PHAROS4MPAs

SAFEGUARDING MARINE PROTECTED AREAS IN THE GROWING MEDITERRANEAN BLUE ECONOMY: OFFSHORE WIND ENERGY SECTOR

POLICY BRIEF
MAY 2019

Interreg Mediterranean
EUROPEAN UNION
PHAROS4MPAs

PRIORITY ACTIONS FOR PUBLIC AUTHORITIES

OFFSHORE WIND ENERGY SECTOR & MEDITERRANEAN MARINE PROTECTED AREAS:

INCREASING INTERACTIONS

In the EU, wind power represents one of the most promising tools for reducing greenhouse gas emissions, and hence diminishing the consequences of climate change.

According to forecasts for the Mediterranean, offshore wind energy is the most promising future source of renewable power. To date though, the development of the sector in the region is in its infancy: there are currently no OWFs in operation; the first is due to be completed by early 2020 in Italy, while several projects are in a pilot phase in France, and Greece is considering potential development of the sector.

However, while its contribution to climate change mitigation is critical, offshore wind development may have potential negative impacts on the surrounding environment. As in other parts of the world, the projected growth of the OWF sector in the Mediterranean is raising concerns over its potential interactions with Marine Protected Areas (MPAs) – these, by definition, are areas of great importance for marine biodiversity and ecosystems. In recent years, across the Mediterranean, MPAs and other area-based conservation measures have been increasing in number and area covered.

As key tools for protecting marine biodiversity and ecosystems, it's essential that their relation to activities such as OWFs is well defined.

With this in mind, future locations for OWFs should be decided through processes which take into account conservation objectives, and aim to avoid ecologically valuable areas, and in particular protected areas. Ecosystem-based marine spatial planning (MSP) and strategic environmental assessments (SEA) should as far as possible ensure that OWFs are not deployed in areas that contain habitats, species and/ or ecological processes that are particularly sensitive to their likely impacts, whether during construction or operation.

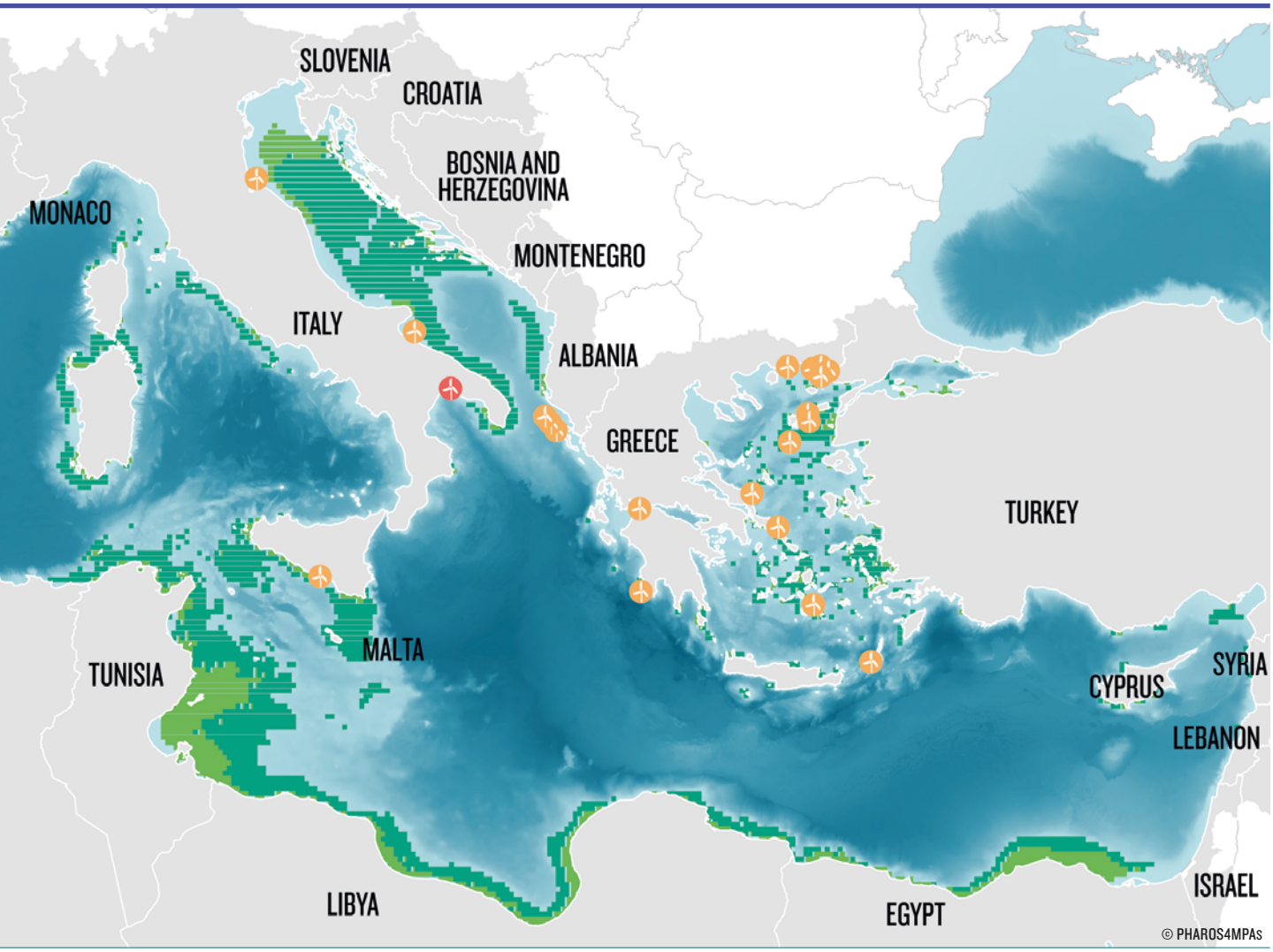
In countries where renewables have already been deployed in MPAs, or which are at the planning and assessment stage, the environmental impacts of each development should be robustly scrutinized on a case- by-case basis under relevant nature conservation legislation.

POTENTIAL AREAS SUITABLE FOR OWF DEVELOPMENT,

Active cross-sectoral participation is essential in MSP to ensure both marine wildlife conservation and the sustainable development of OWFs in the Mediterranean in the face of climate change.

This PHAROS4MPAs policy brief illustrates the main trends shaping the OWF sector, identifies its projected impacts on Mediterranean MPAs, and proposes priority policy responses as well as the best available technical approaches available to mitigate impacts.

AND PLANNED AND AUTHORIZED OWF PROJECTS IN THE MEDITERRANEAN SEA



WINDFARM PROJECTS

- Planned OWF
- Authorised OWF

Potential locations
SOURCE: MedTrends (2015)
Windfarm project
SOURCE: EMODNET (2017), revised by WWF

POTENTIAL SUITABLE AREAS FOR OWF DEVELOPMENT

- Suitable area for fixed OWF (water depth < 50 m and wind speeds greater than 5m/sec at 80 m height above sea level)
- Suitable area for floating OWF (water depth 50 to 200 m and wind speeds greater than 5m/sec at 80 m height above sea level)

OFFSHORE WIND ENERGY:

KEY IMPACTS ON THE MARINE ENVIRONMENT

As OWFs increase in number and size, there's a growing need to consider their cumulative impacts on marine habitats and wildlife.

While the effects of one wind farm on a particular wildlife population may be negligible, the aggregate effects of multiple wind farms through space and time are likely to cause wildlife population declines, while also adding to the pressures generated by other maritime sectors.

PRESSURES, INTENSITY AND OCCURRENCE OF IMPACTS ON MARINE HABITATS AND ANIMAL GROUPS

PRESSURE	IMPACT	TAXONOMIC GROUP / HABITATS
Cable laying	Habitat loss	**Habitats/ benthic communities**
Cable laying	Physical damage, disturbance	
Foundations occupation	Habitat loss/ Physical damage, disturbance	
Submerged structures	Reef effect	
Underwater operating cables	Electromagnetic fields/Temperature increase	
Piling noise	Physical damage, disturbance	**Fish**
Underwater operating cables	Electromagnetic fields	
Submerged structures	Reef effect	
Foundations occupation	Habitat loss	
Piling noise	Physical damage, disturbance	**Marine mammals**
Ship traffic / Ship presence	Collision / displacement	
Ship traffic - noise	Displacement	
Ship traffic	Displacement	**Birds**
Light	Collision	
Operating wind turbines	Collision	
Operating wind turbines	Barrier effect	
Operating wind turbines	Collision	**Bats**
Ship traffic	Collision	**Sea turtles**
Piling noise	Physical damage, disturbance	
Light	Disorientation	
Underwater operating cables	Disorientation due to EMF	
Waste and pollution	Habitat degradation, disturbance, physical damage	**All taxonomic groups and habitats**
Sacrificial anodes	Habitat degradation, disturbance, physical damage	

The level of OWF impacts is highly dependent on the habitat characteristics of an individual site, the types of turbines and foundations used, and the installation techniques involved. It should also be noted that OWFs may sometimes have beneficial effects for some organisms, for instance by acting as artificial reefs, which can enhance biodiversity and increase food sources.

Floating wind farms will likely have different impacts to fixed wind farms, but they are a recent development and research is so far scarce.

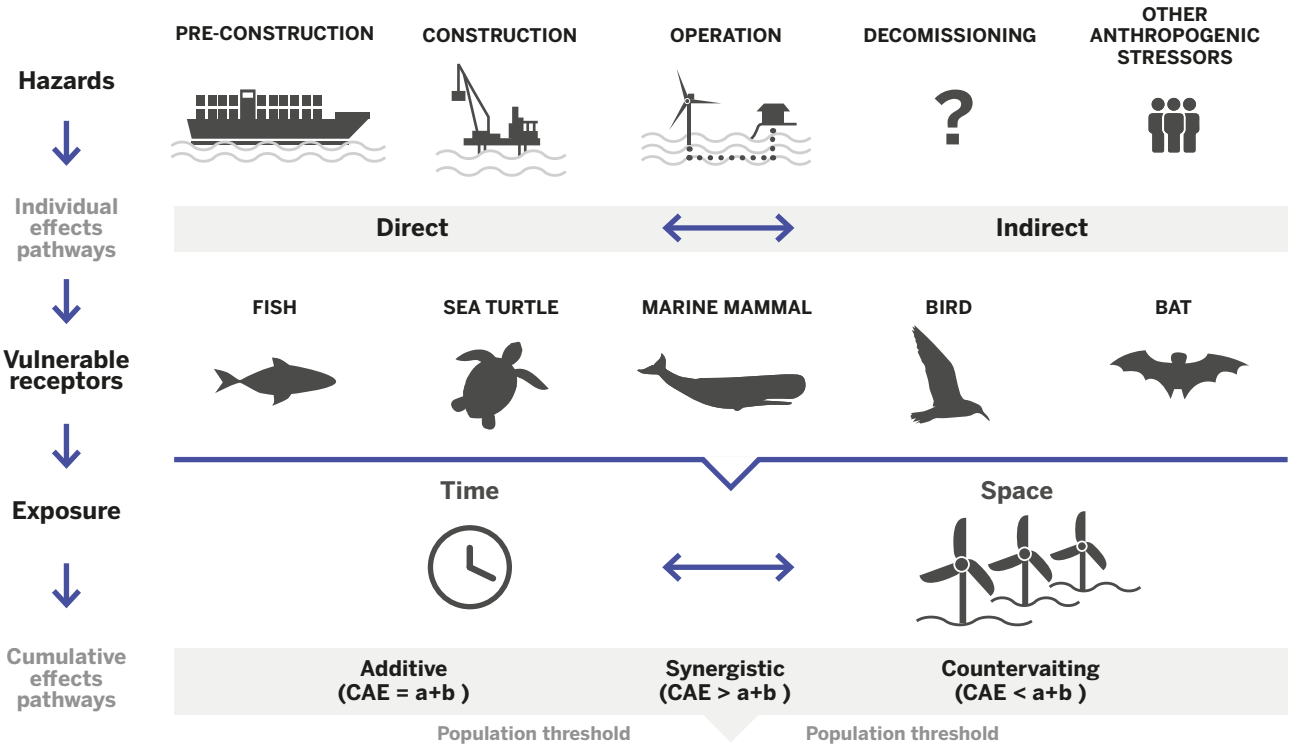
KEY FIGURES RELATED TO IMPACTS

- **Collision risk** – bird fatality rates vary widely by region, ranging from 8-14 per year per turbine in Germany, to a shocking 100-1,000 in the Baltic Sea
- **Noise** – pile driving during construction can displace dolphins by up to 50km, while operational noise is audible to some whale species at up to 18km
- **Metal pollution** – a single turbine's sacrificial anodes input 0.5-1 tonne of metals into the marine environment every year
- **Damaged seabed habitats** – a single turbine 'footprint' on the seafloor can be above 2,000m^2
- **Cable laying** and **cable landing** can have negative impacts on sensitive coastal habitats such as Posidonia beds

DURING THE FOUR OWF LIFECYCLE PHASES

	IMPACT INTENSITY DURING:			
	Siting phase	Construction	Operation	Decommissioning
	—	MEDIUM/HIGH	LOW	LOW/UNKNOWN
	—	MEDIUM/HIGH	LOW	UNKNOWN
	—	MEDIUM/HIGH	LOW	—
	—	—	UNKNOWN	UNKNOWN
	—	—	UNKNOWN	—
	—	HIGH	—	—
	—	-	UNKNOWN	UNKNOWN
	—	-	UNKNOWN	UNKNOWN
	—	MEDIUM/HIGH	LOW	—
	—	HIGH	—	—
	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
	LOW/MEDIUM	MEDIUM/HIGH	MEDIUM/HIGH	MEDIUM/HIGH
	LOW/MEDIUM	LOW/MEDIUM/HIGH depending on species		
	LOW	LOW/MEDIUM/HIGH depending on species		
	—	—	LOW/MEDIUM/HIGH depending on species	—
	—	—	LOW/UNKNOWN	—
	—	—	UNKNOWN	—
	LOW/MEDIUM	MEDIUM/HIGH	LOW/MEDIUM	LOW/MEDIUM
	—	HIGH	—	—
	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
	—	—	UNKNOWN	—
	LOW	LOW	LOW	LOW
	—	UNKNOWN	UNKNOWN	UNKNOWN

CUMULATIVE ADVERSE EFFECTS OF OFFSHORE WIND ENERGY DEVELOPMENT ON WILDLIFE



DURING PILE-DRIVING OPERATIONS FOR THE CONSTRUCTION OF AN OWF, VAN OORD USES A BIG BUBBLE SYSTEM TO REDUCE UNDERWATER NOISE

© VAN OORD

PUBLIC AUTHORITIES CAN PLAY A MAJOR ROLE IN MINIMIZING THE OWF SECTOR'S IMPACTS ON MPAs

Public authorities involved in the development of the OWF sector should follow the Avoid – Mitigate – Compensate approach, and prioritize the spatial segregation of protected areas and areas designated for OWFs.

KEY RECOMMENDATIONS FOR PUBLIC AUTHORITIES

- MSP should follow the ecosystem approach to reach or maintain Good Environmental Status as well as Favourable Conservation Status. This needs strong SEAs to identify potential future locations for OWFs which as far as possible avoid ecologically sensitive areas in general and MPAs in particular. MSP should also consider cumulative impacts and assess them more broadly.
- Decision-making processes regarding future locations for OWFs should reflect conservation priorities and aim to avoid ecologically valuable and protected areas. Effective, ecosystem-based MSP and SEAs should as far as possible ensure that OWFs are not deployed in areas that contain habitats, species and/or ecological processes that are particularly sensitive to their impacts, whether during construction or operation. Sensitivity mapping is one of the most valuable tools for effective OWF planning, helping developers and regulators in the early stages of decision-making to steer development away from sensitive areas where negative interactions are most likely to happen. This also reduces business risk.
- In countries where OWF deployment already lies within MPAs or which are at the stage of environmental impact and appropriate assessment, developments should be robustly assessed on a case-by-case basis in line with relevant nature conservation legislation, taking a precautionary approach to ensure that site conservation objectives are met.
- When OWFs are planned in sensitive areas, including MPAs, where projected information on their impacts is lacking, commercial production should only begin on a small scale (10-20 turbines). This will enable monitoring of environmental impacts and provide data to define the no-go criteria for further development. To ensure environmental conservation objectives are met, specifications for small-scale OWF proposals should be set by a national scientific expert group which includes MPA managers.
- When avoidance is impossible, impact mitigation measures must be implemented by the competent authority. Ultimately, ecological compensation may be needed if there are still significant residual impacts – this could include measures to restore degraded habitat or create new habitat areas. However, due to their uncertainties, complexity and costs, such measures are generally only considered as a last resort and they are not discussed in PHAROS4MPAs recommendations.
- Cooperation between countries and areas sharing sea space or transborder MPAs is essential for the exchange of information, and for setting unified conservation goals, monitoring concepts and action plans.

THE ROLE OF STRATEGIC ENVIRONMENTAL ASSESSMENTS

Strategic environmental assessments (SEAs) are conducted on a large spatial scale, and are a prerequisite for effective MSP. There are many species and marine environmental issues which are not restricted within national borders, so some recent EU projects have focused on how SEAs can be improved to support international MSP protocols and facilitate cross-border collaborations. Mediterranean countries need to develop MSP on an international basis, meaning they can account for the cumulative impacts of large-scale development, including of OWFs. Successful MSP – and thus the SEAs that support it – depends on thorough baseline investigations and research.

The PHAROS4MPAs project explores how Mediterranean MPAs are affected by activities in the growing Blue Economy, and provides a set of practical recommendations for regional stakeholders on how the environmental impacts of key sectors can be prevented or minimized. Encouraging international collaboration across MPA networks and cooperation between state, industry and other actors, PHAROS4MPAs aims to enhance MPA management effectiveness and improve the conservation of marine ecosystems across the whole of the Mediterranean.

Further details, see full report at **https://pharos4mpas.interreg-med.eu**

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FRONT COVER: Immature great black-backed gull *(Larus marinus)* in the Thornton Bank wind farm in the Belgian North Sea

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BACK COVER: Tripods being transported to an OWF construction site

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