



Addressing the Challenges of a Changing World Through an Exemplar Sustainable Building

Working in a design collaboration, Arup has helped to deliver Australia's greenest educational building. The University of Queensland Global Change Institute at the St Lucia Campus has been designed to meet the world's most advanced levels of sustainability, serving as an exemplar for the ecological transformation of a university campus.

It provides the focus for UQ's leadership in learning, discovery and commitment to new technologies for sustainability and research into the areas of broader global change.

Global change encompasses the interactions of natural and human induced changes in the global environment and their implications for society. These changes are occurring at an unprecedented scale and speed. Fundamental global sustainability challenges include issues as diverse as climate change (carbon mitigation and adaptation); human population growth and shift; resource security and consumption (food, energy sources, water and minerals); stewardship of biodiversity and natural ecosystems; and, within a systems framework, managing the complex impacts (including cumulative impacts), convergences and responses on ecosystem health, social resilience and economic prosperity (including business and industry).

Designed as a paperless and open-plan building, the Global Change Institute provides a carbon neutral, zero energy, zero water and zero waste working and learning environment. It is one of the first buildings to be registered for The Living Building Challenge, which will consume 30% the energy of the Green Building Council of Australia benchmark education project.

The five-storey educational structure incorporates a combination of adaptable spaces to encourage varied interactions between staff, students, industry and public. It is intended to be naturally ventilated for 88% of the year.

Key technologies have been adopted as a first for a sub-tropical climate:

- Mixed mode ventilation
- Hydronic slab cooling
- Geopolymer concrete in suspended slabs
- Energy storage via RedFlow batteries

The Institute aims to set up a carbon neutral position into a regenerative mode that will shape the next phase of development within the field of sustainable design. Principles of the

'Living Building Challenge' are also engaged due to the positioning of the building to broaden the scope of the project and challenge existing sustainable paradigms.

This can only serve to benefit the broader built environment in terms of pushing boundaries in the sustainability space. This has a natural flow-on effect to benefit the wider community from an environmental perspective, as well as the buildings' occupants who directly benefit.

The building includes a number of features that are particularly selected to achieve improved operational efficiencies across the areas of: air-conditioning and ventilation; electrical; hydraulic reticulation; and fire protection.

These features and technologies can be applied on similar projects which aim to meet high sustainability outcomes. The design smarts employed on this bold building enable our clients to imagine how it is possible to move towards fully sustainable buildings and at the same time will deliver vast benefits for the broader Queensland community for years to come.

If selected for a presentation, we would explain the building's features in more detail, highlighting the technology and clever engineering that made this complex and ambitious structure a reality – and where it is possible to foster discovery, learning and engagement by creating, applying and transferring knowledge for innovative and integrated solutions to address the challenges of a changing world.