Advanced aerodynamic blade tip technology for offshore wind turbines

BUSINESS PROFILE

- An aerodynamic specialist company that designs improvements to blade performance for new and operational blades.
- Offering a suite of products that extend the life of turbines by reducing fatigue loads and blade leading edge erosion.
- With an established track record of working within the onshore wind sector.

SUPPORT RECEIVED

- **Funding Support**

Solutions for the offshore wind industry

With OWGP's support, Anakata has developed its Super Aero Tip Booster (SATIP) to optimise offshore turbine performance by increasing energy capture, reduce turbine wakes, extend turbine lifespan and improve the lightning protection system on blades.

This innovative solution directly addresses the Advanced Turbine Technology priority outlined in the IGP to tackle key challenges like erosion and fatigue, driving down the Levelised Cost of Energy (LCOE) and boosting UK leadership in offshore wind technology.

Anakata is a specialist company that combines Formula One level aerodynamic solutions with deep wind turbine expertise to improve the blade performance of onshore wind turbine technology. Their existing solutions have been demonstrated to deliver > 5% increase in Annual Energy Production (AEP) and Anakata sought to bring these capabilities to the offshore wind sector.

Impact of the support

Introduced two new marketable products in offshore wind.

Created three new jobs.

Increased exports by £85,000.

Increased turnover by £185,000.

A closer look at blade tip technology

Anakata applied for grant funding to develop their SATIP, an evolution of their onshore wind technology. This new device is tailored to meet the specific additional needs of offshore turbines with their longer blades, higher tip speeds and harsh operating environment. Each design improvement in SATIP is focussed on improving blade performance and supporting the growth of offshore wind.

Before

Anakata, a leader in aerodynamic solutions for onshore wind, had established a strong reputation for designing innovative upgrades for new and operational wind turbine blades. With proven success in increasing AEP by > 5% in onshore applications, the company set its sights on the offshore wind sector and sought grant funding through OWGP to design, develop and test its SATIP solution. Anakata envisioned SATIP as both a retrofit solution for existing turbines and a modular factory-fit component for new blades. This project promised to position the UK at the forefront of offshore wind blade innovation, reducing the LCOE and unlocking significant export opportunities.

During

The development of SATIP has focused on optimising blade performance to lower LCOE and extend turbine lifespan by addressing four key areas; energy capture, reducing turbine wakes, fatigue life and Leading-edge Protection (LEP). This is being achieved by enhancing aerodynamic flow at the blade tip using its patented-winglet technology, employing novel control devices to mitigate unsteady aerodynamic forces at the blade tip and introducing a next-generation LEP system, ensuring turbine performance is maintained over its lifetime. SATIP was designed and developed at Anakata's facilities in Oxford, in collaboration with a UK-based composite prototype manufacturer. Prototypes underwent rigorous testing in UK wind tunnel facilities to validate their performance.

After

The first SATIPs were installed on a 7MW offshore turbine in the UK in summer 2024 with further deployments planned for 2025. With SATIP Anakata has positioned itself as a key innovator in offshore wind turbine technology. Designed for both domestic and international markets, SATIP will support UK-based OEMs and wind farm operators while expanding the UK's export capabilities in blade technology. Initial production utilises existing UK suppliers, with Anakata aiming to establish dedicated manufacturing facilities, creating more manufacturing jobs in the UK offshore wind sector. This initiative not only strengthens the UK's role in offshore wind innovation but also drives down LCOE, improves turbine efficiency, and creates export opportunities. Addressing the critical challenges of turbine performance positions Anakata to deliver transformative benefits to the global offshore wind sector.

> OWGPs support played a critical role in supporting Anakata develop SATIP. The project has involved an intensive R&D programme, engaging with offshore wind farm owners to understand the additional challenges offshore blades face, and designing and testing prototype devices ahead of the first SATIPs being installed this year. OWGPs support helped accelerate this programme and provide Anakata with additional momentum to make it happen.

HUW GRIFFITHS
CEO

Anakata
www.anakatawindpower.com