

17-21 JUNE 2019
EU SUSTAINABLE ENERGY WEEK
SHAPING EUROPE'S ENERGY FUTURE



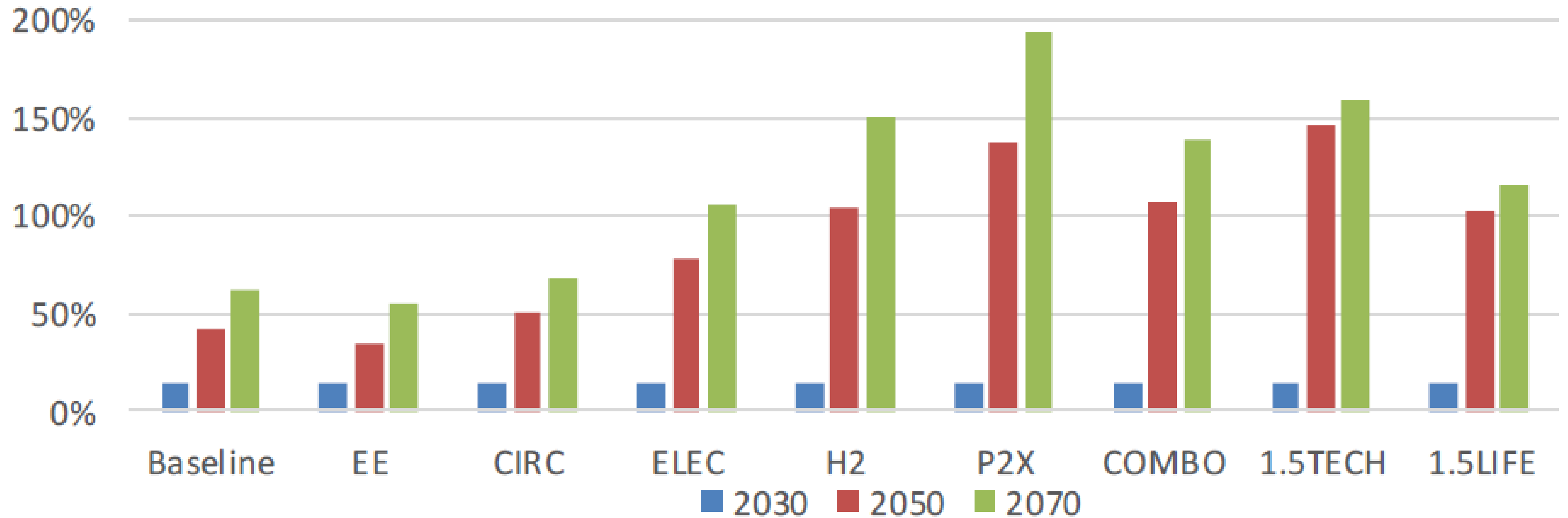
#EUSEW19

a clean planet for all

What do scenarios for reaching carbon zero by 2050 mean for our seas and oceans?

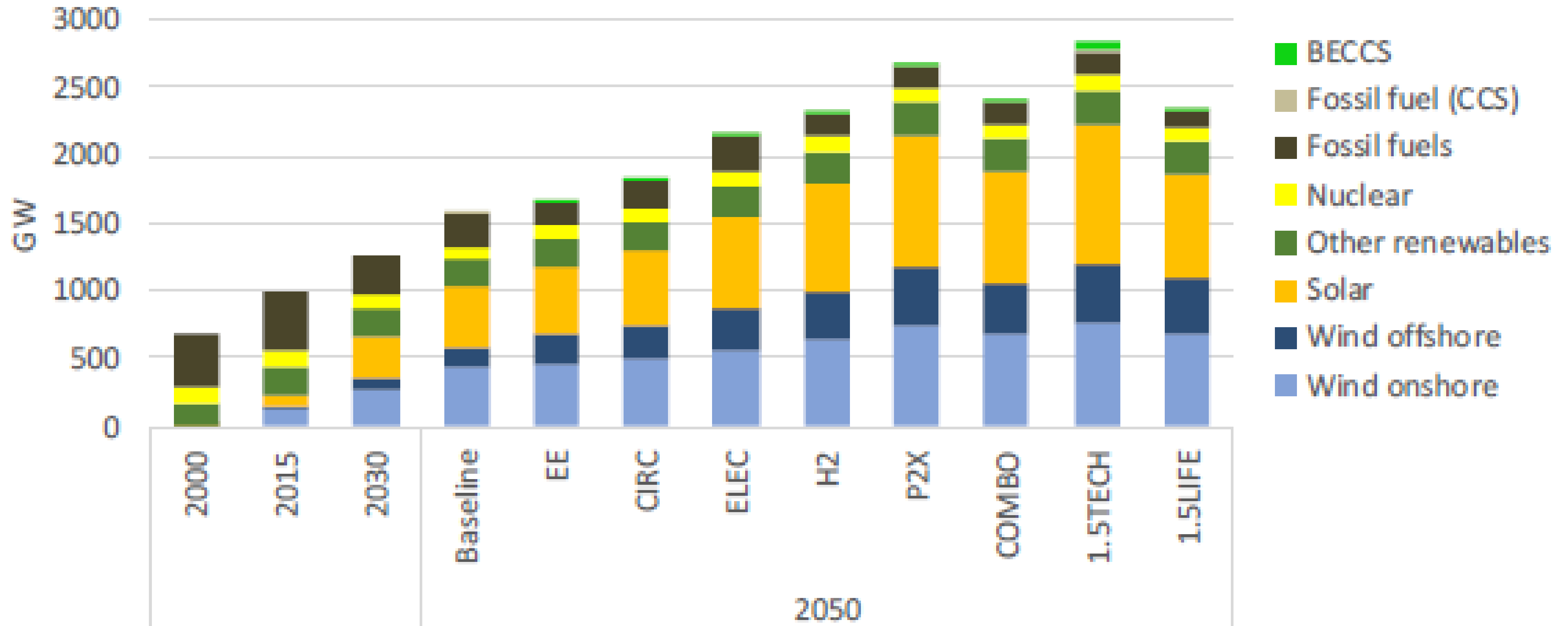
	Electrification (ELEC)	Hydrogen (H2)	Power-to-X (P2X)	Energy Efficiency (EE)	Circular Economy (CIRC)	Combination (COMBO)	1.5°C Technical (1.5TECH)	1.5°C Sustainable Lifestyles (1.5LIFE)
Main Drivers	Electrification in all sectors	Hydrogen in industry, transport and buildings	E-fuels in industry, transport and buildings	Pursuing deep energy efficiency in all sectors	Increased resource and material efficiency	Cost-efficient combination of options from 2°C scenarios	Based on COMBO with more BECCS, CCS	Based on COMBO and CIRC with lifestyle changes
GHG target in 2050	-80% GHG (excluding sinks) [“well below 2°C ” ambition]					-90% GHG (incl. sinks)	-100% GHG (incl. sinks) [“1.5°C ” ambition]	
Major Common Assumptions	<ul style="list-style-type: none"> Higher energy efficiency post 2030 Deployment of sustainable, advanced biofuels Moderate circular economy measures Digitilisation 				<ul style="list-style-type: none"> Market coordination for infrastructure deployment BECCS present only post-2050 in 2°C scenarios Significant learning by doing for low carbon technologies Significant improvements in the efficiency of the transport system. 			
Power sector	Power is nearly decarbonised by 2050. Strong penetration of RES facilitated by system optimization(demand-side response, storage, interconnections, role of prosumers). Nuclear still plays a role in the power sector and CCS deployment faces limitations.							
Industry	Electrification of processes	Use of H2 in targeted applications	Use of e-gas in targeted applications	Reducing energy demand via Energy Efficiency	Higher recycling rates, material substitution, circular measures	Combination of most Cost- efficient options from “well below 2°C ” scenarios with targeted application (excluding CIRC)	COMBO but stronger	CIRC+COMBO but stronger
Buildings	Increased deployment of heat pumps	Deployment of H2 for heating	Deployment of e-gas for heating	Increased renovation rates and depth	Sustainable buildings			CIRC+COMBO but stronger
Transport sector	Faster electrification for all transport modes	H2 deployment for HDVs and some for LDVs	e-fuels deployment for all modes	Increased modal shift	Mobility as a service			<ul style="list-style-type: none"> CIRC+ COMBO but stronger Alternatives to air travel
Other Drivers		H2 in gas distribution grid	e-gas in gas distribution grid				Limited enhancement natural sink	SHAPING EUROPE'S ENERGY FUTURE #EUSEW19 Dietary changes Enhancement natural sink

electricity demand compared to 2015



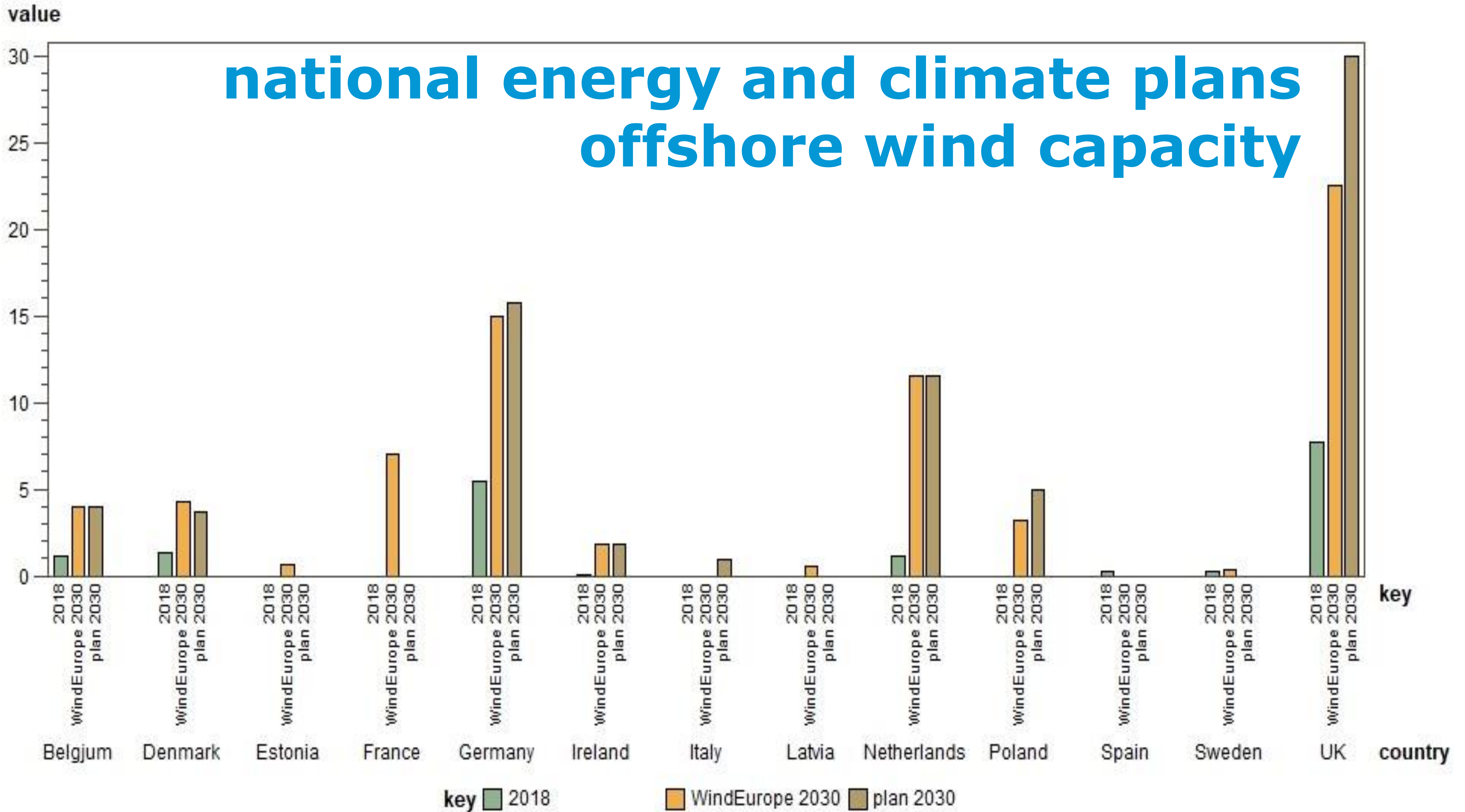
Source: Eurostat (2015), PRIMES.

massive expansion of offshore wind

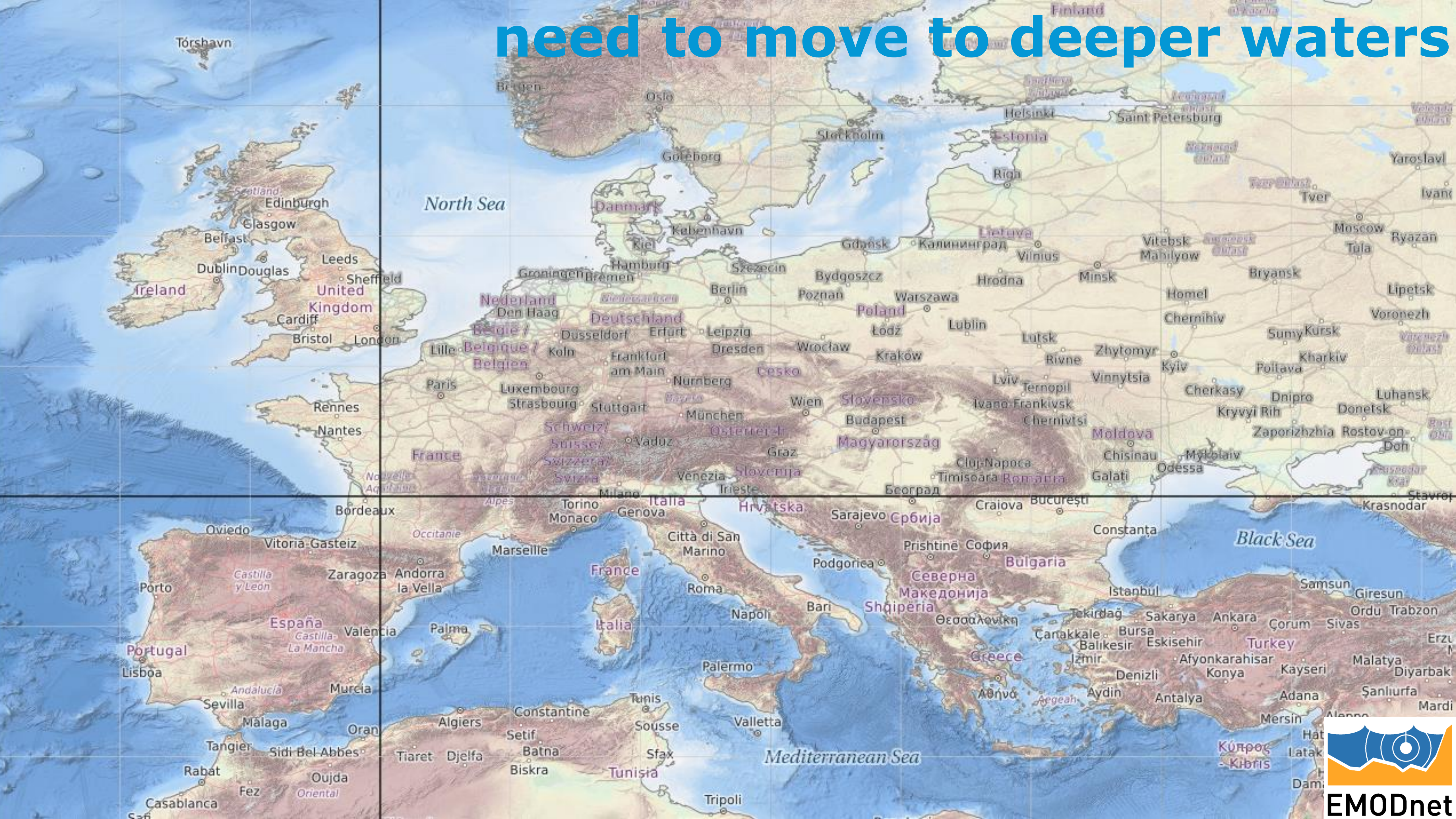


Source: Eurostat (2000, 2015), PRIMES.

national energy and climate plans offshore wind capacity

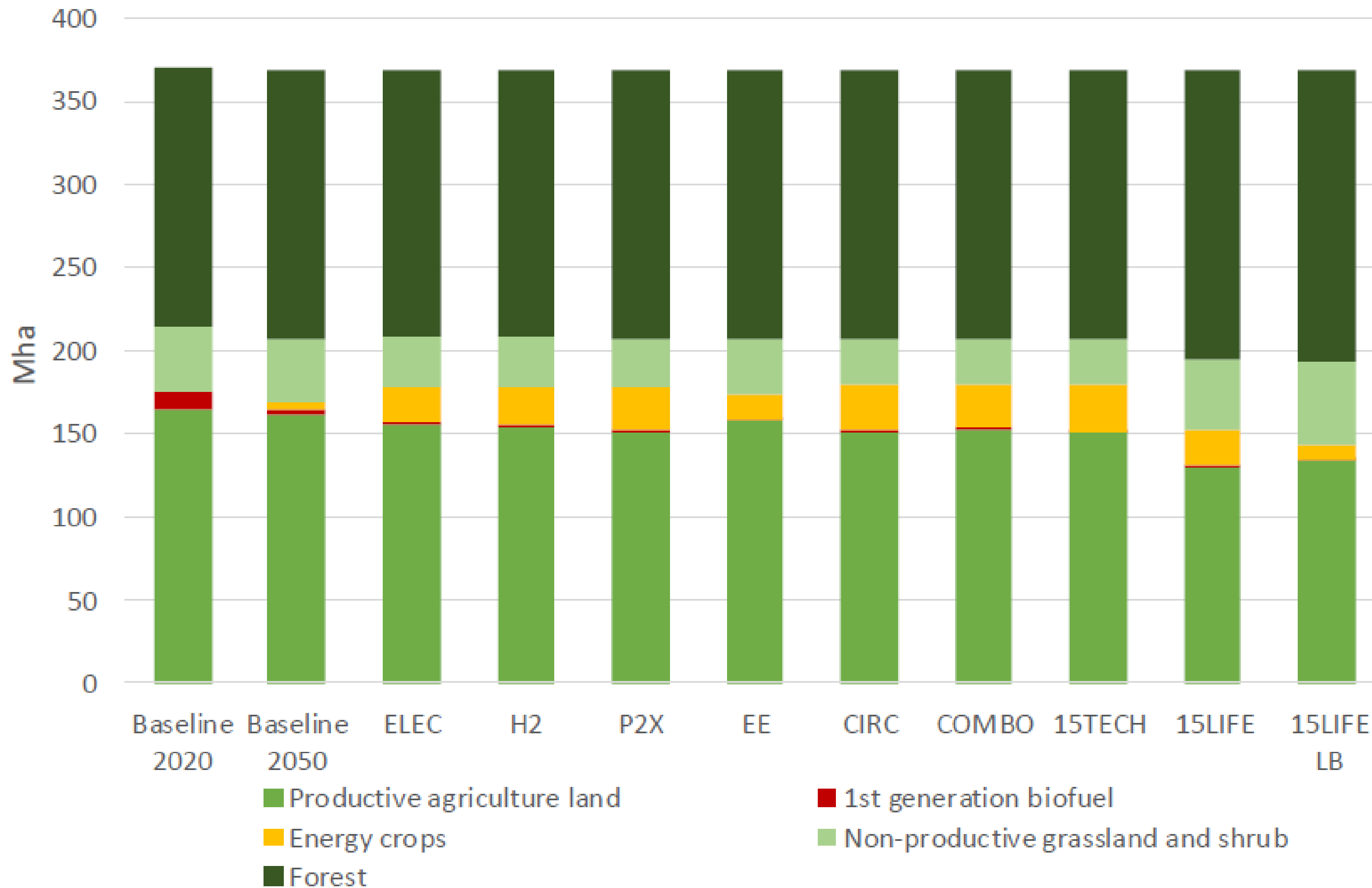


need to move to deeper waters



EMODnet

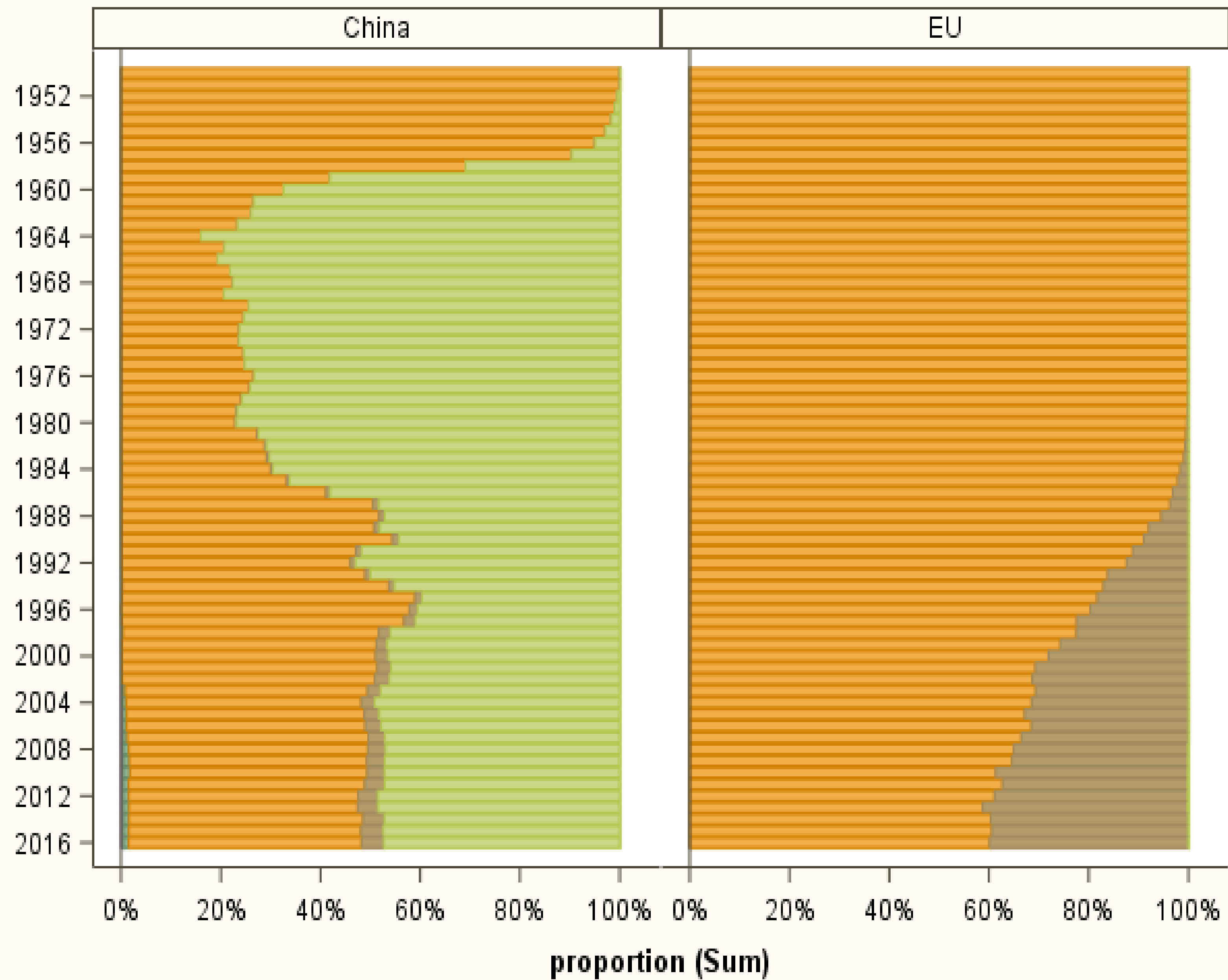
less land for food



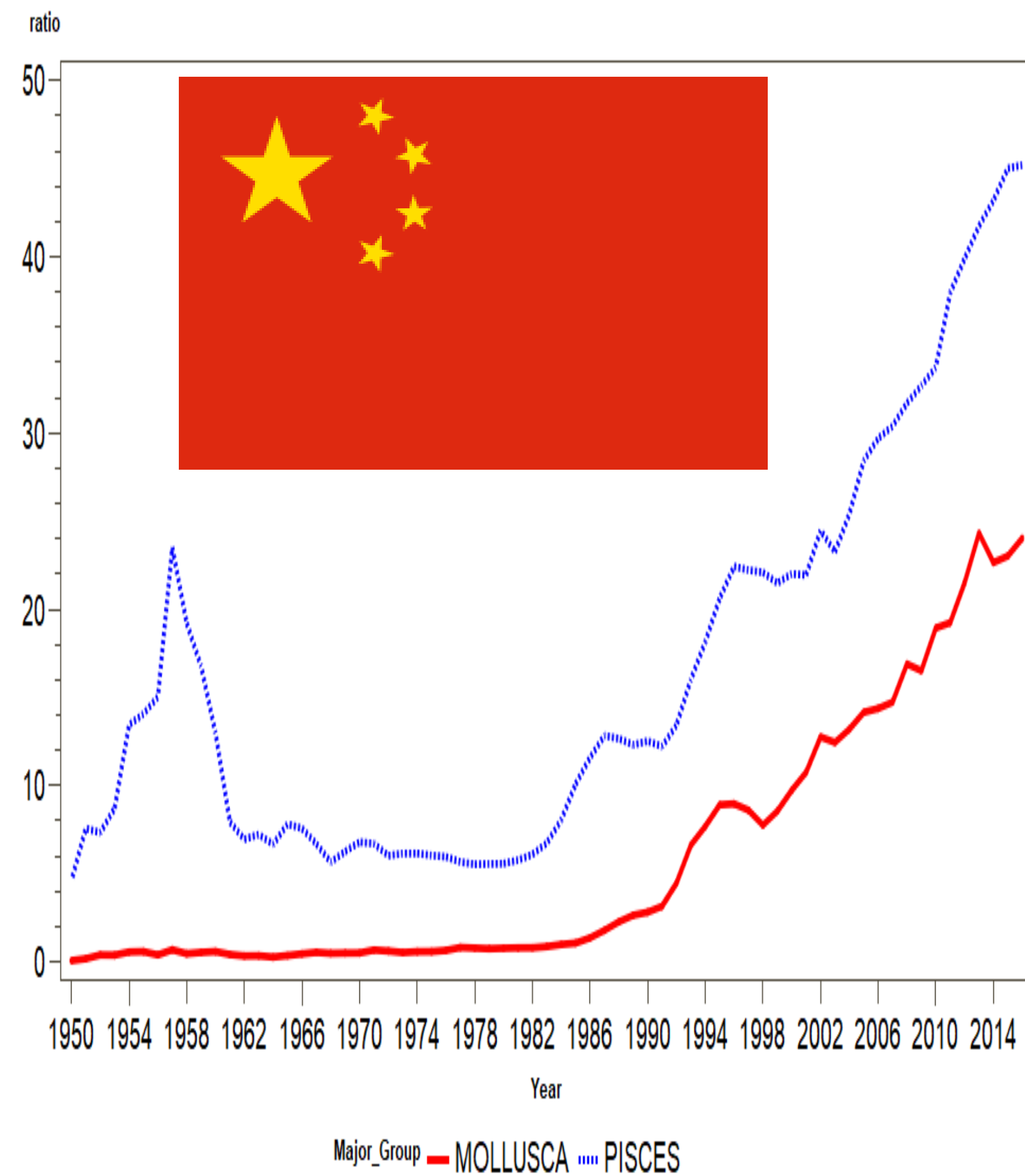
In order to alleviate the multiple demands on the EU's land resources, improving the productivity of aquatic and marine resources will play an eminent role

Source: GLOBIOM.

only marine



**Chinese production
orders of magnitude
greater than EU with
smaller EEZ**



- Floating Wind Turbines
 - how can we move beyond shallow waters?
- Grids, hubs and interconnectors
 - how do we get the energy ashore?
- Algae aquaculture
 - can protein from ocean save land, freshwater and carbon emissions?
- Do we have enough space?
 - what are major challenges?

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