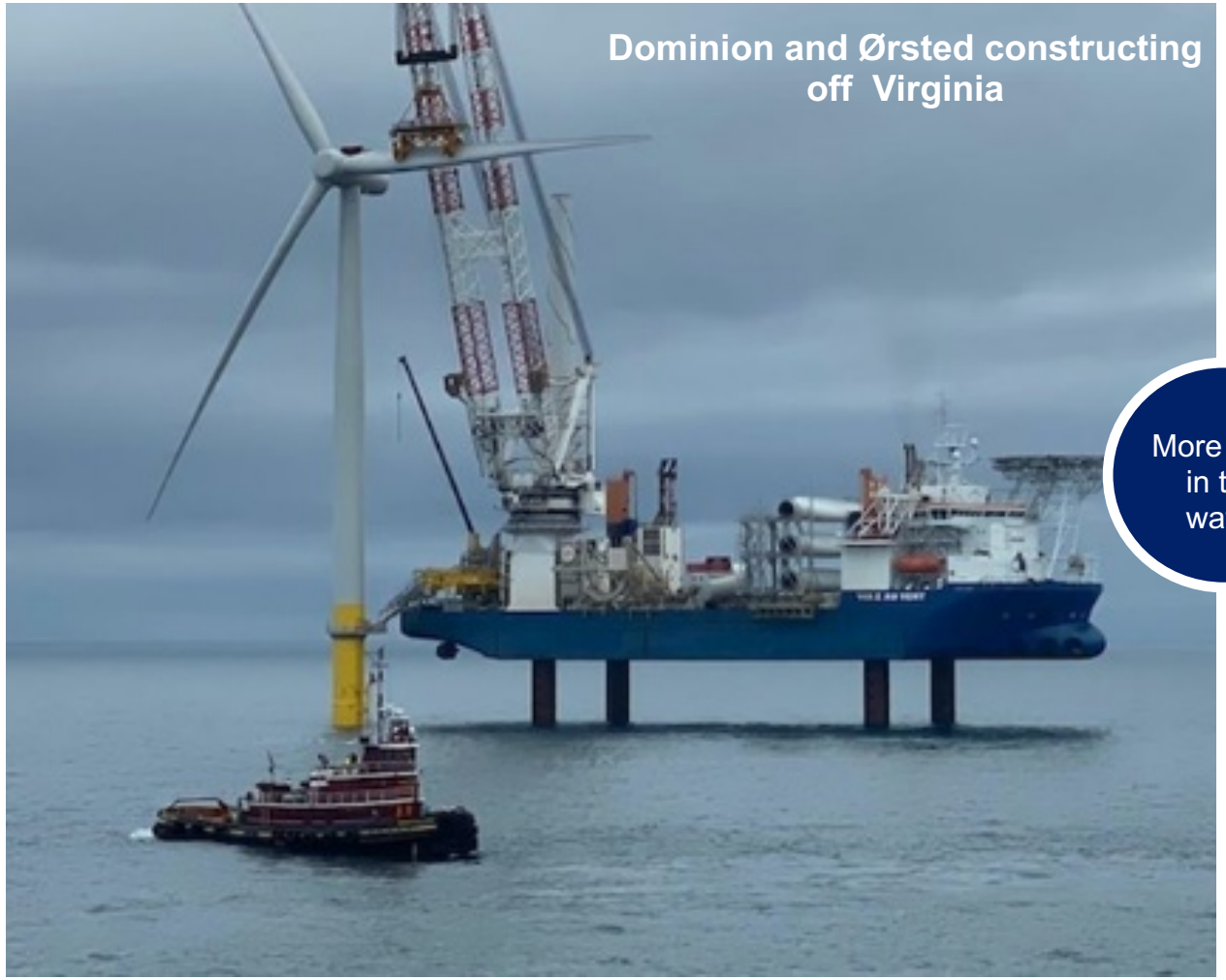
In addition:
15+ CTVs already in place
26 AHTS / AHT
18 PSVs/other OSVs

Only public contracts with defined vessels mentioned are shown on the map.

Vessel already in/enroute to new market
Vessel contract announced in new market

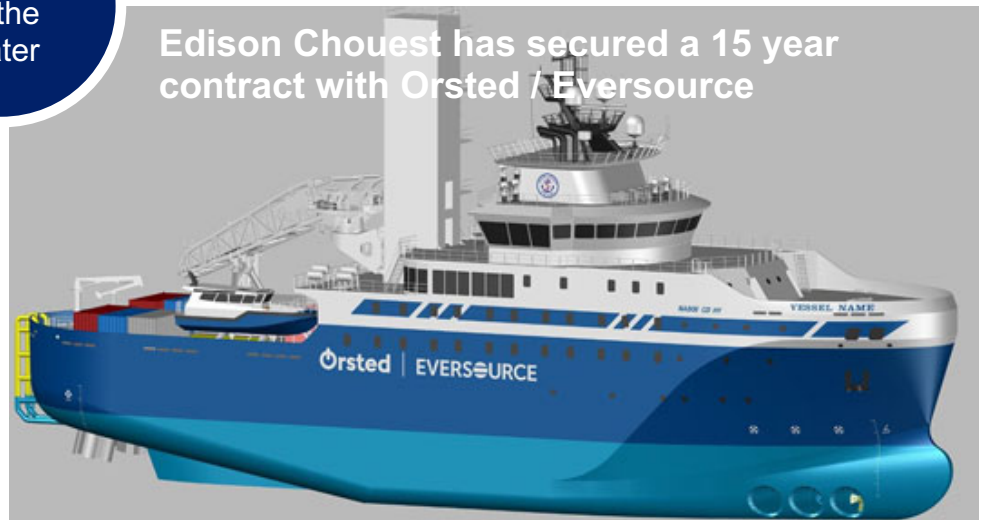
So what about USA? It has been a busy year

Although occasional headwinds the industry perseveres



More steel in the water





Pictures from company web pages

New frontiers, new solutions?

The Feeder concept as a consequence of Jones Act



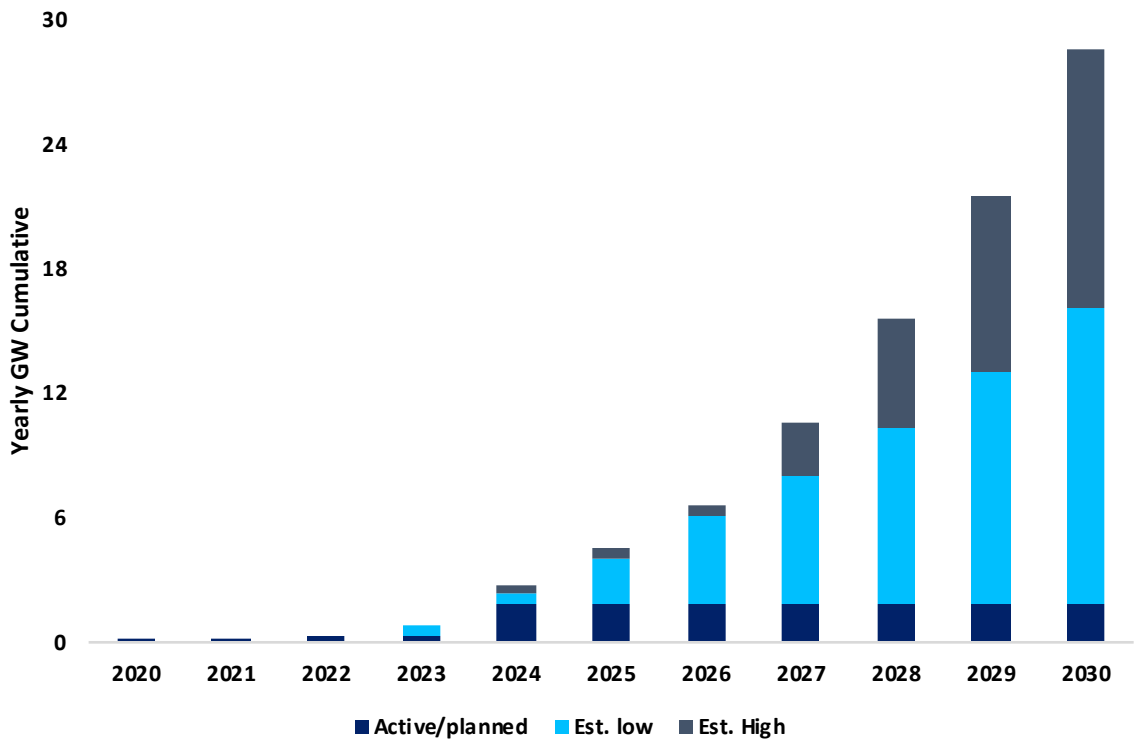




Sharp growth in GW additions for floating expected post 2025

Offshore wind has surprised lately…when it moves, it moves

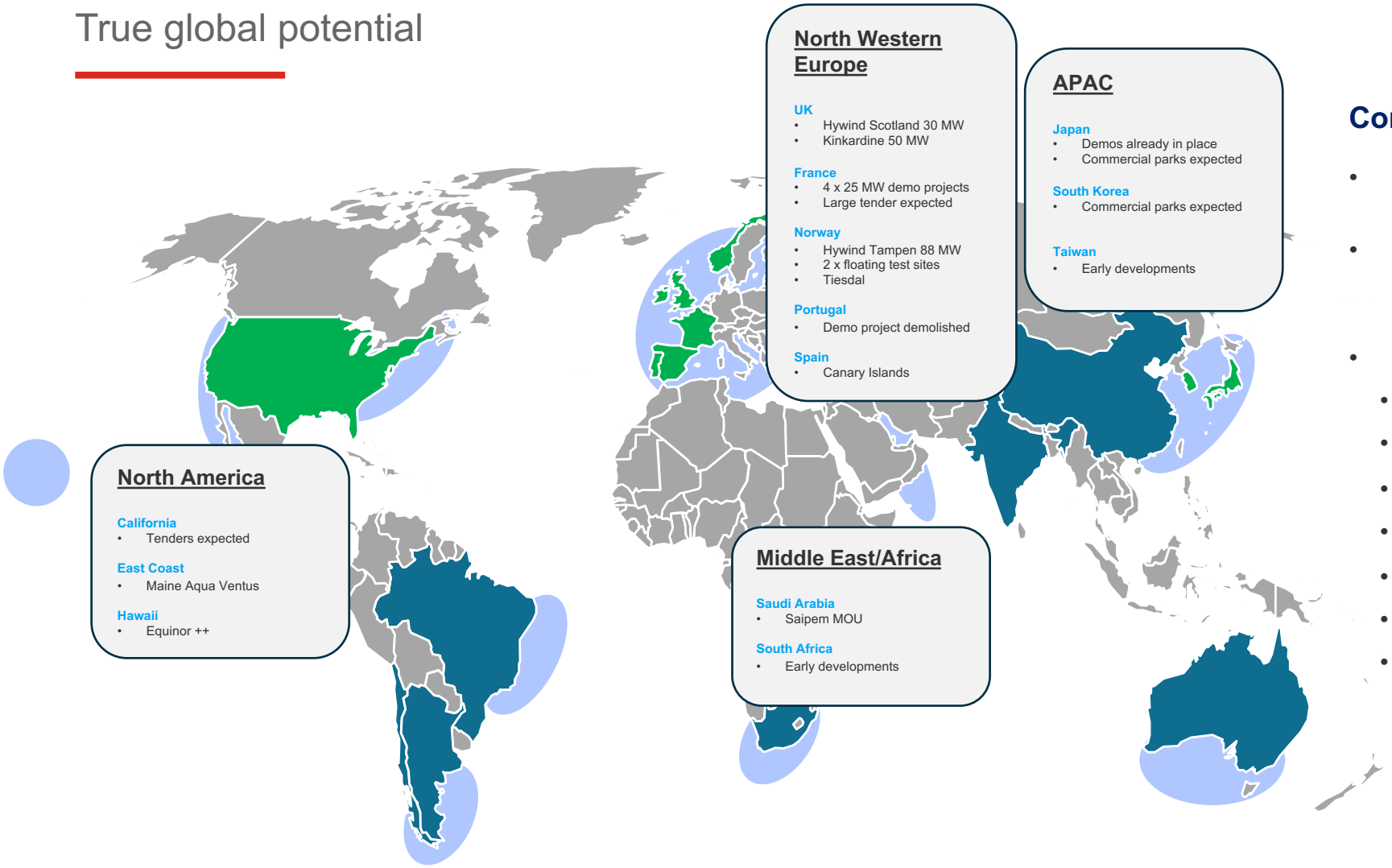
Estimated Floating GW





Global floating offshore wind opportunities

True global potential



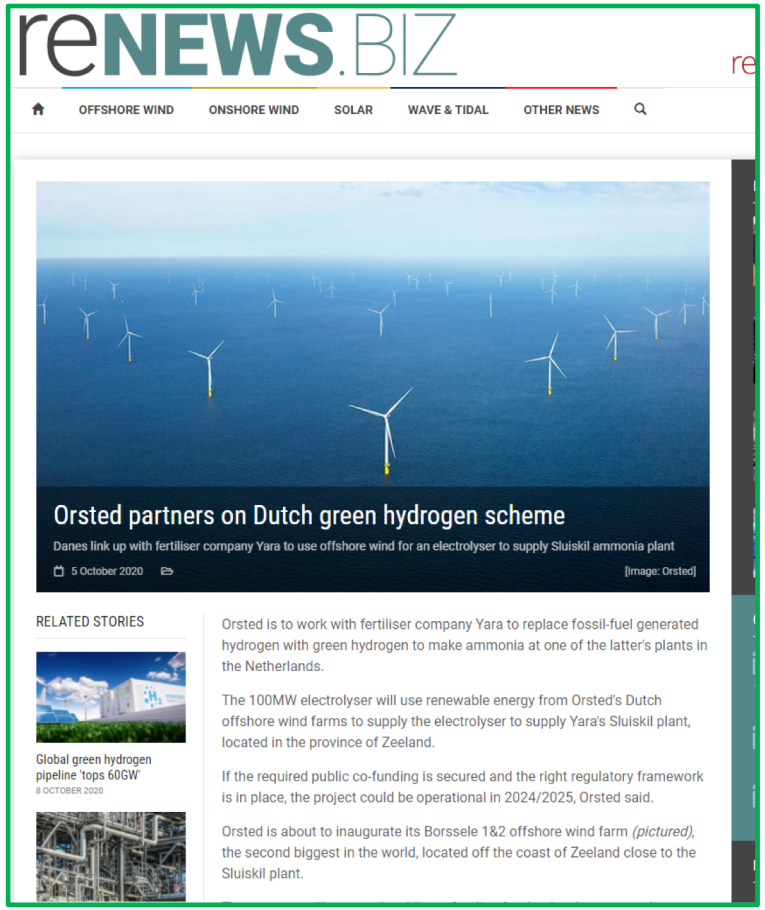
Comment

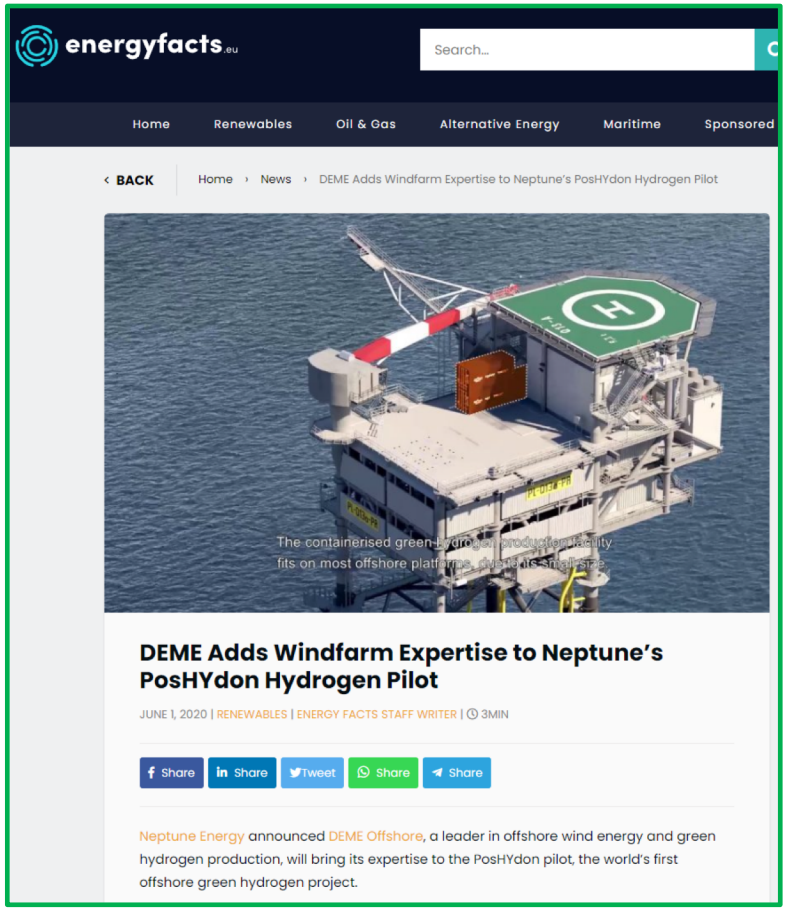
- Floating wind have up to date mainly been demo projects in Europe and Japan
- Hywind Scotland (30 MW) commissioned in 2017, marking the first semi-commercial floating offshore wind park
- Countries to watch out for going forward:
  - Japan
  - South Korea
  - Norway
  - France
  - US, California/Hawaii
  - UK
  - Greece

The next chapter for offshore wind

Green hydrogen and ammonia to become the ultimate enabler, creating a commodity







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