DEVELOPING OFFSHORE WIND IN GREEK WATERS
Challenges & Opportunities

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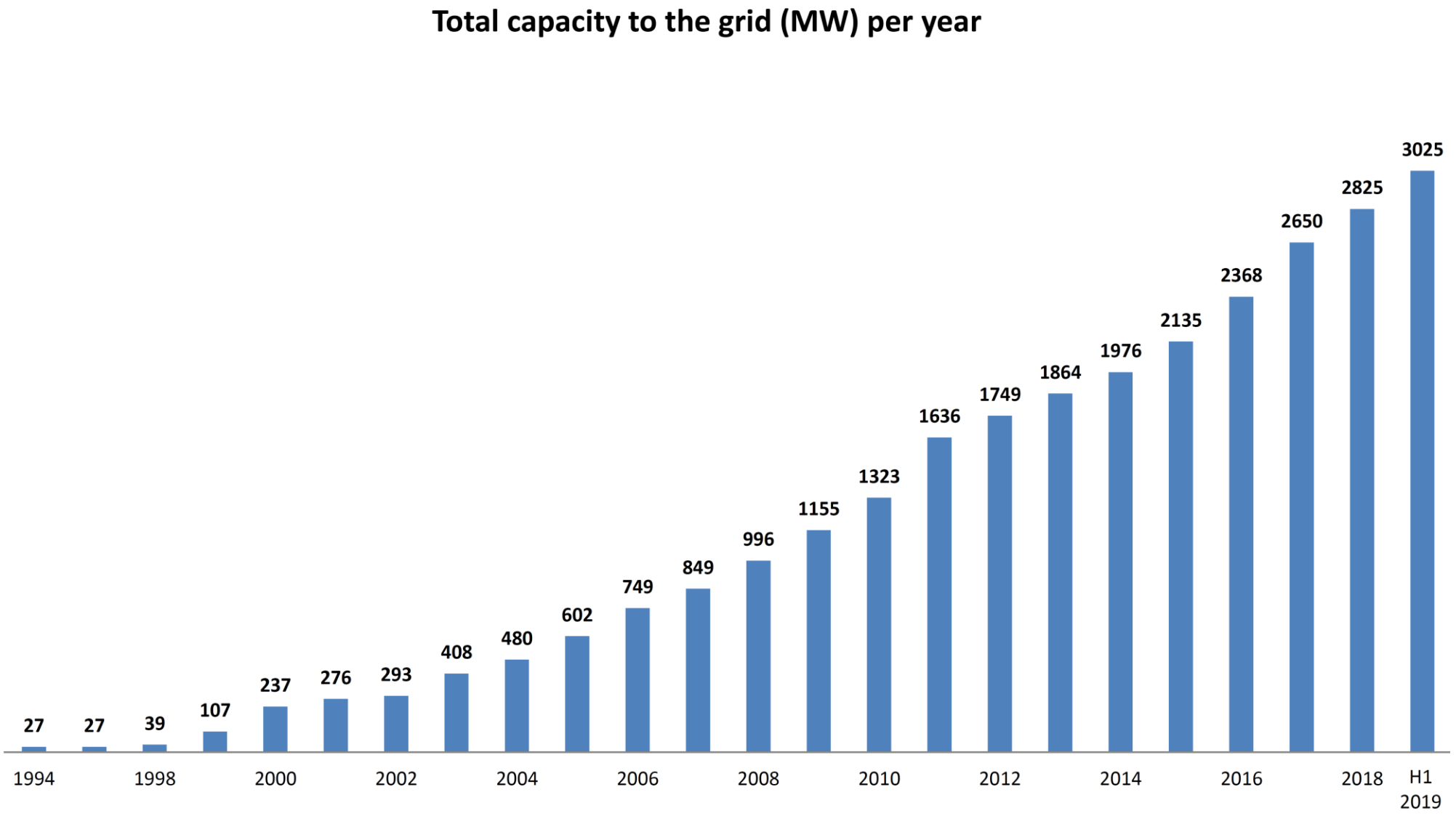
WINDMission **Greece, October 15, 2019**

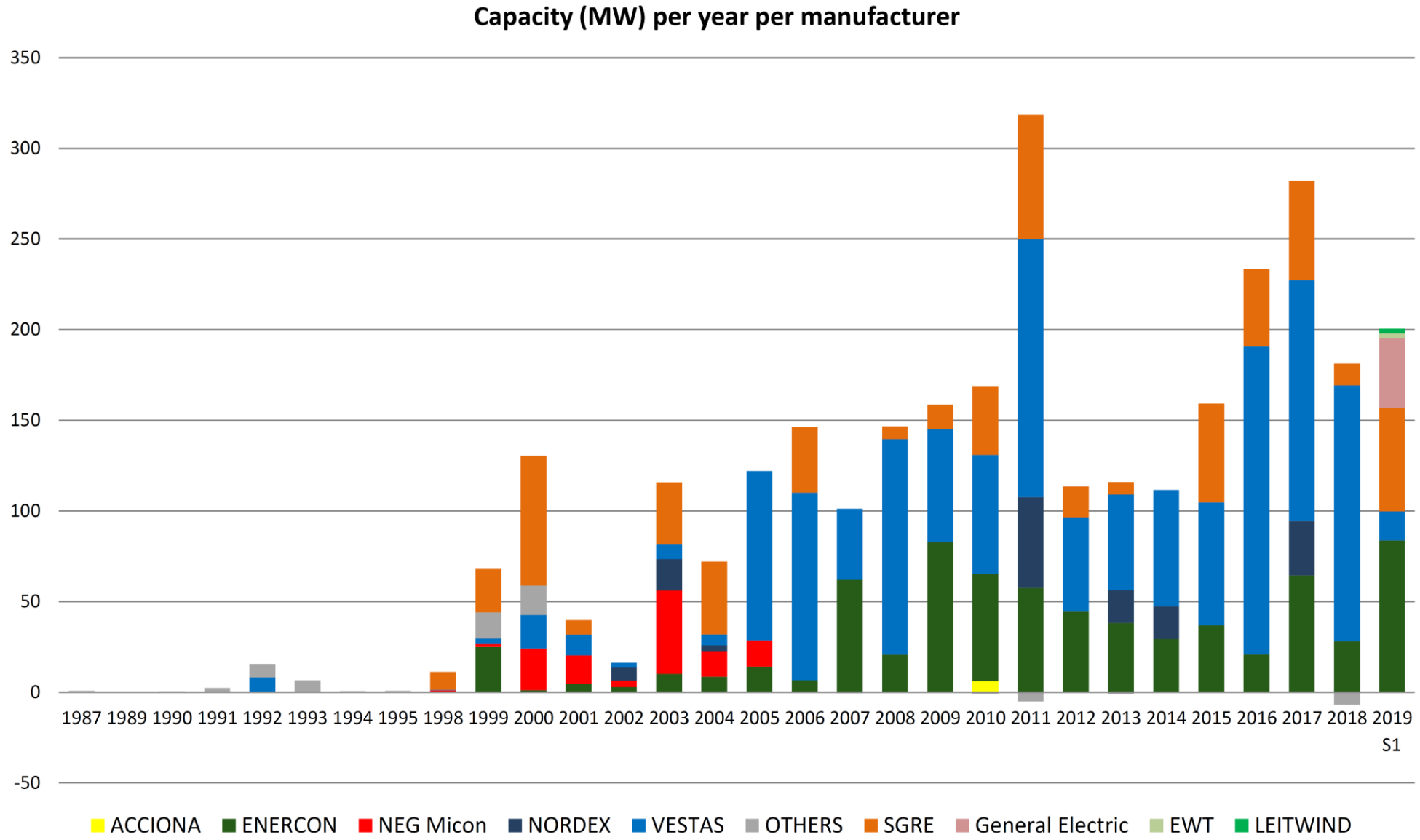
Photo: Poseidon Rising, Rachael Talibat

Evolution of Wind Energy in Greece



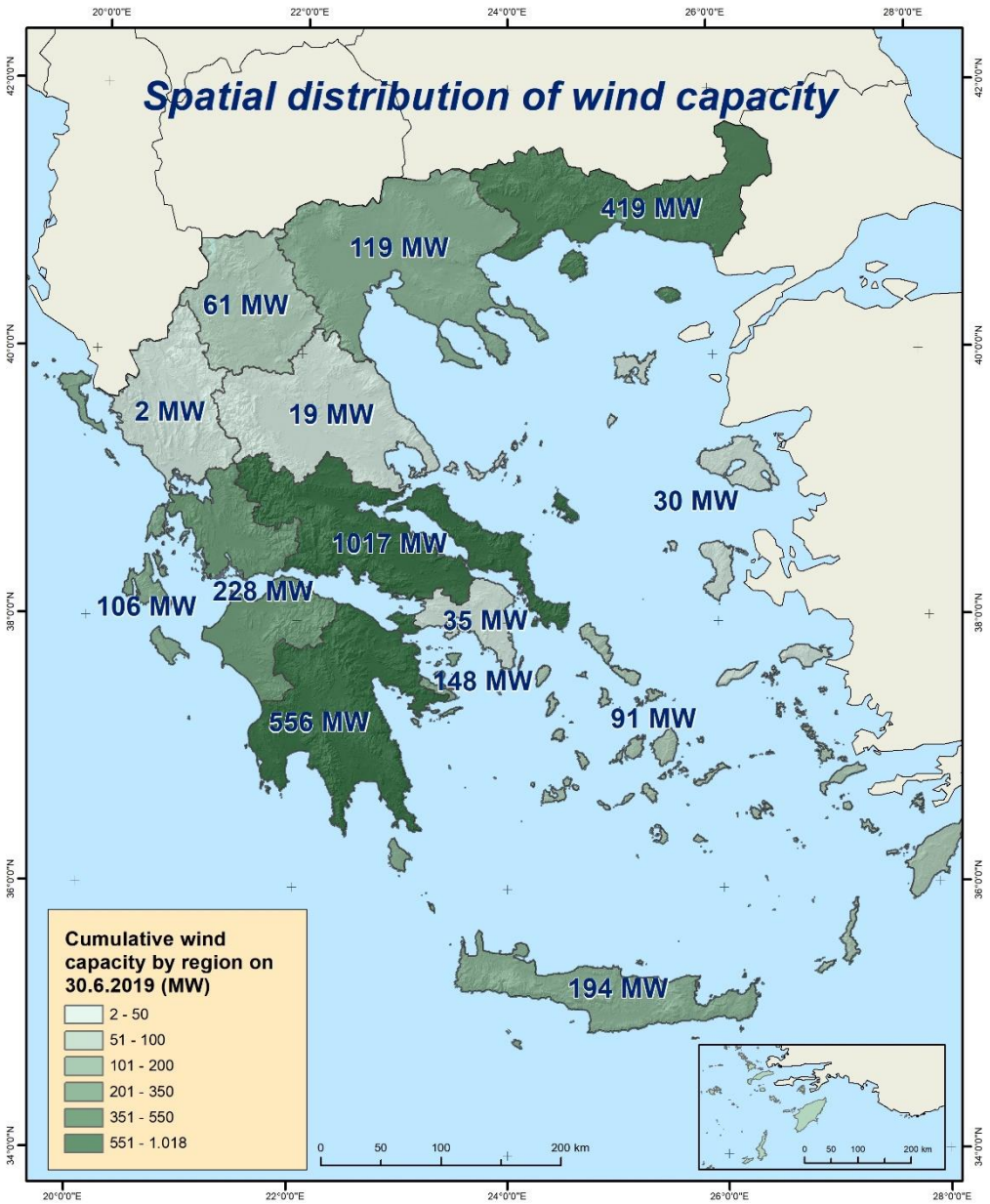
Source: HWEA, Wind statistics H1 2019

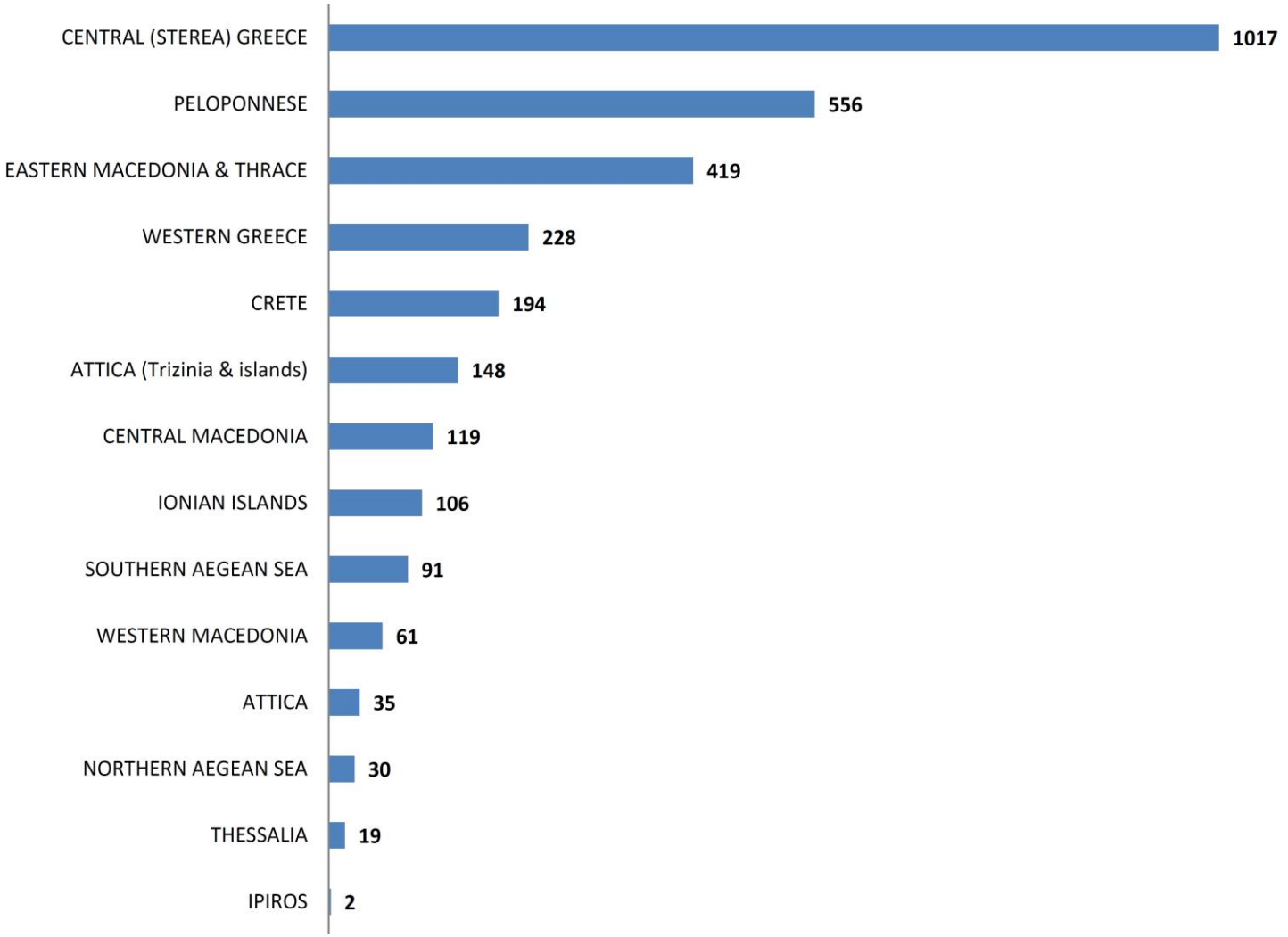
Greece: Annual installed capacity



Source: HWEA, Wind statistics H1 2019

Greece: Spatial distribution of installed capacity (per Region)





Source: HWEA, Wind statistics H1 2019

NECP: A challenging decade for the energy sector in Greece…

National Energy & Climate Plan (NECP)

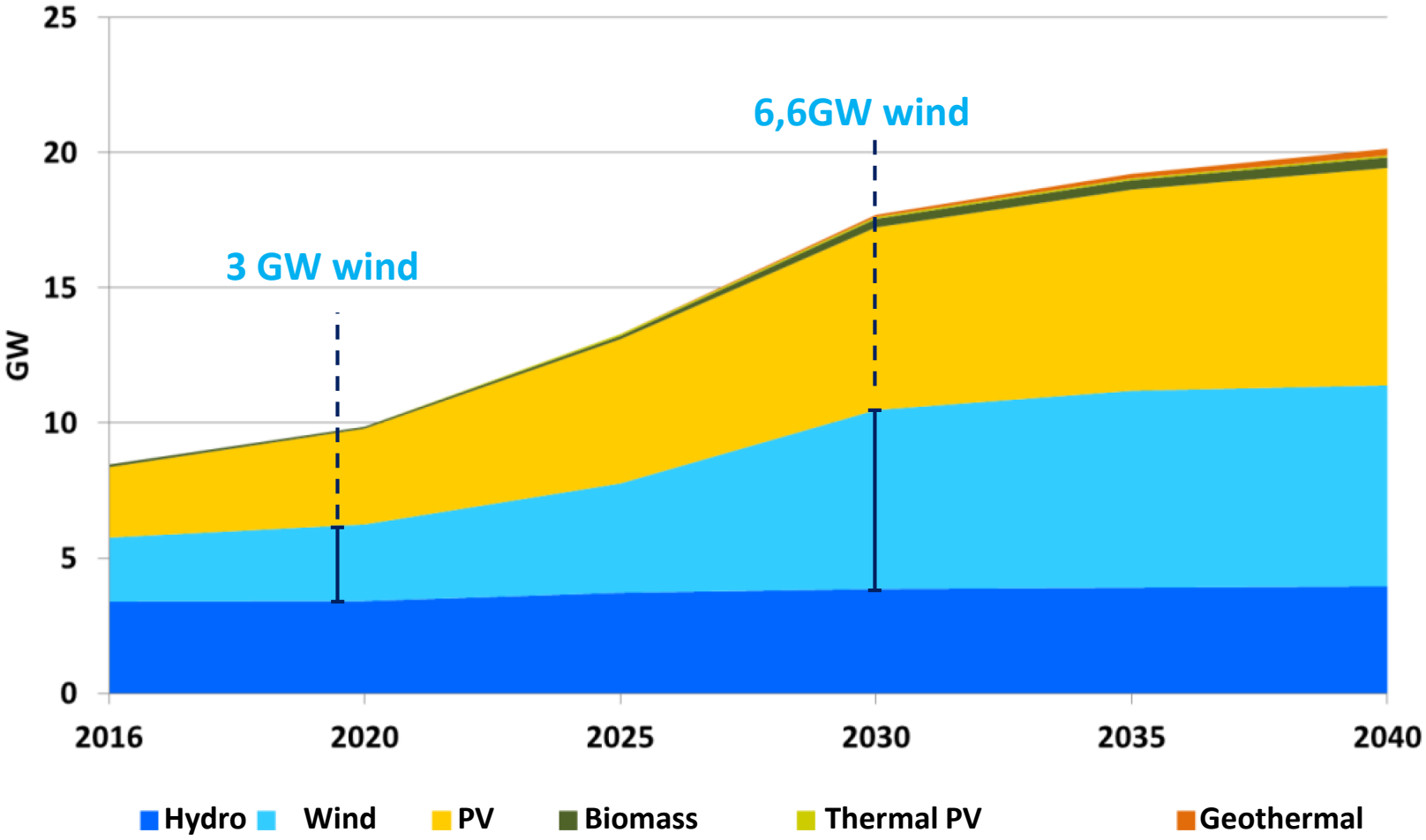
Energy parameter/index		Target 2030	Estimation 2030*
GHGs decrease *compared to 2005*	non-ETS sectors	16%	31%
	ETS sectors	43%	63%
RES share	in Gross Final Energy Consumption	**31%**	31%
	in Gross Final Electricity Consumption	**55%**	56%
	in Heat & Cooling	30%	32%
	in Transportation	14%	20%

** with the application of additional policy measures provided in NECP*

Source: Draft National Plan for Energy and Climate (January 2019)

NECP: A challenging decade for wind energy in Greece…

Estimation for installed RES capacity for electricity



Installing 7,8 GW of new RES until 2030 is a challenge. Could offshore wind ensure the 2030 targets?

Source: Draft National Plan for Energy and Climate (January 2019)

Current status & prospects of onshore wind

- Wind Energy Auctions have been undersubscribed
- Lack of mature onshore wind projects
- High wind onshore sites are gradually exhausted
- Eventually there will be a saturation in onshore wind…

Auction	Category	Tendered Capacity [MW]	Awarded Capacity [MW]	Deficit
July 2018	Wind (3MW<P≤50MW)	300	170,9	**129,1**
December 2018	Wind (3MW<P≤50MW)	229	159,7	**69,4**
April 2019	Common (Wind>50MW & PV>20MW)	600	437,78	**162,22**
July 2019	Wind (3MW<P≤50MW)	300	179,55	**120,45**
December 2019 (upcoming)	Wind (3MW<P≤50MW)	225,45	?	

Only one wind project participated!

Source: RAE

NECP: Few but critical provisions for wind offshore

NECP, pg. 135

*"The specific requirements for the development of a specific regulatory (**licensing and support scheme) and spatial planning framework for offshore wind farms** are also highlighted"*

NECP, pg. 147

Αρίθμηση	Όνομα μέτρου πολιτικής	Στόχος	Επηρεαζόμενος τομέας	Εκτιμώμενες επιπτώσεις (1: Πολύ χαμηλές έως 5: Πολύ υψηλές	Κατηγορία μέτρου	Κατάσταση εφαρμογής
.....						
M2.3	**Αδειοδοτικό και χωροταξικό πλαίσιο για θαλάσσια αιολικά πάρκα**	Αύξηση παραγωγής ηλεκτρικής ενέργειας από ΑΠΕ	Παραγωγή ηλεκτρικής ενέργειας	2	Κανονιστικό μέτρο	Σχεδιαζόμενο

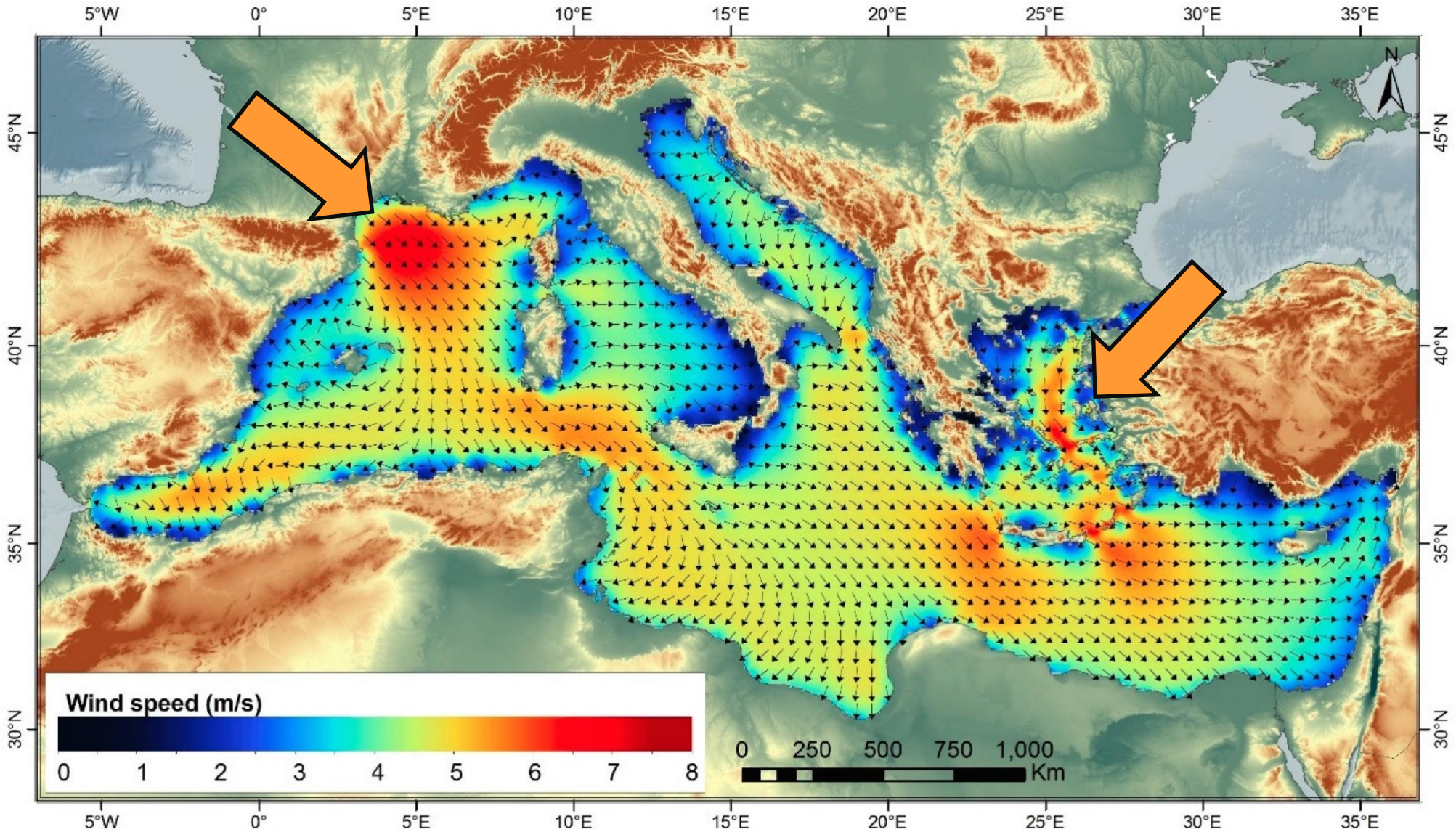
Licensing & Spatial planning for wind offshore

NECP, pg. 279

*"It should be noted that **in order to achieve** the above-mentioned **new wind** and photovoltaic capacity...it is necessary to gradually examine …new categories of projects (e.g. **offshore wind farms**)…In this context, **the respective regulatory framework for the operation of these projects should also be developed**"*

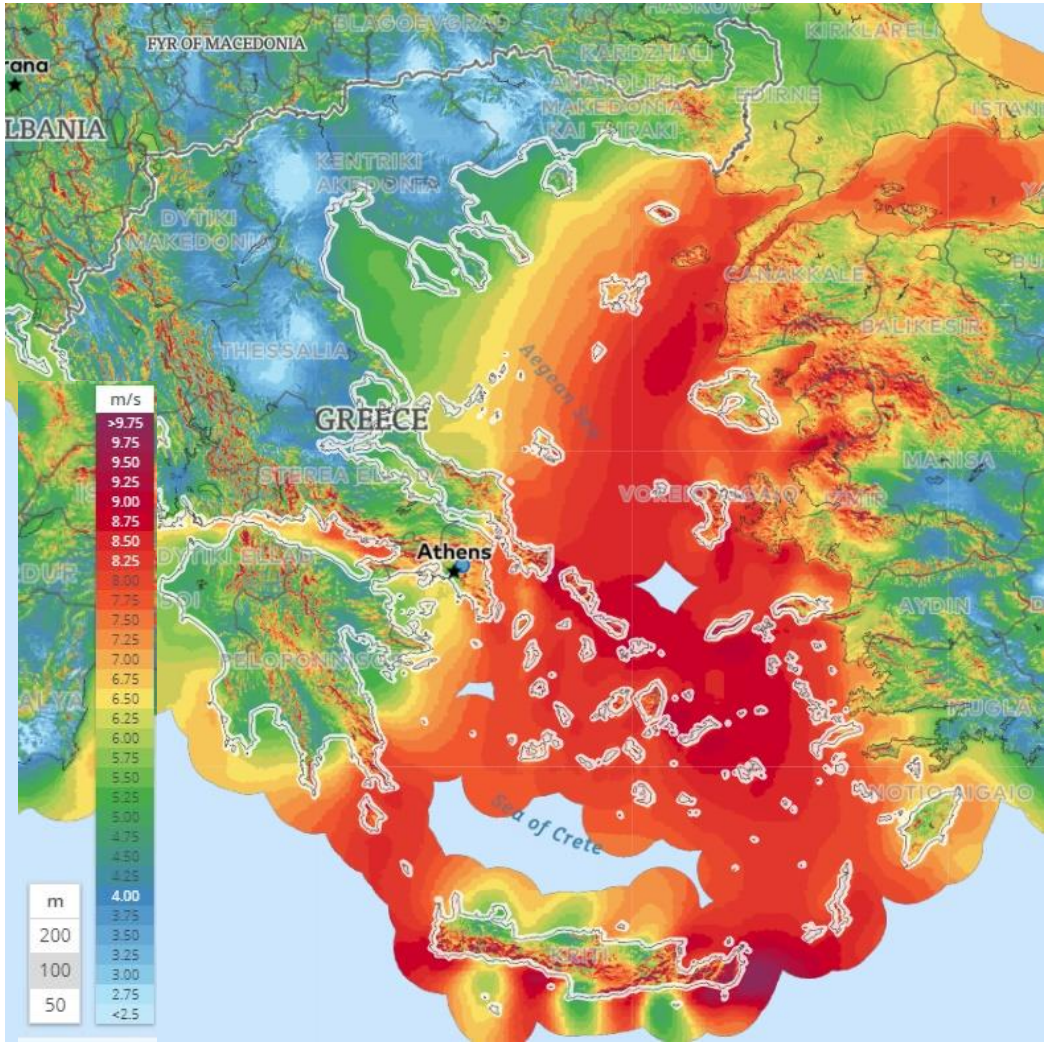
Source: National Plan for Energy and Climate (January 2019)

The opportunity of the Greek seas



Source: Marine Renewable Energy in the Mediterranean Sea: Status and Perspectives, Soukissian et. al., energies, 2017

The winds of the Aegean sea: Still an unexploitable source



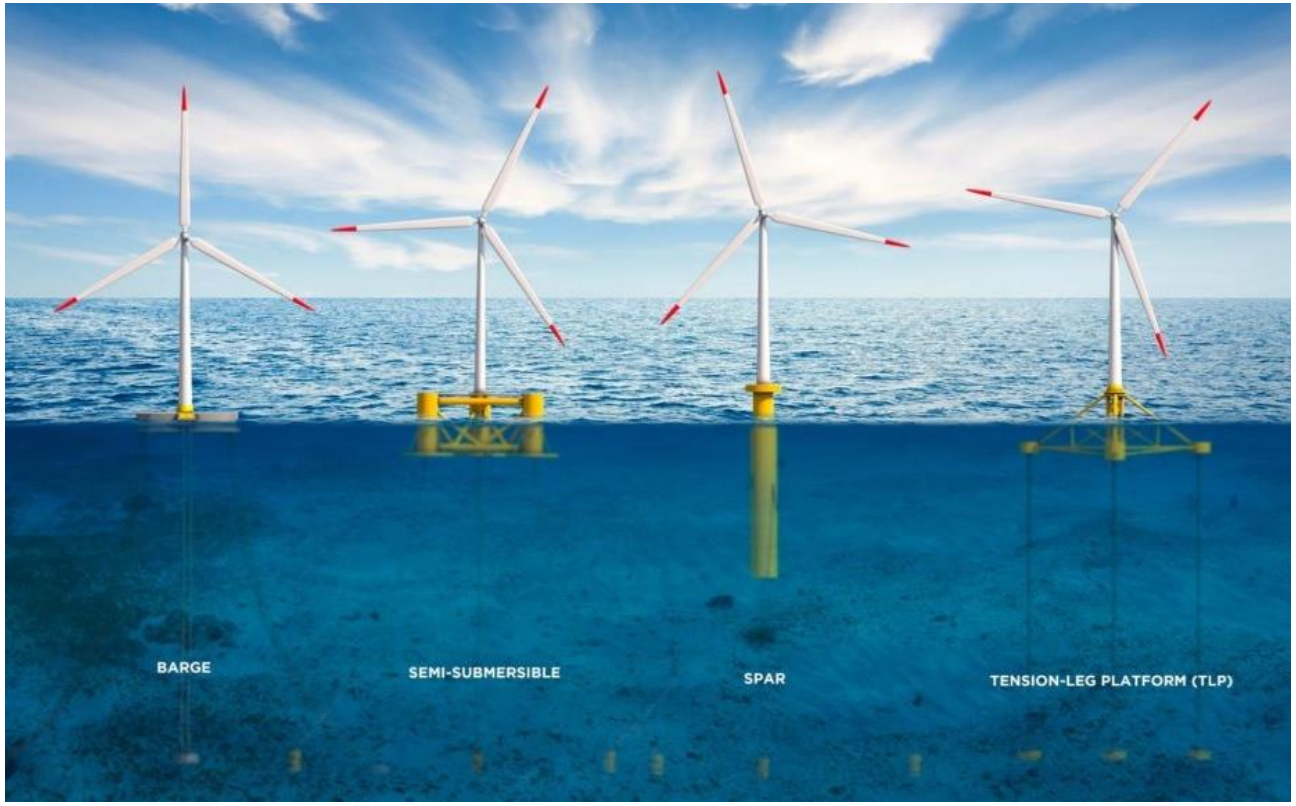
Main challenges for Offshore wind in Greece

- Depth of waters
- Transmission Capacity
- Infrastructure (ports, shipyards)
- Licensing constraints
- Political - Geostrategic constraints
- Costs

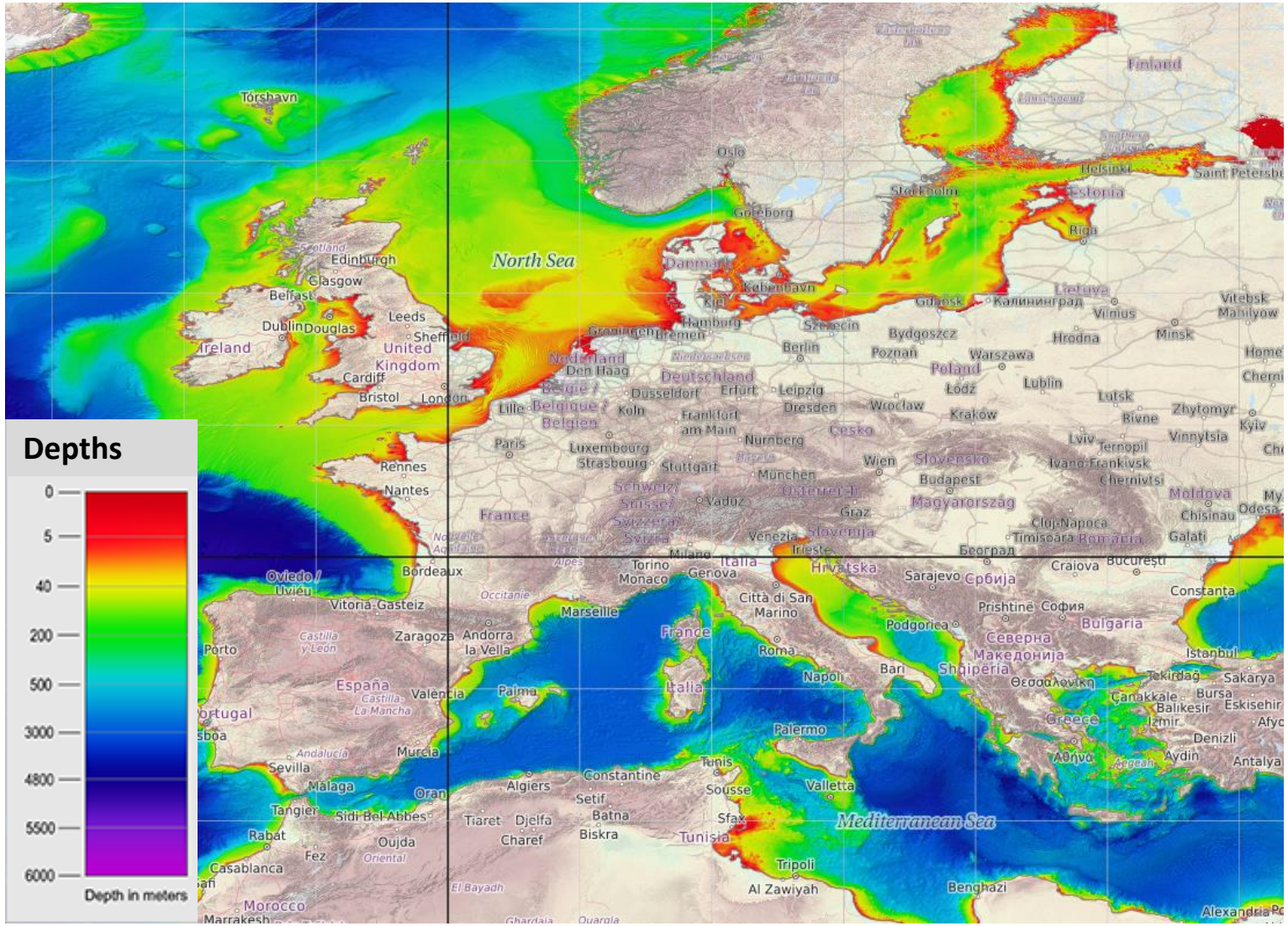
Source: https://globalwindatlas.info

Offshore wind in Greece – Floating is a game changer

- **Rapid developments** in technology, costs, projects
- Exploitation of **domestic experience** & local industrial base (shipyards, cables etc.)
- Significant **domestic value** (WTGs less than 40% of CAPEX)
- **Opportunity** & need for Greece



Global challenge for floating wind - Huge potential in deep waters

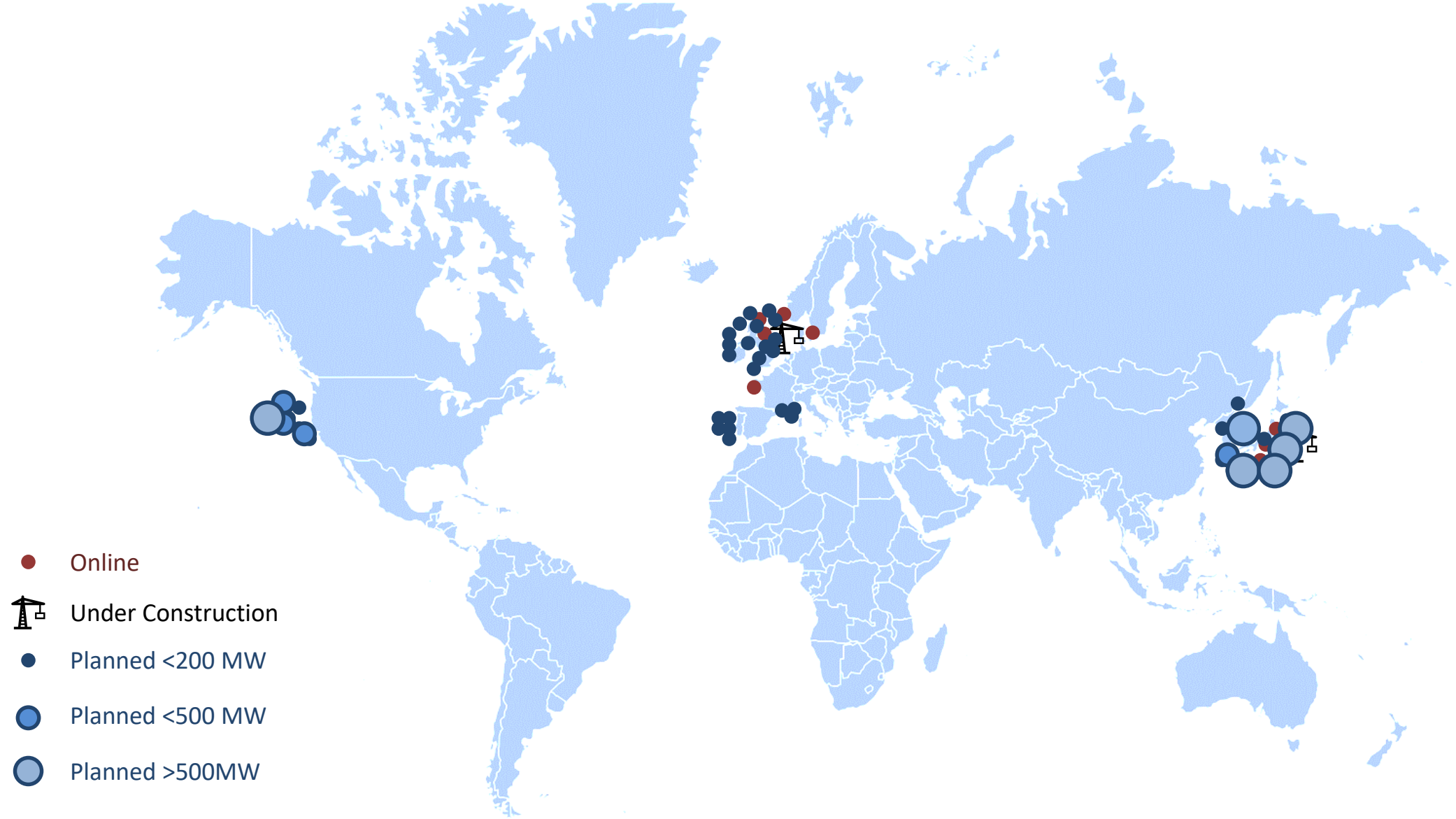


Country/ Region	Share of offshore wind resource in +60m depth	Potential for floating wind capacity
Europe	**80%**	**4.000 GW**
USA	60%	2.450 GW
Japan	80%	500 GW

Source: CarbonTrust

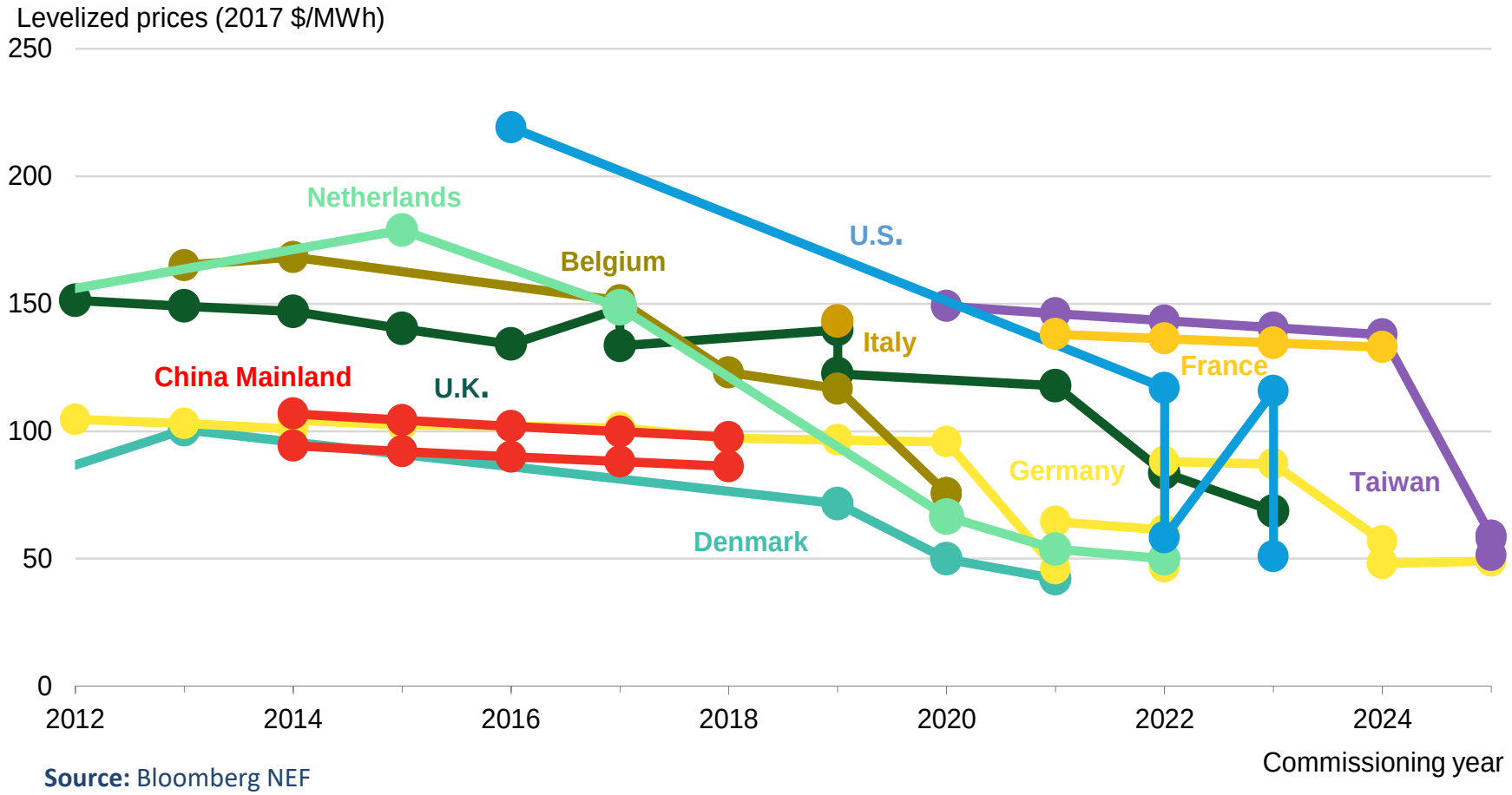
Source: EMODnet

Overview of floating wind today



Source: Wind Europe

Offshore wind LCOE

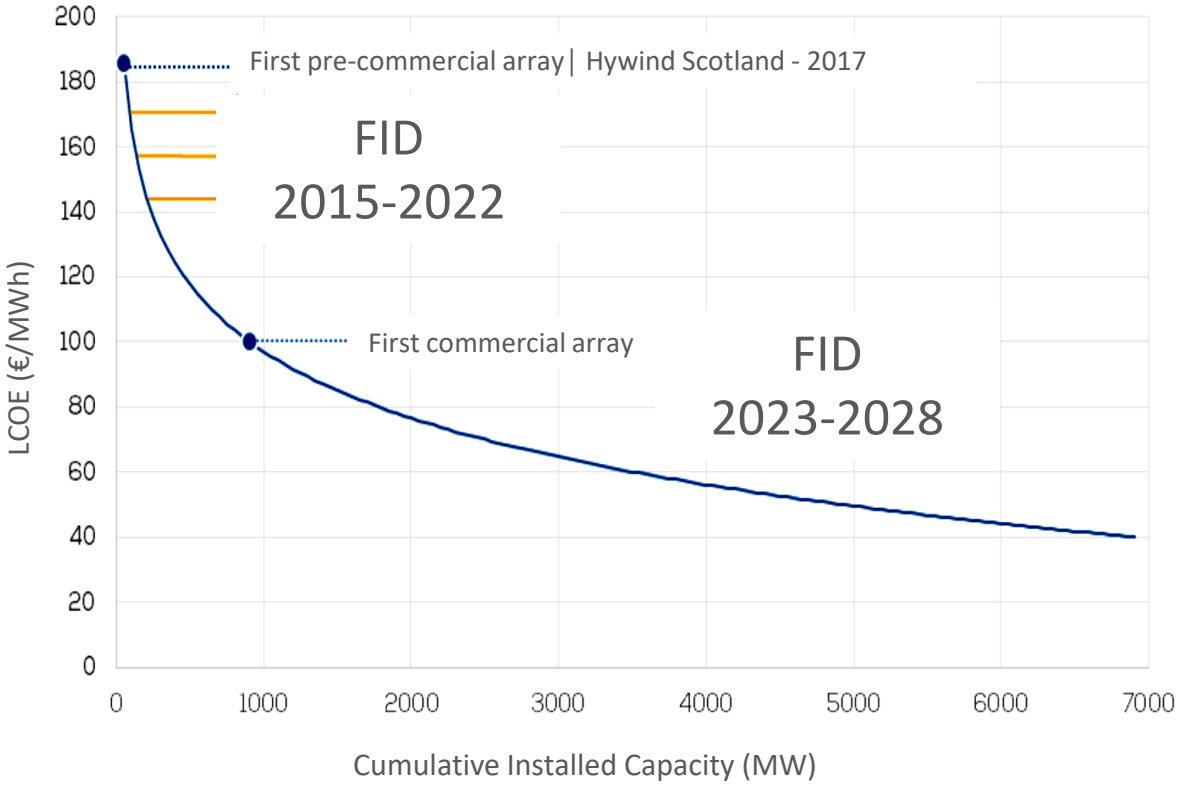


Source: Bloomberg NEF

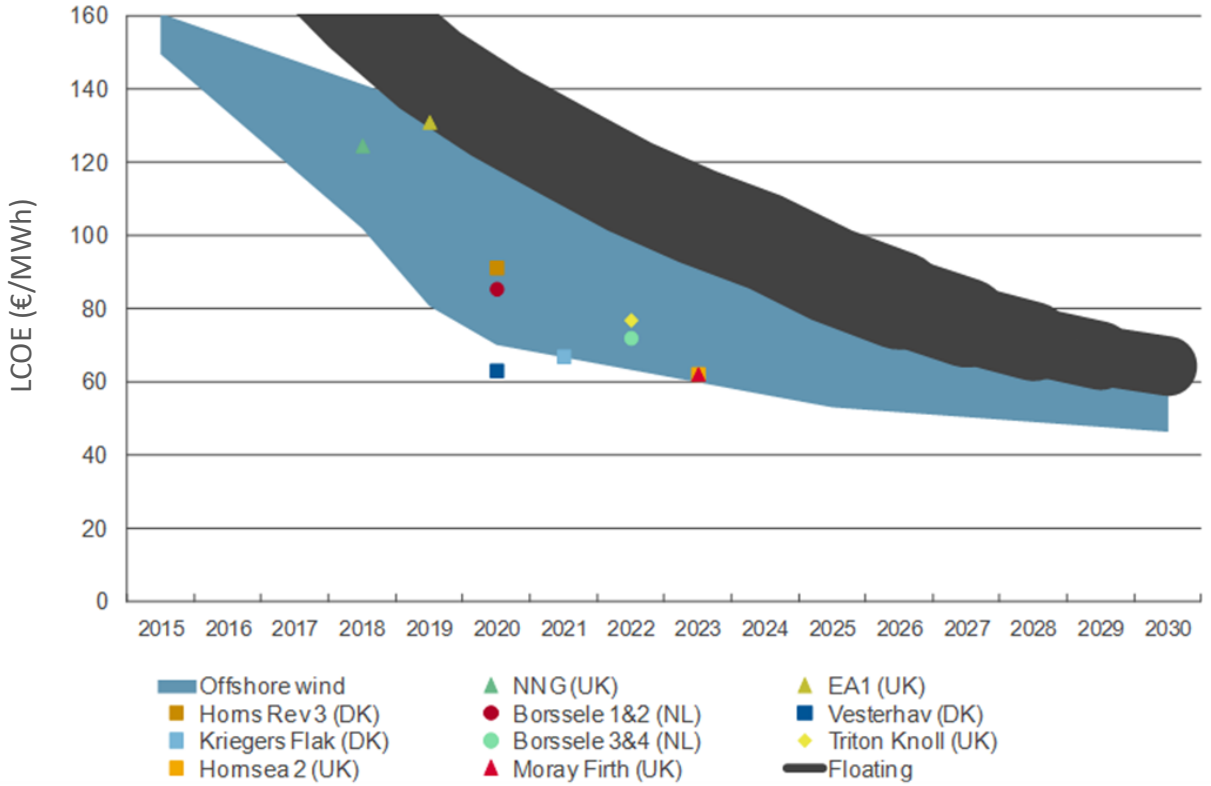
The cost reduction journey of bottom fixed offshore wind provides confidence for similar floating wind LCOE decrease

Floating wind LCOE

LCOE decrease depending on capacity



Floating wind reaching parity with bottom fixed



Source: Wind Europe and BVG Associates

Maybe Greece should wait some years to open the market?

The answer to the question above is negative!

- ✓ Project development & licensing lead-times
- ✓ Adaptation of domestic infrastructure (grid, ports, yards etc.)
- ✓ Whiteboard future planning
- ✓ Advantage of today early stages
- ✓ Premature markets contain great chances

The future is today…Greece must grab the opportunity!

Macroeconomic benefits of floating wind projects

QUESTION:

- *How much would offshore wind impact the Greek economy? real economic growth, jobs, social welfare*

Case study in the UK

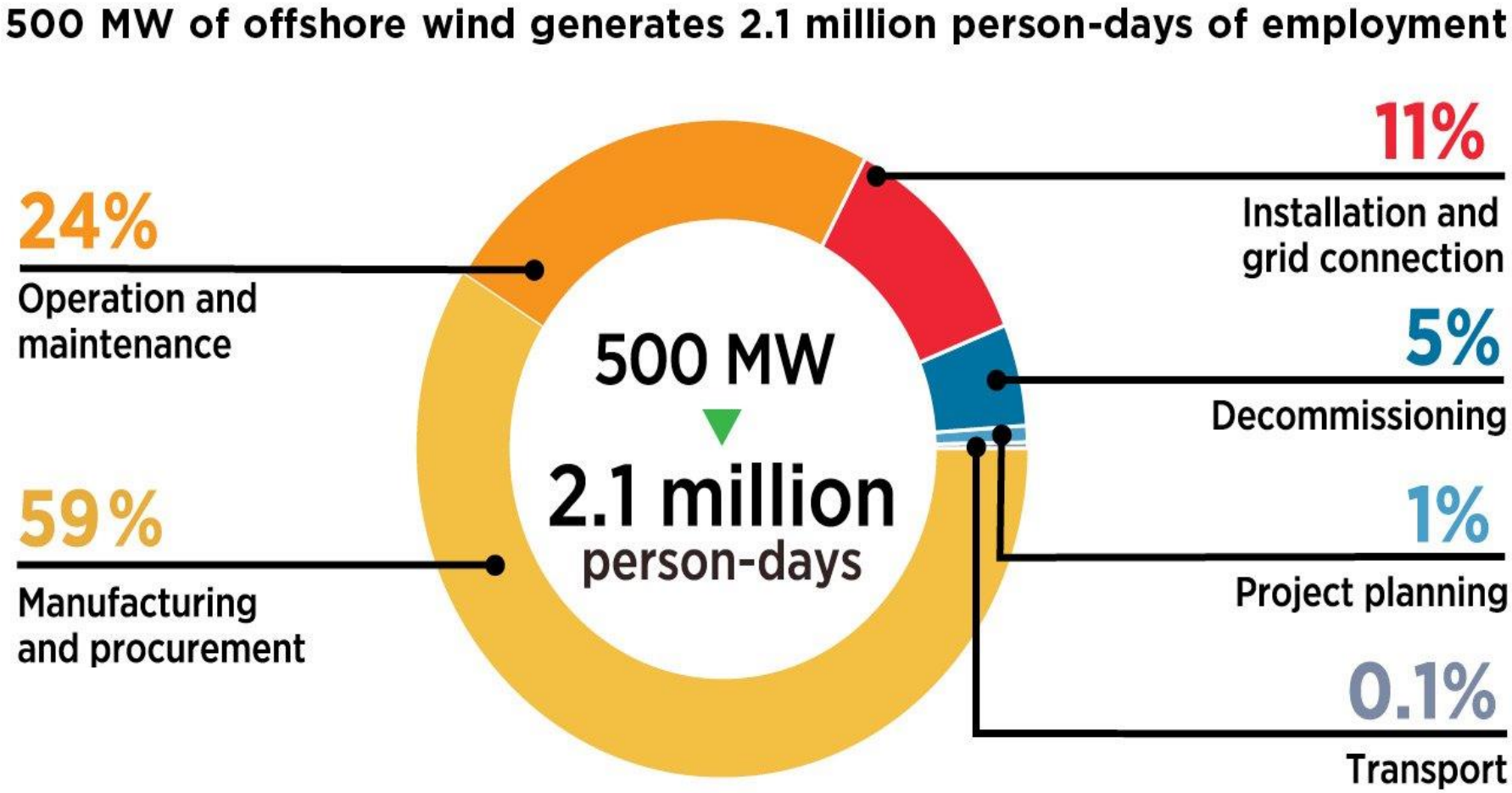
- ✓ 2031-2050: **1GW annual deployment** of floating wind in the UK and **2GW exports** in the growing global market
- ✓ **1 euro** of public support (by 2029) in supply chain, pre-commercial and early commercial stage will have **15 euros cumulative GVA** and **17.000 new jobs** by 2050

Alternatively

- ✓ **0 euro** of public support will have **7,9 euros** cumulative GVA and **3.600 new jobs** by 2050

Source: Macroeconomic benefits of floating offshore wind in the UK, Crown Estate Scotland, September 2018

Macroeconomic benefits of floating wind projects



Source: International Renewable Energy Agency (IRENA)

Are banks willing to finance floating wind?

Existing offshore wind projects in the EU co-financed up to 40% by European Investment Bank. Floating is the new candidate.

*"Floating is a good example. If we could **create a demonstration effect** that led to more projects of this nature that created a supply chain around floating wind, we could **get the costs down** to something that is more economic, and we could then start and **have a snowball effect**… You open up huge potential. You also open up new export markets for Europe…**That's the dream**."*

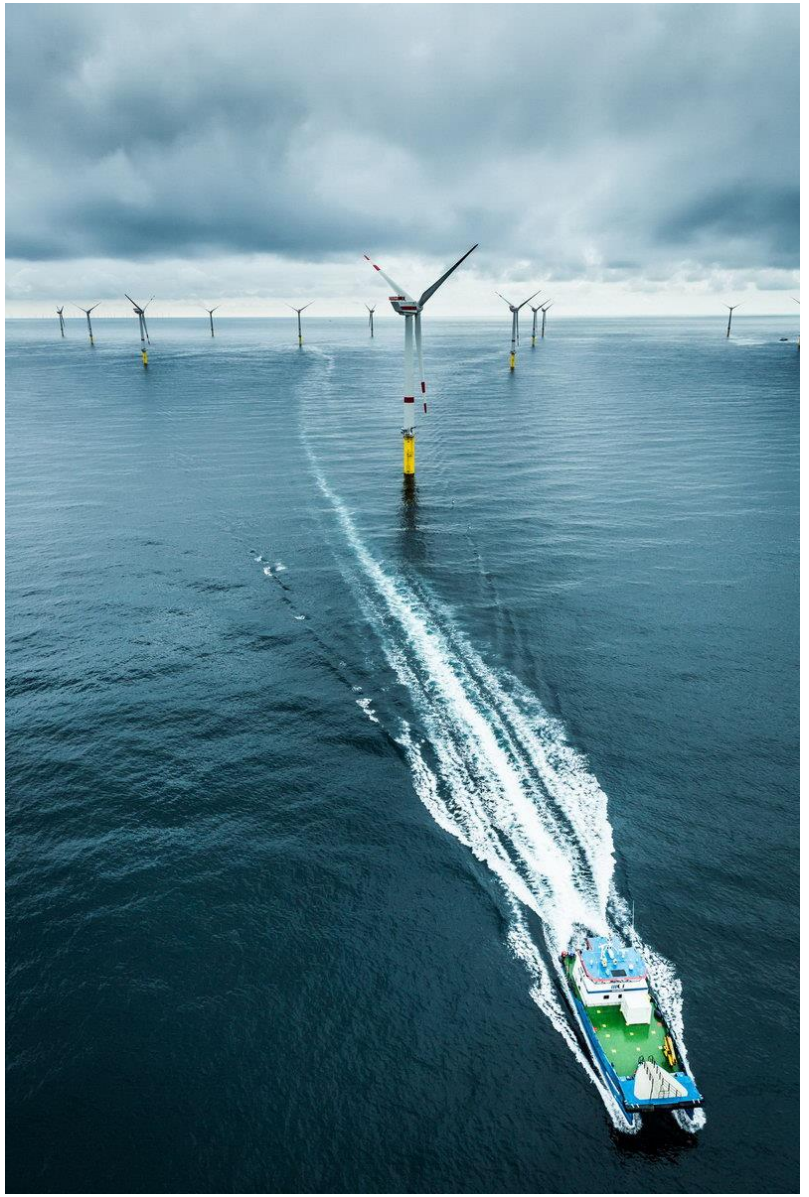
Andrew McDowell, Vice President European Investment Bank

Co-investment on supply chain & support new projects → **Push the cost down** → **Snowball effect** → **Competitive floating wind**

Policy issues: Central planning by the State or not?

Yes, but in a different way

- Current framework should be modified
- Government's role should be the determination of a **marine spatial planning**, **not the licensing** of projects
- Simple and fast licensing approvals (floating is very environmental friendly)
- Remuneration scheme

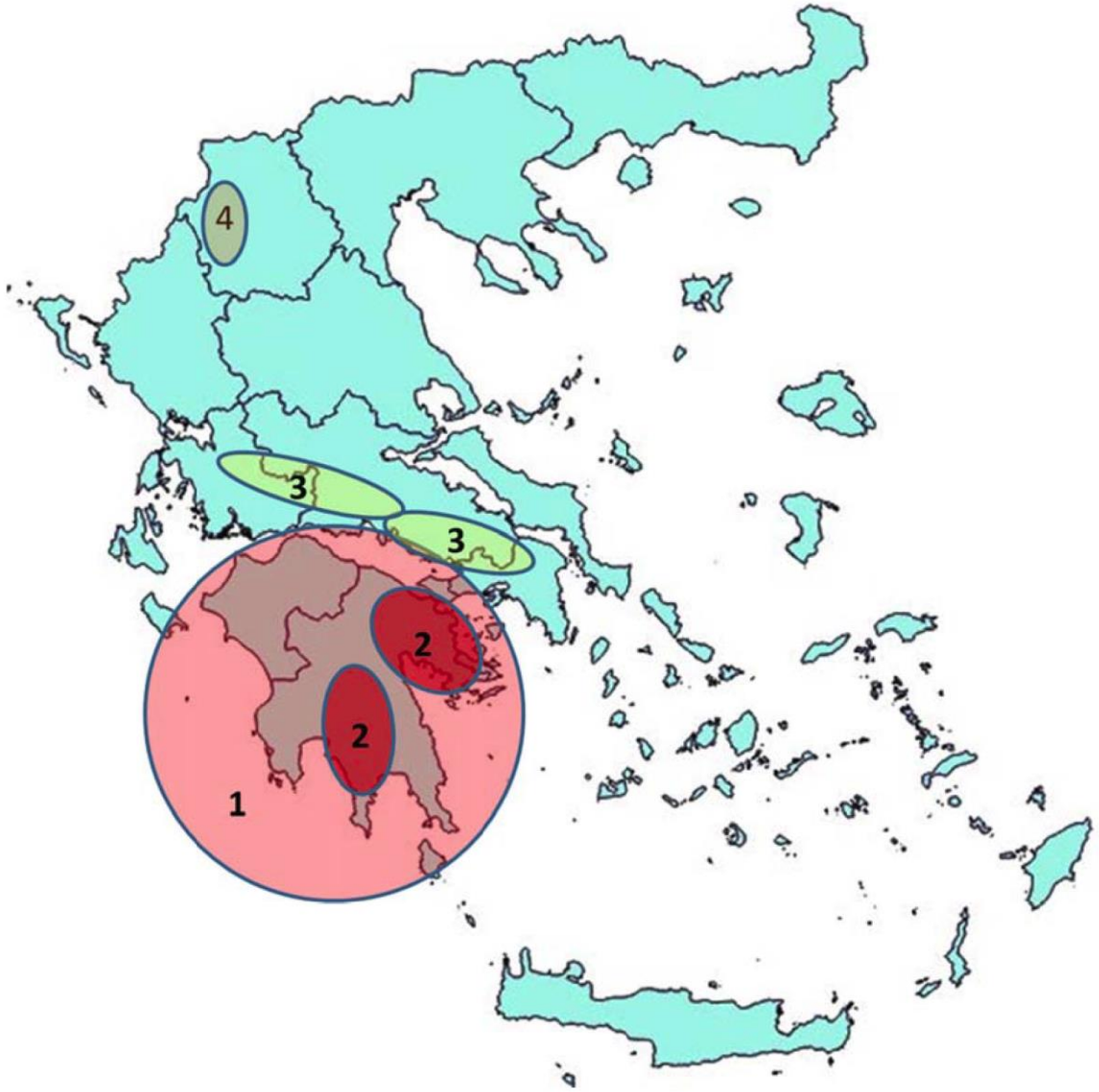


What remuneration scheme for offshore wind?

Various alternative tools could become available

- Special auctions for **offshore wind**
  (Pilot auction for non mature projects has been announced to initiate by the end of 2020)
- Auctions for offshore in **grid hubs** where the System Operator provides connection capacity
- **Common auctions** with onshore wind with special premium for offshore
- **Individual notification** process
  (2014/C 200/01 State aid guidelines provisions)
- **Unsolicited proposals** is also a useful tool

The key role of the transmission network



Saturation of grids in certain areas

- Many grids already characterized as saturated
- Several areas close to electrical saturation

…and

- islands with limited capacity

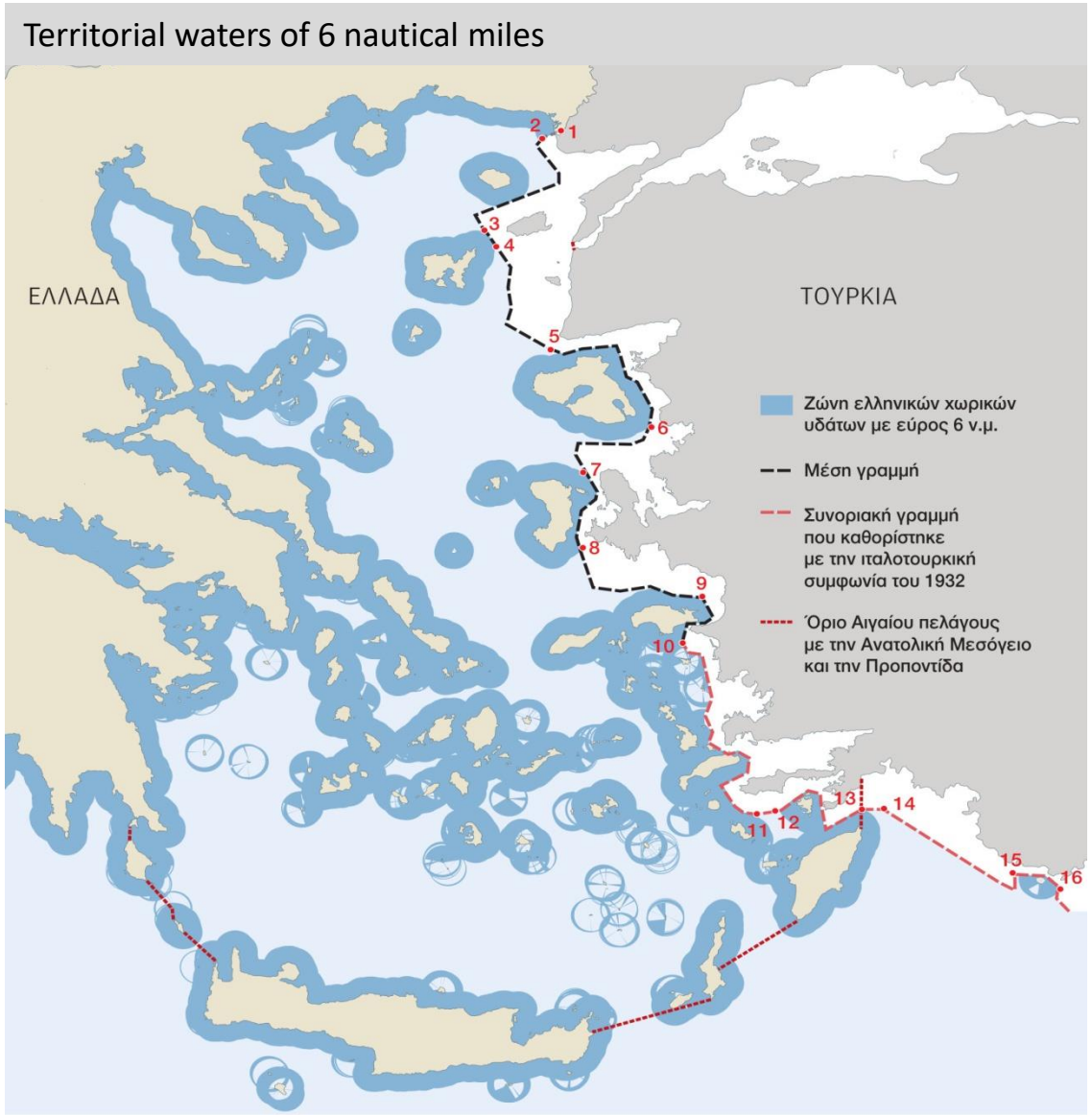
Potential introduction of offshore wind should be coordinated very closely with the expansion of the National Transmission Network!

Source: 2019-2028 Ten-year Transmission System Development Plan, Hellenic TSO, November 2018

Proposals for immediate actions to boost offshore wind in Greece

- ✓ Allow licensing of projects from today
- ✓ The revision of the Spatial plan for RES should incorporate the Greek seas
- ✓ Screening for exclusion zones (marine traffic, firing ranges, sensitive areas etc.)
- ✓ HTSO/ADMIE should consider the idea of building Transmission hubs in the sea for offshore exploitation
- ✓ Pilot Projects & a Pilot Auction will be a catalyst

Last but not least: The geostrategic parameter



- Offshore wind gives the opportunity to exploit the **unexploited territorial waters**
- **Electrical interconnection** in the Aegean
- Development of **Exclusive Economic Zones (EEZ)** in all Greek Seas
- Greece **producer & exporter** of Green Energy
- Contribution to the European Strategy for **Energy Independence**
- Attraction of large **foreign investors**/ investments
- **Geopolitical** empowerment and **sustainable** development

Source: Angelos Syrigos, Assis. Professor, Panteion Univ., Kathimerini, Special Edition 2018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Thank you!