

Marine Spatial Planning- Offshore floating wind:

- AEE offshore wind work group
- Slides for sharing

Offshore wind in Spain & Marine Spatial planning

- The offshore wind group in AEE has indicated the need for an update of the 2009 “Estudio Estratégico Ambiental del litoral español” and align this with the ongoing national Marine Spatial Planning (MarSpa / POEM) process due in March 2021.
- The background is that the baseline for the 2009 may have changed and, more importantly, that the technology has evolved since 2009.
- While the technology has evolved in terms of turbines size (2MW ~ 10 MW) and floating substructures, the knowledge based on experiences, pre & post construction monitoring and joint industry scientific work is far better today than in 2009. Some of these key points are;
 - Larger turbine requires smaller number of installation and better use of the marine space
 - Fewer installations gives less intrusive impact and potentially less impacts on birds
 - Mandatory pre & post construction monitoring has created a better fact-base for the regulator and the developer
- Floating wind is seen to have less impact during construction phase as construction happens inshore / at port and the offshore campaigns are significantly shorter in time than for bottom fixed piled structures. This is good for marine life and for potential conflicts with fisheries and other maritime activities
- A consent application by the developer normally requires a comprehensive baseline monitoring and co-existence plan from the developer - it is our understanding that this process will be applied by the Spanish regulator as well.



Learning captured from 10 years of developing bottom fixed and floating offshore wind on environmental impact and co-existence



Above water – bottom fixed & floating faces similar challenges

- Bird collision and avoidance rates
- Cumulative effect on affected species
 - requires baseline monitoring
 - Assessment of impact and measures
 - Post construction monitoring
- Civil Airline safety
- Radar and Military
- Use of offshore space – practice for restricting zones, use of safety zones
- Co-existence with other maritime users
 - Marking for maritime traffic, navigational chart practice
 - Co-existence with Fisheries
 - Avoid shipping lines
 - Layout adjusted to rescue service needs

Below water surface – bottom fixed and floating faces different challenges

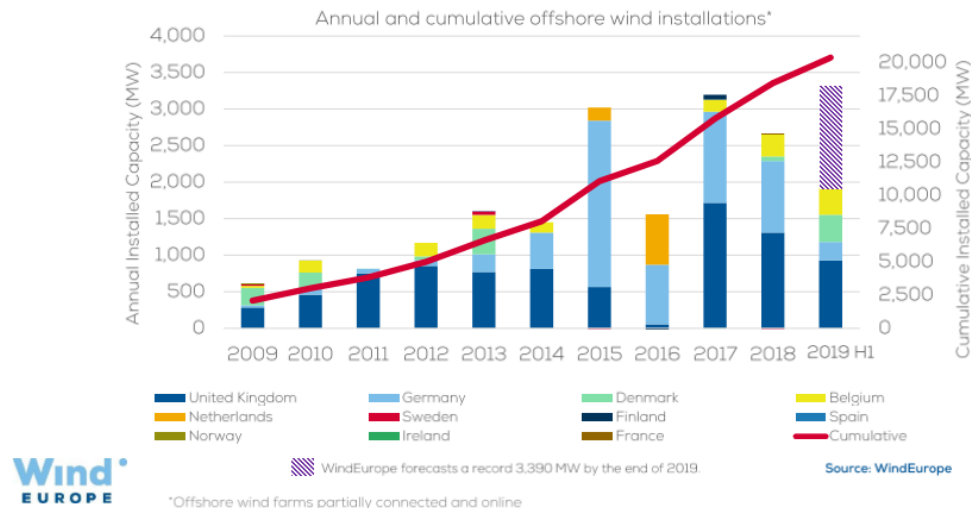
(see also [slide comparing floating vs bottom-fixed](#))

- Effects on marine mammals
 - Underwater noise – piling activities for bottom fixed turbines – not done for floating
 - Construction activity and vessel traffic, disturbance and noise differs
- Effects on benthic communities needs baseline monitoring and follow-up for both systems
- Fisheries and co-existence during construction and operation
 - Shallow areas and bottom fixed – can cause conflict with more permanent fishing gear like potting in the construction phase
 - Trawling and other dynamic tools might occur also in shallow areas far offshore
 - Deeper areas trawling in water column and along the sea bed is more common

	Floating	Bottom fixed (monopiles*) * monopiles most common substructure for bottom fixed
Construction time offshore	Construction time offshore is significantly shorter as assemble of substructure and WTG (Wind Turbine Generators) is done at quay side or close to shore in sheltered areas. Typically subsea installation is done in one campaign and hook up of WTG installations in one campaign. Risk of weather delays is lower than for bottom fixed.	Offshore campaign comprises of piling of, thereafter offshore lifting and assembly of the tower, nacelle and blades offshore. These campaigns are weather sensitive and involves a high number of heavy lifts offshore. Waiting on weather might cause delays.
Construction noise	There is no piling required for floating installations. The subsea installation are done without intrusive activities into the seabed, except in the case of drilled anchors. If drilled anchors are selected the drilling activity might cause noise but these campaigns are deemed to be short and with less noise impact compared to piling.	There is concerns that the noise created during piling of monopiles into the seabed (done with a "hammer") can cause migration and other effects for marine mammals. Noise restrictions is put in place by the authorities in European countries. Similar requirements is expected in e.g. USA, Japan and other countries. Viable technologies are used to protect marine mammals from exposure, e.g. bubble curtains. Documentation and evidence requirements in several countries.
Intrusive impact	Insignificant intrusive impact during construction.	Monopiles are piled 30-40 meters into the seabed
Fisheries	Due to the mooring lines trawling is not recommended in a floating wind farm. This is due to the safety of the fishing vessel should the trawl get entangled into the mooring line / chains.	Bottom fixed windfarms are generally open to fisheries. As the wind farms are installed in shallow areas the fishing activities is often potting and not line or trawl activities. Trawling would not be recommended and possible not requested on shallow areas.
Marine mammals	It is believed to be little impact for marine mammals as the mooring lines and cables are very slim and detectable installations. This is an area of little scientific evidence that could be subject to further studies.	No documented impact during operation. Migration effects during construction can happen if noise is not controlled / mitigated.
Benthic	Footprint issues do not necessarily differ very much if the turbines have monopile foundation/jacket foundations/anchors. Depends on concept for anchoring.	

Offshore wind in Europe currently one of the fastest growing industries

With 1,927 MW connected in the first half of 2019, Europe is on track to break an installations record this year



Offshore Wind in Europe

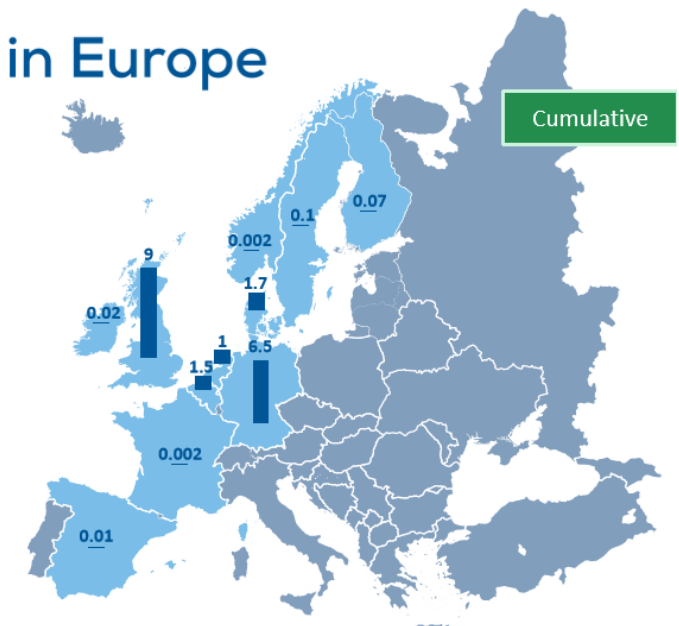
20,381 MW
Connected to the grid

11 Countries

4,811 Turbines

106 Wind Farms

Wind
EUROPE



Global outlook: <https://wfo-news.de/wp-content/uploads/2020/02/Offshore-Wind-Worldwide.pdf>

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