EU-funded researchers have developed a cloud-based platform to reduce energy use in buildings and battery energy storage systems to benefit end users and utility providers.

Climate change is driving Europe to transform its energy sector. As we transition from a fossil-based to a zero-carbon economy in the next few decades, we will use more renewable energy, and the electricity we generate won’t come from a central plant. Instead, it will come from multiple, decentralised renewable energy sources that are near to load demands. But is the existing networking capable of hosting this increase in capacity? And how would the electrical grids of the future work?

To answer these questions, the EU-funded inteGRIDy project is running 10 pilot schemes in 8 European countries. Launched in 2017, the project’s focus is on electricity demand response, enhancing the operation of the distribution grid, energy storage and the smart integration of electric vehicles.

Developing smart buildings on the Isle of Wight

Results from one of the pilots conducted on the Isle of Wight, an island off the south coast of England, have provided greater insight into energy use and its impact on the environment. The pilot’s purpose was to see if reducing demand and using less energy would affect loads in the island's commercial and industrial buildings. The pilot building chosen for this purpose was the Heights Leisure Centre.

Although the Centre already had a building management system in place, this didn’t provide the detailed information needed on the operation of equipment and energy use in the Centre's spaces. To improve the system, project partners set up a flexible, cloud-based platform that shed light on the building's performance and energy use. The platform made it possible for users to access the Centre's data in order to spot potential energy waste and identify ways to improve the building. Overall, 18 000 new readings from 60 data points were provided daily for engineers to analyse.

“The result of this could lead to greater transparency on how the Centre operates using the data analysis services running in the background to identify opportunities to reduce operating costs, increase energy efficiency and improve comfort for the Centre's visitors,” says energy engineer Mark Byvelds of project partner Siemens in a news item posted on the 'Island Echo' website. “This project demonstrates how a conventional building can become a smart building and proves that existing buildings can become easily connected with the right know-how.”
Smarter grid solutions in Thessaloniki

Another of the project’s pilots, this time based in Thessaloniki, Greece, is focusing on achieving better integration of new energy technologies and smarter collaboration between them and the existing electricity grid. To do this, battery energy storage systems have been installed in selected residential and commercial buildings in the city to investigate optimal deployment and operation for both consumers and utility providers. Details on the storage systems are provided in a study posted on the inteGRIDy website.

inteGRIDy (integrated Smart GRID Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization Storage Technologies) concludes in December 2020. Until then, it will continue in its efforts to optimise the operation of electric grids, promote the coordination of distributed energy resources and facilitate collaborative storage schemes for renewables.

For more information, please see: inteGRIDy project website