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Renewables

CASE STUDY

SSE Renewables accelerates innovation to drive sustainability

Working with Avanade and Microsoft to create
a greener future through technology

Business situation
Embracing technology on a mission to achieve net-zero carbon emissions

Climate change is one of the most significant challenges facing our planet, and the need for more renewable, sustainable sources of energy has never been greater. As a leading producer and operator of renewable energy – including wind and hydroelectric – in the UK and Ireland, SSE Renewables (SSER) is helping lead the way toward a greener future. The company understands that innovation is the key to success in a competitive industry like energy.

> "SSE Renewables is looking to grow, but the market is extremely difficult now. We can't do the same things as we have over the last 10 years. We needed a whole new outlook on the way we think."
>
> **John Downes**
> Engineering and Innovation Director, SSE Renewables

This new way of thinking began with exploring how Microsoft technologies can be used to realize SSER's goal of creating a world where net-zero carbon emissions can be a reality. And with so much on the line, the company knows that time is of the essence. "The scale of the net-zero challenge is so great and the significance of achieving it is so important, we need all hands on deck," says Rachel McEwen, chief sustainability officer at SSER. "The energy system – electricity in particular – must be completely decarbonized very quickly."

To accelerate innovation, SSER launched a digital ventures team and partnered with Avanade and Microsoft with a goal to deliver solutions at speed through an exciting blend of ambition and diverse thinking.

Solution
Finding new ways to monitor the environment, protect employees and enhance data analytics

The first phase of our team's engagement included multiple design-led discovery workshops to understand SSER's various business challenges and identify pathways forward. "Microsoft and Avanade can really show us and demonstrate to us technologies that are way outside of our normal thinking," says Downes. "The workshops were absolutely fantastic, really exciting. In some cases, that evening we got responses back and mockups of how we might be able to progress."

SSER selected four use cases to investigate further, and together the team built proof-of-concept (PoC) prototypes for each:

Field service health and safety application

Maintaining wind turbines has risks. That's why the health and safety of SSER's 500 field service technicians working across 50 sites is a top priority. The current process for tracking technicians on and offsite is manual and paper-based, making it difficult to capture accurate information. Our team developed an intuitive, user-centric mobile application to support technicians and provide a control room view to monitor their health and safety. Features include:

- Automated check in/check out at turbines
- Automated fall alerts
- Built-in "proof of life" features to minimize false emergency alerts
- Two-way communication between the control room and technicians

Species and environmental monitoring

Obtaining consent from the UK government to build a wind farm is an intricate and costly process that can take up to 10 years, as determined by regulatory requirements and court decisions. Part of this process involves monitoring protected puffin colonies that live close to the proposed wind farm location to ensure the installation won't have a negative impact on their habitat. Avanade built a new platform for detecting, tracking and recording native species that might be affected by wind or hydro assets on an ongoing basis. This data-driven solution minimizes manual work and provides real-time visualization through Microsoft Power BI dashboards. Based on SSER's regulatory requirements, the platform can be adapted for any species or environment in the future using machine learning and artificial intelligence (AI).

Hydro catchment dashboard

SSER's hydro business wanted to test a hypothesis that it could increase the revenue generated by its catchment assets – which collect and channel runoff water – by digitizing the manual process of identifying leaks and maximizing efficiency. Currently, coordinators examine drainage ditches to detect leaks and document their findings manually. Avanade helped develop a PoC that uses satellite imagery to highlight ditches and other areas of interest and extract in-depth information on their condition without needing a physical visit. Using Power BI dashboards, SSER can generate insights into ditch quality and water saturation metrics.

Hydro dashboard

The company wanted to get a clear picture of the revenue generated by its hydroelectric business. Its current system architecture includes several manual processes and multiple data sets across a number of teams. By pulling together this disparate data into a common dashboard, SSER can get a more detailed view of how its hydro business is performing, with near real-time insights.

The four PoCs were all designed within six weeks and deployed in pilot mode within months. "I've not seen technology tested or deployed that quickly before," says Downes. "It honestly does feel as though it's one single business, working with Avanade."

Results
Several small steps equal one giant leap toward a greener future

By putting the new solutions into practice across multiple areas of the business, SSER is poised to realize several significant benefits for its employees, the environment and its operations:

- **Field service health and safety application:** Automated, real-time monitoring of technicians' activities and health alerts for up to 500 workers across 50 sites will increase safety and improve the workplace experience for both SSER employees and third-party contractors.
- **Species and environmental monitoring:** Improved insights and monitoring efficiency will decrease the amount of time it takes to get a new wind farm approved, help reduce associated costs for on-site monitoring and ensure the protected puffins aren't negatively impacted.
- **Hydro catchment dashboard:** SSER will recover lost catchment revenue to an anticipated total of more than £10 million per year within the next five years due to improved insight and efficiency.
- **Hydro dashboard:** The new dashboard will provide additional insight into the performance and effectiveness of each hydroelectric facility, which will help portfolio managers make better investment decisions to increase revenue.

With a new outlook on the ways technology can help it achieve its goals, SSER isn't slowing down any time soon.

> "We're looking to deploy new technology across all businesses within renewables. Without a doubt, Avanade will keep the speed going, keep the innovation going and really get that value that we're after."
>
> **John Downes**
> Engineering and Innovation Director, SSE Renewables

About SSE Renewables

SSE Renewables is a leading developer and operator of renewable energy across the UK and Ireland, with a portfolio of around 4GW of onshore wind, offshore wind and hydro. Our strategy is to drive the transition to a net zero future – through the world class development, construction and operation of renewable energy assets.

SSE Renewables' overall aim is to deliver enough renewable projects to generate 30TWh by 2030, trebling SSE's renewable energy output from 2019 levels. This will make a significant contribution to decarbonising the power sector and achieving net zero emissions by 2050.

SSE Renewables owns nearly 2GW of operational onshore wind capacity with over 1GW under development. Our 1,459MW hydro portfolio includes 300MW of pumped storage and 750MW of flexible hydro. Our operational offshore wind portfolio consists of 487MW across two offshore joint venture sites, Beatrice and Greater Gabbard, both of which we operate on behalf of our asset partners.

SSE Renewables has the largest offshore wind development pipeline in the UK and Ireland at over 6GW and has an onshore wind pipeline across both markets in excess of 1GW.

For more information, visit www.sserenewables.com.

About Avanade
Avanade is the leading provider of innovative digital and cloud services, business solutions and design-led experiences on the Microsoft ecosystem. With 39,000 professionals in 25 countries, we are the power behind the Accenture Microsoft Business Group, helping companies to engage customers, empower employees, optimize operations and transform products, leveraging the Microsoft platform. Majority owned by Accenture, Avanade was founded in 2000 by Accenture LLP and Microsoft Corporation. Learn more at: www.avanade.com

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