

WIND PROJECTS LATAM



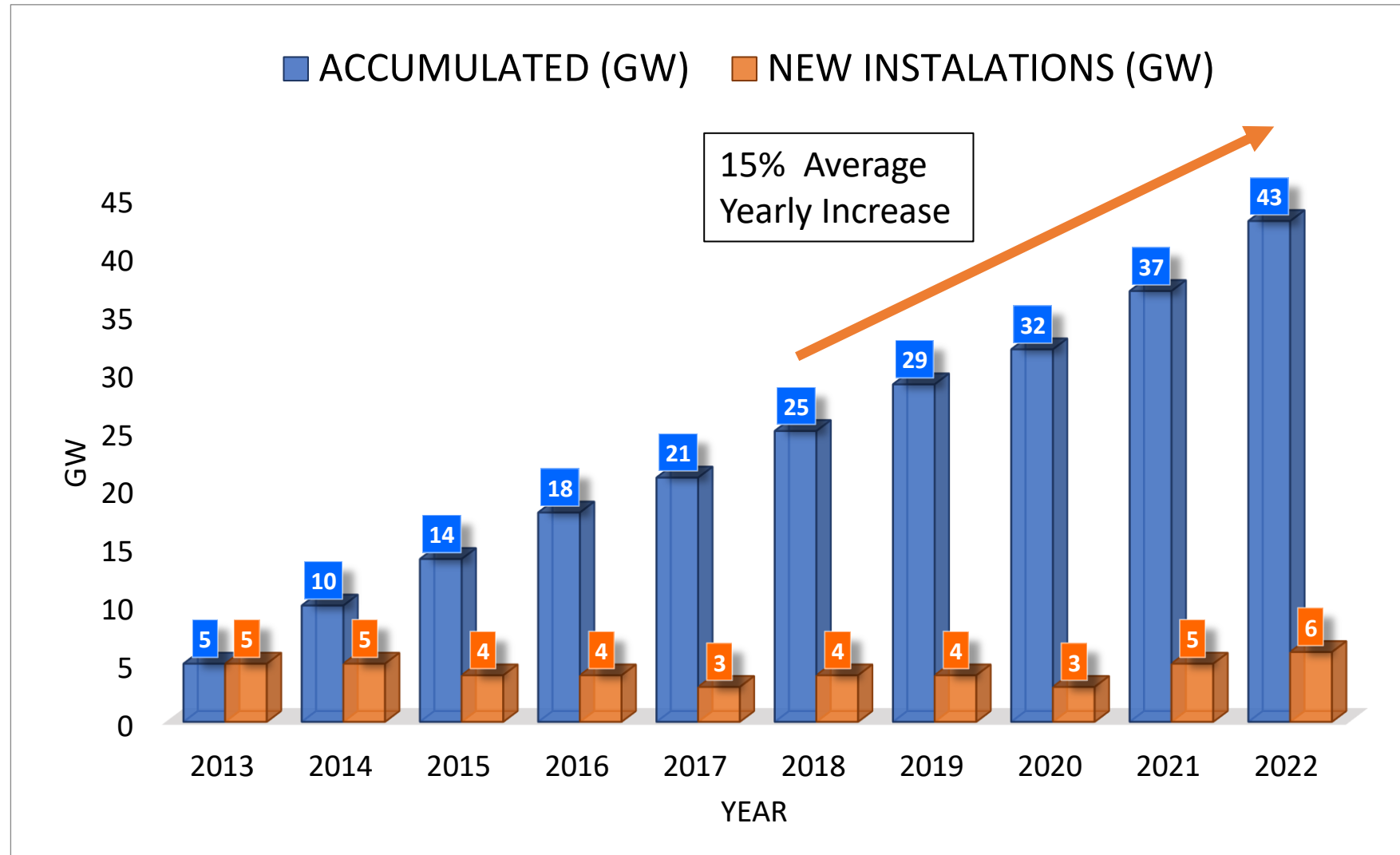
ONSHORE WINDMILLS



OFFSHORE WINDMILLS

CAPACITY OF WIND ENERGY (GW) IN LATAM

- LATAM Onshore wind Capacity of energy will be 50 GW in 2022
- Capacity of energy increased by 4 to 5 GW/year (2013-2021)
- 2022 will be an exceptional year (6 GW)

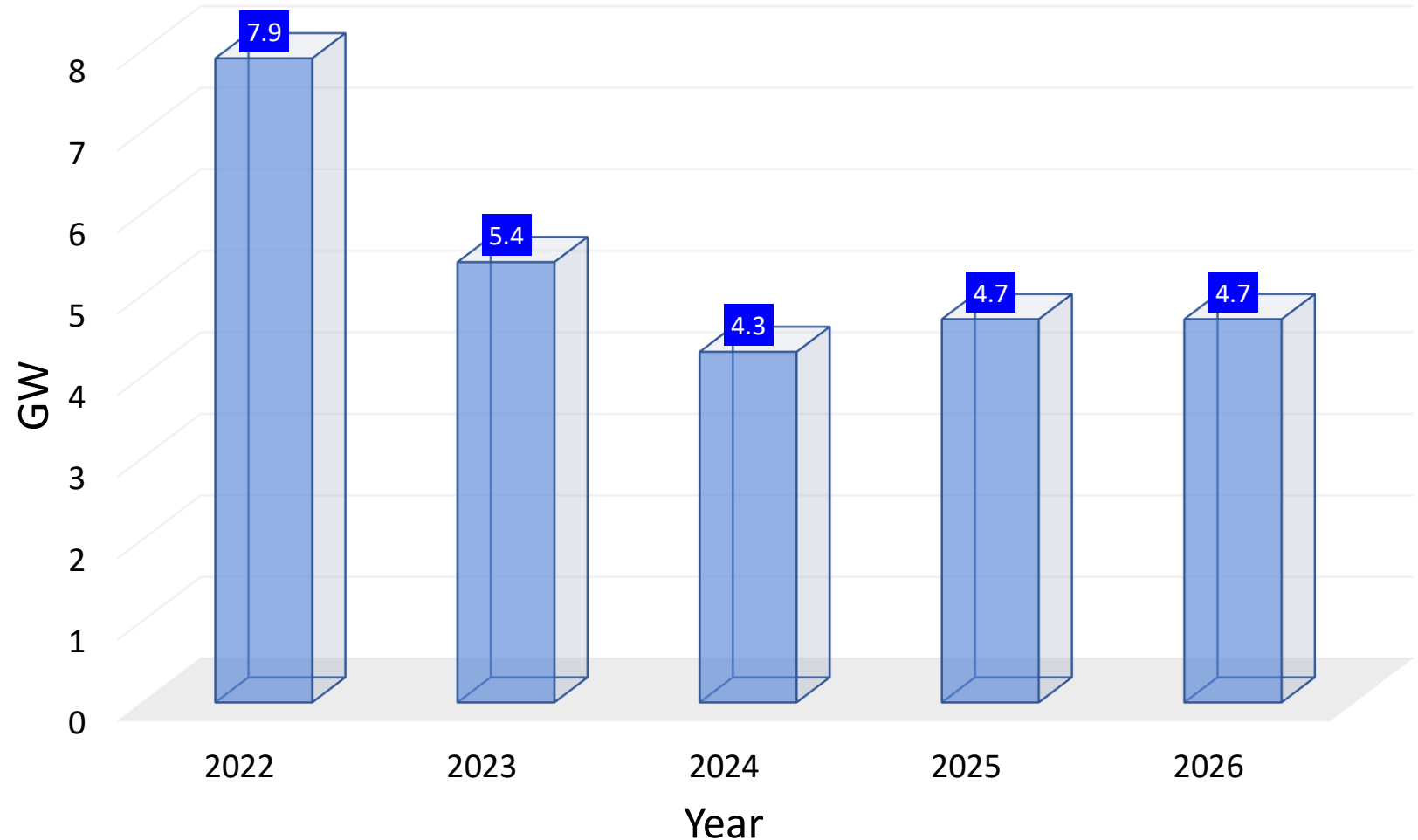


GW = GIGAWATTS = 1000 MEGAWATTS

ONSHORE WIND OUTLOOK (LATAM)

NEW INSTALLATIONS OF WTG IN GW

- 2022 - Onshore Wind project is booming
Pandemic and global shipping crisis
- Capacity will continue to grow by 4-5 GW/year
- Expected growth is from 8% to 12% in the next 4 years
- Global average 6%



COMBINAR CON LA HOJA ANTERIOR

TOTAL MARKET DISTRIBUTION (50 GW)

- 42% of installed capacity is in Brazil
- 15% of installed capacity is in MX
- 16 % of capacity is in Argentina, Chile and Uruguay
- Other countries represent 27%





ONSHORE WIND CHALLENGES





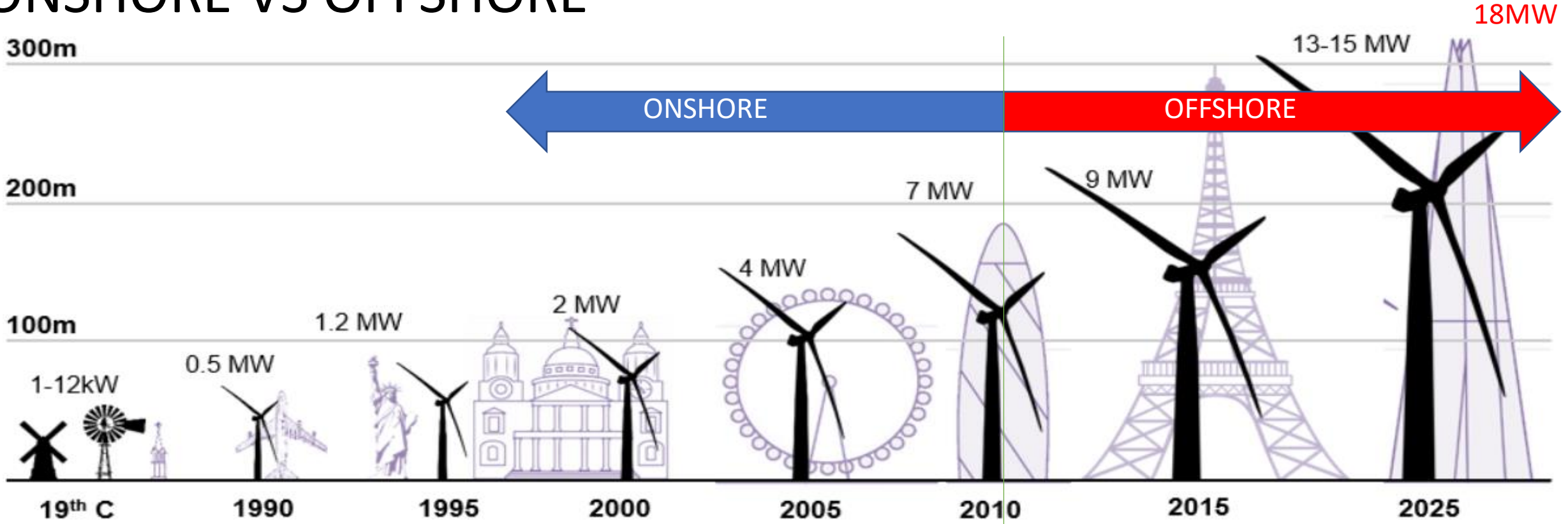
TRANSPORT BY ROAD



A photograph of an offshore wind farm with several white wind turbines on a blue sea under a clear blue sky. The turbines are arranged in a line, receding into the distance. The image is partially framed by a white curved line on the right side.

OFFSHORE WIND LATAM

EVOLUTION OF WIND TURBINE ONSHORE VS OFFSHORE

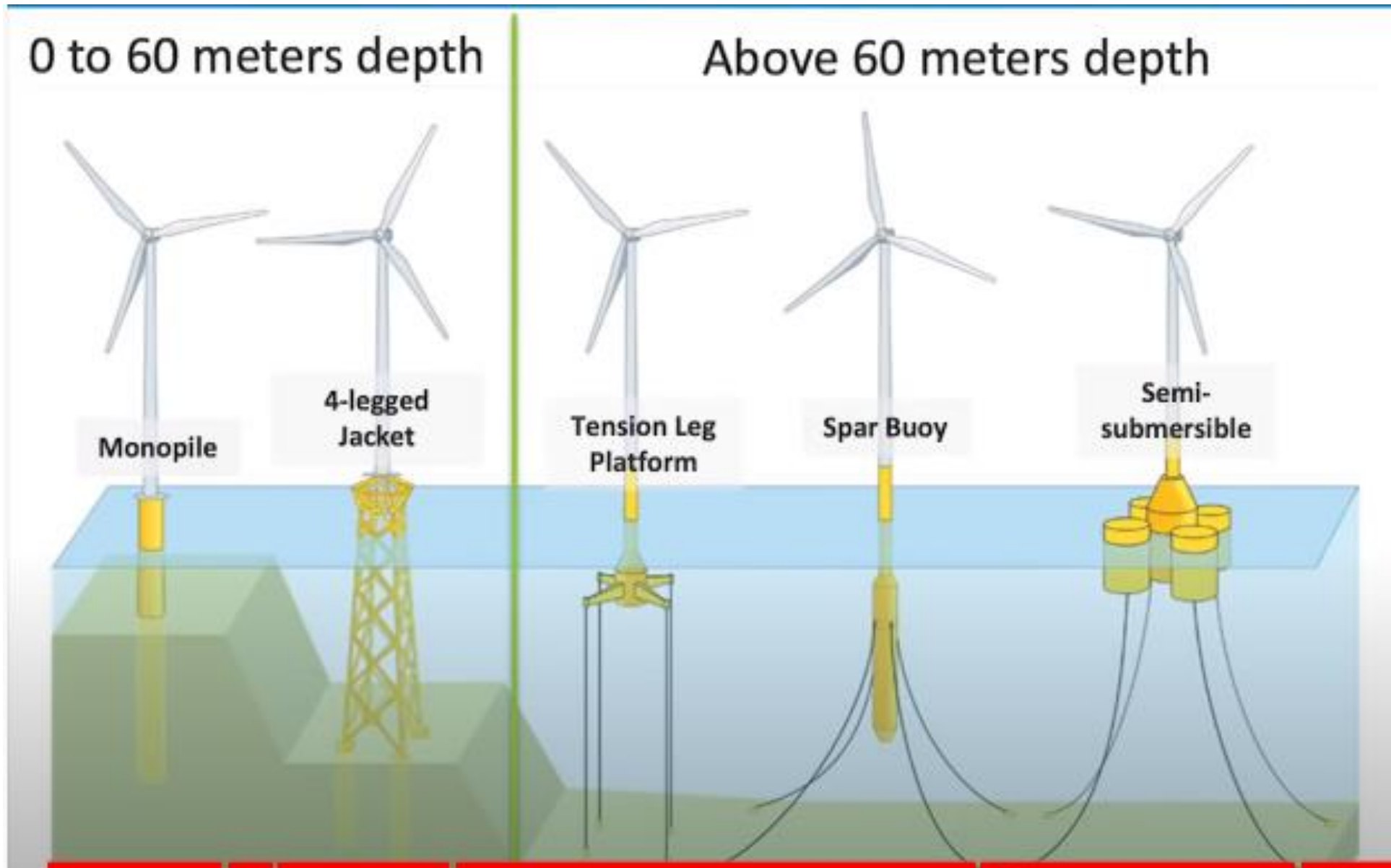


Sources: Various; Bloomberg New Energy Finance

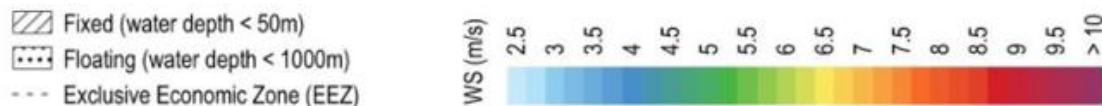
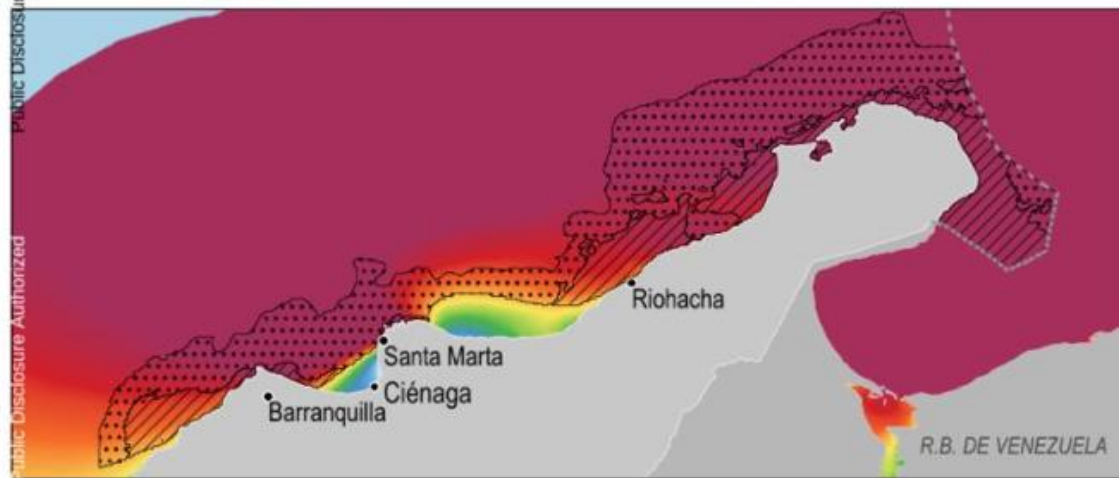
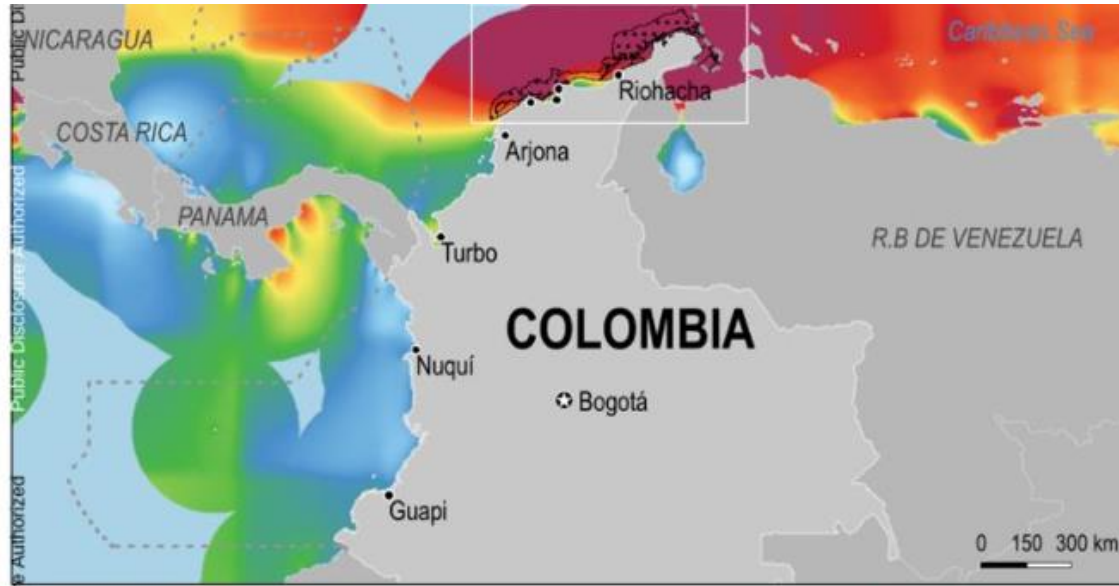
TIV FOR ONSHORE : USD 1.000.000/GW

TIV FOR OFFSHORE : USD 3.000.000/GW

OFFSHORE WIND FARM TYPES

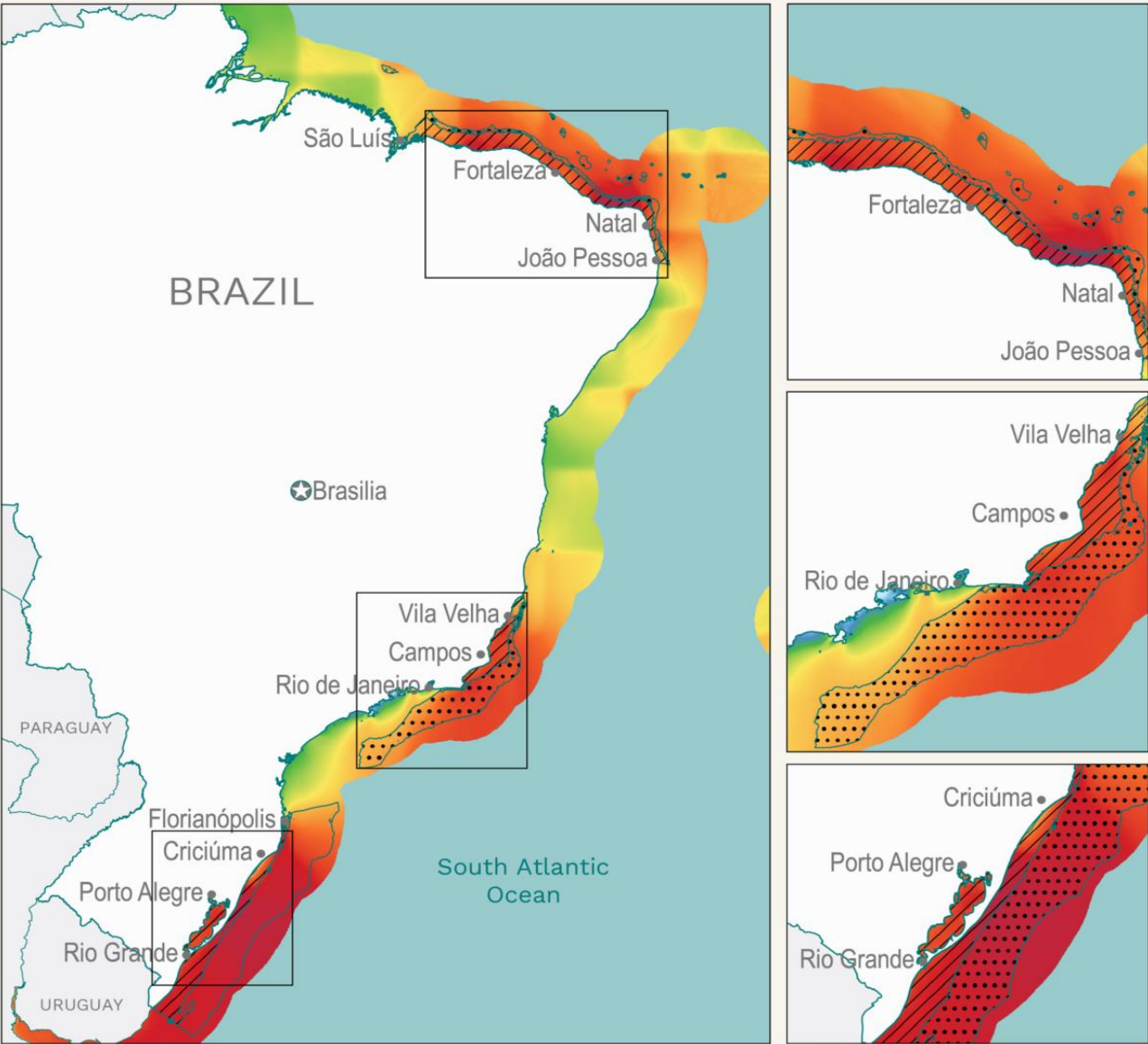


OFFSHORE WIND POTENTIAL COLOMBIA



- 50 GW potential Fixed & Floating
- Wind Speed Average > 10m/s
- 6 GW in development

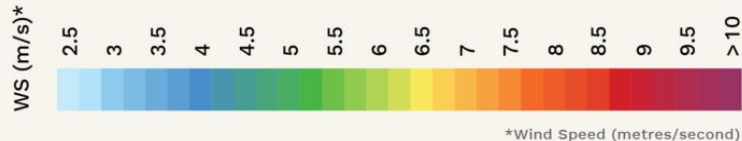
OFFSHORE WIND POTENTIAL BRAZIL



Offshore wind Technical potential in Brazil

Fixed offshore wind potential capacity:
480 GW
 Floating offshore wind potential capacity:
748 GW
GW Total:
1,228 GW

- Fixed installations (water depth < 50m)
- Floating installations (water depth < 1000m)
- Exclusive Economic Zone (EEZ)



Source: <https://documents1.worldbank.org/curated/en/902341586847107376/pdf/Technical-Potential-for-Offshore-Wind-in-Brazil-Map.pdf>
 World Bank Group
 ESMAP

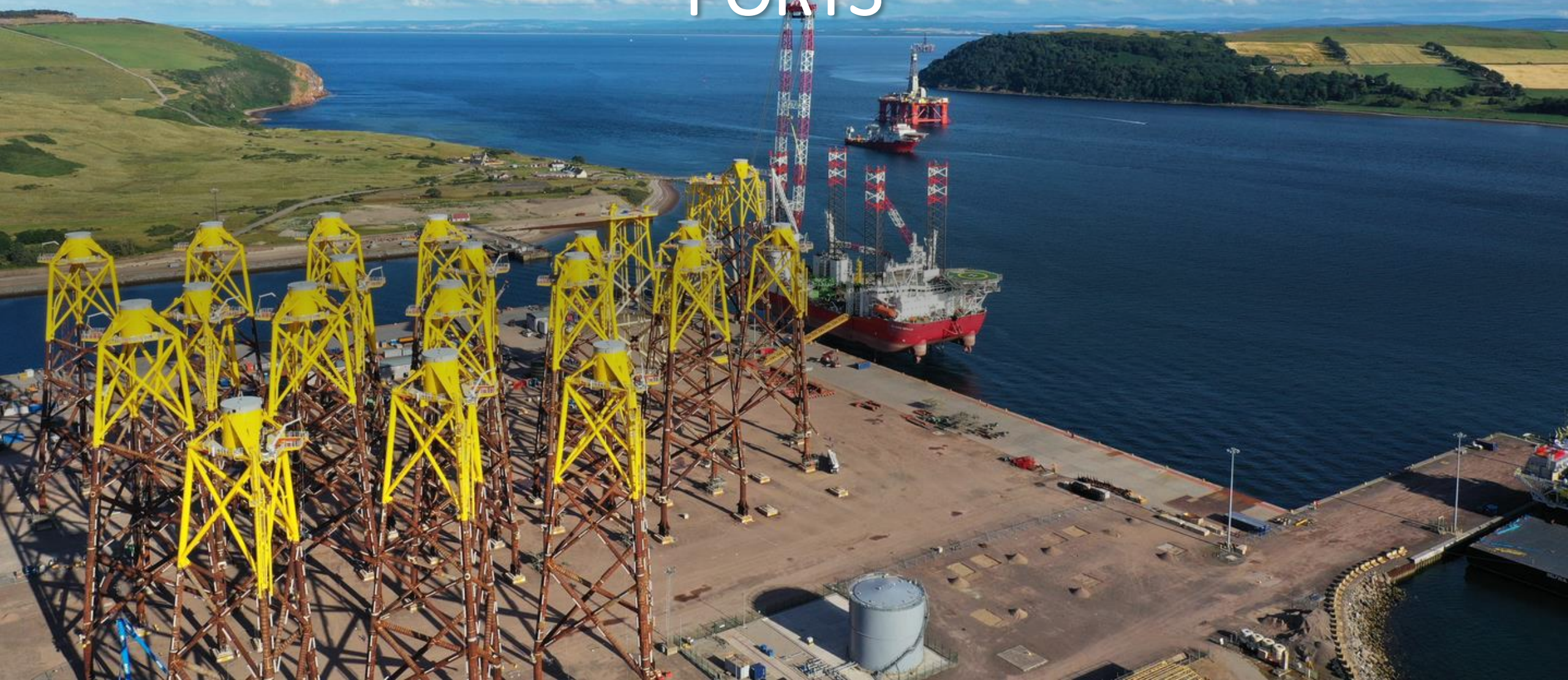
A photograph of an offshore wind farm in the ocean. Several white wind turbines with three blades are visible, receding into the distance. The water is a deep blue, and the sky is a pale, hazy blue. The text 'OFFSHORE WIND CHALLENGES' is overlaid in white, bold, sans-serif font across the middle of the image.

OFFSHORE WIND CHALLENGES

OFFSHORE WIND CHALLENGES



OFFSHORE WIND CHALLENGES AT LATAM PORTS



LARGE CRANES: 2000 to 5000 Ton Capacity



OFFSHORE WIND CHALLENGES FOT LATAM PORTS

REQUESTED NEW INVESTMENTS



OFFSHORE WIND CHALLENGES FOR LATAM PORTS



Ports will need to invest and upgrade for offshore wind projects.

- Expand storage areas
- Reinforce docks
- Improve drafts
- Other civil works

Ports of Europe must invest US\$ 7.0 Billion by 2030, according to WindEurope source

IMPROVEMENTS

- AREA 20 HECTARES per 100 WTG
- DOCK CAPACITY 20 Tons/m²
- WATER DRAFT 12-14 m



THANKS FOR YOUR TIME...

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