Case Study: Magnomatics

Magnomatics®

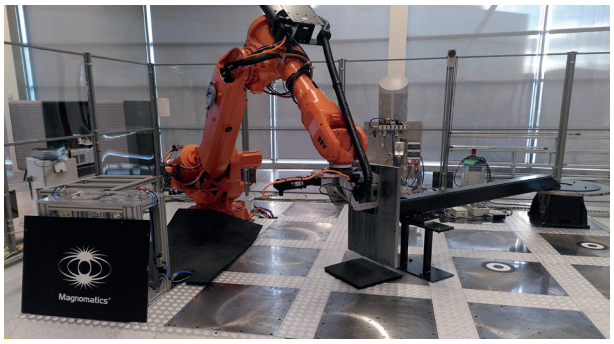
Leaders in magnetic gear box technology, Magnomatics is commercialising the next generation of wind turbine gearboxes.

Business profile

- **Historically focussed in oil and gas, now exploring innovative electrification opportunities across many sectors.**
- **Highly active in exploring commercial opportunities in Offshore Wind.**
- **Technology is licensed to a large global engineering business.**

Support received

GRANT FUNDING



OWGP grant funding support was used for Project ROBOMAG in collaboration with the Advanced Manufacturing Research Centre (AMRC). The project sought to optimise the manufacturing process for permanent magnet direct drive generators through the robotic placement of magnets on the rotor hub of wind turbines. This process can unlock significant safety and productivity improvements.

Impact of the support

- **Reduced time taken to pick and place magnets onto the rotor from 55 minutes to 55 seconds.**
- **Strengthened relationship with large industry partner for the next stage of development.**
- **Saving up to £15,000 per generator.**

A closer look at Magnomatics

Magnomatics' unique magnetic gear technology will deliver significant cost reductions in turbine operations and maintenance (O&M), supercharge the productivity of wind turbines and reduce the levelised cost of energy production by up to 3%.

At the heart of this innovative technology is Magnomatics' utilisation of magnetic gears. With no touching partners, the gearbox components do not wear out and fail. Magnomatics' gearboxes provide superior reliability, efficiency and turbine productivity.

Magnomatics is currently working with a large industry partner to develop the next generation of the machine for Offshore Wind application. This has led to significant investment in the technology's development which is in turn accelerating the commercialisation journey.

- Increased life span and reliability of gearbox.
- 3% reduction in cost of energy production.
- Reduction in O&M costs.

How did OWGP's support propel Magnomatics' business into the Offshore Wind sector?

Before

Magnomatics had previously secured funding from the EU and BEIS for projects which supported growth and development of UK content in Offshore Wind. These projects included the design, build and test of a Magnomatics Pseudo Direct Drive (PDD)® 500kW generator at ORE Catapult's Blyth facility, which is able to deliver a 3% reduction in the levelized cost of energy (LCOE).

Further support and investment was needed to take the PDD to multi-megawatt scale to meet the demands of the UK's burgeoning Offshore Wind sector. Through engaging with ORE Catapult, Magnomatics discovered the OWGP Pilot Funding Competition in 2019 and successfully secured funding to support the development of advanced manufacturing techniques to improve the productivity, reliability and safety of the manufacturing process.

During

The rare earth magnets used within the generator technology are very powerful and potentially dangerous if not handled properly. It was therefore a very time-consuming process to build the rotor, requiring bespoke tooling which was very expensive. These presented critical barriers to commercialisation.

Project ROBOMAG was established with the AMRC to explore the use of a robotic arm to pick, place and bond magnets to the rotor to increase manufacturing efficiency, improve reliability and maximise health and safety. The project successfully validated the process and exceeded expectations in terms of time saved.

After

The principal benefit to the company as a result of this support was reducing a 55 minute process to 55 seconds – a huge achievement with significant cost reduction potential.

Being able to demonstrate that this manufacturing process works has helped to strengthen the relationship between Magnomatics and its industrial partner and provides further confidence in Magnomatics' efficiency. This project has also enabled Magnomatics to cement its relationship with the AMRC and The Future Electric Machines Manufacturing Hub (Femm Hub) to continue its work in driving the electric revolution.

> "The ROBOMAG project was a major step forward for Magnomatics and our magnetic gear technology. We have already proven our technology in terms of performance. The ROBOMAG project demonstrated that a crucial aspect of manufacture was economically viable."

DAVID LATIMER
CEO, Magnomatics

www.magnomatics.com