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## GE Spares unlocks innovation and net zero goals with low cost sensor technology

A steel manufacturer is confident of major breakthroughs in productivity, energy use, and innovation, after investing in low cost sensors and analytics to drive data-led decision-making.

GE Spares, based in Londonderry, Northern Ireland, collaborated with Made Smarter Innovation's Smart Manufacturing Data Hub (SMDH) to collect and analyse energy consumption data via its cloud-based platform, gaining transformational insights.

The company has also contributed to the Manufacturing Data Exchange Platform (MDEP), a data mutual where anonymised data is shared with the wider manufacturing ecosystem, academia and technology to extract insights, explore appropriate solutions and identify wider trends.

Simon Coward, Programme Director for MSI's Smart Manufacturing Data Hub, said: "Technology will play a leading role in helping energy intensive manufacturers contribute to the UK's net zero ambitions."

"Working with GE SPares we have demonstrated how low-cost IoT devices and data analytics can support manufacturers to better understand energy usage, optimise production process and unlock opportunities for innovation across all operations."

Chris Needham, Innovation Lead for Made Smarter Innovation, said: "This Made Smarter Innovation funded data hub gives businesses access to expert guidance and digital solutions to accelerate innovative collaboration"

"This project is a great example of using data to unlock new ways to drive down energy consumption, optimise production processes and transform industry

competitiveness."

### THE INSPIRATION

GE Spares specialises in the profiling, milling, forming and fabrication of abrasive wear plates and special steel products for the crushing, screening, construction, and agriculture sectors.

Price competitiveness and lead times are critical to the business, so the manufacturer operates round-the-clock using a large number of CNC, plasma and robotic welding machines.

As an energy intensive production process, reducing power consumption is a critical factor in business-wide cost saving and the carbon footprint of the company.

GE Spares approached the Smart Manufacturing Data Hub to help them explore how data from their shop floor could be captured and analysed to monitor and improve operational efficiency, as well as support decision-making around purchasing, planning, and costing of orders.

### THE INNOVATION

The project centred on collecting power consumption data from a plasma cutting machine and displaying it in real-time on a single, easy-to-access platform.

This involved deploying a low-cost sensor which clipped around the cable, allowing for a non-intrusive installation. The clamp connects to a multifunction meter that collects the data and sends it to a microcontroller through an RS485 module.

The data is displayed live on a dashboard, which can be accessed via a microcontroller by any device on the same network, and stored for later analysis.

The dashboard illustrates machine utilisation and energy consumption, which can be analysed by shift, day, or week, to identify trends and opportunities to increase productivity.

### THE IMPACT

The power monitoring solution allowed GE Spares to immediately establish a baseline on their plasma cutter and identify any inefficiencies or wasteful practices that may be increasing their energy costs.

The dashboard can be analysed by shift, day, or week, to identify trends and opportunities to increase productivity.

For example, analysis of the machine over a four week period, revealed overall availability was 42%. This has prompted the management team to explore solutions to increase capacity to at least 60%.

GE Spares is now committed to expanding the use of sensors to other machines to compare and contrast performance for additional insight. Real-time access to data will alert production managers to any bottlenecks and issues immediately and remotely. For instance it could help the company predict when assets may fail and schedule maintenance to reduce machine downtime.

With an ERP system already in place for capturing productivity labour costs, energy consumption data will



allow GE Spares to understand exactly how much it costs to produce a specific product at any given time of the day, and using any particular machine. This can be used to price the product accurately to maximise profitability.

With oversight of energy use, GE Spares is also aiming to reduce energy consumption by up to 15% within the first year. This will reduce energy spend and reduce CO2 emissions.

The adoption of new data-oriented technologies has also triggered a cultural change in the business and unlocked innovation potential.

Massimo Riggio, role, said: "Partnering with the Smart Manufacturing Data Hub has helped us to access energy data directly from our shop floor and utilise this information to enhance our production efficiency."

"Just one sensor analysing one machine for a few weeks has given us an

opportunity to improve that workstation's productivity by 50%. Over a longer period of time, that is a significant gain.

"What this project has done is unlocked a door to valuable insights which I am certain will lead to major breakthroughs. Implementing the technology was a straightforward process, and we are eager to further develop the system to capture and analyse data throughout the entire factory"

"It's early days, but by following a digital roadmap there's a really great opportunity to increase productivity and growth, and create new highly skilled jobs."

