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THE STUDY OF
DEMOCRACY

Wind Power Generation in Bulgaria

Assessment of the Black Sea Offshore Potential

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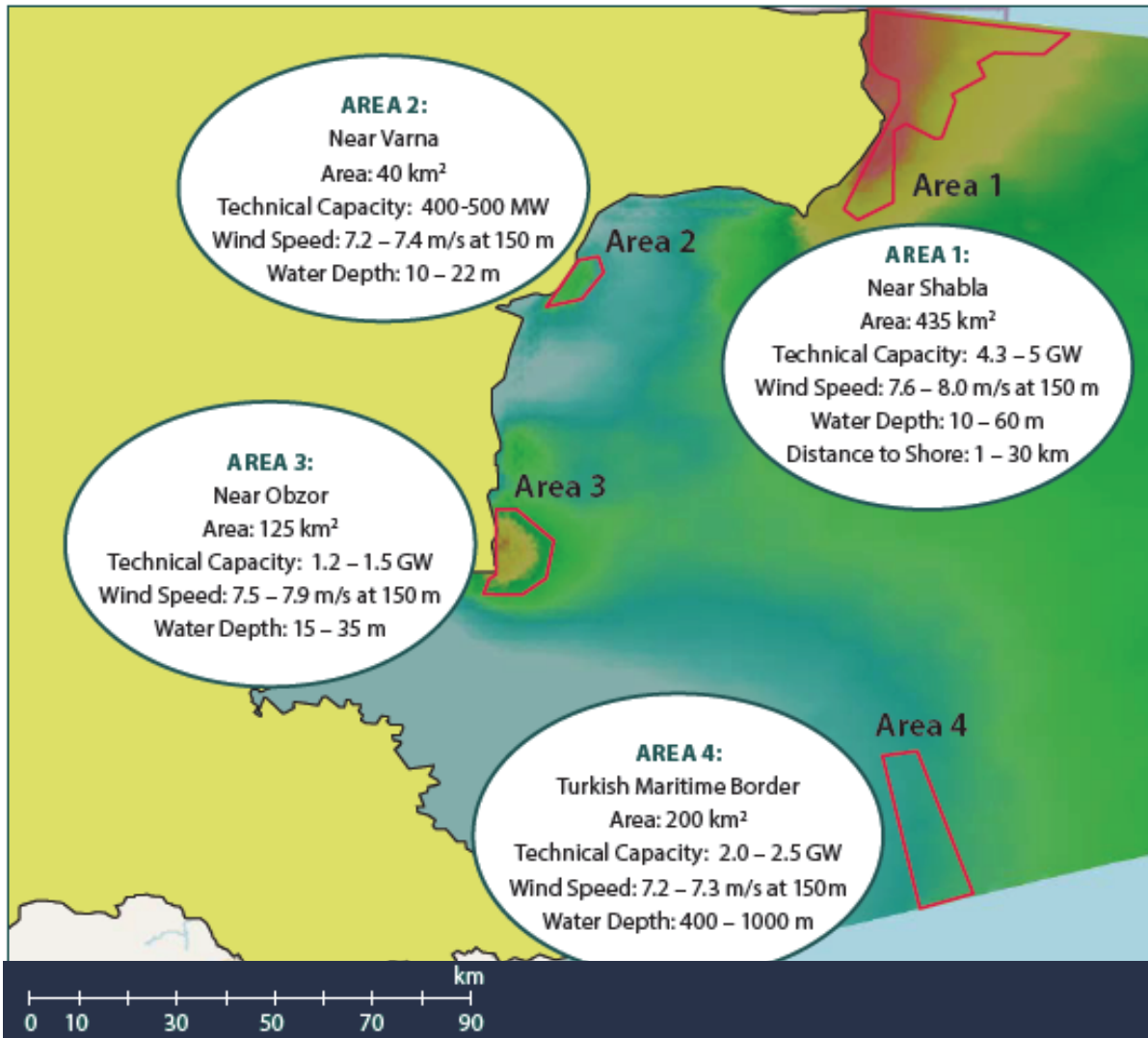


Technical Offshore Wind Potential in Bulgaria

Source	Year	Assumptions	Bottom-Fixed (GW)	Floating (GW)	Total Potential (GW)
World Bank	2019	<ul style="list-style-type: none"> Only selected areas considered Water depth up to 50 m - fixed Water depth up to 1000 m - floating Distance from shore - up to 200 km Wind speed at approx. 7m/s 	2	24	26
JRC, ENSPRESO Database	2019	<ul style="list-style-type: none"> Low restrictions Water depth up to 60 m - fixed Water depth up to 1000 m- floating Capacity Factor > 25% 	24.4	38.4	62.8
Bulgarian NECP	2020	No prospects for development, no potential estimated			
GREEN-X Model		1.2 GW in fixed-platform offshore wind potential based on GIS modelling without consideration of technical (power system) constraints but with sea use limitations			

CSD Assessment	2021	<ul style="list-style-type: none"> Bulgarian EEZ limited by military bases, shipping lanes and areas at water depth > 1000m Water depth between 10 and 60 m - fixed Wind speed > 7 m/s at 150 m 	26		116
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Pre-selected Deployment Areas

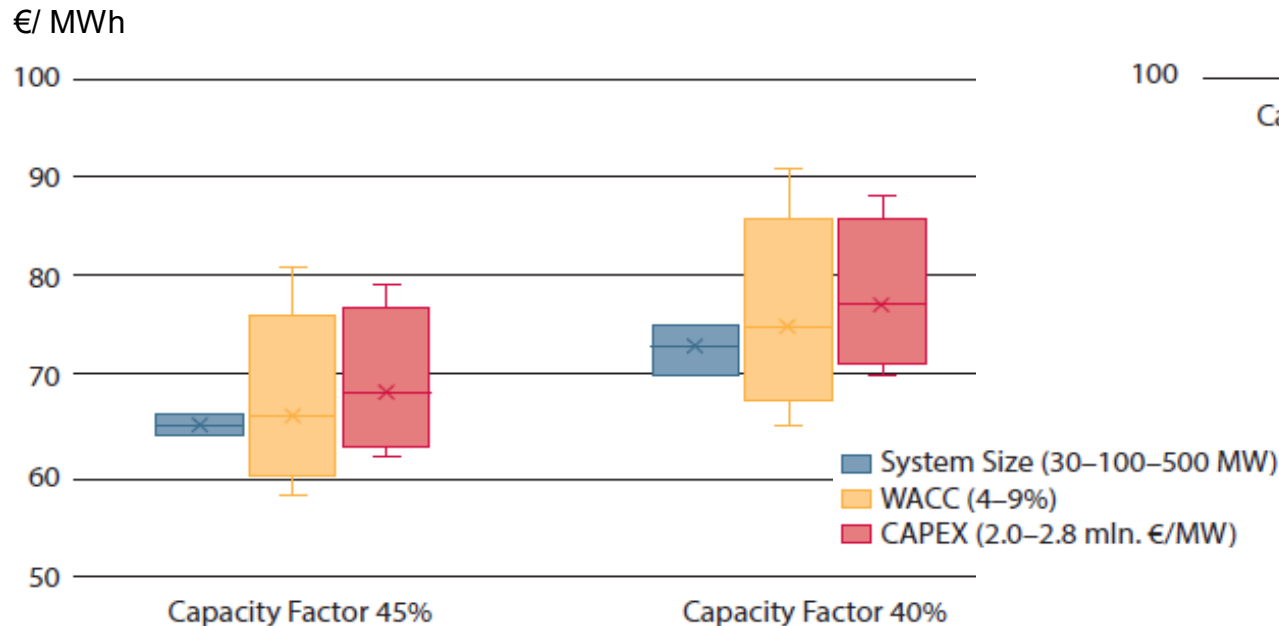


	Net Deployment Potential	Capacity Factors	LCOE
AREA 1 Shabla	1 GW: depth < 40 m 1.9 GW: 40 <depth> 50 m 1.4 GW > 60 m	45-48 %	62-81 €/MWh
AREA 2 Varna	250-300 MW	40 %	79-91 €/MWh
AREA 3 Obzor	Rerouting and detailed micro siting required	44 -45 %	
AREA 4 Turkish Border	2- 2.5 GW	43-44%	

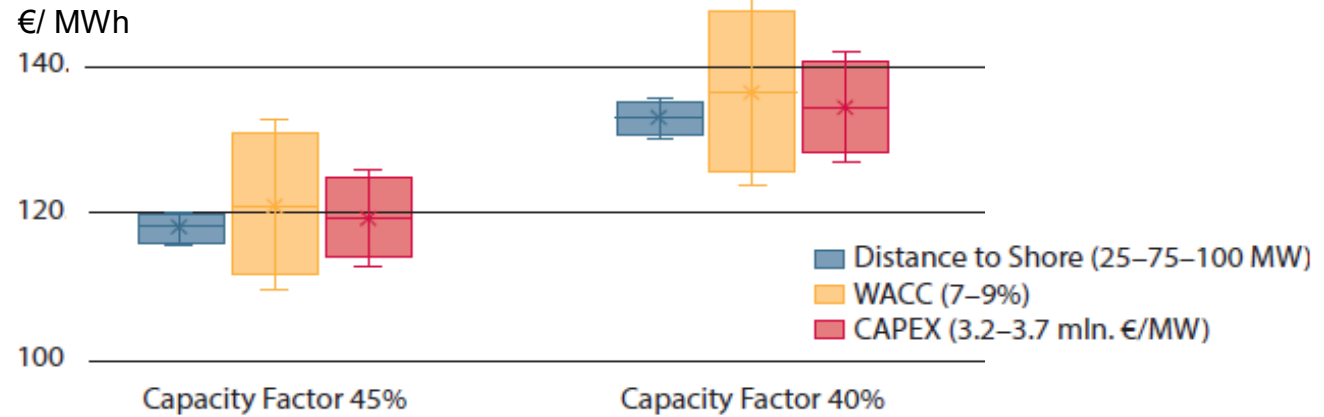
Source: CSD

Cost Evaluation for Offshore Wind Energy Generation in Bulgaria

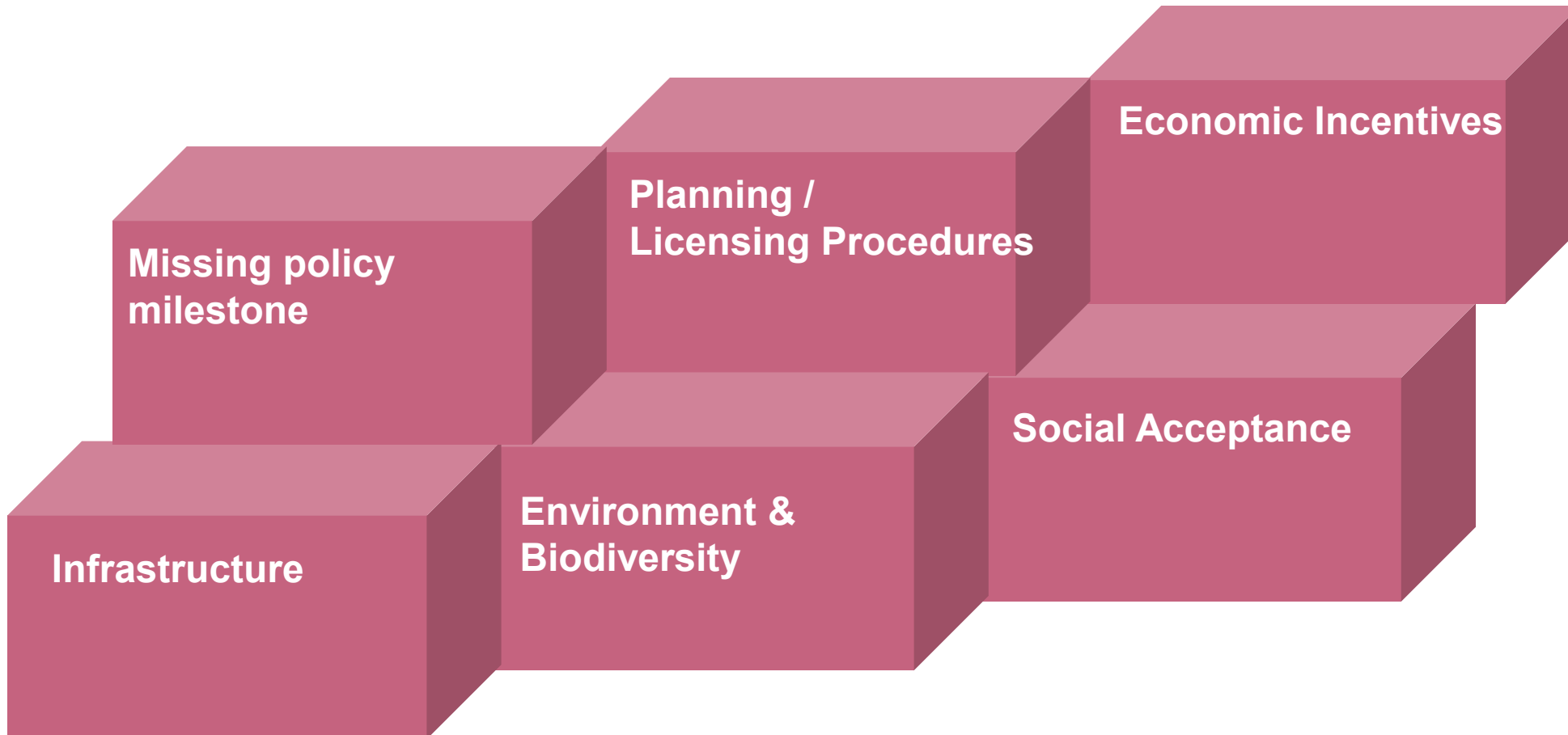
LCOE Calculations for Bottom-Fixed Concept



LCOE Calculations for Floating Concept



Technical, Environmental and Regulatory Challenges for Utilization of the Existing Potential



What's Next?

PLAN

- Set clear targets and deployment corridors (Amending National Energy Strategy, NECP)
- Detailed development plans, preliminary maritime area investigations & capacity density plans for optimal positioning



ENABLE

- Conduct legal gap analysis and develop corresponding legislative framework
- Update the Maritime Spatial Plan
- Use EU and national financial instruments for feasibility studies, pilot projects, port infrastructure, R&D, training, grid improvements



SUPPORT

- Introduce financial support schemes for offshore wind investment through power auctions and CfDs
- Guarantee predictable remuneration for wind investors and deployment corridors



ENGAGE

- Local large industrial energy consumers
- Consider cross-border auctioning mechanisms and cooperation with Romania, Greece, Turkey for technology and know-how transfer



COUPLE

- With green hydrogen industrial development for deep decarbonization of key sub-sectors in energy, transport, and industry.



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Thank you!

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