

specific[®]

Active Classroom

designed to be energy positive



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Active Classroom



generate > store > release

SPECIFIC's vision is buildings as power stations – a world in which buildings can generate, store and release their own solar energy.

The **Active Classroom** Building Demonstration

Welcome to SPECIFIC's latest full-scale building demonstration project, located at Swansea University's new £450 million Bay Campus.

The Active Classroom contains a laboratory and classroom and will be used for teaching students. It will also be monitored closely, enabling researchers to test and validate building performance in an education facility, and to see how users interact with the technology.

Demonstration at a building scale is vital in evaluating and proving techniques and technologies, before they will be adopted by the construction sector, regulators and consumers.

Our demonstration programme has been designed to test and prove the buildings as power stations concept in a range of uses. Whilst the Active Classroom is designed for use in the education sector, previous demonstrators have included The Pod, our first building as a power station, which is used as a cabin for car park attendants at the Bay Campus; the Solar Heat Energy Demonstrator (SHED) warehouse facility in Margam; and the SOLCER House, which was constructed in partnership with Cardiff University and is now used as an office.



The Pod



The SHED



SOLCER House

Built by **Collaboration**



For buildings as power stations to become reality not only requires the technology to work; it also requires new ways of working in the construction industry, new business models and a new skills base.

It is only by working together on real projects with real companies, by bringing together those in the construction, energy and systems industries, that our vision of a more sustainable, more prosperous environment can be achieved.

Benefits of the Active Classroom

Comfort

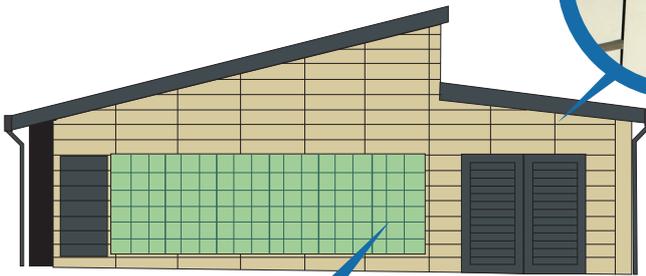


Demonstration of a community building



High steel content

East Elevation



Brand new Colorcoat® colours from Tata Steel

West Elevation



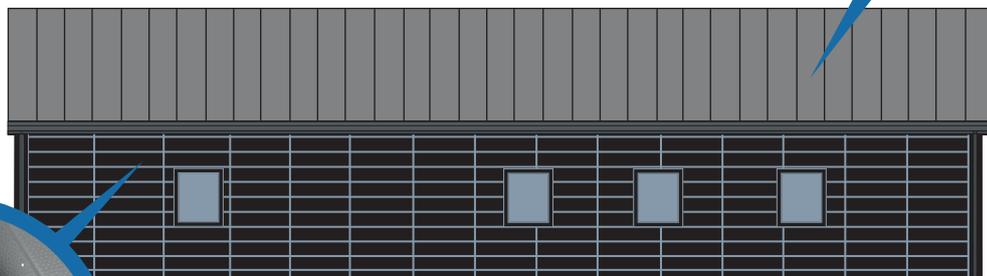
A living wall has been planted with the help of local schoolchildren.

Living walls have a number of benefits:

- Improves aesthetics
- Regulate temperature and reduce carbon footprint
- Protect building façades
- Provide wildlife habitats
- Improve air quality
- Deter graffiti
- Reduce noise

First building with solar cells integrated into the roof panels.

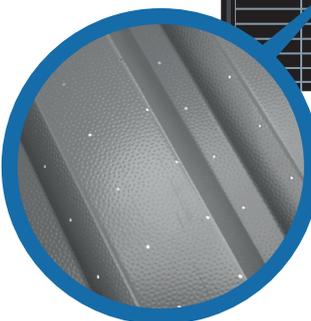
- cost efficient as saves on reduced installation costs
- lightweight and flexible
- modules offer efficiencies of over 14%



South Elevation

Solar air collectors on the South facade consist of perforated cladding that is fitted onto the building skin.

Warm air is drawn in through the tiny holes in the steel using a fan. Even during the winter, there can be enough warm air drawn in at peak hours to provide heat for a building.



Benefits of the Active Classroom

Flexible space



Speed of construction

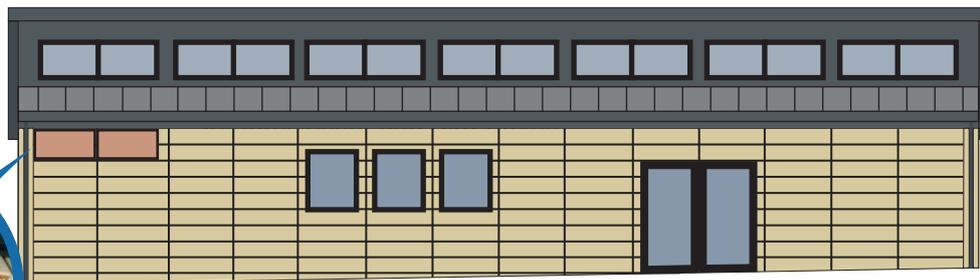


Quality

North Elevation

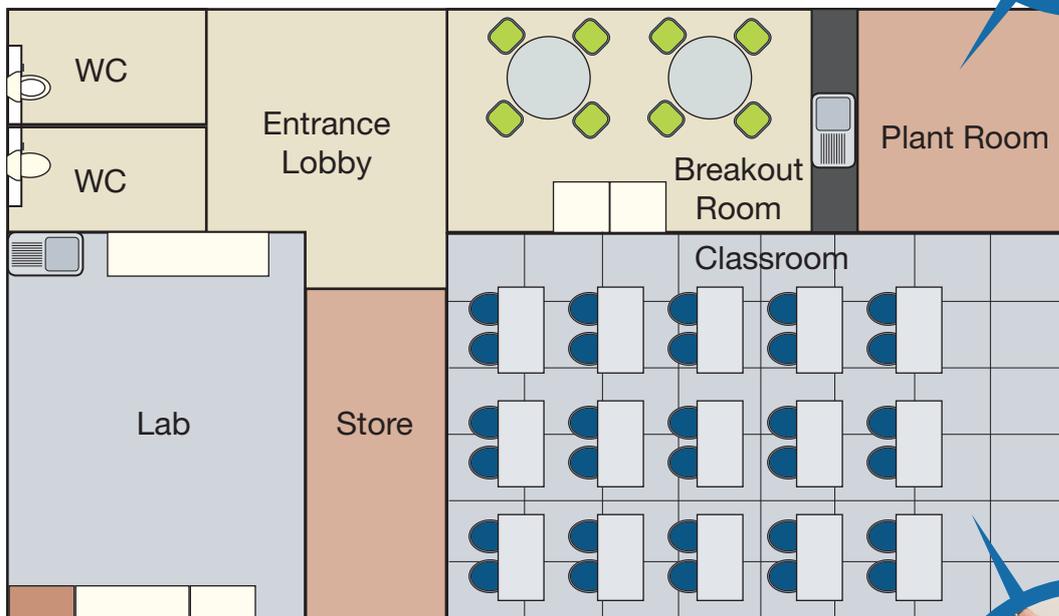
Plenty of natural north light

Integral insect and bird boxes



New saltwater batteries - "Aquion's Hybrid Ion (AHI™)"

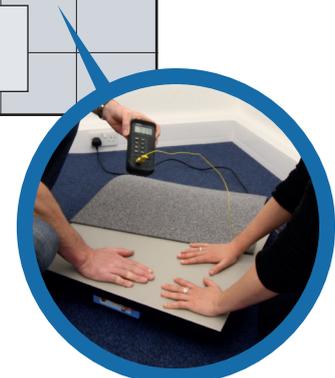
- safe and large scale
- made using abundant, nontoxic materials
- made using modern low cost manufacturing techniques
- maintenance-free
- optimized for daily charge / recharge
- first time used at large scale in the UK



Inside the Classroom

New resistive heating integrated into floor panels

- electrical heating system powered from the sun
- fast, controllable, consistent heat
- ideal for frequent changes in occupancy typical of school buildings
- integrated with building management systems
- generate, store, release systems approach



20+



companies working in collaboration

The building has been designed to be re-used.

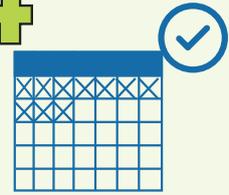


All the major components are

100%

recyclable

14



weeks to build

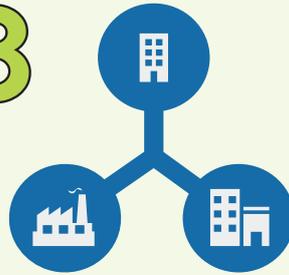
The classroom can be controlled by an app



so the teacher can programme in the number of students each day...

and the classroom will be the perfect temperature when they arrive ready to learn!

8



new building techniques and products used for the first time

No plasterboard

No concrete

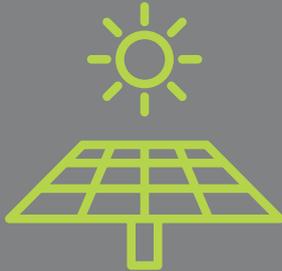


Steel screw piles instead of traditional foundations reducing the carbon footprint



Living wall on one side of the building

generate



135

building integrated photovoltaic roof panels were used

...that's enough power every hour to make

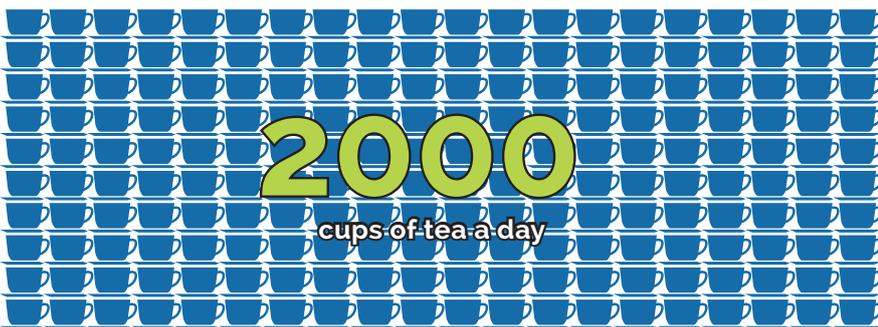
release



10kW



of novel underfloor heating tiles will be used for zoneable, fast action heating



2000

cups of tea a day

store



The classroom batteries can store

40kWh

That's enough energy to power the classroom for 2 days just from the batteries

...or 1.5x the energy consumption of a typical family home

...or enough power to make



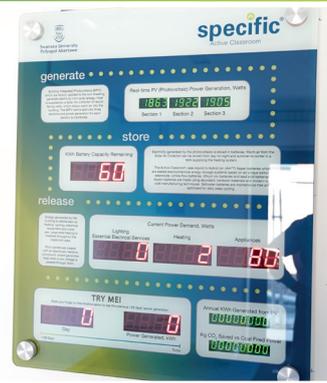
600

cups of tea in an hour



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Led by



Swansea University
Prifysgol Abertawe

Funders

EPSRC

Engineering and Physical Sciences
Research Council

We work with
Innovate UK



Strategic Partners

TATA STEEL

NSG GROUP



CARDIFF UNIVERSITY PRIFYSGOL CAERDYD