case studies

Microgrid Central Controller

Energy | Manchester, UK

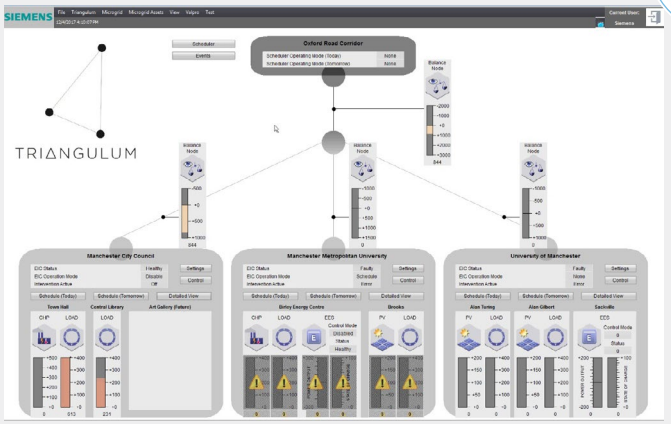

Photo source: Siemens

Microgrids are Low Voltage distribution networks made up of distributed generators (DG), storage devices and controllable loads operating either interconnected or isolated from the main distribution grid. The controller aims to optimise the operation of the Microgrid. Siemens created a city level cloud based energy management platform - a Virtual Power Plant. The platform provides visibility of energy consumption in buildings on the Oxford Road Corridor. The platform integrates to individual Building Energy Management Systems (BEMS). At times of peak demand and high energy prices, the Central Controller (CC) can instruct the BMS to reduce consumption. It integrates with flexible electrical energy storage assets with green generation such as solar PV, with a more intermittent generation, to ensure a constant electrical supply. Reducing peak load decreases the likelihood that the UK's energy system operator will instruct back-up, typically polluting. Bringing together flexible load, storage and generation assets throughout the city into a smart cloud-based management system, demonstrates how sustainable solutions can drive operating cost reductions, reduce city emissions, engage citizens and how city stakeholders can create additional revenues from their existing assets and estates.

Measured Impacts

€2,139,364

tCO_2e 5,250

Per annum

project scale — **Across sites**

development type — **Retrofit**

Benefits

- ☑ Carbon savings
- ☑ Enhance grid stability
- ☑ Improving data availability
- ☑ Reducing use of fossil fuel
- ☑ Reducing operational costs
- ☑ Reducing GHG emissions and peak demand
- ☑ Decreasing energy costs
- ☑ Improving energy efficiency

Lessons learned

- Flexibility in design – different stakeholders require different solutions
- Open protocols and modifications support implementation
- Need building managers involved at onset

Challenges

- Robust baseline data
- Early identification and engagement of stakeholders is critical to success.
- Investment rationale for existing and emerging energy technologies changes rapidly.

Supporting factors

infrastructural — Needs BEMS and communications infrastructures

financial — Monetary savings

geographical — City Centre

social — Contribution to carbon reduction targets for the city

partners — Manchester Metropolitan University, Manchester City Council, University of Manchester, Siemens

Films

https://youtu.be/nff65-0I3kI

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