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The official magazine of the Chartered Institution of Building Services Engineers

April 2011

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Nicola Hurley at nhurley@cibse.org or telephone 020 8772 3697.Individual copies are also available at a cost of £7 per copy plus postage.

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Budget scores zero for homes U-turn

There was much to applaud in last month's Budget, which provided some genuinely good news on the built environment. In just one example, much concern had previously surrounded the proposed Green Investment Bank, which will be a crucial mechanism for funding technological growth and development.

Its coffers were to be limited to just £1bn of start-up finding, and it wasn't going to be allowed to operate as an investment bank. But, according to the Budget, its start-up funding is to be trebled; it will operate a year earlier than expected; and it does seem that it will be given some leeway to act as an actual bank.

This would have been the main green headline from the Budget. However, a document published alongside the Budget details revealed an apparently significant backtracking by the government on its commitment to make all new homes 'zero carbon' from 2016 (News, page 6). Although the details are not fully clear at time of writing, it seems that ministers have effectively watered down the whole definition of 'zero carbon' by explicitly ruling out a household's use of everyday plug-in electrical appliances from the scope of the Building Regulations.

> We can only assume that ministers are yet again kow-towing to the house-building lobby

Why? We can only assume that ministers are yet again kow-towing to the house-building lobby – and thereby undermining Chancellor Osborne's claim that the Budget demonstrates the government's commitment to being 'the greenest ever'.

When it comes to meeting green targets, we need a much more uncompromising approach. Otherwise, we can forget about having any real chance of achieving what the targets – including the 2016 deadline for zero carbon homes – were actually all about: real change.

Bob Cervi, Editor
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In Brief

RISE IN GREEN RETROFITS
The market for green refurbishment is gaining momentum, according to a report by services group Skanska. The research among senior executives in the commercial development sector reveals that 35% had already undertaken a green retrofit or refurbishment project, and 78% of them reported a positive outcome from these projects. More than half of respondents said they had seen an increase in green retrofit.

NEW EDITION OF GUIDE
BSRIA has issued the fifth edition of *Rules of Thumb*, its guide for building services. The publication has been created by referencing various contemporary sources in the building services industry and reflects current design practices. The guide will be calculating values, setting outline targets and comparing different options. **www.bsria.co.uk/bookshop**

RICS UPDATES SKA RATING
An updated version of the Ska rating has been launched by the Royal Institutue of Chartered Surveyors. The new version of the online tool takes into account whether the sustainable improvements introduced in a refurbishment are being fully utilised. **www.rics.org/ska**

ECO-LOANS ON OFFER
The Carbon Trust and Siemens are launching a loan scheme worth £550m over three years, to enable businesses to buy green equipment. All business will be able to apply for finance from the scheme from 1 April. **www.carbontrust.co.uk**

Green body blasts zero carbon 'U-turn'

- **Ministers accused of watering down commitment on new homes policy**

The UK Green Building Council (UKGBC) has criticised the government's 'U-turn' on zero carbon homes, which it says will mean that new homes will not have to source all their energy from carbon-neutral sources from 2016.

The move was announced within a document published with the Budget details, *The Plan for Growth*, which states that: 'To ensure that it remains viable to build new houses, the government will hold housebuilders accountable only for those carbon dioxide emissions that are covered by Building Regulations [which] ... do not cover emissions related to energy use from cooking or from plug-in electrical appliances such as computers, as these are beyond the influence of housebuilders and will be addressed by other policies, for example the EU Emissions Trading Scheme.'

But UKGBC chief executive Paul King said the announcement revealed a shocking weakening of the government's green agenda: 'In the space of two weeks, this government has gone from a firm commitment on zero carbon homes, to a watered-down policy. A zero carbon home will no longer do what it says on the tin. The world-leading commitment that new homes would not add to the carbon footprint of our housing stock from 2016 has been scrapped.'


Budget signals boost for green technology

CIBSE's technical director Hywel Davies was more cautious. He said: 'On the face of it this is not good news, but we will need to look carefully at what's been announced and we will want to ask government more questions about what exactly this announcement means.'

'This U-turn means that a zero carbon home will no longer do what it says on the tin'

The Zero Carbon Hub, the government advisory body whose 'carbon compliance' definition of zero carbon homes has been accepted by ministers, also hinted it was concerned that 'unregulated' areas of energy use in a home will not form part of the policy. Its chief executive, Neil Jeffersen, said the announcement 'will certainly divide opinion' in the industry.

The Royal Institution of Chartered Surveyors said: 'It is disappointing that the government seems to have watered down the zero carbon homes proposals when there was strong support across a range of stakeholders for the previous proposal.'

Other announcements in the Budget included trebling public funding in the Green Investment Bank (GIB) to £3bn. The GIB is to be launched in 2012 – a year earlier than anticipated – but it will not be given powers to borrow until 2015-16.

For more information visit:
www.hm-treasury.gov.uk/2011budget.htm

Other Budget measures

- **Streamline the system for planning applications and introduce new fast-track planning for major infrastructure**
- **Carbon price floor introduced for electricity generation from 1 April 2013, to drive investment in the low-carbon power sector, starting at £16 per tonne in 2013, increasing to £30 per tonne in 2020**
- **Carbon Capture and Storage (CCS) levy dropped; four CCS demonstration plants still planned**
- **Climate Change Agreements extended to 2023; a consultation on simplifying the agreement due this summer**
- **50,000 additional apprenticeship places will be created over the next four years**
- **Equity loans, jointly funded with house-builders, will be created through a FirstBuy programme to assist more than 10,000 first time buyers to purchase a new-build property**

THE HERON TAKES FLIGHT

The Heron Plaza scheme in London has secured planning permission. The scheme will include a 44-storey building designed to complement the adjacent Heron Tower, along with a luxury Four Seasons hotel, apartments, retail, conference and leisure facilities. Multi-disciplinary consultant WSP has responsibility for the structural and building services design, sustainability, fire engineering, façade access, logistics, waste management, infrastructure and transportation. It will develop the designs in 3D, providing BIM services from design to construction.

Key questions remain over RHI

Renewable Heat Incentive welcomed but industry seeks more details

The government's unveiling of its Renewable Heat Incentive (RHI) scheme has been widely welcomed, but key questions remain over its details. The RHI will support companies and individuals installing a range of technologies using various fuels including solid and gaseous biomass, solar thermal, ground and water source heat-pumps.

Owners of these installations will be paid for each kilowatt hour of heat generated, with payments guaranteed for 20 years, including increases for inflation.

In the first phase, long-term tariff support will be targeted in the non-domestic sectors, at the big heat users – the industrial, business and public sector – which contribute 38% of the UK's carbon emissions, according to government.

Under this phase there will also be support of around £15 million for households through the Renewable Heat Premium Payment, which will allow investment in new technologies.

The second phase of the RHI scheme will see households moved to the same form of long-term tariff support offered to the non-domestic sector in the first phase.

This transition will be timed to align with the government's Green Deal, which is intended to be introduced in October 2012.

KEY POINTS RENEWABLE HEAT INCENTIVE

Commercial and public sector:

- A target of 13,000 installations in industrial premises, with a further 110,000 in the commercial and public sectors.
- Community schemes also eligible as long as individual installations provide heat to more than one house.
- Tariffs to be paid for 20 years in respect of eligible technologies that have been installed since 15 July 2009. Payments will be made on a two-tier system: owners will receive a higher rate up to a certain level, with lower payments above that level.

Households:

- RHI tariff payments for homes will start from 2012 to allow a whole-house approach to heat production and energy saving.
- From July 2011 up to 25,000 installations will be supported by a 'RHI Premium Payment' to help people buy green heating systems.

BEAMA, the manufacturers' trade body, broadly welcomed the initiative but added that 'the devil is in the detail' and urged the government to publish the tariff levels that will be in place in 2012.

Graham Meeks, director of the Combined Heat and Power Association (CHPA), said: 'By placing an explicit value on renewable heat supplies, we hope to see an end to the wasteful practices that see much of our precious bioenergy resources dumped into the atmosphere through cooling towers.'

Hywel Davies, CIBSE technical director, said: 'It is important that other measures to identify energy efficiency opportunities, such as wider roll-out of Display Energy Certificate, are co-ordinated with the RHI to ensure that we do not incentivise wasting low carbon energy.

'Using energy more efficiently should always be considered before installing renewable energy capacity.'

Steve Richmond, renewable energy product manager at manufacturer Rehau, said the RHI was 'good news for anyone involved in the renewable heat sector', adding that shorter payback times for ground-source heat pump installations were 'only good news for this growing market'.

But Chris Davis of Dimplex Renewables, was more circumspect. He said: 'The outline plans revealed have not fulfilled all industry hopes; there are a number of omissions representing missed opportunities, while further clarity is needed on other aspects of the scheme. While any support for the UK renewables market is good news, this announcement falls some way short of the industry's expectations.'

For more information visit:
www.decc.gov.uk/rhi

In Brief

ATKINS COMPLETES TAKEOVER OF SCOTTISH FIRM

Atkins has announced that it has taken over the consultancy and technical support firm Technical Services Scotland (TSS) in an £800,000 deal. TSS specialises in electrical and process engineering, control and instrumentation, metallurgy and site-based testing, as well as power generation facilities diagnostics.

WSP PREDICTS FLAT REVENUES AFTER ANNUAL DROP

Multi-disciplinary consultancy WSP reported a 2% downturn in global turnover for 2010, but in the UK sales were down 13.6 per cent. The group's chief executive Chris Cole predicted 'flat' revenues for the UK in 2011, but said there would be growth in other regions.

WARNING GIVEN OVER CONSTRUCTION HEALTH

The UK Contractors Group (UKCG) has warned the government that recent figures are hiding a less-than-healthy construction industry. The UKCG's chairman has written to the Chancellor stating that the industry is 'living off its stock' and that the outlook for the next couple of years looks bleak because of planned public sector cutbacks.

Big solar projects face a funding cut

Government signals fresh squeeze on solar farms

Review of feed-in tariffs signals cuts in funding for large-scale solar operations

New large solar plants are likely to face a cut in financial support in order to ensure projects within homes, communities and small businesses are properly funded.

The government is planning the cuts after a review of feed-in tariffs (FiTs) showed that existing plans for solar photovoltaic (PV) plants could soak up subsidies that would otherwise got to smaller renewables schemes.

'This proposal will mean that the UK will return to the solar slow lane'

Solar installations producing more than 50kW of power – which could include school buildings or covered car parks – will be subsidised to a lesser extent and can expect an annual rate of return of around 5% compared with 12% for smaller-scale projects.

Climate Change Minister Greg Barker said: 'I want to make sure that we capture the benefits of fast-falling costs in solar technology to allow even more homes to benefit from feed-in tariffs, rather than see that money go in bumper profits to a small number of big investors. The FiT scheme was never intended to be a profit generator for big businesses and investors.'

The Renewable Energy Association was highly critical of the announcement. Its chief executive, Gaynor Hartnell, said: 'Larger PV projects are cheaper, and have a major role in driving down costs. We don't want boom and bust in this sector either, but pulling the rug out from under the feet of those that have ventured into this market was precisely the wrong response.

'The UK will return to the solar slow-lane. It's as good as a retrospective change and that does untold damage to investor confidence. It's not acceptable and we will fight it.'

Jeremy Leggett, chairman of solar energy company SolarCentury, called the move a 'mockery': 'No renewables company or investor can easily be able to trust this government again after this U-turn by ministers who were so quick in opposition to call for a more ambitious feed-in tariff, and so ready with empty promises in the early months of government.'

For more information visit:
www.decc.gov.uk/fits

Movers & Shakers | The latest appointments in the sector

Multi-disciplinary consultancy Arup has welcomed a new staff member to its London offices. **John Brown** is the new cultural heritage team leader within the firm's environmental consulting team. He has more than 17 years' experience.

Tania Smith has joined the sustainability consulting team at Arup's offices in London as part of a two-year secondment from Arup in Melbourne. Smith is an experienced sustainability professional with expertise in both financial analysis and environmental science.

Blane Judd has been appointed HVCA chief executive designate. He was previously operations director of SummitSkills, and for the past five years has been chief executive of the Chartered Institute of Plumbing and Heating Engineering.

European engineering consultancy Grontmij has announced CIBSE member **Alex Drysdale** as its director of building sustainability. Drysdale joined Grontmij in 2000 and is a Bespoke and International BREEAM assessor. He has more than 10 years' experience.

Mark Terndrup has been promoted to board director at Waterman Building Services, a multi-disciplinary consultant. Terndrup had previously been a regional director of Waterman since 2006. He joined the board from 1 February 2011.

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News from the 52-storey New York Times HQ confirms that light management is the greatest opportunity to make energy savings in commercial buildings. With our Quantum® system, the building uses 72% less lighting than planned, saving around $1 per square foot a year and cutting annual CO_2 emissions by over 3,000 metric tons. Now that our products allow us to control DALI ballasts, we can deliver similar savings in Europe. For the in-depth New York Times story, go to www.lutron.com/nyt. Quantum is just one of Lutron's new range of scalable, energy-saving products for commercial premises. To find out more, visit **www.lutron.com/globalenergysolutions** or call 020 7702 0657.

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Best practice scheme for Wales

Creators of innovative and exemplary building projects in Wales are being invited to join a scheme that will promote best practice.

The Exemplar Programme was launched by Jane Davidson, the Welsh Assembly minister for the environment, sustainability and housing.

With funding from the Modern Built Environment Knowledge Transfer Network and the Wales Low/Zero Carbon Hub, the Exemplar Programme is being conducted by a partnership of BRE Wales and Constructing Excellence Wales.

'An exemplar is defined as something worthy of being copied that goes beyond normal industry practice,' said Caroline Weeks of BRE Wales.

'The idea of this initiative is to identify, in a standardised and quantifiable way, the reasons why certain projects are successful, and then share these with the whole industry.'

While the programme is being rolled out in Wales, projects are being sought from across the UK. The focus is on three key areas of sustainability – environmental, economic and social.

For more information visit:
www.exemplar.org.uk

Warning on school design 'cuts'

The concept of embodied carbon is still being ignored by the majority of players in the construction industry, according to analysts.

A survey of global senior figures by Faithful+Gould found that 80% believe embodied carbon – that is, carbon created by the construction process – is dismissed because reducing it is either unimportant or too expensive.

In all, 166 leaders were surveyed, with 53% saying embodied carbon had no value. By way of contrast, reducing operational energy was a priority because cost-savings were obvious and enhanced a building's 'green credentials'.

But according to Faithful+Gould, embodied carbon mitigation would save far more energy than operational savings alone.

Non-domestic premises like these will need a Display Energy Certificate

Carbon Plan looks to extend use of DECs

- **Commercial buildings will have to obtain certificate**

Ministers have confirmed their commitment to extending mandatory Display Energy Certificates (DECs) to the commercial building sector.

Unveiling its Carbon Plan, the government laid out a series of timetabled proposals aimed at meeting Britain's targets for cutting CO_2 emissions.

These include a requirement for non-domestic commercial buildings to display their actual energy performance in the form of a DEC, from October 2012. This requirement currently covers only certain public sector properties.

In addition to rolling out DECs to the non-domestic sector, ministers also propose improvements to the 'content, format and quality' of Energy Performance Certificates (EPCs) from April 2012, according to the draft Carbon Plan.

Key aims underpinning the Plan include:

- A dramatic shift away from fossil fuels and towards low carbon alternatives such as renewable energy, new nuclear resources, and fossil fuel power stations capable of carbon capture and storage.
- A massive improvement in the insulation of buildings and a move away from gas boilers to low carbon alternatives such as heat pumps.
- More use of public transport and an effort to reduce the number of journeys, as well as a move towards alternative technologies such as electric vehicles.

As part of the initiative, the government is to require every public sector body to reduce its emissions by 25 per cent over the course of the current parliament.

A final version of the Plan – which brings together many carbon-cutting proposals already announced – will be published this autumn, and then updated annually.

Building tenants 'should be required to obtain a DEC'

Report calls for mandatory Display Energy Certificates for commercial tenants

Occupiers of commercial buildings should be required to obtain an energy certificate, while landlords should produce a Landlord's Energy Statement for the base building, according to an industry working group.

The proposal comes in a report, backed by CIBSE, that was due to be published by the UK Green Building Council (UKGBC) as the *Journal* went to press.

The report's recommendations aim to plug potential holes in future plans to extend mandatory Display Energy Certificates (DECs) to commercial buildings (*see story opposite*).

Large commercial landlords are in favour of this extension of DECs, but they are concerned that a single DEC for a multi-tenanted building will not provide any incentive for individual tenants to reduce their own energy use, according to the UKGBC.

The report says that landlords of multi-let commercial buildings bigger than 1,000 sq m should be required by law to obtain a Landlord Energy Statement (LES), which at present is a voluntary process for detailing energy use and carbon emissions from offices.

LESs could be merged with DECs to provide explicit information that could be specified for each individual tenant, says the UKGBC.

It's senior technical adviser, Anna Surgenor, said: 'A lack of suitable energy data at present means that many multi-tenanted buildings get a DEC rating of G. Having the means to provide a more accurate, possibly higher, rating is a good incentive for energy reduction by landlords and their tenants.'

Detailed information on energy use would also enable better comparisons of types of commercial tenant. This would mean that companies could be more easily grouped together in league tables that are due to be brought in by the Carbon Reduction Commitment Energy Efficiency scheme (CRC), said Surgenor.

'Trying to compare different sectors in the CRC is like comparing apples and pears. We need to be able to compare companies with their peers, which the combination of LESs and DECs would help us to do.'

Andy Ford, CIBSE president-elect, said: 'There is now a clear industry consensus around making more use of DECs to identify potential energy and cost savings.'

£20M SCIENCE PLAN

A planning application has been submitted to create a £20m sustainability science scheme at Newcastle University. If approved, construction on the 24-acre site will start in 2012, with completion expected in 2014. Multi-disciplinary consultancy Mott MacDonald has been appointed as civil, structural and building services consultant.

In Brief

NEW DAWN FOR SOLAR BODY

Two solar energy trade bodies are to join forces to form a 400-strong association. The Solar Trade Association will combine with the Renewable Energy Association's Solar Power Group to represent both the solar thermal and the photovoltaic industries. It will operate from the same offices as the Renewable Energy Association, which will provide adminstrative functions and policy expertise.
www.solar-trade.org.uk

CAMBRIDGE ECO-SCHEME

Plans for 'one of the most sustainable developments in the UK' have been announced in Cambridge. Architects working on the North West Cambridge development are planning a central energy facility that will use gas to generate power and heat for the surrounding homes. The site, in the north of the city, will include 3,000 homes, 2,000 student units, a supermarket and a primary school.

CARBON SIMULATION TOOL

The Department for Energy and Climate Change has launched an online simulation site aimed at allowing the public to explore ways in which they can cut their personal carbon emissions. My 2050 has been funded by the government and Sciencewise-ERC, the UK's national centre for public dialogue in science and technology issues.
http://my2050.decc.gov.uk

Call for more detail on emissions roadmap

The government has expressed its displeasure at a lack of commitment by the EU to new emissions targets and how they should be reached.

In March the EU released a low carbon roadmap, stating that emissions need to be reduced by at least 80% by the middle of the century. However, the UK government has called for Europe to 'raise its sights', stating that there has been no detail published on how to achieve those goals.

In a letter to the Guardian, UK Energy Secretary Chris Huhne, along with six counterparts from around Europe, stated: 'Now is the right time to discuss the most cost-effective route to achieving our 2050 goals, maximising growth, jobs and prosperity throughout Europe. We are not starting from scratch; by 2009, the EU had already cut emissions by 17% from 1990 levels.

'We call on all member states to enter into this urgent debate on Europe's future and agree how the roadmap is put into action – ensuring that Europe gets to the front of this low-carbon race, rather than falling behind.'

Businesses 'should stop wasting energy'

Energy efficiency in the private sector can save businesses £6bn a year, cut carbon and safeguard UK fuel security, according to a report by Carbon Connect, a coalition of businesses and environmental organisations.

Wasting energy already costs British businesses £6bn a year, and the energy watchdog Ofgem says that prices could rise by as much as 40% over the next decade.

The country's 4.8m small businesses are particularly well placed to make savings, the report says. The authors say that the report, *Energy Efficiency – The Untapped Business Opportunity*, has cross-parliamentary party approval, as well as backing from across the private sector.

www.policyconnect.org.uk/cc

Government to pay for green teen training

Employers and sector skills councils to design new apprenticeship frameworks

One thousand green apprenticeships are to be created as part of the government's plans to move towards a more sustainable economy.

The government will pay for the cost of training 16 to 18 year-olds, while it will share the cost for those aged 19 or over with businesses including British Gas and B&Q.

It is hoped the plan will allow the apprentices to become experts in the installation of solid wall and cavity wall insulation, as well as more energy efficient heating systems in homes and businesses.

Climate Change Secretary Chris Huhne said the Green Deal initiative, of which the apprenticeships are a part, is capable of sustaining 100,000 jobs within five years as part of a 'step change' towards wider use of energy-saving technology.

He said: To succeed, we will need a big injection of skills and investment. These apprenticeships are a perfect example of how government and businesses can work together towards a low carbon future.'

For the initiative, employers and sector skills councils will design new apprenticeship frameworks and revise existing ones, for workers to be trained or re-trained with the skills required.

More training is pledged for 16 to 18 year-olds

The Department of Energy and Climate Change will work with the sector to set out new standards for green deal installers and will encourage employers to take on new trainees and up-skill their existing staff.

In addition, DECC will also offer concessions on the Green Deal installer registration fees for those organisations that take on young people.

READY, STEADY, LIGHT!

This year's Ready Steady Light event saw 11 teams competing for three awards to design an exterior lighting scheme in just 180 minutes at Rose Bruford College in Sidcup. Each team was randomly assigned a location on the campus and given a set of lighting equipment, before being told to 'return to basics' by lighting the site in its natural state without using props. Organising body, the Society of Light and Lighting (SLL), presented the Technical Award to Behind the Principal – YLP (*main picture*). The Artistic Award was given to the 'Old House' – Bartlett 2 (*top right*). The Peer Prize went to the 'Old Courtyard' – DPA Oxford (*bottom right*).

www.sll.org.uk

Photos: Liz Peck

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CIBSE NEWS

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Completed your CPD record?

We would like to remind all CIBSE members to keep their CPD records up to date. As a member, you undertake to maintain your professional competence throughout your career. CIBSE assists by providing a clear framework for this development, helping you to succeed within the industry.

Continuing professional development (CPD) is a long-term commitment to enhancing your competence, and is a requirement of CIBSE membership and EC registration. It is about learning and putting into practice new competences year after year, and investing in your future.

Rapid developments in technology, increased competition and the opening of new markets have placed even greater emphasis on the need to be well informed and professionally competent.

You should have already updated your 2010 CPD records. If you have yet to do so please visit your CIBSE CPD log at **www.cibsecpd.org.uk** This easy-to-use tool allows you to update your CPD activities easily throughout the year. A CIBSE CPD Guide is also available on the CIBSE website for reference should you require it. And don't forget that each successfully completed CIBSE Journal CPD module is worth 1.5 hours of CPD.

The CIBSE CPD Panel will be assessing the CPD records of a sample of members and will be providing feedback on the records over the coming months.

Diary date

CIBSE national conference
One building a minute – the great refurbishment challenge
● 7 April 2011, London
www.cibse.org

Know your carbon

● Government continues to develop green policies in the construction sector

Policy on energy and carbon emissions is moving rapidly at present. The biggest current issues are the Carbon Reduction Commitment (CRC) and the planned Green Deal. CRC is now on round four of consultation, which is likely to lead to further major changes to this quasi carbon tax.

The Green Deal is intended to deliver major energy efficiency uplifts to many thousands of homes, using the resulting energy savings to pay off the initial finance package. The initial assessment of the current efficiency and potential improvements must be robust, and the subsequent installation of the selected improvements must be effective and deliver the anticipated improvements in energy performance. And, finally, the occupiers must not 'take back' the savings as improved comfort levels, unless that is assumed in the initial calculation. Delivering this, and avoiding a major 'mis-selling' scandal, is currently pre-occupying a small army of civil servants at the Department of Energy and Climate Change and wider industry groups.

> **'Green Deal intends to deliver major energy efficiency uplifts to thousands of homes'**

Add in the 'zero carbon' buildings target, changes to the European Performance of Buildings Directive (EPBD) and trying to achieve reasonable compliance with the current EPBD Regulations, 2013 changes to Building Regulations, and the wider roll out of Display Energy Certificates. And then there are policies covering energy supply, transport, waste, land use and agriculture.

So government issued its draft 'Carbon Plan' in March, setting out all the current carbon related policies across government, and drawing them together into sector specific lists of actions, and identifying timescales and departmental responsibilities for each action. It's essential reading for anyone wanting to follow these initiatives, and work out what they may mean for their own businesses. The tables are invaluable in summarising what is planned, and when. For more information go to **www.cibse.org**

For more information visit:
www.decc.gov.uk

Shedding light on learning

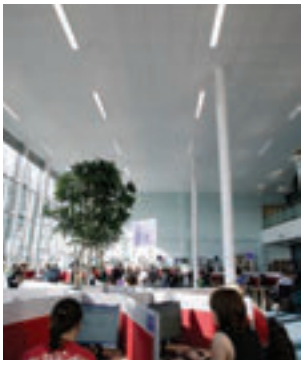
A new Society of Light and Lighting (SLL) Lighting Guide, *LG5: Lighting for education*, will be launched at the SLL AGM on 24 May at University College London.

The new publication will offer guidance on the lighting of all educational spaces, including lecture theatres, teaching rooms, conference rooms and special-purpose rooms, such as gymnasia, art rooms and dance studios. It will highlight the importance of sufficient and suitable lighting for any learning, and how the quality of light in the learning environment will directly affect our learning experience and our motivation to learn.

As well as providing guidance on lighting equipment and its positioning, it will also consider other important factors, such as the decoration and finishes of rooms, sightlines, positioning of lighting controls and access doors, all of which need to be taken into account from the earliest stages of the planning process.

The publication will cover all areas of lighting for education and includes coverage of lighting design, constraints, natural and electric lighting, costs and maintenance, lighting for particular applications, emergency lighting and lighting for pupils with visual and hearing impairments.

Copies of *LG5* will be available to buy at the AGM, or from the CIBSE Bookshop (**www.cibse.org/bookshop**) after the launch, priced at £32 for members and £64 for non-members. To book your place at the AGM, visit **www.sll.org.uk**



For more information see:
www.sll.org.uk

Bursary supports public health engineering

James Day of AECOM, left, presented with his bursary by Stuart Ashenden, director of academic planning at the University of Greenwich

Degree seeks to inspire new generation of building services/public health engineers

James Day, an AECOM engineer, was awarded a newly established bursary for the promotion of public health engineering, at the annual Worshipful Company of Plumbers (WCoP) dinner.

The Alexander Marsh Bursary will enable Day to complete two detailed case studies of projects that have helped maintain the good health of communities worldwide. Day will then use this work to inform a presentation to schools to explain and promote the importance of public health engineering.

Last June, Day became the first graduate of the new BEng Hons in Public Health Engineering Technology degree, from the University of Greenwich. The degree syllabus, which was sponsored by AECOM, was put together with help from the Society of Public Health Engineers.

The degree, the first of its kind in the UK, seeks to train and inspire a new generation of public health engineers.

The degree, the first of its kind in the UK, seeks to train and inspire a new generation of public health engineers

'It is an honour to have been awarded the Alexander Marsh bursary,' said Day. 'I hope the case studies really help to promote the value of public health engineering, and building services engineering among school leavers.'

For more information:
www.gre.ac.uk

Energy data has new epicentre

The Centre for Sustainable Energy has published the complete dataset of the 40,000 public buildings in England and Wales on the Display Energy Certificate (DEC) register.

The data has been collected by the Department of Communities and Local Government following the introduction of DECs for all public buildings of more than 1,000 sq m, in 2008. It includes figures for energy use, floorspace, emissions and efficiency ratings for public buildings in this category.

The publication of the results in full aims to promote openness and learning, and will provide a valuable tool for engineers, surveyors, researchers, policy-makers and those working in the field of sustainable energy.

Until now, the data was only accessible for individual buildings, one at a time, making it very time-consuming to obtain.

For more information see:
www.cse.org.uk/data

Supporting tomorrow's engineers

If you're an employer who is committed to supporting the engineers of tomorrow, make sure you enter the CIBSE Employer of the Year Award, and get the recognition you deserve.

The awards, presented by CIBSE YEN and sponsored by Baxi Commercial Divison, reward organisations that champion young people in the industry – either through a commitment to young people in employment, or by supporting those in education.

Entries need to be received by 6 May. The winners will be announced at a ceremony on 7 July at Millbank Tower, London. For more details and an entry form, visit **www.cibse.org/awards**

Setting sail for sustainability

CIBSE's Southern Region is again holding a Low Carbon Yacht Rally on the Solent. The event, taking place on 2 July, is open to anyone working in building services and challenges teams to round a series of buoys, using only renewable energy. It will be followed by a dinner and prize-giving on the viewing platform of Portsmouth's Spinnaker Tower. If you would like to register, are interested in a place on a boat, are interested in being a corporate sponsor or own a powered craft please email **d.pope@popeconsulting.co.uk**

CIBSE AGM and President's Address

The 2011 CIBSE Annual General Meeting will be held at 5pm on Thursday 5 May 2011 at London South Bank University, The Keyworth Centre, 103 Borough Road, London SE1 0AA. It will be followed by the President's Address by Andy Ford, CIBSE's incoming President. The calling notice will be circulated shortly, with details of timings and registration for the meeting and the President's Address.

Obituary

Professor John Swaffield

Professor John Swaffield

Much respected professor dies

It is with great sadness that we inform you of the death of Professor John Swaffield – engineer, academic, and CIBSE president from 2008 to 2009. He will be greatly missed by the institution and the wider industry.

Professor John Swaffield, FRSE, Professor Emeritus, and head of the school of the built environment at Heriot-Watt University until 2008, was an engineer and an academic who firmly believed in enabling learning through the application of theory and technology. He pioneered the application of engineering and science in water conservation and drainage engineering, and established a number of highly successful Building Services Engineering undergraduate and postgraduate teaching programmes.

After completing his studies in aeronautical engineering, John led the Concorde fuel system test programme with the British Aircraft Corporation in Bristol. In 1972 he joined the mechanical engineering department at London's South Bank Polytechnic teaching fluid mechanics to building services engineers. He moved to Brunel University in 1974, where he first became involved in the application of theory and engineering principles within the field of water conservation.

In 1985 he joined Heriot-Watt University, where he introduced undergraduate and postgraduate building services engineering programmes, becoming head of department in 1988 and 1995, and head of the School of the Built Environment in 2002.

Through UK research councils and government funding, he established a research profile that became recognised worldwide. Outside of the university he was also very active, chairing Defra's Water Regulations Advisory Committee.

'He was a man of remarkable knowledge and integrity and was, without exception, much respected'

In addition, he was a member of the Building Regulations Part H and G working groups, among others.

Within CIBSE, as well as being president, John participated in many committees, including the Education, Training and Membership Committee, the Research Committee, and the Accreditation Panel. He sat on the editorial panels of the Building Services Journal and CIBSE Journal, and was also a strong supporter of CIBSE's Society of Public Health Engineers.

For many years John was chairman of the editorial panel of Building Services Engineering Research and Technology (BSER&T), CIBSE's learned journal. Under his leadership, BSER&T obtained the status of having an impact factor and being recognised as one of the leading journals in the field of built environment research. He authored a number of books, many of which became the 'bible' for those working in the field. John was a pioneer in the field of water conservation and the application of numerical modelling techniques to building drainage problems, leading to him being elected a Fellow of the Royal Society of Edinburgh in 2004.

He was a man of remarkable knowledge and integrity and was, without exception, much respected.

New members, fellows and associates

FELLOW

Lai Yuen Chuk Cheung Sha Wan, Hong Kong

Chuk is director and general manager of Global Toptech Group. He has 35 years' experience in the mechanical and electrical building services industry and is involved from the business development stage through estimating, construction and the maintenance delivery of systems in all sectors.

Seamus McKillop County Antrim, UK

Seamus McKillop is managing director and founder of Semple & McKillop, an engineering practice. With nearly 20 years' experience, Seamus has specialist knowledge of energy conservation and application of sustainable energy generation. Under his leadership, Semple & McKillop has gained a strong reputation.

Eric Charles Roberts Birmingham, UK

Eric Roberts started his career more than 25 years ago as a pipe fitter. He has held a number of roles within the industry, and completed a PhD. For the past 15 years he has been exclusively involved in building modelling and simulation. He founded engineering consultancy Zero Energy Design in 2006.

MEMBER

Chloe Jennifer Agg Coventry, UK

Chun Wei, Leslie Chau New Territories, Hong Kong

Man Chun Cheung Kowloon, Hong Kong

Stephen David Clark Prestwick, UK

Daniel Kevin Coleman Hatfield, UK

Martin Kealy Athy, Republic of Ireland

Kai Yiu Clark Lau Shatin N.T., Hong Kong

Kwok Ho Lau Mongkok, Hong Kong

Sai Hung Lee Shau Kei Wan, Hong Kong

Lap Man Lee Kowloon, Hong Kong

Chi Leung Joe Lei New Territories, Hong Kong

Hong Yau Liu Kowloon, Hong Kong

Manoj Madathil Dubai, United Arab Emirates

Ka Fai Ming Hong Kong

Ronan Pigott Ennis, Clare, Republic of Ireland

George Pollock Paisley, UK

Lindsey Sanders Bristol, UK

Paul Stroud Sevenoaks, UK

Wing Yan Tam Tuen Mun, Hong Kong

Pok Man Daniel Tsang New Territories East-2, Hong Kong

Hung Kay Sunny Tsoi Hong Kong

Craig Thomas White Lancashire, UK

Koon Fung Wong Shatin, Hong Kong

Ka Shing Wong Hong Kong

Fu Xiao Kowloon, Hong Kong

Yau Sing Yeung Kowloon, Hong Kong

Ka Fai Howard Yu Siu Sai Wan, UK

ASSOCIATE

Christopher Thomas Chamberlin Bristol, UK

Kirk James Schartau Ipswich, UK

LICENTIATE

Lewis Alexander Forbes Murray High Wycombe,UK

Musibau Idowu Olayoonu Doha, Qatar

Jason Turner Newark, UK

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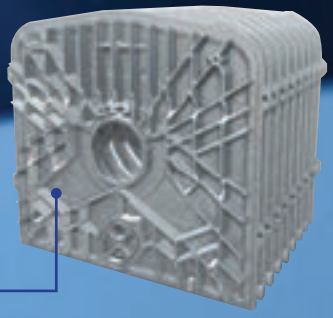

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BIG QUESTIONS

With one property a minute in Britain needing to be upgraded between now and 2050, how can the sector help make this happen? These and other key conundrums were at the centre of this year's Ecobuild event in London. **Bob Cervi** and **Carina Bailey** report

Green Deal needs to instil confidence

The government's Green Deal proposals are seen as crucial to increasing the rate of refurbishment of the existing housing stock, but will it work, and what are the alternatives? The members of a discussion panel on this issue agreed that, with the Green Deal due to arrive in autumn of 2012, it was still unclear how it would work.

With 26m homes in Britain needing to be improved in coming decades, home owners need to be incentivised, but there is also a 'cash-flow problem', according to architect Sunand Prasad, former president of RIBA.

The Green Deal and proposed Green Investment Bank could help with this blockage on cash, but the plans are at 'half cock', said Sunand: 'There's not enough money, and the incentives are not quite there.'

Peter Walls of social housing provider Gentoo Group agreed: 'Don't wait for the government to do it; let's do it ourselves.'

But the Green Deal would need to create a credible marketplace for improvements that managed to instill confidence in home owners, landlords and tenants, according to Paul Tennant, who sits on the board of the National Housing Federation.

Fraser Winterbottom of the Energy Saving Trust argued that industry contractors should be able to offer a 'one-stop shop' for customers: 'We need a whole new supply chain model to bring the trades together.'

Left to right: Paul Morrell, Anthony Hilton, session chairman Stephen Sakur, Dan Labbad and Robert Care

Is Britain geared up for the carbon cutting challenge?

A panel of experts in the built environment expressed their fears that Britain is not yet ready to meet the carbon reduction challenge because of a lack of belief and political will.

Paul Morrell, chief construction adviser to the government, listed a number of obstacles that still pervades industry, government and consumers in achieving a low carbon built environment. They included a lack of belief in the urgency of the issue inside government itself.

Morrell said: 'If we don't believe in the possibility of catastrophe, then we are already wasting billions of pounds. We have to choose.'

He described the industry's inability to be reactive to problems and to act in silos as further barriers to transforming the existing building stock. He added that there was a feeling that the country's biggest problem now is the deficit, not global warming.

Author and broadcaster Anthony Hilton told delegates that the revolution in making our homes energy efficient hadn't happened yet because 'the customers haven't asked for it'.

He added that for this to happen, the industry needs customers, and the government needs to 'create the conditions where one has to comply': 'We need clarity; we need to know who the customer is and what we're expected to deliver to them.'

But Hilton warned that successful change is incremental, it doesn't happen through a 'big bang'. 'The deficit is a feeble excuse at this moment in time.'

'We need clarity; we need to know who the customer is and what we're expected to deliver to them'
Anthony Hilton

Arup chairman for the UK, Middle East and Africa, Robert Care, compared the urgency of global warming to the Second World War. He said: 'Before World War Two people thought this can't possibly happen, and there were a number of people around saying it can.

'It's the same thing here, only the scale is much, much bigger if it happens.'

In a separate conference sessions, Rob Pannell, the head of house building at the Zero Carbon Hub, suggested to delegates that their biggest task in the next 12 months would be to focus on defining the allowable solutions aspect of the 'zero carbon' definition. 'The revised definition will reduce costs for delivering zero carbon. At the moment it is high and is having an effect on some land opportunities across the UK,' he said.

Expert solutions for greening existing homes

In a session looking at the future of the construction industry, the architect Rab Bennetts gave his wish-list of what needs to be done to make existing buildings more energy efficient.

Bennetts insisted that there should be a way of having mandatory assessments of buildings. 'We need a much better understanding of how buildings perform,' he said.

One obstacle to this understanding is the number of people and organisations doing competing research on the issues around green buildings, he said. 'This research must be rationalised – we need a central focus for it.'

Reseach also needs to focus on design because 'the first 50, 60, 70% of efficiencies can come via the design process'.

Bennetts said adopting 'passive design according to local climate' was simply common sense. 'We also need whole-life CO_2 assessments of developments, and design reviews for all major projects,' he insisted.

Nick Raynsford, former Labour construction minister

'Moreover, better interaction between design, engineering and construction functions needs to be the rule rather than exception, which is what it is at present.' Bennetts said he believed architects were well placed to take a leadership role because they are the natural 'generalists'. 'Architects need to get their act together on orchestrating design teams,' he said.

'This huge challenge needs the right supply chain'
Nick Raynsford

Nick Raynsford MP, a former Labour construction minister, asked: 'How do we make the existing stock of around 26m homes energy efficient? This requires improving 600,000 homes a year up to 2050.

'This huge challenge needs the right materials, skills, supply chain and confidence,' he said. 'We also need the right incentives package in place to help people with the costs.'

The government's Green Deal is still not sufficiently developed to instil the confidence needed, he added: 'The funding is probably insufficient for more complex properties, for example those with solid walls.'

Construction Minister Mark Prisk defended government policy by saying ministers had to 'get the right balance between [the application of] nudging regulation while ensuring we don't tie [industry's] hands [on innovation].'

Community role is needed for allowable solutions plan

Henry Demaria, head of zero carbon homes at the Department for Communities and Local Government (CLG), informed delegates of the latest moves to clarify the definition of zero carbon.

During a session entitled 'The zero carbon definition, targets and timescales, and changes to the Code for Sustainable Homes', the senior civil servant said that there had been strong interest in developing community level solutions as part of the allowable solutions aspect of the definition, with particular regard to the concept of a Community Energy Fund.

He also said the Community Infrastructure Levy could be a way forward for financing allowable solutions, as it could be used to pay for new energy infrastructure.

He added that the Code for Sustainable Homes has already undergone one recent consultation, but Demaria said that further minor revisions are now being considered to reflect the approach to zero carbon, once its definition is clear.

Demaria went on to tell delegates that CLG is now looking to introduce a Local Standards Framework for new homes to reduce the 'overlap, duplication and complexity' of standards that are currently available when building homes.

He said that just a sample of those that currently exist include the Building for Life standard, national planning guidance, design standards, Lifetime Home Standards, plus the raft of Building Regulations, all of which have to be taken into consideration before assessment takes place.

Now, Demaria said, a limited 'menu' of standards – the Local Standards Framework – is being considered for new builds, which would allow each local authority to select the standards that matter to them most.

A 'scoping' report on the Local Standards Framework is expected to be presented to ministers later this month.

'Our challenge is to make solid wall insulation sexy'

The drive to achieve 'zero carbon' new homes is important, but how do we take the energy out of existing homes and non-domestic buildings? A panel of experts, including a major energy company chief, offered their views.

Ian Marchant, chief executive of Scottish and Southern Energy, one of the major energy groups, argued that 'new business models' and better enforcement of standards were priorities to persuade home owners to be more energy efficient.

He complained that there were too many 'drive by' energy performance certificates being awarded by sub-standard energy assessors. This was leading to a lack of proper compliance with regulations – and poor information for home owners: 'Many of us don't know how much energy we're using, when we really need this information.'

The industry as a whole needs a 'new business model' aimed at helping home buyers to be more energy efficient, Marchant said. This could involve six months of support once they have moved into a property.

The industry and government also has to work harder to persuade home owners to change their behaviour and to carry out improvements, he insisted: 'For example, we have to make solid-wall insulation "sexy". We need our best brains to be working together to achieve this.'

Gary Wingrove of BT Property Group who is incoming president of the British Council of Offices, insisted that more powerful leglislation is needed to turn around energy-wasting habits.

'For me, it's about changing ingrained behaviour among businesses, together with meaningful legislation.'

Andy Ford, president-elect of CIBSE, predicted that 'energy companies will take over and look after our buildings in the long term'.

This might help to persuade occupiers to 'look after' the buildings they are using, in terms of energy efficency, he said.

When it comes to the green skills needed to improve existing buildings, 'there's a massive problem because so few people have the knowledge,' Ford warned.

Max Fordham, founder of the eponymous firm

We need a complete revolution in people's expectations and behaviour
Max Fordham

Max Fordham, founder of the eponymous engineering consultancy, said he was pessimistic about global targets for cutting carbon emissions.

'The target has to be that we use no carbon fuels at all,' he insisted, which meant that all energy generation has to be renewable energy'.

But he added: 'We need a complete revolution in people's expectations and behaviour – I don't see it happening.'

Let the supply chain get on and innovate

The vision of a future full of green buildings means we need the skills and jobs to make it happen. But is the sector up to the task?

'As engineers we'll need considerable ingenuity to solve the problems thrown up by the green agenda,' said Martin Grant, chief executive of Atkins. 'But the UK at present doesn't produce enough technical skills,' he warned. 'This is serious. School kids "get" the environment but they don't appreciate that, by studying maths, they help [make it greener]. Careers advice for them at present is woeful.'

Engineers came under criticism from BRE chief executive Peter Bonfield. 'We have to open engineers' minds to the supply chain around them,' he said, adding: 'The most intelligent engineers are those who know the right questions to ask of their supply chain – it would be quite wrong for engineers to think they know better than anyone else [how to solve problems].'

Environmental consultant Stephen Ray agreed: 'During their education, our engineers are instilled with analytical and logical thinking. But we also need the new generation of engineers to be creative and able to deal with people.'

He said engineers needed to stop being risk averse when it comes to delivering on green technology and jobs.

Bonfield, who has been involved with the development of the Olympics site in east London, said his experience so far showed that it was imperative to motivate the workforce to do the practical things necessary for sustainable construction. 'It's about giving workers performance targets but then letting them get on and innovate,' he said.

Ban home sales if consumers fail to meet efficency targets, says UKGBC chief

During a session on transforming the existing stock, UK Green Building Council (UKGBC) chief, Paul King, said people should be banned from selling their homes if they don't meet clearly defined energy efficiency targets.

In his view, it is the only way that the government will meet its own legally binding target of cutting carbon emissions by 80% in the built environment by 2050.

King said that the government needs to tell people that, in 10 years' time, all homes need to reach a certain level of energy efficiency. He added: 'It would send a powerful message. It has to happen.'

But Energy Minister Greg Barker responded: 'That's like the government saying, "we don't trust you to do this". We're trying to get away from that mindset. We're trying to empower people to make them part of the solution and get them on board.'

Left to right: Greg Barker, Paul King (shown on big screen), session chairman Stephen Sakur, Kevin McCloud and Robert Peto

TV presenter Kevin McCloud, a pioneer of the Great British Refurb project, stressed the importance of big retailers, such as M&S and B&Q, entering the foray by providing insulation and other retrofitting packages to make retrofitting more accessible to the householder. He said: 'Large retailers are becoming very important in selling products and moving towards advising and offering consultancy services.'

Robert Peto, president of the Royal Institute of Chartered Surveyors, insisted that VAT needs to be dropped from the cost of retrofitting existing buildings if people are to engage with the government's energy efficiency agenda. He also described the term 'zero carbon' as a turn-off for the public, who believe this target is impossible to achieve.

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SYSTEM CHANGE

New directives emerging from Brussels could transform our approach to system design, writes **Nick Stevenson**

It is hard to imagine a more complex piece of legislation than the Eco-design of Energy Using Products directive – or the directive formerly known as the EuP. It has been the cause of much debate among manufacturers and design engineers, and has been held up since 2009, largely because the detail is so challenging.

The new law – due to be enacted this autumn – seeks to impose environmental controls on every stage of a product's development and operating life. According to European Commission officials, 80% of a product's environmental impact is determined during its design. Not only is that hugely challenging, it fundamentally shifts the priorities of a building services design engineer.

Traditionally, a project team will focus on what happens just before and during activity on site. Products are specified during the design phase and closely monitored when they are being installed and commissioned. While thorough, this is not a 'life-cycle' approach. Building services engineers will need to know more about the design phase of a piece of equipment, as well as what happens to the system during its operating lifetime.

The Eco-design Directive seeks to take a cradle-to-grave approach. It will impose a framework for energy efficiency standards from the very start of the design phase, so that specifiers have more information about the equipment they work with. Logically, to see this process through, the building services engineering profession needs to ensure that the products and systems we specify and design are well maintained. The directive recognises this and seeks to ensure that the energy saving principles established at the outset are supported through a product's entire working life. It also establishes the principle that building services products are always supplied as part of a system and, therefore, that is how they should be evaluated.

The natural twin to this piece of legislation is, therefore, post-occupancy evaluation to ensure systems continue to perform as designed. With the recasting of the European Performance of Buildings Directive (EPBD) – also due later this year – we will see wider application of Display Energy Certificates (DECs) that require regular analysis of a building's actual energy consumption. This will give us the opportunity to revisit our work post-handover and check that everything's in order.

> Building services engineers will need to know more about the design phase of a piece of equipment, as well as what happens to the system during its operating lifetime

Further planned changes to the EPBD include the removal of the size threshold so that energy efficiency improvements will apply to all buildings; and there will be a requirement for all public buildings to prominently display building energy certificates. The EC hopes the recast directive will help to reduce the primary energy used in Europe by 20% by 2020.

In order to meet this target, the industry needs to fundamentally change its approach to the design and use of energy consuming equipment. Product manufacturers have achieved a great deal through fine-tuning the energy performance of individual products, but more can and is being done to address the carbon footprint of whole system design.

With one building needing to be refurbished every minute between now and 2050 to reach our energy and carbon reduction targets, we are on the edge of a profound shift in our markets. Building services engineers, equipment suppliers and installers are facing a deluge of new measures all aimed at directing us towards the 'cradle-to-grave' and 'whole-system' route – we all need to prepare for them now and make sure our clients are ready too.

See 'Regulations', page 26

NICK STEVENSON is new energy director of Ideal Commercial Heating

Your letters

This month: A lesson from Edinburgh on persuading planners to accept improvements

Victorian tenements in Edinburgh, where planning officials have allowed listed buildings to have double-glazed windows fitted

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We can draught-proof windows of listed properties

Energy saving refurbishment of homes in conservation areas and the like has always been a challenge but designers can take heart from a recent decision taken in Edinburgh.

In December 2010, Edinburgh's planning committee approved new guidelines to allow double-glazing to be retrofitted in traditional sash windows. Replacing single- with double-glazing is a basic energy conservation measure but its perceived visual effect has made it almost impossible to get permission in many areas. However, the results of a research and demonstration project, *Double Glazing in Listed Buildings*, persuaded Edinburgh's planners to make the change.

The project was led by local sustainable development organisation Changeworks, in partnership with Lister Housing Cooperative and Edinburgh World Heritage, and was done at the council's request. It involved retrofitting a range of bespoke, slim-profile double-glazing units into category A and B listed buildings (equivalent to grades I and II in England and Wales) in Edinburgh's Old and New Towns, both of which are conservation areas and together form a UNESCO World Heritage Site.

The demonstration enabled planners to judge the appearance of the installation for themselves, prior to drawing up the proposed new guidelines, which were opened for public comment before final approval.

Planning permission or listed building consent will still be required but double glazing with a cavity of up to 6mm will be acceptable. The permitted types are defined by specification rather than by manufacturer but uPVC windows are explicitly not acceptable.

The same considerations apply to many other historic parts of the UK and we hope that other planning authorities will have the wisdom to follow Edinburgh's lead.

Phil Banfill is Professor in the School of the Built Environment, Heriot-Watt University, Edinburgh; Nicholas Heath is a senior project officer at Changeworks, based in Edinburgh, and led the double glazing trial in the UNESCO World Heritage Site

> We hope planners in other parts of the UK will follow Edinburgh's lead

Expensive controls? No thanks

I read with great interest the article on the design of a low carbon home ('Green shoots', March *Journal*, page 28) and note that the main environmental control problems all relate to the heating system not being able to control the temperatures adequately.

Calls are made in the article for simpler but more intelligent controls. However, the solution is not to provide expensive and complex controls for home owner and domestic maintenance engineer to struggle with, but to select the correct type of heat emitters in the first place. If the house had been built using low flow temperature radiators or fan convectors – quite feasible with a highly insulated home – then simple, easy to understand and maintain controls are adequate.

CIBSE Journal welcomes article proposals from any reader, wherever you are – whether it be letters, longer opinion pieces, news stories, people or events listings, humorous items, or any ideas for possible articles.

Please send all letters and any other items for possible publication to: bcervi@cibsejournal.com, or write to Bob Cervi, Editor, *CIBSE Journal*, Cambridge Publishers Ltd, 275 Newmarket Road, Cambridge, CB5 8JE, UK. We reserve the right to edit all letters. Please indicate how you wish your letter to be attributed, and whether you wish to have your contact details included.

Traditional quick-response or mixed systems do not need to waste energy by preheating for hours before occupation; nor will they waste energy by continuing to provide heat when the sun comes out. We need a simple, easy to maintain, adaptable and genuine low energy solution. If you go down the ground source heat pump route, you do of course need a designer who understands that heat pump efficiency is related to flow temperature and undertakes the design accordingly, including direct weather compensation.

Over the last few years I've been pleased to display to my employer, through energy monitoring, how school heating systems that my mechanical team have designed in this way have lower heating energy consumption than comparative new buildings with slow-response heating systems.

Geoff Carter

Accidents waiting to happen?

I read with interest the two articles in the February *Journal*, 'Fit for purpose' and 'Digging deep for a solution' (pages 24 and 47). As an industry we face huge challenges to embrace new technologies and integrate them into projects – essential if we are to deliver low energy, low carbon developments.

However, new entrants to our industry face a health and safety challenge, too. Indeed, the photograph of 'the borehole array' on page 48 demonstrates this concern. The photo shows borehole covers removed, with no physical barrier put in place to provide pedestrian or vehicle access control to the area.

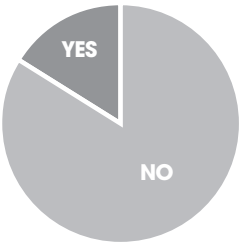
From the photograph, I suspect the project is at commissioning/fit-out phase. But it is still cause for concern – even though, statistically, 33% of accidents occur on building sites during the final stages of completion/handover.

Andy Sneyd

CIBSE.COM READERS' POLL

Each month we will be posing a question to readers at our website, **www.cibsejournal.com**

Last month we asked:
Will Britain achieve the policy goal of all new homes being zero carbon in 2016?



An overwhelming majority of respondents (84%) said 'no' to this question, with 16% saying 'yes'.

This month the question is:
Within project teams, are building services engineers the best people to take a lead on pushing for sustainable design and construction?

Visit www.cibsejournal.com to have your say.

MANUFACTURER'S VIEWPOINT

The industry needs to prepare now for the phase-out of HCFC gases, writes **Martin Fahey** of Mitsubishi Electric, sponsor of this column

The construction industry seems to be beset by deadlines. As legislation on energy efficient and sustainable buildings mounts, it is easy to put actions on the backburner until a deadline is looming closely. However well this might work, it is not always the most cost-effective option in the long or short term.

The air conditioning sector has already passed an important deadline. From January 2010 it became illegal to use virgin HCFC refrigerants, such as R22. This rule is part of the Ozone Depleting Substances Regulations (ODS) which were introduced in the UK in October 2000.

This rule means that air conditioning systems using R22 are now obliged to operate only on recycled or reconditioned refrigerant. The next deadline under ODS is 1 January 2015. At this point, all HCFC refrigerants will be illegal. The ODS rules also specify that any personnel handling refrigerants must be properly qualified and certified.

With four years to go, the phase-out of R22 might not seem like a pressing problem, but the effects of ODS are already being seen in the market. Only around 10% of the required levels of R22 are being returned to suppliers for recycling, which is pushing up the price of this refrigerant to almost three times its level before the ban.

So waiting to deal with R22 systems is a costly decision. This is especially true of business-critical equipment. What's more, as the deadline approaches, demand for those 'certified' personnel and training programmes will also increase – and this seems likely to raise those costs too.

Planning ahead need not be a painful process. One option is to convert an HCFC-based system to a different refrigerant. This can be achieved by using 'drop-in' replacements. However, it is important to bear in mind that these will change the way an air conditioning system operates, can lead to reduced energy efficiency and cooling capacity, and have significant impact on warranties and operating costs in the medium and long term. With three years to plan, it is possible to take a more strategic approach and use this opportunity to consider replacing older systems with modern equipment. Not only is this a more permanent solution, it also offers the benefits of greater energy efficiency and lower carbon emissions from modern equipment.

> One option is to convert an HCFC system to a different refrigerant, using drop-in replacements, but this will change the system operation

Whatever the decision, it is important that end-users start to form their strategies for dealing with HCFC phase-out now. As the deadline approaches it will be important to be prepared for the change, especially where air conditioning is a business-critical system.

PERFORMANCE INDICATOR

The revised Energy Performance of Buildings Directive sets new challenges for the sector, writes **Hywel Davies**

The original Energy Performance of Buildings Directive (EPBD), adopted eight years ago, has led to changes in the way we calculate compliance of buildings with Part L of the Building Regulations – or Part F in Northern Ireland, or Section 6 in Scotland.

But the EPBD was revised last year, and its scope extended in a number of ways. There has also been a shift in its overall emphasis to reflect the greater focus in Europe on security of energy supply and the energy efficiency of buildings, rather than on carbon emissions. There is much more attention to existing buildings and the importance of renovating the existing stock. The changes also seek to reduce the variations in implementation measures between member states.

The provisions of the directive cover energy used for space and hot water heating, cooling, ventilation, and lighting for new and existing residential and non residential buildings. The revision now sets a target for all new buildings, and existing buildings which undergo 'major renovation', to be 'nearly zero-energy buildings' by 2020.

The UK already has goals for zero carbon homes by 2016 and non-domestic buildings by 2019, which will largely address this requirement, but it constrains the government's scope to extend the timetable for 'zero carbon' and the scope for 'allowable solutions' to help achieve 'zero carbon' buildings. The 'nearly-zero' requirement for refurbishment is an added challenge.

The minimum energy performance requirements for new buildings will apply to existing buildings when 'major renovation' is carried out, with no threshold floor area (Article 7). Each government must also provide details of financial incentives for 'nearly zero' energy buildings (Art 10).

The inclusion of existing buildings is important. If we are to meet our national targets, we have more than one and a half million commercial buildings to refurbish. We need to start this soon, as long refurbishment cycles can lock in poor energy performance for many years to come. Given the recent shocks to global energy supply, we simply do not have very long to start reducing our demand for energy from unstable or unfriendly regions of the world.

> If we are to meet our national targets, we have more than one and a half million commercial buildings to refurbish

There are significant changes to the area and the types of buildings which must display an energy certificate. The threshold for public buildings comes down to 500 sq m from July 2013, and in 2015 that will drop to 250 sq m. Many larger private sector buildings will also have to display certificates.

Whenever a building is constructed, sold or rented out, an energy certificate is required and must be made available to prospective purchasers or tenants. The full certificate must be shown to any prospective new tenant or buyer, and a copy handed over on completion of any contract.

All advertisements in commercial media concerning a building or part of it offered for sale or rent must state the energy performance from the certificate (or an initial indicator if under construction). Energy Performance Certificates will have to provide detailed, building-specific recommendations for improvements to the building to reduce energy consumption.

Government must introduce effective penalties for non-compliance (Art 27), in response to the currently widespread lack of effective enforcement of energy certification and air conditioning inspections. The directive states that 'penalties must be effective, proportionate and dissuasive'. Government must tell the Commission what these penalties are by 9 January 2013.

The coalition government has already canvassed views on improving compliance with the existing directive, and work to address this is ongoing. However, further action to improve levels of compliance is now likely to be needed to implement this Article.

Governments must adopt regulations and procedures for most of the requirements by July 2012, and implement them over the following 12 months, with the change in threshold size falling again in 2015.

Consultations on implementating the directive are due in coming months. CIBSE will be contributing to these, so those who are interested should watch the consultation page on the website, the technical bulletin and the *Journal* for news.

● **HYWEL DAVIES** is technical director of CIBSE

EPBD briefing

CIBSE has published a briefing on the EPBD, prepared by Andrew Warren, director of the Association for the Conservation of Energy, with contributions by Hywel Davies. The briefing can be downloaded at **www.cibse.org/knowledgebank**, and provides more detail on the various changes to the Directive and the timescales for implementation.

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GREEN CHAMPION

Design consultancy Atelier Ten, which has just added a new CIBSE award to its trophy showcase, says there is no let-up in its quest to push the boundaries of sustainability. Its co-founder Patrick Bellew tells **Bob Cervi** what makes the firm tick

Having its London headquarters housed within a group of Victorian warehouse units called 'Perserverence Works' in the East End is a happy coincidence for Atelier Ten. The engineering consultancy has won a string of awards in recent years for its continuing determination to develop sustainable buildings. Most recently it was named Building Services Consultancy of the Year in the CIBSE Building Performance Awards 2011.

Last year, Atelier Ten's co-founder and principal, Patrick Bellew, was made a Royal Designer for Industry (RDI), the 'highest accolade for designers in the UK', according to the awarding body, the Royal Society of Arts. Bellew, who is a fellow of a number of institutions including CIBSE, says he is particularly pleased with becoming an RDI, an achievement that is normally the preserve of industrialists such as Sir James Dyson who make highly innovative products.

'The idea that our contribution [as building services engineers] to the excellence of buildings is recognised by fellow [industrial] designers, is a step change in how we as a profession are viewed,' says Bellew. He is also quick to point out that he is not the first consulting engineer to become an RDI: Max Fordham achieved this in 2008.

For Bellew, sustainable design is fundamentally about trying to radically

Simon Weir

> We do a combination of [green] things as standard, and then we look for areas where we can move the debate about green design forward

Simon Weir

Patrick Bellew asserts that Atelier Ten aims to lead by example on sustainability

reduce mechanical heating and cooling within a building. This means following the process – recognised widely in the industry now – of starting with the creation of a highly insulated, energy efficient building envelope that uses lots of natural light, and then looking at what heating, ventilation and cooling 'kit' needs to be installed. This may also mean applying advanced control technology to help deliver the right air movement and heat flow – and to turn off the lights.

Bellew's personal inspiration for pursuing a passive-ventilation approach to building services design – well known to those who have followed his career – is the termite mound, which uses a thermal storage system contained in the ground and an earth tube that brings air into the nest. The nest also uses evaporated water to produce an air-conditioning effect.

> Architects have leadership in the design process but building services engineers have thought-leadership

This natural structure, of course, has its limitations – not least a lack of natural light and poor insulation – but Bellew has used it as a model for the creation of underground concrete labyrinths that 'integrate subterranean thermal storage into air conditioning pre-heat and pre-cooling systems, to minimise demands on the air-handling plant in the building, providing comfortable conditions with very low energy consumption'. One example of this process in action is the Planet Earth Gallery at the Earth Centre Project in Doncaster, UK.

Bellew says that using concrete slabs within buildings – 'applying their high thermal mass as a friend to maximise night-time cooling' – together with earth ducts for ventilation, are intuitively low-energy processes that can now be proven to be effective. 'This is now all underpinned by improved modelling,' he says. However, clients still expect to see hard evidence of green kit in the form of fan coils and chilled beams, he laments.

Atelier Ten is working with two universities to conduct research into nano-materials for buildings, backed by funding from the UK Technology Strategy Board. The aim, says Bellow, is to develop advanced thermal-storage systems that can be applied to larger commercial buildings.

This pursuit of innovative technologies to increase the energy efficiency of buildings offers up some hope that the building services industry can achieve the 'step change' that Bellew believes is necessary if Britain is to achieve its carbon-cutting targets. But collaborative work among different professionals in the industry supply chain is also crucial.

'Architects have leadership in the design process but building services engineers have thought-leadership,' argues Bellew. But will architects be prepared to cede their dominant design role to engineers? 'Some architects will never be persuaded to change. But most are keen to try to delegate, but they complain that engineers don't push themselves forward enough to provide the leadership they could offer,' insists Bellew, who points out that he learnt about architecture as well as engineering as an undergraduate at Bath University. (He is now a Visiting Professor at the School of Architecture at Yale University in the US.)

But, decades later, this multidisciplinary approach to undergraduate learning is thin on the academic ground. Bellew suggests that this may be something to do with the building services education sector not wanting to dilute the engineering content of its courses for fear of not being able to attract undergraduates.

Does Bellew think that CIBSE is succeeding in taking a lead on raising the status of the building services engineering profession? 'I don't sense a huge amount of leadership coming from CIBSE,' he says, but points out that he's not directly involved in the institution. He adds: 'CIBSE could be involved in testing new technologies – for example, jointly with organisations such as the Building Research Establishment.'

Bellew is able to point to several examples of award-winning projects that Atelier Ten has

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CV
PATRICK BELLEW

CAREER

1977-1981: School of Architecture and Building Engineering, University of Bath

1981-87: Buro Happold, Bath

1987-90: Director, Synergy Consulting Engineers

1990-present: Principal, Atelier Ten

ACTIVITIES

Board member, UK Green Building Council

Governor, Building Centre Trust

Fellow of CIBSE, of Royal Society of Engineers, of Royal Society of Arts

Honorary fellow of RIBA

Happold Medal winner, 2008
Royal Designer for Industry, 2010

SOME KEY PROJECTS

Gardens by the Bay, Singapore

National Theatre, London

Herbarium Laboratory/Alpine House, Kew Gardens, London

Baltic Centre, Gateshead, UK

ATELIER TEN AWARDS

CIBSE Building Services Consultancy of the Year 2011

UKGBC Sustainable Consultancy of the Year 2009

CIBSE International Achievement Award 2009

CIBSE Environmental Innovation Award 2000


Atelier Ten

been involved in. But many of these are not typical, everyday buildings. How do we ensure that the bog-standard office development is highly sustainable? And how do we tackle the inefficiencies locked up in Britain's established housing stock?

'Regulations are driving all new office buildings, even bog-standard ones, to be so much more energy efficient that we will need to be increasingly ingenious to deliver them affordably. They have been managing it quite successfully in Germany for more than a decade so we all just need to raise our game.

'The problem of poorly performing existing housing is altogether more difficult. I think the solution will have to come from several directions. The government's Green Deal, where householders can offset capital investment against future energy bills through a quasi-subsidy arrangement, has great potential, though it needs a big push at the moment. The 'allowable offset' element of new building submissions under future Part L updates is already leading to discussions about Community Carbon Funding as a real source of cash for investment in building upgrades or domestic renewable energy – and, as the oil price nudges towards $150 a barrel, energy costs may once again become a serious driver for action by individuals. I heard a very scary statistic the other day that in order to meet our 2020 carbon target we need to be completing low carbon retrofits on housing at a rate of more than 20,000 homes a day across the UK. It is not happening yet and there is not even an 'industry' in existence in the real sense to deliver this change, so it is a huge challenge. But the fact that it is difficult and complex should not mean that we don't make a start.'

Bellew admits that the word 'sustainbility' is 'getting tired'. 'But,' he asks, 'why would we not want to do what we can to create better buildings?'

Atelier Ten, says Bellew, also aims to lead by example: 'Since January 2010 we have achieved [the international standard] ISO 9001, which embeds sustainability within our policies.' The company, which claims to be carbon neutral, publishes what it describes as a 'full' annual sustainability report and monitors its own energy use, which is shown on an energy display in the reception of its London office. Staff initiatives include a Green Committee and carbon champions across the group.

But what were Bellew's early inspirations for wanting to seek a sustainable built environment? He points to Ted Happold, the co-founder of engineering consultancy Buro Happold who was a professor at Bath University when Bellew studied engineering there. Another key influencer was Derek Clements-Croome, who ran the environmental design module at Bath and is now a professor at Reading University.

> Most architects are keen to try to delegate, but they complain that engineers don't push themselves forward enough to provide the leadership

'Both Derek and Ted recognised that future design professionals needed to be educated more broadly so that there was a greater understanding (and mutual respect) across the disciplines of architecture, structure and building services engineering. So we studied together, the engineers learning about Mies Van Der Rohe and the Bauhaus along the way, and the architects learning about thermal

mass and fluids. By the third year we were working as design teams in studio, and I think that this was the point at which we all began to understand the benefit of the programme.'

Bellew admits that he used to do 'stealth' engineering, whereby he would install a green technology such as heat recovery as standard if he was convinced about the efficiency gains of this. 'Otherwise, the minute you put this solution down as an additional item in the "green column" of the analysis, it is then a hostage to fortune and to budget cuts – whereas we would rather see it as being an intrinsic part of a good building.'

But, in this time of recession, can he still get away with this? 'Yes, we've not changed our current approach,' says Bellew. 'We do a combination of [green] things as standard, and then we look for areas where we can "push the boat out", to make for buildings that move the debate about green design forward.'

But Bellew believes a design consultancy should do more than seek to push at the profession's boundaries. It should also extend its green thinking to its local community and, where possible, to the developing world. Examples of such activities include supporting staff in their volunteering work in local schools and charities. The Atelier Ten Foundation has also been set up to invest a proportion of company profits to support staff to undertake humanitarian work overseas.

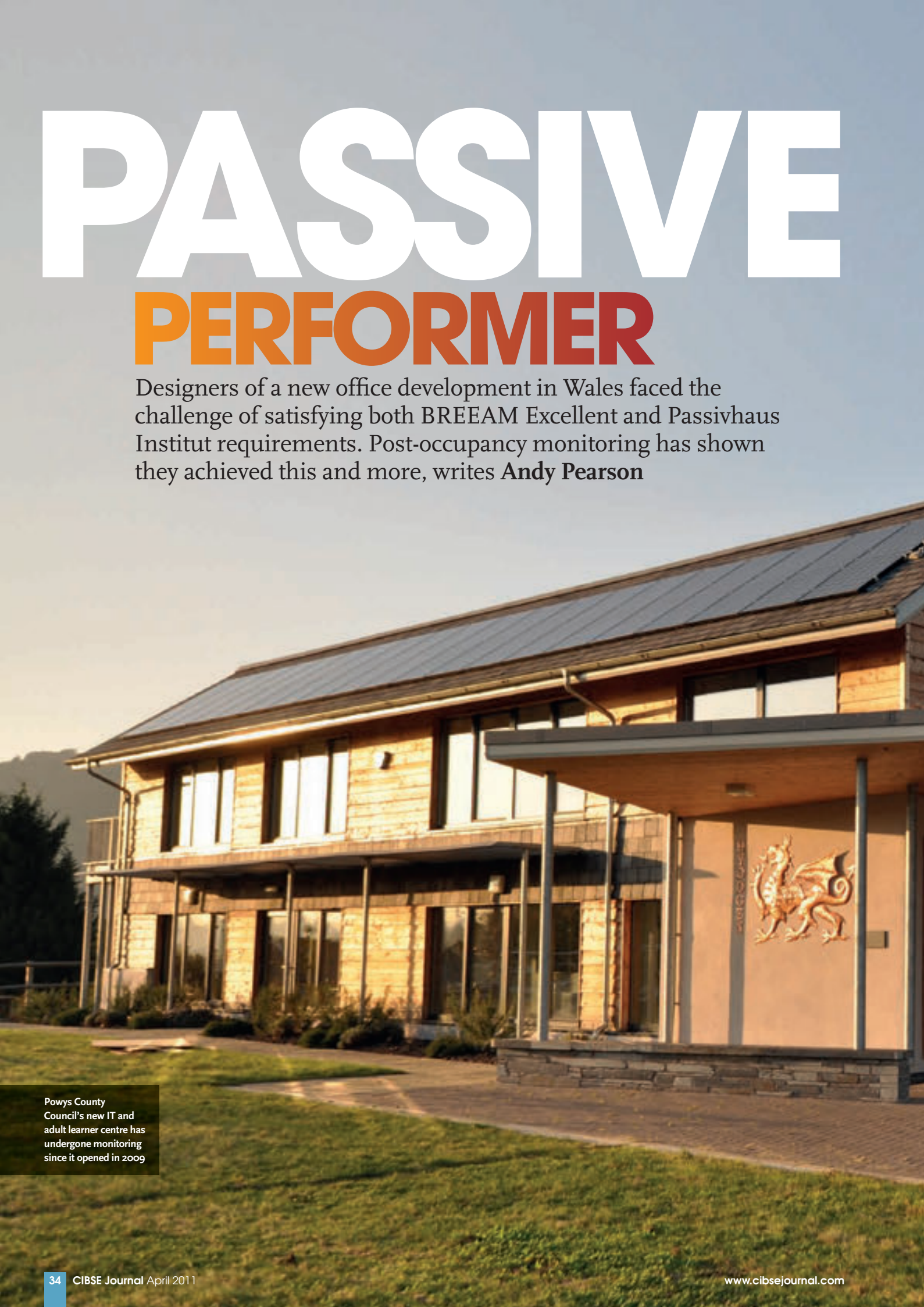
Whether or not you think this all sounds too good to be true, Bellew's and Atelier Ten's string of awards and accolades point firmly to the conclusion that this is one engineering consultancy that – despite its relatively small size – continues to set a benchmark for corporate social responsibility among its peers.

All of which makes Perserverance Works, with its ring of Victorian philanthropy, a highly appropriate address for the company. **CJ**

Above and left: One of two biomes currently under construction at Singapore's Gardens by the Bay development. Atelier is the building services and sustainability consultant for the scheme, which has been designed to be carbon neutral over the period of a year

PASSIVE PERFORMER

Designers of a new office development in Wales faced the challenge of satisfying both BREEAM Excellent and Passivhaus Institut requirements. Post-occupancy monitoring has shown they achieved this and more, writes **Andy Pearson**



Powys County Council's new IT and adult learner centre has undergone monitoring since it opened in 2009

The brief for Powys County Council's new IT and adult learner building was routine: minimise running costs, maximise flexibility. But, JPW Associate's solution for the scheme in Machynlleth, Wales, is anything but routine. The multi-disciplinary consultancy and contractor's answer to the brief has been to design the UK's first Passivhaus Institut-certified office building.

Canolfan Hyddgen (the Stag Centre) was completed in January 2009. Since then the designers have been monitoring the building. Remarkably, the results show the ultra-low energy building is actually performing better than predicted. Its outstanding performance has set a new standard for low-energy office design, a fact reinforced by the pioneering project winning the New Build category at this year's CIBSE Building Performance Awards, which were held in February.

For JPW Associates, a Passivhaus solution was the obvious choice for the council's new building. The practice had just completed the design and construction of the first Passivhaus-certified domestic property in the UK, so the team was already familiar with Passivhaus principles and standards. What's more, the Passivhaus home had been built close to where the Passivhaus office was to be constructed, which also happened to be near to the Centre for Alternative Technology, so the local planners and building control understood low energy construction techniques.

Design challenge

While the designers had proposed a Passivhaus solution for the 443 sq m scheme, grant funding under the Welsh Assembly's Pathfinder Programme was dependent upon the building achieving a ›

The office development, Canolfan Hyddgen ('Stag Centre'), was built to Passivhaus standards

BREEAM Excellent rating. A pre-requisite of funding was that the grant had to be spent by mid-2008, which gave JPW Associates less than eight months to dovetail the Passivhaus and BREEAM design criteria before construction commenced.

From the outset, however, it proved difficult to satisfy both the BREEAM and Passivhaus Institut rating systems; for example the Passivhaus calculations are more rigorous and exclude spaces such as cupboards that do not need to be heated from the building's floor area. The Passivhaus Planning Package 2007 was the primary energy calculation tool used by JPW Associates. However, TAS software was used to model the internal air movement and to provide values for Part L2 Building Regulation's compliance and to check summer overheating risk. As a result, JPW had to duplicate much of the design data.

'Creating two sets of data was time consuming and added to design costs,' explains John Williamson, technical director of JPW Associates. Williamson adds that he would be happy to design future schemes to be compliant with both rating systems providing the client is prepared to meet the additional cost.

Orientation

The site was occupied by a dilapidated school art block building dating from the 1850s, which had disintegrated beyond repair and was to be demolished to make way for the new building. The planners insisted the new scheme fit within the footprint of the original building, without exceeding the height of the roof ridge. Not only did JPW's design succeed in this task, it also ensured that the old building was incorporated into the new office by reusing the roof slates, while the bulk of the building itself was crushed and used in the construction of drainage systems and soakaways on site.

The two-storey scheme is orientated with its glazed front facade facing south. Offices and meeting rooms are located around the building's perimeter to take advantage of daylight, while the three IT teaching rooms are located at its core, one on the ground floor, two on the first. An access corridor and break-out space between the south-facing glazing and offices and IT suites allows low-angle winter sun to enter the building on both floors without dazzling the students.

'Although Mid Wales experiences a fairly

What the CIBSE awards judges said: 'Much hard work has been done to get the energy demand down –and the energy monitoring data has been provided to show that this has been achieved. There is also clear evidence of good user feedback'

jpw

mild climate, annual solar gains tend to be lower than other parts of the UK, so high levels of insulation and large areas of glazing were incorporated into the design to compensate for this and to enhance natural daylight levels,' says Williamson.

Construction

The building uses a hybrid approach to construction. Its structural core of internal partition walls is constructed from concrete blocks mounted on a cast in-situ concrete ground floor slab, while the external walls are prefabricated timber frame and cassette construction. The wood-faced cassettes incorporate recycled newspaper insulation.

The first floor is constructed from hollow-core concrete slabs. This solution adds thermal mass to the interior while allowing a highly insulated facade system to be used. 'We took a fabric-first approach to the low energy design because the fabric will be in place for at least 60 years,' Williamson explains.

An asymmetrical pitched roof caps the building. Its south-facing, slate-clad aspect is pitched at 35 degrees to ensure its 7 kWp covering of photovoltaic panels performs effectively. The north-facing slope is much gentler to enable the living sedum roof to flourish. A green roof also blankets the building's large entrance lobby to help enhance the site ecology.

> It proved difficult to satisfy both the BREEAM and Passivhaus Institut rating systems. Creating two sets of data was time consuming and added to design costs

Fabric airtightness is fundamental to the building's low energy performance. An interior breathable membrane is used to seal the facades. 'The biggest challenge was detailing around the windows, floor plate and wall junctions and where M&E services enter the building,' says Williamson. 'The junctions had to be airtight without creating a thermal bridge and the designs had to be approved by the Passivhaus Institut. 'It was important the timber cassette manufacturer and structural engineer bought into the detailing because they have to stand by their warranty,' explains Williamson.

C Sneade, a family-owned local contractor, was selected to construct the low-energy building. The contractor worked alongside the designers to ensure the building was airtight. Construction joints were pressure-tested before being covered with internal linings. This enabled any reworking to be done with the minimum of disturbance. However, it also required a change to the conventional construction programme to ensure the building's fabric was complete and windows installed earlier than usual in the programme, which could be an issue on larger schemes if the works cannot be phased accordingly.

JPW challenged the contractor to make the building more airtight than their German counterparts were currently achieving. The applied psychology clearly worked; when the scheme was fully pressure tested it registered 0.37cu m/h/sq m at 50 Pa, which is one of the lowest air leakage rates ever achieved in the UK.

Ventilation

With so little air infiltration, the ventilation design is critical. The designers considered natural ventilation for the scheme, but at £500 per actuator per window it was expensive and potentially ineffective on days when there was no wind. Instead JPW Associates opted for mechanical ventilation with heat recovery (MVHR). The problem with this option was that the Passivhaus fresh air requirement was only eight litres per second, but Part F of the Building Regulations have a greater fresh air requirement of 10 l/s per person. Williamson says the designers compromised by designing a system with step control capable of delivering fresh air at quantities up to 10 l/s.

Five Passivhaus-approved Drexel and Weiss ventilation units have been installed, one for each computer room, with the remaining two units serving the offices and public areas. The units operate on three speeds: high, medium and low, with medium being the default for public areas. In summer the MVHR system will supply fresh air during the day. At night the system will run to purge heat from the heavy construction elements if the outside air is greater than 4C cooler than the internal temperature. To save fan energy and prevent any heat transfer, the ventilation units' heat exchangers are removed in summer to enable them to run at 100% bypass.

Williamson did consider using mechanical cooling for the scheme as an alternative to running power-hungry

KEYFACTS
POWYS COUNCIL'S CANOLFAN HYDDGEN IN MACHYNLLETH, WALES

STRUCTURE AND FABRIC: A central masonry core from reclaimed and recycled masonry in conjunction with in situ ground-floor slab (60% ground granulated blast furnace slag), with an external solid timber frame and I-beam Cassette roof; 7kw PV array.

AIRTIGHTNESS: n50 = 0.249-1 @ 50Pa (Passivhaus Institute requirement is 0.6); Q50=0.37cu m/(h.sq m)@50 Pa (UK measurement).

VENILATION/HEAT RECOVERY: Five Drexel & Weiss Aero business units operate across five different zones. Three ventilation levels are varied automatically according to PIR and timer controls.

SPACE HEATING: 9-24 kW gas boiler; point-of-use electric water heaters in toilets, kitchen and cleaners cupboards.

LIGHTING: PIR and daylight balancing is used throughout the building which complements the hybrid decentralised/centralised building ventilation strategy: rooms and equipment only power up when they are in use.

ENERGY MANAGEMENT SYSTEM: System control board is linked to County Hall, allowing remote monitoring and enabling local key holders and caretakers to manage the building under instruction from centralised energy managers.

MONITORING: JPW has applied for funding to expand monitoring and analysis of the building and hopes to use *CIBSE TM22* and BUS questionnaires to gather more information and compare actual efficiencies with building physics methodologies and prediction tools. They will do this using: sub-meters to monitor individually tenanted office spaces; focused mobile monitoring of selected workspaces for actual and perceived comfort levels based on CO_2, relative humidity, temperature and daylight levels; and the actual use of operational energy in IT and similar equipment.

The design of the offices incorporated the idea of keeping the supply of fresh air to a minimum

ventilation fans. His premise was that the scheme would use less energy and the building would be more comfortable if the supply of air was kept to the absolute minimum. This small amount of fresh air could then be cooled, perhaps using a small heat pump, before it is supplied. In summer, this solution would keep heat out of the building during the day and enable the ventilation fans to be turned off at night. He is currently applying for research funding to test his premise on part of the building's ventilation system to find out whether this would be a more energy efficient ventilation solution for future Passivhaus offices.

The ventilation design was further complicated by Powys County Council's last-minute decision to add a computer server room to the scheme, which added an additional 720 W of heat. The council also decided to stick with its existing computer framework supplier rather than purchase ultra-low energy machines.

'Suddenly, IT energy use rocketed,' Williamson laments. What's more, the increased ventilation needed to offset the additional heat gains pushed the scheme's annual energy consumption up from 112 kWh/sq m/yr to 184 kWh/sq m/yr, far above the 120 kWh/sq m/yr allowed by Passivhaus, jeopardising the building's certification.

Following these changes, Williamson was forced to refine the design at the last minute. As a result, a brise-soleil was added to the ground-floor glazing on the southern elevation. Extensive daylight control was added to the T5 lighting to push its energy consumption below 10W/m2. Mechanical timers were installed to shut down all electrical sockets at night to eliminate standby losses.

Movement detectors were added to the MVHR systems serving the computer rooms to enable the lights to be turned off and the ventilation turned to 'low' when the rooms are unoccupied. These units will run on medium speed when the room is in use; the high setting will only kick in when temperatures exceed the Passivhaus

Predicted vs actual energy use

John Williamson's prediction for energy consumption was unnecessarily high. Two years of monitoring has shown the total operational energy consumption to be just 80k Wh/sq m/yr. He says that this is probably because computer use has been lower than expected.

Monitoring showed that internal summer temperatures did reach 26C maximum in the first summer. However, the reason for this was found to be due to an external sensor, damaged by a football, shutting down the night purge ventilation too soon. For heating, through two of the coldest winters on record, temperatures varied between 20C and 22C, depending on the occupier's control of the radiators using thermostatic radiator valves.

However, when the building is fully occupied the heat gains are sufficient to keep the radiators turned off which means the boiler is only used for a short time on very cold mornings. As a result of this, and because the solar gains were higher than expected, the building's space heating load of 14.8 kWh/sq m is also slightly lower than the 15 kWh/sq m/yr predicted. To put this into perspective, the building's gas bill was £130 for a recent 12-month period.

The photovoltaic panels have also performed better than predicted. 'We installed the PVs to show how a small area of a low maintenance, reliable technology can make a big contribution to a low energy building,' says Williamson. The panels have produced 5,987 kWh/yr, which equates to about 20% of building's needs. Unfortunately, because the PV installation was grant-funded, Powys County Council cannot claim a feed-in tariff; had it done so, says Williamson, the tariff would have been 'more or less equivalent to the gas and electricity bills'.

			SPACE HEATING				TOTAL OPERATIONAL ENERGY				TOTAL FUEL COST	PV GENERATION (7KW ARRAY)			TOTAL CARBON EMISSIONS
			Gas 08/10/09 - 08/10/10 (0.194kg/CO_2/kwh)				Electricity 08/10/09 - 08/10/10 (0.568kg/co_2/kWh)					08/10/09 - 08/10/10			
Calculation Methodolgy	sq m		kWh	kWh/m²/a	kWh/ CO_2m²/a	£/yr	kWh	kWh/m²/a	kWh/ CO_2m²/a	£/yr	£	kWh/a	kWh/ CO_2m²/a	Approx FiT income £	kWh/ CO_2m²/a
Passivhaus	335	Predicted	5,025	15.0	2.9		48,240	144	81.8			5250,	8.9	1,895.00	75.8
Canolfan Hyddgen	335	Actual	4,973	14.8	2.9	131.1	26,860	80	45.5	2409.82	2540.93	6,493	11.0	2,600.00	37.4
Canolfan Hyddgen Part L2	391	Actual	4,973	12.7	2.5	131.1	26,860	69	39.0	2409.82	2540.93	6,493	9.4	2,600.00	32.1
Bldg Reg Notional Part L2	391	Predicted	17,986	46	8.9		15,640	40	25.2			5,250	7.1	1,895	127.1

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The building's predicted energy use has dropped to a little over the Passivhaus maximum limit allowed, but certification was still awarded

maximum of 26C or on manual boost.

In winter, the additional heat from the server room is useful in keeping the building's internal temperature above 20C. Additional heating is generated by a 24 kW gas-fired low-NOx boiler and radiators. The building's actual heating load was calculated at a mere 4.8 kW but the M&E contractor, who had not worked on a similar scheme before, was reluctant to fit a smaller boiler so its minimum output of 9 kW is twice what is needed.

Certification

After squeezing every last energy saving out of the building, its predicted energy use dropped to 144 kWh/sq m/yr. This figure was still 24 kWh/sq m/yr over the Passivhaus maximum, but the Institut certified the building because the computer servers supply other buildings and because Williamson had done everything possible to reduce the loads.

One issue the project did highlight was the problem of framework agreements, particularly where IT is concerned on this project. JPW Associates sourced the scheme's Passivhaus-approved components from the UK and from abroad. 'A major issue appears to be that councils are locked into framework agreements involving conventional technologies because their maintenance and procurement officers are reluctant or unable to change suppliers quickly,' says Williamson. And when new products are sourced, an allowance has to be included in the maintenance team's training budget.

> Councils are locked into framework agreements involving conventional technologies because their maintenance and procurement officers are reluctant or unable to change suppliers quickly

Powys County Council says it is happy with the scheme. Handover of the building was simplified through the use of the BSRIA/Usable Building Trust's Soft Landings Framework. In fact, Soft Landings was so successful that JWC Associates has persuaded the council to adopt the framework on all of its new-build projects from now on.

The building cost £1,784/sq m including the PVs and biodiverse roof, which compares well with benchmark cost from BRE and Faithfull + Gould for a BREEAM Excellent secondary school of £1,789 to £1,856/sq m.

'We didn't experience a cost uplift for the scheme,' says Willamson. To cap it all, the scheme obtained a BREEAM (Offices 2006) score of 84.43%, the highest in Wales at the time, and making it the first building in the world to achieve both Passivhaus and BREEAM certification simultaneously. **CJ**

PROJECT TEAM

CLIENT: Powys County Council

ARCHITECT: JPW Construction

CONTRACTOR: C Sneade Ltd

BUILDING SERVICES ENGINEERS: Barry Gwynnett & Adrian Tester

ECOLOGIST: Middlemarch Ecology

BREEAM ASSESSOR: Gordon Brown

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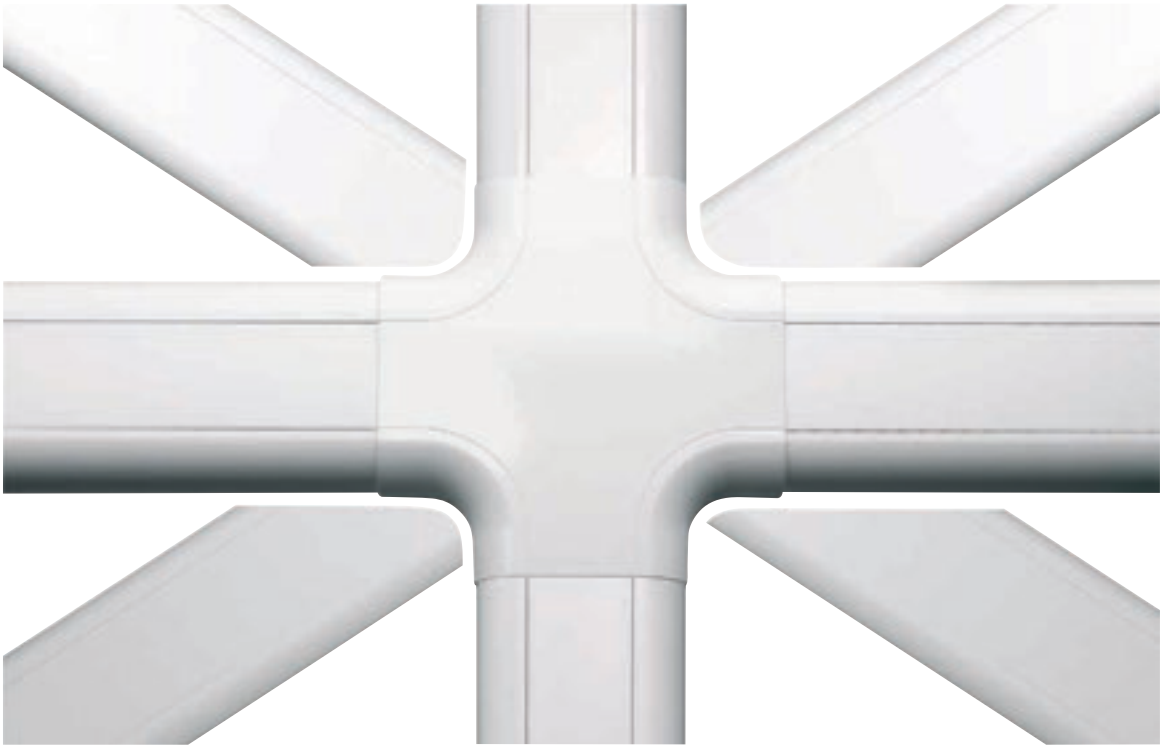

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FRESH APPROACH

How can data centres be designed so that they use outside air for year-round cooling? In this report on sustainable solutions, below, **Marcus O'Brien** discusses his approach to 'free air cooling'. On page 44, **Beth Whitehead** argues the case for life-cycle assessments

Clients are increasingly demanding that their data centres are as energy efficient as possible. A focus on the use of sustainable products, recyclable materials and effective energy is now as important as system resilience. The use of 'free cooling' – where outdoor air is supplied directly without any further mechanical cooling to offset building cooling loads – has the potential to provide a significant part of the energy reduction strategy for data centres while not compromising reliability ('resilience').

When considering the ventilation requirements for a data centre, the principal design goals can be considered as:

- Limit IT failures;
- Maintain a low power usage effectiveness (PUE) - the ratio of the power delivered to the site to that used by the IT equipment;
- Provide adequate filtration;
- Maximise use of ambient conditions; and
- Minimise the use of mechanical cooling.

An assessment of free cooling to data centres in Dublin (and similar climates) has shown that it can provide an energy efficient and reliable method to maintain the equipment (known as the 'data field') at appropriate temperatures. Since there is a reasonably constant cooling load within the space (predominantly unaffected by outdoor conditions) a constant maximum supply temperature can be evaluated based on the peak allowable temperatures.

Revised in 2008 to take account of more resilient data equipment accepting a wider range of operating conditions, ASHRAE's Thermal Guidelines for Data Processing Environments with regard to Data Centre Supply Air Conditions provides guidelines for supply air conditions needed to control air temperature and relative humidity around the data field (see Figure 1, page 45).

Data Centre designs would normally apply 'Recommended' conditions, although occasionally 'Allowable' values are employed to give greater operational flexibility and subsequent energy savings.

Filtered outdoor air is supplied

> Data centre design conditions should be to Recommended Guidelines, with occasional use of Allowable Guidelines

Clients are increasingly demanding that their data centres are as efficient as possible

Life cycles

Getting the true picture on sustainability

As data centre numbers increase, there is a growing need to rate and benchmark their sustainability throughout their full life cycle – that is, beyond current methodologies centred on operational energy, carbon emissions, water usage and cost.

As energy bills have grown, data centre owners and operators have rushed to improve the energy efficiency of their facilities. Draughty racks have been fitted with blanking plates; cable cut-outs plugged with brush seals; containment systems have segregated hot and cold air streams; and free cooling has greatly reduced power demands from cooling infrastructures.

In the UK, data centres can now be assessed under BREEAM for Data Centres 2010. In the US, a similar data centre-specific pilot of LEED is expected this year, to be followed by the Australian NABERS. But elsewhere across the globe certification of data centres remains only possible under bespoke schemes.

Since their inception, the application and criteria of such building environmental assessment methods (BEAMs) have been altered to assess more holistically building sustainability and the interrelated environmental, social and economic impacts. However, while such methods identify efficencies, they only partially consider the full life cycle.

Robert Tozer, of energy consultancy Operational Intelligence, points to some concerns with these adaptations: 'BEAMs have been adapted for data centres. My concern is that many times I have seen project teams carrying out "improvements" for perverse incentives, that is, to get the points, rather than for their impact on the environment.'

We should not downplay the contribution of a data centre's operations to its overall sustainability. Work at Hewlett-Packard Labs in Palo Alto and the University of California at Berkeley in 2009, found operational energy use of a DX CRAC unit to generally be of an order of magnitude greater than other life cycle stages; and likewise concluded the dominance of operational energy demand within IT equipment, including servers, storage, and network switches. Similarly, the Uptime Institute recently suggested 90% of overall lifecycle energy comes from the operation of the computers.

Amip Shah, senior research scientist at HP Labs, part of computer giant Hewlett-Packard, says his work on the full life cycle of data centres shows how the choices to reduce environmental and social impact may not always be clear without full life cycle studies.

'Particulate emissions [of PM10 size] are often more pronounced during the embodied phases of the data centre life cycle than during operation,' he says. 'Among various sources, the building shell certainly contributes a very high fraction, due to the large volumes of fine particulates released during construction. But so does the manufacturing of IT hardware that is periodically refreshed within the data centre; and this source is often overlooked because the manufacturing of IT hardware is outside the scope of most data centre constructions.'

BREEAM considers the embodied impacts (including human toxicity and water extraction) of construction materials for structural elements, finishes and landscaping. So does LEED through the use of the Athena EcoCalculator. But neither scheme includes consideration of IT equipment or the power and cooling infrastructures.

Tozer explains: 'In data centres the turnaround of IT equipment is close to three years compared to around 20 years for M&E systems and 60 years for buildings. Therefore the impact of the embodied energy of materials within IT equipment will be roughly seven and 20 times higher than for the same materials in M&E systems and buildings respectively.'

Without a study of the full life cycle, it is difficult to know whether our data centres are truly sustainable. Complex though the process is, it is the necessary next step in building sustainability.

● **BETH WHITEHEAD** is a PhD researcher at London South Bank University

Definition

LCA is an iterative tool for assessing the impact a product or service has on the environment throughout its full life cycle. It looks at material and energy flows to and from nature – from the extraction of raw materials, to the manufacturing, transportation and operation of the product, and its eventual disposal.

	Recommended Guidelines	Allowable Guidelines
Dry Bulb Temperature	18C to 27C	15C to 32C
Humidity	< 60%	20% to 80%
Lower and Upper Dew Point Temperatures	5.5C and 15C	5.5C and 17C

Figure 1: ASHRAE's Thermal Guidelines for Data Processing Environments

underfloor to the data field, supplying air to every second aisle of the racks of equipment, so creating a hot and cold aisle configuration. And by compartmentalising each aisle all the cool supply air must pass through the IT equipment.

This maintains it at an appropriate temperature by removing the heat produced by the electronic components. The air is then extracted at high level in the hot aisle. The air from the hot and cold aisles does not mix and, by constraining the flow of air to pass intimately across the data components at a reasonable velocity, the cooling potential of the incoming air is maximised.

Since the range of acceptable supply conditions is primarily determined by the cooling effected by the air dry-bulb temperature, evaporative humidifiers within the air handling unit may be used to provide adiabatic cooling. So long as the outdoor air wet-bulb temperature is a few degrees below the required supply dry-bulb temperature, adiabatic cooling can reduce the dry-bulb temperature to an acceptable value.

This will consume water but there may be opportunities to use desiccant systems to exchange moisture between incoming and discharge air to reduce water use.

And for those days when the outdoor air temperature is too cold to supply to the

CIBSE REPUBLIC OF IRELAND

CIBSE Republic of Ireland supports building services engineers and helps promote the sector in the region by accrediting courses of study, approving work-based training programmes and providing routes to full professional registration and membership.

With more than 800 members, the region hosts regular conferences, technical seminars and social events. The most recent event, which attracted around 150 delegates, was a one-day conference enitled 'Sustainable Engineering for the Smart Economy', at which Marcus O'Brien gave a presentation that formed the basis of his article on page 42.

The region is also holding the Irish Lighter and Young Lighter Awards 2011. The awards, sponsored by Enlighten and supported by CIBSE, Dublin Institute of Technology, Institute of Lighting Engineers and the Society of Light and Lighting, are open to all building services professionals and are now inviting entries. A preliminary 200 to 300-word extract needs to be submitted by 14 June – and should cover projects in Ireland, or lighting research.

For further information visit **www.cibseireland.org** or email **kevin.kelly@dit.ie**

> Free air cooling should be a primary consideration when designing a data centre

data centre, return air may be scheduled to mix with incoming outdoor air to maintain appropriate supply temperatures.

The combination of simple free cooling and adiabatic cooling can provide appropriate supply conditions for 99.9% of the year.

For an existing data centre, a new 'free-cooled' data field may be able to co-exist, and connect into, the existing site cooling infrastructure. For new sites, cooling plant will need to be installed for the small period when free cooling is not available. This can be in the form of DX or chilled water cooling coils in conjunction with centralised chillers. This can be a significant capital cost outlay for the client, but the overall operational costs are reduced, due to the significant cost savings achieved using free air cooling. Like every piece of mechanical equipment, it will require maintenance and needs to run on a regular basis (a few minutes a month), but this is insignificant compared to the savings from the reduction in PUE. In addition, the active cooling offers resilience in the event of an external fire, a mains water failure or during periods of maintenance.

It is also possible to use free air cooling in cities like Madrid (99%), San Francisco (99%), Melbourne (98%) and Riyadh (98%) – with maximum supply air temperatures and relative humidity within ASHRAE Allowable ranges. **CJ**

MARCUS O'BRIEN works for Red Engineering Design. **mobrien@red-eng.com**

CASE STUDY FREE COOLING WORKS FOR SWINDON DATA CENTRE

Business services group Capgemini sought proposals for a new data centre design that would deliver a power usage effectiveness (PUE) rating of 1.4 or better when fully loaded.

Red Engineering Design built and tested an off-site modular centre for Capgemini that has been shown to have a PUE of 1.11 – this means that, for every kW of power used by the servers it houses, it uses a further 0.11 kW to provide cooling, lighting, ventilation, and so on.

Using a pre-engineered, factory-built modular system known as BladeRoom, of which it is the first example, the Merlin data centre in Swindon, UK, was constructed within a refurbished, specially adapted warehouse (shown here). The facility operates at 1,000 sq m but this can be doubled in size.

According to Red, the BladeRoom system allows server capacity and all associated support services at Merlin to grow, to meet a rise in demand. Modular construction also 'signficantly' reduces embodied carbon costs levels, the consultancy says. BladeRoom primarily uses evaporative cooling and free fresh air to deliver the cooling requirement, together with a back-up DX system that delivers cooling on rare occasions when required.

Red developed a bespoke climate emulator, which it says meant it could model any climate condition as a fresh air source to the BladeRoom. Red says this enabled it to prove the control functionality in all the different psychrometric control zones, and to demonstrate the control system functionality at all the intermediate points.

Merlin's current performance indicates it will run on free cooling for 99.79% of a typical year. Based on actual weather data, it would have run on full free cooling for 100% of the last four years while providing conditioned air to the computer equipment at a temperature no higher than 24C.

The centre was shortlisted in the New Build Project of the Year category in this year's CIBSE Building Performance Awards. **www.red-eng.com**

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ZONING FOR ENERGY

MASTERCLASS
Professor
Doug King

This month we look at how reviving old-fashioned ways of controlling building systems may offer opportunities for the future

In building services design, we used to have to zone systems for heating and cooling because control systems were relatively crude and did not allow for much in the way of local control. The principle of zoning was to understand how the demands varied in different parts of the building, due to factors like variable solar gains during the day, and occupancy patterns, and then configure the distribution system such that the terminal devices in an entire zone could be controlled as one.

The simplest form of zoning involves dividing the parts of the building with a normal occupancy period from those with extended use, such as the hall and central circulation of a school used for community activities in the evening. The two zones would be provided with separate distribution and circulating pumps, so that the system in the unoccupied zone could be shut down in the evening whilst the occupied zone could be maintained. Further sophistication in zoning would consider the variation in solar gains to the perimeter spaces in the building, as well as the difference between perimeter spaces and the interior. Thus for a typical building you had north, south, east and west perimeter zones, an interior zone and any further subdivision of the zones required for different occupancy periods.

These days, with the advent of cheap control components and the energy benefits brought by using variable flow systems, it is much easier simply to connect all the terminal units to a common distribution, and let the building management system take care of the diversities by directly controlling individual terminal units. So it is rare now for engineers to think in terms of zoning a building in the traditional sense, which I believe is a lost opportunity.

Doug King

Extensive zoning of heating and cooling systems may lead to more distribution pipework, but it could also create new opportunities to exploit surplus energy from solar or casual gains more easily by maintaining exergy between different parts of the building.

> Thinking about how a building naturally divides into zones of heat demand or surplus could fundamentally change the decisions we make about the design of the systems

Zoning a building by occupancy and orientation, even as a simple mental exercise, reveals a great deal about the diversity of demands across the systems. This allows you to estimate the coincident energy peak demands, to come up with approximate plant sizes, without having to resort to modelling the building in an analysis package. Consider also how our perceptions might change if we thought about the building zones as both sources of energy and sinks for energy.

When there is simultaneous excess solar gain in the south perimeter zone and a heating demand in the north perimeter zone, it is common to find that the south zone is cooled whilst the north is heated. If we thought about zones of energy use, perhaps we could find ways to use the surplus heat in the south zone to compensate for the heat loss in the north zone.

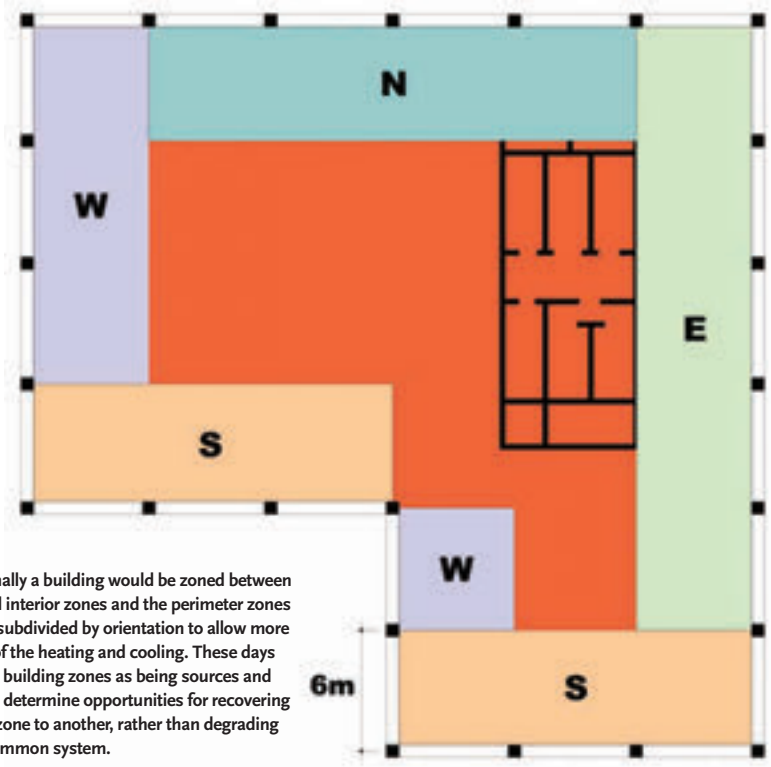

Figure 1: Traditionally a building would be zoned between the perimeter and interior zones and the perimeter zones would be further subdivided by orientation to allow more effective control of the heating and cooling. These days we should look at building zones as being sources and sinks of energy to determine opportunities for recovering energy from one zone to another, rather than degrading the energy in a common system.

In some systems, such as variable refrigerant flow air conditioning or systems using local heat pumps connected to a common water loop, such a point-to-point heat recovery is already a feature; but since all the energy sources are mixed on a common distribution, we sometimes lose the potential exergy by blending the energy sources into the common distribution condition.

The ultimate form of heat recovery is surely process heat, but we are limited by the equipment manufacturers' willingness to engage with the building services systems. It is not unusual for building owners to expend substantial energy cooling central computer rooms, but throw the surplus heat away. Yet you can buy a water cooling system for a PC that will happily harvest around 100W of heat from the computer processing units at a useful 40°C to 50°C. With the heat output from a fully loaded server or blade rack now approaching 20kW, it is surely a nonsensical waste to cool the electronics by forced air and then cool the air back down in a fan coil unit.

Even without such advancements we should still zone distribution systems by operating temperature. Keeping the flow and return pipework to underfloor heating systems separate from the higher temperature distribution for radiators or fan coil units allows us to exploit low-grade heat sources, such as heat pumps, much more efficiently. Alternatively, we can use the low return temperature from the underfloor system to ensure condensing conditions in our boilers before mixing it with the high temperature common return.

Consider also the missed opportunities for air-to-air heat recovery. As we have seen in previous Masterclasses, the magnitude of the temperature difference between the source air stream and the sink is all-important in heat recovery. Yet in most central air systems we mix the exhaust air from all zones together, diluting the heat from the zones that have energy to spare and reducing the opportunity to capture that energy. Perhaps we should instead be keeping the extract air from hot zones at as high a temperature as possible and recovering the heat to zones that need it, rather than delivering it equally back to the zone it came from.

In some cases we will find that the sources and sinks of energy are displaced by time rather than by space. In this case we need to develop means of storing the energy for later use. The simplest form of energy storage is to use the thermal mass of the building structure and contents. Thermally massive buildings are slow to heat up during the day, and slow to cool down at night when the heat gains are removed. This is the basis for all passive heating and cooling strategies.

We can also look further afield to find complementary sources and sinks for energy. The time will soon be upon us when we can no longer consider buildings in isolation, but in order to maximise their efficiency, we must consider them together with their neighbours. A recent development at Stockholm Central Station does just this. Waste heat from the air-conditioning plant that serves the station concourse and shopping mall is pumped across the plaza to an adjacent office building, where it is used to pre-heat fresh air for ventilation.

So, thinking about how a building naturally divides into zones of heat demand or surplus – depending on occupancy, use and orientation – could fundamentally change the decisions we make about the design of the systems. It is certain that this approach will make the design of building services systems more complicated, but that is why our profession exists. I believe that such an approach will become more important as we find that simply bolting renewable energy technology onto buildings will not achieve our carbon reduction commitments. If we can identify a surplus of energy anywhere within our buildings, we should be looking to that first as the source for our heating or cooling needs. **CJ**

> It is rare now for engineers to think in terms of zoning a building in the traditional sense, which I believe is a lost opportunity

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Source: Department of Energy and Climate Change, Consultation on the Renewable Heat Incentive (RHI).

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Indoor air quality

Air quality is set to become even more significant in the work of the building professional, and this CPD article aims to provide an update on those parameters that are currently thought to contribute to indoor air quality

The built environment is rightly focusing increasingly on energy efficiency. But it is important to remember that a primary purpose of the occupied building envelope is to provide a safe and comfortable environment for people – and this where internal air quality (IAQ) becomes a key consideration.

Aside from the easily observable considerations of 'basic' occupant thermal comfort, the effects of the IAQ may have transitory or lifelong consequences for building users. Such effects can be highly visible (as with condensation or mould), or less so but easily measurable (as with radon gas accumulation, for example). Some effects can go undetected and, as such, lead to environments that become linked to 'sick building syndrome'. By maintaining good levels of IAQ, there are likely to be tangible financial benefits through increased productivity and less workplace sickness [1].

As with any real-world design challenge, it is impossible to satisfy all occupants of a building in terms of IAQ. In his seminal work the late Ole Fanger[2] considered the integrating effects for thermal comfort. However, this did not include the effect of IAQ. His later work included the development of the 'olf', and he attempts to provide a numerical correlation between emissions and olfactory response (human sense of smell). This is a complex relationship: the ways that people perceive contaminants will itself be affected by the other room conditions including temperature, humidity and lighting, as well as personal preferences and susceptibilities.

In addition, it is unlikely that contaminants in the air will be dispersed evenly in a space, thereby providing IAQ problem 'hot spots'. In terms of comfort, there are published criteria [3] relating to subjective perception and the acceptable periods for discomfort.

The principal contaminants that are associated with causing problems in IAQ (principally in terms of health) are:

Particulates

The focus here has traditionally been on PM_{10}, which refers to particles of less than 10 µm (micrometres). But attention has increasingly been turning to $PM_{2.5}$ (< 2.5 µm) particles that are measured in µg/m^3 (micrograms per cubic metre).

The recently published SNIFFER report[4] on $PM_{2.5}$ in the UK provides an extensive summary of the current state of scientific knowledge on $PM_{2.5}$. It concludes that there are serious health consequences for long-term exposure to $PM_{2.5}$ (small particles are associated with reduced lung function and increased risk of heart and respiratory disease) and that currently no safe exposure limit is really known. The control of $PM_{2.5}$ in external air is complex because much is outside local control, although activities such as smoking [5], vehicle emissions and a rise in the use of wood stoves have been shown to increase localised values. (EU directive 50/2008 has set a limiting value for $PM_{2.5}$ of 25 µg/m3 in outdoor air by 2015.)

Tobacco smoke

This is generally known as environmental tobacco smoke (ETS). Although not such a widespread risk in public areas in the UK, there are many places around the world (as well as in domestic and other exceptions in the UK) where ETS is still a major

contaminant. ETS is a mixture of particles that are emitted from the burning end of a cigarette, pipe, or cigar, and smoke exhaled by the smoker. Smoke can contain any of more than 4,000 compounds, including carbon monoxide and formaldehyde (see below). More than 40 of the compounds are known to cause cancer in humans or animals, and many of them are strong irritants. ETS is often referred to as 'secondhand smoke' and exposure to ETS is often called 'passive smoking'.

Polycyclic aromatic hydrocarbons

PAH is an organic class of compounds containing just carbon and hydrogen released from burning of fossil fuel and biomass for both room heating and cooking. The cooking food itself will emit PAHs but the greatest indoor influence is ETS. There is a strong connection between PAHs and lung cancer.

Volatile organic compounds

VOCs are chemical compounds that have a carbon (organic) basis and evaporate readily into the air at room temperature. The presence of VOCs is commonly associated with an odour; however, this is not always the case – all can be harmful. There are thousands of different VOCs produced and used daily, examples being Benzene, Formaldehyde, Methylene, Napthalene, Toluene, and Ethylene glycol. Many are not anthropogenic (man-made).

Radon

A radioactive gas formed by the disintegration of radium, radon occurs naturally, especially in areas over granite, and is measured in Becquerels (a measure of radioactive decay) per cubic metre of air (Bq/m^3). Once produced, radon moves through the ground to the air above. When radon undergoes radioactive decay (it has a half-life of four days), it emits ionizing radiation in the form of alpha particles. It also produces short-lived decay products (progeny), some of which are also radioactive. Unlike radon, the progeny are not gases and can easily attach to dust and other particles. Radon is strongly associated[6] with lung cancer. The Health Protection Agency recently announced that it was introducing a 'target level' of 100 Bq/m^3, to reflect international guidance from the International Commission for Radiological Protection[7]. The ingress of radon may be reduced by appropriate building details effectively trapping the gas by a gas-impermeable sheeting (plastic) and venting the trapped gas away from the occupied areas.

> Carbon dioxide is often measured when trying to determine the indoor air quality of a building as it can provide an indication of the number of occupants

Figure 1: Table of recommended exposure levels for some substancesa

Guidelines for limiting amounts of selected substances in air			
	Averaging time	**By volume**	**By mass**
Benzene	1 year	5 ppb	16 µg.m^{-3}
Carbon monoxide	15 min	86 ppm	100 mg.m^{-3}
	30 min	52 ppm	60 mg.m^{-3}
	1 hour	26 ppm	30 mg.m^{-3}
	8 hours	10 ppm	12 mg.m^{-3}
Formaldehyde	30 min	80 ppb	100 µg.m^{-3}
Nitrogen dioxide	1 hour	150 ppb	300 µg.m^{-3}
	1 year	21 ppb	42 µg.m^{-3}
Ozone	8 hours	60 ppb	120 µg.m^{-3}
PM10	24 hours	-	50 µg.m^{-3}
Toluene	1 week	68 ppb	260 µg.m^{-3}

Other inorganic gases

These include the following:

Ozone (O_3) concentrations are generally lower at urban locations than at rural locations. This is due to the destruction of O_3 by nitric oxide (NO) that is emitted by vehicles. O_3 levels are usually higher during the spring and summer months because of more movement from the upper atmosphere and more sunlight, which allows O_3-forming chemical reactions to occur more rapidly. O_3 can have a characteristic sharp odour when at very high concentrations, such as that associated with photocopiers and laser printers.

Carbon monoxide (CO) is an odourless, colourless gas that interferes with the delivery of oxygen in the blood to the rest of the body. It is produced by the incomplete combustion of fuels.

Carbon dioxide (CO_2) is also a colourless, odourless gas. It is produced when any carbon-based material used for fuel (coal, oil, wood, etc.) is burned, as well as by tobacco smoke, human and animal respiration. Vehicles and industrial equipment, and burning fuel for power are some of the major contributors to CO_2 in the air.

CO_2 is not generally found at hazardous levels in an indoor environment, and it is often measured when trying to determine the indoor air quality of a building as it can provide an indication of the number of occupants. If the levels of CO_2 are high, it is assumed that there may not be adequate ventilation to that area, which in turn may allow for the build up of other environmental contaminants. For a 'standard' room occupation a rate of 8 l/s fresh air per person would mean that the levels would rise 600 ppm CO_2 which, when added to the normal outdoor CO_2 of 400 ppm, gives an internal CO_2 concentration of 1000 ppm – this is unlikely to provide any discomfort

Nitrogen oxides (NO_x) arise from combustion and vehicles (including garden equipment), together with hydrocarbons, reacting to produce nitrates and, with the assistance of sunlight, ozone. They have been shown to affect the respiratory tract of humans and increase the susceptibility to infections.

Sulphur dioxide (SO_2) is produced in various industrial processes. Coal, oil and petrol combustion generates sulphur dioxide. It irritates the human respiratory tracts and the effects are felt very quickly – within 10 or 15 minutes.

Mould and fungal spores

Moulds produce tiny spores that waft through the indoor and outdoor air continually. When mould spores land on a damp spot indoors, they may begin growing

and digesting whatever they are growing on in order to survive. There are moulds that can grow on wood, paper, carpet, and foods. When excessive moisture (a relative humidity greater than 60%) or water accumulates indoors, mould will grow. Once established, mould will continue to thrive even at lower humidities and so continue to release musty odours. Potential health effects and symptoms associated with mould exposures include allergic reactions, asthma, and other respiratory complaints.

The removal of mould is particularly hazardous, as when it is disturbed it can release spores into the air that are easily inhaled. There is no practical way to eliminate all mould and mould spores in the indoor environment; the way to control indoor mould growth is to control moisture.

Viruses and bacteria

Bacteria is carried by people, animals, and soil and plant debris. Viruses are transmitted through the air by people and animals with infectious diseases. Such ailments as SARS, influenza, measles, tuberculosis and chicken pox are transmitted through the air.

Dust mites

Humidities above 50% at normal room comfort temperatures are associated with adverse health implications for asthma and allergy sufferers. If the space humidity is maintained below 50% for an extended period, the risk of mites can be substantially reduced.

Exposure in practice

Table 8.2 in *CIBSE Guide A (2006)*[3] provides some guideline values for currently accepted limit values of exposure to substances – see Figure 1 for part of this list – the exposure levels are given variously in parts per million (ppm) and parts per billion (ppb) depending on their magnitude.

A BRE study in 2002[8] indicated a wide range of contaminants present in homes with a good degree of correlation with high levels of VOCs such as toluene with houses that suffered with condensation – the likelihood being that high levels of contaminants were present due to poor or inadequate ventilation strategies. Both benzene and toluene are constituents of tobacco smoke and the survey indicated that their concentrations were strongly related to smoking in the home.

The levels of benzene were found to be above the requirements set by the UK National Air Quality Strategy in more than 50% of homes.

The levels of NO_x and CO are affected differently to those of the VOCs. VOCs are linked to building materials and furnishings that provide a constant source of emissions throughout the year, whereas CO and NO_2 are combustion products whose indoor emissions are mainly activity related and so more prevalent in the cooler months. They are also strongly intermittent and will vary with the use of such things as gas cookers, paraffin heaters and tobacco.

Increased levels of VOCs – as given off by some carpets, PVC flooring and floor varnishes – tend to make the occupants more critical[9] of their thermal comfort – presumably they feel discomfort and can more openly rationalise it in terms of temperature and humidity. Inevitably, newer premises are likely to have higher levels of VOCs due to the materials used, particularly flooring and wall coverings. However, the fabric of a house can also act as a collector (or 'sink') for some substances such as NO_2 giving potentially lower values inside than outside. External influences such as roads and industrial and commercial processes will lead to higher levels of NO_2.

There do not appear to be recently published UK surveys of IAQ in energy efficient homes (those complying with the Level 4, 5 or 6 of the Code for Sustainable Homes) – there is a need for some research. It is likely that areas susceptible to increased flooding in the UK will lead to greater potential problems in IAQ. Standing water and wet materials can become a breeding ground for microorganisms: bacteria, mould, and viruses.

CIBSE[3] recommends that the following measures, in sequential order, can be adopted to reduce the exposure of occupants to airborne contaminants in buildings:

1. Eliminate contaminant(s) at source;
2. Substitute with sources that produce non-toxic or less malodorous contaminants;
3. Reduce emission rate of substance(s);
4. Segregate occupants from potential sources of toxic or malodorous substances;
5. Improve ventilation, for example by local exhaust (if source of contamination is local), displacement or dilution; and
6. Provide personal protection.

When contaminants are being produced within a space, some basic modelling may be undertaken (most easily using a spreadsheet) to establish the averaged levels. ASHRAE Standard 62[10] provides extensive guidance on both single and multi-space ventilation. CIBSE[11] provides some useful formulae to establish ventilation requirements to maintain internally emitted contaminants at prescribed 'safe' levels.

Bibliography

*CIBSE Guide A*1, 2006

ASHRAE Fundamentals Handbook 2009, Chapters 10, 11, 12, 13

ASHRAE Standard 62-2010, Ventilation for Acceptable Indoor Air Quality

CIBSE Knowledge Series, KS6, *Comfort*

CIBSE TM40: 2006, *Health issues in building services*

WHO guidelines for indoor air quality: selected pollutants, 2010

References

1. *Indoor Air Climate and Productivity*, Seppanen, Proceedings of 9th International Conference on Indoor Air Quality and Climate, Beijing September 2005
2. *Fanger PO, Thermal Comfort*, McGraw Hill, NY 1973
3. *CIBSE Guide A*, 2006
4. *Scotland & Northern Ireland Forum for Environmental Research (SNIFFER), ER12 Final project report* (PM 2.5 in the UK), 2010, **www.sniffer.org.uk/**
5. *Not just 'a few wisps': real-time measurement of tobacco smoke at entrances to office buildings*, Kaufman et al, Ontario Tobacco Research Unit, 2010
6. *Report of Independent Advisory Group on Ionising Radiation*, The Health Protection Agency (HPA), 2010
7. *International Commission on Radiological Protection Statement on Radon*, ICRP Ref 00/902/09, 2009, **www.icrp.org/docs/ICRP_Statement_on_Radon(November_2009).pdf**
8. Coward et al, *Indoor air quality in homes in England (Volatile organic compounds)*, BRE Centre for Safety, Health and Environment 2002
9. Fang, L G Clausen & PO Fanger 1996 *The impact of temperature and humidity on perception and emissions of indoor air pollutants Indoor Air '96*, Tokyo, 1996
10. ANSI/ASHRAE Standard 62-2010, *Ventilation for Acceptable Indoor Air Quality*
11. CIBSE TM40: 2006, *Health issues in building services*

Module 27

April 2011

1. What is the limit to PM2.5 set by the EU for 2015?

- ☐ A 5 µg/m3
- ☐ B 10 µg/m3
- ☐ C 15 µg/m3
- ☐ D 20 µg/m3
- ☐ E 25 µg/m3

2. What is target value for maximum radiation from radon?

- ☐ A 1Bq/m3
- ☐ B 10 Bq/m3
- ☐ C 100 Bq/m3
- ☐ D 1000 Bq/m3
- ☐ E 10000 Bq/m3

3. When applying 'normal' ventilation rates to occupied zones approximately what level of CO2 is likely?

- ☐ A 1 ppm
- ☐ B 10 ppm
- ☐ C 100 ppm
- ☐ D 1000 ppm
- ☐ E 10000 ppm

4. Which of these humidities would be most appropriate to reduce numbers of dust mites?

- ☐ A 45%
- ☐ B 50%
- ☐ C 55%
- ☐ D 60%
- ☐ E 65%

5. What is the guideline maximum exposure to carbon monoxide averaged out over 8 hours?

- ☐ A 5ppb
- ☐ B 80ppb
- ☐ C 10ppm
- ☐ D 26ppm
- ☐ E 52ppm

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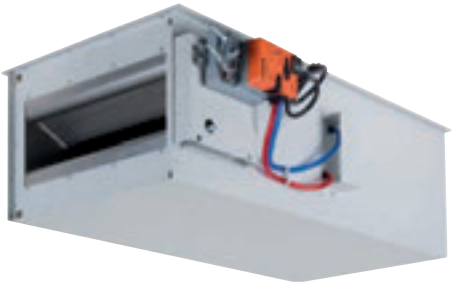

Compact piano sound damping units from Schako – music to your ears

The Piano range of sound damping control units from Schako – European leaders in quality ventilation and air conditioning systems – provide a compact solution to noise reduction in supply and return air systems. Without any detrimental effect on performance, Piano control units are half the height of many comparable products, making them easy to install, especially in tight spaces such as suspended ceilings, where space is at a premium.

For more information call 01344 636389, visit www.schako.com or email schako.uk@btconnect.com

Legionnella risks controlled by Oventrop at Aston Student Village

Oventrop valves have been used for Phase one of the new Aston Student Village (ASV) at Aston University's Campus in Birmingham city centre to provide effective control and hydronic balancing in heating systems for 1330 student en-suite bedrooms. The first phase of the ASV comprises two accommodation buildings, one of which incorporates an 18-storey tower. The other building is eight storeys high. Carillion were the main contractors. The scheme also serves other premises including local authority offices, a library, hotel, theatre and a children's hospital.

For more information call 01256 330441 or email sales@oventrop.co.uk

Keep your workforce comfortable

Delivering a healthy working environment free of air-borne contaminants in industrial and commercial premises is a high priority for many employers in order to meet health and safety regulations. The problem is that, historically, the technology available has been relatively inefficient. Clivet has now developed a high efficiency packaged unit, the Zephir2, which provides filtered fresh air while simultaneously extracting energy from the exhaust air. This ensures that full air renewal and purification is achieved at maximum efficiency.

For more information call Andy Mayes on 01489 550626, email a.mayes@clivet-uk.co.uk or visit www.versatemo.co.uk

HygroMatik steam injection system humidifies the UK

HygroMatik is introducing the DDS to the UK – a significant development in steam injection humidification. Suitable for use in air supply ducts, the DDS provides dry steam on demand into the system. The equipment is light-weight, easy to install and operates with great sensitivity, combining very rapid reaction for high humidification requirements with especially fine control in lower ranges. The DDS is a highly engineered, closed system that humidifies with condensate-free saturated steam.

For more information visit www.feta.co.uk/humidity

The versatile SOLATRON S2.5 from MHS Boilers

MHS Boilers has launched a new easy to install, low cost and highly efficient flat panel solar collector that can be mounted in-roof, on-roof or in-frame. The SOLATRON S2.5 from ELCO is a state-of-the-art collector that has been designed to be versatile, economic and incredibly easy to fit – needing only a cordless screwdriver, a hammer and a tape measure! SOLATRON S2.5 is available in both horizontal and vertical hydraulically-optimised versions, and each orientation is supplied with matching mounting systems and roof flashings.

For more information visit www.mhsboilers.com

Fabbri, a heating and recycling solution for manufacturing facilities

Businesses generating waste wood could heat their workspaces for free with a Fabbri wood-biomass boiler from Euroheat. Thomas Panels and Profiles, in Leominster, is one of the UK's biggest independent manufacturers and merchants of roofing and cladding sheets. Waste is now incinerated in a 400kW Fabbri wood-burning heater. This pumps out enough heat to keep staff at a comfortable temperature – even in the depths of winter.

For more information visit www.euroheat.co.uk

Telephone: 020 7880 6206 **Email:** darren.hale@redactive.co.uk

Fantech Ventilation breezes into Tesco Portlaoise Shopping Centre, Ireland

Fantech Ventilation has just supplied its largest-ever order for car park ventilation equipment for a turnkey project at a new Tesco superstore in Portlaoise, Ireland. The Dublin company works closely with local engineers and contractors, supplying a wide range of fans, grilles, diffusers, air handling and heat recovery products manufactured by Elta Fans. The original order came from client Automatic Smoke Ventilation Systems, which is currently undertaking the ongoing car park installation at Portlaoise Shopping Centre.

For more information visit www.fantechventilation.com

BG Controls helps Bradford council reduce energy bills with BMS

Building controls specialist BG Controls is helping Bradford Metropolitan District Council save money by installing a building management system (BMS) in six of its buildings. BG Controls has recently upgraded the BMS for the following buildings: Richard Dunn Sports Centre, Bowling Pool, Jacob's Well council offices, Neville Grange care home, Baildon Recreation Centre and Heaton Primary School. BG Controls has also won the contract to upgrade the BMS of another four buildings for the council.

For more information call Duncan Biggins on 01909 517460, email enq@bgcontrols.co.uk or visit www.bgcontrols.co.uk

SE Controls provides a breath of fresh air

The Mavis Peart Building is a centre for people with learning difficulties in Sutton. The building is provided with mixed-mode, cross-flow ventilation that is fed through automated windows on one side, interfaced with low energy VAV ducted extract via modulating dampers on the other. The window and damper positions are controlled with temperature, CO_2, wind and rain sensors. Underfloor heating is installed in each classroom. The college's facilities management team can monitor the SE Controls system from anywhere on campus, using networked computers.

For more information visit www.secontrols.com or call 01543 443060

The best just got better… and there's more to come with new Evolution launch

Casella Monitor will shortly release its new Evolution range of ambient gas analysers. Building on the heritage, reliability and high quality of the existing certified ML 9800 series, these new analysers have been designed to offer improved user interface and functionality without compromising on measurement cell performance or quality of data. The Evolution range offers outstanding technical advances and extends Casella Monitors worldwide product offering in the ambient air quality measurement and control market.

For more information call 01234 844100 or visit www.casellameasurement.com

Best in class and a whole lot SMARTer

Greenwood Airvac launches Unity CV2GIP, the easiest to fit and commission dMEV fan in the UK – especially in line with GIP (Guaranteed Installed Performance), now a crucial part of the Building Regulations 2010. The ultimate single fan, Unity CV2GIP has been intelligently designed with speed and simplicity in mind. With fuss-free installation, Unity CV2GIP boasts eight patents and registered designs, including a 'twist-lock' front fascia, which simply turns for removal.

For more information call 0870 900 1880 or visit www.greenwood.co.uk/GIP

Trainee teachers warm to Weatherite

Students and staff at Enfield teaching college in London will be feeling much warmer thanks to a heating system installed by Weatherite Building Services. Weatherite assumed full responsibility for the supply and installation of a Buderus gas condensing boiler, two Grundfos circulation pumps, plus a new flue system from the boiler house to the roof and all associated building and electrical work. The boiler will reduce the college's energy bill and contribute to its environmental credentials.

For more information call Robert Boswell on 0121 665 2266 or email rboswell@weatheritegroup.com

Securitherm thermostatic basin/sink mixers offer '50% water savings'

Douglas Delabie has extended its Securitherm range with new thermostatic basin and sink mixers – independently tested and certified by BuildCert to NHS model engineering specification D08 / TMV3. Bob Purdom, commercial director, said: 'With the basin mixers regulated at 5 lpm (at 3 bar), 50% water savings are delivered and the sink mixers deliver 18 lpm for an optimised fill time. Users can select comfort temperatures to prevent water wastage and they are ideal for hospital and healthcare applications.'

For more information call 01491 824449 or visit www.douglasdelabie.co.uk

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Polypipe heat recovery units offer compact, effective solution

Polypipe Ventilation, manufacturer of domestic and light commercial ventilation systems, has had its heat recovery system installed in a housing development for South Shropshire Housing Association. The association currently owns and manages more than 2,000 properties and, as part of Shropshire Housing Group, will contribute towards the development of 500 new homes by 2013. The Polypipe HR01 heat recovery units have been installed into the housing association's new properties by Hereford Boiler Services.

● **For more information call 08443 715523 or visit www.polypipe.com/ventilation**

Further education in space heating from MHS Radiators at Exeter University

MHS Radiators has supplied a selection of Galeria, Matrix, Monoplan and Carat radiators to the INTO International Students Centre at the University of Exeter, Devon. The project, which will increase academic performance and capacity for international students, is a joint venture between INTO University Partnerships and the university. Comprising a lecture theatre, learning resource centre, flexible teaching spaces and a café, the centre is scheduled to be completed in early 2011, at a cost of £7m.

● **For more information visit www.mhsradiators.com**

BACnet Control from Titan Products

Titan Products has developed a range of application specific controllers. Designed for every control requirement, the controllers offer total flexibility. The BACnet range includes fan coil, VAV, room, natural ventilation and plant-room controllers, as well as BACnet to Modbus gateways. The controllers can be used as stand-alone or as part of an integrated building management system, and have an option for a built-in display. Each controller can be used in conjunction with Titan's RDU (room display unit).

● **For more information visit www.titanproducts.com or call 0161 406 6480**

Grundfos introduce Blueflux – the next generation of motors

Grundfos produces 16 million pump units annually, and continues to invest heavily in high efficiency motors. This is important, as energy generally accounts for 85% of a pump's overall life cycle costs and, without the right motor, even the best pump will not perform optimally. The next generation of Grundfos motors is called Blueflux. This technology represents the best from Grundfos within energy efficient motors and variable frequency drives.

● **For more information call 01525 850000 or email uk-sales@grundfos.com**

Teekay Couplings selected for Royal Navy aircraft carriers

Pipe coupling manufacturer Teekay Couplings has announced it is supplying patented fire-protected pipe couplings to the Queen Elizabeth Class Aircraft Carriers – the Royal Navy's largest vessels. The Queen Elizabeth Class vessels are 65,000-tonne aircraft carriers, 280m in length. The vessels are being built in multiple stages at major shipyards around the UK. Teekay Axilock-FP Pipe Couplings have been selected for joining steel, copper nickel and GRE plain end pipes on the QEC project.

● **For more information call 01494 679500 or email info@teekaycouplings.com**

Ark Academy in Wembley features REHAU Profila data cable management

REHAU's Profila data cable management system has been installed in many classrooms at the new Ark Academy in Wembley. The 180mm x 65mm system was chosen by outsourcing company MITIE for the power and data cabling, on the basis of its quality, durability and ease of installation. John Eagan, project manager, said: 'We were very impressed with the REHAU product, particularly the ease and speed of fitting. An excellent quality of finish could be achieved in a very short time.'

● **For more information call Jo Price on 01989 762600 or email jo.price@rehau.com**

Telephone: 020 7880 6206 **Email:** darren.hale@redactive.co.uk

Vaillant is king of the castle

Vaillant's 18 ecoTEC plus 6 series boilers and uniSTOR cylinders are being installed at Golden Hill Fort near Yarmouth on the Isle of Wight, which has been converted into a complex of 18 luxury homes. Sean Cousins, a developer at Golden Hill Homes, chose the Vaillant products for the project because of their high quality, as well as the company's reputation, market position and after-sales service. A green roof system was also installed, affording a landscaped roof garden with spectacular views.

For more information call 01634 292300 or visit www.vaillant.co.uk

JS Air Curtains goes to great lengths

A 7.4m-long stainless steel Rund air curtain system has been supplied and installed at 151 Buckingham Palace Road, London, by JS Air Curtains during a recent refurbishment. The bespoke system comprises two 2m-long air curtains with a dummy section at each end. The air curtain system was specified by building services consultants, The Anslow Partnership. The functioning central air curtains create a barrier of air to help prevent cold air from entering the reception area, even with the doors in regular use.

For more information call Mike Verney on 01903 858656 or email mverney@jsaircurtains.com

New Freedor swings into action

Freedor is the new, unique, ergonomic solution for holding fire doors open safely and legally, while enabling improved access. Freedor couldn't be simpler; it's a wireless, electrically powered free-swing door closer that's installed at the top of a fire door, allowing the door to swing freely or be left in any position, automatically closing the door when the fire alarm sounds. Freedor is simple, neat and unobtrusive, and it's easy to install in new buildings and in retrofit projects.

For more information visit www.firecoltd.com, call 0845 241 7474 or email sales@firecoltd.com

Samsung takes digital air conditioning to new heights of efficiency and comfort

The launch of Samsung DVM Plus IV takes digital VRF air conditioning for large buildings to new levels. This fourth generation of the pioneering DVM system, Samsung's high-tech digital hybrid technology, now packs even more power and extended piping lengths and elevations into a compact design. Featuring the world's largest capacity module at 80HP, and an industry leading 20HP single unit, the DVM Plus IV range saves space and installation costs without compromising cooling and heating performance.

For more information call Richard Lockwood on 01932 455000, email r.lockwood@samsung.com or visit www.samsungac.co.uk

Vulcathene educates prep school

Vulcathene chemical drainage pipework was the choice for a refurbishment project at Newton Prep School in London. The independent school has undergone a refurbishment of the science block to bring its facilities up-to-date. The refurbishment saw all of the existing laboratories stripped out and replaced, as well as the installation of three new laboratories. Vulcathene Mechanical pipework system, in sizes up to 76mm, has been installed by Brava Building Services for the chemical drainage requirements of the school's science laboratories.

For more information call 01543 279909 or visit www.durapipe.co.uk

New bio-fuel brochure now available

Atlantic's R Series, dual-fuel, year-round maximum condensing boiler, can burn vegetable and waste oils as transformed B100 bio-diesel, as well as light oil, kerosene, natural gas and LPG in a clean manner, and within EU NOx emission standards. For all these fuels, efficiencies exceed 92% GCV and can rise to more than 97% GCV. This environmentally friendly boiler has been installed in a variety of buildings, including country houses, royal residences, colleges and housing developments.

For more information call 0161 6215960, email nabeela@atlanticboilers.com or visit www.atlanticboilers.com

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For more info visit www.aircraftairhandling.com

Armstrong helps drop-in centre provide a warm welcome

When the heating system in a housing scheme and drop-in centre for vulnerable people in Bristol reached the end of its useful life, it looked as though the facility would have to shut down for maintenance. But the off-site construction of a heating system by Armstrong made it possible for the changeover of the boiler plant to take just one day, so visitors to the centre could continue to receive support. Fuel bills at the centre were also reduced.

For more information call 08444 145145, email sales@armlink.com or visit www.armstrongintegrated.com

Air Diffusion launches 24-hour service

Leading ventilation product supplier, Air Diffusion, has launched a next-day delivery service for its stock range of grilles and diffusers. The Shropshire-based company says it is responding to growing demand for short lead times and is building up its stocks accordingly. Part of the Ruskin Air Management group, Air Diffusion has been manufacturing air distribution products since 1972 and is now regarded as one of the UK's top manufacturers of standard and bespoke products.

For more information visit wwww.air-diffusion.co.uk

Air Diffusion has a strong reputation, according to sales and marketing director David Fitzpatrick

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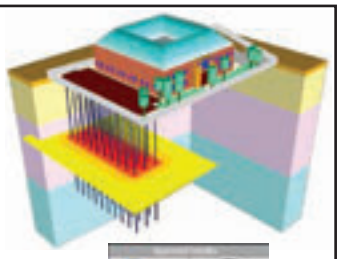

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Electrical Engineer

£30-35k +Benefits. ***London***

Intermediate electrical engineer required to work on projects including retail, leisure and commercial schemes for a rapidly expanding consultancy in London. Candidates will be degree qualified, be conversant with Amtech or Hevacomp calculation software and have previously been responsible for design of lighting, small power, containment and distribution, along with attending design and client meetings.

BAR579/JA

Technical Director (Electrical)

60,000 Dirhams p/cm. ***Dubai UAE***

A major International engineering consultancy requires a Technical Director to head up a team in their regional Abu Dhabi Office. This position offers the opportunity to play a key role in the delivery of ever more imaginative development projects including landmark buildings in the UAE. The ideal applicant will currently reside in Abu Dhabi or the UAE and be from an electrical building services background.

BAR562/PA

Int. Mechanical Engineer

£30k +Benefits. ***Surrey***

Our client requires a degree qualified intermediate engineer with a solid foundation which they can invest in and build upon. You should be able to demonstrate a good technical understanding of building services, design, surveys, site supervision and inspection in a range of sectors. The client is a medium sized building services consultancy established 35 years with projects in the commercial, residential, education, industrial and leisure sectors.

BAR581/CB

Mechanical Asc. Dir.

£60k +Bonus +Benefits. ***Berkshire***

Our client, a small independent consultancy established 10 years requires an associate to provide additional leadership and management, whilst driving technical excellence and client care. The role will involve a high degree of business development, and as such applicants will have excellent inter-personal and presentation skills, capable of communicating effectively at all levels. A significant contribution to the development and profitability of the business has the potential to lead to equity.

BAR 565/PA

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IT'S TIME FOR A CHANGE!

Project Controls Director | Hampshire | £NEG! | ref: 3289
We are looking for someone with solid planning, commercial and technical experience to run major projects for our growing client. You will have a good engineering background and come from a planning environment.

Electrical Design Engineer | London | to £33 LTD | ref: 3543
Blue chip client, looking for senior level engineer for long term contract role. This is a top 3 practice which has a solid order book for 2011. Various projects including aviation, rail and overseas.

M & E Design Engineers – Airports! | London | to £33 LTD | ref: 4878
Our client has won a major international airport scheme and is looking for experienced mechanical and electrical design engineers to join the project. Previous aviation experience would useful but not essential.

Business Development Manager | Hampshire | £NEG! | ref: 6854
We are looking for an individual from the technical end of BD. The role is primarily client, not consultant, focused. Experienced within multi-disciplined environments would be useful.

Elec Design Eng – Critical Facilities | London/Surrey | £NEG! | ref: 6412
You will ideally be Chartered and have significant experience, with a particular focus in the data centre/critical facilities sector.

Principal Public Health Engineer | London | to £60K | ref: 1250
We are looking for an experienced Public Heath Engineer to perform a lead role for this blue-chip consultant. With offices across the UK they are currently involved with commercial, retail and major mixed use developments.

For more information or a confidential discussion please contact Mark Butter

t: 02392 603030

e: mark.butter@blueprintrecruit.com www.blueprintrecruit.com
E3 & E5 Heritage Business Park, Heritage Way, Gosport, Hampshire PO12 4BG

Recruitment for Building Services Professionals

bsv

Sprinkler Design Engineer

Ref: 11767 Kent, circa £35-£45,000

Our client is a multi-disciplinary company providing the full spectrum of building services to many of the biggest companies in the world. With a greater demand for their services they now need to find a specialist Sprinkler Design Engineer with the right aptitude to continue their progress. This position requires the applicant to have the ability to use AutoCAD, have hydraulic calculations experience and you will have designed sprinkler systems in accordance with relevant standards and codes.

Contact richard.sutton@bsvconsultants.co.uk for further details.

Building Services Design - Real Estate adviser

Ref: 11419 C.London £45-50k plus excellent benefits

Working for an international Property Management company you will deliver an agreed Building Services strategy and business plan for the business and it's external clients. Coming from a design background you will be familiar with M&E Asset Register Verification Surveys and Reports and provide lifecycle analysis of M&E Assets. This role will include internal and external relationships including commercial clients, local authorities, service providers and statutory bodies with regard to M&E matters. This is a fantastic opportunity to develop a new division which could be rolled out nationwide.

Contact darrenw@bsvconsultants.co.uk for further details.

Senior Mechanical Design Engineer

Ref: 11659 Birmingham, £30-50,000 + excellent benefits

Our client who has become one of the UK's largest environmental building services consultancies, requires a Senior Mechanical Design Engineer. They provide bespoke solutions to a wide range of market sectors, covering a multitude of building types and complexities delivering for both private and public sector clients. You will be project managing mechanical design projects from inception to completion whilst identifying and managing recourses to achieve project requirements. You will be mechanically degree qualified with a solid background in building services consultancy work, good technical knowledge, in addition to experience in project management and the leadership of projects. This is an excellent opportunity with a company that offer attractive benefits, on-going training, good prospects and a friendly working atmosphere.

Contact richard.sutton@bsvconsultants.co.uk for further details.

For further information please contact Richard Sutton or Darren Warmington on 01483 768600 or email your CV in confidence to richard.sutton@bsvconsultants.co.uk or darrenw@bsvconsultants.co.uk.

Be the first to check out the new BSV website!

www.bsvconsultants.co.uk

Events & Training

Excitement builds for football World Cup

The Building Services World Cup is a prestigious annual international football tournament for building services engineering and built environment professionals.

Engineering Sport has been set up to manage the event – with the help of Liverpool City Council, Liverpool County FA, CIBSE and other partners.

The tournament is registered with the English Football Association – and this year's event will be held in Liverpool, UK, on Saturday 11 June.

Team registration ends on the 31 May 2011 – or once the maximum tournament team numbers has been reached.

There will be a tournament draw shortly after the registration closing date, and details will be announced soon. All competition matches will take place at the Liverpool University Mather Avenue site in the city.

The event will be seven-a-side, and it is anticipated that the game duration will be 30 minutes, over two halves.

The entire competition will be played on 11 June 2011, and will be extensively promoted across all REHVA/ASHRAE regions. It is open to all associated industry businesses and employees.

Last year's winners, Crown House Scotland FC

Profits from the event will be donated to the Everyman charity.

For more details visit www.buildingservicesworldcup.com

NATIONAL EVENTS AND CONFERENCES

Th!nkFM Conference 2011
05-06 April 2011, Nottingham
Focus on facilities management.
www.thinkfm.com

CIBSE national conference
07 April 2011, London
One-day conference focused on the refurbishment challenge
www.cibsetraining.co.uk

Understanding major hazards in construction
13 April 2011, London
Half-day conference examining how industry deals with catastrophic events
www.ciria.org/service/hazards

YEN Evening Reception
10 May 2011, London
River Thames, London
www.cibse.org/yen

The Facilities Show
17-19 May 2011, Birmingham
Seminars, products and more.
www.thefacilitiesshow.com

Institute of Domestic Heating & Environmental Engineers conference 2011
26 May 2011, Hatfield
Focus on government policies.
www.idhee.org.uk

Building Services World Cup 2011
11 June 2011, Liverpool
Teams competing for the CIBSE World Cup
www.buildingservicesworldcup.com

SOCIETY OF LIGHT AND LIGHTING

SLL Masterclass – the low carbon challenge
28 April, 2011, Dublin
Seminar focusing on how we can meet the low carbon challenge
www.sll.org.uk

SLL Masterclass – the low carbon challenge
19 May 2011, London
Including a look at the ultra-efficient lighting and designing for efficient visual comfort
www.sll.org.uk

CIBSE REGIONS

UV Filtration
04 April 2011, Cardiff
Presentation by Peter Hudson of UVGI.
jno@neiloliver.plus.com

East Midlands region CIBSE AGM
12 April 2011, Nottinghamshire
Further details to be advised.
densel.davy@ntlworld.com

Southern region AGM and hospital lighting AGM
14 April 2011, Chichester
Presentation by Iain Macrae.
laurie.socker@gifford.uk.com

SoPHE Northern Dinner
06 May 2011, London
The Inaugural Northern Dinner for all SoPHE engineers and industrial associates based in the north of England
www.cibse.org/sophe

CIBSE/OTHER TRAINING

CPD Part L update for LCEAs
12 April 2011, London
www.cibsetraining.co.uk

Air conditioning inspection for buildings
19 April 2011, CIBSE Balham
How to undertake inspections and become accredited by CIBSE
www.cibsetraining.co.uk

CPD Part L – exam only
27 April 2011, CIBSE Balham
www.cibsetraining.co.uk

CPD TRAINING

Visit **www.cibsetraining.co.uk,** call 020 8772 3660 or email eventbookings@cibse.org

GENERAL INTEREST

Electrical Services Explained
10 May 2011, Birmingham

Mechanical Services Explained
16 May 2011, Birmingham

Mechanical Services Explained
15 June 2011, London

ELECTRICAL SERVICES

Introduction to 11kV distribution and protection
16 May 2011, London

Electrical Services Explained
21 June 2011, London

BUILDING REGULATIONS

Part L Building Regulations 2010
07 July 2011, London

ENERGY EFFICIENCY AND SUSTAINABILITY

Energy Surveys
11 April, London

The Carbon Reduction Commitment (CRC)
08 April 2011, London

Energy Strategy Reports
13 April 2011, London

Low and zero carbon energy technologies: undertaking feasibility studies and understanding design considerations
10 May, London

FACILITIES MANAGEMENT

CHANGED DATE!
Introduction to facilities management
11 April 2011, London

Effective Maintenance Management
14 April 2011, London

FIRE SAFETY

Fire safety engineering design
11 April 2011, London

Fire doors, fire doors and more fire doors
12 April 2011, London

Part B (Fire Safety) of the Building Regulations
05 May 2011, London

Emergency lighting to comply with fire safety requirements
02 June 2011, London

MECHANICAL SERVICES

Air conditioning basics 1: comfort, climate and heat gains
06 April 2011, London

Air conditioning basics 2: the air conditioning process
07 April 2011, London

Introduction to combined heat and power (CHP)
04 May 2011, London

Design of heating and chilled water pipe systems
11 May 2011, London

Design of ductwork systems
12 May 2011, London

Variable flow water system design
25 May 2011, London

Air conditioning basics 3: air conditioning
31 May 2011, London

Air conditioning basics 4: automatic controls and refrigeration
1 June 2011, London

PUBLIC HEALTH AND WATER

Sanitary and rainwater design using BSEN 12056:2000
26 May 2011, London

BUSINESS SKILLS AND MANAGEMENT

Practical project management in construction and building services industries
04 May 2011, London

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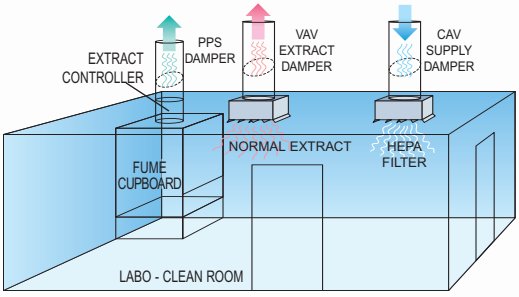

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