

South Lanarkshire College Winner - colleges and smaller institutions

“Low-energy, low-carbon future proofing the curriculum”

Summary

South Lanarkshire College's low-energy house is a practical project developed to be:- a showcase; an education and training resource; a catalyst for significant change in the college's curriculum; an inspiration for individuals and companies to adopt low-energy approaches; a resource for knowledge exchange; and an influence for policy makers.

Project partners

All of the following organisations sponsored the project with either specialist products or services. Dawn Homes, housebuilders and Jewitt Arschavir and Wilkie Architects, were major sponsors.

Company/organization - Contribution

- Albar Landscapes - External landscaping
- Brickwork Scotland - Building Works
- British Gypsum - Internal partitions and walls
- CAS Ceramics - Tiling wall & floor
- Citybuilding (Glasgow) - Kitchen
- D Dodds - Taping and painting works
- Dawn Homes - Design, development, construction
- DGS plumbing and heating - Plumbing installation
- Doria Door - Internal doors
- G E Lighting Limited - Low-energy lighting
- Glasgow Caledonian University - Monitoring and readouts
- Glidevale Limited - Breather membranes, sun tunnels
- Grant Engineering (UK) - Photovoltaic and solar panels
- Ibstock - Earth bricks
- Ideal Standard (UK) - Bathroom fit out, low-water use bath and taps, etc
- JDR - Bike shelter materials
- Jewitt Arschavir & Wilkie Architects - House design
- Narley Eternit - Roof tiles
- Marshalls Landscape Products - Block pavers
- McMann and Melvin - Internal joinery works
- MEP and Hire Station - Plant and machinery
- Merchant City Distributors - A-rated "white goods"
- MGM Timber Scotland - Timber for the timber frame
- Miller Pattison - Loft insulation, air leakage tests
- Mira Showers - Low-water-use shower
- MJD Scaffolding - Scaffolding
- M K Electrical - Electrical components
- Nationwide Platforms - Heavy plant
- NIBE Energy Systems Limited - Air heat-recovery system and ground-source heat pump
- Oregon Timber Frame - Design and build of the timber frame
- Peter Grant - Soil
- Plumbing Trade Supplies - Sponsorship of solar panels
- Porcelonosa - Grout and adhesive
- Polypipe Building Products - Above and below ground drainage
- Polypipe Ventilation - Ventilation and exhaust air pipe
- Quinn Group - Insulation
- Rehau Limited - Rainwater harvesting system, door and window frames, underfloor heating ground probes, associated pipework, wall heating
- Rocklift - Lifting for heat pump
- S&G - External Joinery
- SSA Building Services - Electrical works
- Saint-Gobain Weber Limited - External render
- Scottish Funding Council - Contribution to project funding
- Sentinel Performance solutions - Growth and corrosion inhibitors
- Solaglass - Triple glaze Krypton Gas
- South Lanarkshire Council - Advice regarding planning and building standards
- T. Lawrie - Drawings
- Timber Components - Stairs
- Uponor - Pipework to heat pump
- Versatile - Roof work
- Walker Profiles - Window frame manufacture
- Weber - External render



South
Lanarkshire
College
East Kilbride

Profile

- Scottish College, 6500 students 180 staff, moved from multi campus to single new building in 2008.
- Construction and Construction Management account for around one third of the college's students.

Registered Office : EAUC UK Office, University of Gloucestershire, The Park, Cheltenham, GL50 2RH
Tel : 01242 714321, info@eauc.org.uk, www.eauc.org.uk

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The problem

25% of UK energy use is associated with housing. Scottish building standards will not deliver net-zero carbon buildings until 2016. We need to be building affordable net-zero carbon new houses before then. In Scotland, too many people are living in fuel poverty.

We are too profligate in our use of energy for heating – partly a historical consequence of readily available north sea gas.

There is a huge training need in all areas of the construction industry regarding low-energy buildings and construction apprentices need to be taught new approaches.

Educational establishments need to incorporate lessons about sustainability into all curriculum areas.

The approach

After approaching several housebuilders, we found a particular one that was very enthusiastic about what we were aiming to achieve and was keen to be involved in the project. We also brought together a critical mass of around 20 companies with an interest in sponsoring the project with their products or services free of charge – insulation, ground source heat pump, solar thermal panels, pioneering ventilation systems, triple glazing, architectural design, timber frame, etc.

Once we had this “critical mass” of companies we held a public launch with the sponsors, we produced press releases, invited key companies and generated further interest and enthusiasm. The project was “right for its time” and the publicity drew in more sponsors until we ended up with fifty in total and were at a point where we were actually turning away offers from some very large and well-known companies.

The Depute Principal chaired a steering group for 6 months post-launch to get the design right, co-opting various sponsors at different stages of the design, making sure that it adhered to the principles of affordability, low-energy and net-zero carbon and achievability in terms of timescale and outcome. A very enthusiastic member of lecturing staff co-ordinated detailed arrangements and made sure that the various products and services integrated sensibly. We got a Scottish Government Minister with responsibility for sustainability, John Swinney, to “cut the turf” at the start of the building phase, generating more publicity. He was enthusiastic about the project and came back 6 months later to open the finished low-energy house.

The approach attracted companies, schools, energy action groups, staff, students and others to find out how this house operated and from then on we have had a “snowball effect” of more and more interest and more and more associated activity.

Our goals

1. To prove it is affordable and relatively straightforward to construct an affordable low-energy, low-carbon house.
2. To use the finished building as a training resource
3. To engage with industry and share the knowledge widely regarding the design and construction
4. To engage with Scottish Government MSPs to move the debate on low carbon buildings forward
5. To use the building as a catalyst for changing the curriculum and influencing students to adopt sustainable approaches.

Obstacles and solutions

- Obstacle: Technologies from different manufacturers are not always compatible
- Solution: At different stages of the project design we invited suppliers to join the steering group for a period of time to consider their product’s application in the context of the whole project. We levered up the performance of some of the technologies by doing this.
- Obstacle: Some aspects of the design – e.g. not having trickle vents in the structure were not consistent with current building standards expectations
- Solution: Engaged early with building standards to discuss requirements such as air change and alternative ways of achieving that through innovative and more efficient design

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Green Gown Awards case study



- Obstacle: some current building approaches are not compatible with a low-energy thermally efficient envelope round a house.
- Obstacle: some staff are skeptical about adopting more sustainable approaches
- Solution: we demonstrated significant financial advantages associated with greener approaches
- Solution: Some of our suppliers invented new ways of working to improve the efficiency of their products.
- Obstacle: Some people said it couldn't be done.
- Solution: We pushed the vision forward!

Performance and results

1. The low-energy house performs beyond design expectations: It cost £78 to heat for the first full year of operation and it generated the equivalent of around £1400 of electricity from its solar panels.
2. The college has also received sponsorship of around £200,000 for training students in low-energy approaches.
3. The college has changed its curriculum and now incorporates options on sustainability in vocational programmes as well as bespoke courses in building technologies and micro-renewables.
4. In addition to its use as a training facility for students, around 1000 people from companies, local authorities, housing associations, architects practices and other private and public organisations visited the project in its first year of operation and went away with new ideas and enthusiasm for what can be achieved.
5. Companies involved in the project and also those who have visited the project have changed the way they do things, to incorporate low-energy, low-carbon approaches. One company even engineered one of its products a different way to make it more effective in terms of energy efficiency.
6. Five Scottish Government ministers, including the First Minister, and other MSPs have visited.
7. The Scottish Government held a Greener Housing Summit at the college in November 2011.

Lessons learned

- Low-energy design and construction in new housing is easily achievable and affordable.
- Building techniques and approaches need to be modified. This is largely a skills gap and a training need.
- In a low-energy building the important thing is to get the building design right (fabric first) and reduce the energy required to operate the building first before looking at ways to supply the energy. We spent more time on design than on build.
- Objectives relating to sustainability are entirely compatible with objectives to be efficient, effective and financially sound.
- A "big idea" such as this project, can generate multiple benefits in being an effective catalyst for change.

Further information

Angus J. Allan
South Lanarkshire College
College Way
East Kilbride
G75 0NE
T:01355 807605

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