



Reducing maintenance costs through predictive monitoring of offshore wind turbines

BUSINESS PROFILE

- Advanced sensing: ecoCMS and ecoPITCH hardware systems that have been successful in providing strong ROIs to offshore operators.
- Software: FleetMONITOR is a hardware-agnostic software platform with fine-tuned analytics, thresholds and alarms for component failure monitoring and detection.
- Engineering: A fleet of skilled field engineers, with decades of experience, available for anything from inspections to RCA work.

SUPPORT RECEIVED

- Funding Support

Solutions for the offshore wind industry



ONYX Insight is developing advanced predictive monitoring solutions to address one of the offshore wind sector's key challenges.

These solutions aim to fill a critical market gap by providing wind farm operators with continuous blade monitoring, allowing early detection of faults before they escalate into costly failures.

ONYX Insight is a UK-based high-growth technology company that provides analytics software, advanced sensor solutions, and engineering services to the global onshore and offshore wind industry. ONYX's advanced technologies enable wind farm owners and operators to perform predictive maintenance on their wind turbines - detecting machinery faults many months before a catastrophic failure and is highly regarded, capable, and active in the offshore wind industry.



Impact of the support

- Acceleration of product development.
- Expedition of revenue generation.
- Ability to diligently explore different sensor technologies to decide best fit for product.
- Two jobs created to support the development team.

A closer look at predictive monitoring solutions

ONYX identified a market need for predictive monitoring solutions for turbine blades. Specifically, they saw an opportunity to address the spiralling costs of blade maintenance and blade condition monitoring in offshore wind. At present there is no accepted predictive maintenance solution for blades in the market. This means that progressive blade faults that could be fixed early and at a relatively low cost often develop to a severe and catastrophic state requiring much more expensive maintenance or a complete replacement. Continuous blade monitoring enables wind farm operators to predict failures well in advanced and schedule less costly early blade maintenance to reduce costs.

Before

Prior to engaging with OWGP, ONYX had already established itself as a key player in the offshore wind supply chain. In 2021 it launched ecoPITCH, an advanced sensing solution to detect blade pitch bearing failures, which saw a strong market response. This led ONYX to investigate other market gaps, where similar predictive solutions would prove useful in identifying turbine blade faults and maintenance issues before a failure occurs. As such, ONYX applied for a Development Grant through OWGP and were successful.

During

ONYX utilised the grant to develop methods for monitoring wind turbine blades in order to detect structural blade damage, including internal root cracks and delamination. This project has enabled ONYX to address critical challenges in the blade O&M market that demand effective solutions.

Among these challenges, blade liberation is the most severe, posing significant HSE and financial risks. Blade liberation can result in entire sites shutting down while RCA is conducted, leading to substantial financial losses. With crack progression sometimes advancing to liberation within as little as just a few months, periodic drone inspections may fail to identify these developments in time.

This highlights the need for a continuous monitoring solution to mitigate catastrophic failures. The product aims to transform down-tower blade repairs and blade liberation incidents into manageable up-tower repair cases by enabling early detection through continuous monitoring.

After

The product has now been deployed on several turbines, successfully delivering true positive cases of damage detection through its analytics. These analytics are seamlessly integrated into ONYX's existing fleetMONITOR software platform, while the blade sensor technology utilises the existing ecoPITCH hardware platform. With these advancements, the product is fully prepared to enter its commercialisation phase. ONYX is keen to share its learnings with the wind industry and plans to explore benefits for its existing customers with blade issues.



OWGP's support has been invaluable in helping us develop our understanding of blade monitoring, addressing a critical need in the offshore wind industry. The Development Grant has enabled us to explore advanced blade sensing technologies and integrate them seamlessly into our fleetMONITOR platform. With proven damage detection now in place, we're excited to explore how we can significantly reduce maintenance costs and improve safety for wind farm operators. OWGP has been a key partner in driving this innovation forward.



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