



Active  
Building  
Centre

# ABC Case Study: Y Twyni



# Y Twyni

**Location:** Swansea University Bay Campus

**Client:** Swansea University

**Project sponsor:** Lee Chambers (ABC)

**Project Board:** ABC and Swansea University

**Project managers:** Swansea University Estates Department

**Principal contractor:** RDM Electrical & Mechanical

**Client owner engineer:** Galetch Energy Services

## Background

Y Twyni is a building on Swansea University's Bay Campus with integrated renewable energy technologies and a smart energy-control system. Swansea University employed Galetch Energy Services to compile the design brief, drawings and employer's requirements to go out to tender.

The building has been fitted with 135 kWp of solar photovoltaics, a large-scale electrical energy storage system and EV charging capabilities. A control system manages the energy generated by the solar panels and distributes it between the energy storage system, car chargers and the adjacent School of Management building. A solar PV carport with space for five vehicles will also form part of the energy system. The carport will be fitted with perovskite solar technology from Oxford PV.

These integrated renewable technologies will help Y Twyni to save money and carbon emissions, enable investigation of control and use strategies for battery storage, and help the university reach its net zero carbon target by 2040. The energy generated by the solar panels can be stored in the batteries and released when needed. Depending on the cost and carbon intensiveness of grid power at different times of the day, the control system will decide when to draw energy from the grid and when to use the renewable energy generated by the building.



Y Twyni represents the University's commitment to developing flexible learning spaces, sustainable building methods, and working with local manufacturers.

(Martin Stringer, Swansea University Pro-Vice Chancellor)

## Project information

The objective of this project was to successfully retrofit the Y Twyni building into an active building that would:

- generate renewable energy from the sun through PV panels installed on the roof
- store energy generated from renewables, and/or drawn down from the grid only when carbon intensity is at its lowest, in batteries
- release energy to power the buildings and the university EV fleet during grid peak times, and
  - use smart controls to manage interaction with the wider energy network
  - compare the performance of commercially available PV versus more innovative technology (perovskite).

## ABC activity

- Funding of the capital demonstrator of the project enabled the University to implement a new microgrid control system. This in turns helps with the aggregation of the energy-generation systems on buildings across the campus to work together.
- Preparation of design brief, drawings and Employers' Requirements (ERs) to allow the university to go to tender.
- Project team support, including project meetings, approval of technical submissions and general compliance to Employers Requirements to ensure that the implementation of the new control system wasn't diluted. This included working with the manufacturer and the specialist sub-contractor to ensure continuity.
- Supporting the client with data collection and monitoring over a minimum of 12 months. This will enable the stakeholders to understand best-use case for energy generation/energy storage and optimisation of energy use across multiple buildings.
- Remote monitoring and analysis of performance data to contribute to the research and development agenda.



## Benefits

- Saving energy through load shifting, using renewable energy and energy storage to reduce reliance on the grid to power adjacent buildings and electrical vehicles.
- This development will be a demonstrator of repeatable and scalable frameworks for energy optimisation in the education sector.
- Using building monitoring systems to allow data to be fed into evidence frameworks and performance assessment. This will enable future building designs to be improved towards net zero carbon.
- Demonstrating control methodologies for energy storage, trading and end-use optimisation across buildings (i.e. Y Twyni and School of Management).
- Applying the Active Building approach in the education sector.
- Supporting research, development and innovation – the project will provide access to energy performance data and socio-economic outcomes that will benefit the research and development agenda of ABC and SPECIFIC IKC. This will ultimately benefit any building systems designer trying to achieve net zero carbon.
- Offering a potential resilience asset for running critical systems during times of power outage.

## Lessons learned

- COVID-19 delayed the tendering processes, mainly due to significant rises in material and equipment costs since the original tender submission that could not be absorbed. Delivery times of associated equipment significantly increased as a result. In future, project management processes and forward ordering of equipment should allow for unexpected issues in the supply chain.
- We will soon be entering in the monitoring and evaluation phase of the project where we will look at the overall performance of the system. More information will be released as it becomes available and the project progresses.

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

