Active Building Code of Conduct
Version 1.0, July 2020

0 Introduction

This document forms part of an Active Building Toolkit, and should be read in conjunction with the following documents:

- Active Building Design Guide
- Active Building Glossary
- Active Building Technology Showcase
- Active Building Project Template
- Active Building Plan of Work Checklists
- The Active Classroom Case Study
- The Active Office Case Study
- Active Building Induction/Toolbox Talk

Use of the Active Building Interactive Process Flow Diagram will assist navigation through these documents and other useful resources to aid the delivery of an Active Building project.

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Active Building Origins

SPECIFIC was one of seven Innovation and Knowledge Centres set up in 2011 to foster new industries by closing the gap between scientific research and its commercial exploitation. The centre is based in the College of Engineering at Swansea University.

At SPECIFIC energy technologies and systems are researched and developed, from the fundamental science of materials and products to full-scale demonstration on buildings. This research work is brought together in one design concept called Active Buildings, in which buildings are designed to generate, store and release their own renewable energy.

Our goal is the development of affordable technologies that can be manufactured at scale and re-used or recycled at the end of their life.

An Active Building is a type of Net Zero Energy and environmentally responsive building described as ***"a building that supports the wider grid network by intelligently integrating renewable energy technologies for heat, power and transport."*** It responds to the natural, built and energy environments and has 6 core principles:

- Building Fabric and Passive Design
- Energy Efficient Systems
- On-site Renewable Energy Generation
- Energy Storage
- Electric Vehicle Integration
- Intelligently manage integration with micro-grids & national energy network

A single Active Building combines a range of integrated renewable energy technologies, which work together in one system to generate, store and release heat and electricity. Using data from the building, the national grid and electric vehicles, the system can manage and optimise energy performance.

Whilst they can be self-sufficient, Active Buildings are not designed to operate in isolation: they use their ability to generate and store energy to exchange or trade with other buildings, the national grid or electric vehicles. This creates energy communities that are more resilient to sudden changes in supply or demand.

How do Active Buildings benefit consumers and society?

- Lower energy consumption
- Lower fuel bills
- Lower carbon emissions
- Energy independence – building owners and users have control of their own supply, with less dependence on national networks and corporate, political or economic stability
- A flat load profile – which promotes grid stability
- The opportunity for demand side response or energy balancing services – responding quickly to unexpected events in the national electricity network.

Active Buildings align with the United Nations Sustainable Development Goals (UN SDGs) and the RIBA 2030 Climate Challenge.

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Our Sphere of Influence

As an Innovation and Knowledge Centre (IKC), funded through the Welsh and UK Government, with support from our industrial and academic partners, we are well placed to influence the construction industry and to change the way buildings are conceived, designed, delivered and operated.

Through engagement activities, including presentations at business and academic conferences, peer reviewed academic journal articles, construction industry journal articles, social media and other media avenues, we promote the Active Building concept and its role in providing a low carbon society.

We work with many different organisations, to help introduce ways to reduce their energy consumption and their carbon footprint.

We want our stakeholders to champion the Active Building concept and strive to adopt the same mission that we have.

Cross-Sector Collaboration

Our unique and growing network of over 50 leading universities and companies – from multi-national corporations to innovative small and medium enterprises (SMEs) – is working together to scale-up technologies, develop supply chains and identify routes to market for emerging technologies.

Within both the IKC and our network of partners, our unique mix of people comprises researchers, engineers, business development, engagement, intellectual property (IP) and commercialisation professionals as well as architects and construction specialists.

Systems Integration and Building Demonstration

In order to reach market, new technologies and systems must first be proven. As well as developing the technologies, we are working on the systems that connect them: with each other in a building and with the wider energy system.

We do this in our demonstrator buildings, which are used to test and validate new ideas with a range of building uses:

- the Active Classroom, which is used to teach students at Swansea University, for meetings and for industry engagement events, contains a number of new and experimental technologies

- the Active Office is used by SPECIFIC staff and was built using only commercially available technologies

- the Solar Heat Energy Demonstrator (SHED) is an exclusive test facility used to test a range of heat and electricity systems at scale, also demonstrating retrofit possibilities on an industrial building

- Various housing schemes for social housing providers aspiring to reduce their tenants energy bills while transitioning to a Net Zero Carbon environment

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Our Code of Conduct

This Code of Conduct outlines our commitment to helping the UK meet its targets to at least halve the energy consumption of all new buildings by 2030 as set out in the UK's Industrial Strategy; and to achieve Net Zero greenhouse gas emissions by 2050 or sooner.

This document aims to provide all stakeholders of an Active Building project with a clear definition of our missions, values and principles. It also sets out our expectations from the project delivery team.

This Code of Conduct does not supersede other Professional Codes of Conduct, such as The Architects Code, which must be adhered to when undertaking building projects.

Vision

We envisage a future where buildings generate, store and release their own solar energy, and are integrated into the energy system, assisting the energy grids to perform efficiently through use of buildings as 'nodes' that help balance energy demands. The deployment of many Active Buildings integrated into the energy grid will help the UK achieve their decarbonisation targets and reduce pressure on the existing grid infrastructure.

Mission

Our mission is to significantly reduce the energy use and associated carbon emissions of buildings by integrating renewable energy technologies with intelligent controls and energy storage, to ensure controlled export or import of energy to or from buildings. This has the potential to reduce pressures on the national energy grid, saving costly and disruptive grid upgrades and ensuring the existing grid can perform efficiently.

Values

In our role as an IKC, we endeavour to seek out emerging, innovative renewable energy technologies to use on buildings and carry out due diligence on such technologies before recommending their use by others.

We are technology agnostic, meaning we are unbiased towards the use of different technologies to solve different problems. We believe there is no 'one size fits all' for building projects.

We strive to assist project delivery teams in developing the best solution for their client, always with the aim to reduce energy consumption, reduce running costs and reduce operational carbon, contributing to overall carbon reductions in a building.

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Our Expectations

All stakeholders of an Active Building project are expected to adhere to the following principles:

Overall Project

1. Agree clear aims for the project and ensure these are retained throughout the project

2. Communicate any changes to client requirements to the project design and delivery team quickly and effectively

3. Work collaboratively to develop solutions to meet the Active Building principles

Design and Construction

4. Utilise the Active Building Toolkit and Interactive Process Flow Diagram in the design and delivery of the project

5. Ensure all members of the project design and delivery team for the Active Building project have undertaken, as a minimum, the 30 minutes Active Building Induction session

6. Maintain an accurate record of the Active Building project using the Active Building Project Template, which will be used to produce a Case Study at project completion

7. Engage with installers, end users and facilities management teams throughout the design process

8. Undertake Life Cycle Cost Reviews in accordance with the RIBA Plan of Work 2020 recommendations

9. Select an appropriate procurement route that enables collaborative working, and ensure project delivery team is appointed at the earliest possible stage

10. Use Building Information Modelling (BIM) to fully model building services, including Plant Rooms before construction commences

11. Ensure systems are commissioned thoroughly before handover within an agreed timespan, such as 3 – 6 months post-completion

12. Provide sufficient training and handover material to building users/occupiers

Data Collection and Information Dissemination

13. Post project completion, undertake Building Performance Evaluation (BPE), including Post Occupancy Evaluation (POE) - use data collected to optimise systems, develop control strategies and produce Case Studies

14. Share data generated from the project with all stakeholders and use to inform lessons learnt reviews

15. Work with the SPECIFIC Marketing Team to assist promotion of the project outcomes using appropriate reporting methods