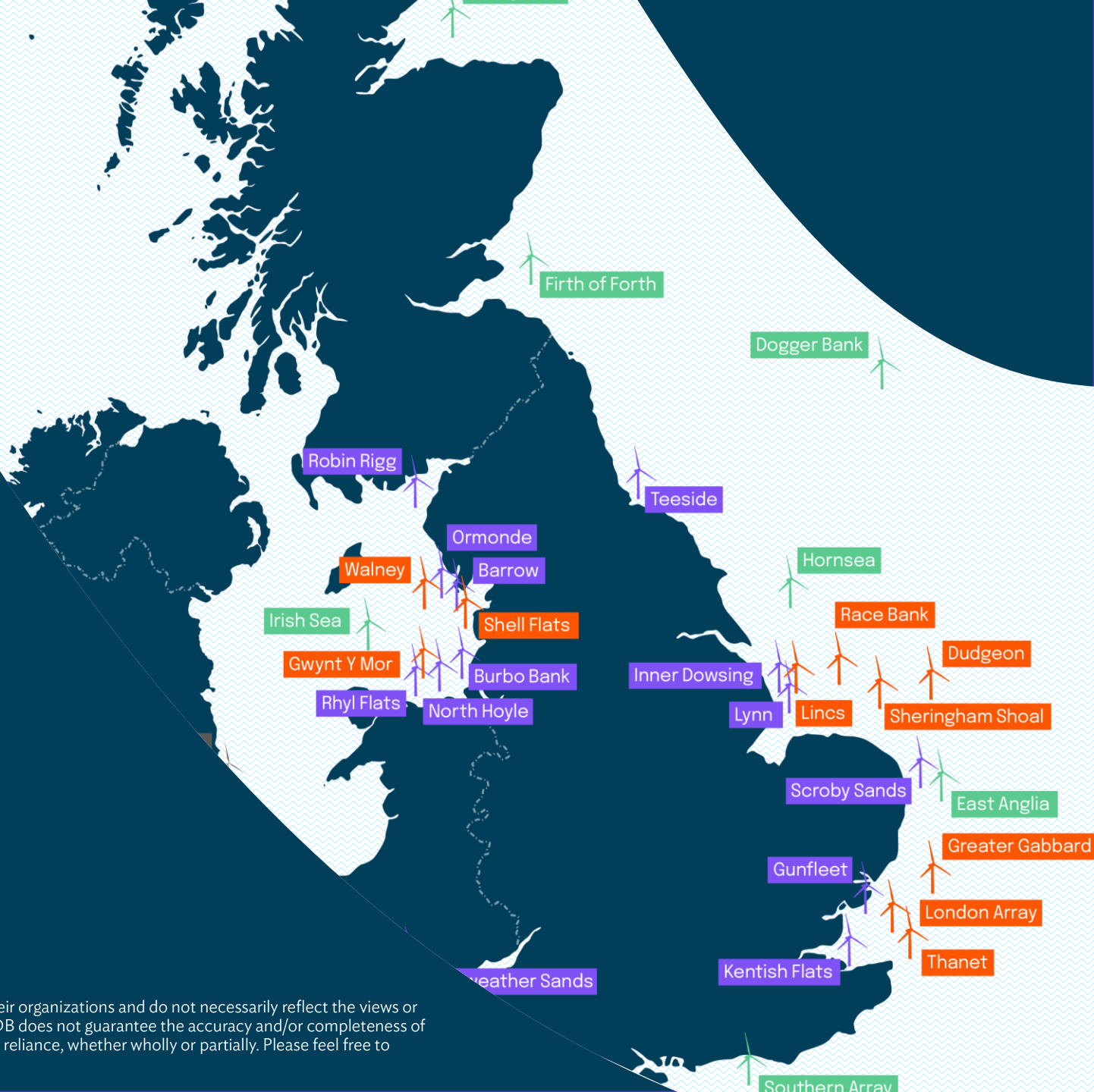


Offshore Wind Energy

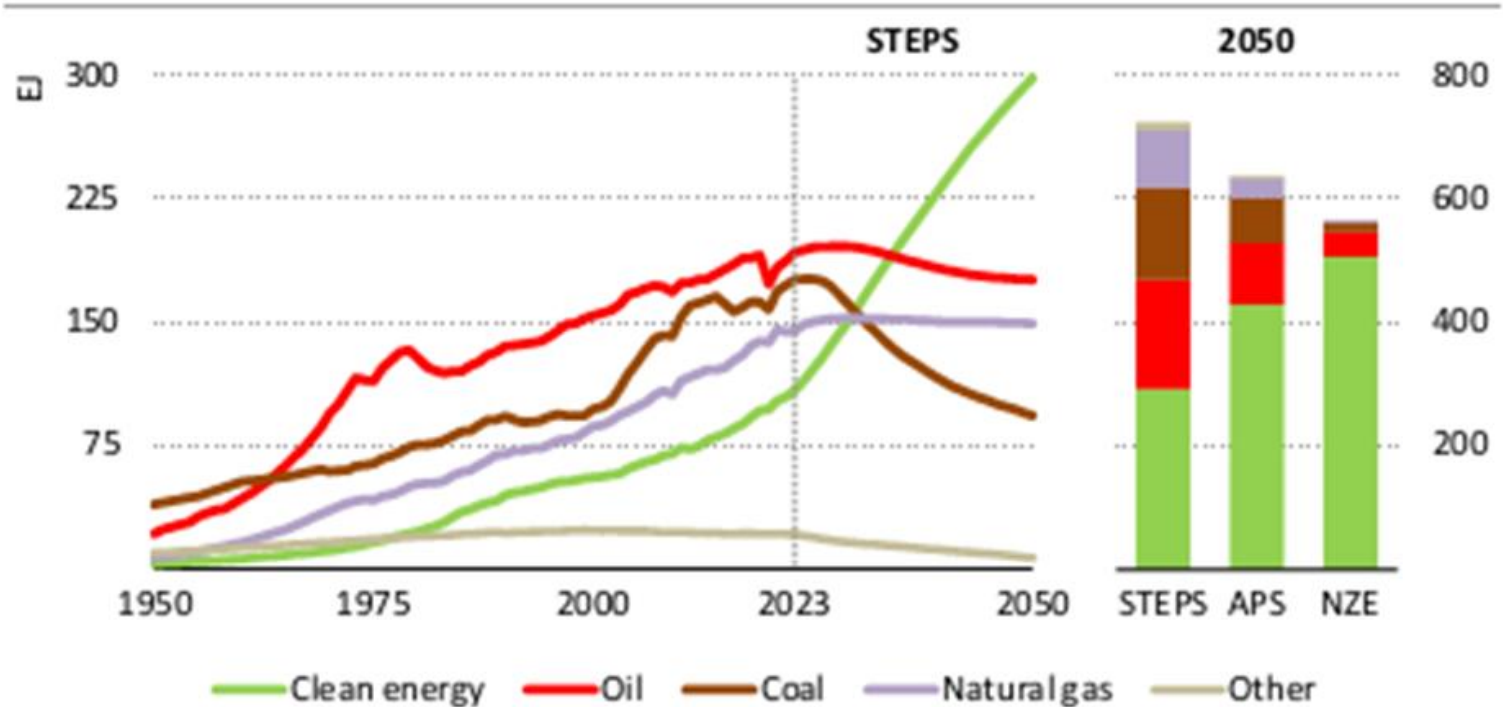
James Sutherland
08/11/2024

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New IEA report World Energy Outlook 2024

Figure 1.1 ▶ Global energy mix by scenario to 2050



IEA. CC BY 4.0.

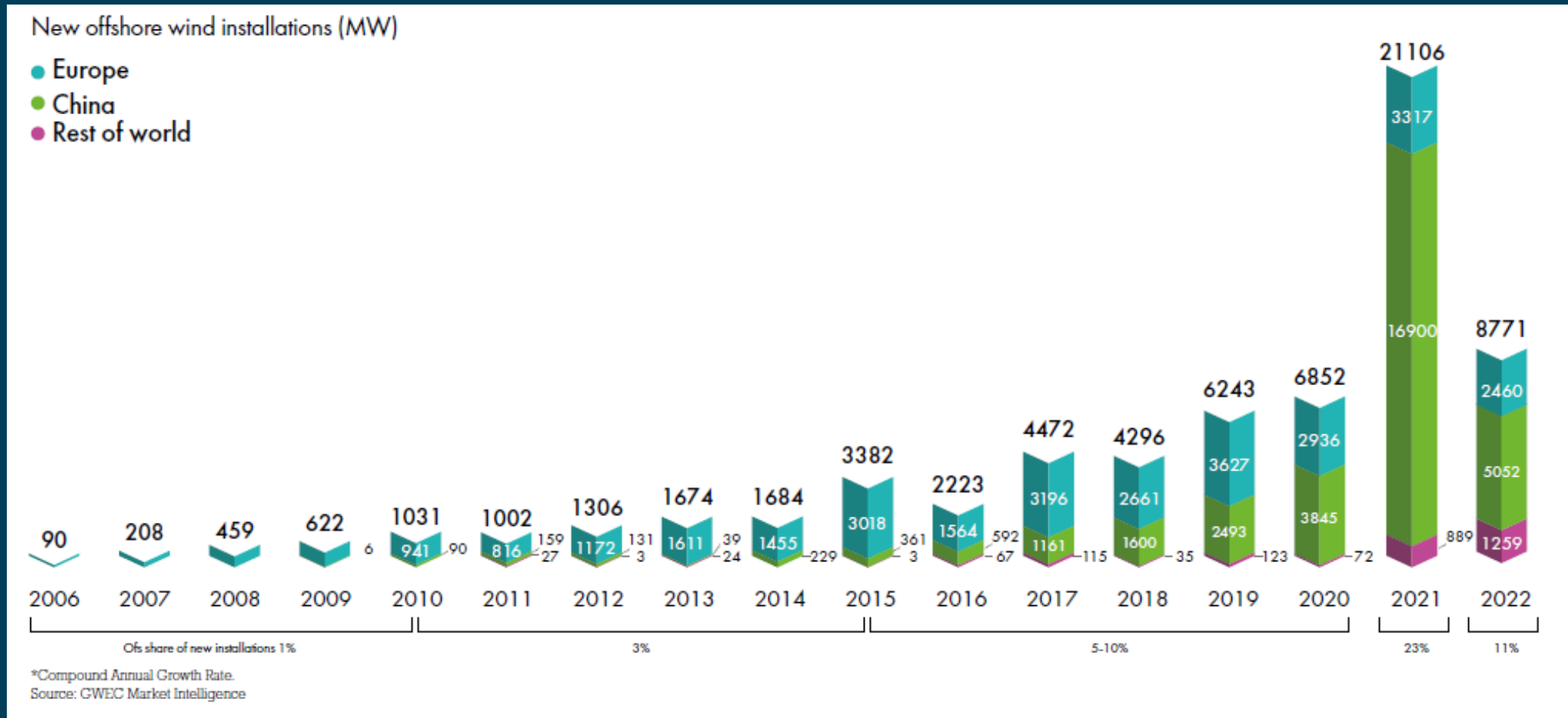
STEPS, a scenario based on current policy settings, sees clean energy poised for huge growth, while coal, oil and natural gas each reach a peak by 2030 and then start to decline

Notes: EJ = exajoules; STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario. Oil, coal and natural gas refer to unabated uses as well as non-energy use. Clean energy includes renewables, modern bioenergy, nuclear, abated fossil fuels, low-emissions hydrogen and hydrogen-based fuels. Other includes traditional use of biomass and non-renewable waste.

CC BY 4.0.



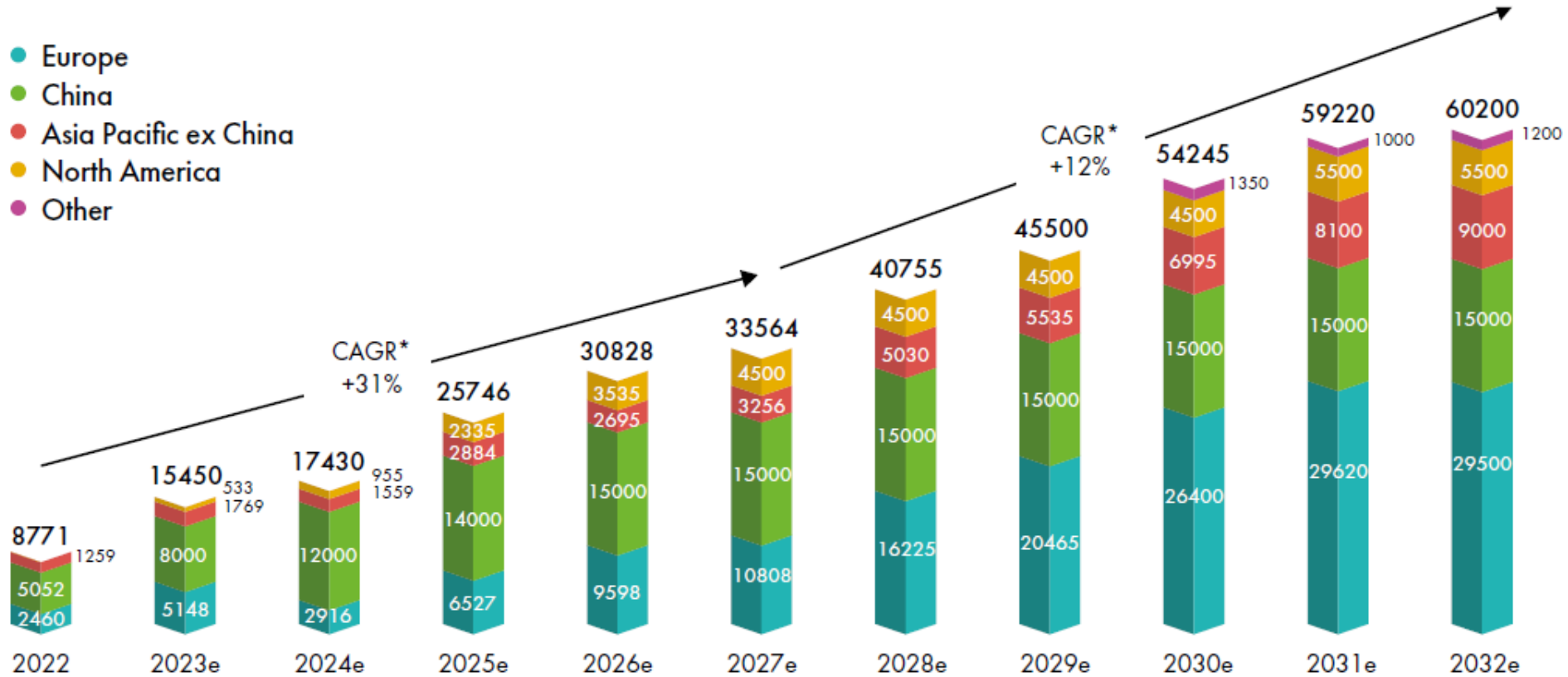
Annual Installations



Projected Annual Installations

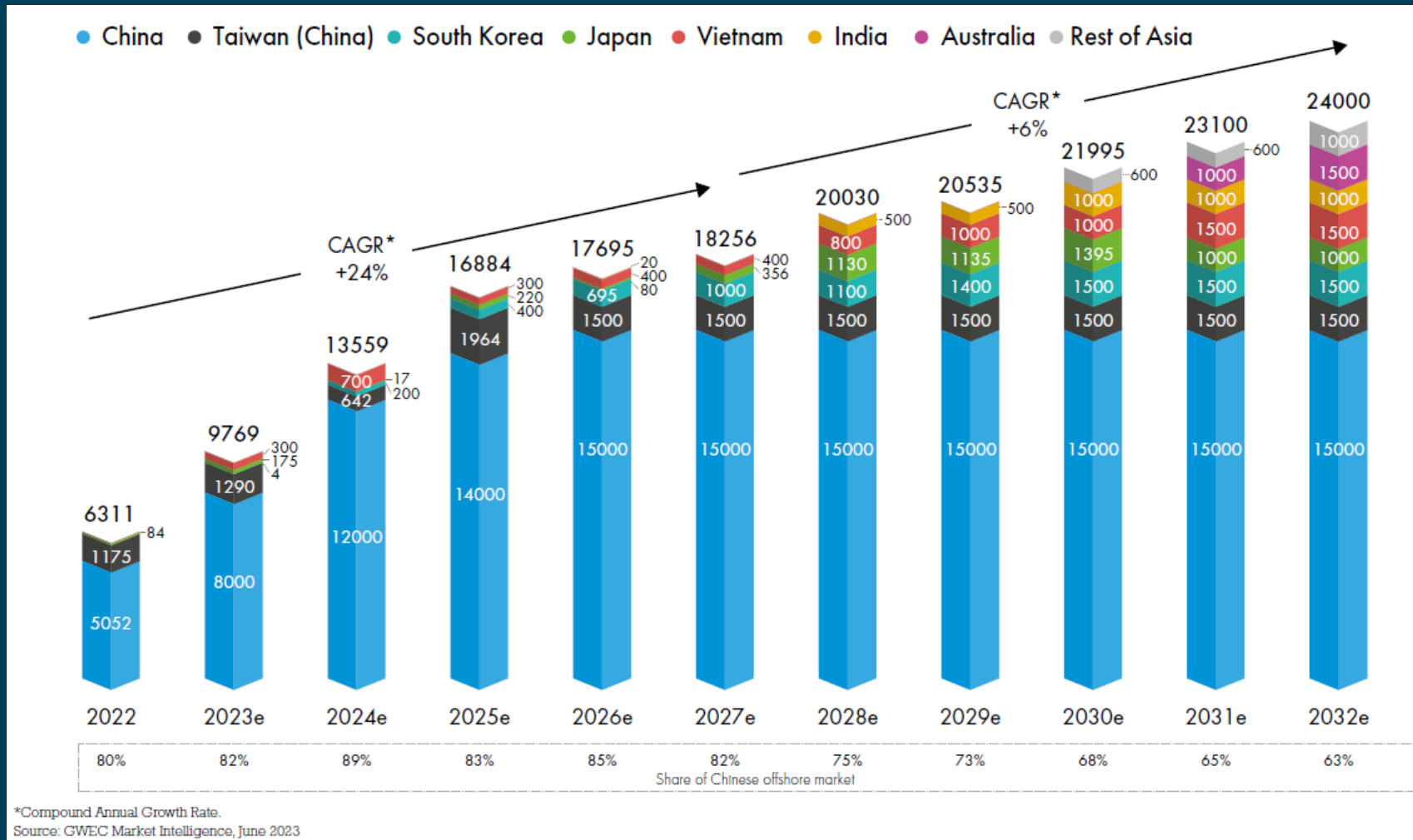
New offshore wind installations, global (MW)

- Europe
- China
- Asia Pacific ex China
- North America
- Other

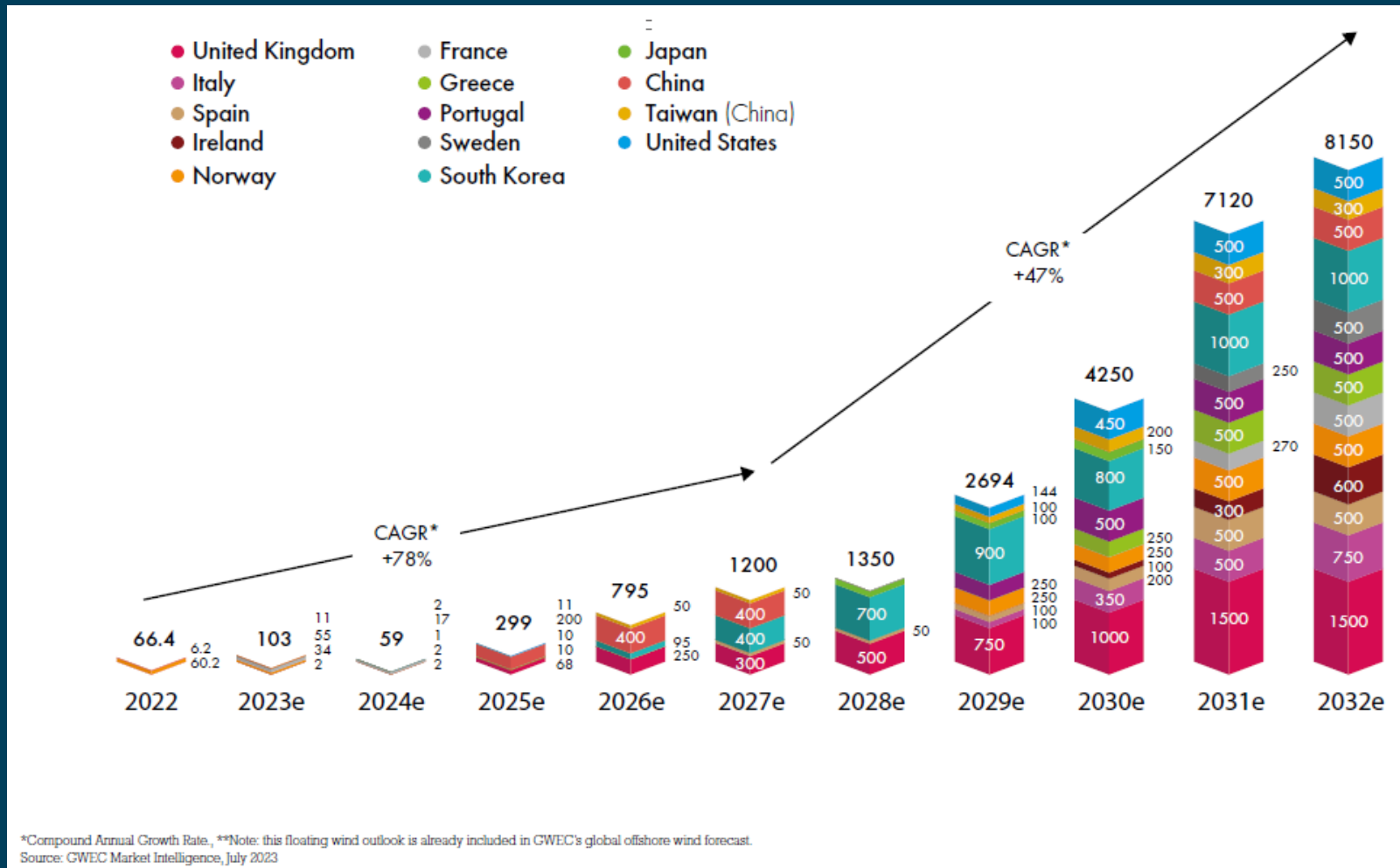


* Compound Annual Growth Rate.
Source: GWEC Market Intelligence, July 2023

Projected Annual Installations – Asia Pacific (MW)



Projected Annual Installations – Floating Offshore Wind (MW)



UK Floating Offshore Wind



SCOTWIND & INTOG

- 23GW leased (25+ projects)
- ~1,520 turbine units (15MW)

Celtic Sea

- 4GW initial leasing
- ~266 turbine units (15MW)
- Further 20GW planned



Resource constraints

- Materials
- Fabrication facilities
- Assembly and integration
- Equipment



Applicability of technologies to APAC / SEA

Vast yet unrealised renewable potential:

- ASEAN's Plan of Action for Energy Cooperation (APAEC)
- Vietnam's Power Development Plan 8 [PDP8]
- Just Energy Transition Partnerships (2022)
- ASEAN Power Grid (APG)

Applications to islands:

- Some islands not connected to national grid;
- Transmission networks may be expensive;
- Many SIDS have a narrow shelf:
 - limited space for fixed offshore wind.
 - Floating Offshore Wind is more expensive and less mature.

Source: DNV Energy Transition Outlook 2024.

Offshore Wind Energy

Requirements for success

- Seabed leasing / MSP
- Efficient permitting –OSS
- Create social and economic value
- Grid connections
- Supply chain
 - Wind turbine installation vessels
 - Cable lay vessels
 - Gear boxes / high voltage switches
 - Port availability

Issues to be addressed:

Intermittency

- Storage
- ASEAN Power Grid Advancement Programme, 2023.
- Alternative energy sources
- Smart devices
- Energy efficiency

GWEC Global Offshore
Wind Report 2023