



## Smart Energy Network Demonstrator

# CASE STUDY

Keele University's Smart Energy Network Demonstrator (SEND) is the largest project of its kind in Europe. It has been combined with the Low Carbon Energy Generation Park (LCEGP), the only site in the UK where solar, wind and battery assets are located together.

SEND and the LCEGP 'living lab' were launched in 2022, becoming Europe's leading smart energy demonstrator. With 12,300 solar panels, two wind turbines and an industrial-sized battery, SEND generated 5.99GWh of renewable energy in 2022, 5.39GWh of which was used to directly power the university, reducing reliance on the grid and saving 41% of carbon emissions.

The project has used a cloud-based Decentralised Energy Optimisation platform developed by Siemens. This has enabled SEND to analyse and balance the campus load by increasing consumption to absorb and store excess generation; shift the energy source of the university's district heating systems from natural gas boilers to a low-carbon alternative; decrease consumption in the event of a network constraint, and reduce the energy consumption of assets when the grid carbon-intensity is at its highest for CO<sub>2</sub> minimisation.

Considering the scheme can be scaled up and down, it is envisaged as a blueprint for the energy systems of towns and villages which will enable

the UK to achieve its carbon reduction goals. It has been instrumental in helping accelerate the energy transition by supporting other organisations across different sectors and scales, regionally, nationally and internationally, through demonstration tours and research and education developments.

A knowledge exchange programme linked to the project has supported more than 270 Staffordshire businesses with energy-related projects. Tours hosting local, national and international organisations, academic and commercial partners have been a regular occurrence, providing a platform to share experiences and knowledge of implementing and managing the SEND infrastructure.

Further benefits include a new, popular MSc in Smart Energy Management introduced in 2021; the integration of smart energy into other University courses and projects; and the University securing funding from the West Midlands Combined Authority to run Net Zero and Smart Energy Transition Bootcamps to upskill employees in the West Midlands.

Credit:

<https://www.keele.ac.uk/society/keeledeals/newkeeledeal/priorities/smartenergynetworkdemonstratorsend/>

<https://www.keele.ac.uk/business/businesssupport/smartenergy/>

<https://www.keele.ac.uk/about/news/2023/march/green-energy/smart-energy-network-demonstrator.php>