A Realistic View on the Floating Wind Project Pipeline

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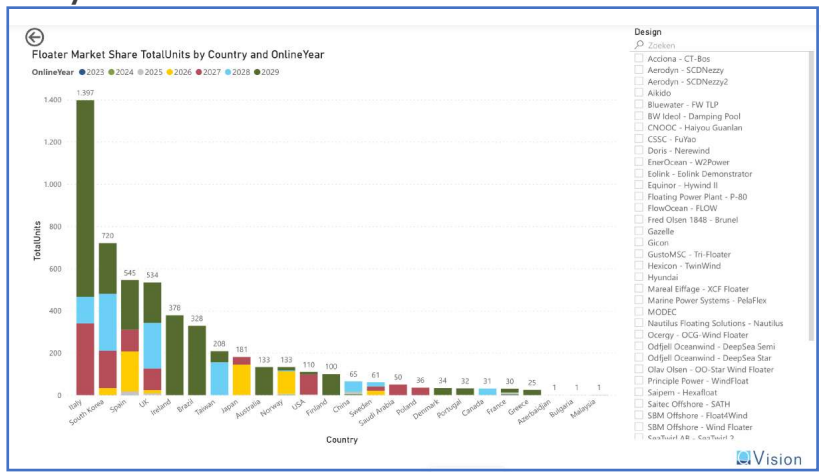
Between Hype and Reality

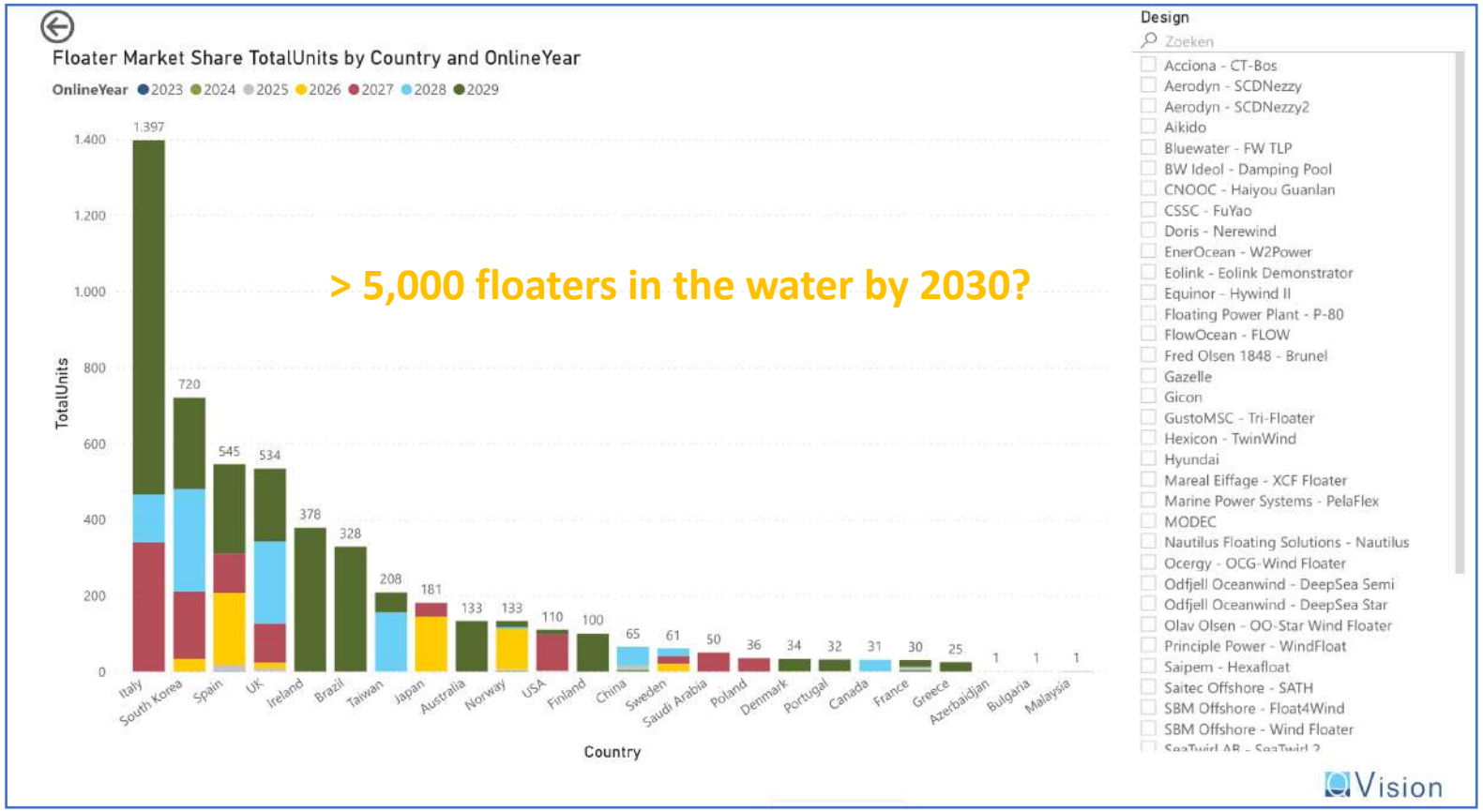
A hype is a fundamental misconception of the market.

- Daily ever-bigger targets cross our media, supported by so-called 'forecasts' with a target year/benchmark.
- This 'top-down' data is **exploratory** and 'forecasts' are merely extrapolated projections based on **undefined data**.
- The forecasts only show possible 'market volumes' often not backed by actual project data.
- Basing our business decisions on these numbers imposes risk to be disappointed.

Top-down GW forecasts hide complexity.

- GW/MW for market economics is fine.
- GW-volumes hide the complexity of producing large numbers of units.
- #Units per capacity or project better suits forecasting on project level.
- Top-down Global Forecast is 5,000 units by 2030?





Top-down GW forecasts hide the complexity.

Top Down

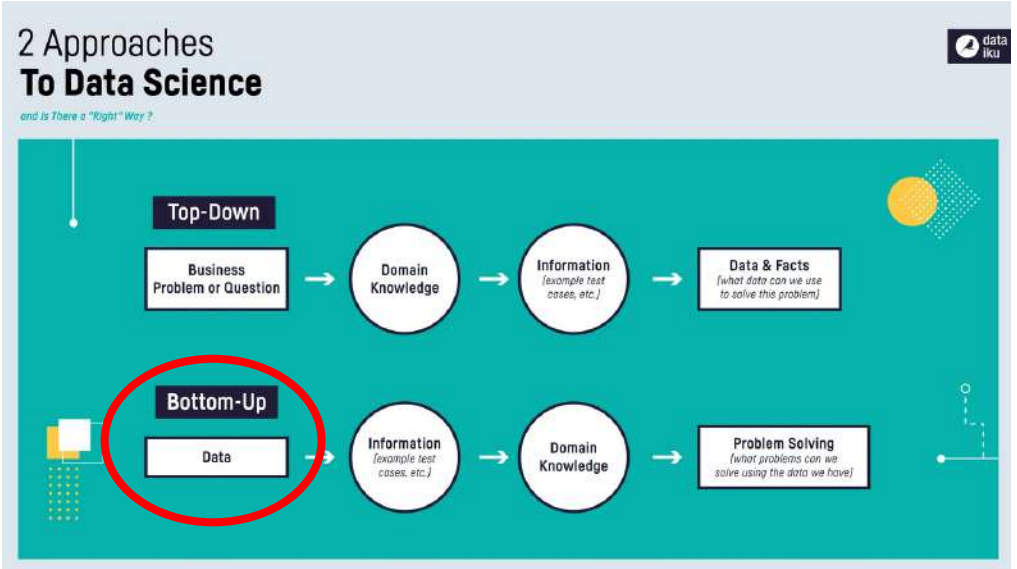
1 GW

Bottom Up

Floating Wind Solutions

Modeling data to increase reliability.

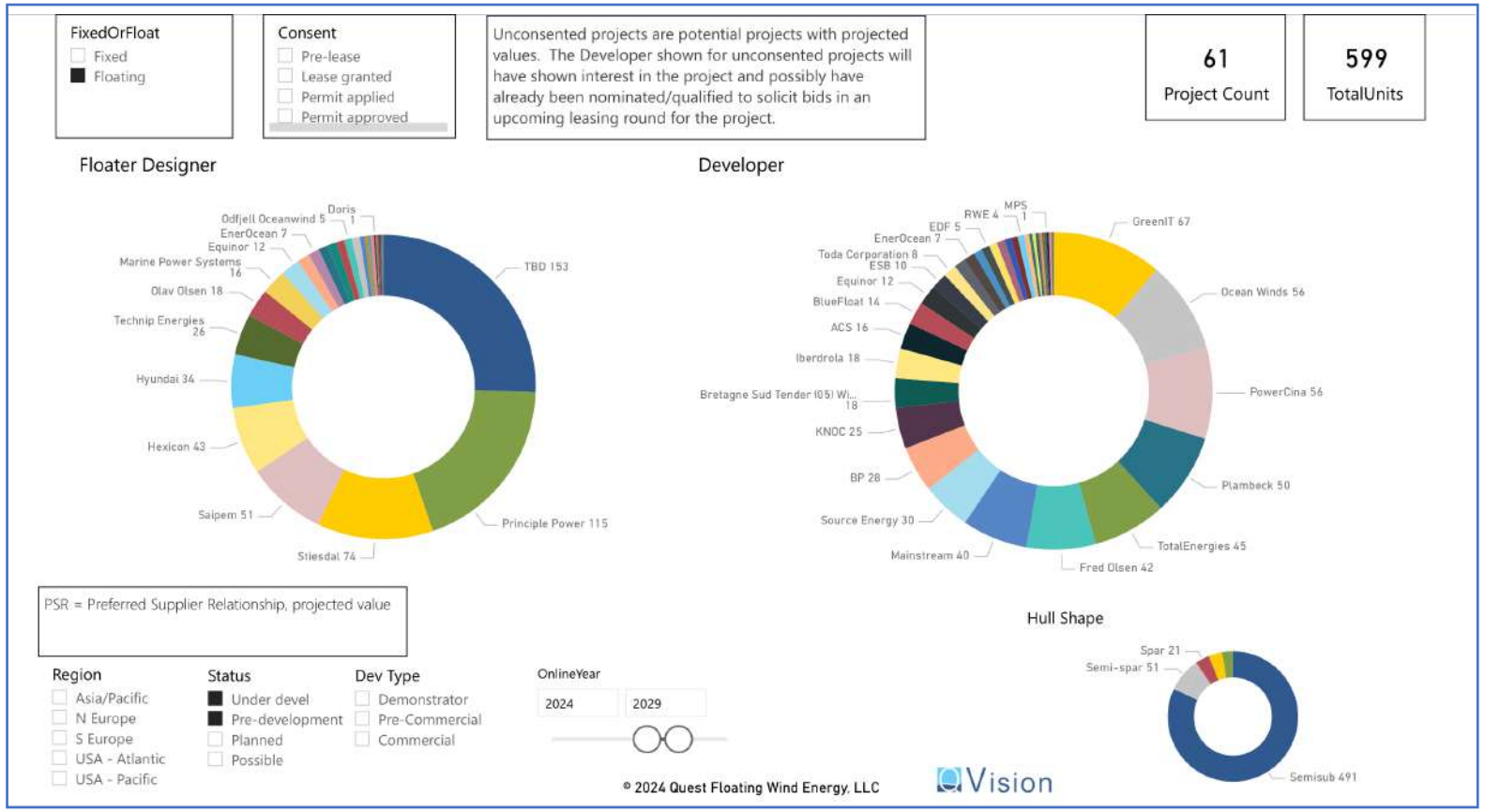
- A more reliable look into the future should be based on **'bottom-up'** data with the largest component possible of **'true'** information.
- The 'true' data component can be analyzed, structured and serve modeling to derive insights.
- Reliability can be built to control data up to defined reliability levels which then become the new benchmark in the model applied.



Global Forecast 2030 (Bottom-up)

Total realistic #units forecasted for <2030

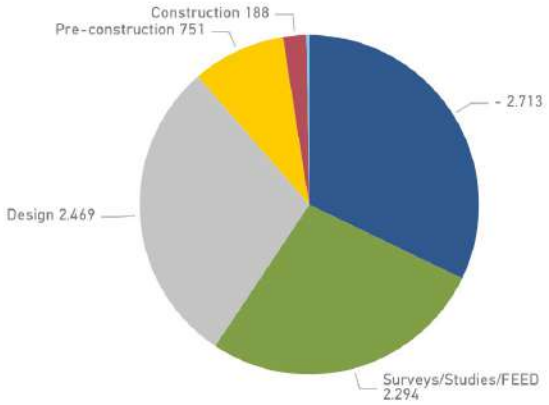
- Focus/filter on existing projects only (Under Dev. and Pre-Dev.).
- Focus on feasible #units to be fabricated (Max 50 units).
- Global Forecast for 2030 is 599 units (61 projects).
- Breakdown for Developer and Designer indicates biggest market players.
- Breakdown per region shows where the short-term market is.



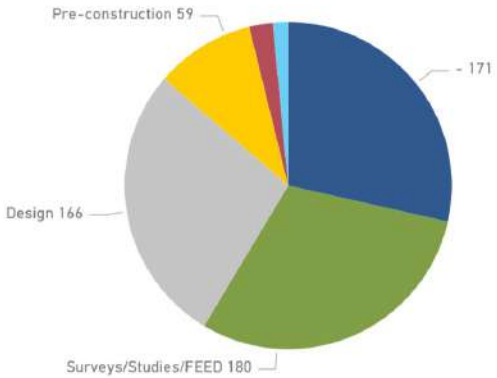
Global Forecast 2030 (Phase)

Status	Phase	TotalMW	TotalUnits	No.Projs
Pre-development	-	1.812	122	8
Pre-development	Surveys/Studies/FEED	766	61	5
Pre-development	Design	96	8	6
Under devel	-	901	49	7
Under devel	Surveys/Studies/FEED	1.528	119	7
Under devel	Design	2.373	158	18
Under devel	Pre-construction	751	59	3
Under devel	Construction	188	14	5
Under devel	Installation	22	9	2
Totaal		**8.437**	**599**	**61**

TotalMW by Phase



TotalUnits by Phase



61
Project Count

8.437
TotalMW

Region
- Asia/Pacific
- N Europe
- S Europe
- USA - Atlantic
- USA - Pacific

FixedOrFloat
- Fixed
- Floating

DesignConf
- Confirmed
- PSR
- Spec

Status
- Possible
- Planned
- Pre-development
- Under devel

Phase
- -
- Surveys/Studies/FEED
- Design
- Pre-construction
- Construction
- Installation

Online Year
2024 2029

PSR = Preferred Supplier Relationship, projected value

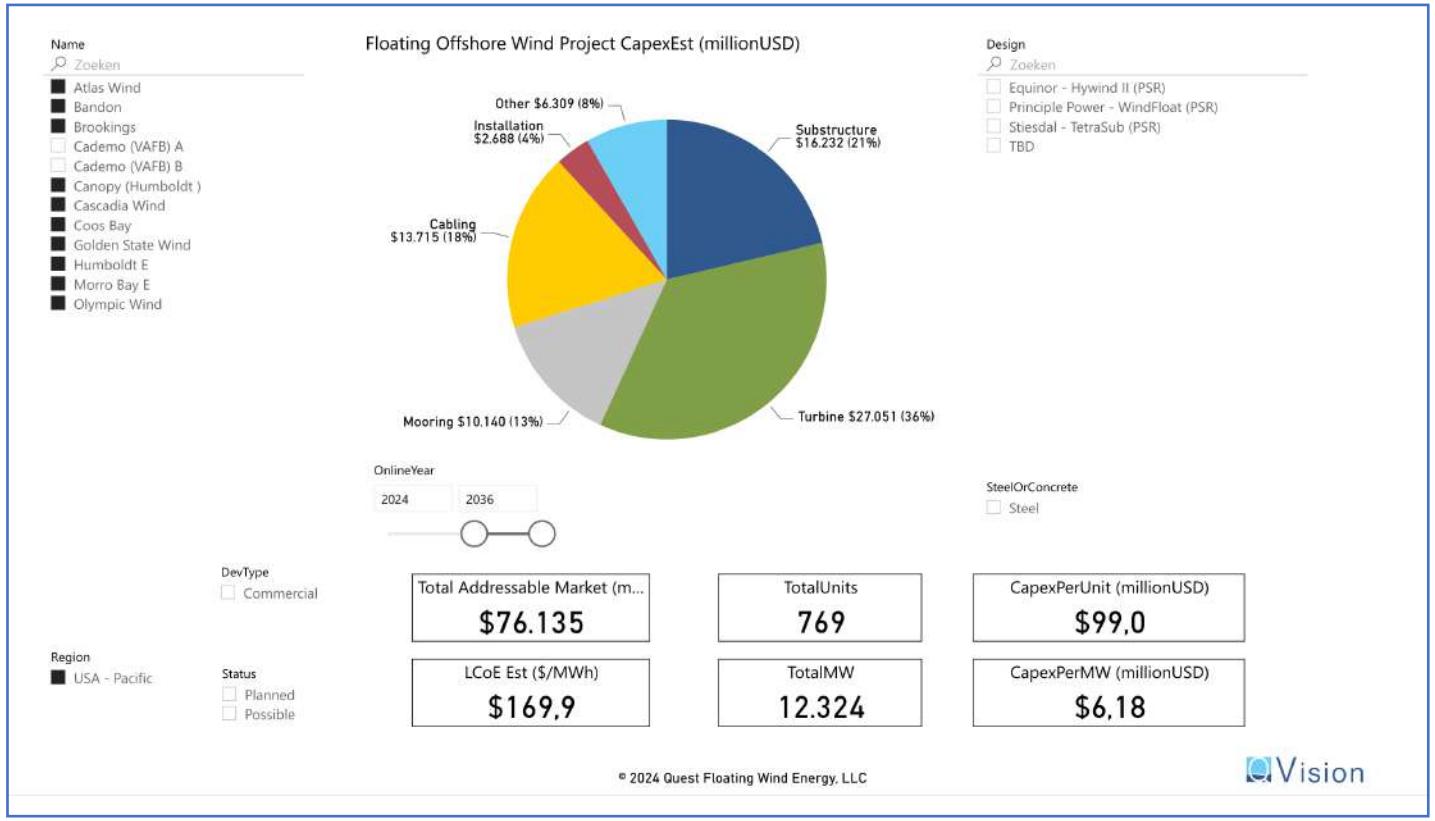
Vision

USA West Coast

California, Washington, Oregon

Total #units forecasted for <2030

- 10 Projects WD ~1,000-1,500m
- All fall within the new Strike-price
- Average LCoE $169M/MWh
- CapEx/unit $99M

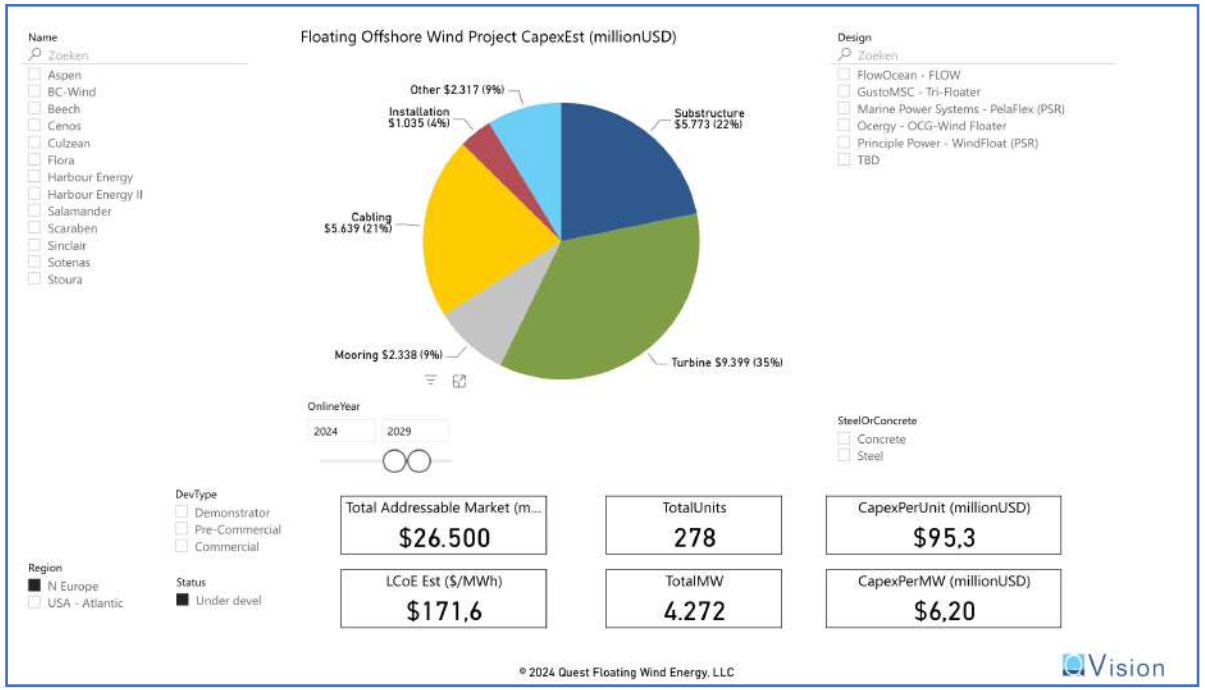


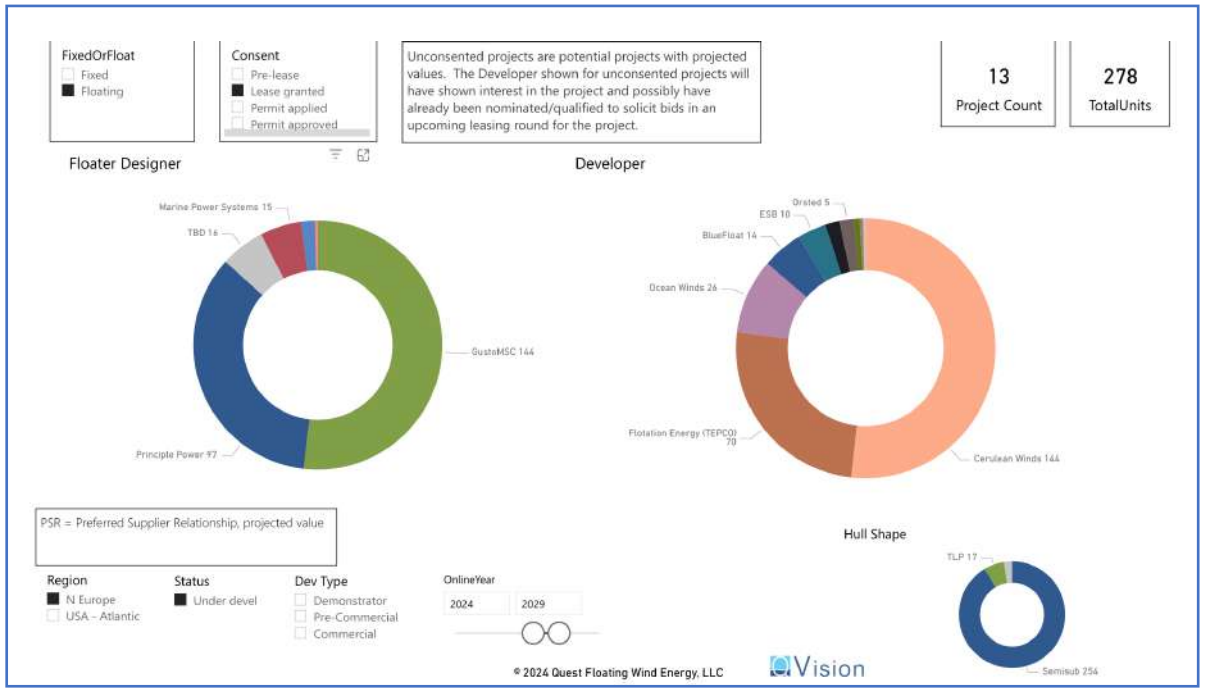
Northern Europe

Northern Europe *Under Development CapEx*

Total #units forecasted for <2030

- 13 Projects WD
- Average LCoE $172M/MWh
- Average unit cost is - $95M



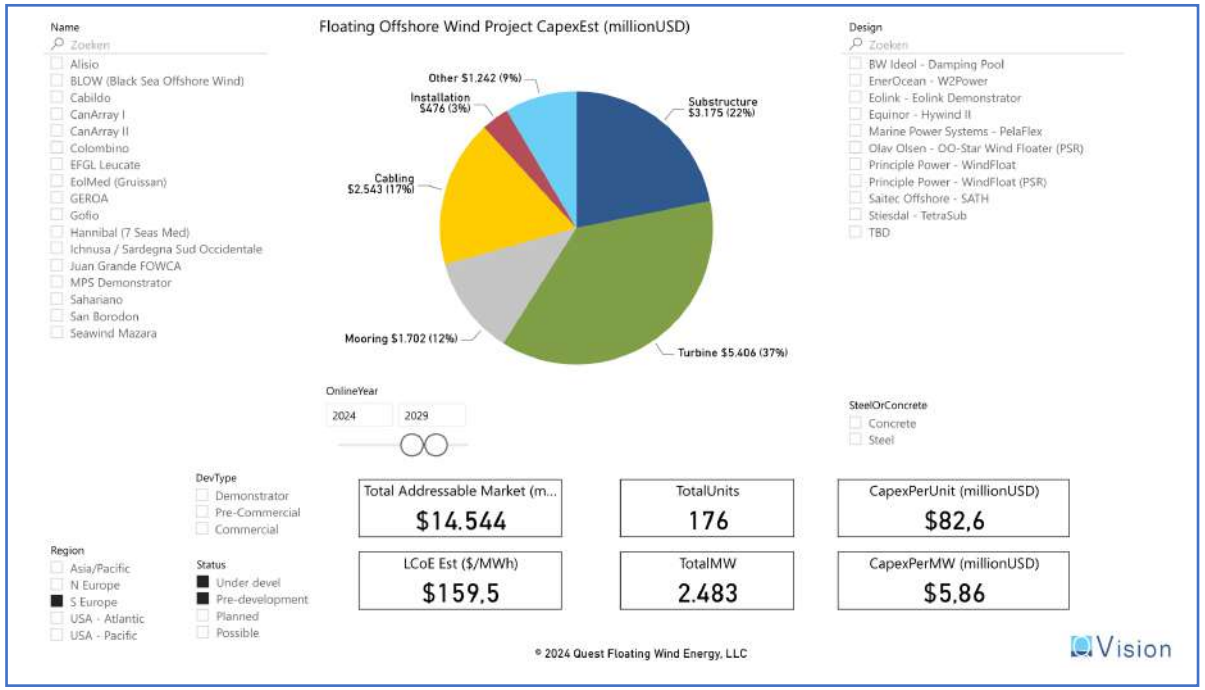


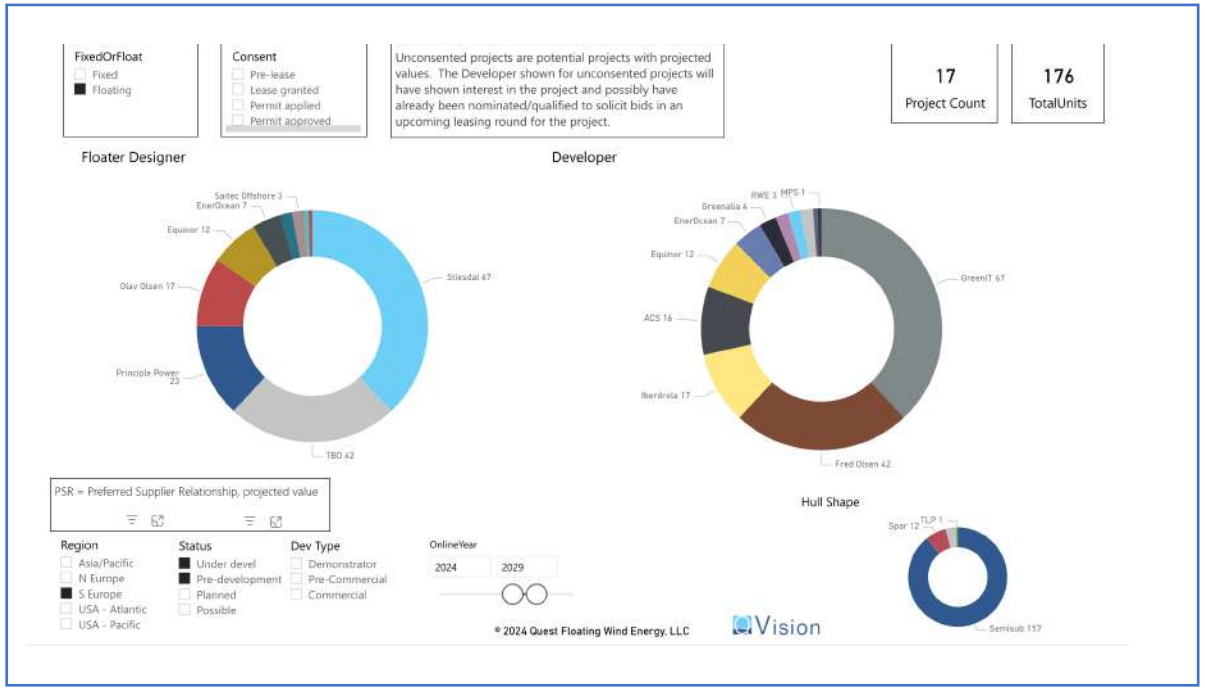
Southern Europe

Southern Europe *Under Development, Lease granted*

Total #units forecasted for <2030

- 2 Projects qualify
- Pre-dev. Projects (preferred qualified) included adds another 11 projects.
- Average LCoE $160M / average unit - $83M



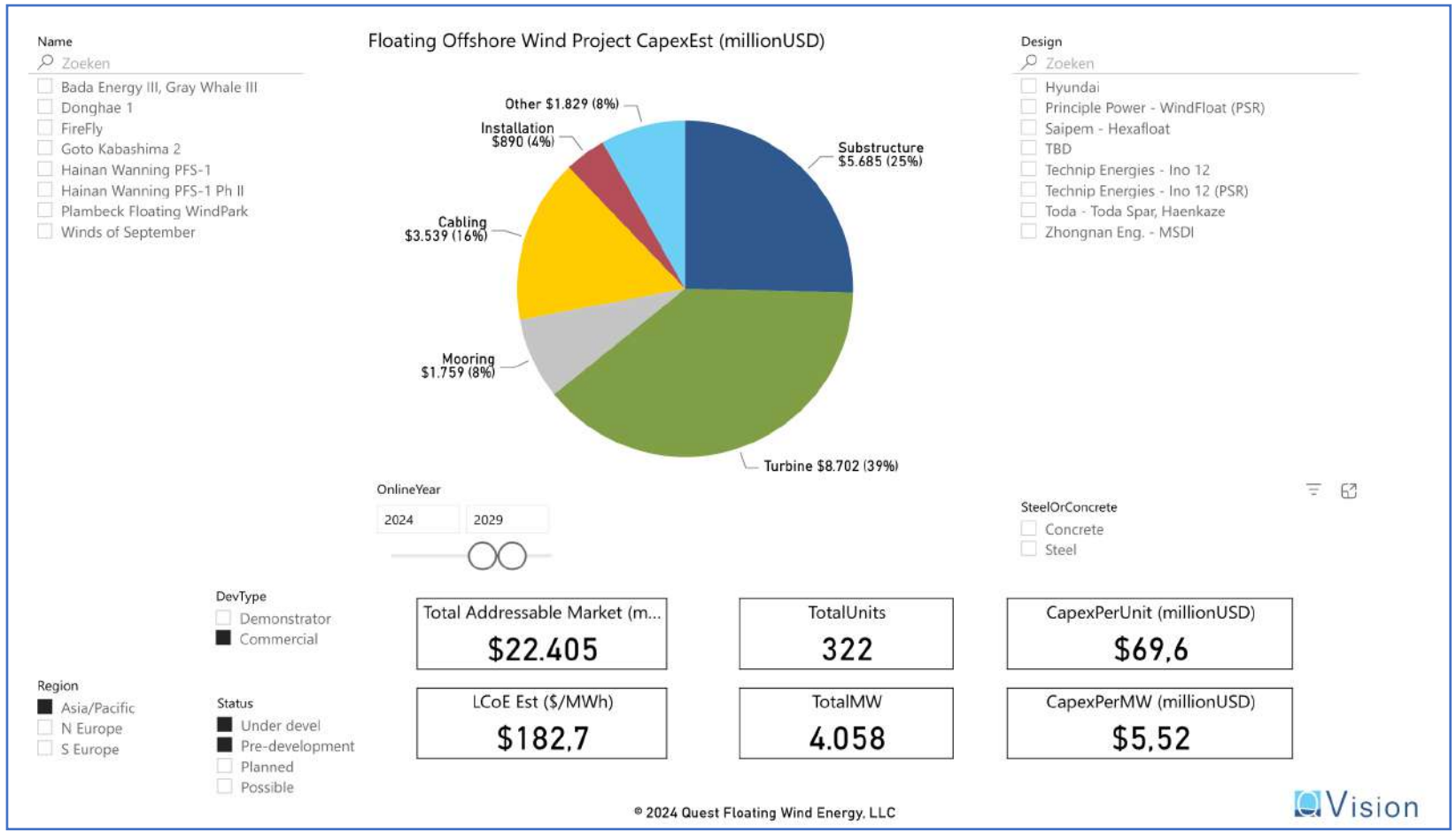


AustralAsia

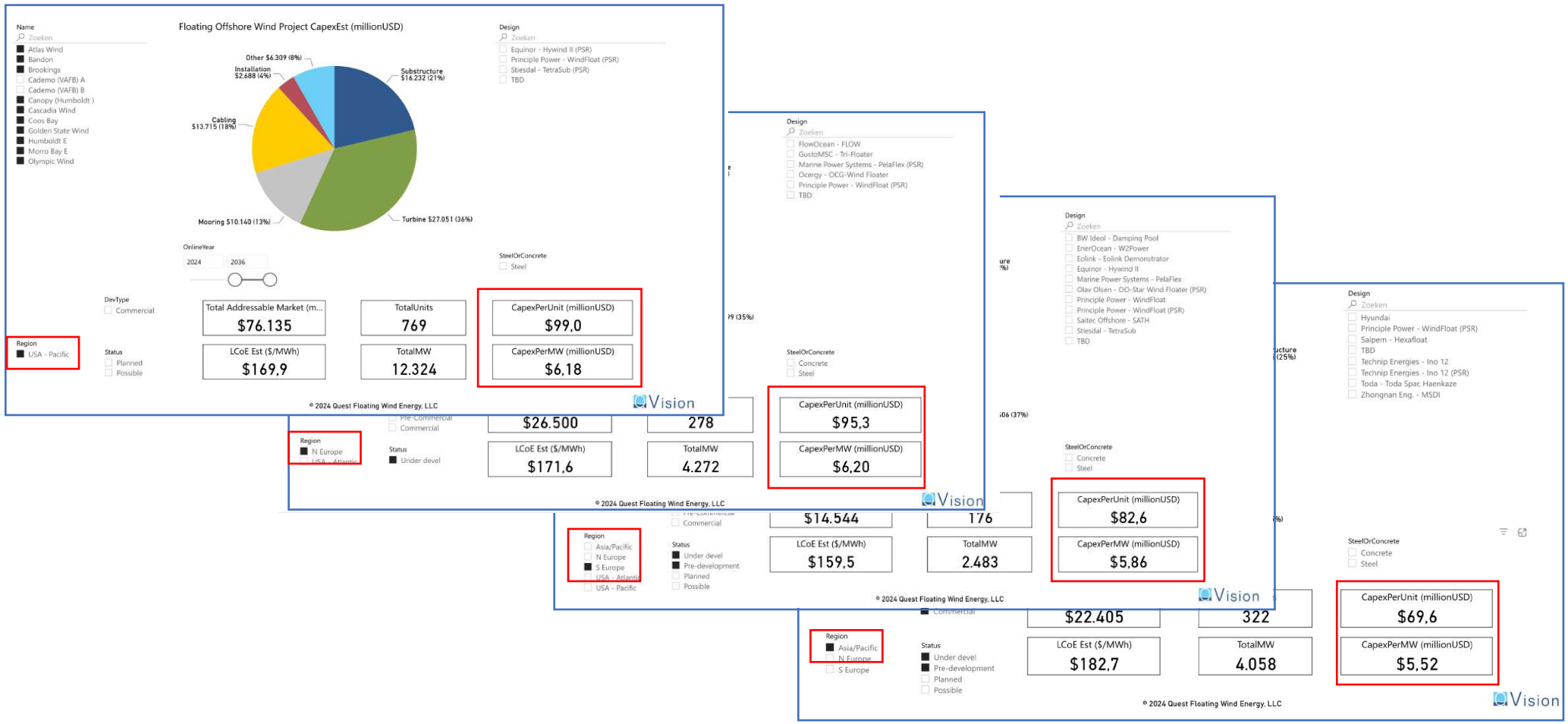
Asia *Under Development*

Total #units forecasted for <2030

- 8 Projects including pre-dev. projects.
- Average LCoE $182M



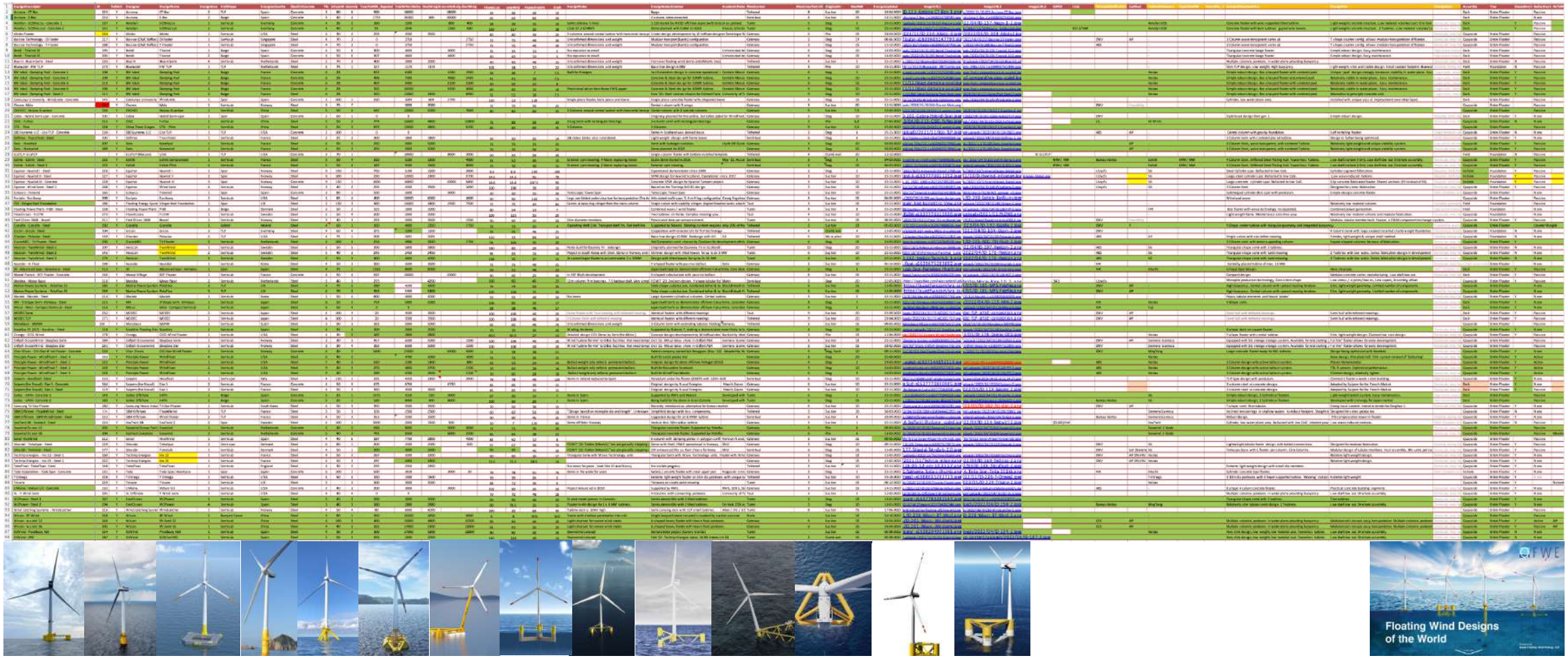
CapEx/MW between various regions



Technology

One Floater Design a Day …

The Q FWE Database holds 145 ‘Concepts’ of which 65 ‘mature’ if which 15 are front runners, of which 4 are proven.



Floater Designs progress based on lessons learned

Floater technology in the fast lane

Technip Energies - Ino 15 - Steel 1

Designer	Technip Energies
DesignName	Ino 15
DesignerCountry	France
DesignGen	1
TRL	4
MaxMW	15
TurbinePreference	Vestas
SteelOrConcrete	Steel
HullShape	Semisub
ColumnQty	3
SteelWeight (t)	4300
ConcreteWeight (t)	
BallastWeight (t)	
TotalWtInclBallast (t)	4300
FloaterLng (m)	73
FloaterWidth (m)	73
FloaterHeight (m)	29
Draft (m)	14
MinOperWD (m)	50
Typical MoorSystem	Catenary
Typical MoorLinesPerUnit	3
BallastSystem	None
Assembly	Quayside
Tow	Entire Floater

PrincipalCertification	DNV
Certified	AiP DNV-RU-OU-0512 , "Floating offshore wind power installations"
DesignNotes	
DesignCh	
DesignPr	
Current P	
Possible I	
DesignUp	

Ocergy - OCG-Wind

Designer	Ocergy
DesignName	OCG-Wind Floater
DesignerCountry	USA
DesignGen	1
TRL	4
MaxMW	15
TurbinePreference	Vestas
SteelOrConcrete	Steel
HullShape	Semisub
ColumnQty	3
SteelWeight (t)	2800
ConcreteWeight (t)	
BallastWeight (t)	
TotalWtInclBallast (t)	2800
FloaterLng (m)	61
FloaterWidth (m)	61
FloaterHeight (m)	27
Draft (m)	14
MinOperWD (m)	30
Typical MoorSystem	Catenary
Typical MoorLinesPerUnit	3
BallastSystem	Passive
Assembly	Quayside
Tow	Entire Floater

PrincipalCertification	
Certified	
DesignNotes	Concept design development by Windfloat designer Dominique Roddier, supported by Chevron and Moreld
DesignCharacteristics	Y-shape floater with central turbine.
DesignPros	Slim, light weight design. Claimed low cost design.
Current Projects	Atlantic OCS Floating Demo, Salamander, Hunter / Illawara
Possible Projects	
DesignUpdated	2023-06-12

Global Floating Projects 2024 World Map

DOWNLOAD from

www.QuestFWE.com