Behind-the-Meter project Starting the uprising of Active Energy Communities

Challenge

How to decarbonise the building stock in a subsidy-free way, whilst reducing the impact on the grid from the shift in energy generation sources.

Aim

- Demonstrate innovative Energy Service Company (ESCO) business model, working with established suppliers and within grid constraints
- Establish optimal scale and size of distributed energy solutions
- Understand customers' relation to flexible pricing schemes

Trent Basin Demonstrator



Architecture

76/200 energy efficient houses using fabric first approach



Renewable Generation

Urban floor-mounted PV system rated at 198 kWp + Phase 2 PV system rated at 67.2 kWp



Energy Storage

Community Battery rated at 2.1 MWh / 500 kW provides Firm Frequency Response services

Energy Service Company

Trent Basin energy infrastructure belongs to UoN and is operated by the ESCO

of energy tradec

on the grid

2019 Data



annual demand

per property



of energy

generated





energy needs

fulfilled through

of CO_2 saved

34t



91%

battery

round-trip





Path to Net-zero

Objectives



Progress Update

32 participants have been recruited, 16 from Phase 1 and 16 from Phase 2, with recruitment closing in July. The Ofgem derogation has been extended and the Tender process is underway.



• Change regulations to ensure all new build developments are net zero and provide green uplift to neighbouring communities, e.g. by considering wider impact during SAP calculations

• Move towards a flexible virtual private wire grid, which enables community assets to provide energy to households via existing infrastructure

Reduce **Reduce** overall and peak time energy consumption



Reuse **Reuse** locally generated energy during peak times and within the community



Reunite **Reunite** energy markets and energy users

- 13/16 enhanced monitoring kits fitted 12/16 surveyed & signed contracts
 - 7/31 heat meter issues will be solved 14/31 remaining visits scheduled
 - 10/16 enhanced monitoring kits fitted 11/16 surveyed & signed contracts





Scenarios investigated



- No behind the meter supplies • All electricity from grid through the meter
- Standard utility supply
- Standard utility bill shared with project
- Remain on their chosen tariff
- Provide enhanced in-home monitoring data



- ESCO's PV panels supply Home behind the meter • Utility supply (no connection to Energy Centre)
- ESCO sells PV energy below grid prices
- ½ group on Flat Rate tariff
- ½ group on Octopus Agile (Time of Use) tariff
- Combined grid and ESCO bill provided by ESCO



Home PV & Battery

- ESCO's PV and Battery supply Home behind the meter • ESCO controls when Battery is best used • Utility supply (no connection to Energy Centre) • ESCO sells PV/Battery energy below grid prices • All transferred to Octopus Agile (Time of Use) tariff • Combined grid and ESCO bill provided by ESCO



- ESCO's Energy Centre supplies Home via private wire • ESCO controls when Communal Battery is best used
- No grid connection
- ESCO sells Communal PV/Battery energy below grid prices • On Limejump (Time of Use) tariff via ESCO • Fully transferred to ESCO billing for all supplies



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Eco Control

- Provide reference for cost & CO2 benefits of all groups

Home PV

- Establish benefit of traditional domestic PV approach

Establish benefit of domestic PV & Battery approach

Community Powered

Establish benefit of new community ESCO approach





UK Research and Innovation

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