



**Enabling Energy Transition:**  
Advanced Solutions for Marine Mammal Monitoring  
Delivering Operational Efficiencies for Windfarm  
Construction

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# Europe Offshore Wind

## Market Outlook and Dynamics - Windfarms planned in the next 10 years

- 100+ projects in early planning and pre-construction phase
- Approximately 80GW



## Ambitious governments' goals require increase installation rates and operational efficiencies



## A critical aspect of construction operations is marine mammal mitigation

- Challenges with traditional methods lead to inefficiencies and cost impacts

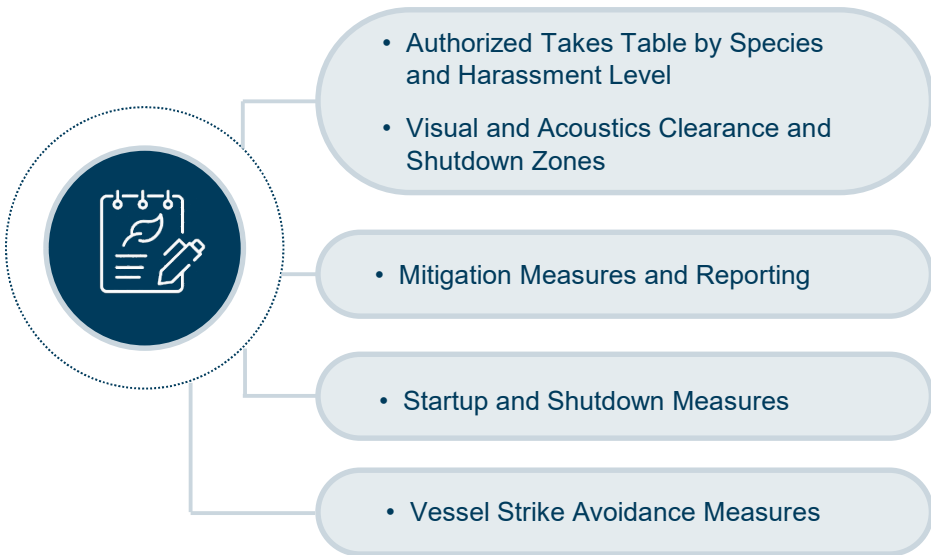


## Technologies and innovated methods to marine mammal mitigation will be presented



# Marine Mammal Mitigation Regime

## LICENSING AND PERMITTING



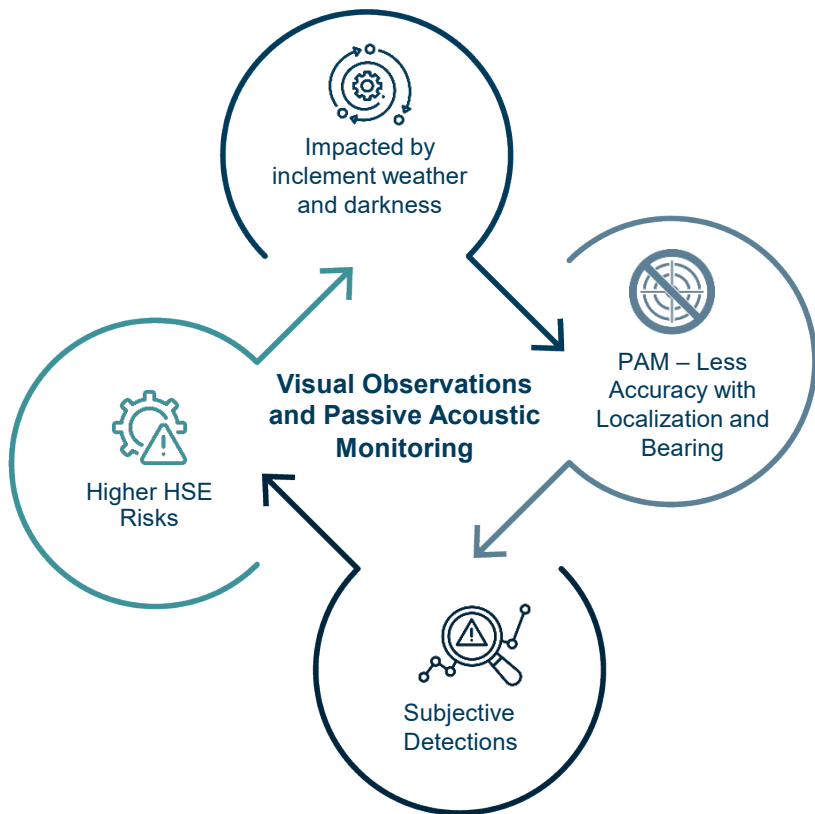
## ENVIRONMENTAL IMPACT STATEMENTS

## TRADITIONAL METHODS

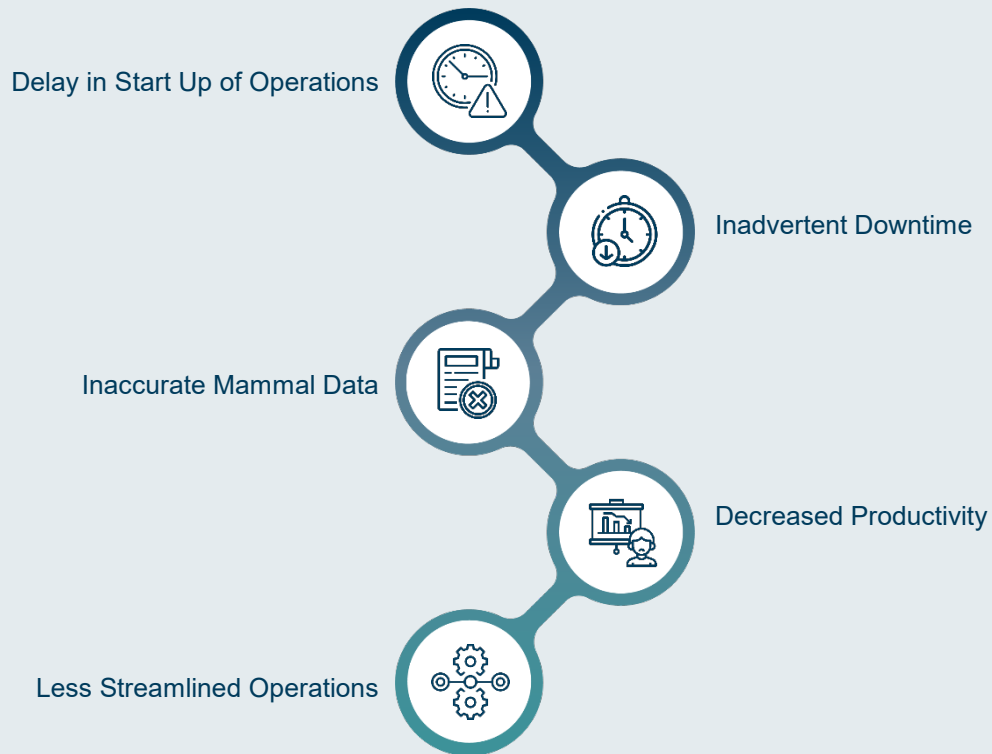


PSOs stationed on vessels making visual observations and PAM PSOs listening for vocalizations.

# Challenges with Traditional Methods



## IMPACTS TO OPERATIONS AND MITIGATION REQUIREMENTS



# Delivering Technology and Innovation to Marine Mammal Mitigation

## OCEAN PERCEPTION

### Innovating on Conventional Methods of Operations

A unique patented software solution that integrates equipment and sensor information to a vessel-based control center streamlining operations and overall situational awareness. Remote Operations infrastructure expands remote operations to other key stakeholders onshore.

## Perception is Visualization

<b>Situational Awareness</b>	Visualization of Timers, Alarms, Mammals, Vessel Traffic
<b>GPS and AIS</b>	Navigational Suite for bird eye's view
<b>Remote Operations Architecture</b>	Real time Operations for all users and the sensor fusion
<b>AI/ML Monitoring</b>	Enhances PSO monitoring
<b>Radar Integration</b>	Enhance monitoring for nighttime operations

# Ecosystem of Enabling Technologies



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A large whale is swimming underwater, its body visible against the deep blue background of the ocean. The whale is positioned horizontally, with its head towards the left and its tail towards the right. The water surface is visible at the top of the frame, showing gentle ripples. The overall scene is serene and captures a moment of marine life in its natural habitat.

# **OCEAN PERCEPTION**

## **Field Trial Results**

A large whale is swimming underwater in a deep blue ocean. The whale is positioned diagonally across the frame, moving from the upper left towards the lower right. Its body is dark and sleek, with a visible dorsal fin and a long, tapering tail. The water around it is slightly rippled, suggesting movement. The overall scene is serene and majestic.

**THANK YOU**