

Quest Sees a Thriving Offshore Wind Market with Europe and Asia Notable Bright Spots

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Quest Floating Wind Energy
a Quest Offshore Resources company

Who We Are

About Us

Expert knowledge of the entire Energy Value Chain. Quest has decades of experience empowering our clients with Clarity, Insight and Vision.

Mission

We actively develop strategic relationships with management teams of prospective clients initiating with major power developers and leading designers to tier-one and tier-two global supply chain companies and across the financial sector.

Market Focus

Quest serves the entire global supply chain for offshore wind and possesses expert knowledge across multiple focused technical areas.

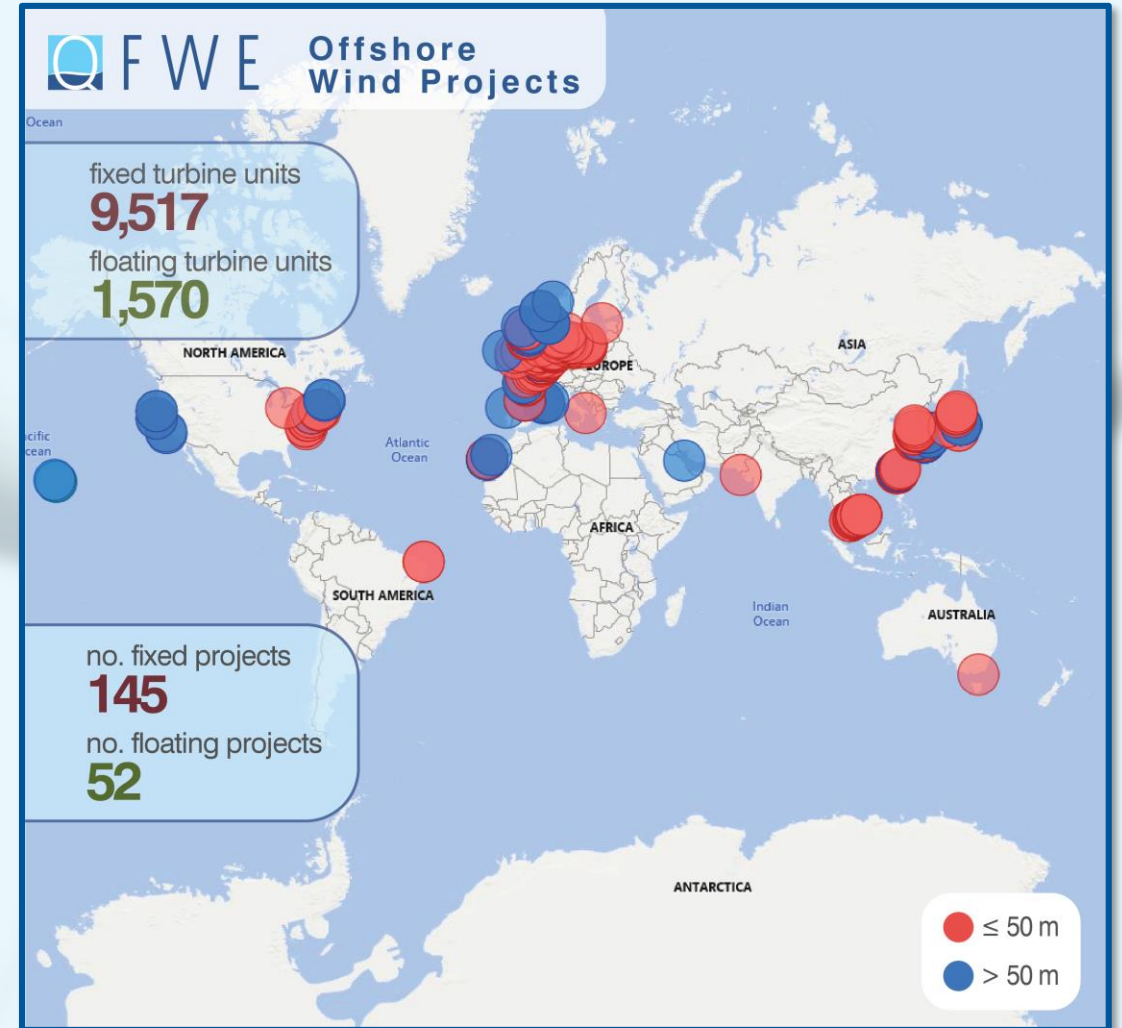
Products and Subscription Services

Quest Offshore Wind Turbine Index - QOWTI analyzes key economics indicators and provides an overview of supply chain opportunities by segment plus benchmarking of key metrics and CapEx trends

Q Vision - Robust Suite of Data Analytics and Market Analysis

Project Data - Details sales opportunities, timelines and key project specifics in Excel

Consulting - Supporting clients with strategic data-driven decisions. Primary research, project benchmarking, CapEx & LCoE modeling and supply chain analysis

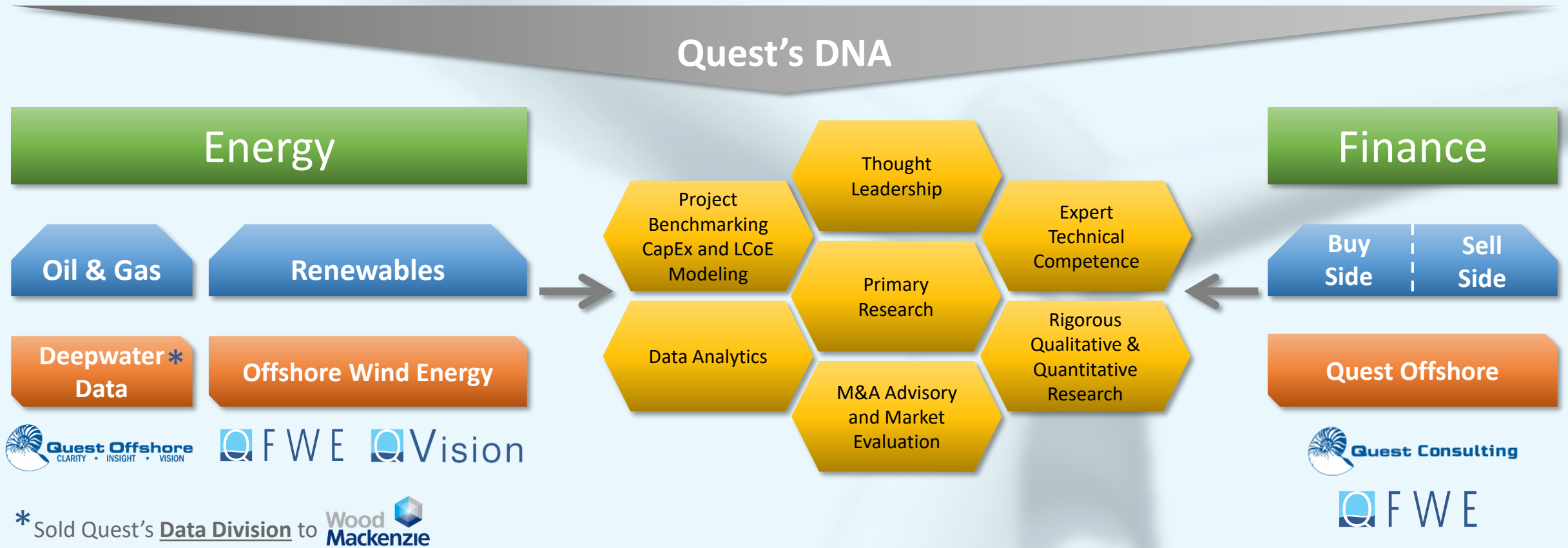


Source: QOWTI

Our Industry Is Evolving to Encompass Sustainable Energy

Quest Offshore's Evolution – Decades of Empowering Our Clients with Clarity, Insight and Vision.

Twenty-years of expertise in predictive analytics, technical market analysis and the development of offshore floating projects provides us with the means and the network to offer critical insight on the Offshore Wind industry going forward.



* Sold Quest's **Data Division** to **Wood Mackenzie**

Table of Contents



Macro Overview

- Growth in Offshore Wind is projected to outpace Onshore by a factor of 2x
- Costs for Offshore Wind have plummeted more than 50% since 2012



A Burgeoning Offshore Wind Market

- Economic and Leading Indicators
- Europe reigns as top market
- Fixed and Floating comparison
- Major Projects by Region in CapEx
- Accelerated entrance of Major oil & gas players



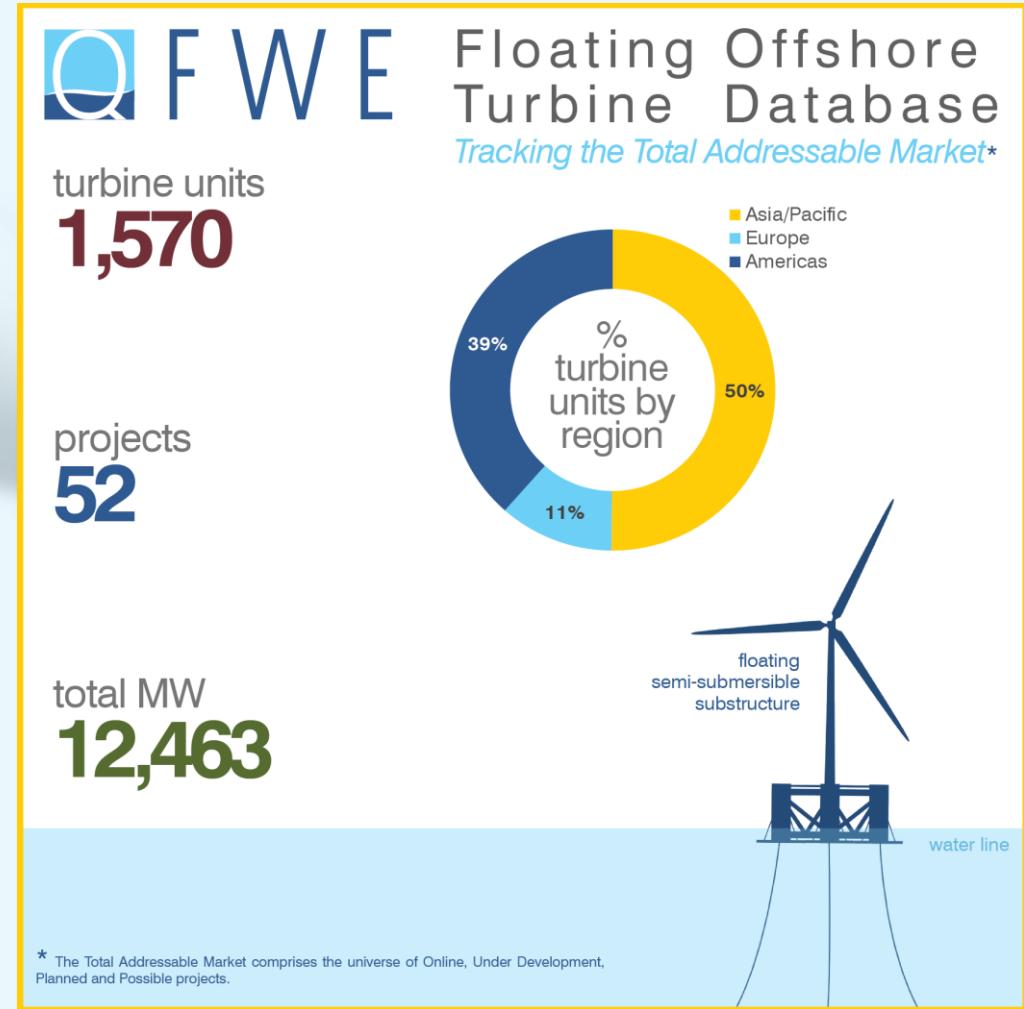
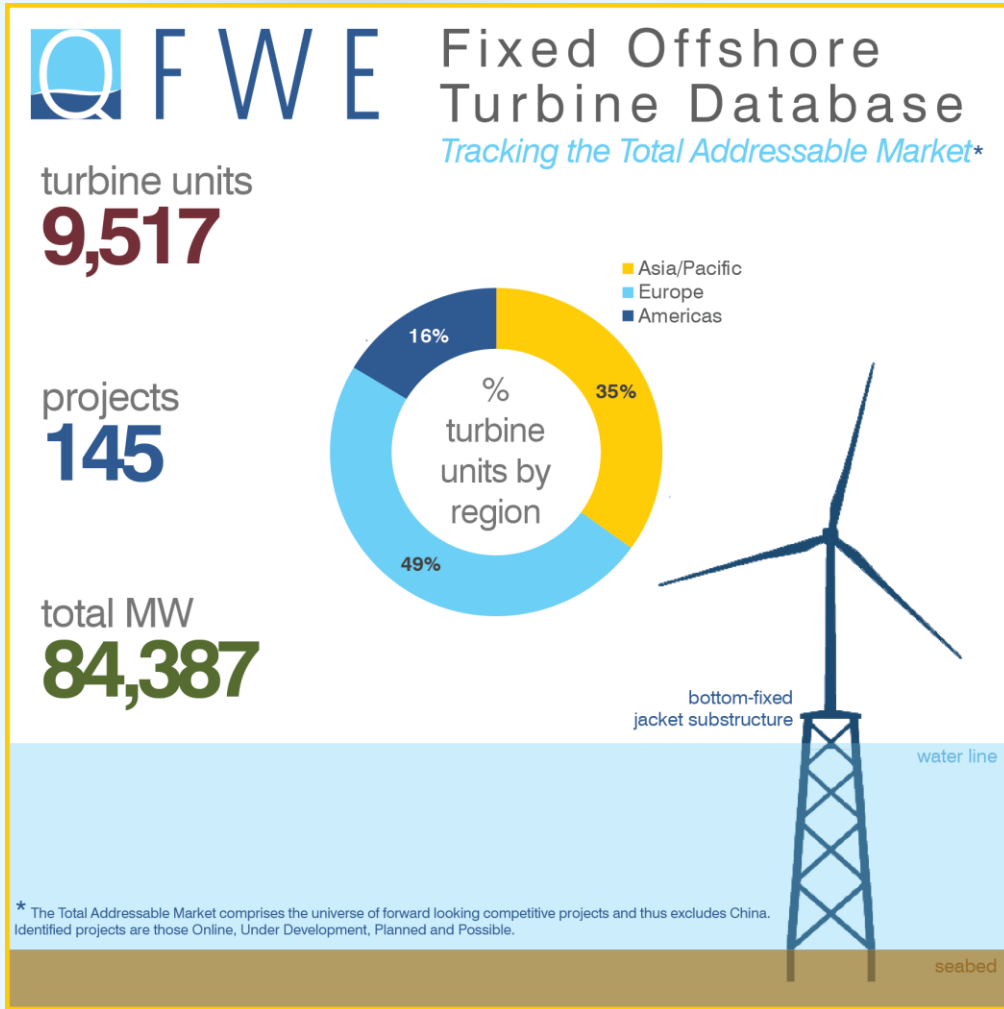
A Deep Dive into Floating Wind

- Most active Floating designers
- Asia Pacific's near dominance
- Another Giant Leap
- CapEx / LCoE Modeling



A Burgeoning Offshore Wind Market

Projects Under Development, Planned and Possible



Source: Q FWE

Quest Offshore Wind Turbine Index - September 2019

GLOBAL	Total No. Turbines			Total MW			Economic Indicators						
	total	total	change	total MW	total MW	total MW	CapEx	CapEx/unit	CapEx/unit	change	CapEx/MW	CapEx/MW	change
	total	total	total	total MW	total MW	total MW	total \$mil	avg \$mil	avg \$mil	%	avg \$mil	avg \$mil	%
Global Total	11,087	11,156	-69	96,849	97,856	-1,007	\$296,099	\$26.7	\$26.7	-0.02%	\$3.3	\$3.3	0.36%
Global Fixed	9,517	9,615	-98	84,387	85,689	-1,302	\$248,458	\$26.1	\$26.2	-0.29%	\$3.2	\$3.2	0.25%
Global Floating	1,570	1,541	29	12,463	12,167	295	\$47,641	\$30.3	\$30.0	1.11%	\$4.0	\$4.0	0.34%

Quest Offshore Wind Turbine Index (QOWTI) analyzes key Economic Indicators and provides an overview of Supply Chain opportunities by segment.

28

Data Attributes

2,520

Total Values

4

Regions

24

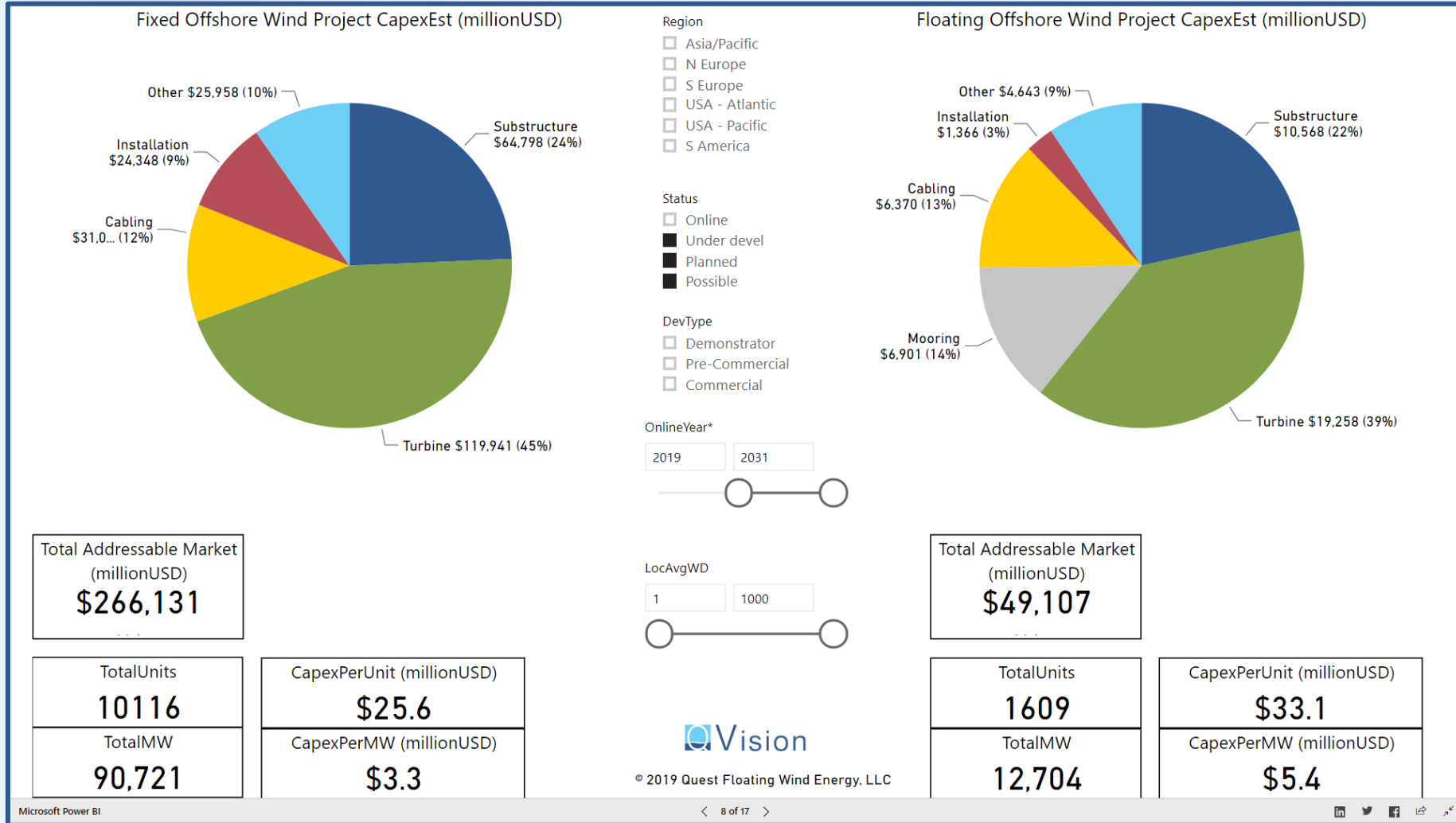
Countries

QOWTI spots important **Leading Indicators** such as average rotor diameter, average distance to shore, average MW per unit, and benchmarking of key metrics.

Economic Indicators						Leading Industry Indicators				Supply Chain Indicators				
substructure CapEx	turbine CapEx	mooring CapEx	installation CapEx	cabling CapEx	other CapEx	rotor diameter	MW/unit	distance to shore	water depth	project size (units)	mooring line length	anchors	array km	export km
total \$mil	total \$mil	total \$mil	total \$mil	total \$mil	total \$mil	avg m	avg	avg km	avg m	avg	total m	total	total km	total km
\$70,549	\$130,017	\$6,713	\$23,950	\$36,105	\$28,765	172.4	8.7	37.7	102.7	57.6	6,620,140	8,081	19,548	6,328
\$60,343	\$111,270	-	\$22,625	\$29,959	\$24,261	176.2	8.9	37.1	30.1	65.7	-	-	15,180	4,832
\$10,207	\$18,747	\$6,713	\$1,325	\$6,146	\$4,503	157.5	8.1	40.4	458.8	35.9	6,620,140	8,081	4,369	1,497

Total Addressable Market in CapEx USD

Fixed and Floating Comparison

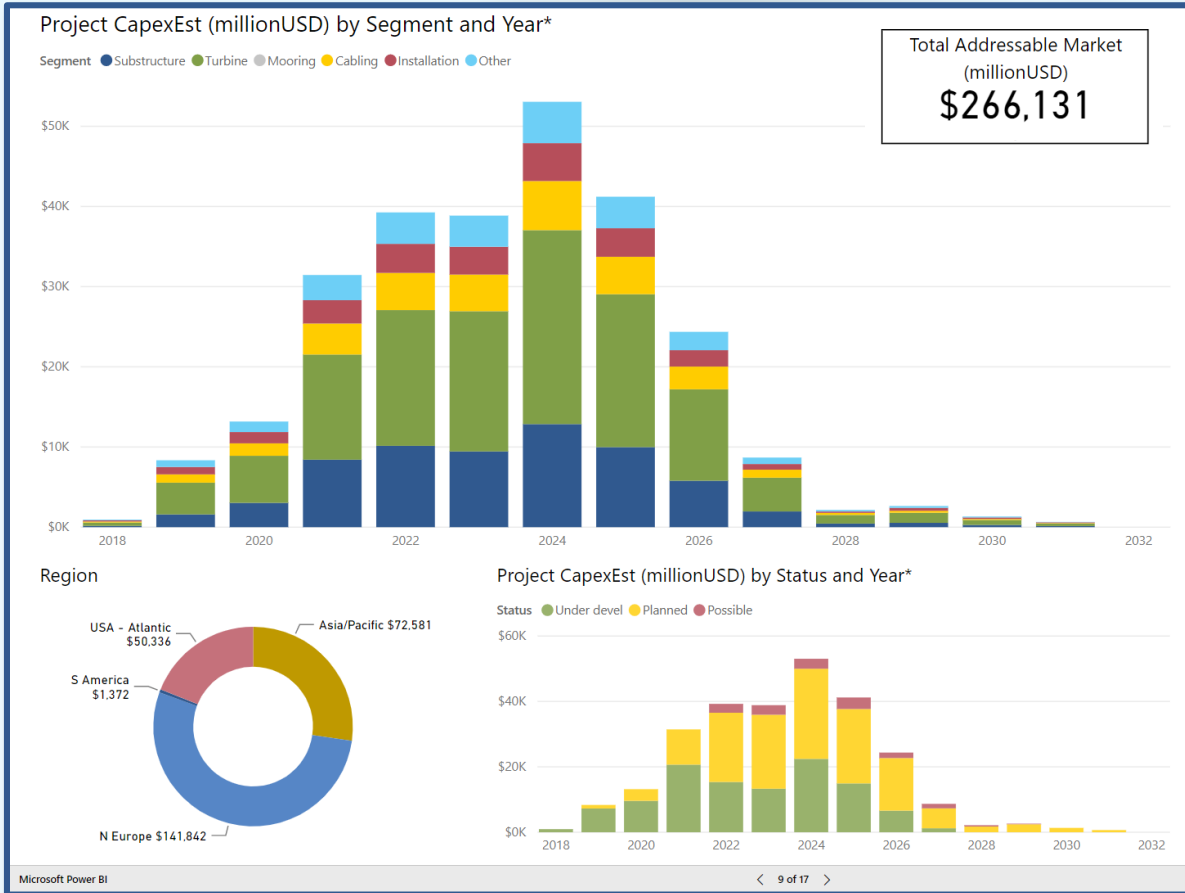


Source: Q Vision

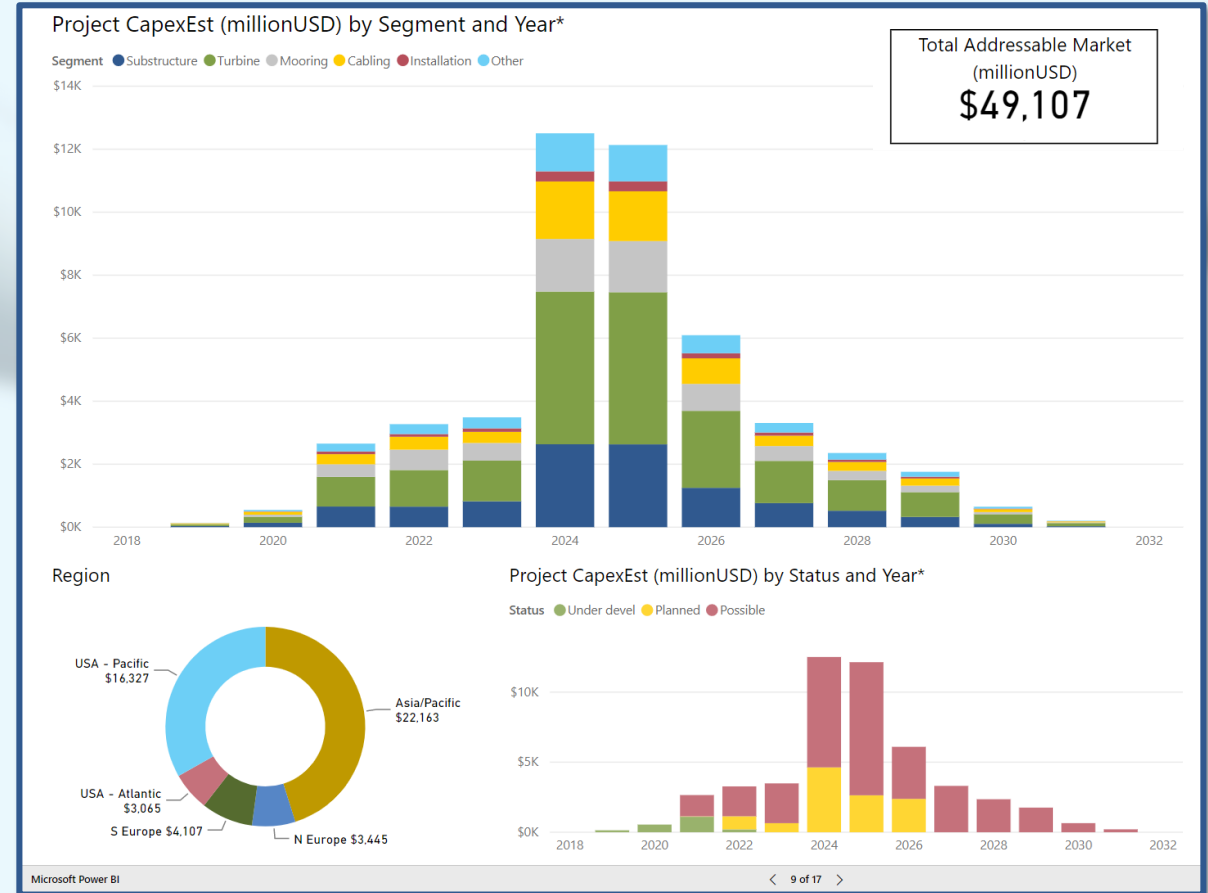
Fixed and Floating Offshore Wind Projects by Region

Total Addressable Market in CapEx by Segment and Year

Fixed



Floating



Source: Q Vision

Fixed Offshore Wind Activity by Project in CapEx

North Europe by Project Size

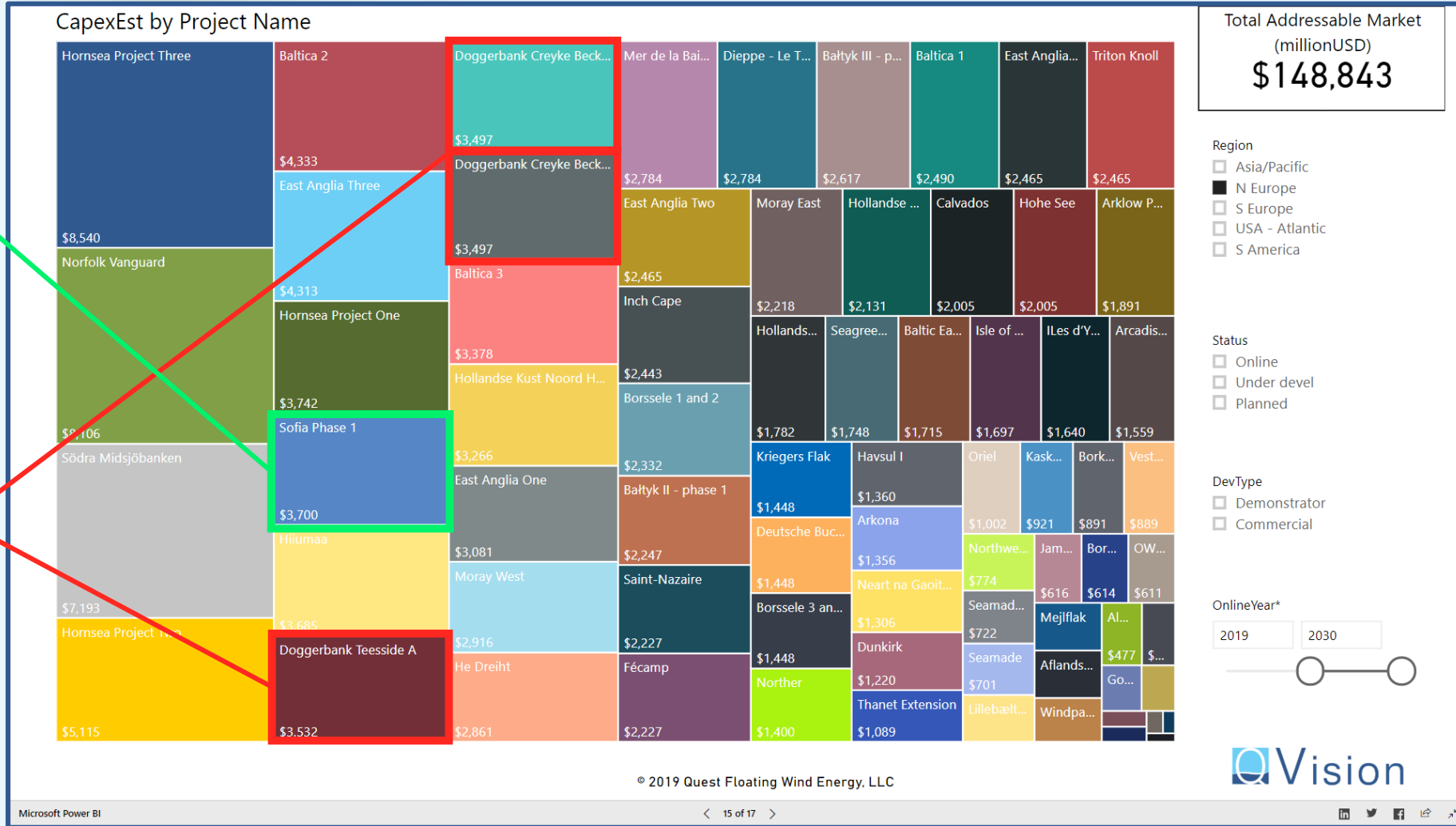


innogy
Renewables
UK Limited

DOGGER BANK
WIND FARMS
BY



Dogger Bank
All 3 Phases



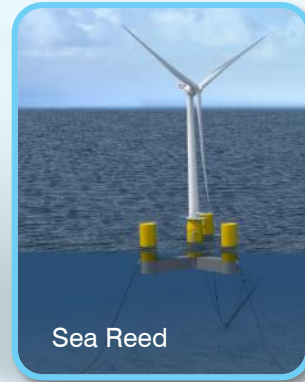
Source: Q Vision

Offshore Wind Developers/Owners

Sampling of Active Players



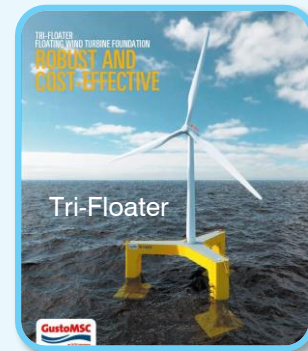
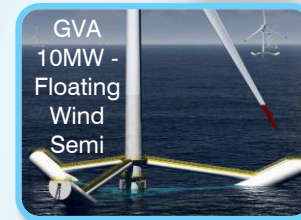
Key Supply Chain Participants



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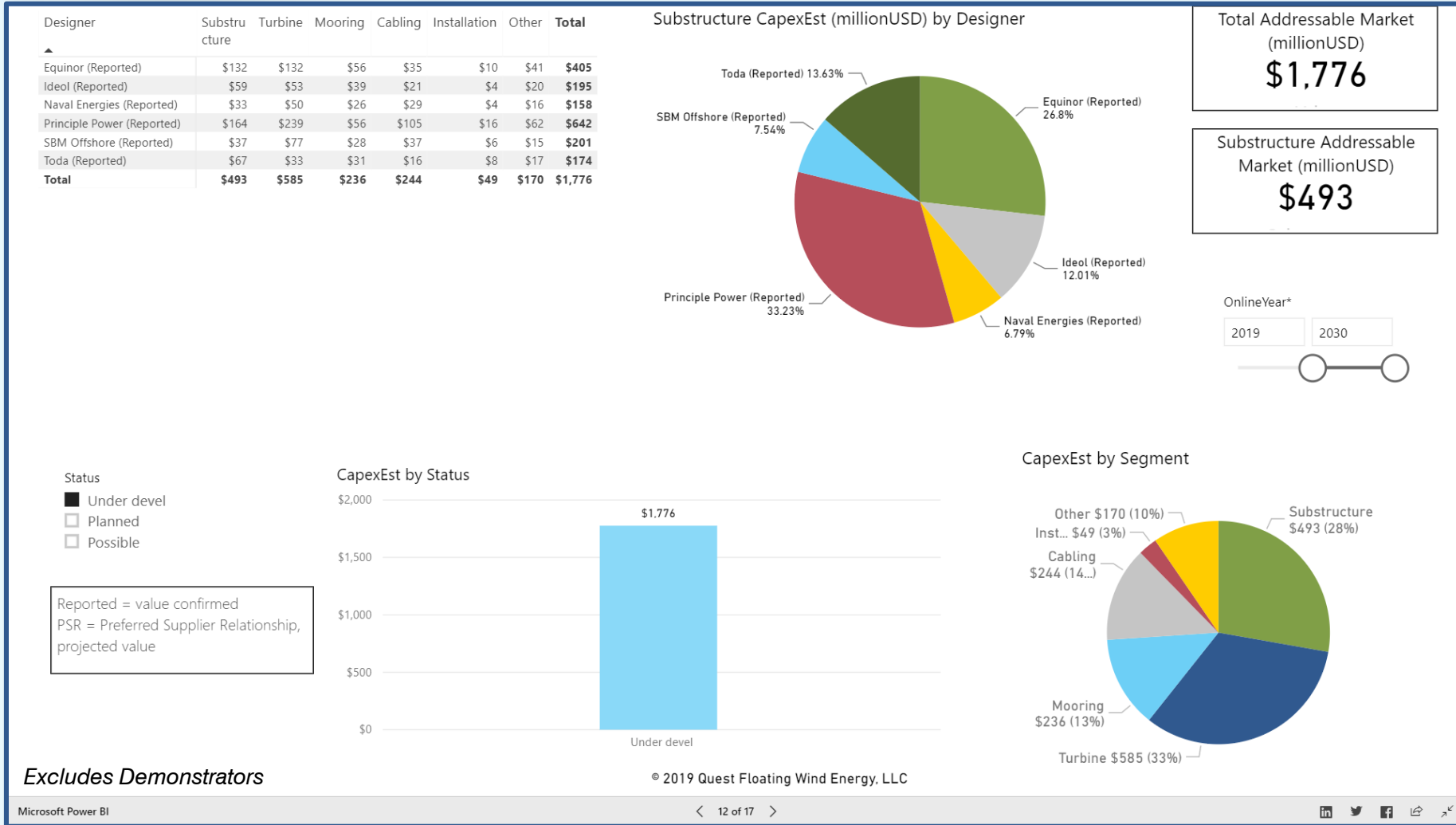


Entrance of Leading Players from Oil & Gas Sector



Floating Total Addressable Market in CapEx by Designer

Under Development Projects

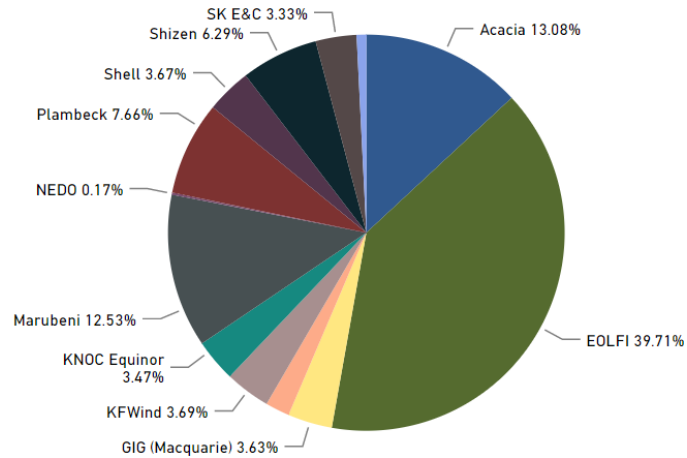


Source: Q Vision

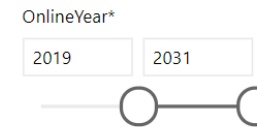
Floating Project CapEx by Developer in Asia Pacific

Developer	Substructure	Turbine	Mooring	Cabling	Installation	Other	Total
Acacia	\$665	\$804	\$771	\$316	\$67	\$277	\$2,900
EOLFI	\$2,020	\$3,350	\$1,365	\$886	\$335	\$844	\$8,801
GIG (Macquarie)	\$173	\$279	\$124	\$131	\$21	\$75	\$804
Jeju Energy Corp	\$109	\$168	\$55	\$51	\$17	\$39	\$438
KFWind	\$207	\$279	\$94	\$138	\$21	\$78	\$818
KNOC Equinor	\$173	\$279	\$94	\$125	\$21	\$77	\$770
Marubeni	\$473	\$1,417	\$364	\$204	\$59	\$258	\$2,776
NEDO	\$12	\$5	\$7	\$10	\$1	\$1	\$37
Plambeck	\$315	\$698	\$215	\$266	\$42	\$162	\$1,698
Shell	\$118	\$328	\$147	\$122	\$16	\$81	\$814
Shizen	\$327	\$352	\$415	\$132	\$29	\$140	\$1,395
SK E&C	\$151	\$279	\$124	\$95	\$21	\$69	\$739
Toda Corporation	\$67	\$34	\$31	\$16	\$8	\$17	\$174
Total	\$4,811	\$8,272	\$3,808	\$2,493	\$659	\$2,120	\$22,163

Project CapexEst (millionUSD) by Developer

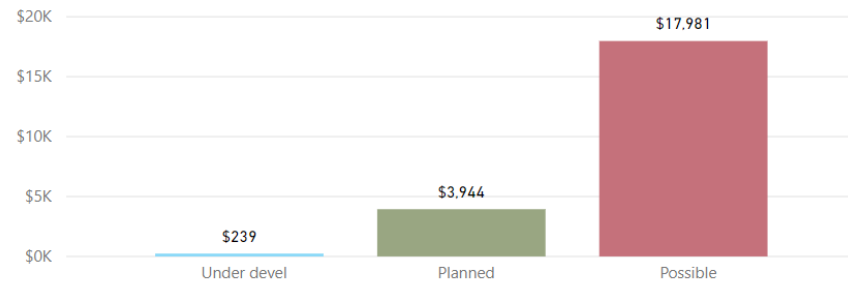


Total Addressable Market
(millionUSD)
\$22,163

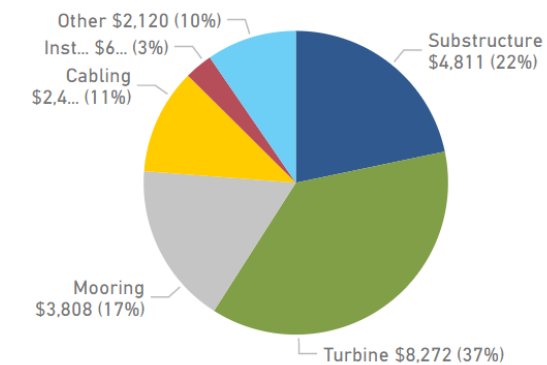


- Status
- Under devel
 - Planned
 - Possible

CapexEst by Status



Capex by Segment



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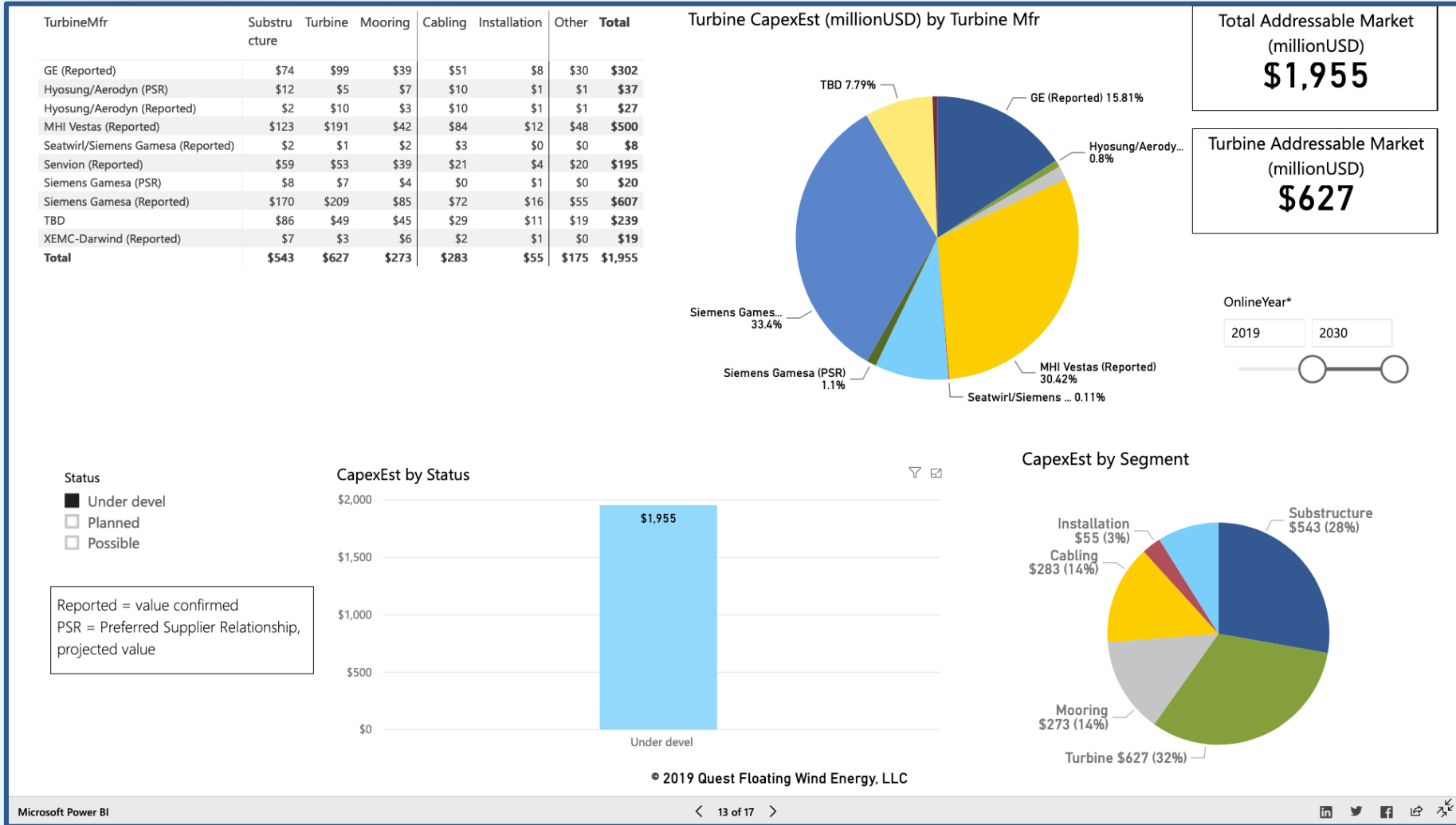
Microsoft Power BI

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Floating Total Addressable Market in CapEx by Turbine Mfr.

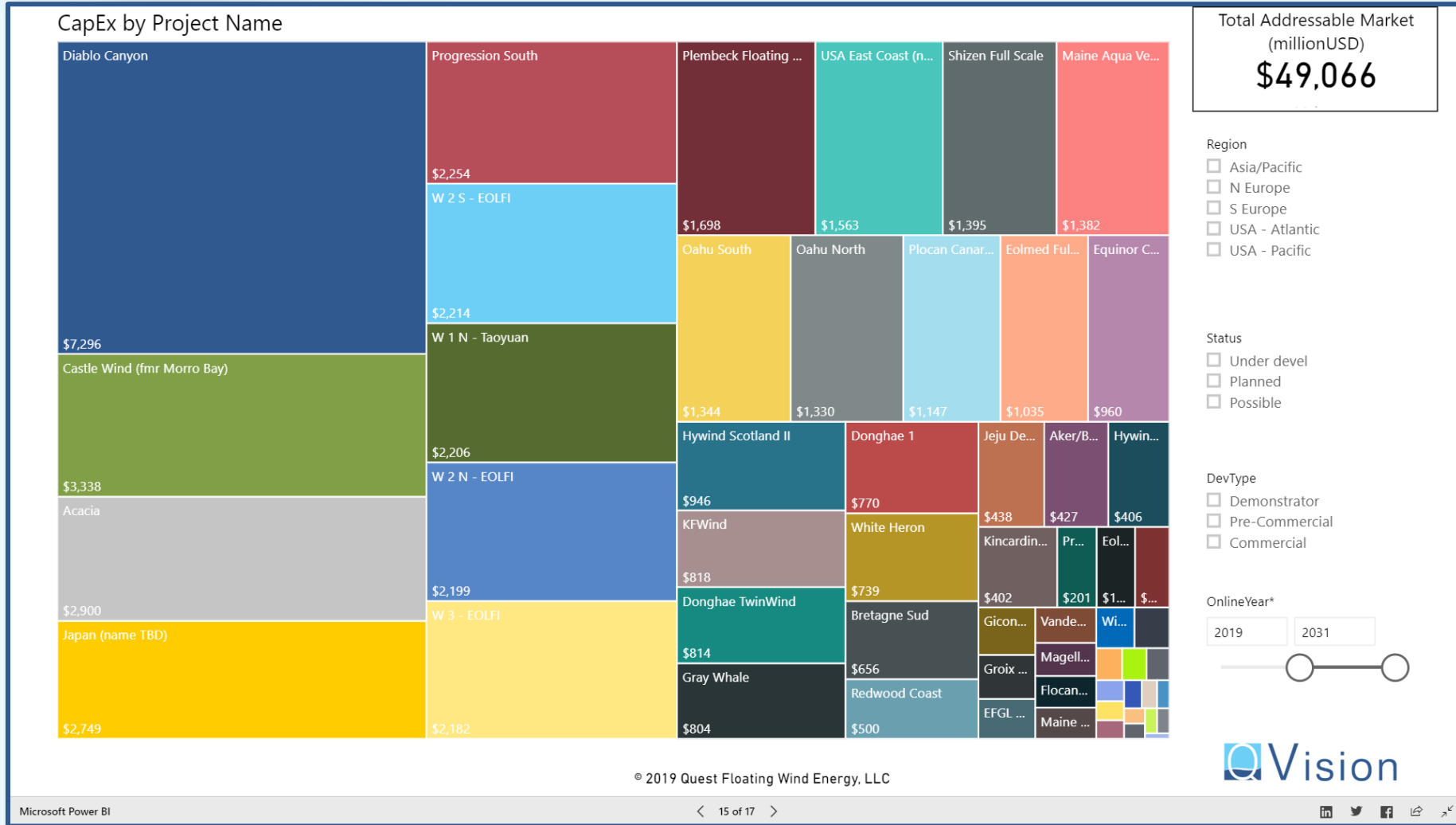
Under Development Projects



Source: Q Vision

Floating Offshore Wind Activity by Project in CapEx

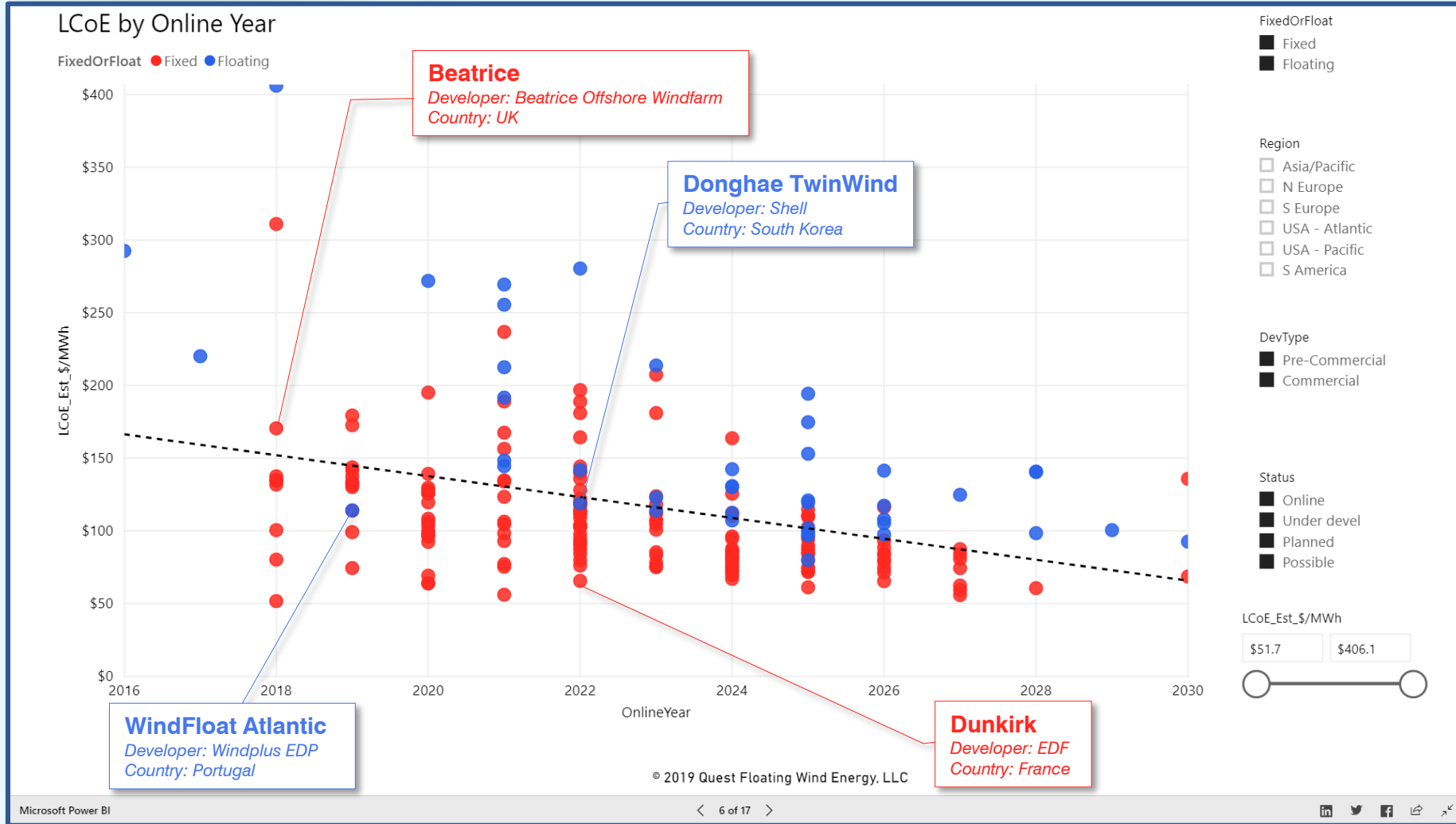
Global Projects by Size



Source: Q Vision

LCoE - Levelized Cost of Energy in \$/MWh

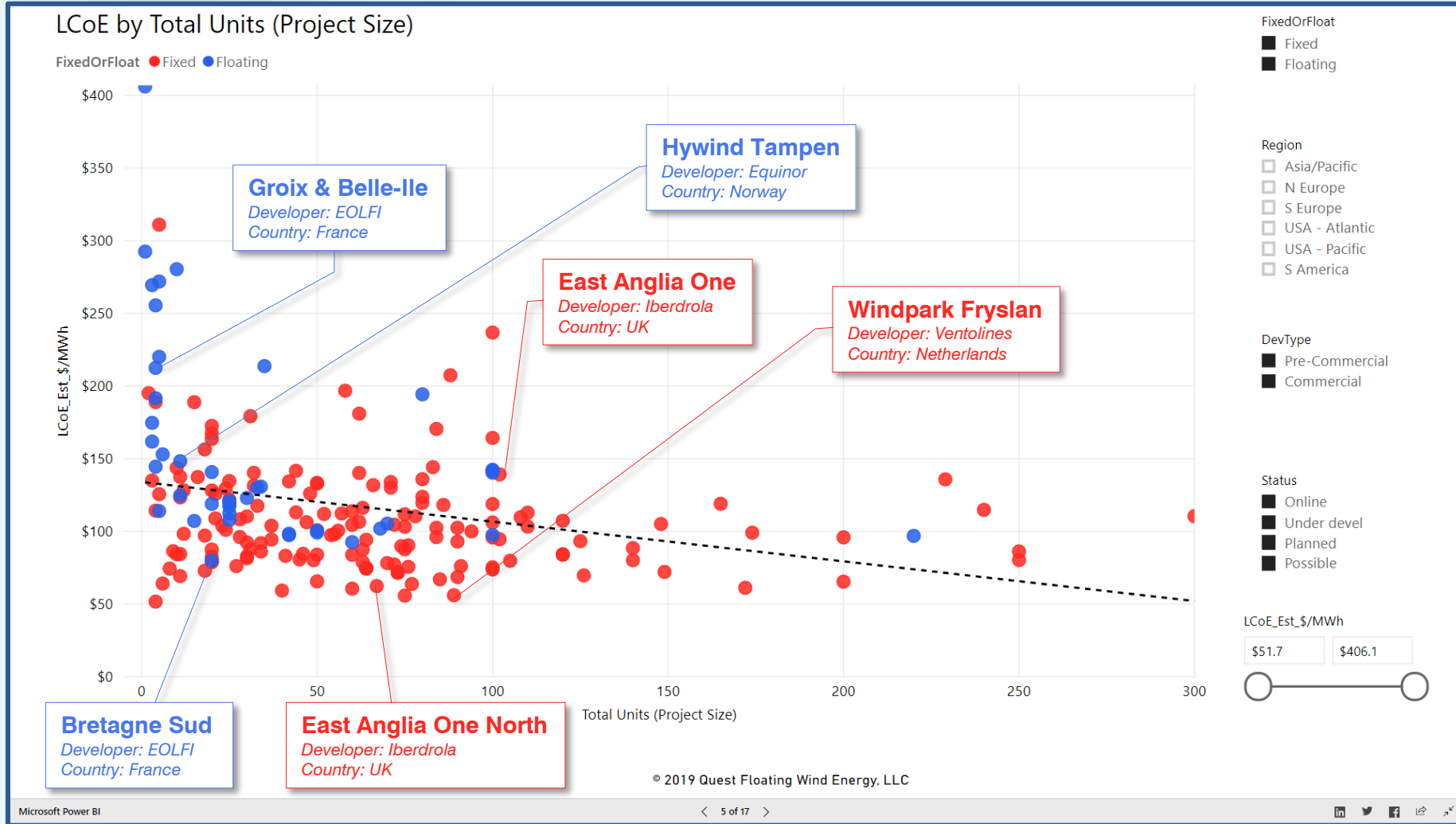
By Online Year



Source: Q Vision

LCoE - Levelized Cost of Energy in \$/MWh

By Project Size in Total Units



Source: Q Vision

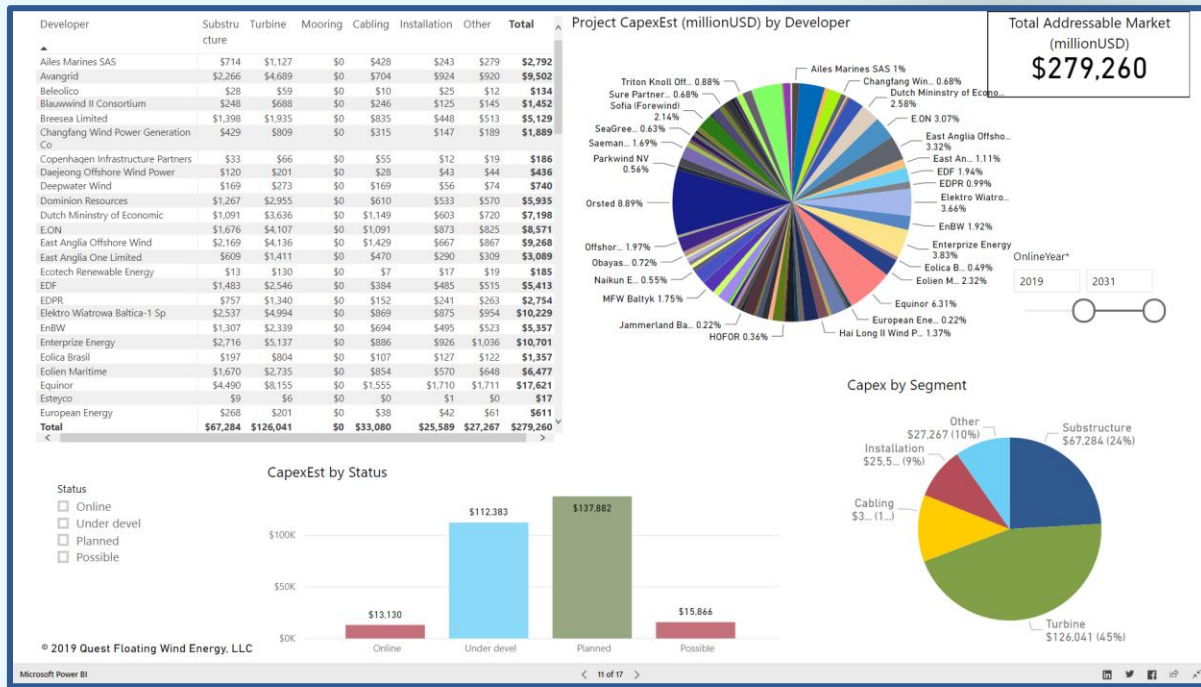
Q Vision - Robust Analytics and Market Analysis

Q Vision is our proprietary **Business Analytics** tool delivering real-time data and analysis giving you a competitive advantage to win **Fixed** and **Floating** Offshore Wind Energy projects.

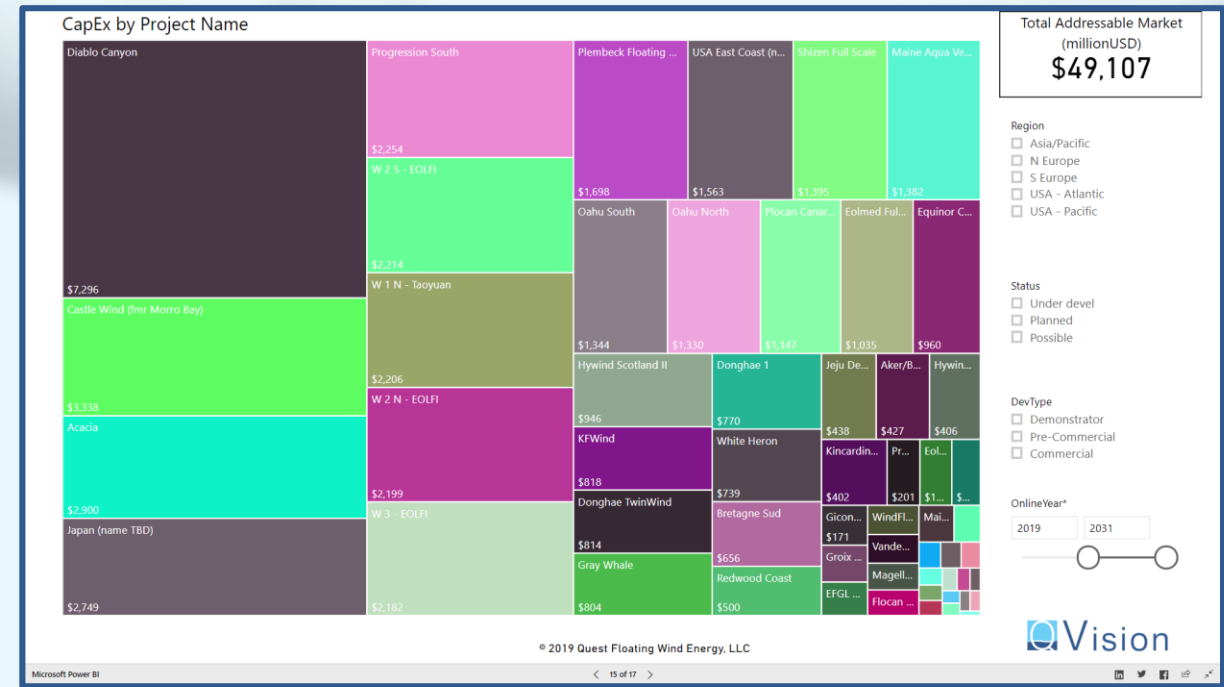
CapEx / LCoE Project Economics

Analyze the Total Addressable Market in CapEx by segment including LCoE across projects.

Fixed



Floating



Q FWE Consulting Advisory

Supporting Clients with Strategic Data-Driven Decisions

Client Directed Inquiries

Supply Chain Analysis

Primary Research

M&A Advisory

- Project benchmarking, CapEx & LCoE modeling
- Expert and technical market analysis utilizing a bottoms-up / top-down approach
- Rigorous quantitative and qualitative research
- M&A advisory and market evaluation
- Actively develop and assist clients in sourcing niche financing alternatives
- Market reviews, sizing and demand modeling
- First source referencing (Market/Client/Customer)

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