



RystadEnergy

The Shifting Energy Landscape

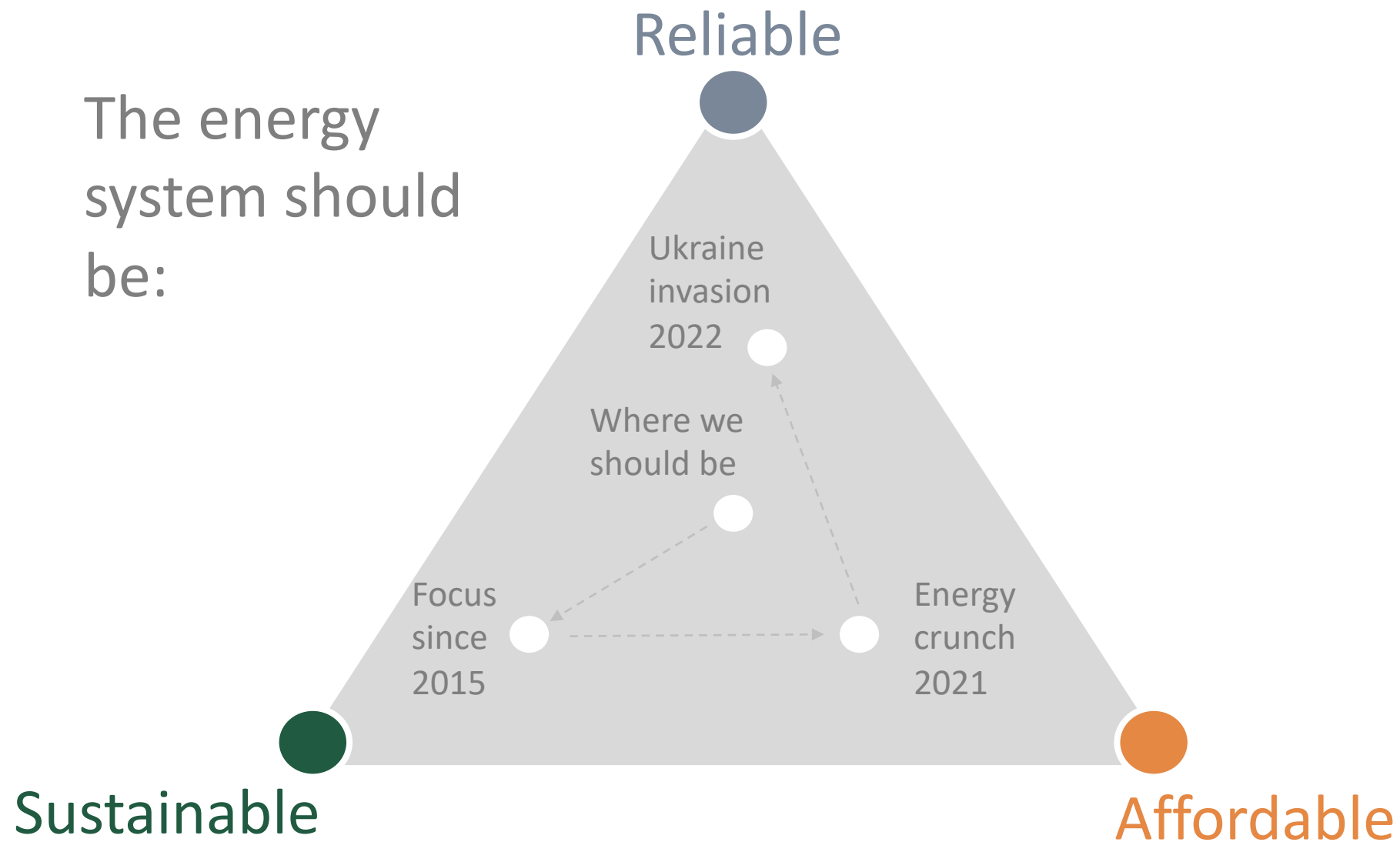
Marine Money Offshore Energy Forum

Martin Opdal, Consulting Partner

25.04.2023

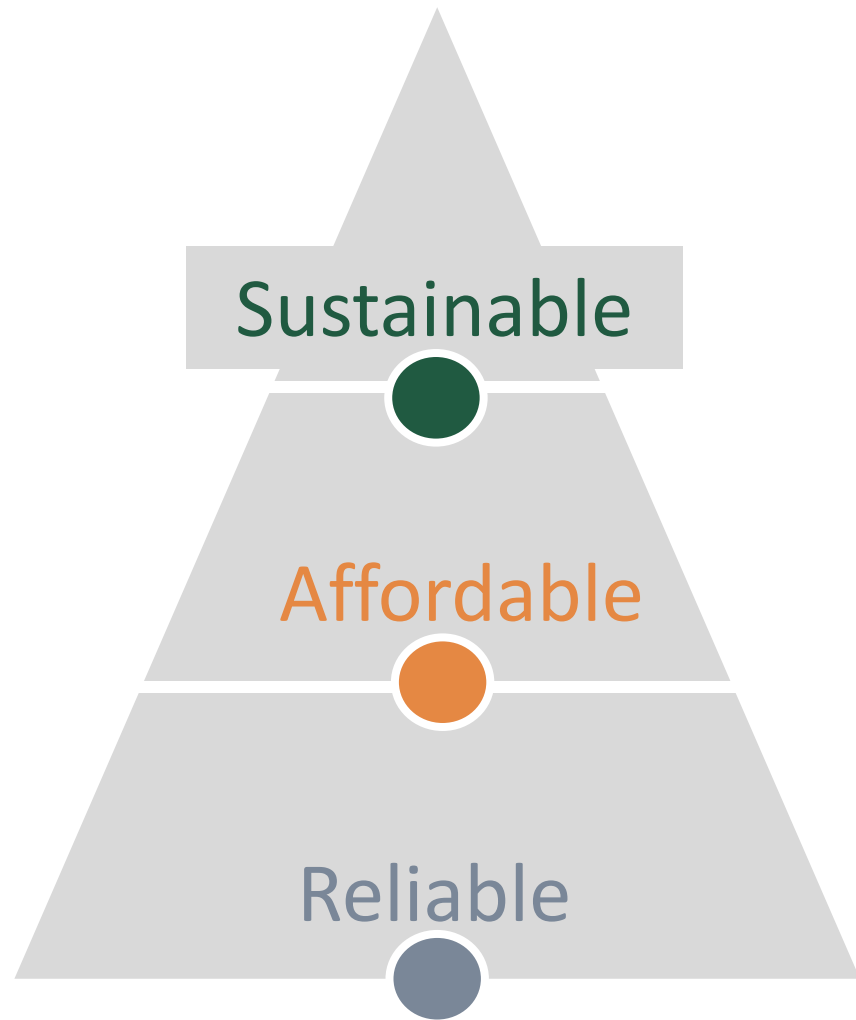
The Energy Trilemma

The energy system should be:



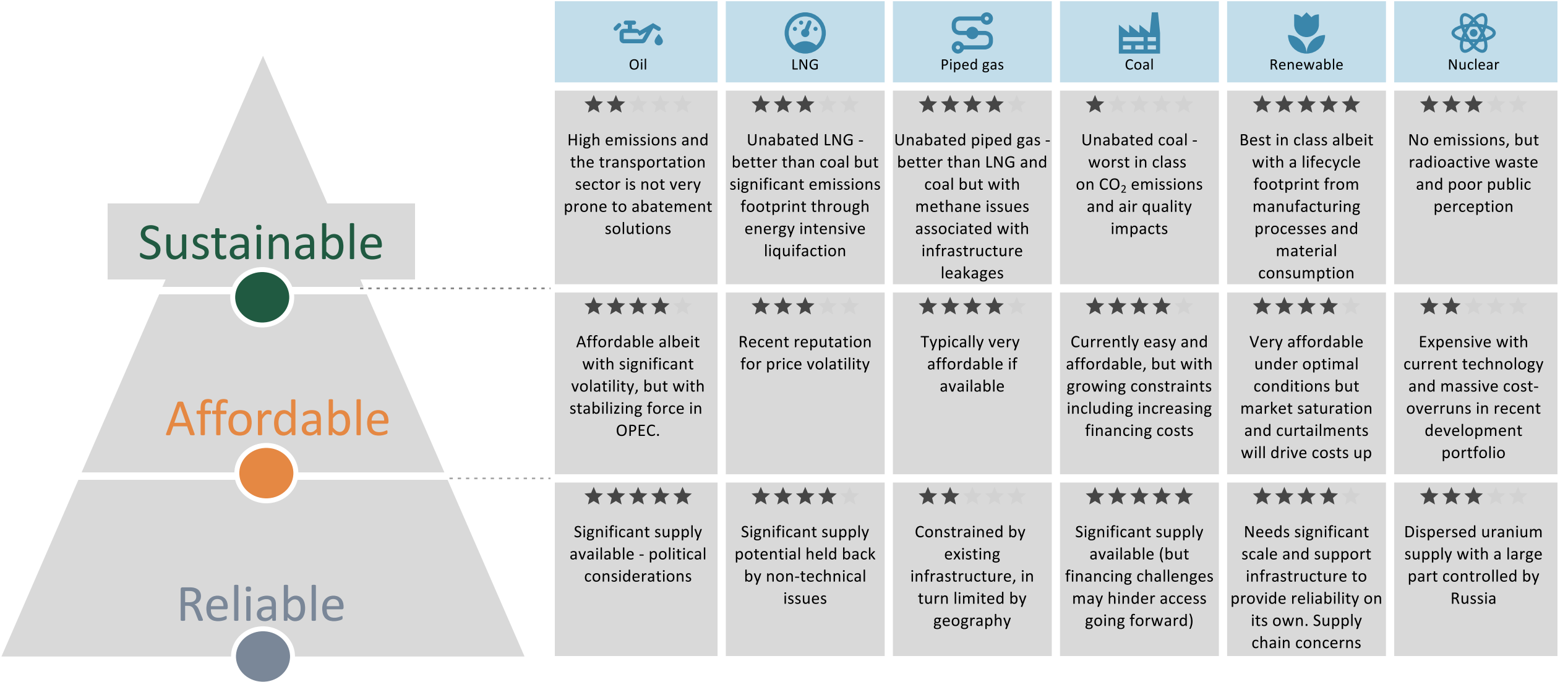
Source: Rystad Energy research and analysis

An Energy Trilemma – or a hierarchy of needs?



Source: Rystad Energy research and analysis

No single silver bullet that solves for all aspects of the Trilemma / Hierarchy of needs



★★★★★ Higher number of stars indicates higher level of compliance

Source: Rystad Energy research and analysis

There is an east/west divide to the response on last 18 months events

Europe plans to spend \$221 billion to ditch Russia's energy

By Anna Cooban, CNN Business
Updated 12:12 PM EDT, Wed May 18, 2022



Clean energy package would be biggest legislative climate investment in US history

By Ella Nilsen, CNN
Updated 3:47 PM EDT, Thu July 28, 2022



Iran Khan/Los Angeles Times/Getty Images

3 minute read · February 14, 2023 1:48 AM GMT+1 · Last Updated a month ago

Exclusive: Pakistan plans to quadruple domestic coal-fired power, move away from gas

By Gilbran Naliyyar Peshimam



Power transmission towers are seen near a body of water in the background. Photo

3 minute read · March 6, 2023 9:51 AM GMT+1 · Last Updated 9 days ago

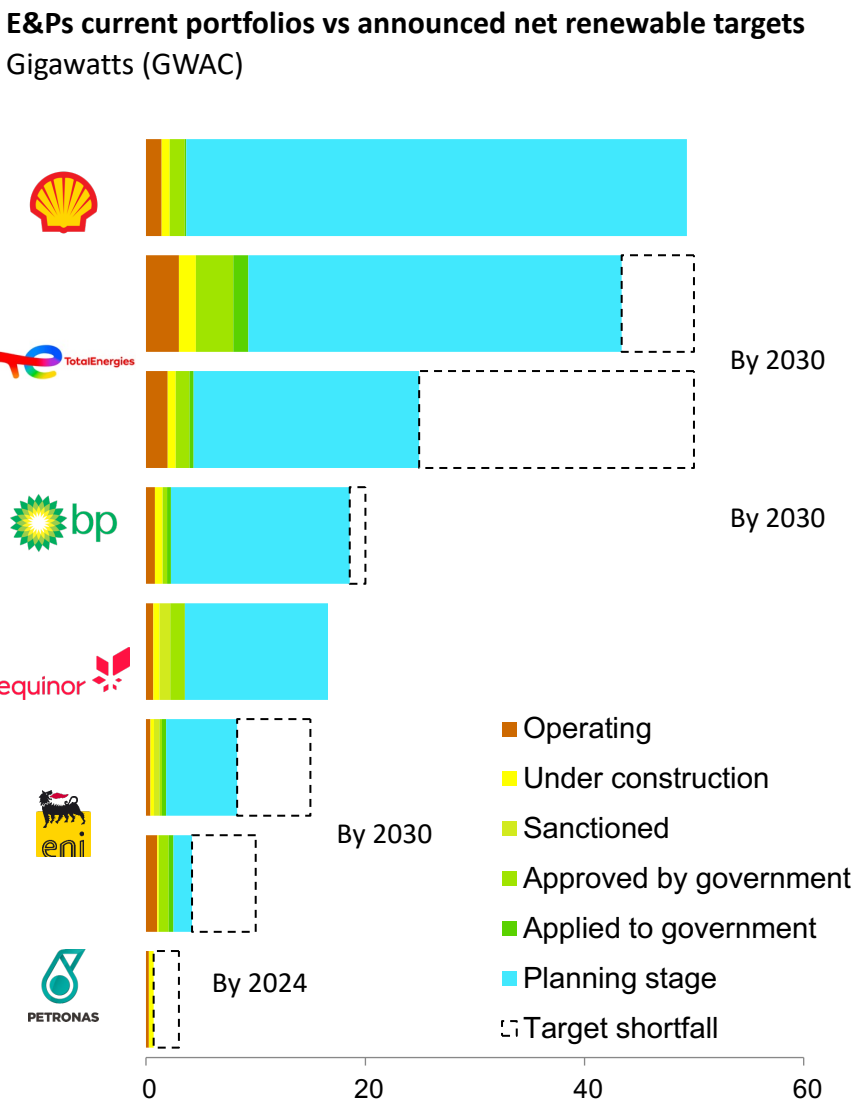
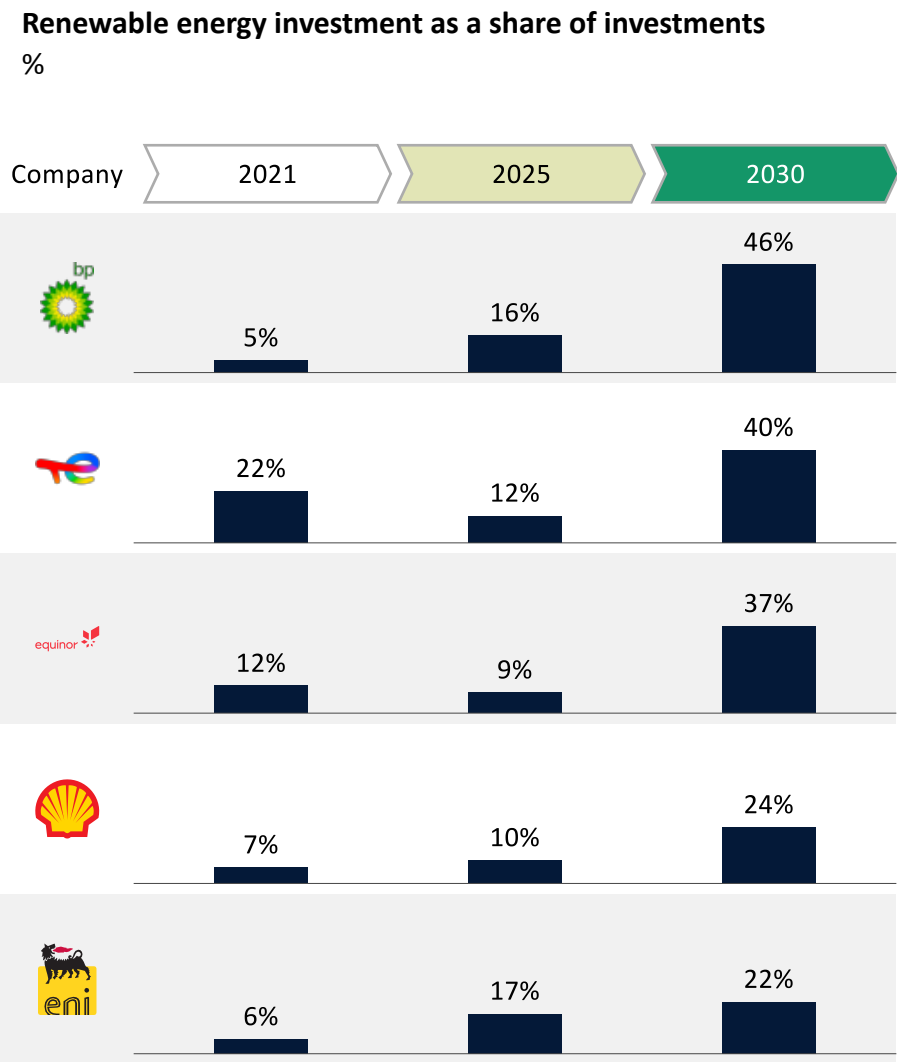
China leans on coal amid energy security push

By Andrew Hayley



A coal barge berthing is seen at Tanjung Priok port in Jakarta 26, 2011. REUTERS/Crack Palinggi

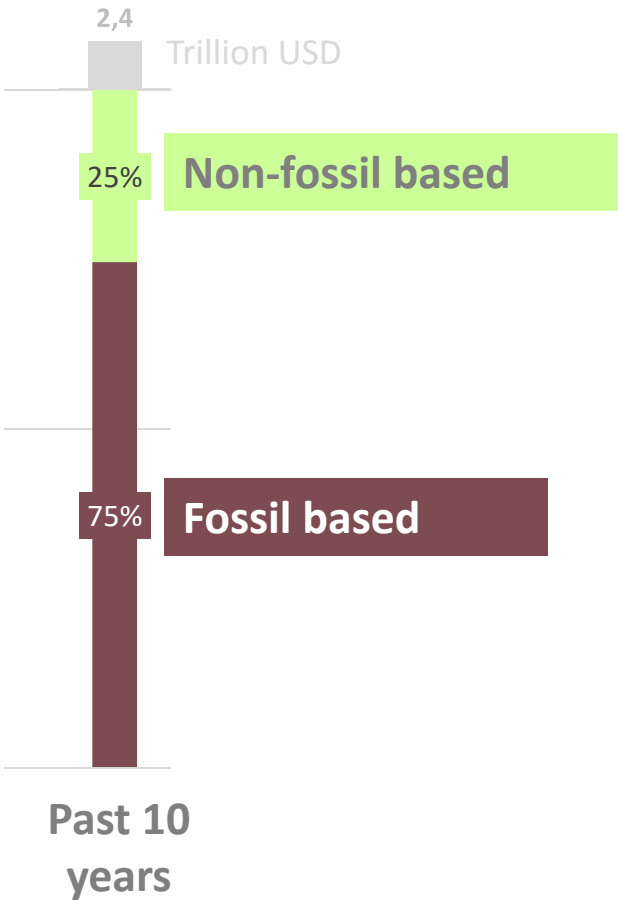
European E&Ps are making largescale renewable investments, substantial FIDs ahead



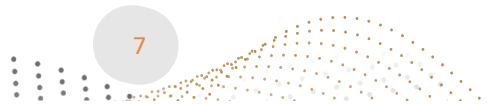
Source: Rystad Energy research and analysis; Rystad Energy E&P Energy Transition Strategy Dashboard

Energy is an extremely capital intensive industry, with fossil fuels grabbing lions share in the past

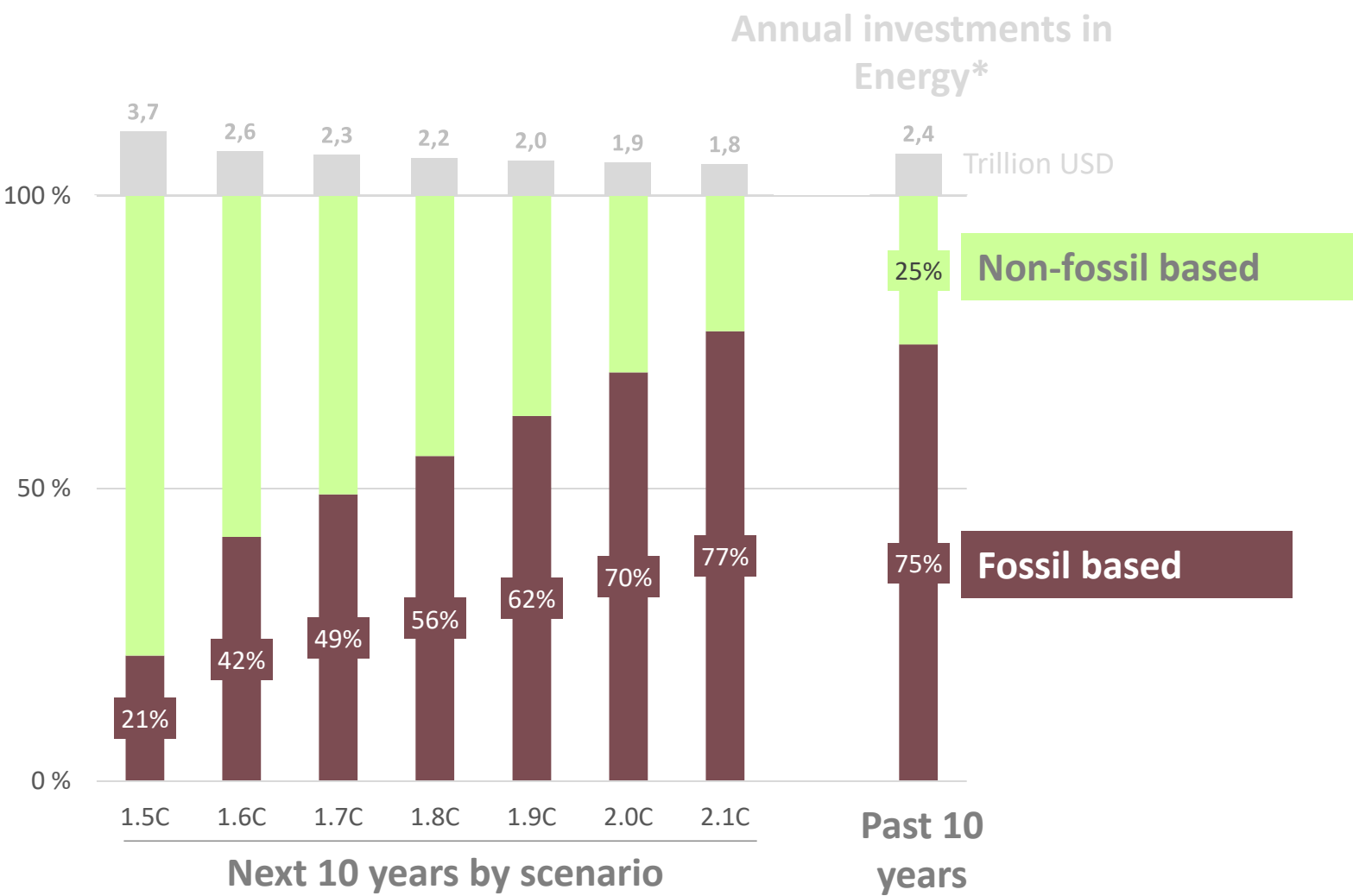
Annual investments in Energy*



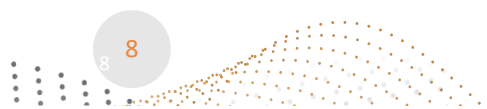
*Includes upstream energy; wells, mines, power generation. Excludes investments in downstream infrastructure and electricity grids



All future scenarios call for a re-direction of capital flows towards non-fossil Energy



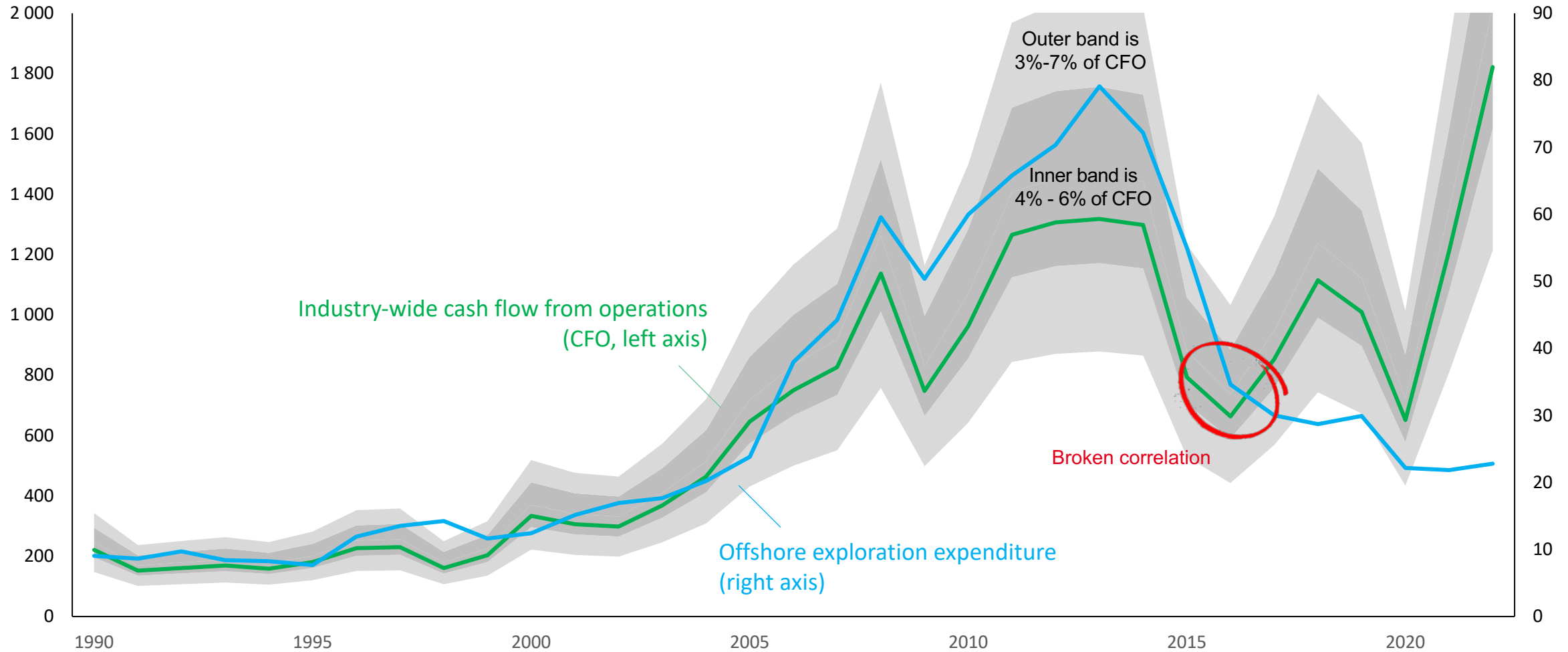
*Includes upstream energy; wells, mines, power generation. Excludes investments in downstream infrastructure like electricity grids



The appetite for capital allocation to long-cycled projects is diminishing

Operating cash flow¹ (left hand axis) vs Offshore exploration spending (right axis)

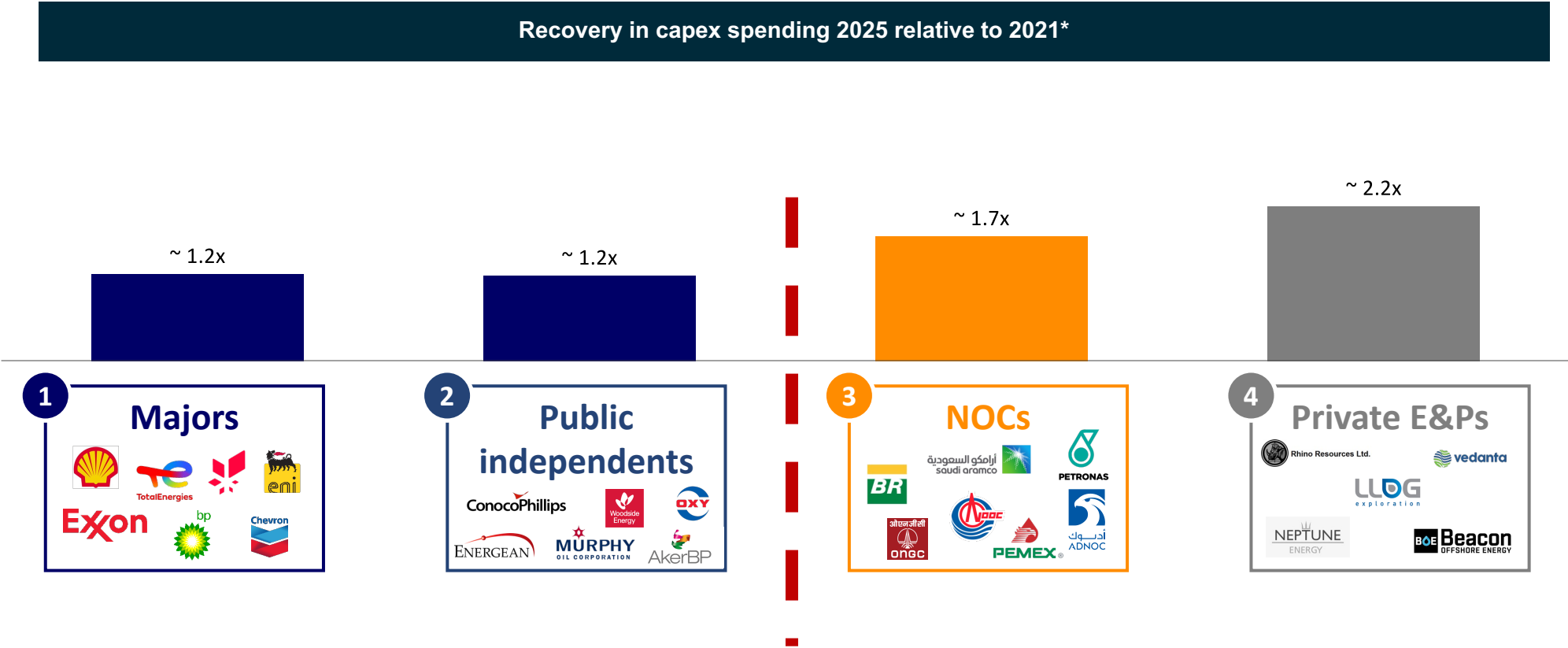
Billion USD



1. Operating cash flow is revenues minus operating costs and direct taxes.

Source: Rystad Energy research and analysis

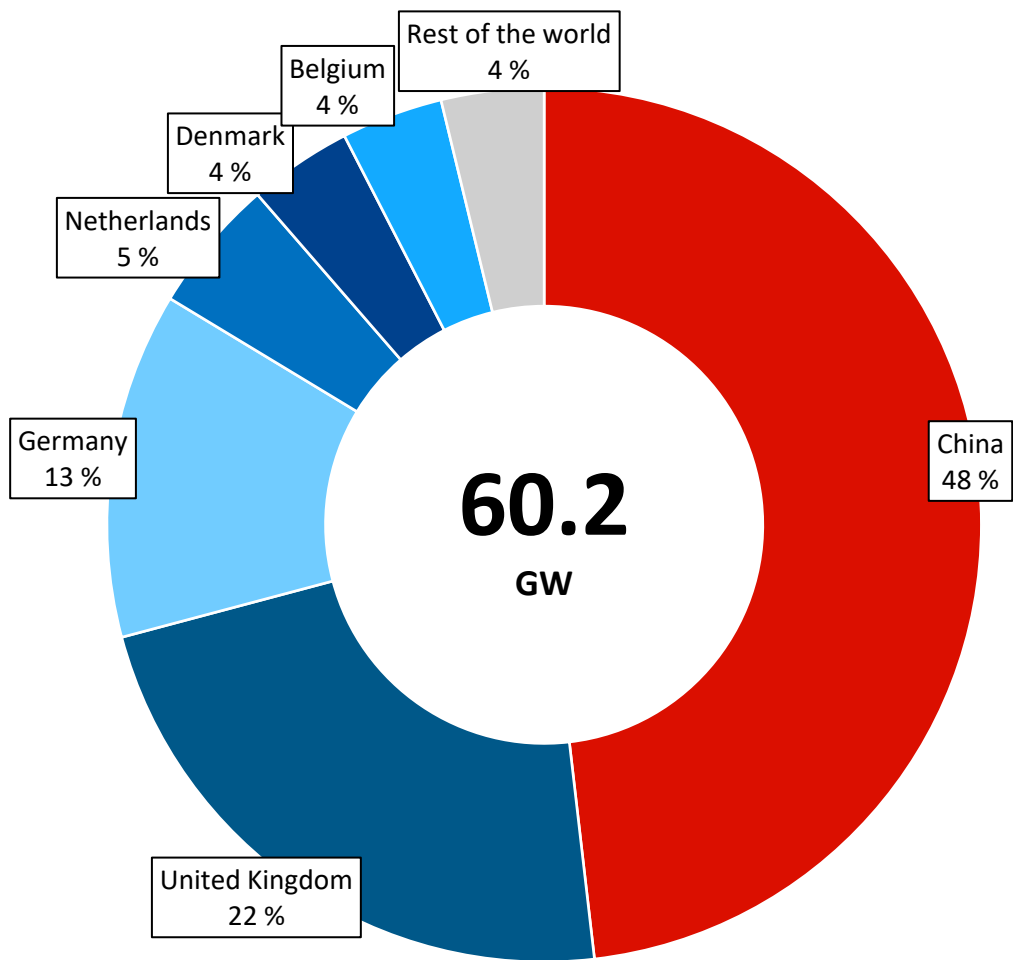
Amid the recovery, important nuances in the player landscape



Source: Rystad Energy research and analysis
*Estimated on an operated asset basis

Global operational offshore wind capacity surpassed 60 GW by year-end 2022

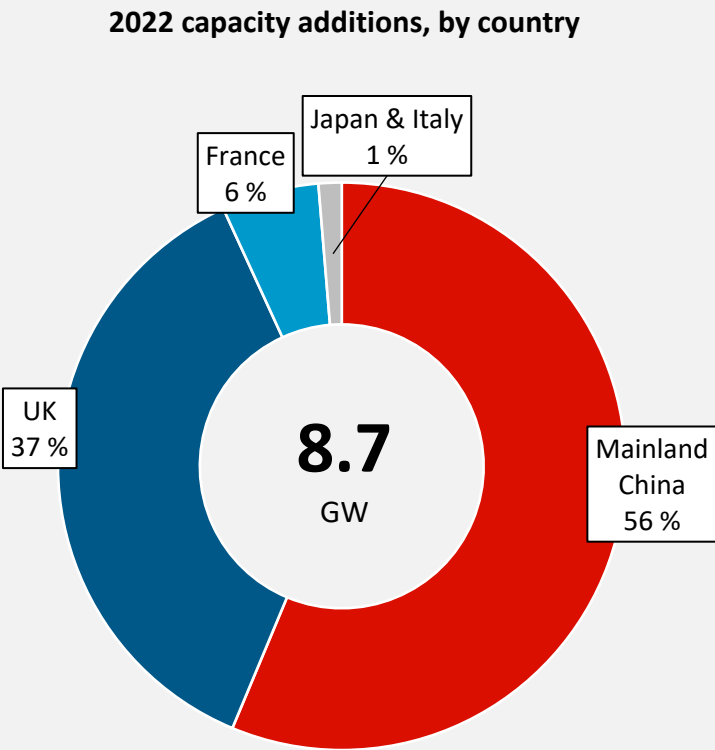
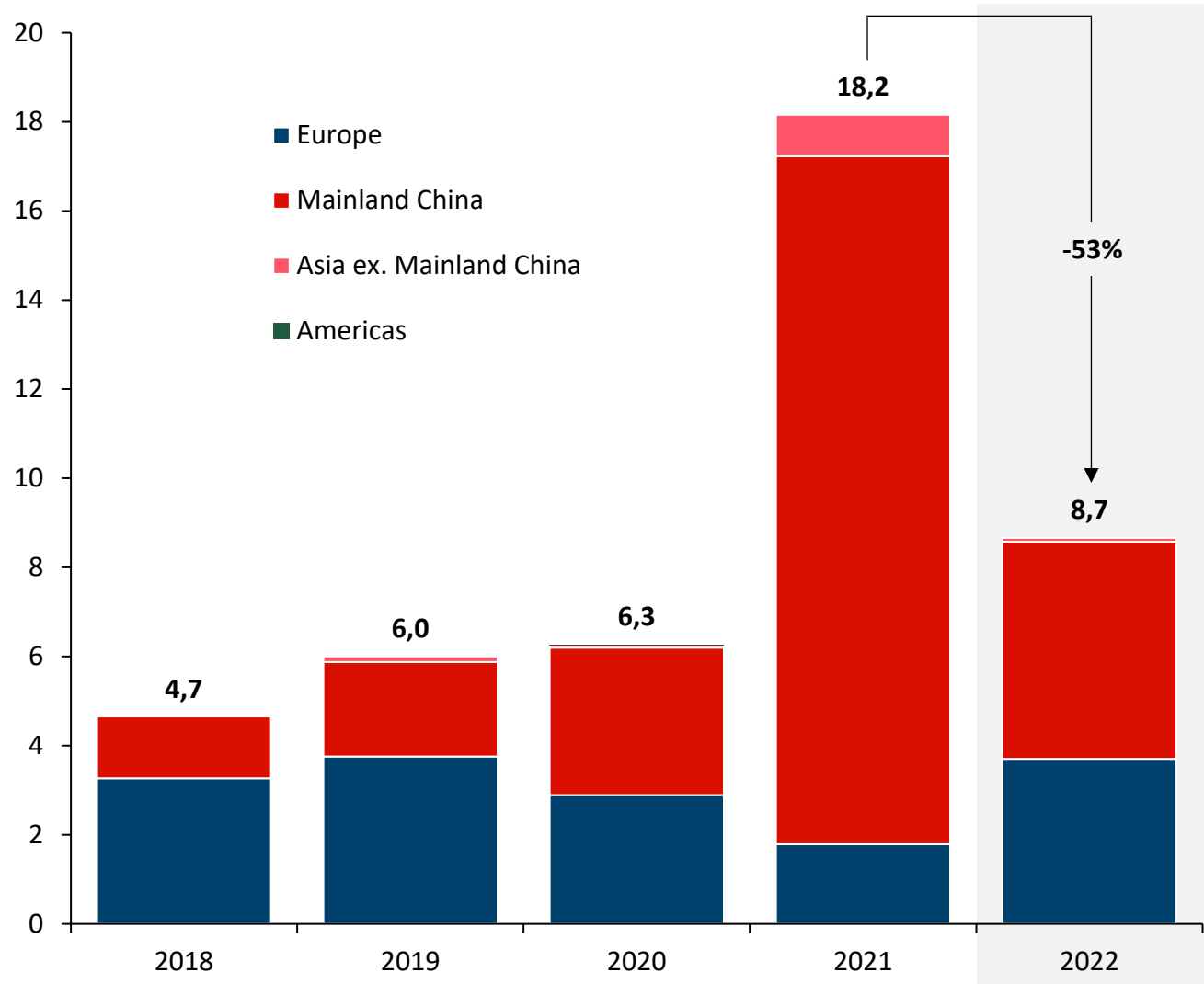
Installed base of capacity by 2022 year-end
Share (%)



Source: Rystad Energy OffshoreWindCube; Rystad Energy research and analysis

Capacity additions more than halved y-o-y in 2022 after China's record-breaking 2021

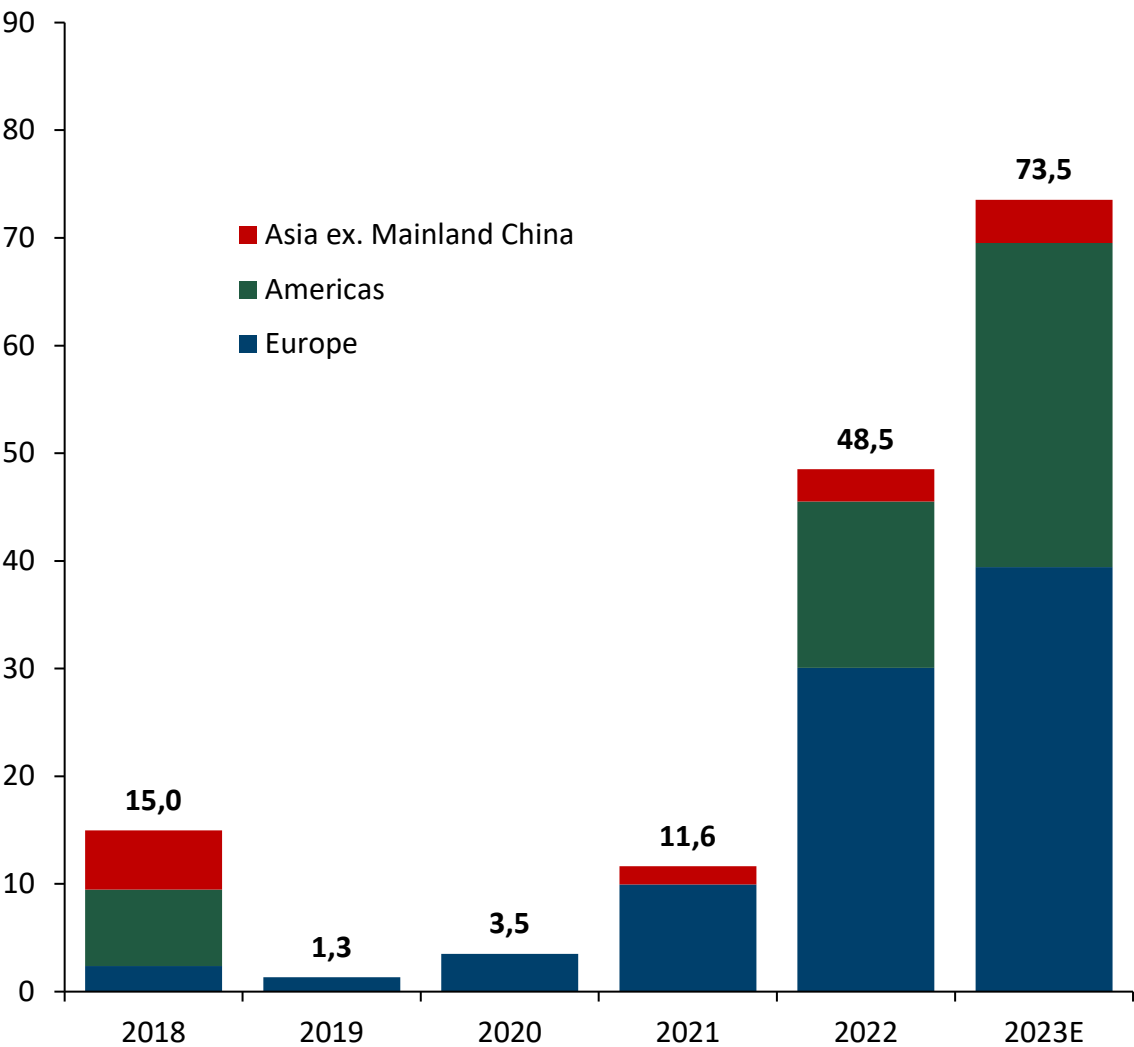
Annual capacity additions 2016-2021, split by country
Gigawatts



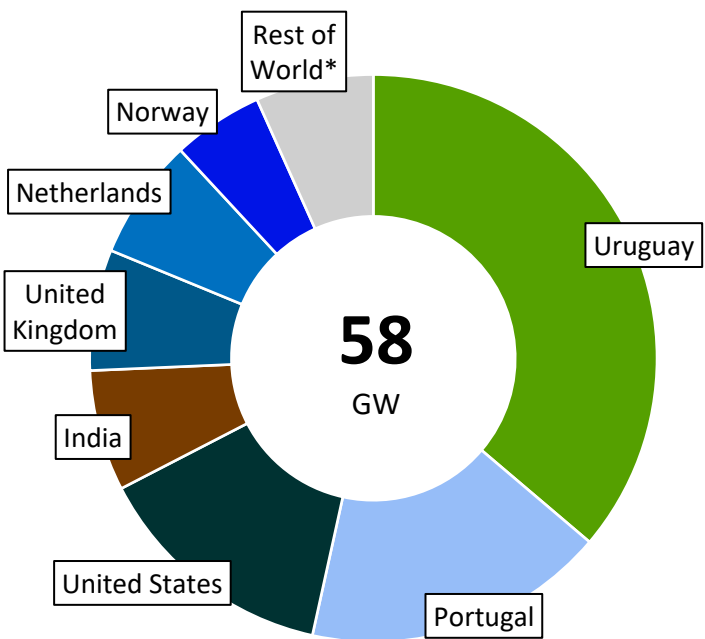
Source: Rystad Energy Offshore Wind Dashboard; Rystad Energy research and analysis

Auction awards increased significantly in 2022, and set to rise further in 2023

Offshore wind auction/lease capacity by award year, split by region
Gigawatts



Auctions/lease sales expected to launch in 2023, by country
Gigawatts

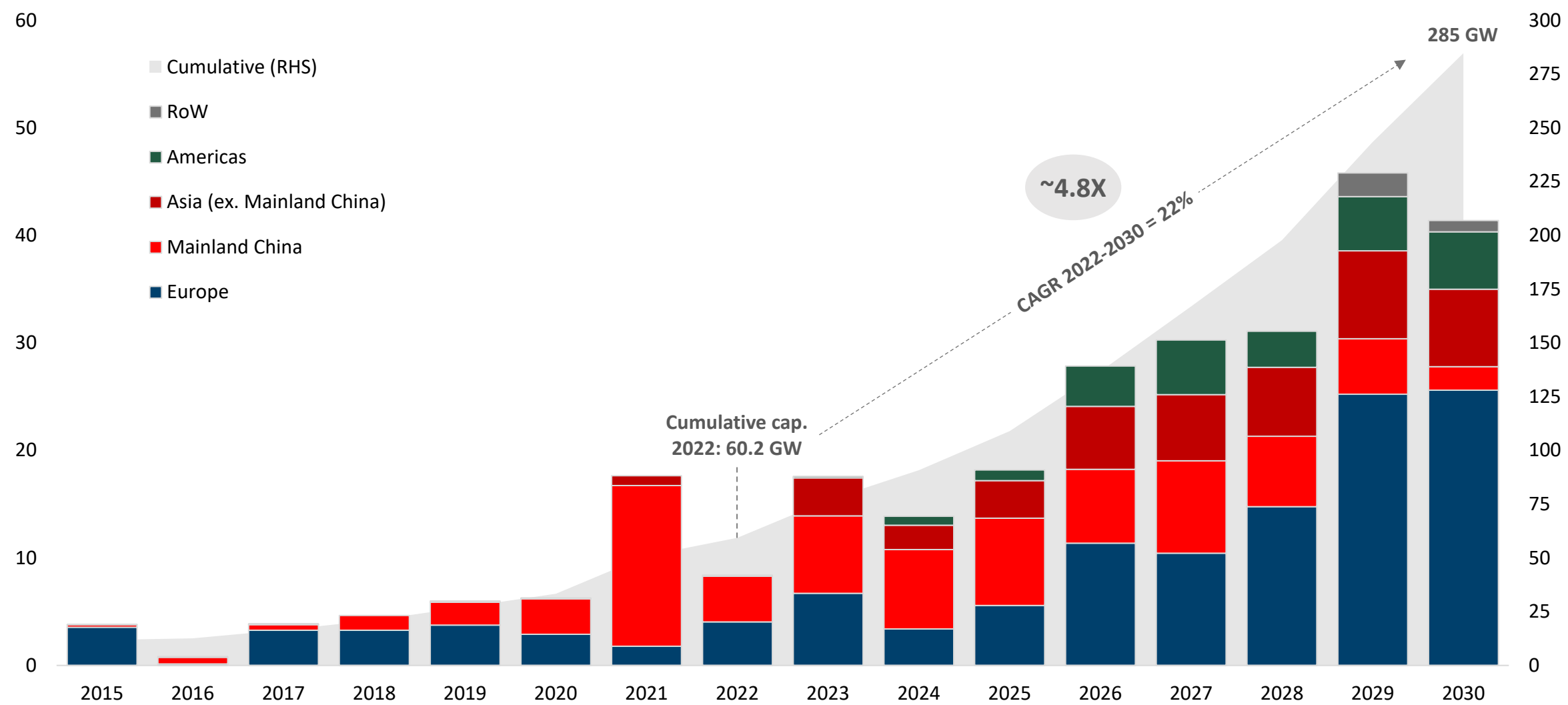


*Rest of World includes Denmark, Colombia, Germany, Lithuania and Spain

Source: Rystad Energy Offshore Wind Dashboard; Rystad Energy research and analysis

Global offshore wind capacity to grow nearly five-fold from 2022 to 2030

Annual capacity additions by region (LHS), and global cumulative capacity (RHS)
Gigawatts

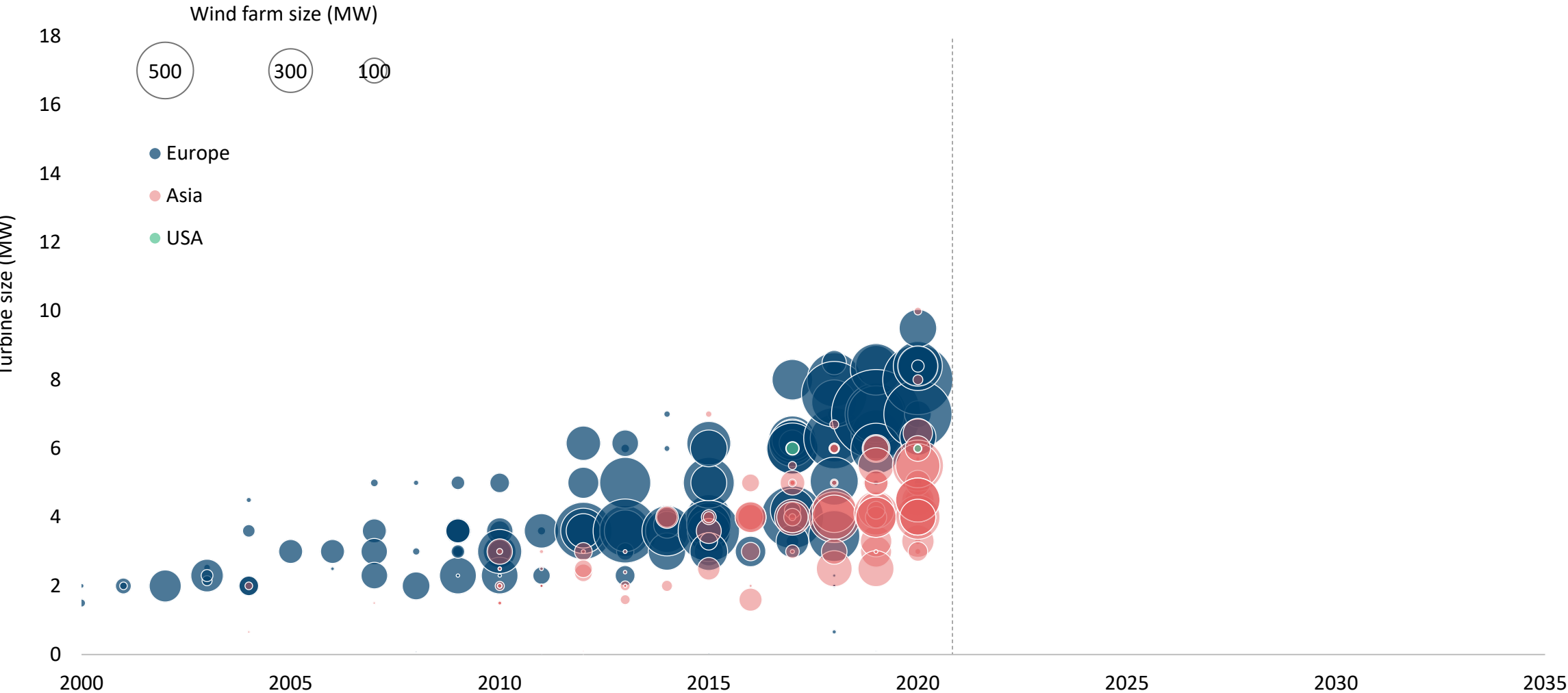


Source: Rystad Energy OffshoreWindCube; Rystad Energy research and analysis

Projects are getting bigger in size, leveraging advances in turbine technology

Offshore wind farms by start-up year, turbine size and capacity

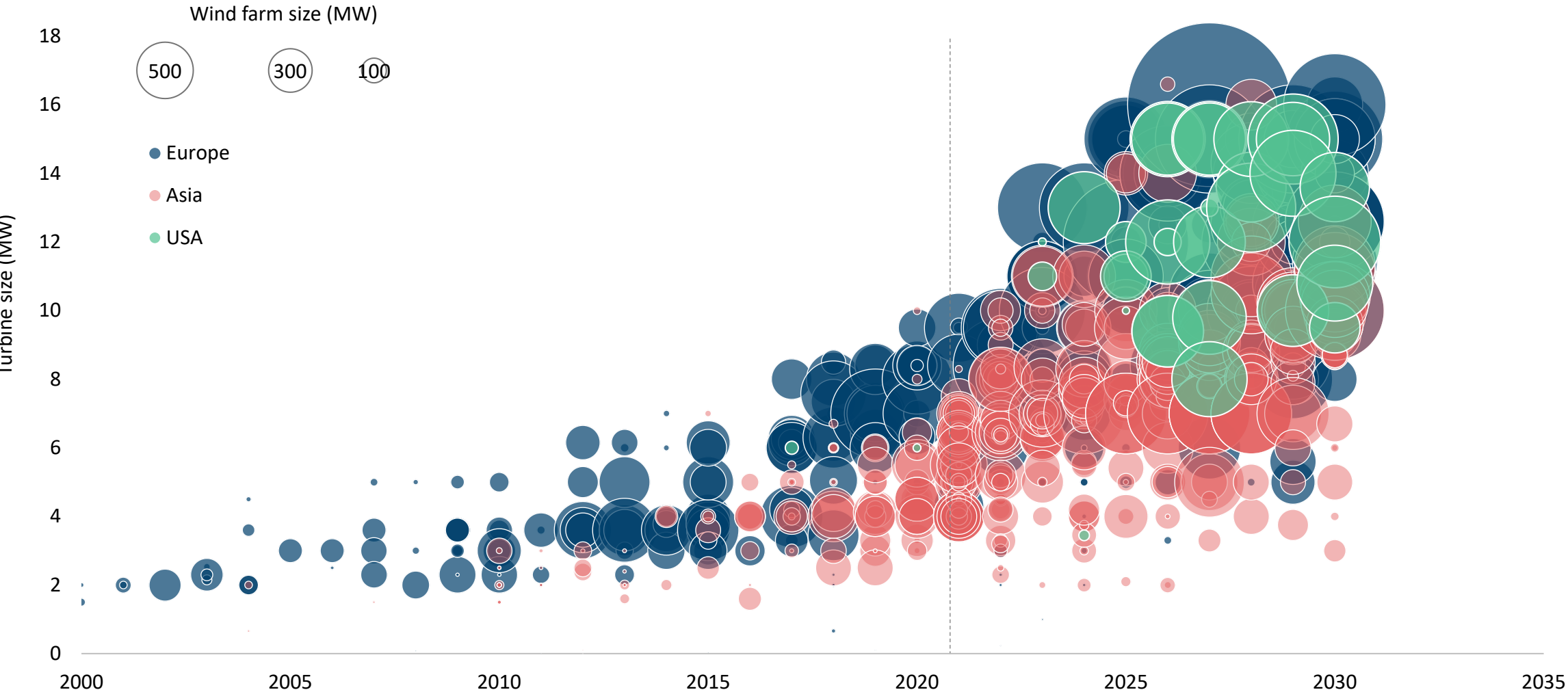
Megawatts, size of the bubble correspond to project sizes



Source: Rystad Energy OffshoreWindCube

European and US developers planning for largest turbines in the market and large wind farms

Offshore wind farms by start-up year, turbine size and capacity
Megawatts, size of the bubble correspond to project sizes

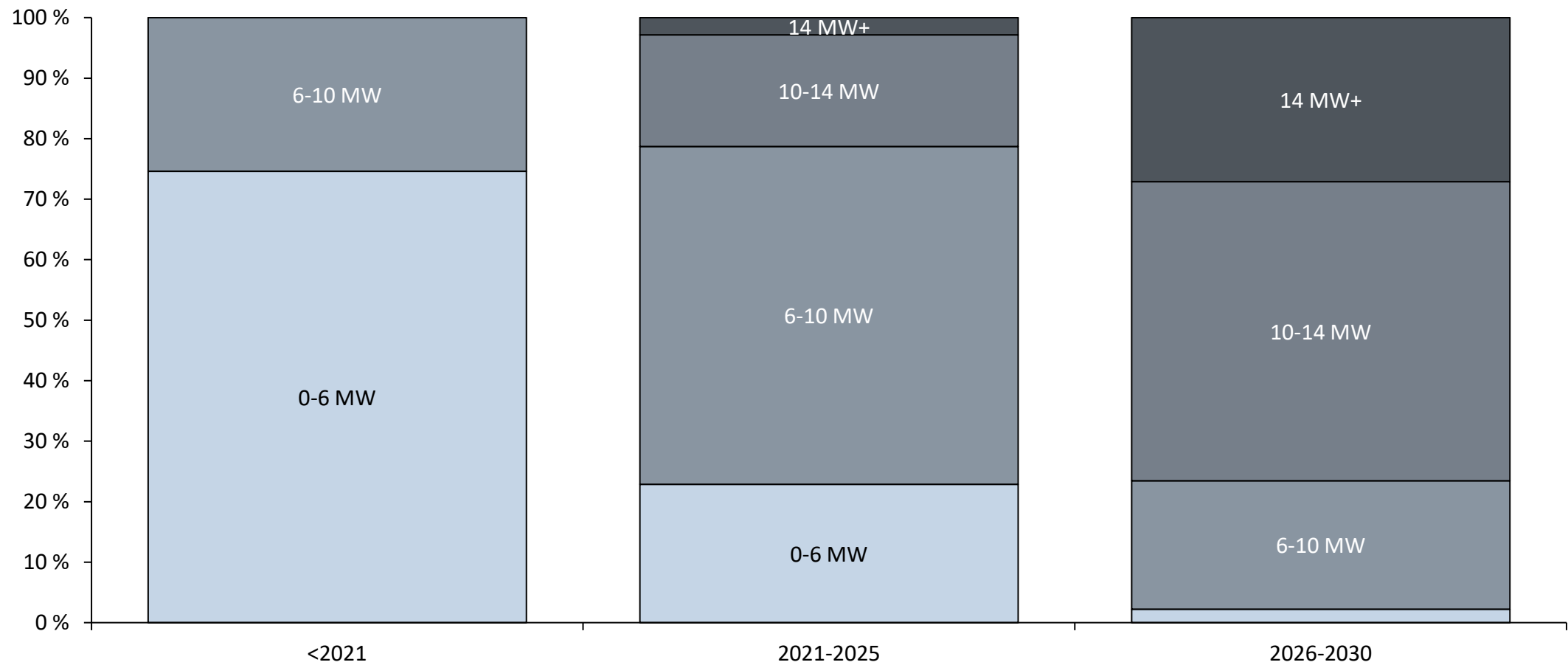


Source: Rystad Energy OffshoreWindCube

Three quarters of turbines to be installed from 2026 are above 10MW

Share of installed turbines by size (in megawatts)*

Share (%) of number of turbines

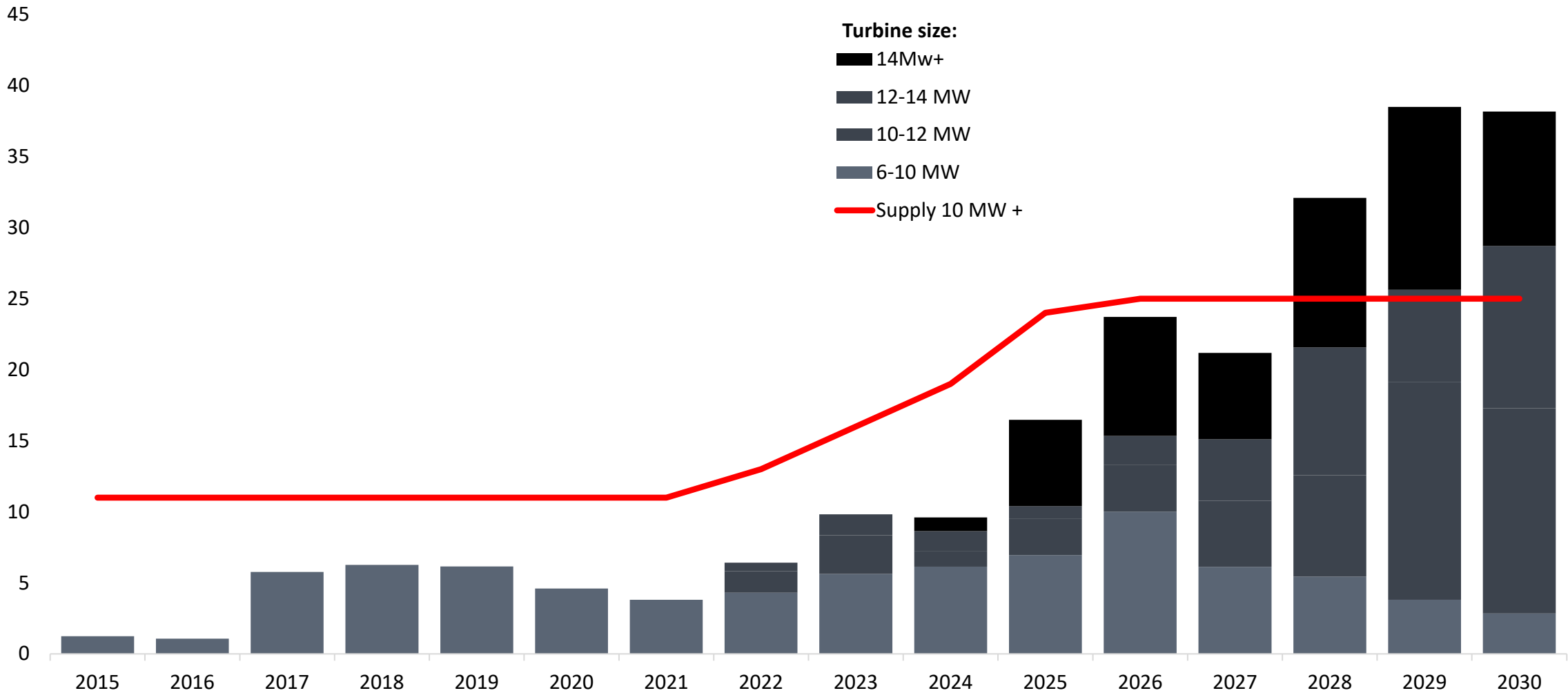


*Ground turbines only. Excluding mainland China and intertidal windfarms
Source: Rystad Energy OffshoreWindCube

Significant increase in WTIV demand, larger turbines to require next-generation vessels

Supply and demand for wind turbine installation vessels*

Vessel years**



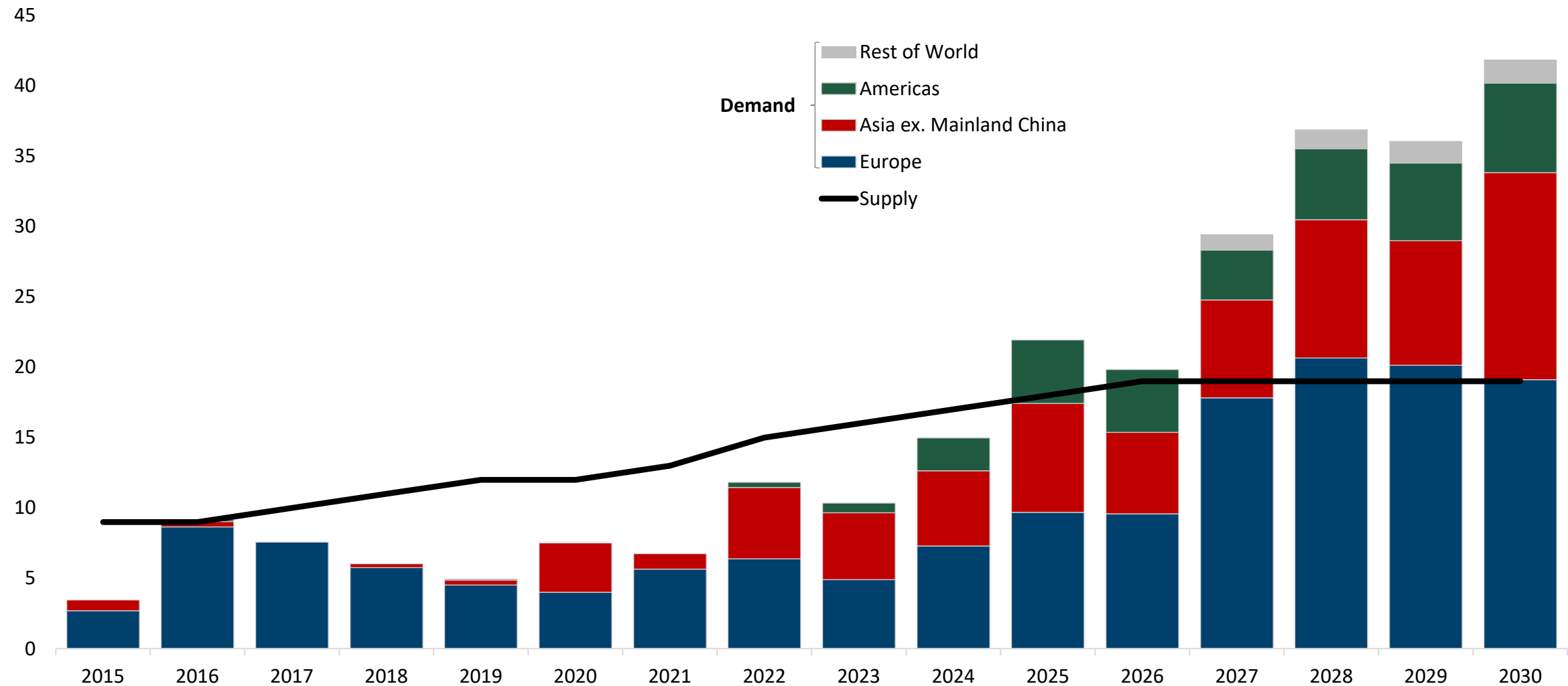
*Current fleet and newbuilds, purpose-built vessels capable of installing 10MW+ turbines only. **Excluding demand from China and intertidal wind farms.

Source: Rystad Energy OffshoreWindCube, Rystad Energy research and analysis

Foundation installation demand to outpace supply of dedicated vessels by mid-decade

Supply and demand for foundation installation vessels*

Vessel years**

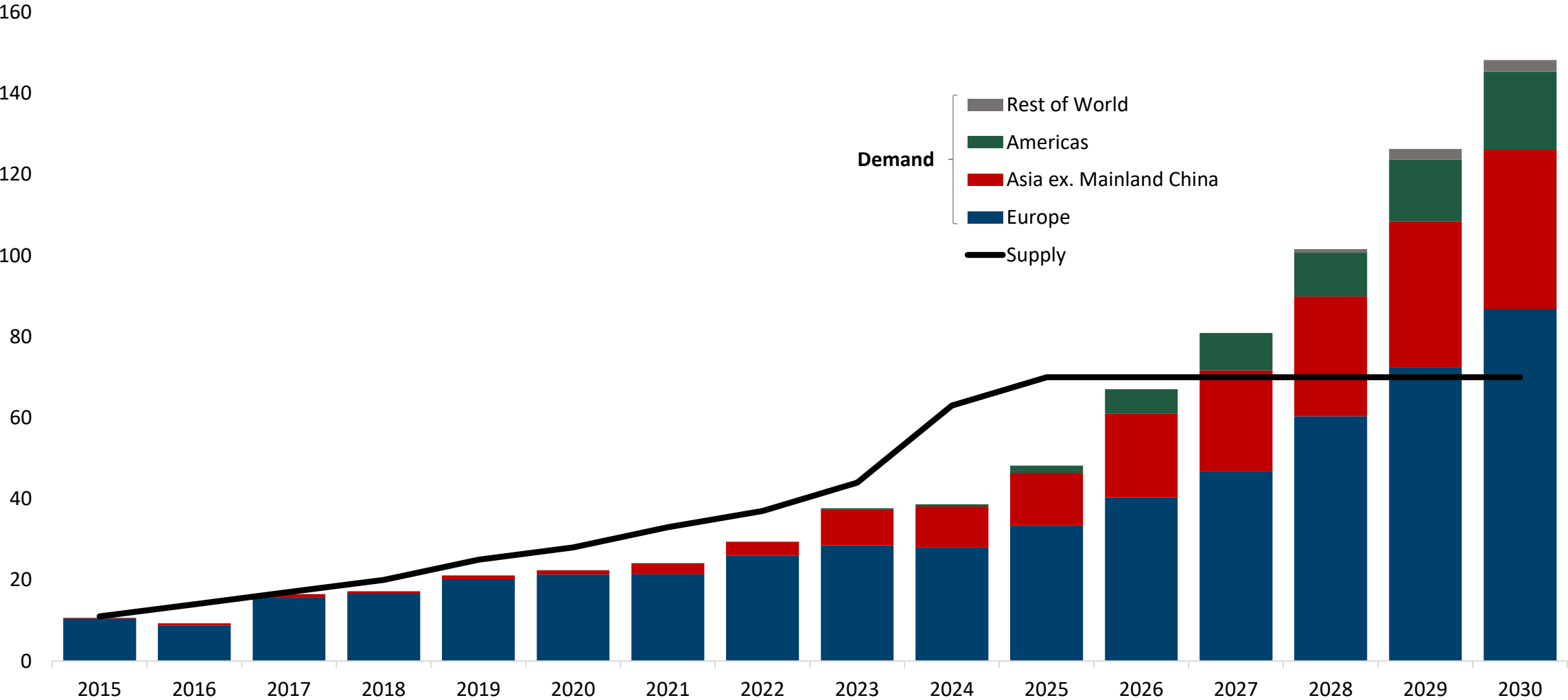


*Supply includes core fleet only. **Excluding demand from China and intertidal wind farms.
Source: Rystad Energy OffshoreWindCube, Rystad Energy research and analysis

Many SOVs deliveries in coming years, bottlenecks less likely compared to other vessel segments

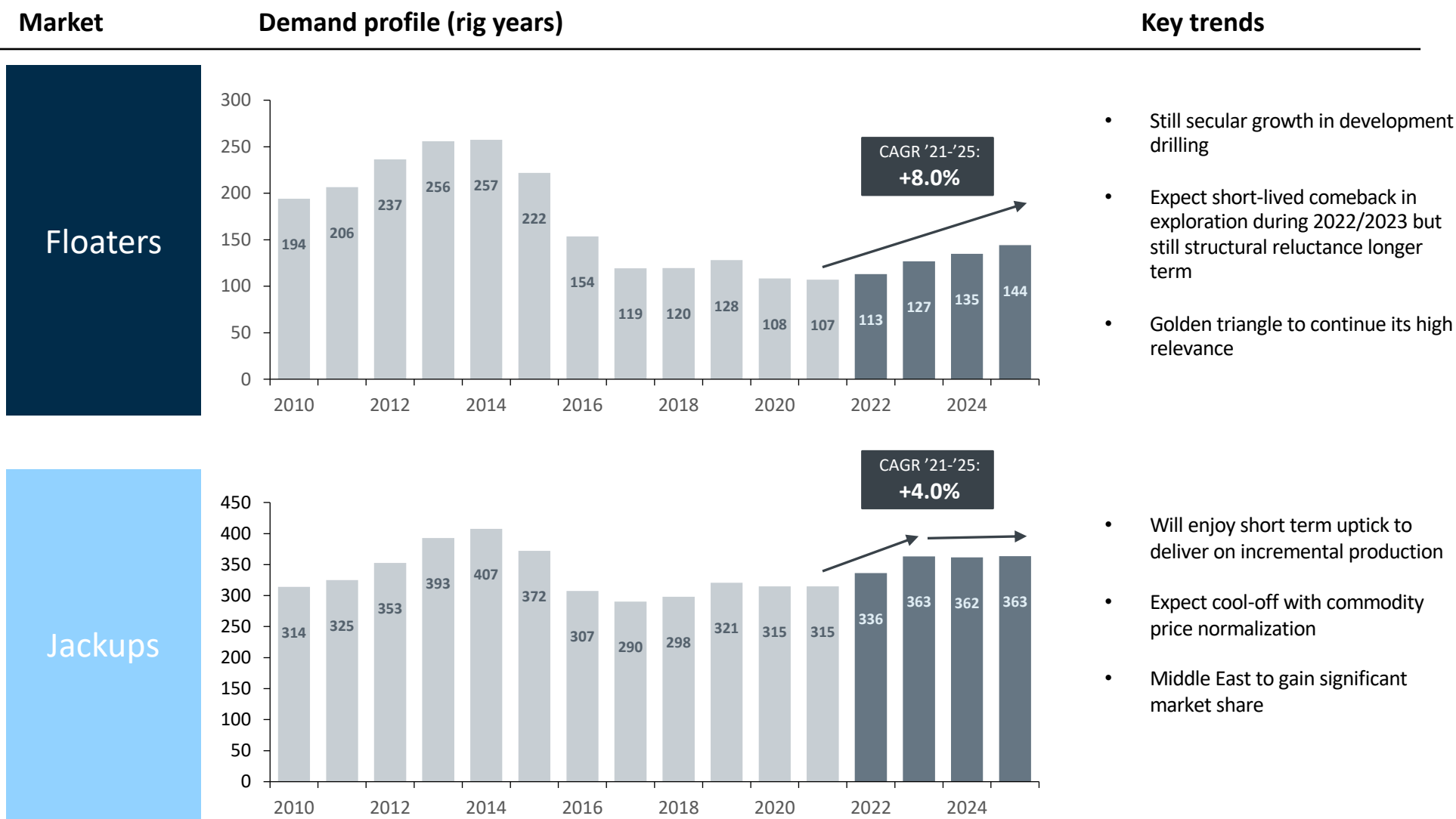
Supply and demand for service operation vessels*

Vessel years



*Excluding supply and demand from China, and demand from intertidal wind farms.
Source: Rystad Energy OffshoreWindCube, Rystad Energy research and analysis

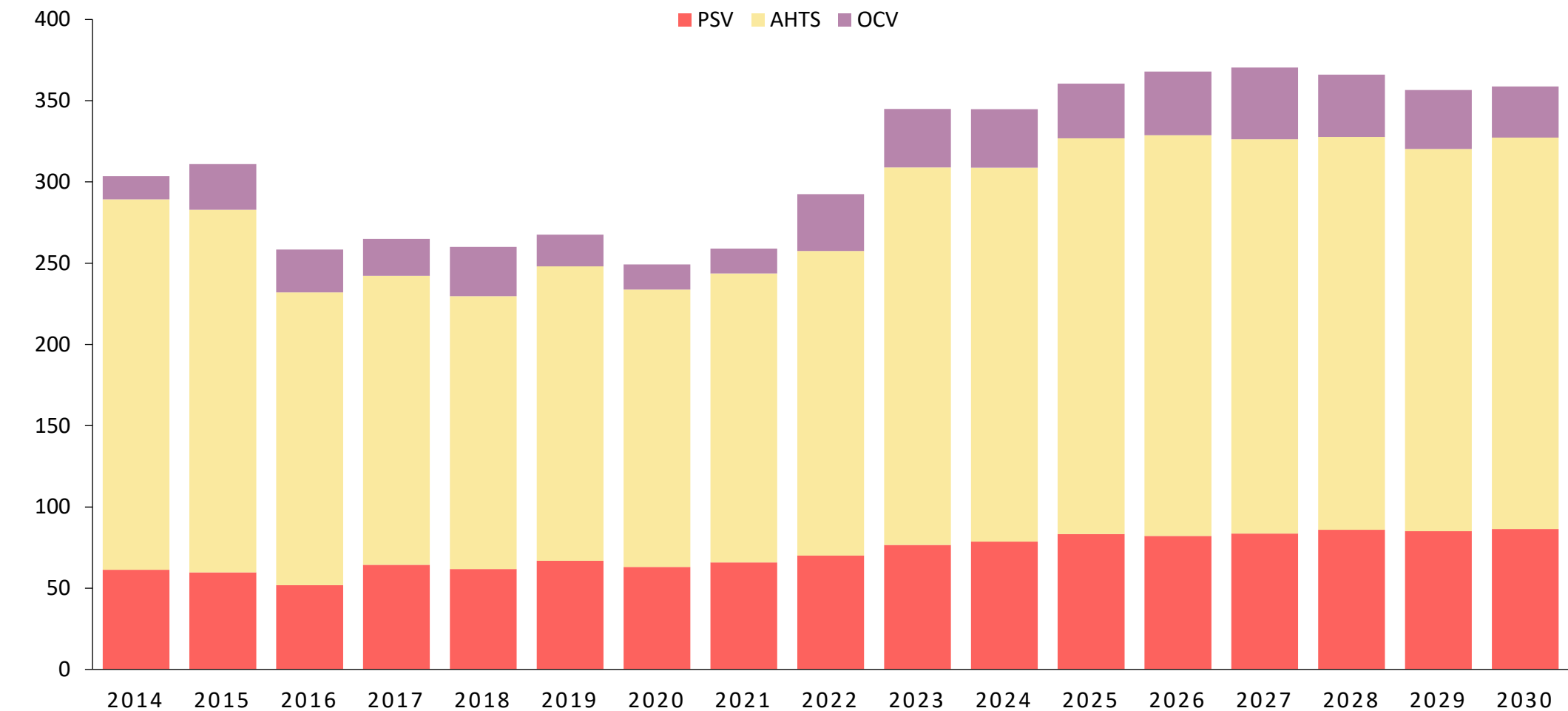
Increased drilling activity is driving offshore vessel demand



Source: Rystad Energy RigCube

Increased jackup activity in the Middle East bodes well for AHTS in the region

Middle East Offshore vessel demand by vessel type
Vessel years



Source: Rystad Energy Offshore Vessels Analysis dashboard



RystadEnergy

Navigating the future of **energy**

Rystad Energy is an independent energy consulting services and business intelligence data firm offering global databases, strategic advisory and research products for energy companies and suppliers, investors, investment banks, organizations, and governments.

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