Building as a Power Plant

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Building as a Power Plant

Using the Urban Sciences building in Newcastle Helix as a source of network flexibility

- 12,500m² (337 zones)
- £58m asset
- Instrumented by:
  - 182 Heat meters
  - 266 Electrical meters
  - 24 Water meters
  - 4 Gas meters
- 2500 sensors in total reporting
  ~16,000 data streams
Building as a Power Plant

- GasGrid: 500
- PVT: 4
- ElecGrid: 400
- PV: 9
- DHW: 91
- SpHt: 474
- HP: 62
- Cooling: 6
- EE+HRU: 10
- AHU: 44
- Lifts: 6
- Lighting: 25
- Circulating pumps: 13
- Small power: 190
- Lab&CommsRoom: 50
Building as a Power Plant

Breakdown of Daily Electricity Cost*

*does not include TNUoS, Capacity Charge or daily MPAN charge
Building as a Power Plant

- The Smart Grid Lab and Energy Storage Test Bed are grid-connected facilities at Newcastle University.

- Funded through a combined £2 million grant from EPSRC, Newcastle University and industrial partners Northern Powergrid and Siemens.

- Grid-connection through bi-directional AC/DC power converter rated for active and reactive power flow control and provision of ancillary services.

- Multiple real and emulated storage technologies to enable testing of conventional and hybrid energy storage systems
Building as a Power Plant

- How can inherent thermal mass be augmented by active thermal storage to increase building’s resources as a power plant?
- Internal balancing vs External service modelling
- Interaction with aggregator(s)
- Optimisation across a portfolio
- Additional optimisation targets – carbon?
BaaPP partners: