



BUILDING FOR THE FUTURE

UK sustainable skills go global

ECO-LUXURY From New Delhi to Shanghai the call of the East is strong for UK companies and practices providing sustainable solutions in property. The West, however, is far from won, with fresh opportunities on the horizon, says **Jim McClelland**

In the middle of the Atlantic, some 2,500 miles from the nearest port, Purcell Miller Tritton, the only architectural firm in the Top 60 of The Sunday Times Best Green Companies list, is developing the design for an Oberoi hotel, set to become a global exemplar of eco-luxury.

With a client brief to deliver the world's greenest facility, the design intent is to 'grow' a hotel on the island of

St Helena, using indigenous flax and lime for wall construction, plus a living roof. Purcell Miller Tritton is not the only British sustainable building company enjoying considerable success outside Britain.

MARKETS OPENING UP

Sailing still further west, routes into attractive North American markets are also opening up. In February this

year, the Clean and Cool Mission – organised with assistance from the Technology Strategy Board and the support of UK Trade & Investment – took a shortlist of 19 UK businesses out to San Francisco. For one in particular, carbon-banking building-system specialist ModCell, the trip proved the catalyst for a move into California, resulting in them launching in the US this month.

"It was revealing to see that European legislation on carbon reduction has driven a huge amount of innovation back home in the UK, whereas in America, most is only dated as recently as 2009, from the Obama administration," Director Craig White explains. "In many regards, Europe is up to 10 years

ahead, although when America moves on this agenda it will do so very powerfully. Consequently, we saw a clear business opportunity." As it is for so many industries China is increasingly offering opportunities for the British sustainable building industry. UK eco-entrepreneurs and consultancy BioRegional, for instance, has established BioRegional China as a Wholly Owned Foreign Enterprise.

OPPORTUNITIES IN THE EAST

Weighing up the wider prospects, Pooran Desai, co-founder of BioRegional, offers a measured assessment of the prospects there: "China is hungry for ideas but on their own terms. There are opportunities to license and manufacture green technologies. Some engineering companies are doing well. Planning and sustainability consulting is much tougher. I suspect ultimately

the companies that are successful in China may have some roots here but will be, in essence, Chinese."

In general, according to the Construction Products Association, UK figures for both imports and exports of industry goods continue to hover around the 10 per cent mark, in spite of fluctuations in currency markets and volatile trading conditions. As regards project work for UK firms, whilst we are becoming accustomed to reading stories of activity in architecture and building coming out of Asia, by no means all journeys of export and expansion into international waters are headed East.

Whether looking East or West, it seems clear that UK companies are set fair for a shot at achieving future exporting success, in terms of knowledge, technology and even the building materials themselves that are driving sustainable development worldwide.



**WILLMOTT DIXON
GROUP**

Helping reduce our clients' carbon liabilities

www.willmottdixon.co.uk

Design, build, improve.



Gentoo Group is a people and property business that aims to have a tangible, positive effect on the way people and communities live, develop and improve.

Our passion for the environment is not simply about bricks and mortar, we know that influencing the hearts and minds of our staff, customers and stakeholders is the best starting point for change.

As a Group, our multi-disciplinary team can provide a range of cost effective design, development and build services all with environmental sustainability at the forefront.

Our work in this area is setting a precedent for the design and construction of sustainable, low carbon homes throughout the UK. Not only new build is considered, an ambitious 'retrofit' programme of current housing stock is also being undertaken.

With experience in both commercial and residential construction and a willingness to try new things and find innovative solutions, we're confident we can make the most of your development.

It's what we do.

To find out how we can help you to build a better future contact
Nigel Pearson, Business Development Manager, on:
0191 525 5000 or visit **www.gentoo-group.com**



gentoo
Living for a new **generation**



INSIDE

4 Man with a plan

Dan Labbad, the new Chairman of the UK-GBC talks about his plans

5 Green shoots

Britain has a wealth of talent in sustainable building – meet the new stars

6 Sourcing

From carbon footprints to human rights abuses – ethical sourcing is increasingly important

8 Green and pleasant

Sustainable building involves accommodating nature in new, imaginative ways

10 Teach yourself sustainability

The new UK-GBC online training course reviewed

11 The next generation

Training and education for sustainable building gets a 'B- could do better'

12 The business case

Sustainable buildings are good for business too

13 Green bank

The government is keen on it, so will the Green Investment Bank get the green light?

14 Down Mexico Way

Copenhagen raised hopes. Now the stakes are higher than ever at the next summit

15 Future perfect

New building technology is already around us

Distributed in **THE TIMES**

Editor: Simon Brooke

Contributors: Ben Bamber, David Blackman, Ruth Bloomfield, Simon Brooke, Tom de Castella, Ron Condon, Paul Evans, Marguerite Lazell, Jim McClelland, Mark Smulian

Publisher: Henrik Kanekrans

Production manager: Fabiana Abreu

Design: Hervé Boinay

Published in association with:



WORLD GREEN BUILDING COUNCIL

For more information about Raconteur Media publications in *The Times* and *The Sunday Times*, please contact Freddie Ossberg
T: 020 7033 2100 E: info@raconteurmedia.co.uk
W: www.raconteurmedia.co.uk
twitter.com/raconteurmedia

The information contained in this publication has been obtained from sources the proprietors believe to be correct. However, no legal liability can be accepted for any errors. No part of this publication may be reproduced without the prior consent of the Publisher. © RACONTEUR MEDIA

At home with the big society

COMMUNITY INVOLVEMENT It's the new Coalition government's big idea. It's been making big headlines, and attracting big plaudits – as well as big criticisms. So how – if at all – does the Big Society translate into sustainable buildings? **Simon Brooke** investigates

David Cameron's offer to parents to establish and run their own schools has generated interest and condemnation in equal measure. Controversial it might be but the government is also keen to apply this principle to the built environment.

"Real change towards low-carbon living must be owned and driven by communities and localities," says the Department of Communities and Local Government. "The new Government is making it easier for communities to take action in their own area. That's why we will back, for example, genuine new eco-town or eco-village developments, which have broad-based local support and are genuinely environmentally sustainable."

Already communities are being invited to get involved in greening their neighbourhoods. One Brighton, for instance, is a new development of 172 studio, one and two bedroom apartments made from 25 per cent recycled materials. But, construction and design aside, what is more revolutionary is how the residents are being asked to play their part. Roof top allotments and balcony planters are an integral part of the development where residents are encouraged to grow their own produce. A rainwater harvesting system provides irrigation.

GREEN LIFESTYLES

Organic waste bins have also been provided and their contents are transferred by locals to an on-site composter. One Brighton is linked to local cycle routes leading into the city as well as to Brighton train station and there is even an on-site Car Club for longer journeys.

"The development concept has a strong focus on encouraging healthier, happier, and greener lifestyles," says Pete Halsall, managing director, BioRegional Quintain Ltd, one of the partners in the site. "As part of this, we've acknowledged that some of the most significant and cost-effective carbon reductions are to be made in community-based services, such as car clubs and on-site food growing. Hot water and heating is provided by an on-site biomass boiler using locally sourced wood chip."

At Miller Zero in Basingstoke, a research and development project that has allowed developers Miller Homes to test out aspects of working with the Code for Sustainable Homes, ready for roll out next year, thought has been given to the layout of the site in order to make it easier to involve the community in green projects.

Engaging the local community is increasingly important to developers



This trend is occurring world wide, especially in countries such as India and China that have hundreds of new cites planned over the next twenty years

"The Code level homes have been built on a piazza style street, which encourages a community feel," says Sue Warwick, marketing director for Miller Homes. "It's hoped that greener living will encourage residents to share their experiences of the various new technologies and help one another make the most of their homes."

Wembley City will comprise around 4,200 homes built across 87 acres around the National Stadium. The residents of the first phases now separate their waste and recycling into colour coded containers within their apartments before dropping it into corresponding chutes in the courtyard of their block. It is then removed through a system of underground vacuum pipes at speeds of 50mph, instead of by road. This is the first time this community-based waste technology has been used in this country and it should cut carbon emissions by 90 per cent.

"We know that simply making the technology available is not always enough and to maximise overall sustainability of the scheme, we need to actively interact with our residents to get them to use

the technology and change their habits," says Nick Shattock, deputy chief executive of developer Quintain. "The Envac system, which relies upon the co-operation of the residents to sort and separate their waste, has been a big success, helping Wembley City achieve recycling rates that are twice as high as the rest of the borough."

TREND OCCURRING WORLDWIDE

At Jubilee Wharf, a mixed used development of six flat, 12 workshops and five offices near Penryn in Cornwall, a communal boiler providing under floor heating and hot water uses wood chip pellets which are delivered four or five times a year and there is a wind turbine on the roof generating electricity. Flat and business owners meet regularly to review their workings.

A central recycling system handles cardboard from the residential and commercial tenants and there are even ceramics classes where broken glass and crockery from the café and flat owners are reused.

Jane Henley, CEO of the World Green Building Council, points to similar developments in other

countries. "This trend is occurring world wide, especially in countries such as India and China that have hundreds of new cites planned over the next twenty years. This large scale system thinking is also a solution to socio-political challenges such as water and energy dependencies for many countries."

PROPER MANAGEMENT IS KEY

"Proper management is the key in these developments," says David Goatman, Head of Sustainability at estate agents Knight Frank. People appear to want these facilities but want them to be run properly. However, he also believes that involving the community in the maintenance of green building developments could offer wider benefits. "There is a strong social dimension - very often green space in developments doesn't look attractive because no one is in charge of it but if allotments and green roofs are run by all the residents then there is a vested interest in their upkeep."

"In two years time this sector is going to be astonishing," says David Birkbeck, Chief Executive of Design for Homes, which champions good design in housing industry. "There are so many exciting projects on the drawing board at the moment and the technology and the ideas to make them work are growing. Developers are struggling at the moment because this movement towards sustainable developments with a community involvement has clashed with a slump in the property market. But when we see a return to healthy market this stuff will really start to fly."

A man with a plan

INTERVIEW Dan Labbad, has taken over as Chairman of the UK-GBC at a time when the opportunities – and the challenges – for sustainable building have never been greater. He talks to **Simon Brooke**

Why have you accepted this role?

Sustainability is a very complex and evolving challenge and no one has a monopoly on all the ideas. The UK-GBC is uniquely qualified to bring the industry together to talk about the green agenda with all its complexities in a positive, progressive way. It talks to government on an equal level to industry and acts as an independent catalyst for change. I've always had a strong interest in sustainability and I have to play my part individually as well as Lend Lease.

Why is an Australian heading up UK-GBC?

Sustainability is an international issue but the fact is that I have been living in the UK coming on five years. Being Australian is irrelevant. In my opinion the UK and Europe are progressive in carbon reduction regulation while Australia is progressive in areas such as water conservation.

I'm cautiously optimistic about the forthcoming Mexico and Singapore summits – albeit slow, there is a convergence of opinion internationally on what is required. This is where the World Green Building Council of which the UK-GBC (along with

Is technology keeping up with these aspirations?

There is a significant amount of innovation at the moment and the market is waking up to the opportunities available. Many of the big players are now see-

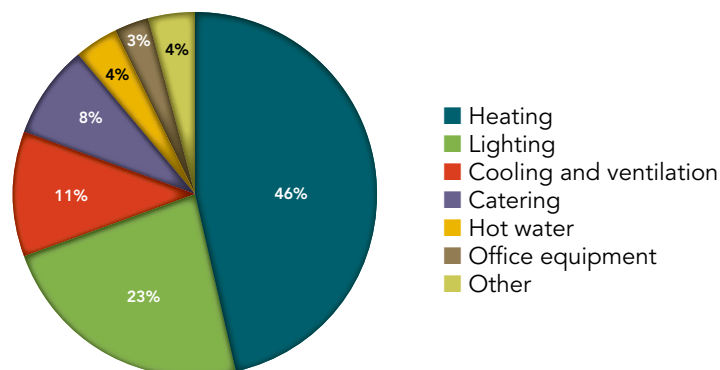
No car – 3 bikes

DOB: 24th Jan 1972
Marital status: Partner, Kristina
Education: Bachelor of Civil Engineering, 1st Class honours, University of Technology, Sydney ; MBA, AGSM, University of New South Wales
First job: Working with his grandfather, making suitcases
Car: No car, 3 bicycles – including a Brompton
Last film: Remember Me.
Last music purchased: Latest Kings of Leon album
Favourite food: All Pasta.
Favourite Gadget: iPhone 4
Most influential/inspirational figure: Italian grandfather, who emigrated to Australia
Downtime: Family, cycling, reading – currently reading Modern History of Egypt
Working day: Typically 7:30 am – 6:30pm.

Dan's role includes responsibility for Lend Lease's projects and businesses across Europe and the Middle East.

Industrial output

Carbon emissions by end use in the UK's non-domestic buildings



Source: BRE (2005); Carbon Trust analysis

What are your plans?

The organisation has a got off to a great start in the last three years and my role is to continue that. But the financial crisis poses challenges, regulatory requirements are increasing and the public is becoming more aware of sustainability.

My challenge is to ensure that we are translating the complexities into something that people can understand and to ensure that we're setting out a pathway and building capacity so that the industry knows where it's heading.

other GBCs) are members has a part to play in ensuring discussions are progressing in the right direction. There is also a growing international understanding that sustainability is a collective responsibility.

That's why the UK-GBC is so important, connected locally and networked globally – they're at the grass roots level of being able to collaborate on the right pathways for progress considering market conditions and the political environment both locally and globally.

ing new ways to access the supply chain, for instance. Sustainability is bringing in a new challenge and so people are asking – 'What is the right way to procure and how do you innovate through procurement?' From a business perspective the industry is beginning to ensure sustainability informs strategy and at the property level more are introducing sustainability filters at the investment stage. At a project level, sustainability is becoming a fundamental part of the design phase rather than an afterthought during delivery.

How can local communities get involved in sustainable developments and what role can the UK-GBC play here?

Local people need to have stake in sustainable development and the UK-GBC will have a role to play here. One of the interesting things about the decentralisation of energy provision is that you're effectively linking energy and the com-

The UK-GBC is uniquely qualified to bring the industry together

munity. I do think over the next five to ten years that we're going to see more and more green demand from consumers and communities. For example, a growing part of the decision making process about where and how you live will be informed by green choices or putting it another way, green competition.

Dan Labbad, 38, is currently Chief Executive Officer-Europe, Middle East and Africa of Lend Lease. He was the inaugural Chief Executive of the Hornery Institute, a non-profit organisation focusing on community engagement. He then moved to Lend Lease where he developed and implemented a Sustainability Transformation Plan for the Lend Lease group. He was a board member of the Australian Green Building Council before relocating to the UK and has been on the advisory board of the UK-GBC since its inception.



Save energy in your home and...

Make your home a



Brought to you by:



Sponsored by: **KNAUF INSULATION**
it's time to save energy

greatbritishrefurb.co.uk/superhomes

Green shoots—the rising stars of sustainable building

UNSUNG HEROES From steam engines to the Internet, British innovation has informed and directed much of the industrialised world – and green building is no exception. **Ben Bamber** and **Simon Brooke** reveal some of the new stars of the green building movement

What can the building industry learn from a beetle? Quite a lot when it comes to creating structures that can save water, it turns out. Michael Pawlyn, Exploration Architecture has been observing closely the Namibian Fog-Basking Beetle which harvests its own water. At night its matt black shell radiates heat and then cools down rapidly. The now cool shell causes moisture from the breeze to condense on it and, at the end of the night, the beetle simply tips this water into its mouth.

“The shell is hydrophilic, in other words it has very small ridges which cause the moisture to produce particularly tight spherical forms which makes them more mobile and so they tip into the mouth more quickly and efficiently,” explains Pawlyn, aged 42. At his architectural practice, Exploration Architecture, Pawlyn specialises in bio-mimic architecture, where buildings are designed to mimic useful attributes found in nature.

Another of Pawlyn’s projects includes a new form of large-scale offshore wind turbine. The Aerogenerator is a Grimshaw design originally inspired by the forms of sycamore seeds and beach pebbles. This vertical axis device is designed to float (anchored to the sea-bed with cables) so that it can be positioned far out to sea in high wind speeds. Each rotor arm is the same length as the Eiffel Tower is high. The output could exceed that of any conventional turbine constructed to date. This scheme is currently undergoing scale prototype testing.

While large UK based multi-nationals like ARUP and Foster+Partners shape greener buildings, towns and cities all over the world there are oth-

er individuals such as Pawlyn who are also adding value to the green building revolution.

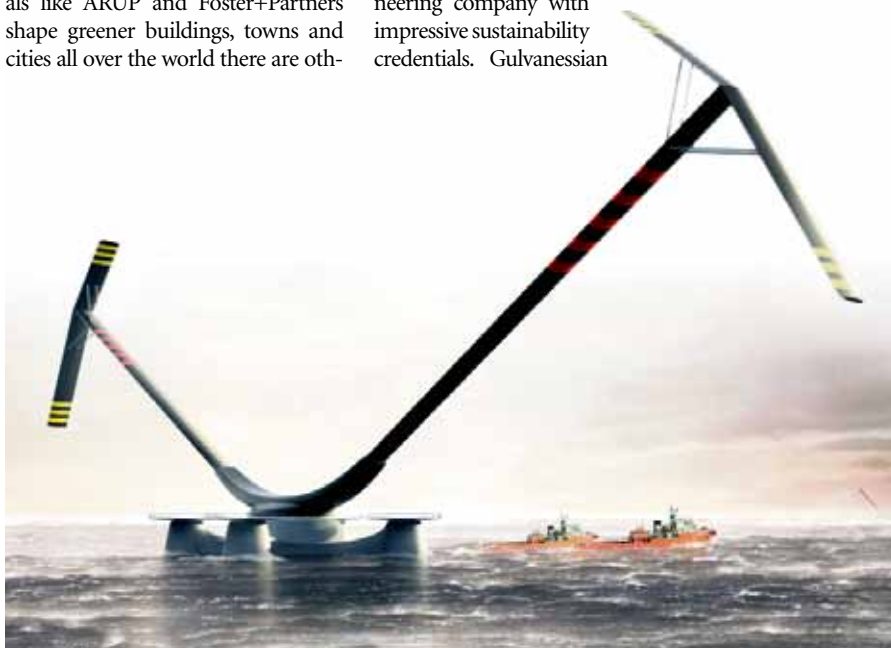
Michael Gratzel, a Swiss academic has offered up a significant leap forward in energy production, in the shape of a Photo Voltaic dye which will turn windows – only ever really used for letting light into buildings, into mini electricity generators. Professor Gratzel, just won Millennium Technology Prize, the world’s largest technology award, for his new solar cell based on a dye which sensitizes nano-crystalline semiconductor oxide particles.

This allows the dye to be applied to windows, something that could eventually be done very cheaply, meaning it could one day bring affordable energy to millions more people – particularly in those in parts of the world where energy is currently scarce or unavailable.

Getting the message about sustainable buildings to the widest possible audience is essential. A communicator doing good things for green building is Marco Marijewycz, 26, a communications manager at E.ON in the New Technologies Division. Marijewycz is now even producing his own videos on YouTube to spread the word about sustainability and he is often seen crossing the boundaries of organisations to promote collaborative work with the UK Green Building Council and Zero Carbon Hub among others.

Christina Gulvanessian, 30, is the Marketing and Communications Manager at Cundall, promoting its works as a leading engineering company with impressive sustainability credentials. Gulvanessian

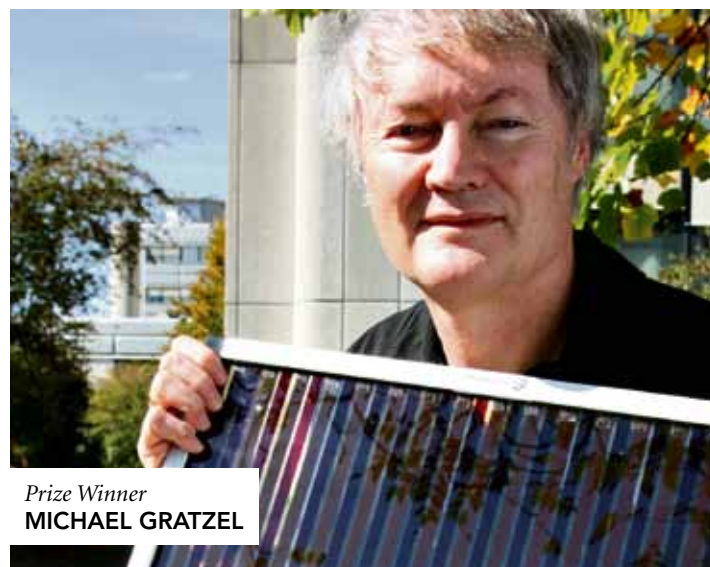
The Aerogenerator X is a Grimshaw design originally inspired by sycamore seeds and beach pebbles



Natural optimist
THOMAS BRIAULT



Putting the message across
CHRISTINA GULVANESSION



Prize Winner
MICHAEL GRATZEL



YouTube whiz
MARCO MARIJEWYCZ

also worked for the Building Research Establishment (BRE) – an organisation that designed BREEAM – a world leading benchmark in green building assessment. “My goal has always been to communicate and push the importance of adopting a sustainable approach across all areas of the design and construction industry,” she says.

Dan Phillips’ list of business partners reads like a who’s who of sustainable architecture and planning, including Richard Rogers, Battle McCarthy and Feilden Clegg.

He now works as Group Director for Sustainability at Buro Happold, a multi-disciplinary engineering company. “Sustainability has moved from the periphery to the centre ground of building and urban design,” he says. Phillips has helped to develop the Co-operative HQ in Manchester as well as many other leading projects.

Jules Saunderson’s work for Fulcrum Consulting (which joined the Mott MacDonald Group late 2009), has enabled him to work on eco-city master planning, such as Guangming Smart-City. A radical concept city designed by acclaimed architect CJ Lim, it seeks to take a truly holistic approach to sustainable development, incorporating food production, energy production, waste and waste water services, as well as critical components of a developing local economy into the very fabric of the design, right from the outset. Recently Saunderson, 28, was seconded to the Government’s Zero Carbon Hub.

“Working on large-scale projects has enabled me to see how high-level policies and regulation steer the design process and highlighted the dangers of perverse outcomes when trying to make rapid changes on a large scale,” he says. Understanding that the technical minutiae can be just as important as the overall goals has enabled him to pursue a very interesting career essentially linking the technical and political worlds.

“Moving forwards the demand for these types of skills is only going to increase and I hope that the next generation of Engineering students have even more opportunities to tackle such interesting challenges.”

As politicians and scientists around the world look at ways of cutting carbon emissions Thomas Briault, 32, currently project manager in the London Building Sustainability Team at Arup has an impressive CV in this area.

“Cutting carbon is certainly one of the biggest issues,” he says. Amongst others things, he has managed the delivery of a tool that the Carbon Trust can use for modelling to predict the cost of achieving the target of 80 percent carbon reductions by 2050.

He has also worked on the Olympics, in particular on the Sustainable Development Plan (SDS), launched by the then Prime Minister Tony Blair in January 2007. Here he developed the venue briefs to ensure the targets within the SDS were incorporated into all the Olympic Venues and infrastructure.

Is he optimistic about the future for green buildings? “Yes,” he says. “There’s a lot of great work being done. Anyway, I’m a natural optimist.”

Tackling the problem at source

SOURCING From human rights abuses to supporting for child labour – sourcing materials irresponsibly can do more than damage the environment, says **Jim McClelland**

As well as being complicit in acts contributing to global warming and water poverty, plus exploitation and waste of natural resources, could you also be guilty of environmental discrimination and exporting pollution, plus human rights abuses including benefiting from child labour? Are you personally and professionally responsible?

Failure to ensure responsible sourcing of products, goods, services and materials for specification and procurement on the part of a decision maker in the construction industry could leave that person answerable on all counts.

Some wrongdoings are more likely to result in accusations of engendering economic greed, environmental harm and anti-social behaviour, than actual charges on legal, ethical or moral grounds, but all are effectively crimes against sustainability. All are bad for business. Most are, however, commonplace. So, what is construction doing to clean up its act?

Well, to manage it, first you have to measure it. Sadly, this is not as straightforward as it sounds, even for resource use and efficiency. London 2012 set out to be “the most sustainable Games ever”, with targets and objectives that are unprecedented for major construction projects, driving forward innovation.

Do the Games showcase the industry’s thorough understanding of its resource impacts? Unfortunately they do not, as Shaun McCarthy, Chair of the Commission for a Sustainable London 2012, frankly explains: “The discovery that 67 per cent of the 3.4million tonne carbon footprint for the Games is embodied in construction was a shock and a revelation. I was also surprised to see that the Aquatic Centre has three times the embodied energy of the Velodrome, for instance. The construction industry does not know how to manage embodied impacts and the UK sustainable construction strategy is silent on the subject.”

ENERGY-RESPONSIBLE CONSTRUCTION

In response to the industry’s obvious frustrations with traditional evaluation tools, a new methodology called Carbon Profiling has been developed by Sturgis Associates. It combines both operational and embodied carbon emissions. On British Land’s Ropemaker Place, a recent case-study project in London, profiling showed that over half of the building’s CO₂ impacts are attributable to embodied carbon.

So, does quantifying embodied energy and embedded carbon hold the key to unlocking the secrets of energy-responsible construction? No, it does not, according to Dr Miles Wat-

kins, Director of Sustainable Construction, at Aggregate Industries Europe, who argues for an altogether more joined-up assessment: “Embedded carbon in isolation is not really that helpful. Performance of materials in use has to be taken into account. It is simply not sustainable to build a building with the lowest embedded carbon possible and then have to add crazy levels of renewable bling to make it work properly.”

Whilst the industry grapples with assessment methods and measures for energy and carbon, other formal standards and sector-wide initiatives abound.

Construction contracts themselves are changing. The £7million iCon building in Daventry is the first project completed using the sustainability guidance newly introduced by the Joint Contracts Tribunal (JCT). British Standards are also multiplying: in addition to the existing BS 8902 for Responsible Sourcing, this autumn will see the launch of a brand new standard for Sustainable Procurement, BS 8903.

ADDRESSING THE ISSUES

On the materials front, representative bodies are addressing issues of responsible sourcing. The concrete sector, as well as working to ambitious 2012 waste targets, has warmly embraced the requirements of the BRE standard BES 6001 for Responsible Sourcing of Construction Products. The Steel Construction Sustainability Charter, as advocated by the British Constructional Steelwork Association (BCSA), operates to objectives of economic viability, social progress and environmental responsibility. Plus, for timber, long-touted

as the only truly carbon-neutral (or better) building material, advanced certification systems have been developed, involving chain-of-custody standards, plus product labelling, lead by the Forest Stewardship Council (FSC) and Programme for Endorsement of Forest Certification (PEFC). These have helped distinguish the sustainable from the merely legal, with the prospect of further EU legislation on due diligence set to raise the bar still higher.

landscaping company Marshalls was the first in its sector to become a member of the Ethical Trading Initiative (ETI), but says initially, it had met with a lot of resistance and cynicism about the serious issues facing the stone industry in India.

Group Marketing Director, Chris Harrop says: “So many disputed the fact that child labour was still in existence. It was only by being in India we saw it for ourselves, and decided to do something about it.”

RESPONSIBILITY AS OPPORTUNITY

Whilst details may be complex and sometimes conflicting, the business case for responsible sourcing is nevertheless clear. Or, at least it is to clients, as Diane Booth, Head of Environmental Policy at Network Rail, explains: “Once baselines and the cost/benefit are well understood, it is relatively easy to design specifications and contractual incentives to drive improvement.

“However, gaining detailed understanding of the opportunity can only be done in conjunction with contractors and suppliers, some of whom seem reluctant to engage. They are not seeing this as a differentiating factor, when clients do.”

In short, for construction, the future is lean, green and responsible, as Paul Toyne, Head of Sustainability at Bovis Lend Lease, concludes: “The age of austerity could become the age of sustainability as both are about efficient resource use, which if we get it right allows the industry to offer affordable solutions, here in the UK and abroad. Companies need to position themselves ready for the upturn in the market.”

Do the Olympics showcase the industry’s thorough understanding of its resource impacts? They do not

In addition, the mainstreaming of natural and renewable building materials, such as hemp, straw and lime to provide low-impact construction methods, is rapidly expanding the range and application of responsible solutions.

Less responsible sourcing of products and materials from parts of the world where emissions targets may be more lenient (creating so-called ‘carbon leakage’), pollution more poorly policed and resource depletion more tolerated, often causes harm and creates risk indirectly, as a seemingly faceless crime. Sourcing that carries a direct cost to human life and wellbeing is different.

Ethical supply chain management is not, however, easy. In 2007, hard

The Aquatic Centre has three times the embodied energy of the Velodrome, says one expert



Water, water everywhere...

WATER CONSERVATION Floods and drought around the world are forcing builders and planners to concentrate more than ever on our use and storage of water. **Paul Evans** reports

The current devastating floods in Pakistan and China and the droughts bringing wildfires to Russia and Brazil are clear reminders that water – either too much or too little of it – is perhaps the most important single issue facing the planet.

In the UK, the floods of 2007 brought home the need for a strategic approach to how water affects our lives. When rain falling in the hills fills up living rooms downstream, it's time we looked at the links between housing and the environment. This year, a hosepipe ban in Manchester of all places reinforces the need to look at the way we conserve water too as well as how we use it in the built environment.

FLOOD RISK GROWING

Tony Grayling, head of climate change and sustainability for the Environment Agency predicts, "flood risk is growing because of climate

change with sea-level rise, warmer wetter winters and intense bursts affecting rainfall patterns but an overall reduction in rainfall with big changes in river flow patterns projected to be only half or less flow of water than there is currently." In the light of this scenario, Grayling is clear about the Environment Agency's recommendations, "Not to build in high flood risk areas and to manage risk of drought 25 years ahead because of demographic and climate change."

Kate Nelson, head of sustainability for development consultants Capita Symonds sees a shift in thinking away from this kind of prescription towards local scale solutions. "Water is a more emotive issue than energy or carbon," she says, "how people adapt to flooding, reduce water consumption and find solutions to water requirements is a big challenge and progress is about thinking holistically."

CIRIA, the construction industry research and information associa-

The floods in Pakistan show that too much water can be as dangerous as too little

tion's guidance on water management in new developments recommends that an integrated water management approach is adopted where water is managed on a site to site basis – such as Ashford Thames Gateway - but the whole river catchment should be considered at this scale.

AN INTEGRATED STRATEGY FOR WATER

High on Plumlumon in the hills of mid Wales, this approach is be-

ing taken to the management of the Severn and Wye river catchments. A partnership between Wildlife Trusts, farmers, forestry and government bodies is managing 40,000 hectares of upland to hold water, increase biodiversity, improve natural carbon storage, soil and air quality. Improvements to this ecosystem will have positive effects on home and buildings in towns many miles away, such as Shrewsbury and Bewdley, which have been badly

flooded in the past. For many it is a model of an integrated strategy on a landscape-scale.

"Managing the hills to moderate the flow of rivers provides a boost for rural areas and has huge economic significance for urban communities," says environmental adviser Chris Baines, "In a society driven by people who want hard, short-term solutions to problems, this inspires us to champion soft, long-term solutions."



© KeystoneUSA-ZUMA/Rex Features



If you're planning a zero carbon building in the near future, **just follow our lead.**

Target Zero is a free online resource offering guidance to anyone in the construction industry who would like to know more about the construction of sustainable, low and zero carbon buildings. The Target Zero project delivers clear, costed advice for achieving government targets for five building types, including Schools, Warehouses, Supermarkets, Offices and Mixed Use.

For more information and to download the reports, visit www.targetzero.info



Green and pleasant land?

GREENSPACE Both wildlife and humans depend on each other – building for the future requires green innovation to sustain both, says **Paul Evans**

The nuthatch on the bird table comes from oak trees behind the old houses. The peacock and red admiral butterflies on the buddleia come from nettle clumps on the railway embankment; darting dragonflies are from the canal; bees pollinating apple trees come from a derelict wall. The wildlife most of us who live in towns and cities see in gardens may not originate there but from the odd

courting couples but they're also the places which soak up storm water, filter pollution through leaves to improve air quality, cool urban hot spots and store carbon in vegetation and soils."

UNDERSTANDING GREENSPACE

This, says Professor Baines, is what constitutes "greenspace" but he adds: "The challenge to-

According to Professor John Hanley of the school of environment and development at the University of Manchester, "a green infrastructure is as important as our roads network or our telecommunication systems and requires a systematic pro-active approach as a matter of national importance." We notice this green infrastructure through birds, bats, beetles and wild plants which become part of our communities.

Urban areas contain remnant bits of countryside, including pastures and hedges with trees; scrub-woodland and grassland habitats which have appeared on disused industrial sites; 'corridors' linking wildlife habitats along roadsides, railway lines and canals; public parks and private gardens. In fact, urban gardens take up about 27 percent of the land in the UK and as a total of all greenspace, gardens make up 35 percent of Edinburgh and 47 percent of Leicester. In the UK, 48 percent of home owners feed garden birds but most of those birds depend on greenspace other than gardens to breed in. All this greenspace is essential for sustaining both biological diversity and human communities.

MORE WILDLIFE IN CITIES

Ironically, because of agricultural changes, towns and cities have more wildlife than surrounding countryside and recent research for the National Trust found honey bees fare better in urban areas than the countryside. There is body of scien-

Urban gardens take up about 27 percent of the land in the UK

tific evidence now to show that contact with Nature improves mental health and general wellbeing. However, government figures published last month reveal one in seven new homes are being built on 'residential land' – garden-grabbing. Street trees are being cut down when seen as risky. Much urban greenspace is designated as 'brownfield' for planning purposes and, under pressure to meet housing and business needs, wildlife habitats and internationally recognised species are at risk of being lost to development.

Less greenspace means less carbon sequestration in vegetation and soils, fewer absorbent surfaces for rain water run-off and water conservation, less biodiversity and wildlife connectivity between countryside and through developed areas, less atmospheric pollution filtered through vegetation, less tempera-

ture amelioration, less physical and psychological well-being, and an erosion of the sense of identity and distinctiveness for communities.

A recent report by the UK Green Building Council (UK GBC) aims to provide information and guidance for stakeholders involved in the built environment and encourages developers to get wildlife and greenspace into their schemes, such as designing urban waterways for otters, providing bat roots under bridges and swift nest boxes up on office blocks.

Globally green

Organised by the World Green Building Council, World Green Building Week takes place from 20th to 26th September. It will see a series of meetings, conferences, lectures and discussions which will move green and sustainable building further up the agenda of politicians, businesses and the public alike.

Key activities for this year include the launch of the World Green Building Council Special Report entitled "Tackling Global Climate Change - Meeting Local Priorities," and a series of synchronized green building events hosted by Green Building Councils from around the World. Countries including Brazil, Australia, Bulgaria, Mexico and South Africa will be engaging in a range of activities and discussions to raise awareness of these important issues and explore options to develop them internationally.

The event follows on from the success of World Green Building Day which was launched for the first time last year.

scruffy corners of land which have so far escaped development.

"Look at towns and cities on Google Earth," says environmental advisor Professor Chris Baines, "and you see a woodland of trees in old boundary hedges, parks and gardens, along streets and roads, railways and canals running through the city and in privately-owned land in limbo awaiting development. These are the places we are often unaware of, many are unofficial back-lands and by default they are the places for wildlife, children's play, dog-walkers and

day is to look beyond blinkered ideas about land as territory to the bigger picture and understand the functionality of greenspace and its role in landscape integrity."

Going up the wall – the Athenaeum Hotel, Piccadilly



Save the planet yourself some

MICRO-GENERATION There's more than cavity walls insulation that will save you money – as we Ruth Bloomfield offers some

According to the Energy Saving Trust, the amount of carbon being unnecessarily haemorrhaged from our homes each year because of uninsulated cavity walls is enough to fill 22 million double decker buses.

In total the heat lost from houses accounts for 26 per cent of the UK's annual carbon emissions. And although by 2016 all new build homes will have to be carbon neutral, our older housing stock – and the attitude of its owners – presents the greater challenge.

Oliver Heath, the broadcaster, designer and author of *Urban Eco Chic*, is outraged by our collective apathy. "There just doesn't seem to be any motivation," he complains, pointing out that with grants from energy companies lofts can be insulated and cavity walls filled for around £200. "I am appalled by the lethargy and I really believe that legislation is

MAKING PROVISION FOR WILDLIFE

Carol Williams, who chaired the UK-GBC biodiversity task group says, "The construction and property sector has been pilloried in the past for its negative impact on green space, wildlife and habitat – but the industry can actually have a positive influence on ecological value. If we don't make provision for wildlife now, then we might not be able to attract it retrospectively quite so easily."

Making provision for wildlife is about protecting what we've

got and creating new, innovative greenspace. "Roofs are a key asset for the green and sustainability agenda," says Jeremy Blake, head of the sustainability practice group for Purcell Miller Tritton. Blake was involved with the nine-story living wall containing 226 plant types, from shady ferns to mountaintop alpine on the Athenaeum Hotel in Piccadilly and the UK's largest green roof, which now supports nesting skylarks, for brewery distributor Adnams in Suffolk. He says, "Roofs have huge environ-

mental advantages for biodiversity, absorbing heat and providing opportunities for energy. We came up with a future vision for Cambridge with cows grazing on roofs and rooftop allotments."

DESIGNERS

Not far from the scene of that futuristic vision is Camborne, a shiny new settlement in Cambridgeshire designed and built around the natural environment and where developers collaborate with conservationists. Paul Wilkinson, head

of living landscapes for the Wildlife Trusts, says, "We have to think about greenspace in broader ecosystem terms now, working with developers and the community."

The original housing scheme was designed to incorporate existing biodiversity features, such as woodland, ponds, watercourses and old hedges. Having identified the existing natural assets, the developers linked these together with footpaths and cycleways and created large areas of new wildlife habitats, including species-rich meadows, wood-

lands and wetlands. These areas are now managed by the local Wildlife Trust for the benefit of wildlife and the enjoyment of people.

Black redstarts hunt spiders on the green roofs of high-rise office blocks where nesting peregrine falcons swoop on pigeons; water voles plop into city centre streams where kingfishers catch minnows: these wonderful wildlife moments are happening in intensely urban areas but they depend on a functioning green infrastructure and creating new greenspace for the future.

Planet – and the cash

might be sexier subjects about greening your home all as saving the planet. The advice



the only answer. How long are we going to wait for people to act? People are just not bothering to make their homes more energy efficient and they are throwing money away."

One of the biggest problems – lethargy aside – is the confusing array of options, conflicting claims for each, and the cobweb of grant funding available.

GET YOUR HOME AUDITED

A first step to greening your home is to get it properly audited. Parity Projects (www.parityprojects.com), and the Energy Saving Trust (www.energysavingtrust.org.uk) both offer impartial advice.

The older your home the more carbon it is likely to emit. This is partly because houses built when fires were a universal feature had to be less airtight than modern, centrally heated homes.

According to Simon McWhirter,

director of the Great British Refurb campaign, the key message is simple – insulation, insulation, insulation.

"It is unfortunate but the basic, boring stuff is by far the most important," he says. "You have to look at your walls, your floors and the roof. You need to insulate and draft proof so that the energy you are using stays in the house."

Once the basics are in place you can look at the altogether sexier subject of micro-generation, and produce your own power. As well as generating green energy these technologies are a money spinner because you can sell the power you generate to the national grid – an annual income of approximately £1,000, although this figure will fluctuate depending on the type and scale of the technology you use.

Leonie Greene, a spokeswoman for the Renewable Energy Association (www.r-e-a.net), predicts that over the

Wind turbines only come after you've insulated your walls

next decade micro-generation will become increasingly commonplace.

SOLAR PANEL COSTS HALVED

"A quarter of a million people in Germany had solar panels fitted last year alone – that is more than we have as a country," she says. "We are late adopters, but we are getting there."

"Everybody complains about the cost, but the costs have halved in the last ten years and they will fall again. Pretty soon it will be as affordable as buying electricity from the grid. We anticipate 'grid parity' happening by 2020."

However, one major emerging problem is cowboy operators who are springing up to take advantage of the green minded but naive.

"They are totally unscrupulous criminals basically," said Greene. "They charge utterly excessive prices and provide technology which is not eligible for the tariff scheme so you can't sell your power. We need to stamp them out." As with any home improvement, the message is clear – do your research and get recommendations before you buy.

TOP TIPS TO GREEN YOUR HOME

Dull but worthy:

• Insulate your loft for around £250 and save between £45 and £150 a

year depending on the type of insulation. You will save up to 800kg of carbon each year.

• Install cavity wall insulation. Most homes built after 1920 have cavity walls that can be filled. This will cost around £250, but save an average 610kg of carbon a year and knock £115 off heating bills.

• Solid wall insulation is the more expensive option for older homes. You can either use insulation boards inside the property, or use render or cladding on outside walls. This is not cheap, from £5,500 (for internal insulation) up to £14,500 for external but will save around two tonnes of CO₂ each year, bringing savings of £380 a year and more.

• Solar thermal panels heat hot water, while solar electric panels (known as solar PV) create electricity.

• A typical solar PV system will cost around £8,000 including installation, save around a ton of CO₂ a year and earn you around £800 by selling power back to the grid.

Solar thermal systems cost between £3,000 and £5,000, and can save up to half a ton of CO₂ a year. You can cut heating bills by £100 annually, but you can't sell energy generated back to the grid.

• A ground source heat pump is a box mounted on an outside wall,

which takes heat out of the atmosphere and uses it to warm your home. They cost £7,000 and £13,000 and – if your home is well insulated you can knock £500 a year off your bills and save up to a ton of CO₂ a year.

• A typical domestic wind turbine costs about £14,000 including installation. If your home is in the right location – coastal or on high ground – you could earn £900-a-year from selling power to the grid and save 2.5 tons of CO₂. However, it is crucial you have a wind survey before going down the turbine route as results are variable in urban areas.

Discover how to green your home at www.greatbritishrefurb.co.uk and find out about the Renewable Energy Association at www.r-e-a.net. The Energy Saving Trust offers a guide to micro generation and information on sources of grant funding at: www.energysavingtrust.org.uk/. Only use firms covered by the Real Assurance Scheme (www.realassurance.org.uk) and make sure your technology and installer is accredited by the Microgeneration Certification Scheme (www.microgenerationcertification.org) or you will not be eligible to sell your power back to the grid.

A New Deal to green your home

The government has committed to a policy called the Green Deal which will offer all householders a package of energy efficiency measures. The value of the offer could be up to £10,000. The cost of refurbishment is spread over time and paid for through savings on the household energy bills. Up to 14 million homes could benefit from the scheme, Deputy Prime Minister Nick Clegg, announced last month.

Green Deal customers will be entitled to an independent assessment of their home's energy efficiency, and improvements will be carried out by kite-marked installers.

First proposed by the UK-Green Building Council under the Pay As You Save campaign, this offer is now part of the Energy Bill which is due to come before the House of Commons in November and the scheme is expected to be available in 2012.

Climate Change Capital aims to provide attractive financial returns to investors, demonstrating the financial opportunity associated with the low carbon economy – **Creating Wealth Worth Having®**

Advisory | Carbon Finance | Private Equity | Property | Energy Infrastructure

Climate Change Capital®

www.climatechangecapital.com



Teach yourself sustainability

TRAINING The UK-GBC's online course, launched today, guides people from any built environment discipline into thinking about sustainability in their work. **Mark Smulian** tries it out

Sustainability is not something companies do just to improve their public image, or because a regulator has told them to do it. It makes sound business sense and those that grab the opportunities stand to outperform those that do not.

Those are the main ideas behind the UK Green Building Council's online course Introduction to Sustainability in the Built Environment – the first course from UK-GBC's Sustainability Training and Education Programme (STEP).

For those built environment professionals who realise they need to understand sustainability, help is at hand with slides, animations, text, video inserts and case studies.

Chad Harrell, director of operations and business development at the UK-GBC, explains: "The overall objective of the course is providing a facility in a common language across built environment professions. Any-

one at any level can take the course and get something from it."

It entitles users to eight hours' worth of continuing professional development credits. They can choose to take an online assessment, successful completion of which leads to a certificate.

"We hope people will want to show it to their employer to demonstrate they have gained a foundation in sustainable development, which will be recognised across the industry," Mr Harrell says.

So, what does the course feel like? I had a look.

It starts with a video explanation from UK-GBC chief executive Paul King of what is meant by sustainability. He tells built environment professionals:

"The challenge of dealing with our current unsustainable behaviour is already affecting your business or organisation. And that impact is only going to increase."

Next up is a video of interviews with industry figures interviewed at Ecobuild this year, including Royal Institute of British Architects' president Ruth Reed and Paul Morrell, the Government's chief construction adviser, on why they were converted to the need to promote sustainability.

This section introduces the basic concepts, clearly explaining otherwise baffling terms like 'the triple bottom line' and 'the five capitals model'. Yes, even something as new as sustainability has its own jargon.

The later modules dispense with the videos in favour of written material as well as animations and scenario-based exercises. UK-GBC advertises the course as taking 480 minutes (or eight hours), but doing so is not like spending that length of time immersed in a textbook.

Each module makes its point quickly, and gets students thinking about how to apply these concepts in their work, not whether they have absorbed a mass of detail.

For example, the second module describes the skills needed for sustainability. Some are technical, but it also shows how skills in assessing the impact of unsustainable practices on a company's finances, people and regulators are also essential.



The A to Z of sustainability – now available online

Module three discusses the technical solutions available to make buildings sustainable, and module four is about how to communicate the need for sustainability and engage others with it.

This is a 'soft' skill, but is important as the idea that one should be concerned with whole life costs, rather than short-term ones, is central to sustainability, and users need to be able to convince sceptical bosses that savings from today's short cuts may be unsustainably costly in the long run.

The final module links the course's ideas together into how to change behaviour, improve efficiency, cut spending and embed sustainable practices in a supply chain.

Case studies from, amongst others, Aggregate Industries, Balfour Beatty

and Keepmoat, show that if companies of that size think sustainability is worthwhile, so should the rest of the industry. An online forum allows participants to raise questions and exchange ideas with other users.

Chad Harrell says that of 50 students, who piloted the assessment, the average score was 82.5 per cent. So still plenty to learn – even for those involved in the pilots whose day job is sustainability.

Even for those with little previous knowledge, this course shows a clear way through the jargon and concepts to how sustainability can be applied for sound business reasons.

For more information on taking the course, go to www.ukgbc.org/step



Profitable Markets



Healthy Communities





2020 vision

- Profitable Markets** – Customers – Influence
- Healthy Communities** – Our people – Our supply chain – The communities we serve
- Environmental Limits** – Climate change – Waste – Water – Materials – Ecology
- Commitment**
- Innovation**
- Integrity**
- Durability**
- Sustainable Successful Balfour Beatty**



Environmental Limits

BUILDING A LONG-TERM FUTURE

SUSTAINABILITY IS A COLLECTIVE RESPONSIBILITY

Can any one company deliver true sustainability, that is economic, social and environmental alignment, on its own? I think not. It is a collective responsibility of customers, contractors, suppliers and communities.

The UK's larger contractors, however, do have a responsibility to take action. Sustainability can sometimes conjure up negative images of increasing costs, doom-and-gloom climate change stories, regulation and unnecessary complication. We need to counteract these perceptions by creating added value through more sustainable thinking and actions.

Sustainability is not a single-issue topic. It's more than carbon and goes beyond the environment to encompass wider social and economic dimensions too. Sustainability is too important to be left to the sustainability manager. Thinking and acting sustainably needs to be embedded into everything we do. We all have a role to make sustainability the way we do business.

This means our industry playing its part to encourage customers to make more sustainable choices – a challenging thing to do in austere

times. Our business development and project management colleagues should have many more sustainability conversations with our customers and their advisers. These conversations should not be about choosing sustainability over profit but looking for opportunities to add value through sustainability.

We need to encourage longer term thinking and integration. Will our infrastructure be resilient to the future impacts of a changing climate? Have we maximised the community and economic benefits of the scheme, restored and enhanced the natural environment, kept people safe, created employment opportunities, avoided waste and re-used rather than sourced new materials?

We will not be successful every time but as increasing numbers of customers experience the wider benefits of a more sustainable approach, the quicker we will get to a critical mass where sustainability is the norm, not the exception. This requires a collective industry push. Innovation is

important too and with the help and expertise of our supply chains we can deliver sustainable solutions.

We need pull as well as push. When a customer is serious about sustainability, we see great examples of more sustainable projects. So customers also have a responsibility to specify more sustainable outcomes at the outset and to stick to their guns through to completion.

We have an opportunity for new thinking and moving on from the old ways of doing things. For change we must. The more sustainable economy of the future will bring real opportunities for those that can embrace this change.

Jonathan Garrett
Group Head of Environment
Balfour Beatty plc

Find out more about Balfour Beatty's approach to sustainability at:
www.balfourbeatty.co.uk/bby/sustainability



The next generation

EDUCATION The future success of sustainable building relies on new talent – but is that talent being nurtured? Marguerite Lazell reports

Read any organisation's website and you'll find it has a green patina – references using low-energy light-bulbs, encouraging staff to cycle to work and turn off their PCs when they go home. But do those working in the industry – some of whom graduated during a time when there was talk of global cooling, rather than warming – have the skills it needs to make sure sustainability runs more than skin deep?

Last year the UK-GBC led a research project looking at the provision of sustainability training and education for those working in the built environment sector. Using both quantitative and qualitative research methods, it found people were keen to learn, and that many had attended training courses. Respondents rated two-thirds of existing courses "below par" and described feelings of frustration and confusion as they attempt to meet both their own, and their organisation's training needs.

FRAGMENTED AND DISPARATE

"Our research into existing education shows that it's fragmented, disparate, and [often] below par," says Chad Harrell, director of operations and business development at UK Green Building Council. "In

the first instance we want to sign-post members to the good stuff, and then fill the gap."

These feelings were also reflected in the previous government's Low Carbon Construction Innovation and Growth Team review, which published its interim findings in the spring. The report found that a lack of collaboration in the supply chain, and lack of skills at all points along that chain, were two of the principal barriers to meeting the low-carbon agenda.

Robin Nicholson, a senior architect at Edward Cullinan Architects, is frank about the lack of skills and knowledge he has encountered across the industry.

"Over the past year I have run seven workshops for local authorities, architects and contractors engaged in or getting ready to engage with the BSF programme," he says. "I start by asking them to tell me their discipline and what they have done personally in the past year to reduce their impact on the planet; apart from a couple of full-on engineers who have photovoltaics and the rest (like me) the typical answers were 'I take the bus to work' and 'I do take recycling quite seriously'."

TEACHING SUSTAINABILITY

He is not impressed. "Out of nearly 100 grown-ups only two knew their carbon footprint and until you start measuring you have not begun to

reduce your impact," he says. Even worse, he still finds that those trying to drive sustainability up the agenda are not getting the support they need. "The stars of the industry, the good sustainability managers in the major contractors, are considered to be at best a necessary evil by their project manager colleagues, and at worst a bloody menace."

It's not unexpected that a bunch of hoary old property professionals are slow to embrace the new green paradigm. But surely the graduates now joining the professional ranks have sustainability drilled into them at university?

INTEGRATING SUSTAINABILITY

Sahiba Chadha graduated from Bath in 2009, and is currently doing her year out at Edward Cullinan Architects. She admits that not all her fellow students were as wedded to the green agenda as she was.

"At Bath they force you to integrate it into your design. It should be inherent in the design, as simple as will [the building] stand up, rather than added on, but that's not necessarily applied by all the students. Some see it as their main agenda, but some don't."

Peter Clegg, senior partner at Feilden Clegg Bradley Studios is a pioneer of low-energy architecture. As well as heading the Bath-based practice, he has retained close ties with academia, acting as a guest lecturer and examiner at several UK universities. And he is not impressed by much of what he has seen.

"Education in schools has got worse," he says. "I've been examining

in schools and I don't think things have got any better. They don't have the expertise to teach the interface of architecture and engineering."

George Martin, head of sustainable development at the Willmott Dixon group, has also returned from visiting student end-of-term shows in a sombre mood.

He says: "In the last nine months I've been invited by two universities, and I've been pretty appalled by the young people I've met. I ask what's the energy solution, and very few of them understand."

Yet despite this, Nicholson, Clegg and Martin insist that they remain optimistic, convinced that the industry can and will gain the skills it needs to address climate change. Nicholson singles out a handful of universities,

Students are keen to learn but two thirds of courses are considered 'below par'

"There's a lack of joining-up. People understand their bit, one element, but there's a lack of understanding of other disciplines," he says. "Often people have very good specific skills, but don't understand the whole life-cycle [of a building]."

So is there a skills gap, or is it that there's a gap between the people who have the skills we need to build a low-carbon UK? Chad Harrell thinks it's the latter.

"It's not a skills gap per se - the skills exist - but there needs to be a holistic approach. It's how to work with others, a multi-disciplinary approach," he says, before using that word again: "There's a silo mentality across the built environment sector, which is why the UK-GBC has launched its Sustainability and Education Programme – beginning with an introduction to sustainability for anyone working in the sector."

Back in Bath, Peter Clegg is adamant that people from every corner of the built environment sector, from the architects and planners to the accountants and surveyors, must improve their skills, and learn from completed projects as they go through post-occupancy evaluation.

He hopes the end of the recession, which is hitting the built environment sector so hard, may have a silver lining. "In the boom years, everyone was out in industry. The recession might help, as people look for a secure income in the academic world. It's been really difficult to fill those roles [of professor of sustainability]. Now it will be easier, that will help hugely."

With high-profile jobs hard to come by, perhaps now those that can, will teach.

There's a lack of joining-up, of understanding of other disciplines

including Bath, Nottingham Trent Oxford Brookes and the University of the West of England, as really tackling the issue head on. These are places, he says, which are daring to reject the "silo" mentality which is dogging not just the architectural profession, but the entire built environment sector.

Miles Keeping, a former lecturer at Oxford Brookes, is now head of sustainability at property consultancy GVA Grimley. He says the failure to think about how environmental issues play out across the disciplines is holding the industry back more than the level of skills in any one profession.

Green will make good business sense – eventually

GREEN RATING Building green may be good for the planet, but does it also make good business sense? Ron Condon sifts the evidence

Will a sustainable building be more valuable on the open market, and will it attract a rental premium? Will tenants of sustainable buildings benefit by having happier, healthier and more productive staff?

While every instinct might tell us it must be so, historically there has been surprisingly little empirical evidence of these benefits occurring, at least in Britain. “There are just not enough events – lease renewals, sales of new properties – in greener buildings to prove the point yet in the UK,” says Tim Mockett, a partner at Climate Change Capital.

There are signs of that changing, however. Mockett says property valuers are now starting to take account of green factors, and that from his own experience of refurbishing commercial property the right sort of clients will appreciate, and demand, more efficient buildings.

HIGHER RENTS

While solid figures are thin on the ground here in the UK, evidence from the US and Australia certainly supports the notion that

sustainable buildings will indeed command a higher price.

For instance, a seminal report published by the RICS in March 2009, called *Doing Well by Doing Good?*, examined a large number of green buildings across the US. It found that those with a recognised green rating could command a rental premium of around three per cent, and because they tended to be easier to let, the actual rent they earned was around six per cent higher than a non-rated building. A green rating also boosted the selling price of a building by an average of 16 per cent.

The same authors followed that up with a further report in July 2010, published by the University of California, Berkeley, called *Why do companies rent green?* Ecological responsiveness and corporate real estate. This time, they looked at what factors influenced corporations to choose a sustainable building.

The researchers concluded that although lower energy costs associated with more efficient buildings were a major factor in boosting rents, bigger companies are choosing to adopt sustainable buildings for other reasons. “These empirical findings suggest

that there is an identifiable group of corporate real estate users that are willing to pay a premium for leasing green space,” it said.

The report also found that companies with a chequered environment history, such as those in mining and oil exploration, tended to place a particular emphasis on choosing a sustainable office building, possibly as a way of legitimising their work. The public sector also likes to set an example by choosing sustainable accommodation, the research revealed.

NEW RESEARCH EXPECTED

Research in Australia shows similar premiums occurring. According to Jess Moyer, Head of Research for IPD Australia and New Zealand Rental, values are increasing faster for those properties with a higher energy or

Companies with a chequered environment history place a particular emphasis on a sustainable office building as a way of legitimising their work

water rating, with values per square metre increasing by \$20 over the year to September 2008 for higher energy rated buildings compared to only \$15psm for lower energy rated buildings. There is a similar story for water ratings, she says, with higher rated buildings increasing by \$22psm and an increase of only \$16psm for lower rated buildings.

The UK picture should become clearer when a major study carried out by the University of Maastricht is published in the autumn. Until then, developers, investors and tenants have to rely on their own knowledge and the unmistakable factors that will favour a greater emphasis on sustainable buildings.

For a start, the Carbon Reduction Commitment (now known as the CRC Energy Efficiency Scheme) will start to bite over the next year, as large users are required to register and declare their energy usage. That will not only carry a cost in carbon credits, but will also open up big companies to public scrutiny. Any large corporation failing to live up to the promises of its CSR reports is likely to be quickly exposed as a sham.

Furthermore construction standards are constantly being forced up, with a target of all new domestic housing being zero-carbon by 2016, and all other buildings (offices, public buildings) achieving the same level by 2019.

ENVIRONMENTAL CREDENTIALS

As Paul King, chief executive of the UK Green Building Council says: “Institutional property investors now routinely ask about the environmental credentials of buildings because for them it would be a risk to invest in a building that will be out of date in a few years time. They need to future-proof their investments.”

That view is endorsed by Andries van der Walt, head of sustainability at property consultancy Cushman & Wakefield. “Smart property investors are increasingly looking at sustainability as a way to help deliver their commercial objectives,” he says. “Examples of sustainability-related risks include exposure to a rise in energy costs, the failure to meet the minimum requirements of certain groups of occupiers such as government departments, and the impact of legislative changes.”

Cushman & Wakefield recently conducted a poll among 500 business executives across Europe and found that 50 per cent said sustainability plays a significant or fundamental role in their choice of new spaces to buy or lease. The figure was slightly lower at 47 per cent for the UK.

Only 21 per cent of respondents currently occupied a ‘green building’, but a further 47 per cent said they were interested in doing so. The main barriers to occupying green spaces were cited as: occupiers being locked into existing leases (especially in the UK where lease terms are still on average longer than on the continent), insufficient choice of green buildings, and higher rents (especially in France and Switzerland).

The scene is therefore set for higher adoption of sustainable buildings. But Paul Edwards, head of sustainability for property firm Hammerson, identifies one last missing part of the puzzle – how do you know if a building is ‘sustainable’ or not?

“The problem we have in the UK is that a tenant can’t look at two buildings and know which is the greener. There is no easy way of knowing which has the best actual performance,” he says. He and others say that Energy Performance Certificates provide only a theoretical guide to a building’s performance, and a much better indicator comes from the Display Energy Certificate (DEC), currently only required on public buildings, which shows actual energy performance.

“Until DEC’s become the norm, you can’t fairly value that aspect of a building. Then you have to add water and waste. There is no benchmark for someone to value against,” he says. Demand for green buildings from far-sighted companies could well change that.

British Land has measured the carbon footprint of its Ropemaker Place development across its lifetime





Athenaeum Hotel | London



Coworth Park Spa | Surrey



Secret Hills Discovery Centre | Shropshire

Architecture
Masterplanning
Conservation
Sustainability

www.purcellmillertriton.com

Banking on sustainability

LOW CARBON FUTURE 'Like creating a new house building industry overnight,' is how one leading developer describes the urgent challenge of improving the energy efficiency of the UK's building stock. Can the Green Investment Bank help? David Blackman reports

Up to £300bn worth of investment is needed in the built environment by 2025 if the country is to meet its carbon reduction targets, experts predict. But help could be at hand from an initiative launched by Chancellor of the Exchequer George Osborne - the Green Investment Bank.

While still in opposition, Osborne commissioned former European Merrill Lynch chairman, Bob Wigley, to produce a report on setting up a bank to finance the infrastructure

Another problem with the government's current plan, Matthew argues, is that it relies on commercial lenders - and they will not be able to supply loans cheaply enough and in a large enough volume to realise the government's vision. Even a typical saving of £500 per annum will not raise enough to cover the cost of these savings. And even these could be wiped out by price rises on the increasingly turbulent energy markets.

Unless the right finance packages can be delivered, Matthew insists,

GREEN BONDS

George Martin of the Association of British Insurers says green bonds could provide insurance companies with an attractive alternative to increasingly risky corporate and government securities. The loans themselves could be tied into mortgages, he suggests.

The bank could also work with councils and other agencies to set up area-wide energy efficiency schemes, which would be even more attractive to investors.

The Wigley commission's proposal for green bonds could be crucial

needed to enable the UK to adapt to a low carbon future. In June, with Osborne now installed in the Treasury, Wigley submitted his report which recommended the establishment of a new government backed bank that would both nurture investment in and allocate grants and loans to low carbon projects.

The Treasury is now mulling over how it will respond to Wigley's report in October's comprehensive spending review. The impetus behind the bank has been the problem of funding big ticket infrastructure items like offshore wind farms.

However, just building more generation capacity while ignoring the potential of energy efficiency would be a huge economic and environmental mistake, warns a spokesman for the Construction Products Association. "The built environment is responsible for half of all emissions. It doesn't take a great deal to work out that that it has a huge part to play," he says.

THE MISSING LINK

Ed Matthew of environmental finance consultancy E3G, which advised Wigley, believes the bank could be the missing link that enables another government initiative - the Green Deal energy efficiency programme - to get off the ground. Under the Green Deal, announced by Osborne in June's emergency Budget, the government aims to offer householders loans worth up to £6,500 to insulate their properties.

The idea is that they would then repay the loans using money they have saved on their energy bills as a result. But most homes will require more like £10,000 to get them up to scratch, according to the UK-GBC.

the Green Deal will remain the preserve of the eco-evangelists. This is where the Wigley commission's proposal for green bonds could be crucial.

Bonds could be issued, tapping the vast financial resources of the UK's in-



George Osborne is expected to make an announcement in October

surers and pension funds that could then be used to back relatively low cost loans for energy efficiency projects. "If you could access that money, you could access all the capital you need," Matthew says.

Chris Brown, chief executive of the Aviva backed urban regeneration developer Igloo, says: "If it's done right, this could be long-term, securitised, index-linked cash flow, which totally complements the insurance companies and pension funds."

Brown believes the bank has a crucial role to play. "There's a need for somebody to get this thing off the ground. Once the private sector sees the profits to be made from retrofitting projects, it will come on board," he predicts. Treasury civil servants are understood to be cool about the Green Investment Bank. However, Matthew believes that it is too important an opportunity to miss. He says: "At the moment Green Deal is a relatively limited package - this could make it into a transformational project."

Down Mexico way

CLIMATE CHANGE The Copenhagen summit over promised and under delivered, many carbon campaigners believe – so what, asks **Tom de Castella**, are the prospects for the next climate conferences?

Copenhagen is an attractive, cycle friendly city that will be synonymous with environmental failure for years to come. The culprit is last December's climate change summit. The Danish capital was lined up far in advance as the moment that global leaders would come together to save the planet. Instead the final accord was an unsatisfactory, non legally binding fudge, and noises off hinted at intransigence from the United States and China, deep splits and bitter recriminations. As Mike Childs, head of climate change at Friends of the Earth puts it, Copenhagen was a "photo op that went horribly wrong."

So where do the negotiations go from here? The next major stop is Cancun in Mexico in November before the bandwagon rolls on to South Africa at the end of 2011. Then in mid 2012 the Earth Summit will be a high profile milestone, and later that year there'll be climate talks in Qatar or South Korea.

Few are optimistic. Myles Allen, Head of Climate Dynamics at Oxford University warns that Copenhagen's mistaken approach will be repeated at Cancun. "What the environmentalists and EU governments were demanding – a global, legally-binding system of nationally negotiated emission quotas – would almost certainly have locked us into 20 years of fruitless pseudo-action. So we dodged a bullet – but the tragedy is that everyone seems keen to jump back in front of the gun in Cancun." The only

realistic way forward is mandatory carbon sequestration tied to fossil fuel extraction, he believes.

ROLE OF BUILDINGS

Others argue that buildings are the forgotten solution. Jane Henley, CEO of the World Green Building Council, says the built environment has a huge role to play but "didn't get a look in," at

Copenhagen was a "photo op that went horribly wrong"



Hopes are high for the Mexico summit

Copenhagen. "The negotiations have so far focused on the heavy polluters but not on the solution providers. The building stock offers the biggest opportunity as our industry represents 40 per cent of energy consumption."

By using existing technology between 30 and 50 per cent could be cut from energy consumption, she says. The good news is that buildings are now starting to be included in national mitigation strategies. However for real progress to be made the high level discussions need to set climate targets and a realistic price for carbon, she argues. The UK is ahead of the game with the Code for Sustainable Homes, she says. "But even that only applies to new buildings. We need to look at what is already there and that means insulation and high efficiency windows for the existing stock."

Diana Urge-Vorsatz, lead expert on buildings for the Intergovernmental Panel on Climate Change's latest report, bemoans the fact that her specialism "is not a sexy solution" unlike geo-engineering or carbon capture. And yet improving the building stock's energy efficiency is the most realistic and politically feasible way of solving the problem, she argues. In her native Hungary almost half the country's energy goes on heating. "If Hungary retrofits its building stock not only would we save 70-80 per cent of energy on heating and cooling we'd create hundreds of thousands of jobs and cut fuel poverty," she says.

HOPE AT CANCUN

The country would also cut by 70 per cent its reliance on Russian gas during January. While not hopeful that buildings will get much of a look in at Cancun she remains optimistic in the long-term. "It's how the details are carved out that matters," she says. "It was the Marrakech accords after Kyoto where details like the clean development mechanism and emissions trading was hammered out."

Allan Thompson, head of operations at Gentoo Homes, a social landlord and house builder, calls for greater certainty from government. The company is building a 28 unit PassivHaus but if more is to be done the current system of changing the rules on energy efficiency every year must cease. The Coalition government has talked of a Green Deal in which landlords claim back the cost of insulation from tenants' reduced heating bills. Such enlightened plans need to come forward soon, Thompson urges.

Mike Childs at Friends of the Earth says that economic and social pressures may come to the rescue of buildings, noting that domestic energy prices have increased by 125 per cent in the last five years. "That's put a lot of people into fuel poverty. Politicians need confidence that tackling emissions can be achieved in a politically palatable way. And buildings give great scope for this good news."

Sustainability Services Working together for the green economy



Responsible business

- Corporate strategy
- Transaction and business support
- Operational integration
- Reporting, assurance and communications

Climate change and carbon management

- Climate adaptation
- Carbon accounting and CRC Energy Efficiency Scheme compliance
- Measurement and reduction strategies
- Carbon markets

Sustainable property

- Building carbon management
- Design advisory and accreditation services
- Responsible property investment
- Sustainable estate and built environment strategies

Guy Battle
Partner – Sustainability Services
+44 (0)20 7007 7537
gubattle@deloitte.co.uk

Cindy Cahill
Partner – Head of Sustainability Services
+44 (0)20 7007 2139
cicahill@deloitte.co.uk

The future is already here

FUTURE TRENDS New technology is already improving the carbon footprint of shops and homes – and it's set to be even more evident in our everyday lives. **Simon Brooke** investigates

Technology, like time, waits for no man, and with the need to cut carbon emissions becoming ever more urgent that's probably not a bad thing. Innovations that make buildings more sustainable are becoming increasingly evident in our every day lives.

One of the biggest changes that many people will see in their homes over the next few years is the introduction of smart meters. Less than a year ago the then Secretary of State for Energy and Climate Change announced that smart meters would be introduced to all homes in Britain by the year 2020.

Smart meters have two main advantages over the traditional variety. First, they provide more accurate data readings and this reduces the possibility of inaccurate bills. Second, there's no need for a meter reader to call round since the data can be updated remotely by the power supplier.

But, more interestingly home owners can see their energy consumption in real time as they use their cookers, hairdryers and televisions and learn how to control it more effectively. They can monitor this usage on their televisions, their mobile phones or perhaps even an iPad at some point in the near future.

People who generate their own energy, perhaps with a wind turbine or solar panel, can use their smart meters to sell that energy back to the National Grid.

Developers are already trialing entire homes that feature new green technology. The experimental Barratt Green House is "future proofed". This means that high levels of thermal mass in its structure will reduce the need for cooling during the hotter summers predicted to be a feature of climate change, while flexible internal spaces allow different layouts to suit changing family needs.

Making the most of natural day light rather than relying on electric light is another feature. Here, high performance triple glazing and thermally-broken wooden frames allow sufficient glazing to bring day light throughout



the whole house. Hi tech window shutters, a distinctive design feature of the house, also optimise solar gain, control overheating and prevent glare, as well as offering potential insulation benefits.

There is also whole-house mechanical ventilation system with heat recovery which warms incoming fresh air using heat from air being exhausted from the building, and circulates it to the habitable rooms by a ductwork system.

Home owners can see their energy consumption in real time

Outside the home sustainable building technology is also becoming more apparent. When Sainsbury's opened its store in Dartmouth, Devon, the best use of energy, water, waste, timber and land was at the forefront of its considerations.

The store aims to be one of the first supermarkets to achieve an official BREEAM 'Excellent' rating for its commitment to sustainable construction, and has been specifically designed to reduce the amount of CO₂ emitted into the atmosphere, saving around 40 per cent of overall. This is achieved by using new technology such as a 'biomass boiler' which heats the building and its water, and uses locally sourced wood which would otherwise be wasted. Using no gas whatsoever at the store, this system uses renewable energy and means energy currently taken from the national grid has been slashed by 50 per cent.

The store has been designed to leak fewer draughts. Wind turbines now power the checkouts, and contribute to cutting its electricity usage by a third. Rainwater is collected, and used to flush toilets and

Sainsbury's in Dartmouth – saving over a million litres of mains water a year

to irrigate plants in the store. The store will save over one million litres of mains water every year, and uses 60 per cent less water overall.

Lower lighting levels, the use of daylight and dimming light also make carbon savings, and cool air will be collected from chillers to keep the store cool during warmer months. Plus the lights at the back area of the store turn off if no-one's there.

Neil Sachdev, Commercial Director at Sainsbury's when the store first opened, says: "It's a leader in sustainable construction, it's sensitive to its local environment, and is extremely low in energy usage. We've been keen to experiment with a number of energy saving measures here, from sun pipes which provide amazing natural light, to using a timber frame rather

than steel, which consumes less energy in its production, but looks good too. We now want to apply all these benefits to the rest of our stores."

One of the most promising new technologies that Macfarlane Wilder, which describes itself as "an urban environmental land planner", has been working on recently is geothermal paving. This integrates slinkies or long coils, into gravel filled sump beneath porous paving. The increased efficiency of heat transfer in the water filled gravel matrix has produced some remarkable yields in terms of heat per square metre of paving surface.

New developments in chemical membranes are helping to lock up hydrocarbons meaning that the water stored beneath car parks

can be treated nearly to drinking standards. It would still be more likely to use it for irrigation, car washing, toilet flushing but this still has a meaningful contribution to the water consumption.

Up until now the system has primarily been used in single tenancy buildings but Macfarlane Wilder is currently building the BRE Innovation Park in Scotland which will incorporate what is thought to be the first such use of geothermal paving in the world.

New technology is also being show cased as never before. This summer saw the opening of the Centre for Efficient and Renewable Energy in Buildings (CEREB), the first research and demonstration facility of its kind in London.

Based at London South Bank University its purpose is to enable academics and industry to develop the technology that will help reduce the city's carbon emissions by 60 per cent by 2025.

Occupying the roof space in one of the buildings of the university's Southwark campus, CEREB has a range of low carbon technologies integrated into the design including ground source heat pumps, photovoltaic arrays, a wind turbine and solar fibre optic lighting.

A photovoltaic test bed provides technology developers with the opportunity to evaluate new solar panel designs, while smart meters and energy monitoring equipment throughout the building enable researchers to access data on energy consumption and the contribution of renewables in real-time anywhere in the world via a web portal.

Tony Day, Professor of Energy Engineering at the University and director of CEREB says: "This is the first centre of its kind to be built in an inner city location in the UK, so will play a vital role in future building design, in both the capital and other world cities."

Green buildings - the situation worldwide in figures

AUSTRALIA

190 building projects certificated green
400 registered to achieve certification
With 23% of total GHG emissions from residential and commercial buildings
With 11% CBD office space certified saving an average of 159,300 tonnes CO₂-e per annum equivalent to taking 16,744 cars off the road
For the future... Government outline long-term target of a 60% reduction in GHG emissions from 2000 levels by 2050



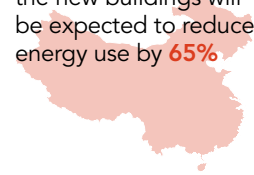
NEW ZEALAND

17% of total emissions can be attributed to the build government with 11.4% of building stock space undergoing green certification
For the future... Government has announced by 2020 an emissions reduction target range of 10-20% below 1990 levels and a 2050 target of 50% below 1990 levels.



CHINA

By 2003, roughly 60% of the Chinese population will be urban, compared to under 40% in 2005, with China home to half to new buildings built in the world every year, China is expected to add twice the amount of current US office space between 2000 and 2020...
With 42% of total energy use is attributed to buildings, new buildings are subject to the design standard of 50% energy conservation. By 2020, all the new buildings will be expected to reduce energy use by 65%



BRAZIL

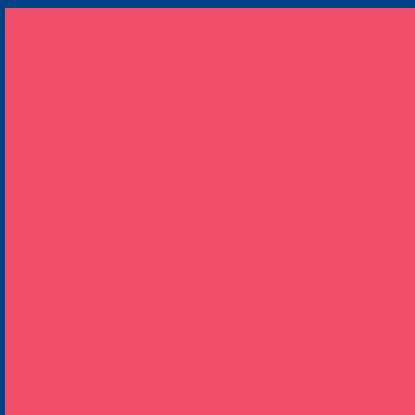
42% of total energy used from buildings
23% from residential homes
11% from commercial buildings
8% from public buildings
However... 75% of energy comes from renewable sources
For the future... The consolidation of a national educational program and the establishment of strategic partnerships to strengthen its activities in domestic territory



UK

45% of total emissions used from buildings
23% from residential homes
18% from non-domestic buildings
For the future... 80% cut in carbon emissions from the UK by 2050
All new homes to be 'zero carbon' by 2016
Non-domestic new building will be zero carbon from 2019
With all existing buildings to be 'approaching zero carbon' by 2050





BUILDING FOR TODAY DESIGNING FOR TOMORROW

Mott MacDonald's 14,000 staff are adding value on a host of projects worldwide through sustainable solutions and innovative ideas. Our global experience and professional excellence save time and money for our customers and help make their investments work harder. We bring best practice, cutting edge solutions and holistic thinking to each project to achieve the greatest benefit for customers and communities alike.

For more information please contact us:

UK Andy Ford: andy.ford@mottmac.com

Singapore Greg Cox: greg.cox@mottmac.sg



www.sustainability.mottmac.com
www.buildings.mottmac.com