



Active  
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Centre

# ABC Case Study: Trent Basin



# Trent Basin

**Location:** Nottingham

**Client:** Research project with Nottingham University SmartKlub

**Development manager:** igloo: People, Place & Planet

## Background

Imagine a future where communities across the UK generate enough renewable energy to meet their needs, with a surplus flowing into the national grid. Trent Basin, a riverside neighbourhood of low-energy homes and apartments located on the banks of the River Trent, does exactly that!

The development is part of a regeneration project in Nottingham and sees Nottingham University working with Smartklub and Blueprint, among others (more information on the consortium, Project SCENe, can be found [here](#)). Using novel consumer-engagement tools and a focus on business model development, the consortium has developed and tested business model templates that could be used by other developers of large-scale housing projects.

An essential part of the project has been to trial four different group scenarios for making on-site renewables and arbitrated energy storage services available to 20 residents, including a control group. The findings aim to show residents their savings from the different analyses, as well as the impact any behaviour change has on money or carbon.



## Project information

- 350 low-carbon homes: Willmott Dixon Phase 1 and 2 (73 homes).
- Trent Basin ESCO Ltd – existing community energy scheme in operation for the past three years. Tasked with creating a scheme encouraging developers to incorporate renewables into their developments as standard.
- The development includes Europe's largest community battery allowing renewable energy – generated by solar panels located on homes and throughout the neighbourhood – to be stored on site, while still connected to the national grid.
- Another innovation is the UK's only urban solar farm, occupying a brownfield site before being transplanted to the roofs of new homes as they are built.

## ABC activity

- Funding investment of £485K.
- Supporting the project team through procurement and solution development.
- Contributing to monthly and quarterly project team meetings.
- Monitoring the client's programme of works.
- ABC staff attended project and outputs review meetings.

We are generating data sets on consumer energy use that will influence the roll out of similar community energy schemes across the UK. And at Trent Basin, by involving residents and through interactive technologies, we are demonstrating how a socialised sense of responsibility can influence individual attitudes to energy use and sustainability.

(Dr Lewis Cameron, Project SCENE)

## Benefits

- An essential part of the project was to show residents their savings from the scenarios as well as the impact that any behaviour change has on money and carbon. The University deployed cutting-edge smart monitoring systems to provide unprecedented data on energy use and consumer behaviours in the home.
- Live data was collected and analysed over one year from 20 homes based on four different methods/group scenarios of energy delivery to low-energy homes.
- The community is working together to maximise the use of self-generating energy.
- The community is less reliant on the national grid as energy savings and decarbonisation are done behind the meter.

## Group scenarios

The project analysed four different groups/scenarios:

- **Group A** – Home PV, intended to model the benefits of the 'traditional' PV approach for individual domestic installations, where PV is typically installed to supply the home while generating, with any excess generation automatically feeding to the grid.
- **Group B** – Home PV and battery, intended to model the individual home approach to PV with local energy storage, where a battery connected behind the meter is used to store excess PV generated during the day, for use during periods of higher demand when PV generation is low.
- **Group C** – Communal PV and battery via private wire, used to test the community-level generation and storage approach proposed by the ESCO in comparison to the individual models of groups A and B, where PV on the roof of each home is used to supply the community battery, with all electrical supply to the home supplied via the community energy centre (battery or community grid import).
- **Group D** – Eco control, no PV or battery, used for the 'no intervention' control – where no PV or energy storage is implemented.

## Lessons learned

- The project was able to deliver the installation of a fully community supplied domestic energy model, alongside the technical designs, preparatory work, financial modelling, billing models and algorithm work to further deliver the planned alternative domestic energy generation and storage models.
- The next step will be to focus on forecasting power demand for the community with a learning algorithm that predicts half-hourly power demand for each home to construct an aggregated community demand.
- Following this, the inclusion of grid carbon intensity forecasting and grid services will be implemented to form components of the control strategy and energy management system. This will lead to an analysis of financial and carbon savings and finding a balance for the community scheme.

The research project is scheduled to finish in April 2024.



For further information on the work of ABC, download the  
**ABC Blueprint - Our approach to net zero**

