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# Finalist's case study

## University of East Anglia

### Built Environment

## The Enterprise Centre: Celebrating localism and low carbon futures at UEA



University of East Anglia

### About the project

#### Summary

The Enterprise Centre (TEC) is one of the UK's most sustainable buildings, a centre for student entrepreneurship, and a regional hub for innovators and businesses that are committed to a low carbon future.

Built on a brownfield site at the University of East Anglia (UEA), TEC has worked to minimise greenhouse gas emissions at every stage of its lifecycle. TEC has been the first large commercial building in the UK to achieve both Passivhaus Certification and BREEAM Outstanding, two of the most rigorous sustainable built environment standards. In The Enterprise Centre UEA has delivered a large scale, functional, exemplar low carbon building. With a construction cost of £11.6m, TEC demonstrates the affordability of low carbon design.

TEC minimised the emissions associated with construction through the innovative use of natural and recycled materials. Where possible, materials were sourced locally and included items such as timber, straw, hemp, clay and stone. Achievements from this whole lifecycle carbon analysis include an embodied carbon calculation of  $193\text{kgCO}_2\text{e/m}^2$  – approximately 20% of a conventional university building. TEC highlights what is possible to achieve through strong project team collaboration and the seizing of opportunities.

Providing a unique mix of academic teaching and learning spaces alongside private tenants, a creative and dynamic hub of entrepreneurship and innovation has been created. TEC has brought a sense of space where we can bring our students and staff together with enterprising and entrepreneurial community of the city and region. Using TEC as an educational centre has realised our original vision to develop a student base aware of the business community, and of the importance of enterprise and skills in education.

#### Project partners

The idea for TEC was originally conceived by Professor John French, CEO of the Adapt Low Carbon Group at UEA. Professor French was the Project Director, with the University's Estates and Buildings Division managing the construction project. Architype were the architects, under a single point delivery contract led by Morgan Sindall. BDP were the structural engineers with Churchman Architects responsible for landscape and planning. ERDF funding was secured to a value of circa £7m, BBSRC £2m, BRE contributed £0.5m and NALEP £0.25m, with the balance being met by UEA.

#### Profile

- Higher Education
- 14,300 students (includes full and part time students)
- 3,300 staff
- Greenfield edge of city location



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## The results

### The problem

While a number of issues were encountered throughout the project, TEC would not be described as a solution to a specific problem. The goal of the building and project was to provide a gateway building to the campus that was an ecological interpretation of UEA's unique architectural legacy and delivered on its ambitions to engage directly with entrepreneurial businesses for mutual benefit. From the construction project to current day, TEC has demonstrated leadership in both the built environment and entrepreneurship sectors.

### The approach

The dissemination of information as a means to contribute to and develop the regional built environment sector was a founding principle of the project. A collaborative working approach was adopted from the offset, which assisting in embedding the requirement to minimise environmental impacts across the whole project and construction team. Creative and innovative approaches were devised to navigate numerous practical obstacles. The building is currently in year 2 of a 3-year post occupancy evaluation process, specifically adopted to bridge the industry gap between initial building design and operational outcomes.

### Our goals

- To provide an exemplar building within the construction industry and to encourage the use of sustainable practices and materials by demonstrating use and cost effectiveness.
- To stimulate further innovative and aesthetically stunning architecture, particularly of design which is intrinsically linked with its immediate natural surroundings.

TEC is the most recent building in UEA's legacy of sustainable construction and reputation for world-leading environmental research. Combining academic teaching alongside businesses is a first for the University, however, and TEC is leading UEA's entrepreneurial aspirations and interactions with the business community. As well as providing high quality work space for businesses we are able to cater for event and conference needs for an even wider audience with our range of innovative and inspirational spaces.

Stimulation of new local supply chains and support for existing ones was a project aim realised to high potential during the construction phase. The development of a supply chain for timber from the local Thetford Forest is a particular highlight: timber previously used only for low grade purposes was included in construction of the building.

### Obstacles and solutions

Value engineering was a challenge to maintaining the visionary brief	The team adopted collaborative working for risk management and adopted Radar as a risk tool
Understanding the impact of cost on carbon – having information early enough to inform decisions	The team used the Rapiere carbon assessment tool as part of its BIM assessment



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## Performance and results

Perhaps the most important element to reflect on is the fact that the building is being happily used by students, tenants and local businesses alike. The student body takes obvious pride in its surroundings and our tenants have established a vibrant and inclusive community. Our tenant representative on the TEC Local Management Committee commented, "TEC is a fantastic building to work in. The growing business eco-system here means that the variety of business based in the building is growing rapidly. Friendships and relationships between these businesses are really starting to create a brilliant environment for all the business based here to grow." A member of the New Anglia LEP Green Pathfinder Board expressed his support: "Visiting and working at The Enterprise Centre is quite simply a real pleasure. It is a superb exemplar of sustainable lifestyles. Having worked on the Green Economy for many years it is very satisfying to visit a building that now provides a leading low carbon hub on a European scale."

In terms of practical and demonstrable achievements, TEC's primary energy demand is less than 47 kWh/m annually and airtightness is under 0.21 ach/h @ 50 Pa. Annual energy consumption figures compare positively even against the University's next most sustainable building (102 kWh/m annually for the ZICER Building). In monetary terms this equates to a saving of £4.81 per m<sup>2</sup> per year.

Minimising the embodied carbon within the building was always a primary driver. The embodied carbon within an average office building is 925 kgCO<sub>2</sub> per m<sup>2</sup> to the point of construction. UEA has a more impressive stance at an average of 845 kgCO<sub>2</sub> per m<sup>2</sup>, but TEC goes way beyond that in achieving only 440 kgCO<sub>2</sub> per m<sup>2</sup> over a 100-year lifespan.

## The future

### Lessons learned

A 3-year post occupancy evaluation is well underway and will ensure that the building and its technological innovations are being optimised. Adoption of such a process is a first for the University and has already proved invaluable in ensuring the complexities of the design and technologies are working correctly, something not otherwise readily achieved with Passivhaus buildings.

A number of practical improvements have been rolled out across campus as a result of developments established within the building. For example, all computers and data projectors in seminar rooms and lecture theatres have had a simple piece of software installed to automatically shut down at the end of an evening to save energy. This practice originated from TEC.

### Sharing your project

Significant dissemination of information took place during the development of the building and, since completion, tours have continued to share detailed information about construction and sustainable materials. Team members have presented at around 100 events, including speaking at national sustainability conference such as Passivhaus, Eco-building, Education Estates and Constructing Excellence. Linking with groups including CIOB, RICS, RIBA, UK Green Building Council and Norfolk Constructing Excellence all helps to ensure that crucial findings for the construction sector are shared. The team has also been keen to ensure that the general public and wider business community can be involved and find out more. As part of this we have been involved in the likes of the National Heritage Open Days and hosted the UK Green Film Festival in Norwich.



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We have always been keen to generate publicity around the building and have maintained links with local and national sector press in order to achieve this. As part of a wider 'Comms Hub', including PR professionals from the wider project partnership, a number of high profile publications have been reached, for instance University Business, Building for Education, Times Higher Education, CIBSE Journal, Architects Journal and edie.net, to just name a few.

## What has it meant to your institution to be a Green Gown Award finalist?

The fact that the University's vision and practical approach to establishing a centre for enterprise has been acknowledged by peers is of great significance to us.

TEC sits very strongly in the University's values and ethos – based around a sustainable campus that promotes sustainable living and helps to educate people around the importance of sustainability. We believe that TEC is leading the sector in demonstrating how you can build in a sustainable but functional way, and to have this recognised at a national level is very exciting for both the project team and the University.

## Further information

Web: [www.theenterprisecentre.uea.ac.uk](http://www.theenterprisecentre.uea.ac.uk) / [www.uea.ac.uk/about/sustainability](http://www.uea.ac.uk/about/sustainability)

Twitter: @lowcarbonspace / @SustainableUEA

Tel: 01603 591366

Post: The Enterprise Centre, University of East Anglia, Norwich Research Park, Norwich, NR4 7TJ