

Developing the building blocks of low carbon construction

The built environment accounts for approximately 50 per cent of energy use, and recent legislation has set down a target of reducing greenhouse gas emissions by at least 80 per cent, by 2050.

Much technical work has already been done by government departments and agencies, developing standards for new buildings, regulating energy systems, promoting energy efficiency, and promoting sustainable construction.

Here we feature four companies from the East of England that are leading the way in finding innovative solutions to meet the challenge of building low carbon, sustainable buildings head on.



Willmott Dixon - Community Healthcare Campus, Watford

Better healthcare, lower carbon

Based in Hertfordshire, the Willmott Dixon Group is one of the UK's largest private construction, housing, property care and investment companies. Dedicated to reaching its own goal of being a zero carbon company by 2012, it was ideally suited to develop a demonstration Community Healthcare Campus at BRE's Innovation Park in Watford.

The key challenge was to adapt an existing building into a state-of-the-art, community-based primary care centre, using low carbon innovation. Willmott Dixon worked with a variety of partners, including Primary Asset/ MedicX Group and BRE, to build low carbon innovation into every step of the process.

The framework of the building was largely based on timber from the existing wood in the building, locking away the carbon in its very structure. Other materials were innovatively incorporated, such as copper for handrails to give a hygienic and infection-controlled environment.

Several design features of the Campus ensure minimum energy use, including high levels of wall, roof and floor insulation and high-performance low-emissivity double glazing.

Natural daylight is used wherever possible, ventilation is carefully controlled and energy is sourced from a wind turbine, photovoltaic cells and solar wall panels. A high-visibility central energy display records all metered system performance, highlighting where further energy savings can be made.

The Campus has been fully fitted with cutting-edge ICT technologies that are low or zero carbon, with the ultimate sustainability aim of creating a carbon neutral building. Learning from BRE's expertise, Willmott Dixon also reduced the waste produced throughout construction, with a fixed policy to sub-contractors that if you produce it, you remove it.



Open Hub Ltd

New smart home systems in old buildings

The UK has the oldest housing stock in the developed world, with one in five UK homes being over 100 years old and nearly 8.5 million homes in England classified as 'non-decent'. Mass replacement is simply not an option. So, how do you transform a disused Victorian stable block into an efficient home fit for the 21st Century?

Cambridge-based SME, OpenHub, took on the challenge to see how innovative smart technologies can be applied to an old house, addressing both a resident's needs and broader sustainability challenges. The company has cutting edge experience of designing, producing and installing best-of-breed innovative solutions, as well as developing inter-operable systems for digital technology within the home.

The system that Openhub developed incorporates interactive monitoring and management of both energy and water used in the home, making it easier for residents to significantly reduce consumption, avoid waste and minimise running costs. It also monitors homes susceptible to fuel poverty in winter, and controls security and access to the home through intruder and fire alarm systems. The systems are all controlled through the occupants' domestic television set, making them ideal for use by elderly residents who may have vision and cognitive impairments.

Lawrence Groundworks

Waste not, want not

On-site waste into new building materials

Economic, legislative and environmental factors are forcing the construction industry to find innovative ways of dealing with waste generated on-site. This is a particular concern where construction is taking place on land that has been previously developed, involving the demolition of existing buildings. Whereas many components can be recycled or sold for scrap, there is still a considerable volume of waste that is typically headed for landfill.

Lawrence Groundworks has developed a new way of re-using site demolition waste, with a portable on-site crusher. This low carbon solution enables the waste materials to be crushed on site, helping clients to meet their site waste management targets to reduce waste to landfill, transportation costs and disruption to the local community of carrying waste offsite.

The Rickmansworth-based SME has since won contracts with a number of local authorities who are keen to benefit from the reduced costs and increased sustainability of this innovative approach.

Econovate Ltd

Construction paper

The drive towards more sustainable buildings means that the construction industry is increasingly scrutinising the sustainability of the materials it uses. Hemel Hempstead company Econovate decided to investigate how recycled materials could be used to develop new and more sustainable construction materials. The result is an innovative construction block, using concrete made of waste paper.

The company has developed a formula for producing lightweight structural blocks with high thermal and acoustic performances, to reduce energy consumption. The product itself uses 80 per cent recycled materials, diverting considerable quantities of waste from landfill. It is a simple replacement for current standard concrete blocks, using a system that can be handled on-site and maintained in the same way as standard systems currently in use, so there is no need to retrain technicians.

Besides reducing carbon costs, the blocks themselves now make a cost effective alternative to other existing wall products on the market.

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