CIBSE JOURNAL

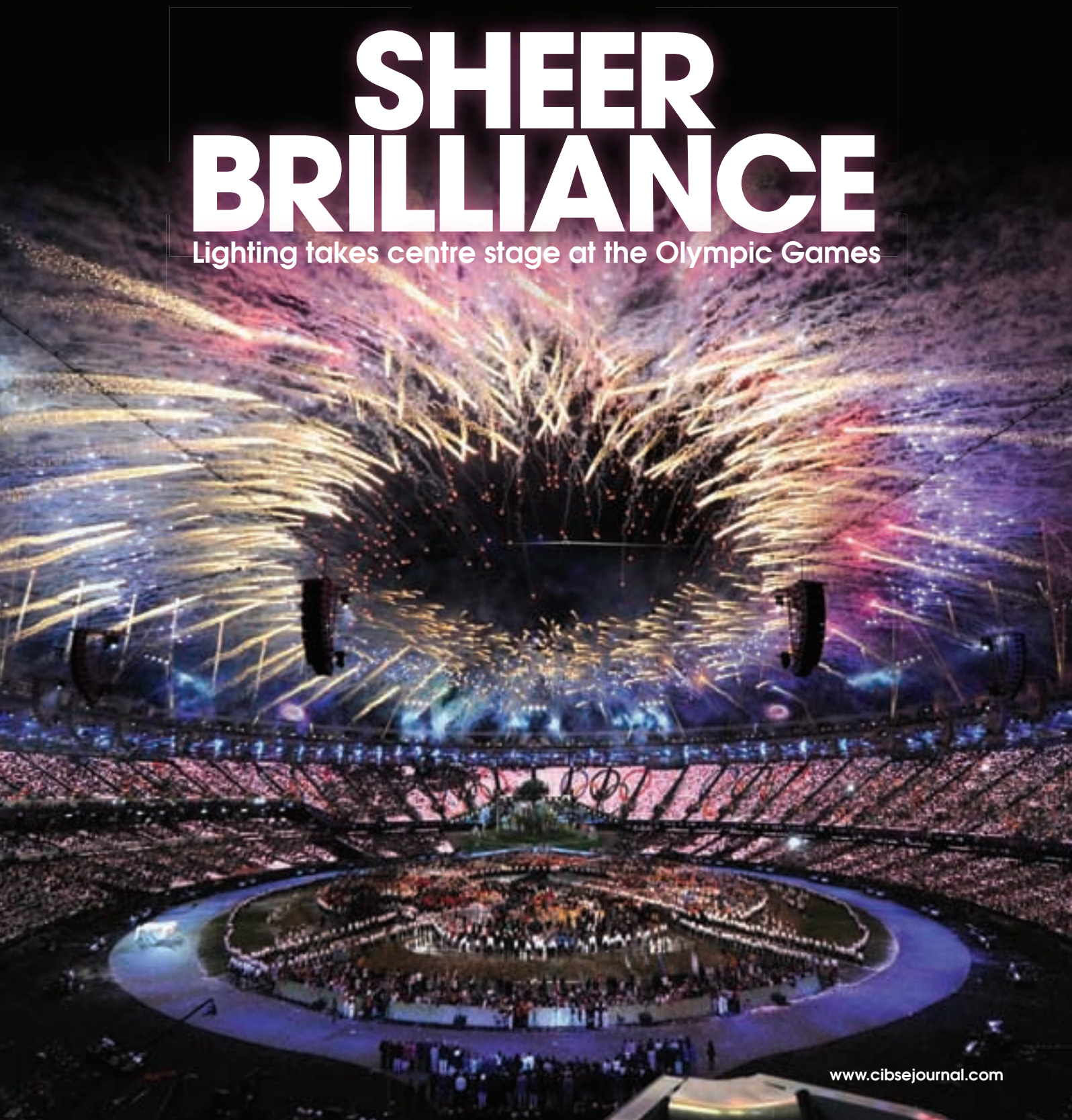
CIBSE

The official magazine of the Chartered Institution of Building Services Engineers

September 2012

SHEER BRILLIANCE

Lighting takes centre stage at the Olympic Games



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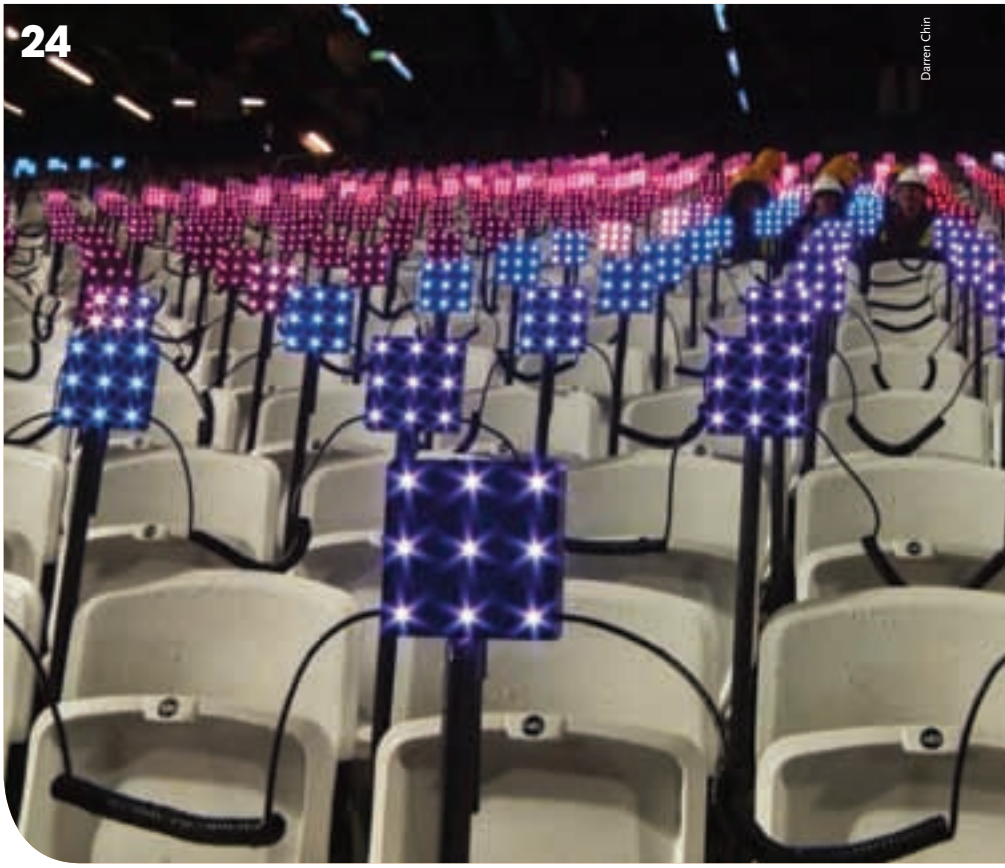

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LEARNING

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Olympic brilliance blinds us to reality

That was very special indeed. The Olympics may only have lasted two weeks but there have been enough magnificent moments to keep us reminiscing well into our Horlicks years.

The construction industry can be proud of its part in this monumental piece of sporting theatre. It created the stage for the world's best athletes to dazzle and amaze in front of a TV audience of billions.

One sector that particularly came to the fore during the Olympics was lighting. The combination of technical innovation and design brilliance produced a spectacle at the opening and closing ceremonies that few outside a U2 concert would ever have witnessed.

LED arrays transformed the Olympic Stadium stands into a huge canvas for lighting designer Patrick Woodruff. He interpreted Danny Boyle's creative vision with a series of spectacular animations that redefined what could be done with lighting on such a huge scale

Lighting expertise was also key in ensuring that billions of television viewers could enjoy the latest innovations in broadcast TV. The lighting requirements for 3D and HDTV have also changed the way sporting arenas need to be lit, and architects had to involve lighting engineers at an early stage to ensure that floodlights could be positioned correctly – it was due to the input of the lighting team that the stadium floodlights changed from square to the – now iconic – triangular shape (page 24).

> Due to the input of the lighting team the stadium floodlights changed from square to the – now iconic – triangular shape

The euphoric bubble of the Olympic Games meant it was easy to forget that we are in one of the worse recessions of modern times, but the gloomy data from the B&ES and CPA (page 21) is a sharp reminder of the tough times we're living in.

The economy is just one of the challenges facing incoming chief construction advisor Peter Hansford. It is hoped the former ICE president will be able to carry on the good work of Paul Morrell in overhauling procurement and encouraging collaboration. Choppy economic waters must not be allowed to push industry off course.

Hopefully, the European Commission won't make things worse with its move to increase VAT on low energy measures. The UK government has gone to Brussels to argue its case. Surely the emergence of a conflicting action plan from the EC to actually *reduce* VAT, to stimulate growth, will give Team GB the winning hand (page 6).

Alex Smith, Editor
asmith@cibsejournal.com

NEWS

All the latest news from around the building industry

In brief

KING CROWNED BY ROYAL ACADEMY

Doug King has been made a fellow of the Royal Academy of Engineering (RAE) for his dedication to integrated engineering design for high performance buildings, and his career-long commitment to sustainable design. King is the principal of Doug King Consulting, chief science and engineering advisor to the BRE and visiting professor of Building Engineering Physics at the University of Bath.

KIER MOVES INTO BIOGAS

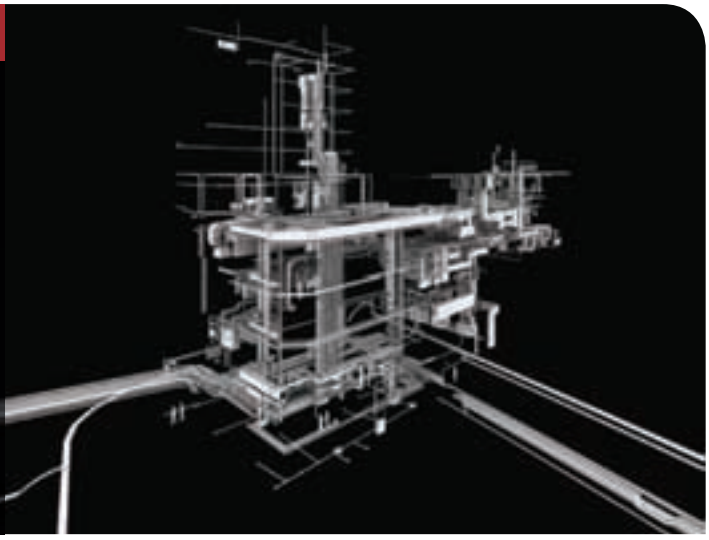
Kier has invested £24.4m in British food waste-to-energy business Biogen. The 50/50 joint venture with Biogen's parent company Bedfordia Group is designed to complement the Pure recycling business that Kier acquired in 2010. Bedfordshire-based Biogen designs, builds and operates large-scale anaerobic digestion (AD) plants to process food waste and produce renewable energy.

HOME ENERGY GUIDANCE

Guidance to help local authorities improve the energy efficiency of their housing stock has been published as part of the Home Energy Conservation Act (HECA). This requires all local authorities to publish their plans to improve energy efficiency by 31 March 2013.

BIM ON TRACK

Crossrail has opened a BIM Academy to train contractors on the latest software. Bentley Systems is running the initiative from its offices near Bank station and will capture, develop and share best practice with Crossrail's supply chain. Andrew Wolstenholme, Crossrail's chief executive said: 'The training received at the academy will help contractors use the knowledge and skill gained here on other major projects such as HS2.'



VAT confusion as Brussels proposes lower rates for green construction

The European Commission has caused confusion among policy makers and manufacturers by proposing a cut in VAT to boost low-energy construction

The proposal comes as the EC threatens to take the UK government to court for not increasing VAT on energy saving products from 5% to 20%.

In June the EC said the UK must change legislation to bring rates on energy saving measures into line with VAT levels across Europe.

Despite this, the EC published an action plan entitled *Construction: unleashing the potential of low energy buildings to restore growth* that proposed stimulating the renovation of buildings and infrastructure by reducing VAT rates.

It stated that 'financial support measures such as reduced VAT rates are needed to support investment.'

CIBSE technical director Hywel Davies said the plan contradicted the action being taken against the UK.

He said: 'The action plan seems to make the argument against the UK on VAT quite futile.

'If they are talking about fiscal incentives I'm struggling to understand what Brussels are doing targeting UK VAT.'

This month the government announced it would contest the Commission ruling, which could result in an appearance in the European Court.

There is widespread industry concern that an increase in VAT could wreck the Green Deal, the government's grant scheme aimed at improving the energy efficiency of existing homes.

The fear is that higher VAT on green measures could break the Golden Rule, which states that the cost of work must be less than energy savings.

Cabinet minister Oliver Letwin was urged to oppose the EU on the issue in a letter signed by 18 industry bodies – a move supported by CIBSE.

New construction chief faces big challenges

The building services sector has welcomed the appointment of former Institution of Civil Engineers president Peter Hansford as the government's new chief construction adviser. He will succeed Paul Morrell when the latter stands down at the end of November after three years in the job

Morrell has been widely praised for establishing the role and improving communication between the industry and the government, but leading industry figures believe the new man faces a number of major challenges.

CIBSE warned that his biggest challenge would be to get a collective view from the industry on the main tasks ahead.

'Paul Morrell has done an outstanding job,' said CIBSE chief executive Stephen Matthews. 'Much has been achieved, but there is still frustration with the long list of issues that remain to be addressed.'

He pinpointed the introduction of BIM as a key milestone for the new man.

'The pressure on public spending, the increasing cost of energy and the challenge of the Green Deal will all feature large in Peter Hansford's in-tray,' added Matthews.

'The pressure on public spending, the increasing cost of energy and the Green Deal will feature large in Hansford's in-tray'

Contractor bodies also welcomed the appointment with the Building and Engineering Services Association (B&ES) pinpointing improved procurement and project delivery as priorities.

'He has some clear challenges in terms of the delivery of the strategy agreed by the industry and government,' said B&ES deputy chief executive Roderick Pettigrew. 'Cost reduction and improved procurement arrangements are key to the task ahead, as well as driving home industry sustainability and integrated working arrangements.'

The Specialist Engineering Contractors' (SEC) Group said Hansford was the ideal candidate. 'Paul Morrell has set the standard, but I'm confident Peter Hansford will be a worthy successor,' said chairman Trevor Hursthouse.

Hansford will report to the Department for Business, Innovation and Skills and Cabinet Office Ministers. His responsibilities include chairing the government construction board to deliver the government's construction strategy that targets a 15-20% reduction in the cost of construction procurement to the public sector.

Minister for the Cabinet Office Francis Maude said it was 'an incredibly important role', and that Hansford would oversee 600 government funded construction projects and £40 billion of investment over the next four years.

Barker ready to 'sort' heat pump RHI dispute

Air source heat pumps have moved closer to inclusion in the Renewable Heat Incentive (RHI) scheme, following a concerted campaign by industry groups.

Many building services engineers believe it is a technical nonsense that air-to-water systems remain outside the consumer incentive scheme, when ground source heat pumps are included alongside biomass and bio-gas heating and solar thermal systems.

Air source products were excluded when the RHI scheme got under way last October because government said there was insufficient data to set appropriate tariffs. However, the heat pump industry claims that data was provided in May 2011.

Now groups including the Micropower Council and Heat Pump Association have issued a joint call for air source heat pumps to be included in the RHI from October.

'We have confirmed with officials that [energy minister Greg Barker] has no legal reason why he cannot proceed without a further consultation,' said Micropower Council chief executive Dave Sowden.

'Our call is to apply a tariff to the same formula as other technologies, and the EC told us it could process a properly completed State Aid application within two months.'

Barker recently tweeted that he was 'keen to sort this vital issue too' and has agreed to a meeting with the industry groups.

In brief

SMART METER CONSULTATION
A second government consultation on smart metering is now under way with industry comments invited by the closing date of 8 October. The first consultation looked at 'functional interoperability' and this second stage aims to identify fully interoperable technologies including the proposal for a home area network. It will also consider the development and regulatory timetable the government plans to follow.
www.decc.gov.uk

NEW CIBSE DIVERSITY PANEL
CIBSE is setting up a diversity panel in a bid to advise and support the institution, and recognise groups that may be under-represented. Meetings will be held three or four times a year in London, with the possibility of teleconferencing from other parts of the world. If you would like to be considered please go to **www.cibse.org/diversity** Closing date is 10 September.

ENERGY PRODUCTS WEBINAR
The first *CIBSE Journal* webinar, sponsored by Grundfos, is to be held on 20 September at 1pm on energy-related products (ErPs and EuPs), to bring people up to speed on the legislative changes brought about by the EU Directive. The webinar will cover Ecodesign legislation and how you can meet the requirements. Register for this free event via **http://tinyurl.com/c67u5vu**

F-GAS REGULATIONS WORK
100% of firms on its register are complying with the European F-Gas regulation, according to Refcom, the F-Gas certification body. It made the claim following its random inspection of member firms during the quarterly audit, which is a legal requirement as part of Refcom's operating agreement. Most of the 50 firms audited were fully compliant and the few who weren't became compliant after guidance. However, some firms were removed from the register.

Many contractors now in financial distress


Shutterstock/Kazhdan

Falling workloads, tighter margins and rising costs have left small and medium-sized construction contractors in an extremely vulnerable financial position, according to new research.

Accountancy group Baker Tilly said one in six contractors would not be able to pay off their immediate debts if required to do so by creditors, and most are dependent on the support of their banks. It added that profits are 'falling fast among contractors turning over £2m-£25m', and that one in 39 of these firms are 'likely to fall into financial distress over the next 12 months'.

Around 25% of construction contractors saw pre-tax profits drop sharply during 2011, with 41% recording a fall of between 10 and 20%. A similar proportion of sub-contractors saw profitability collapse by more than 50%, and 38% saw a fall of between 10 and 20%.

'One in six contractors would not be able to pay off their immediate debts if required to do so'

However, sales were not as badly hit, with just over a quarter of firms reporting sales declines of at least 10% last year compared to around 40% of firms the year before.

'The fact that profits are falling at a faster rate than sales suggests that companies are being hit hard by a double whammy of rising costs and falling margins, as they face an ever more desperate fight for sales,' said Mark Wilson, partner at Baker Tilly Restructuring and Recovery. He said it was 'very risky' to keep cutting margins to win short-term work.

The Building & Engineering Services Association (B&ES) also reported a drop in workload for one in three contractors during the first six months of 2012. Its 'state of trade' survey showed that the North East of England, Yorkshire and Scotland were the worst hit regions with residential heating and ductwork the market sectors under greatest pressure. Half of the respondents said that tender prices were lower than six months ago, but the cost of materials had risen. As a result, direct employment has fallen across the sector and 61% said they had not taken on an apprentice or trainee in the past year. However, most did say they expected employment levels to rise again during the second six months of 2012.

B&ES members said the biggest negative impact on their businesses came from 'late payment, tight margins and insolvency further up the contractual chain', although they see rising demand for renewable technologies as grounds for optimism and investment in skills.

**The latest casualty of the tough trading conditions was Leeds-based building services contractor Airedale Mechanical and Electrical with the loss of 135 jobs. The collapse of the £66m turnover business follows the demise of MJN Colston earlier this year.*

CIBSE conference tackles key topics

Clients, architects and engineers will join representatives of the government and academia to share the latest thinking, best practice, expert opinions and industry developments at the CIBSE Conference in London next month.

The economic downturn will provide the backdrop to sessions covering business challenges, case studies and debates featuring top industry names such as CIBSE president David Fisk; chief construction adviser Paul Morrell; Robin Nicholson, senior partner at Edward Cullinan Architects and British Land's Sarah Cary.

Case studies will be provided by: Max Fordham LLP on soft landings; Atelier Ten and Buro Happold on overseas business challenges; Arup Scotland on passive retrofit projects; and Hoare Lea will bring delegates up to speed on building performance evaluation.

Around 300 companies are also expected to participate in the accompanying exhibition at London's Olympia on 10 and 11 October.

For more information and booking details go to **www.buildingservicesevent.com**

Guaranteed funds boost Green Deal launch

A £7m government loan, plus guarantees of further funding as part of public infrastructure spending, have provided much needed support for the launch of the Green Deal in October

The loan comes from the Department of Energy and Climate Change (DECC) to The Green Deal Finance Company, which is the vehicle established to provide funding to Green Deal providers from early next year.

Providers will then offer low cost finance packages to consumers upgrading the energy efficiency of their homes.

Danny Alexander, the Chief Secretary to the Treasury, also announced that the Green Deal would be a candidate for support within the 'UK Infrastructures' scheme that is designed to support up to £40 billion of investment in infrastructure projects.

'The Green Deal is the largest ever programme for investing in the energy efficiency of our housing stock and we are looking at whether and how a guarantee could help ensure that the finances are in place to get the programme off to a very strong start,' said Alexander.

The register for Green Deal Providers, Assessors and Installers is now open for applicants who, once approved, can display the Green Deal Quality Mark to demonstrate they comply with the required standards.

'This will be vital for protecting customers from any rogue traders. Only registered and authorised businesses will be able to use this mark,' a DECC statement said.

As *CIBSE Journal* went to press, it was expected that about 20 'pioneers', including British Gas and a number of energy suppliers, would be announced as approved Green Deal providers.

The register will be managed by Gemserv and its partner REAL, which was appointed as the Green Deal oversight body earlier this year.

Assessors and installers will have to gain authorisation to operate as an official Green Deal company from a number of approved certification bodies, which will then register the companies to start operating under the Green Deal.

The finance providers will register directly with the oversight body.

Solar industry facing boom and bust

Cuts to government subsidies for solar PV installations are forcing the industry into a damaging 'rollercoaster' ride of boom and bust, according to campaigners.

There was a sudden surge in demand during the last week of July as business users and consumers tried to beat the 1 August deadline for the latest cut to the Feed-in Tariff.

Installed PV capacity rocketed by 62% to 8,305 in the week to 29 July, according to figures released by the Department of Energy and Climate Change (DECC).

The subsidy for systems under 4 kW fell to 16p/ kWh from 21p/ kWh and the tariff will be cut again on 1 November by a further 3.5%.

This 'rollercoaster' ride for the industry was condemned by campaign group Our Solar Future, which said it was creating a boom and bust cycle.

CIBSE NEWS

CIBSE

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President: David Fisk CB FRAEng FCIBSE FRIBA (Hons) FIoP | **Chief executive:** Stephen Matthews

New Mid-Career College programme begins

Inserted in this month's *Journal* you'll find your copy of our new Mid-Career College course programme (UK members only). The programme covers a wide range of building services topics, including mechanical, electrical and public health subjects, as well as fire, lighting and facilities management. We also have a number of courses on energy efficiency and sustainability. Discounts are available for members and those who book early. For more detailed course listings, visit **www.cibsetraining.co.uk/mcc**

Final call for abstracts

Anyone wishing to submit a paper for the 2013 Technical Symposium should do so by 17 September. The Symposium, which will take place at Liverpool John Moores University on 11 and 12 April, is seeking papers based on recent or current research and application, as well as the actual or potential impact of that research on the built environment. For more information, and for details of how to submit your paper, visit **www.cibse.org/symposium2013**

Note the price

In the August edition of the *CIBSE Journal* the price advertised for *CIBSE Guide F* was incorrect. Please note that the correct price is £55 for members and £110 for non-members.

President's blog celebrates Higgs Boson

David Fisk posts his views online

In his presidential address, David Fisk promised to try out the power of social media and has been blogging away furiously – without yet being sued!

This month he's discussing the 'momentous plumbing event' that was the discovery of the Higgs Boson, and the effect that extreme weather conditions will have on engineering, suggesting it's perhaps time to be more realistic about the worst case scenarios our buildings might need to survive.

Blogging on the report of the government's panel on Fair Access to the Professions, he wrote:

- 'Engineers do not get much of a mention, except to be told the blatantly obvious – that we are gender lopsided. Thank heavens Andy [Ford] is onto that because the report doesn't seek to explore why.'

On climate change, he wrote:

- 'Mega-typhoons in Hong Kong, fry-an-egg-on-your-porch temperatures in Texas, and a monsoon in India so severe that power taken to pump river water to agriculture induced the largest-scale power failure in history. Maybe it's time we took climate change seriously, too?'

When blogging about the economy, he wrote:

- 'I suspect CIBSE members would give their eye teeth to get away from "boom and bust". Some others in construction's broad church make their living buying at bust and selling at boom. Is not another boom what they mean by the recovery? They are powerful voices but we ought to have allies. Wasn't "boom" how we got taxpayers into Northern Rock in the first place?'

Read the full blog, along with previous posts, at www.cibsepresident.blogspot.co.uk

Building bridges in Canada

The CIBSE Canada group is reaching out to other engineering groups to help it establish building services as an independent field of engineering.

The group was set up in September 2011 to support members in the region, and to establish building services as a legitimate field of engineering.

At present, meetings are held in Toronto, but there are plans to add groups across Canada, ultimately following the Australia/New Zealand model. The group generally meets every other month, with a mix of technical presentations and informal networking.

For incoming members to Canada – or members considering the move – it provides a unique resource to help them acclimatise to the Canadian construction sector.

For existing members it is a forum to carry on their Continued Professional Development (not yet widespread in Canada), to keep abreast of technical developments and to socialise.

'Building services is not currently recognised as an independent discipline'

In Canada, building services engineering is not currently recognised as an independent engineering discipline, leading to significant challenges in registration as a professional engineer. Now, the group is appealing to local engineering regulatory bodies, such as Professional Engineers of Ontario (PEO), to formally recognise building services.

The immediate objective of the group is to elevate the status of building services engineering, with the ultimate goal being to enable members to effectively engage in the complete process of delivering energy efficient buildings across Canada.

To find out more and get involved, please visit **www.cibse.org** and select the link to Canada in the Regions section, or contact Malcolm Wallace at **malcolm.wallace@arup.com**, the CIBSE Canada group representative.

Shortlist announced for Young Lighter of the Year

New talent will be recognised

The shortlisted entries for this year's Young Lighter of the Year award have now been announced – and this year you can vote for who you think should win.

The annual competition, run by the Society of Light and Lighting (SLL) since 1996, aims to encourage young talent in the lighting industry, and has historically uncovered a selection of creative and unique young lighters.

The categories have recently been expanded and now include awards for 'Best Paper', awarded by the Institution of Lighting Professionals, and 'Best Presentation' awarded by the Worshipful Company of Lightmongers, as well as the overall award of 'Young Lighter of the Year', presented by the SLL.

Entrants were initially required to submit abstracts and video blogs, at which point six were shortlisted and asked to submit full papers. The shortlist will be whittled down to just four finalists.

The 2012 entries have once again attracted a wide range of entries, with the shortlisted titles including: *shadow defining space; saturated coloured light and its role in the night time environment; catching the light – lighting for humans in the urban context; the current performance of daylighting practice and design; the merits of utilising task-based lighting in the office environment;* and *the use of coloured light in the urban environment: is it time for legislation?*

For the first time, you can view the video blogs for each of the shortlisted competitors at **www.sll.org.uk/yloty** and vote for who you think should win, although votes do not count towards the final decision.

This year, the Young Lighter of the Year award final will take place at the LUXLive exhibition, on 6 November. The finalist presentations will take place at 1pm, with the winner announced in the Live Forum at 5pm. If you would like to attend please register at **www.luxlive.co.uk** for your free visitor's pass.

The finalists will be announced on 17 September.

For more information, visit **www.sll.org.uk/yloty**

Training and development

All new trainees following an approved employer-training scheme, should register their training with CIBSE.

Trainees must hold a grade of CIBSE membership, for example Graduate for those progressing towards ACIBSE/IEng or MCIBSE/CEng, or Student for LCIBSE/EngTech. If they have not already applied for membership, we would invite them to do so.

School leavers who are on an appropriate academic course of study are eligible to apply for Student membership. Information and application forms for all grades of CIBSE membership are available at **www.cibse.org/membership**

The Training & Development (T&D) Plan registration form is included in the current T&D Manual. Trainees can email their T&D Plan registration form direct to Olwen Williams at **owilliams@cibse.org** They will receive confirmation by email that we have registered that they are on an approved employer training scheme. For more information, visit **www.cibse.org/cpd** and follow the link to Employer Training Schemes.

APPROVED COMPANY TRAINING

The Arup and DSSR approved company training schemes have recently been renewed.

CPD DIRECTORY UPDATE

The Directory of CPD Course Providers is produced to assist members in identifying suitable courses in respect of their Continued Professional Deveolpment (CPD) needs.

CPD course providers who would like to apply for an entry into the Directory of CPD Course Providers should contact Olwen Williams on **020 8772 3605** or email **owilliams@cibse.org**

We also accept applications for online courses, and welcome more e-learning applications. The following organisations have recently been added to the directory:

- Ability Projects;
- Electrical Contractors Association (ECA);
- Lighting Industry Association;
- Redring Expelair;
- Renewable Resources (Energy Solutions); and
- S&P Coil Products.

A concessionary rate is available for entries into selected categories. Please visit **www.cibse.org/cpd** for more information.

CPD COURSE SPEAKERS

All CPD course speakers are invited to apply for CIBSE membership. For further information contact **membership@cibse.org** or refer to the Membership section at **www.cibse.org**

Engineers encouraged to share knowledge

Tom Watson, 2012-13 ASHRAE president, used his inaugural presidential address at the recent ASHRAE Conference in San Antonio to focus on his newly initiated Community Sustainability Project Programme.

This is squarely aimed at spurring engineers to voluntarily share their knowledge with local projects as a means of improving the built environment for groups that would otherwise struggle, both technically and financially.

San Antonio is home to the Alamo, where the bravery in defeat of the defending Texans inspired a resurgence and the subsequent rioting that ended a revolution. And maybe Watson's message was allegorical, because if ASHRAE members can become known for improving the sustainability of local communities,they can establish themselves as more prominent – and potentially respected – members of society.

However, it would be unjustly cynical to infer that this initiative was founded on personal gain – he was sincere in his call for engineers to take a more proactive role in the education and development of their communities – a call that undoubtedly bears serious consideration across the global engineering community.

For more information visit **www.ashrae.org/community**

New members, fellows and associates

FELLOWS

Anderson, Peter John
Chelmsford, Essex

Chapman, Peter John
Woodford Green, Essex

Krstanovic, Aleksandra
London

Mangan, Alan
County Kildare

Phillips, Stephen Robert
Croydon, Surrey

MEMBERS

Akkermans, Daniel Craig
Manchester, Lancashire

Al-Alawi, Bakar
London

Alway, Simon
Bristol

Anthony, Richard Leslie
Poole, Dorset

Au Yeung, Shiu Man Henry
Ma On Shan, N.T.

Azorin Garcia, Jorge
London

Badcock, Graeme James
Lewes East Sussex

Bareham, Stuart James
Burgess Hill West Sussex

Beer, Richard
Maidenhead, Berkshire

Bhanderi, Ketan
Harrow, Middlesex

Bhuie, Gurpreet Singh
White Waltham, Berkshire

Black, Gordon John
Jersey

Bowcock, Mark Arthur
Manchester, Lancashire

Bragoli, Riccardo
Lichfield, Staffordshire

Bui, Tran Hieu Trung
London

Burbridge, Andrew Steven
Stansted, Essex

Burrows, Steven Michael
Cardiff, South Glamorgan

Chalk, Ian Peter Ormskirk
Lancashire

Chan, Siu Hung
N.T.

Chau, Wai Tong
Yeun Long

Choi, Hong Fei
Macau

Coles, Andrew
Cambridge

Connolly, Darren Anthony
Ruislop, Middlesex

Cook, Rachel Winifred
Belfast

Cooper, Nigel Leslie
Weybridge, Surrey

Costas Freire, Alicia
London

Davey, Olivia Catherine
London

Desai, Anand Rajnikant
Sunbury-on-Thames, Middlesex

Dibari, Giuseppe
20154 Milano (MI)

Dickson, Michael John
Surbiton, Surrey

Dimmock, Alan James
Reigate, Surrey

Dodds, Peter Andrew
Long Benton, North Tyneside

Duffy, Patrick
Colchester, Essex

El Abed, Riad
Tripoli

Fowler, Jonathon Henry
London

Foy, Allan John
Glasgow, Lanarkshire

Gardner, Andrew James
Birmingham, West Midlands

Ghaly, Amir
Ontario, Canada

Grace, John
Carrigaline, Cork

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FELLOWS

Peter Anderson

Peter is a partner with Troup, Bywaters + Anders and manages teams in London and Ireland, supporting clients' business needs in the commercial, health, education, public and retail sectors.

Peter Chapman

Peter formed his own engineering management consultancy in 1990 and has developed an extensive client base, which includes government agencies, health trusts, utilities and leisure authorities. Much of his building services work is directed to the development and auditing of maintenance and facilities management systems. He is a visiting lecturer at Brunel University, an external examiner at London Southbank University and presents a range of training programmes for CIBSE.

Aleksandra Sasha Krstanovic

A regional director with urban development and infrastructure consultancy, AECOM, Sasha has more than 15 years' experience in design and building engineering, and is the European lead for the higher education and arts and culture sectors. A Fellow with the Institution of Mechanical Engineers, Sasha's focus is on low energy and zero carbon design.

Alan Mangan

Alan is an engineer working in the estates office for Dublin City University (DCU). Alan is studying for his Masters in Management for Sustainable Development. The research for his thesis is currently based on rainwater harvesting and the reuse of grey water.

Stephen Phillips, Croydon, Surrey

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WINNING NUMBERS

It has been often mentioned that Team GB won 29 Olympic gold medals, but did you know there was 2km of ventilation ductwork in the Velodrome, or 10,000 toilets on the Olympic Park? Here are some of our favourite stats from the London 2012 Olympic Games

STADIUM

x10,000
80,000
Specator capacity during Olympics

45,000
Tonnes of steel used for Beijing Olympic Stadium

x10,000
25,000
Specator capacity designed for legacy

4,500
Tonnes of steel used for London Olympic Stadium

532
Number of individual floodlights housed in 14 **28m**-high towers

65
Medals won by **Team GB**

7
The number of records broken by **Team GB**

70%
Reduction in mains water usage as a result of rainwater recycling

x1,000
6,000
Spectator capacity

4.2km
Water pipework

300,000
Nails used to build the Velodrome

5.5km
Mechanical pipework

2km
Ventilation ductwork

28°C
Temperature at track level to optimise performance

VELODROME

6

The number of gold medals won by **Sir Chris Hoy**, making him the most successful British Olympian ever.

COPPER BOX

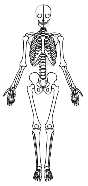
40%
Reduction in water use due to rainwater collected from roof

88
Sunpipes incorporated into the roof

x1,000
7,000
Spectator capacity during Olympics

x1,000
6,000
Spectator capacity in legacy

4
Skeletons found in the ancient settlement on the site of the Olympic Park and carefully removed



ENERGY CENTRE

COOLING

57MW
Cooling capacity during Olympics

64MW
Cooling capacity in legacy

HEATING

92.8MW
Heating capacity during Olympics

194.9MW
Heating capacity in legacy

46,000
Number of construction staff on Olympic venues

x100,000
2,400,000
Number of people who visited the Olympic Park in Stratford

AQUATIC CENTRE

30°C
Temperature at poolside during Olympics

28°C
Temperature at poolside in legacy

26°C
Temperature in stands

16.5%
Savings in carbon, using efficiency measures

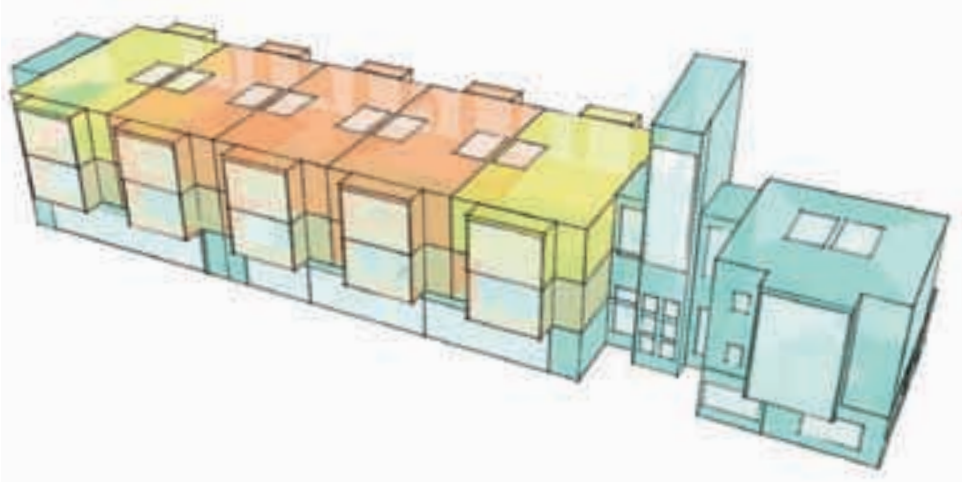
49%
Improvements on Part L 2006 based on 'as built' performance

84%
Sensible heat recovery in pool ventilation systems

x1,000
2,500
Specator capacity in legacy

x1,000
17,500
Spectator capacity during Olympics

Your letters



This month:
'Real' simulation tools, praise for the admittance method and a question over graduate pay

Simulations need to get 'real'

As developers and expert users of dynamic-thermal performance analysis software we couldn't agree with Becci more ('Bad by Design', July 2012 *CIBSE Journal*). We offer tools, which follow the UK's National Calculation Method (NCM) and provide compliance calculation routes for Part L and energy performance certficates (EPCs).

However, we also supply true dynamic thermal simulation tools for whole building performance assessment. We've consistently advocated, since the introduction of Part L in 2006, that design for compliance is not the only route to true high-performance, low-energy, zero-carbon structures.

Once you understand that dynamic modelling tools for compliance differ from true dynamic thermal simulation tools then you can appreciate the root of the issues being discussed in this piece. We want to encourage the move towards 'real' simulations where designers try to mirror exactly how buildings will operate.

Yes there are limitations, but as a design tool to aid architects and engineers, thermal, daylighting and solar dynamic simulation has proven to be a powerful addition to many practices. Alternative options, passive strategies and innovative technologies can be road tested virtually before making decisions, ensuring that the optimum design solutions are built.

We have always advocated that the best route to compliance is to focus on building the best building you can, and checking against compliance at each stage. The compliance and design model are inherently two different versions of the same thing. The compliance model is NCM-based to give a common benchmark for compliance across buildings of similar usage, whereas the design model version is bespoke to individual designs. Our approach allows both of these models to be created and compared using the same platform.

Interestingly, the future of analysis we are investigating takes this design model on through commissioning into operation, to ensure the building has a chance to operate as designed. Models can now be calibrated using real usage and performance data, alongside actual weather conditions, to highlight faults and areas for improvement, continuously commissioning a building over its lifecycle.

David McEwan, director IES

> We want to encourage the move towards 'real' simulations where designers try to mirror exactly how buildings will operate

Sound physics

I could not agree more with John Harrington-Lynn that the CIBSE Admittance Method is based on sound physics ('Admittance method provides accurate load methods', Letters, August 2012, *CIBSE Journal*). The simplification lies in the use of the fundamental frequency of a harmonic series. This simplification allows for total transparency so providing a methodology that enables a good understanding of the thermal response of spaces within buildings.

For these reasons I included the complete algorithm describing the admittance method in the 2006 revision of Guide A. The algorithm, upon which the PDA is based continues in later revisions. That algorithm suffers in that only a constant ventilation rate is allowed. The introduction of variable ventilation is not well handled by a manual method (which was the original intention for the admittance method) although John has shown that it was possible if certain assumptions were made. A new variable ventilation algorithm that uses an hour-by-hour solution has been added to the PDA and is now under test.

I believe that the widespread use of black box tools (detailed thermal models) makes simplified methodologies that are based on sound physics essential, as they may be the only way that people can obtain an appreciation of how spaces work. It may be necessary to use black box tools for compliance and detailed performance prediction; however, without understanding the physics that might be seen to be the function of a technician and not a chartered engineer.

Michael Holmes
Consultant, Arup

Off the salary scale

I have to say that I was surprised to read that building services graduates earn an average of £34,000 a year, or am I just living in another world 'up North' (£10 to save the world, August 2012, *CIBSE Journal*)? Current graduate salaries for sustainable/built environment/engineers in this region seems to be in the low £20,000s, depending on the company and the graduate, assuming that they're lucky enough to actually find a job in today's climate. Can I assume that this was a reference to the assumed earning potential several years in the future?


First day at work for a building services graduate in the South?

Without contributing to a political debate about the right or wrong of student fees, I agree with the thrust of the article that monthly repayments of student loans do appear to be low in relation to salary levels when repayment is required and shouldn't put anyone off going to university.

Shona Williams, senior consultant
CO2Sense CIC

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.

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MANUFACTURER'S VIEWPOINT

The flatlining UK economy needs defibrillating, and green investment could give it the necessary jump start, says **Martin Fahey** of Mitsubishi Electric

There is a lot of talk at the moment relating to the economy and whether plan A is working or whether we need to find a plan 'B'.

How about adopting plan 'G' – the green agenda?

Part of the government's argument against a so-called plan 'B' is that, while it may lead to some stimulus for the economy, we would have to finance this by increasing national debt in the short-term.

Yet the green agenda does seem to promise both immediate and long-term benefits for both the country and individual businesses and consumers, once we've got over the initial expenditure needed.

When budgets are as tight as they are at the moment, it is natural to focus on what are perceived to be the 'essentials' and for many businesses, that means balancing expenditure and cash flow with salaries, while trying to simultaneously protect existing markets and grow new business.

Yet a quick examination of almost anyone's energy costs will show that they have risen year on year, and we know that most of our buildings are underperforming in terms of efficiency.

So finding ways to improve in this area would seem to offer real, tangible financial benefits for both the individual energy consumers and the nation – in terms of helping reduce emissions.

News reports also talk of businesses sitting on capital, waiting for the economy to pick up.

Surely a better use of any spare finances would be expenditure that will offer a much better return on investment than any ISA or bank rate. One that will reap both short-term and long-term gain in terms of reduced energy bills month-on-month.

I would suggest that a lot of businesses, like a lot of households, only think of their expenditure on energy costs when fuel prices increase.

However, technology already exists that can reduce expenditure and it needn't cost the earth in terms of up-front costs.

For a typical office, introducing a better control system wouldn't break the bank but could pay for itself in the short-to-medium term.

And replacing that 10-year-old air conditioning unit or boiler will rapidly repay the investment in terms of both lower monthly bills and a better performing system. There is even technology that will provide both air conditioning and hot water now utilising advanced, inverter-driven heat pumps.

There are government incentives in the form of the Enhanced Capital Allowance Scheme, which allows companies to offset expenditure on new equipment against their annual tax bill.

You will note that I have avoided any discussion on whether this government is for or against the green agenda.

That's far too big a discussion for a simple column, but while we are all waiting for our politicians to decide the most economic and efficient way to run the country, shouldn't we all just get on with it and find the best ways to run our buildings more efficiently?

Time for plan green!

*Martin Fahey is sustainable solutions manager at Mitsubishi Electric. Join the debate by visiting the Green Gateway LinkedIn group, or following Martin's Twitter account (**@green_gateway**) which offers followers a chance to receive up-to-the-minute news and views from those within and outside the industry, including key opinion leaders.*

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ASBESTOS ALERT

The EU has forced the government to tighten up rules on exposure. **Hywel Davies** explains the changes and how non-compliance can lead to a £5,000 fine

New asbestos regulations (1) came into force on 6 April 2012 to address European Commission view that the UK had not fully implemented the requirements of the EU Directive on exposure to asbestos (2).

The new Directive brings together the amendments to the previous Directive, which was first adopted in 1983. It aims to protect workers' health from risk of asbestos exposure, by setting limiting values and specific requirements. The EU took the view that the initial UK implementation of the new Directive did not fully implement certain aspects of the Directive. As a result, the recent UK regulations make some changes to the regulatory regime, but a number of the requirements remain unchanged.

The major change is that some types of non-licensed work with asbestos now have additional requirements, for example notification of work, medical surveillance and record keeping. Failure to comply with notification can lead to a £5,000 fine, so it is worth understanding what has to be notified.

From 6 April 2012, some non-licensed work needs to be notified to the relevant enforcing authority. There are three types of work with asbestos: licensed work, notifiable non-licensed work (NNLW) and non-licensed work. The Health and Safety Executive (HSE) provides some guidance on how to decide which of the three categories apply to any given case, based on the kind of work being done; for example, maintenance, removal, encapsulation or air monitoring, the type of asbestos and the state it is in. For fuller guidance see **www.hse.gov.uk/asbestos/licensing/notifiable-non-licensed-work.htm**

There is also a guide called *a0, Asbestos Essentials*, which helps those seeking to identify notifiable non-licensed work (**www.hse.gov.uk/pubns/guidance/a0.pdf**)

For all notified non-licensed work brief written records should be kept, including a copy of the notification with a list of workers on the job, plus the level of likely exposure of those workers to asbestos. Air monitoring is not required on every job if an estimate of the likely degree of exposure can be made, based on experience of similar past tasks or published guidance.

Additionally, by April 2015, all workers doing notifiable non-licensed work with asbestos will need to be under medical surveillance. Workers already under health surveillance for licensed work need not have another medical examination for non-licensed work, but medicals for notifiable non-licensed work are NOT acceptable for those doing licensed work.

Finally, the section on prohibition has been removed, as the prohibition of supply and use of asbestos is now covered by Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulations 2006.

What is unchanged?

If existing asbestos-containing materials are in good condition and are not likely to be damaged, they may be left in place and their condition monitored and managed to ensure they are not disturbed.

Those responsible for maintaining non-domestic premises have a 'duty to manage' the asbestos and to protect anyone using or working in the premises from the risks of exposure.

Those wanting to do any building or maintenance work on premises, plant or equipment that might contain asbestos need to: identify where it is and its type and condition; assess the risks, and manage and control those risks.

The requirements for licensed work remain the same in the majority of cases; work with asbestos needs to be done by a licensed contractor. This work includes most asbestos removal, all work with sprayed asbestos coatings and asbestos lagging, and most work with asbestos insulation and asbestos insulating board (AIB).

Non-licensed asbestos work still requires effective controls to protect people from exposure to asbestos. The control limit for asbestos is 0.1 asbestos fibres per cubic centimetre of air (0.1 f/cm^3). A control limit is not a 'safe' level, and any exposure from work activities involving asbestos must be reduced to levels as far below the control limit as is reasonably possible.

Training is mandatory for those liable to be exposed to asbestos fibres at work. This includes maintenance workers and others who may come into contact with, or disturb, asbestos, as well as those involved in asbestos removal work.

Asbestos is a potential killer. We understand the hazards of working with asbestos much better now, and with the guidance available there should be no reason for anyone to be unaware and not to manage them effectively.

> There should be no reason not to comply with the rules

● **HYWEL DAVIES** is technical director of CIBSE **www.cibse.org**

REFERENCES

1 Control of Asbestos Regulations (2012)

2 Directive 2009/148/EC – exposure to asbestos at work – 30 November 2009 on the protection of workers from the risks related to exposure to asbestos at work. *http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:330:0028:0036:EN:PDF*

FURTHER READING

1. *Asbestos: The Licensed Contractors Guide* Intended for businesses holding a licence to do repair or removal work *www.hse.gov.uk/pubns/books/hsg247.htm*

2. The management of asbestos in non-domestic premises: Regulation 4 of the Control of Asbestos Regulations 2006. Approved Code of Practice and guidance, L127. *www.hse.gov.uk/pubns/books/l127.htm*

3. *Managing asbestos in buildings: A brief guide INDG223* (rev 5). The leaflet is for people who own, manage or have responsibilities for buildings, which may contain asbestos. *www.hse.gov.uk/pubns/indg223.htm*

WHERE NOW FOR BUILDING SERVICES CONTRACTORS?

The double-dip recession is making life hard for construction firms as work dries up in sectors previously driven by public sector investment. **Noble Francis** looks at the state of the industry and finds a glimmer of hope in the rail market

Construction and the economy are not in a great state. Despite the recent optimism from the Olympics, the economy is in a deepening 'double-dip' recession and construction is suffering from the adverse effects of sharp falls in government cuts at the same time as a faltering private sector.

You can add to this the excess capacity that still exists following the initial downturn in 2008/09, and for anyone who has been in the industry for a long time, the depressingly familiar reaction of the major contractors in extending payment terms and tighter retentions. But it's not all bad news.

If you are in private housing, it depends whether you deal with large house builders or SMEs. The main housebuilders are happy at the moment. They are raising the book value of the land, enjoying profit margins of around 10%-15% and gradually raising units.

They also have 6-7 years of land with planning permission. However, SME housebuilders are not so fortunate. They suffer from delays in planning, struggle to obtain lending facilities and they don't benefit from NewBuy.

Private housing starts are anticipated to rise 3% in 2012 before economic recovery boosts house building by an average of 10% each year between 2013 and 2016. On the public side, housing is falling sharply and we're anticipating that starts will fall 23% this year and a further 10% next year due to the sharp fall in DCLG's capital investment.

Education and health are also falling away due to cuts in departmental spending. This is in addition to PFI now being off the agenda – is it no longer considered value for money and there is no replacement to fill the funding gap. Education construction is expected to fall 15% this year and a further 12% in 2013 with no growth until 2015.

The priority schools investment will help, but certainly won't completely replace work finishing on BSF projects. Work on small and medium-size hospitals continues in the health sector, but the multiple large hospital projects of £500 million-plus that occurred in the last decade are long gone. As a consequence, work in the sector is expected to fall 15% in 2012 before a 9% fall in 2013 and, again, no growth till 2015.

The government was hoping that the fall in public sector work would be offset by private sector growth, but the UK recession has led to falls in consumer and business confidence, reducing both consumer spending and business investment respectively that, in turn, are vital for retail and office demand.

> Most contractors don't think they do rail as they don't do tracks, but remember an awful lot of rail investment isn't track

Until recently, office construction was shot to pieces outside of London but relatively buoyant within the M25. However, even within London, apart from a few major projects, the offices market is slowing and this does not bode well over the next 12 months.

Within retail, the supermarket expansion plans were driving recovery in the last 12 months, but they now appear to be scaling back. Work will continue to grow on small urban retail units, which will benefit interiors, lighting and HVAC contractors, but you have to be in with the major supermarket chains, some of whom don't have a great reputation on payment.

One of the greatest opportunities is in rail. Most contractors don't think they do rail as they don't do tracks, but remember that an awful lot of rail investment isn't track maintenance. It is station refurbs – retail, offices and even residential. There is a £1 billion redevelopment at Tottenham Court Road station as part of Crossrail, Europe's largest construction project. This includes 500,000 ft² high profile retail, office and residential floor space. Plus, there are station refurbs all around the country. Rail output is forecast to grow by 16% in 2012 and expected to accelerate to 22% in 2013, followed by 9.3% growth in 2014.

Overall, it is going to be a difficult year ahead for building services contractors and it is a case of either beating the market or moving into areas where there is likely to be growth. When recovery does come, it is likely to be relatively rapid, but it won't be in the next 12 months.

Construction forecasts £m Constant Prices (2005)

Source: ONS, Construction Products Assocation

	Rail	Office	Education	Retail	Public new housing	Private housing
2012	3797 **16%**	6,235 **-2%**	2,379 **6%**	5,259 **-3%**	3,463 **-22%**	14,294 **2%**
2013	4633 **22%**	6,298 **-1%**	2,260 **-5%**	5,364 **2%**	2,944 **-15%**	14,866 **4%**
2014	5063 **9.3%**	6,612 **5%**	2,238 **-1%**	5,553 **3.5%**	2,796 **-5%**	15,757 **6%**
2015	5086 **0.5%**	7,009 **6%**	2,372 **6%**	5,803 **4.5%**	2,880 **3%**	16,860 **7%**
2016	4688 **-7.8%**	7,360 **5%**	2,491 **5%**	6,057 **4.4%**	3,053 **6%**	18,547 **10%**

● **NOBLE FRANCIS** is economics director at the Construction Products Assocciation
www.cibse.org

A VERY BRIGHT IDEA

After 133 years the light is about to go out on the incandescent lamp. **John Otten** looks at its history and says LEDs are now on course to become our main source of lighting

Product life cycles are generally well known and understood, but very few can compare with the humble electric light bulb or the incandescent lamp, which were banned from sale on 1 September. It is inconceivable today to imagine a world without electric light, and yet 133 years ago the light bulb revolutionised the developed world.

The electric light bulb – otherwise known as the standard incandescent or General Lighting Service (GLS) lamp – is considered a relatively simple product, but when it was invented by Joseph Swan in 1879, it was one of the greatest inventions of its time. Thomas Edison patented his version in the same year and some of the most famous patent battles of the era ensued.

Edison, the founder of American-based GE, was backed by shrewd financial backers who ruthlessly challenged all would-be inventors trying to copy his product. Fierce court battles were fought, but a few equally shrewd entrepreneurs either avoided or won their cases and survived.

The race to invent this product had widespread implications in driving electrification and companies of the time were not slow to exploit the market possibilities. Rapid growth of these businesses, often with cut-throat competition and practices that would be very questionable today, the industry was driven by a few men creating large companies, resulting in trading rings and pricing agreements on a national and international scale.

> The incandescent lamp was the foundation for some of the world's greatest electrical companies of America including Philips and Toshiba

This resulted in monopolies and industrial cartels, investigated by government select committees and monopolies commissions in Europe and 'anti-trust' legislation in America.

The shrewdness and tenacity of some of these great businessmen resulted in the incandescent lamp being the foundation for some of the world's greatest electrical companies, including GE of America, Philips, Toshiba and Siemens/Osram.

The industry was challenged by the oil crisis in the early 1970s, when the cost of energy rose dramatically and, for the first time, companies were forced to think of alternative technologies.

By the late 1970s, compact fluorescent lamps (CFL) started to emerge as competitors for the incandescent bulb, but they were expensive.

In the mid-1990s, a Japanese development engineer called Dr Shuji Nakamura, of the Nichia Chemical Corporation, created a white LED. Unlike CFLs, Nakamura's invention was dimmable and lit instantly.

Incandescent lamps are basically heating elements, using approximately 94% of their energy generating heat. By comparison, about 80% of LEDs' energy is used to create light, with only 20% lost to heat. For the latest LEDs, 90% of the energy gives off light.

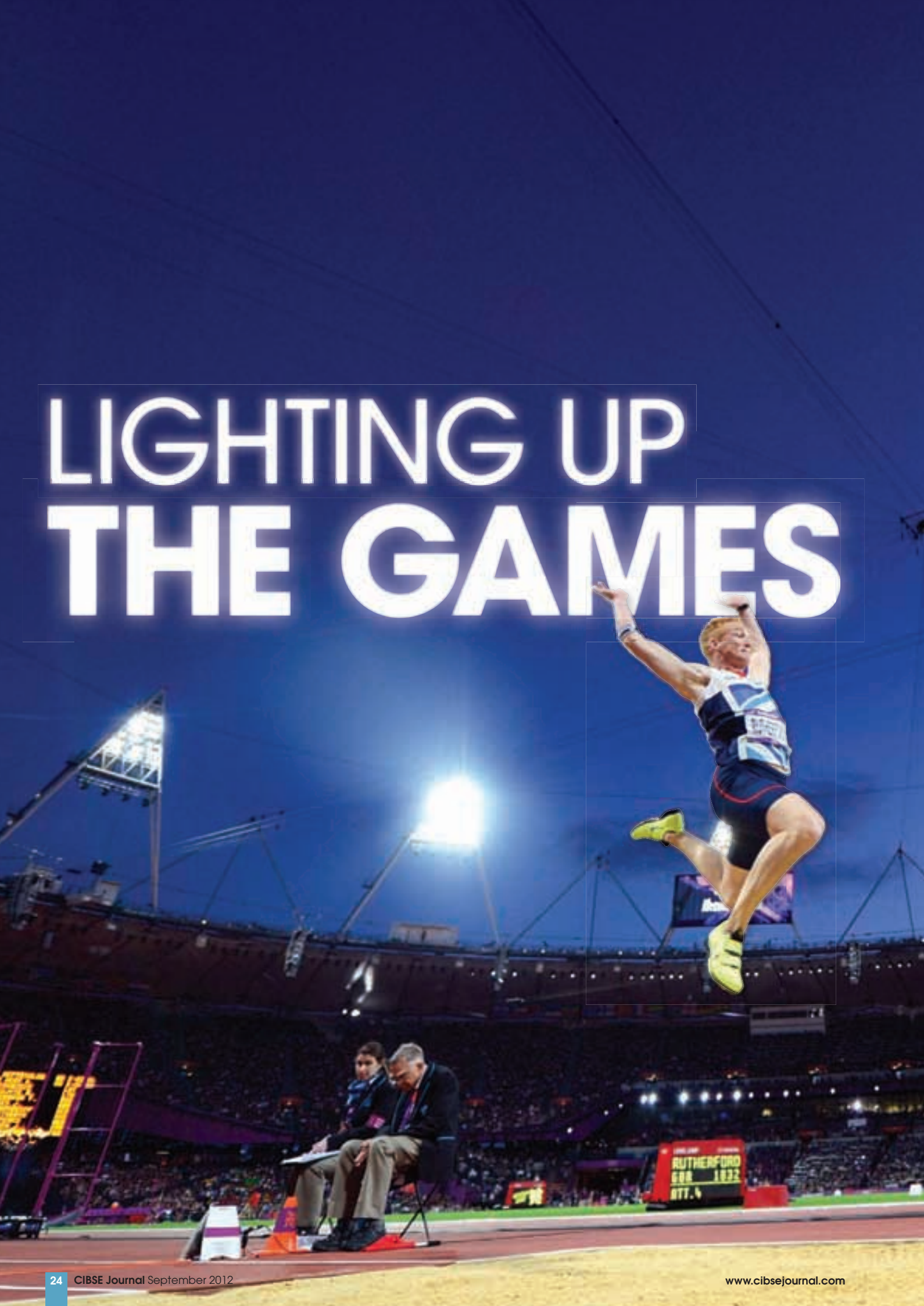
The industry quickly realised that LEDs were the future and this culminated in European legislation banning 25W incandescent lamps from 1 September 2012 – bulbs of 60W or above were banned a year ago.

Today, there is a wide range of LEDs on the market, covering most incandescent lamps and even some fluorescent and discharge lamps. Expect further developments in terms of light output, colour consistency, heat management and higher wattage.

Pricing is still an issue with LEDs, but with a product life of 30-50,000 hours, they will be the choice of many purchasers. Already, many hotels, shops and restaurants are installing them. There is no doubt the LED is the major light source of the future.

John Otten is the author of the Death of a Light Bulb, *published by Blue Ocean Publishing 2012, ISBN 978-1-907527-08-1*
www.deathofalightbulb.com

LIGHTING UP THE GAMES



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From the Queen, Bond and Boyle, to Bolt, Ennis and Hoy – what a show it's been, and thanks to the lighting design, TV viewers had as good a view as spectators watching live. **Andrew Brister** reports on the Olympics that took broadcast lighting to brilliant new levels

Wow. What was your favourite moment? From Usain Bolt's historic retention of his sprint treble, Chris Hoy's golden exploits in the velodrome to Michael Phelps extending his record medal tally in the Aquatics Centre, the 2012 Olympics certainly lived up to its promise to inspire a generation.

A massive medal haul for Team GB fuelled Olympic fever at home, and not just for those lucky enough to have tickets. The broadcast coverage has been superb, with the latest generation of cameras giving the world some amazing close-ups and slow-motion pictures.

Such quality images would not be possible without the best lighting. 'Superior broadcast lighting is essential: it is the core of a successful show,' explained Giulio Antonetto, associate at Arup and part of the team behind the lighting design at the Aquatics Centre.

'The value of a shot is immense; it is historical, cultural, iconic and forms our memories. We still see pictures of the Berlin Olympics to this day. There is also a commercial dimension with the branding that can come from a single frame, so there is a financial implication for the lighting that goes beyond capital and running costs.'

Nowhere is broadcast quality lighting more critical than in the three main venues in the Olympic Park – the main stadium, the velodrome and the Aquatics Centre. Philips Lighting is the supplier to all three, responding to Arup's design at the Aquatics Centre but having full design responsibility at the velodrome and main stadium, working alongside M&E consultants BDSP and Buro Happold respectively.

'Making sure the lighting levels at the three main arenas reached the formidable demands of television broadcasting was made even more difficult by the unique challenges that each of them presented,' said Mike Simpson, technical and design director at Philips Lighting. 'Both the velodrome and Aquatics Centre required strong architectural input and many of the design decisions were made before the lighting was detailed.'

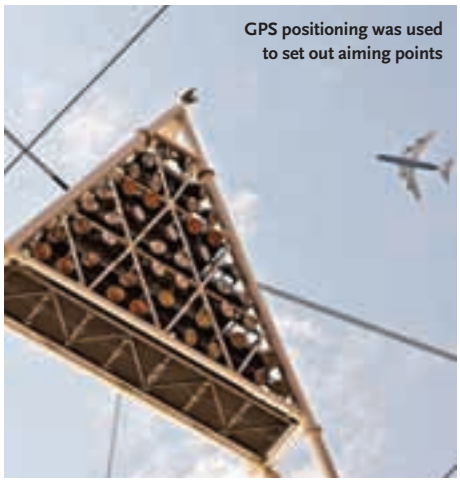
Olympic stadium

The triangular masts for the floodlights are a distinctive feature of the main stadium. Yet, early artist's impressions show a very different, rectangular array. 'We got involved early on, even before we won the bid, and worked out that the proposed light positions were too low for camera angles and broadcast requirements,' said Simpson. 'So we sat down as a team and that's how we've ended up with the triangular towers.'

The main stadium uses 536 2kW metal halide floodlights on 14 towers, achieving an average of 2,000 lux vertical in Olympics mode, with 1,400 lux minimum. Half of the lamps are of the hot restrike type, so they would come on instantly in the event of a power failure.

'Access to floodlights was high but well-designed, which made the commissioning easier,' said Simpson. 'We used GPS positioning to set out aiming points, which significantly reduced the time to commission compared to traditional tape measures. We would normally reckon on two people aiming 50 floodlights in a day so would set aside 10 days for a project of this size. Using GPS, all towers were aimed in less than three days, which we believe is a record for a stadium of this size.'

pcruciatti/shutterstock.com



GPS positioning was used to set out aiming points

LEDs outshine video screens

Yet there was one small problem. 'When the outside broadcast service people came in, they found that they were picking up flicker,' explained Simpson. It turns out that lighting guidance has not kept pace with camera technology and the higher shutter speeds now in use. The solution lay in rebalancing the phases of the luminaires.

'If you look at any individual point on the track, you want your 2000 lux to come from the three different phases in equal amounts. By rebalancing them, we got the flicker down from 20% to about 6%.'

> So we sat down as a team and that's how we've ended up with the triangular towers
> *Mike Simpson*

The lights fantastic – how LEDs made Boyle's vision all right on the night

Beat that, Rio. Danny Boyle may not have had the budget of Beijing, but boy did he deliver an opening ceremony to remember.

Boyle's bonkers take on these Isles of Wonder, from green and pleasant land through the dark satanic mills of the industrial revolution to the birth of the NHS and beyond, was brought spectacularly to life with the help of the latest LED technology.

In effect, the audience became part of the presentation as mini LED units, or tablets, mounted on the backs of seats in the Stadium, turned spectators into a giant video screen. Tait Technologies, specialists in the integration of LED technology, produced more than 70,500 LED pixel tablets for the entire stadium seating grid. Each hand-held video tablet contained nine LED pixels, all of which could be individually programmed and viewed at angles of 180 degrees horizontally and vertically.

Content for the opening ceremony was devised by digital imaging specialist, Crystal CG, in conjunction with Boyle and his team. Crystal CG programmed the pixels to display a series of spectacular graphics, from giant waves, to the union flag, to a section documenting the birth of the internet that lit up the audience with the words 'this is for everyone'.

Crystal CG said this was the first time the pixel tablets have been used on such a large scale. 'The audience literally became part of the action,' said Will Case, creative director at Crystal. 'No longer limited by large flat screens, we were presented with the challenge of creating animations to bring the stage and the spectators together. The live audience and those watching at home were drawn into the action. We are witnessing the death of the traditional video screen – this will transform the way event content is presented in future, becoming a more immersive experience.'

The project was delivered in 14 weeks using a team of 50 designers, with the first tests carried out on 10 July in the Olympic Stadium.

A film by Crystal CG on the lighting at the opening ceremony can be seen at **www.cibsejournal.com**

CIBSE/SLL members can hear more at a SLL event in October. Lighting designer Patrick Woodroffe had responsibility for both opening and closing ceremonies and he will be on hand to reveal just how they made those Olympics rings look like molten steel as they converged from the side of the stadium. LEDs anyone?

> No one can doubt the elegance of the velodrome, yet, the 6,000-seat arena proved difficult to light

Velodrome

No one can doubt the elegance of Hopkins Architect's velodrome, yet, the 6,000-seat arena, nicknamed the Pringle due to its curves, proved difficult to light. With a roof some 10 metres lower than any other velodrome and, at points, the track and roof almost at touching distance, space for lighting was at a premium.

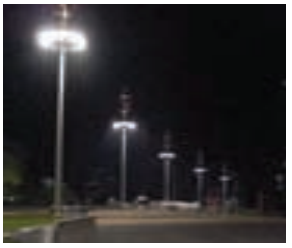
The cable-net roof was designed before loadings of the lighting were known. Floodlights were attached to a suspended containment from the roof, but there wasn't sufficient height or load capacity to use a walkway, so floodlights were set to correct angles before being hoisted into the air.

A total of 356 1 kW floodlights are used to achieve 2,000 lux vertical. 'When taking readings we used a special ladder to reach points of steep banking' said Simpson. The design had to provide for eight switching steps (2,000 lux, 1,000 lux, 2x 750 lux and 4x 300 lux). The multiple steps at lower levels in legacy mode were to extend lamp life, so no floodlight could appear in more than one switch mode.

With the action in the velodrome much faster than in the stadium, balancing the phases was never going to be acceptable to the broadcasters in terms of flicker.

'We've developed some electronic control gear to run these lamps, which produces a square wave so that you don't get the phasing issue,' said Simpson. 'Broadcasters said they have never been able to capture this quality of slow motion before.' Broadcasters can take shots at 500 frames/s from anywhere, even with Chris Hoy hurtling by at 70 km/h.

Lighting a path



Park life

The lighting for pedestrians and amenities around the Olympic Park may not be as glamorous as that for the stadium, velodrome and Aquatics Centre, but it has been playing a crucial role in helping the Olympic Delivery Authority (ODA) meet it sustainability and carbon targets.

The ODA initially committed that, across the site as a whole, sufficient on-site renewable energy generation capacity would be installed to meet at least 20% of the annual carbon emissions, both of the venues, and other buildings to be retained within the site in the legacy phase. The ODA also aspires to achieve a reduction in carbon emissions for the built environment of 50% by 2013.

'The landscape and public realm lighting plays a central part in achieving the 50% reduction in carbon,' explained Ian Guest, group director of Buro Happold, part of the consortium that provided strategic engineering advice and design on the masterplanning of the London Olympic Park.

Lighting designer Sutton Vane Associates devised the special circular-formed 'halo' lights supplied by Philips Lighting. 'They were designed to provide an iconic landmark along the main southern concourse, add to the festival atmosphere in Games and legacy, and, promote the message of sustainability,' said Michael Grubb, director, Sutton Vane Associates.

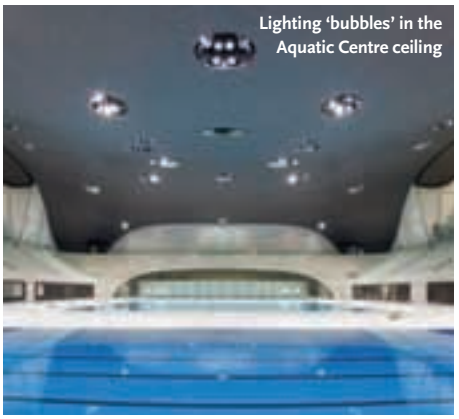
The seven halos are set on 32 metre-high columns that incorporate micro wind turbines. 'The turbines need a wind speed of 3m/s to start running, but we anticipate an average of 5 m/s throughout the year,' said Ian Guest. 'The electricity generated will offset around 40% of the lighting energy consumption, saving some 23.9 tonnes of carbon per year.'

Away from the main concourse, lighting columns were devised to incorporate photovoltaic (PV) panels. There are currently 80 on site, which will expand to 107 in legacy mode. The PV panels will offset some 60% of the energy required by the LED units, mitigating some 3.5 tonnes of carbon per year. 'That might seem quite a low figure, but they are an important contributor,' said Ian Guest. 'If you could reduce energy consumption by 60%, from a lighting perspective in buildings and externally, that would go a long way to meeting the UK's targets for 2020 and 2050.'

This is supplemented by around 3,500 m² of PV panels – both on the press centre and legacy car parking – that will offset approximately 40% of all the park-wide lighting electrical load and save some 193 tonnes of carbon each year.

There's more to sustainability than energy, of course. The waterways around the Olympic Park are vital feeding areas for bats and this proved to be an important consideration for the lighting. 'Protecting and increasing biodiversity in the wildlife areas and waterways of the parklands was a priority from the start of the design; this led to the specification of LED lighting units to minimise disturbance along identified bat corridors,' explained Grubb. 'LED lighting does not emit ultraviolet light, which disturbs the moths that bats feed on. The lighting strategy identified 'dark zones' within the Parklands that are free from artificial light.'


Taking light meter readings by boat


Lighting 'bubbles' in the Aquatic Centre ceiling

> 'You learn an awful lot through the process and we'll try and capture that for the next people that have to design a pool or velodrome
> *Mike Simpson*

Aquatics Centre

Like the velodrome, the stunning design of the Aquatics Centre, by Zaha Hadid Architects, caused some compromises with the lighting. 'The event lighting comes through holes or 'bubbles' in the roof that were fixed before the quantity of floodlights had been finalised,' said Simpson. 'This has resulted in some crowding of lights to achieve TV performance.'

These bubbles contain between two and 14 1 kW floodlights, with just under half being hot restrike lamps. A total of 420 1 kW and 122 400 W floodlights are used to achieve 2,000 lux vertical. To take light meter readings over the pool, Simpson and his team used an inflatable dinghy tethered with ropes.

Lighting over the diving pool is equipped with low frequency, square wave control gear for super-slow motion broadcasting.

Mike Simpson is keen to take lessons learnt from these venues to update guidance from CIBSE and the Society of Light and Lighting. 'You learn an awful lot through the process and we'll try and capture that for the next people that have to design a pool or velodrome. For example, there's no flicker spec in the lighting guide and TV is only going to increase.'

Arup's Giulio Antonetto urged designers to go back to first principles. 'Very few existing standards talk about cameras and how they work. A camera needs light, so it is important to understand the effects of shutter speed, aperture, exposure index, frames/s and so on.

'Try CFD optimisation to balance phasing of luminaires, use 3D, photometrically-accurate rendering technology and interactive tools to explain your design to stakeholders, and always push for the best.' Few would argue that all concerned have not strived for the best at the Olympic Park. **CJ**

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Building on a flood plain posed extraordinary challenges for the designers of the award-winning Brockholes Nature Reserve visitor centre. **Andy Pearson** finds out more

Ioana Marinescu

WONDERFUL

It was a difficult brief. Design a visitor centre complete with shop, classroom, exhibition space and conference centre right in the middle of an ecologically sensitive site in the middle of a flood plain.

The competition was advertised on the RIBA website and so I set about forming a team to win the project,' says Hareth Pochee, an engineer at Max Fordham. He joined forces with Adam Kahn Architects, structural engineers Price and Myers, and quantity surveyor Jackson Coles to come up with a design for a visitor centre for Brockholes Nature Reserve, which is sited close to the River Ribble near Preston.

The team's winning design for the 67 ha wetland site gave each of the centre's functions its own building. These are clustered together, village-like, on a 2,400 m² concrete pontoon that floats on one of the site's three lakes. As well as giving the centre significant flood protection – the area floods every 15 years – this innovative solution brings visitors close to the reeds at the water's edge: 'The buildings are located where the nature is happening,' says Pochee.

Once they'd won the contract, Pochee and the team sat down with the client to develop the scheme. 'It was clear from the outset that environmental performance was top of the client's agenda,' explains Pochee.

Initially, BREEAM was not a project requirement. However, as the design developed, a revised version of BREEAM was published that included a new 'Outstanding' rating for ultra-sustainable developments. According to Pochee, both the design team and client were inspired by this new rating – and, as a result, BREEAM Outstanding became a key aim.

Concrete evidence

In addition to this aspiration, Max Fordham decided to conduct an embodied energy analysis of the £6.2m scheme's construction materials. The investigation was based on the Environment Agency's database, coupled with the consultant's own research. 'The methodology is straightforward, but confidence in some of the data is frustrating because different sources have different energy values for the same materials, so we had to make a critical assessment based on the

Ioana Marinescu

> It was clear from the outset that environmental performance was top of the client's agenda

accuracy of the calculations,' says Pochee.

One result of these studies was that concrete, rather than steel, was used to construct the floating pontoon. This was cast in-situ, around polystyrene void formers. 'Its construction means that, even if the concrete pontoon does spring a leak, it will still float,' reassures Pochee.

The pontoon has a rustic appearance, thanks to a series of narrow, barn-like buildings with tall, pitched roofs and no ceilings. Their walls and roofs are formed from structural insulated panels (SIPs), topped by an oak shake roof.

Pochee is particularly pleased with the façade design, which he describes as 'an environmental conditioning machine', and waxes lyrical about the part the windows, insulation, apertures, shading, glazing specification and air tightness have contributed to the environment and servicing strategy.

The buildings have been designed with areas of carefully orientated glazing to ensure good views out and excellent levels of natural light, minimising the requirement for artificial lighting. The windows are made from high-specification double-glazed units, combined with a low conductivity timber frame and thermal-break edge-spacers to produce a unit with an overall U-value of 1.1 W/m² K. Pochee says this gives the units 'a comparable thermal performance to triple glazing but with better light transmission'. As a result, daylight factors exceed 4% in all the main spaces, and even in secondary spaces, such as WCs, the daylight factor is still above 2%.

Any artificial light required is provided by bare fluorescent tubes suspended beneath the roof. The lack of a diffuser significantly increases light output. A reflective panel mounted above the bare lamps helps direct light downwards. The fittings also incorporate daylight controls and presence detectors to turn off the lighting when there is sufficient daylight or rooms are empty.

In addition to daylight, the glazing also admits passive solar heat from the low winter sun. In summer, external awnings are used to prevent rooms from overheating. As well as providing shade, says Pochee, the awnings allow views out beneath the sloping canopy, while enabling air to flow freely through the open windows.

A breath of fresh air

A series of rooflights, positioned close to the roof ridge, open to allow warmed air to rise out of the buildings as part of a natural ventilation strategy. These are predominantly orientated north to avoid over-exposure to the summer sun, with retractable blinds fitted beneath to help prevent summer overheating.

The buildings that make up the visitors centre are naturally ventilated, with the exception of a few rooms such as the toilets and kitchen. In winter, fresh air enters buildings through a row of small, low-level vents positioned beneath the windows. The vents are opened and closed using a building management system (BMS), depending on room temperature and CO_2 levels. When it is very cold the vents open far enough to allow 4 l/s/person of fresh air to enter the space increasing to 8 l/s/ when the weather is mild.

Ventilation rates can be increased in summer by manually sliding open the 2m-high windows because of the building's relatively low thermal mass. 'We're implementing a marquee strategy: if you

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want cooling, you just open the windows,' Pochee explains.

Despite its lack of thermal mass, Pochee has introduced what he terms 'a night-cooling strategy'. In effect, this is an option to flush the rooms with cool morning air. 'Because the buildings are so well insulated and sealed, they will still be hot in the morning,' he explains.

Cooking up carbon savings

Natural ventilation is also a feature of the commercial kitchen, which serves the centre's restaurant. 'The caterer has the option of natural ventilation when the hobs are not in use,' says Pochee. For the remainder of the time, however, a mechanical ventilation system incorporating variable speed fans will remove heat and moisture from the space.

Like the materials used to construct the buildings on the scheme, the kitchen equipment, too, has been selected to provide a low carbon solution. Max Fordham took the catering consultant's equipment schedule, which specified the types and numbers of appliances, such as ovens, deep-fat fryers and hobs, and analysed the efficiency of the different cooking devices.

'We worked with the catering consultant to specify equipment that was of the highest efficiency, used the lowest carbon fuel source, but was affordable within the client's budget,' says Pochee. For example, the team would have preferred to use electric induction hobs because these were found to be the most efficient catering solution; however, they were also too expensive so liquefied petroleum gas (LPG) hobs have been specified instead.

Heat for the visitor centre is provided by a 150kW low NOx biomass boiler, burning locally produced wood chips – a cheaper solution than providing a gas supply to the site, according to Pochee. Air and ground source heat pumps were also considered but were found to be a more expensive option than biomass in terms of carbon saved per pound invested.

The boiler house is situated on land adjacent to the lake and is connected to the floating village by flexible, pre-insulated heating pipes. These have the capacity to cope with a 4m rise in water levels, and all services are flexible and waterproof to enable them to run under the lake.

> It was quite bold and daring enough to give me a couple of sleepless nights

Ioana Marinescu

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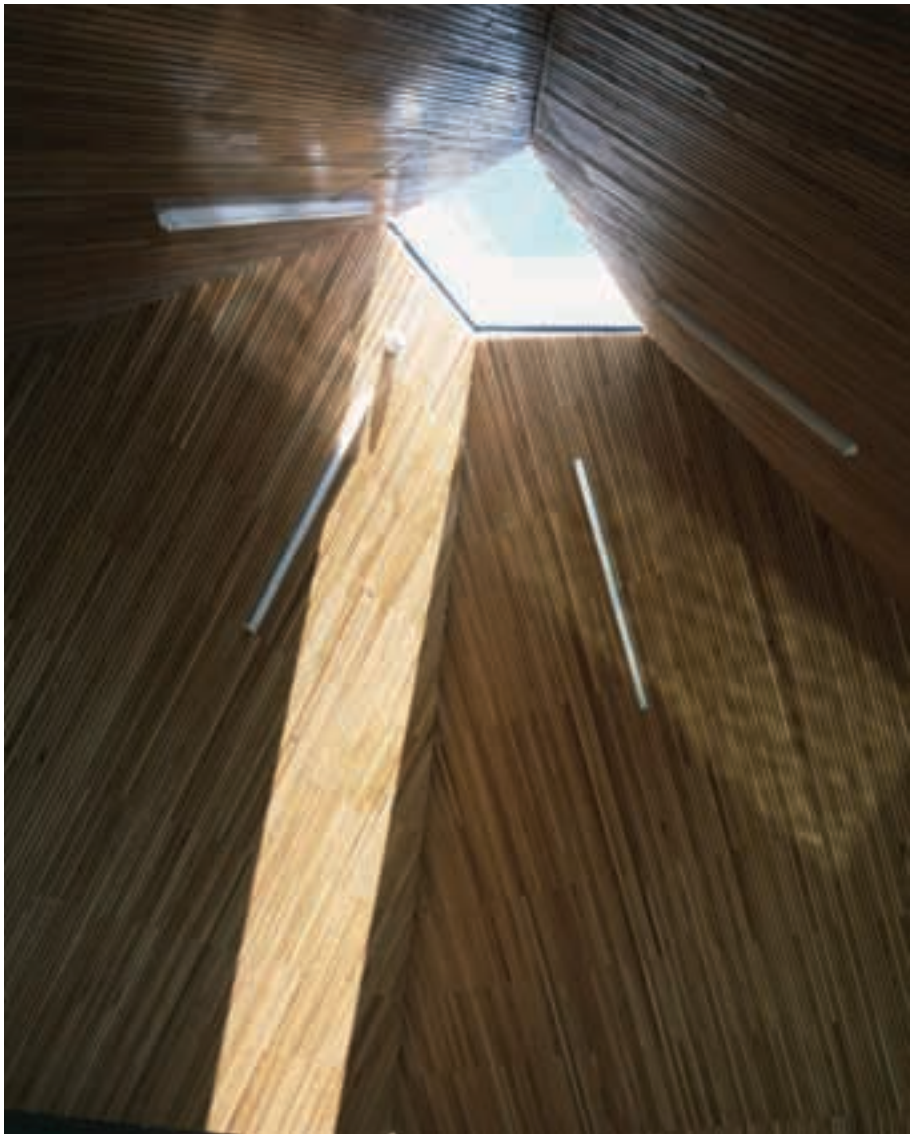
Entrenched habits

On the pontoon, services distribution is through a series of floor trenches linking the various buildings. The trenches, which are up to 2,000 mm wide and 500 mm deep, only provide access to the cables and pipes at corner junctions because the architect did not want access panels along the lengths of the trenches. Extensive co-ordination was required between the services engineer, architect and structural engineer to achieve this.

'As a solution, it was quite bold and daring enough to give me a couple of sleepless nights,' recalls Pochee. To enable installation, all services are flexible to enable them to be pushed and pulled through trenches between buildings, although 'it was not the most popular solution with the contractor,' says Pochee.

The building's pontoon-based location also created some interesting challenges for the drainage design. Water for most uses is supplied from a nearby borehole while lake water is used to flush the WCs. Water consumption is minimised by low-consumption sanitary fittings and low-flow taps and urinals.



The remote site does not have a mains sewer connection, so an onsite sewage management system was needed. Drainage pipework delivers wastewater to a pumping station housed within the pontoon, from where it is pumped to a septic tank on land and then to a reed bed treatment system designed to co-ordinate with the site's ecology. This solution has about 25% of the energy demand of a municipal sewage treatment system, but it does require a similarly-sized site to the footprint of the building, adds Pochee.

In addition to the service trenches, the pontoon houses heating pipes beneath its polished concrete surface. This is the underfloor space heating system. Pochee says space heating loads are minimised by high levels of insulation in the building envelope, which has a U-value of 0.1 W/m² K, combined with low levels of air permeability. On average, air leakage is about 6 m³/m²/hour @ 50 Pa. 'It's not as good as we wanted, because rectifying errors was expensive', admits Pochee.

Control buttoned up

Users control heating through 'iPod controls', so termed because they have been designed to be intuitive to operate without the need for instructions, although the team did draw on symbols to help users.

'In general these have worked well,' says Pochee. 'What could have been improved is the time delay between pressing a button and the equipment responding,' he says.

Max Fordham is now monitoring the building post occupancy. Overall it is performing well: monthly reports show the temperatures to be comfortable. However, the consultant is looking into the amount of biomass being burnt, which is 'a little higher than we anticipated,' says Pochee.

The building has achieved an A-rating Energy Performance Certificate. Its energy efficiency measures alone reduce its carbon emissions by 35% compared to Building Regulations Target Emissions Rating (TER). And when the biomass boiler is included, carbon emissions drop by 85% compared to the TER.

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GREEN LAND

British Land won the Client Energy Management category at the CIBSE Building Performance Awards 2012. **Andrew Brister** looks at the developer's winning ways and hears about its ambitious plans to cut energy use across its diverse property portfolio

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British Land is the UK's largest listed retail landlord. Its portfolio of 27 million ft² of retail space includes 90 retail park properties, 99 superstores, 12 shopping centres and 10 department stores. Couple this with office accommodation for a number of London's leading financial and business service companies, and you are looking at a very diverse portfolio, with wide-ranging energy use issues.

British Land has set itself tough energy reduction targets on both a portfolio-wide basis and at a single building level. Having achieved a 27% reduction in landlord-influenced energy use in 2011/12 across the like-for-like portfolio ,compared to a 2008/9 baseline, the company has now set itself the ambitious target of achieving 40% reductions in landlord energy use across the existing portfolio by 2015.

So how is it going about doing it? 'We are achieving significant energy reductions by working with our occupiers, building management teams and sustainability

experts, investing in leading technologies, sharing information, encouraging behavioural change and managing buildings efficiently,' says Justin Snoxall, head of British Land's business group.

British Land scooped the Client Energy Management Award at this year's CIBSE Awards, following its success in the Building Operation category in 2011. And it's not just CIBSE's judging panel that has recognised the achievements the property owner has made on energy reduction: the firm was named as one of the Sunday Times Top 60 Green Companies 2011 and was a double winner in the Guardian Sustainable Business Awards 2011.

Central to its energy-reduction strategy has been an energy monitoring and optimisation process, developed and implemented by EP&T Global. British Land has used EP&T's Edge Mars monitoring, analysis and reporting tool since 2009, starting with a trial at its London head office York House. The encouraging results gave the team the confidence to roll-out the technology in 11 properties (nine office buildings and two shopping centres, with agreement from more than 40 occupiers) across its portfolio, with more to follow.

'At our York House head office more than £64,000 of savings are attributable to the optimisation process (as at 31 March 2012),' says Snoxall. 'This has contributed significantly to the 51% reduction in British Land-controlled energy use we have achieved over the last three years, as well as the 14% reduction we have helped occupiers to achieve in their areas.' The 2011 Landlord Energy Statement for York House confirms that energy efficiency has improved significantly in recent years, with 55kg of carbon per m² in landlord-controlled areas in 2011 (C rating), compared to 101 kg in 2009 (E rating).

The roll-out of the Edge technology has required almost £1m of capital investment so far, sourced through a range of different funding methods agreed with occupiers in each building. These have been through:

- The service charge – with occupiers benefiting from energy cost savings
- Third-party funding – paid back through energy cost savings
- Funding from British Land – with

> 'We are achieving significant energy reductions by working with our occupiers, building management teams and sustainability experts
> *Justin Snoxall*

investment recovered through energy cost savings.

'We expect to recoup capital costs in each building within three years through guaranteed energy cost savings,' says Snoxall. 'EP&T offers guaranteed reductions in base-building energy use (common areas and shared services) of at least 10% in each building in the coming years, through continuous improvement. We expect it to result in greater savings, based on our York House pilot.'

As part of the specification process when implementing the Edge system, British Land developed a stringent brief with well-defined objectives. These included:

- Providing a comprehensive data reporting system for key energy users
- Introducing a remote monitoring service that identifies energy saving opportunities quickly
- Optimising energy efficiency in British Land controlled common areas and shared services
- Automating the occupier billing process
- Offering a scalable system across multiple buildings, with online access.

Edge gives access to energy data through extensive sub-metering, with a breakdown of consumption by occupiers, floor levels and most significant types of usage, from small power and lighting to major pieces of equipment, such as lifts and boilers. Electricity, gas and water data is uploaded automatically to a central system online every 15 minutes, and a remote diagnostic service identifies opportunities to optimise consumption, providing regular alerts and reports that quantify cost-saving opportunities. It also details measures completed to improve efficiency.

> British Land offers to fund energy reviews in areas where office occupiers are committed to energy reductions

The British Land team works closely with the building management team to achieve the projected reductions, with the on-site engineering manager actioning the energy saving recommendations highlighted by the remote diagnostic service. Energy efficiency measures introduced as a direct result of the monitoring system and optimisation process include:

Encouraging best practice

As well as working in partnership with its building occupiers to reduce energy, British Land is a strong believer in working collaboratively with its commercial property peers on sustainability issues and is a founder member of the Better Buildings Partnership (BBP). The BBP includes London's leading commercial property owners and allied organisations, supported by the Mayor of London and the Greater London Authority. Its aim is to develop solutions to improve the sustainability of London's existing commercial stock and achieve substantial CO_2 savings in support of the Mayor's target of 60% by 2025.

British Land chaired a BBP working group, which developed a Green Building Management Toolkit to help owners, occupiers and building management work together more effectively to reduce energy, water and waste.

The developer is also working with University College London, CIBSE, Verco and the Usable Building Trust to use its data to help to calibrate, establish and introduce Landlord Display Energy Certificates (DECs) on a voluntary basis. British Land has completed a prototype Landlord DEC at York House using the Landlord energy statement - tenants energy review (LES-TER) methodology, and has undertaken LES-TER assessments in 16 other multi-let office buildings.

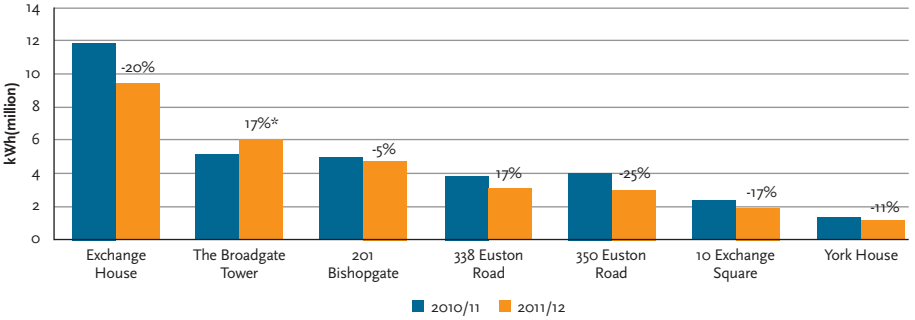
- Repairing a broken sensor that had been causing constant gas use for heating
- Reprogramming the Building Management System (BMS) to fix constant gas use for cooling
- Identifying and fixing faults with the BMS programming for air handling
- Maximising the use of external air for free cooling
- Reprogramming the BMS to facilitate weather compensation, with a new 15.5°C set-point
- Introducing economy cycles and new set-points for summer and winter heating and cooling schedules.

In most buildings with the optimisation process, British Land is seeing savings ahead of schedule, with a reduction of 12% in base-building consumption (common areas and shared services) from 1 April 2011 to 31 March 2012 (see bar chart left). In existing buildings, this has saved 11 million kWh, over 4,100 tonnes of carbon and almost £610,000.

'In the two new developments where we have installed the energy monitoring system, we do not have the same opportunity to establish year-on-year reductions. Instead, we are developing design baselines against which we can benchmark performance and target savings,' explains Snoxall.

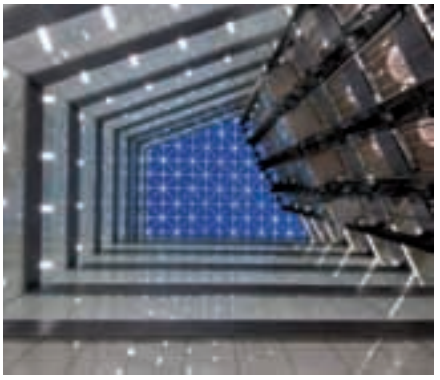
As well as achieving reductions where the new optimisation process has been rolled out, British Land's strong approach to energy management is reflected in its overall 2011/12 performance (from 1 April 2011 to 31 March 2012), which included 27% less energy use across its like-for-like managed portfolio, compared to the

Base-building energy use in the seven existing buildings with the new monitoring system and optimisation process



* At the Broadgate Tower (where development completed in 2008), an increase in people based in the building has led to more energy use. British Land is working closely with occupiers and building management to improve efficiency


338 Euston Road



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For further information on this year's winners, as well as details of how to enter the 2013 awards, please visit **www.cibseawards.org**

2008/09 baseline, saving 47.4 million kWh, 24,500 tonnes of carbon and £3.3m on occupiers' energy bills.

Land share

British Land can only be successful in its energy-reduction initiatives by working in partnership with its building occupiers. The developer uses green building groups, with occupiers and building management teams, to provide a forum to agree energy-saving initiatives and monitor progress, with roles and responsibilities formalised through Green Memoranda of Understanding.

British Land provides office occupiers with building environmental statements every six months. It believes that this is unique in the sector in providing detailed, year-on-year building management and occupier performance comparisons. It offers to fund energy reviews where occupiers are committed to energy reductions. These reviews will highlight initiatives occupiers can implement to drive energy reductions.

There have also been improvements to the reporting and transparency of energy invoicing. In July 2011, all multi-let office occupiers received an energy statement for each whole building, detailing the basis for allocation of costs to each occupier and identifying total costs of energy by occupier.

'The information provided through our new monitoring system and optimisation process is also providing the basis for much better collaboration with occupiers and building management teams. At our green building group meetings, we are able to focus much more on results than we ever could in the past,' adds Snoxall.


10 Exchange Square

All change on the Euston Road and Broadgate

At 338 Euston Road at London's Regent's Place, British Land achieved £35,000 of energy savings this year, with 17% lower base-build energy use than last year and 2% less energy use by occupiers in their areas. This follows a recent refurbishment of the building and upgrades to equipment, including:

- New water heaters, so that the main boiler system can be switched off during the summer
- More energy efficient air handling units
- Upgrades to the building management system to enable more sophisticated programming for heating and cooling
- Improvements to the lighting system, with more energy-efficient lamps and motion sensors.

British Land expects to achieve further energy reductions going forward, following the implementation of the Edge optimisation process.

The green building group at 10 Exchange Square at London's Broadgate has been particularly successful this year, with £82,000 of energy savings cutting carbon emissions by around 500 tonnes.

Occupiers achieved a 17% reduction in their areas and British Land cut base-build energy use by 17%. Initiatives included carrying out overnight lighting surveys, installing motion sensors, and deactivating override buttons on air handling units, with occupiers' facilities managers now arranging when plant needs to be run out-of-hours.

What next?

Subject to the energy monitoring system achieving its projected reductions in base-building energy in the these buildings, British Land plans to roll it out across more of its office buildings and shopping centres in the UK and Europe, with occupier agreement.

'We believe that, within three years, further energy reductions will require capital investment, and behavioural change by occupiers,' says Snoxall. 'We are therefore undertaking detailed base-building energy and water reviews to highlight energy-saving opportunities via capital investment. We will continue our efforts to lead on energy efficiency to cut costs for our occupiers, at the same time as reducing carbon emissions.' It seems that British Land has the Edge. **CJ**

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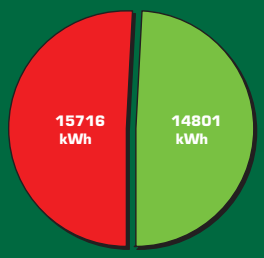
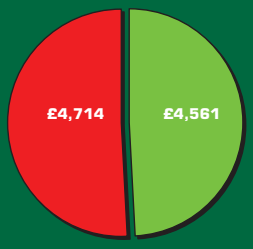


Carbon Usage / Savings

Running Cost / Savings



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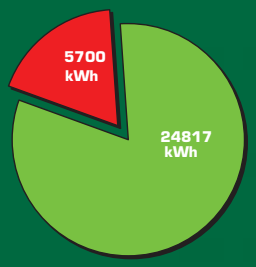
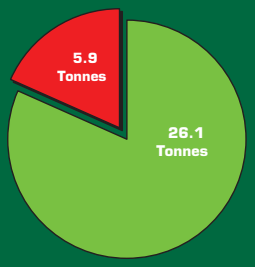


Carbon Usage /Savings



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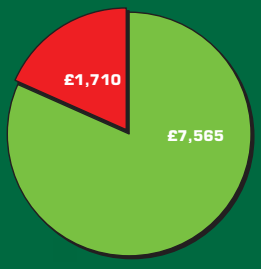
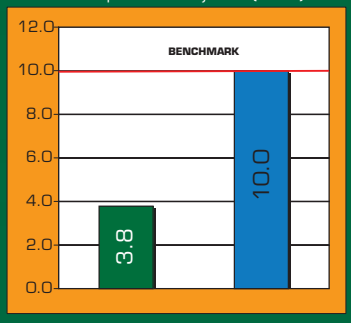
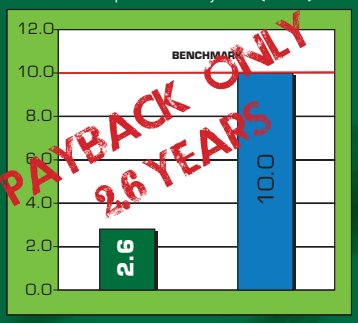


Units Up To **70%** Pay Back (Years)



Units Up To **95%** Pay Back (Years)



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HOW MUCH VENTILATION DOES THIS ROOM NEED?

Demand controlled ventilation allows air to be circulated according to a building's use and occupancy. Its omission from SAP should be quickly rectified, challenges heating and ventilation consultant **Dr Chris Irwin**

Emphasis on the Standard Assessment Procedure (SAP) by housebuilders seeking the most energy efficient method of ventilation is leading to a situation where mechanical extract ventilation (MEV) and mechanical ventilation with heat recovery (MVHR) are perceived as the only systems that can ventilate airtight homes adequately and still meet target emission rates (TERs).

We are only four years away from the government target to make all new housing carbon neutral, but demand controlled ventilation (DCV), arguably the most effective energy saving ventilation innovation proven to reduce emissions and slash running costs, is left to languish on the sidelines of new build projects because the Code for Sustainable Homes (which DCV satisfies completely) is so tightly tied to SAP.

SAP is only applied to 'recognised technologies' such as MEV and MVHR – the 'key' indicators of energy efficiency measured under SAP being specific fan power (SFP) and heat recovery efficiency through the heat exchanger.

DCV uses sensors to monitor and measure ambient conditions and feed real-time data back to the zone controller. This adjusts the fan speed modulating the ventilation rate to match the use and occupancy of the building.

SV Luma/shutterstock.com

DCV systems can't be measured against SAP as they provide variable ventilation depending on occupancy. This state of affairs has left MVHR in pole position simply because SAP has no methodology to measure DCV performance. This has put the technology on the back burner despite its many advantages over MVHR in terms of better indoor air quality, energy efficiency, cost and ease of installation and operation.

Nevertheless, DCV is the system recommended in the 2009 NHBC report *Indoor air quality in highly energy efficient homes – a review* which says: 'The next drive by the industry will be for advanced controls and, in particular, for demand controlled ventilation (DCV). If the energy savings resulting from the potential reduction in fan operation and heat loss are to be realised, the "building empty" and "room empty" minimum ventilation rates must be determined.'

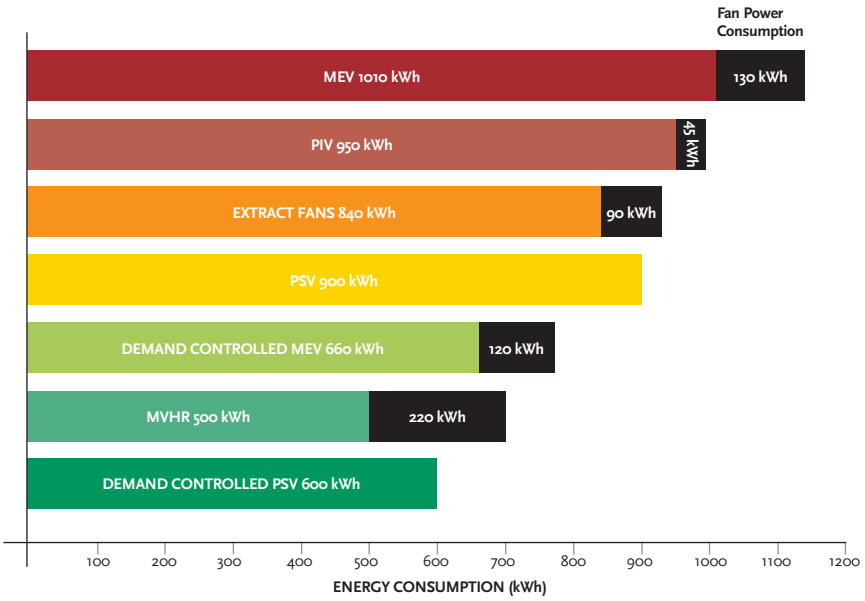
And now there is evidence showing the impact of different ventilation systems on annual energy consumption.

The house used for this comparison (see graph) is a typical 1930s two-storey, three bedroom semi-detached property with three 'wet' rooms. Typical air tightness for this type of property is N50 value around 7 $m^3/hr/m^2$ envelope area.

The annual heating season is taken to be 33 weeks long and, for the purpose of comparison, it is assumed that the property has a gas-fired central heating system.

The research shows that the most energy efficient ventilation system is demand controlled passive stack ventilation, followed by MVHR and demand controlled MEV.

The three worst energy consuming ventilation systems are, in the following order: Standard MEV, positive input ventilation (PIV) and finally, individual extract fans.



Research showing most energy efficient ventilation systems in a three-bedroom home

In SAP Q bench testing, MVHR meets all the Code criteria for energy efficiencies but, in reality, an installation turns in different results from a SAP bench test carried out in laboratory conditions. The problem is that for the technology to deliver the high efficiencies seen in the SAP Q tests, the dwellings must be airtight – and this is not happening.

At the Zero Carbon Hub conference in February, 'Progress towards 2016', Alan Gilbert of BSRIA informed the meeting that in 2011 BSRIA tested approximately 7,500 properties for airtightness of which only 200 met the 2010 version of the Building Regulations. In 2012 he estimates BSRIA will test 8,000 to 10,000 properties of which 1,500 will achieve Building Regulations.

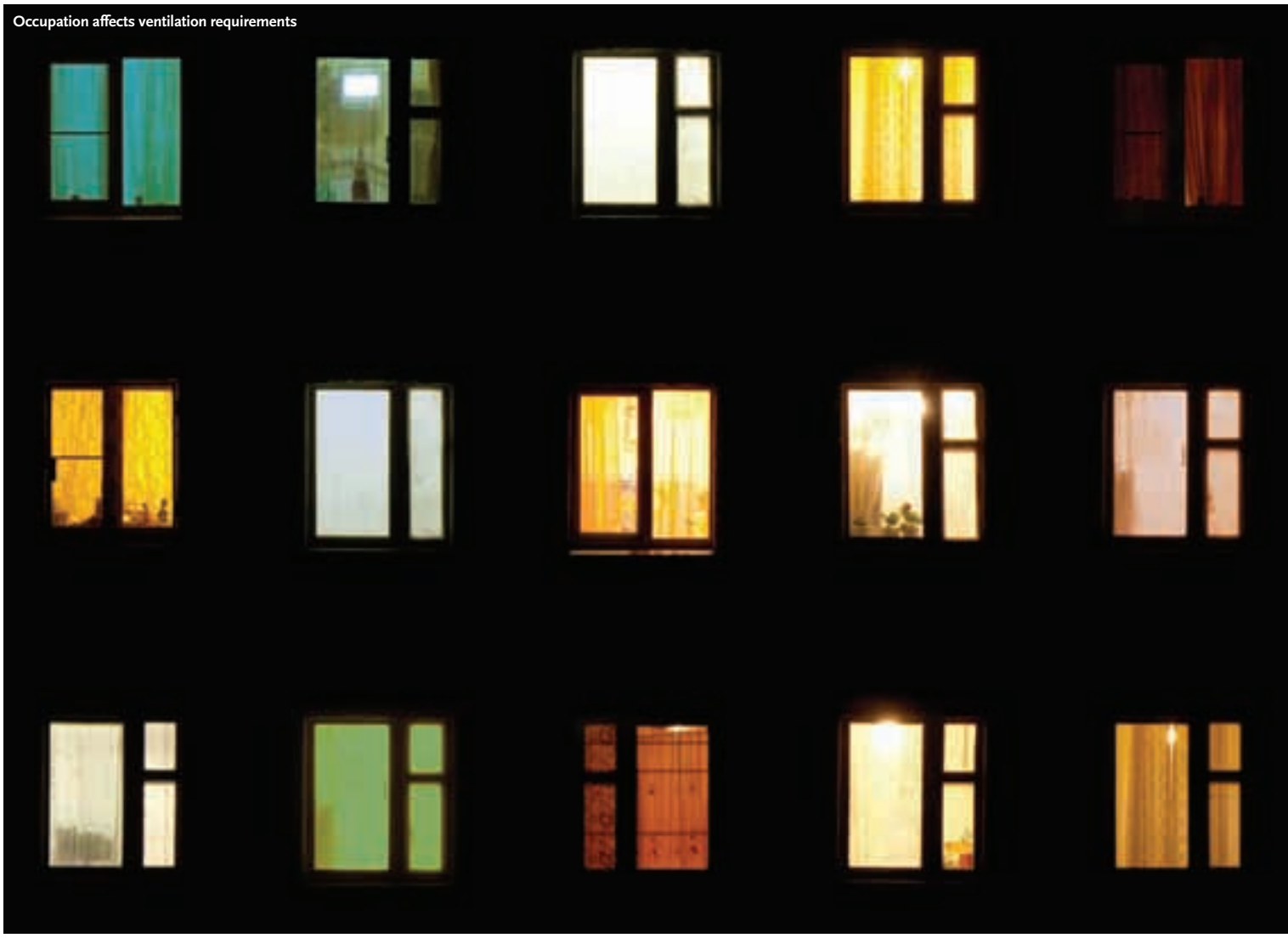
He went on to say that according to *The Domestic Ventilation Compliance Guide* Section 5.2, measurement of air flows should be performed using equipment that has been calibrated at a UKAS accredited calibration centre.

BSRIA Instrument Solutions is the only UKAS accredited calibration laboratory for evaluating air volume devices with a test facility specifically designed for products used on domestic ventilation systems. However, said Gilbert, Instrument Solutions has to date only calibrated three hoods and anemometers not belonging to BSRIA for air volume. 'So who is measuring compliance and on what authority?' he asked.

A recent Ventilation and Indoor Air Quality Task Group (VIAQ) report[1] raises concerns about MVHR that need to be taken very seriously: 'The task group considers that examples of failures in typical design, installation and commissioning practice are all too common and these will have the effect of reducing the performance of systems. Badly performing systems may not deliver the anticipated carbon savings and may result in degraded IAQ with related consequences for health.'

It also noted that: 'Although good control is essential to the correct operation of systems, good practice in the design and provision of controls is uncommon. Clearly this needs to be addressed. Realising good performance throughout the life of systems also requires that maintenance is undertaken in accordance with manufacturers' requirements. The task group noted that many systems have been installed in locations, such as roof

> MVHR is in pole position simply because SAP has no methodology to measure DCV performance



Occupation affects ventilation requirements

> Specifiers and contractors must put pressure on government to have SAP overhauled

spaces, where access for user-maintenance is restricted. It also noted anecdotal reports that a market for replacement filters does not exist at present, which suggests that even basic maintenance is not being undertaken, possibly because users are not aware of the requirement for it.'

There is also the worry that badly installed and unmaintained mechanical systems may actually increase the risk of health and respiratory problems. The good news for DCV is that under the Government's flagship Green Deal scheme, which will target energy savings among the UK's existing housing stock, scheduled for launch in October 2012, it would appear that MHRV systems will not be an approved technology for use in refurbished houses.

At the Zero Carbon Hub conference, 300 industry stakeholders heard Stewart Baseley, executive chairman, HBF, call for a model of SAP to be put in place that is fully and properly fit for purpose. He said: 'Without this, builders are in the invidious position of having to design buildings that they believe should deliver the performance that is expected but subsequently discover – though no fault of their own – that actual performance is not what is predicted.'

The current state of affairs has left the not so effective MHRV in pole position, simply because SAP has no methodology to measure DCV performance. This has unfortunately put the technology on the back burner despite its many advantages over MVHR in terms of better indoor air quality, energy efficiency, cost and ease of installation and operation.

Specifiers and contractors must put pressure on government to have SAP overhauled so it recognises the technology of DCV, and allows any energy-saving ventilation product to be judged fairly and on its merits.

References

1. Mechanical Ventilation with Heat Recovery in New Homes Interim Report, Ventilation and Indoor Air Quality Task Group January 2012

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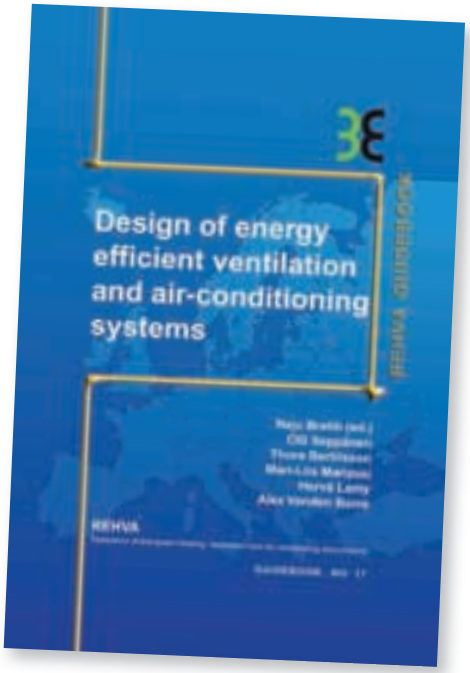


A new REHVA guide on energy efficient ventilation and air conditioning is a great starting point for designers and consultants wanting to get up to speed on the latest systems, says **Tim Dwyer**

As REHVA heads into its 50th year, the Federation has expanded its series of guidebooks with the publication of the *Design of energy efficient ventilation and air conditioning systems*, edited by Nejc Brelih, which marks the 17th booklet in the series.

Despite the title, the modest 100 pages quickly establish that this is not a design manual but clearly a 'starting point', aimed at designers and consultants so that they can update their knowledge on contemporary, state-of-the-art commercial systems.

Having provided a brief glossary of terminology, the book considers the state of the European building stock. Although there are different climatic conditions, the common factor in European building stock (of which about 29% is non-residential) is that a substantial proportion is more than 50 years' old, with nearly 60% having been constructed prior to 1975 (see Figure 1).

The implication is that the principles conveyed in this book are potentially as important in the operation and refurbishment of existing buildings as they are for new build.

Providing some useful context, the proportion of built environment energy used in European non-residential buildings (with buildings consuming approximately 40% of total European energy consumption) matches their proportion at (just over) 30% of the total energy use.

The guide laments that there is no detailed breakdown of the energy use in European non-residential buildings, but looks forward to the outcome of two ongoing projects – available to be reviewed at **ecbcsa53.org** and **iservcmb.info** – which will provide this missing intelligence.

The importance of being able to examine – and benchmark – the non-residential building stock with greater discrimination is highlighted by wide variations in electrical energy use recorded in buildings across Europe. This will, of course, be influenced by climate, but without proper differentiation it is almost impossible to assess relative performance of buildings, and to head towards the visionary expectation of net zero energy buildings laid out in the Energy Performance of Buildings Directive (EPBD).

Having set the scene, the succeeding 11 technical chapters provide a somewhat eclectic mix of topics related to the energy performance of building services systems. That is not to criticise, as it would be an unrealistic expectation that this pocket-sized volume would provide the breadth and the depth of a 'Faber and Kell' style textbook. The contributions appear well informed and the book was also independently peer reviewed.

And so turning to the technical chapters, (as listed in the box), these rightly open with the almost obligatory review of indoor environmental quality – the maintenance of which is the very reason for the existence of the industry represented by REHVA.

The chapter successfully conveys the need to have a holistic understanding of the parameters that define a wholly appropriate internal environment, from the basics of temperature and the influence of clothing and activity, through to outlining the

> To cover such a potentially broad area, while including detailed discussions in such a condensed format, is challenging

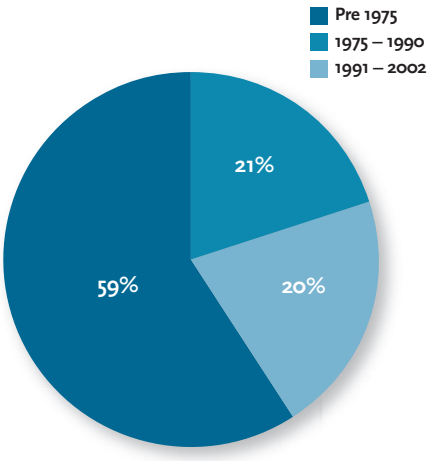
REHVA

Formed in 1963 REHVA, the Federation of European Heating, Ventilation and Air-Conditioning Engineers (originally Representatives of European ....), has 26 association members across Europe (including CIBSE), plus company and associate society supporters. REHVA's aim is to undertake activities to improve the health, comfort and energy efficiency of all buildings and communities, and through its active members has some influence on relevant EU and international standards.

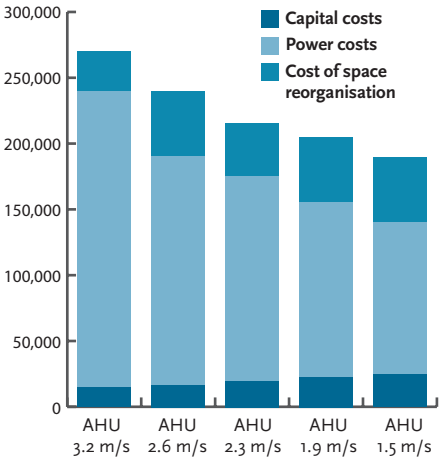
It also supports research initiatives, as well as providing networking opportunities, and educational and training programmes. REHVA publishes a free journal that is available online at www.rehva.eu, together with freely downloadable presentations from its conferences.

The CIBSE representative, Donald Leeper, will be speaking at the REHVA seminar, *Buildings and HVAC-products related EU regulations*, which will take place in Brussels on October 18 2012

www.REHVA.eu



Distribution of non-residential buildings (excluding industrial) based on the year of completion (Source: Tabula)



LCC analysis of five different sizes of AHUs with different face velocities. Operating time: 24 hours per day, seven days per week (Source: AL-KO)

impact on the economic performance of the building. The layout of the subsequent chapters start with 'Recommendations in a nutshell', relating to the subject of each of the specific sections. The form of these naturally imply 'rules of thumb' that are bound to be keenly sought by students and developing practitioners alike and can, when properly informed, give a useful steer to the uninformed or forgetful.

The strength of these particular recommendations is that the reader can, and should, within a few hundred words, read the rationale and justification behind them. The descriptions of the application of equipment associated with air handling units (AHUs), and particularly filters, fans, heat recovery units and pumps, is orientated towards minimising life cycle costs (LCC).

There are some interesting examples comparing the effect that face velocity (the velocity that the air passes through an AHU) has on the LCC of AHUs, indicating the benefits of larger section AHUs and in conjunction with discussion on appropriate speed control of properly selected fans and pumps. (See figure 1)

The inclusion of a dedicated chapter on motors and speed control is to be applauded in what otherwise may be thought of a 'mechanical services' publication – the brevity of the material is still capable of providing some important 'keynote' facts that may otherwise be marginalised.

These core technical chapters provide a good grounding in the sensitivities of selection in centralised air conditioning and ventilation. The most extensive chapter covers on demand controlled ventilation (DCV), which contains some useful background on the benefits of using such systems, together with the practicalities of their impact on airflows into rooms and control.

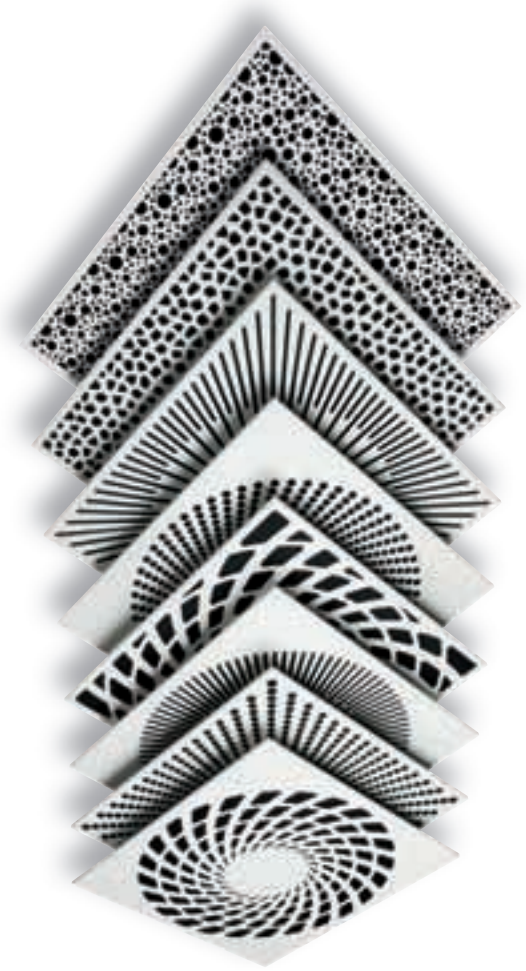
Oddly, the book ends with a chapter on passive solar shading – no doubt an important influence on building performance – but the space may well have been used to cover areas conspicuous by their absence, including general room air distribution and decentralised systems, such as fan coils, chilled beams and hybrid embedded systems. Some of these are covered in other dedicated books in the series but, then again, so is solar shading.

This guidebook provides a quick, well presented read of specific aspects of energy efficient centralised ventilation and air conditioning system technologies applied in commercial buildings. To cover such a potentially broad area, while including detailed discussions in such a condensed format, is challenging.

- *Design of energy efficient ventilation and air-conditioning systems* is available at **www.rehva.eu** for €50.

IN REVIEW

- Technical Chapters
- Indoor environmental quality
- Air handling units
- Energy efficient fans
- Air filters
- Air-to-air heat recovery systems
- Demand controlled ventilation (DCV)
- Design and balancing of ductwork
- Chillers and heat pumps
- Pumps and hydronics
- Electric motors and variable speed drives
- Solar shading equipment



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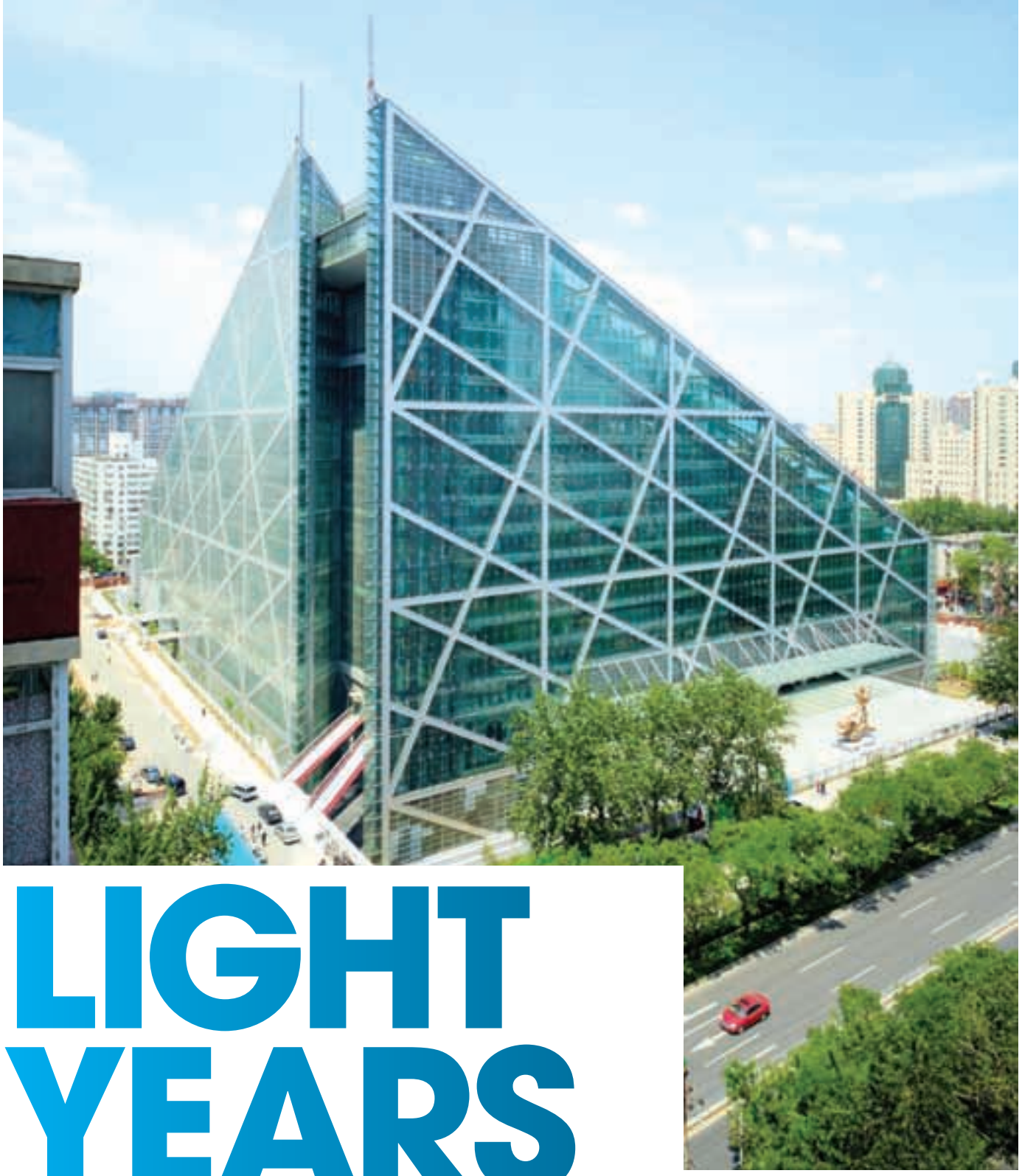
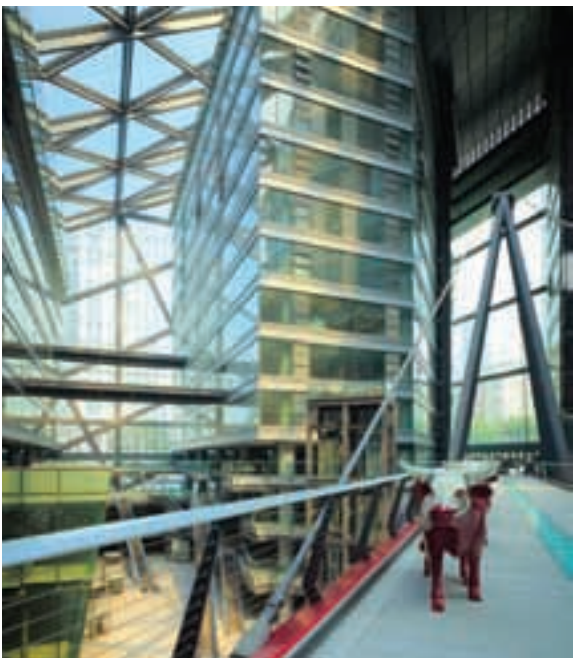


LIGHT YEARS AHEAD

Beijing has more than its fair share of jaw-dropping modern architecture, but sustainability has not always been high on the agenda. One developer is bucking the trend and has delivered a mixed-use scheme with a LEED Platinum rating. **Rob Shepherd** speaks to Arup to find out how a natural ventilation strategy cut energy use by 45%

Beijing was best known for opulent palaces, temples and Tiananmen Square, but China's economic boom has turned it into an architectural playground for superstar designers such as Rem Koolhaus, Zaha Hadid and Herzog de Meuron. China's second city now has some of the world's most exuberant modern buildings, but they haven't always been the most sustainable. The bird's nest Olympic stadium, for instance, used 45,000 of steel in its design – 10 times the amount used by London's Olympic stadium.

But some Chinese developers are taking sustainability seriously, including a company that once owned Battersea Power Station –



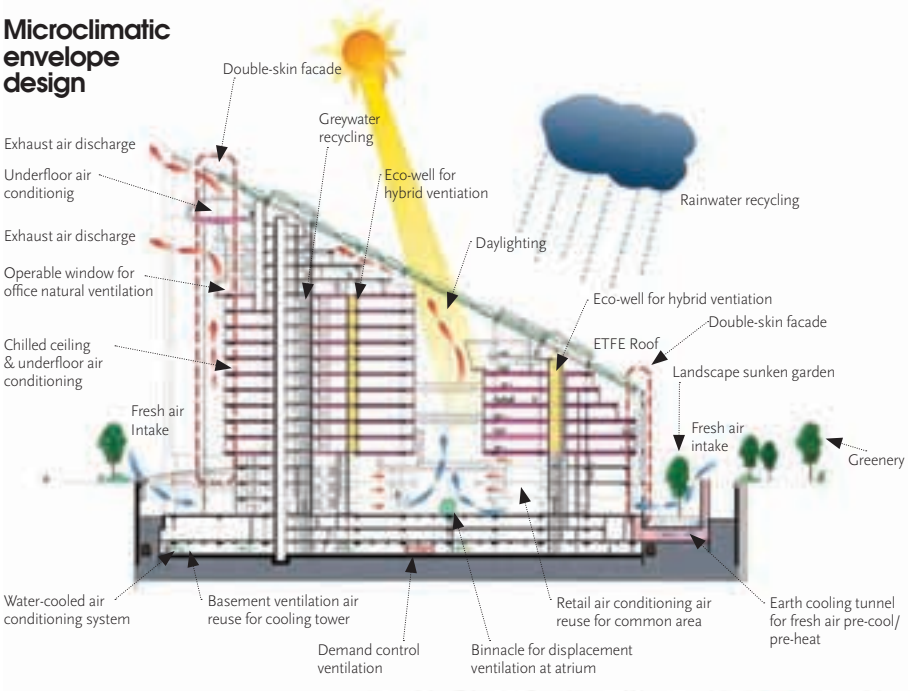
the Chyau Fwu Group. Its new 200,000m² mixed-use scheme Parkview Green FangCaoD has been designed to be naturally ventilated for most of the year and has been awarded a LEED Platinum rating for its core and shell.

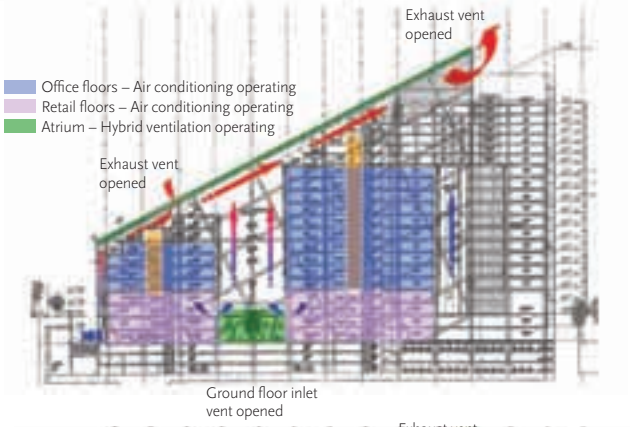
The developer made it clear to the architect Integrated Design Associates that it wanted to set a new standard for sustainable design in Beijing. "Parkview Green FangCaoDi had an open brief, but with a strong sustainable agenda,' says Ed Peter, IDA's associate director. 'We wanted to create a development where natural ventilation systems could be deployed.'

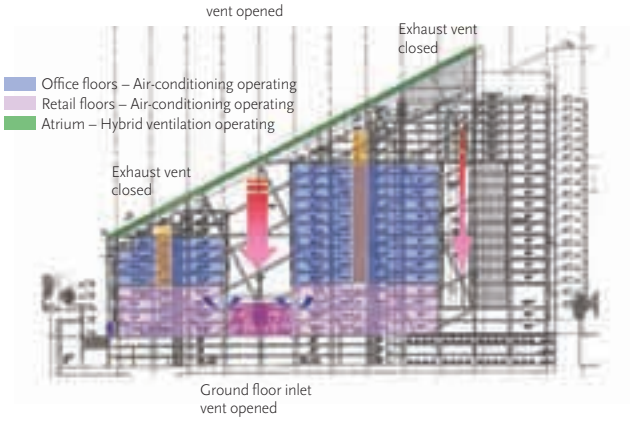
Arup was the consultant engineer on the scheme and has worked with the developer since the planning stage 10 years ago. Dr Vincent Cheng, Arup's director of building sustainability, says aiming for a high LEED rating made commercial sense. 'One of the benefits of having LEED-CS is that it has helped it secure a lot of commercial tenants that have global corporate social responsibility policies, which require them to rent LEED certified buildings,' he says.

Parkview Green FangCaoDi is pyramidal in shape, and comprises two nine-storey and two 18-storey towers containing 82,000 m² of office space, a 100-room hotel and 50,000 m² of retail space. A 236m pedestrian bridge spans the complex, offering views across a public plaza. A boutique cinema, a mini-spa and a gym on a terraced garden sky lounge on the 18th floor are among the building's commercial perks.

The building blocks are encased in a double skin façade of glass and an air-filled ethylene tetrafluoroethylene (ETFE) envelope. ETFE film is 1% of the weight of glass, and transmits more light. The ETFE roof is set 3m away







Heating and ventilation through the seasons

In winter the exhaust vent at the top of the roof is closed, as is the inlet vent. This increases the atrium's air temperature and the double-skin façade lowers energy consumption of the heating system by reducing heat loss through the fabric.

During summer, the intake opening at low level and the exhaust vent at the top of the building are both opened to allow ventilation through the space between the double skin façade. Air moves up and removes heat from the atrium by the heat stack effect, and binnacles inside the atrium provide spot cooling to enhance the thermal comfort to their surrounding areas.

The difference in atrium temperature in the summer and winter is due to its large area. If heating were used for the entire atrium, it would result in huge levels of energy consumption. When compared with the outside sub-zero winter temperatures in Beijing, 3-10°C is high enough to ensure adequate comfort conditions in the atrium.

Ventilation louvres vent the atrium spaces

> LEED is a new standard in China and not many local manufacturers of mechanical, electrical, plumbing and interior fit out products are aware of it
> *Dr Vincent Cheng, Arup*

from the main structures and effectively insulates the offices and retail space from the extremes of Beijing's climate, which averages 25.9°C in July and -4.8°C in January.

There are two atria cutting through the site – a diagonal space bisects an L-shaped 'high street' to create the scheme's four quarters.

The building was designed to minimise the amount of air conditioning and lighting required. Arup used extensive modelling to ensure that as much daylight as possible streamed deep into the building plan. The L-shaped 'high street' is 24 m-wide to allow as much light as possible to enter via the roof.

For more than 60% of the year natural ventilation is sufficient to maintain comfortable conditions within the offices, hotel and retail areas. To encourage the heat stack effect, Arup incorporated ventilation louvres at the top of the envelope enabling the removal of hot air. 'These act as chimneys, allowing the warmest air to escape and creating an upward flow. As the air escapes, cooler air is drawn up from the bottom of the building, creating air movement and natural ventilation. Cool fresh air or warm air is fed into the internal areas of the buildings as required,' says senior engineer at Arup, Gigi Kam.

To meet the LEED-CS Platinum rating, Arup aimed for a 30% better energy performance rating, compared with the ASHRAE Standard 90.1 2007. The hybrid ventilation approach offers up to 60% energy savings in the summer, compared to a conventional office air conditioning system. Overall, an energy saving of 15,820MWh is achieved annually.

Meeting the requirements in Beijing wasn't easy, says Cheng: 'LEED is a new standard in China and not many local manufacturers of mechanical, electrical, plumbing and interior fit-out products are aware of the standard.

'We needed to explain and work with them on how to achieve this standard – an exercise which turned out to be worthwhile as we were ultimately able to source almost all the materials locally.'

As a result of LEED-CS compliant design, Parkview Green FangCaoDi is able to save up to 44% in energy consumption and 48% in water consumption. Moreover, 25% of its total building construction material is made up of recycled content and Arup also managed to recycle 81% of its construction waste material.

To achieve energy savings during operation, a building management system integrates the building services systems between the four blocks for information sharing, data transmission and system management.

Through Parkview Green FangCaoDi, Arup has proved that sustainable building is possible in the economic hothouse of the world's fastest developing major economy. Cheng concludes: 'The prime objective was to create a new benchmark for a technologically innovative building that provides an energy effective solution for the client, as well as for visitors and occupiers. This has been fully realised and we are all delighted with the result.' **CJ**

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Assuring the performance of fire dampers in buildings

This module covers the evolution in, and application of, legislation and standards for fire dampers to ensure effective lifelong operation

As fire dampers are hidden from building occupants, and potentially also from the building owner and operational team, their essential role in maintaining protection against the spread of smoke and fire may only become obvious if a property suffers one of the 50 fires that occur daily in non-domestic UK buildings.[1]

Fire dampers are installed to prevent the spread of fire where air ducts penetrate fire-resistant barriers. Typically, smoke dampers are designed to prevent the flow of smoke and products of combustion (and are able to withstand high differential pressures); these are operated by thermally-tripped actuators from smoke detectors in the ductwork or via a centralised fire detection system. *Fire and smoke (or fire and leakage rated)* dampers combine both functions. For the majority of escape routes and sleeping areas, the fire dampers must also be operated by a smoke detector or suitable fire detection system.[2]

Main types of fire dampers

There are three principal types of fire dampers:

Curtain fire dampers are normally a series of interlocking blades, which fold to the top and are held open by means of a thermal release mechanism (that may be electrically actioned) that activates at around 72°C.

Intumescent fire dampers incorporate components that expand when heated by a fire, activating typically in the range 120°C to 270°C. Some incorporate an electro-mechanical device to provide cold smoke containment through an external control.

Single and **multi-blade fire dampers** have one or more linked framed pivoting blades, released by a thermal release mechanism (that may be electrically actioned) at around 72°C.

Figure 1: Multi-blade fire damper installed in a circular duct (Source: Ruskin Air Management)

The evolution of harmonised standards

The Construction Products Regulation (CPR) aims to harmonise conditions across Europe for the marketing of construction products – identified by the use of the 'CE' mark. This mark[3] is to promote free trade and remove technical barriers by unifying the recognition of products with 'European conformity'. This ensures that a product meets essential harmonised requirements of the applicable EC directives, but it is not, in itself, aimed at improving standards, nor does it imply that the product is made in Europe.

Prior to 1997, the only available UK standard for assessing the performance of fire dampers was BS 476 20-22:1987 – *Fire tests on building materials and structures*. As its name suggests, this standard was principally designed for static construction components, and so did not include the breadth of testing that could fully assess the tolerances, fit and dynamics that are intrinsically associated with the performance of a mechanical fire damper. The subsequent development of the 'testing' standard BS EN 1366 – *Fire resistance tests for service installations*, provided a set of standardised tests that were relevant to the practicalities of application of fire and fire/smoke dampers.

From 1 July 2013, it will be a requirement for all new fire and smoke control dampers used in UK buildings to be CE-marked to indicate compliance with the relevant 'product' standard (see Table 1). These product standards provide recognised criteria covering their integration into the building structure, referring to the 'testing' standard

	Standard	Fire (and leakage) rated dampers	Smoke-rated dampers
Product standard	EN 15650:2010 Fire dampers	✔	
	EN 12101 Smoke and heat control systems		✔ Part 8:2011 Specification for smoke control dampers
Test standard	EN 1366 Fire resistance tests for service installations	✔ Part 2:1999 Fire dampers	✔ Part 10:2011 Smoke control dampers
Classification standard	EN 13501 Fire classification of construction products and building elements	✔ Part 3:2005 Classification using data from fire resistance tests on components of normal building service installations	✔ Part 4:2007 Classification using data from fire resistance tests on components of smoke control systems
Standard for variations from tested applications	prEN 15882: Extended applications of test results for fire resistance tests for service installations	✔ Part 2: in approval process Dampers	

Table 1: Principal European standards regulating fire dampers

BS EN 1366, and unlike the previously employed BS 476 procedures, this standard contains test procedures that are attempting to ensure dampers are installed in ways that are clearly consistent with the regulated and tested installation detail.

Fire damper testing

Figure 2 shows a simplified layout for a BS EN 1366 test that, in this case, is designed to assess the ability of a fire damper to withstand heat and prevent the passage of smoke and gases at high temperatures in a horizontal duct. The damper is installed into the furnace wall and a plenum is fixed to the face of the damper, leading to a fan that maintains a set subatmospheric pressure on the face of the damper during the test. The damper is opened and closed 50 times (based on two maintenance checks per year, nominally simulating 25 years' service), prior to the fans or fire being started to test mechanical robustness and then left in an open position at the start of the fire sequence. If a leakage test is to be undertaken, the damper is closed and the leakage rate measured using the measuring system in the test duct at ambient conditions prior to the fire test. The damper is then set to a position to give a velocity of 0.15 m/s across the face of the damper, the furnace is started, and the damper blades must fully close automatically within two minutes. The damper is then subjected to a required subatmospheric pressure and temperature of 1,050°C to 1,150°C for two to four hours.

Leakage (S) is leakage during the fire test of less than 200 $m^3 h^{-1}$ per m^2 of damper face area, measured at ambient temperature. This is the same requirement for all sizes of manufactured dampers, and so can be particularly demanding for a range with small size dampers.

Integrity (E) is the time that a damper allows a leakage less than 360 $m^3 h^{-1}$ per m^2 without a failure. This would normally be associated with smoke dampers and the fire performance of a fire and smoke damper.

Insulation (I) is the average temperature rise on the unexposed face to 140°C, with a maximum point value of 180°C.

The rating will reflect the performance of the damper – for example, ES 240 would indicate a damper that has been tested for both integrity and leakage and has maintained performance to standard requirements for four hours. (Historically, the UK has used the format 'ES 240', but under EN 13501 this will be shown as 'E240S'.)

System design

System design and installation for fire and smoke dampers must be project-specific, taking into account up-to-date legislation and manufacturers' recommendations. So while it is important to ensure that appropriately certified dampers are used, it is as critical to install those dampers so that they reflect the conditions in which they were tested and assured. This requires close liaison between manufacturer, designer and site workers. Consideration must be given not only to damper installation, but also to access for maintenance and testing during the lifetime of the building.

The key tasks for successful fire protection in a building, as identified by DW/145, are:

Fire/smoke compartmentation – A fire strategy should be established and recorded that clearly shows fire and smoke compartmentation and the details of the protected areas.

System specification and design – Those responsible must ensure that the design and application is suitable for the particular project and not simply generic.

Programme of activity – This includes the relationship with other trades, and the physical position of the damper in relation to the building fabric and other services.

Damper procurement – All the appropriate specifications for dampers must be supplied by the designer. Substitutions for dampers other than those specified require checking by the designer.

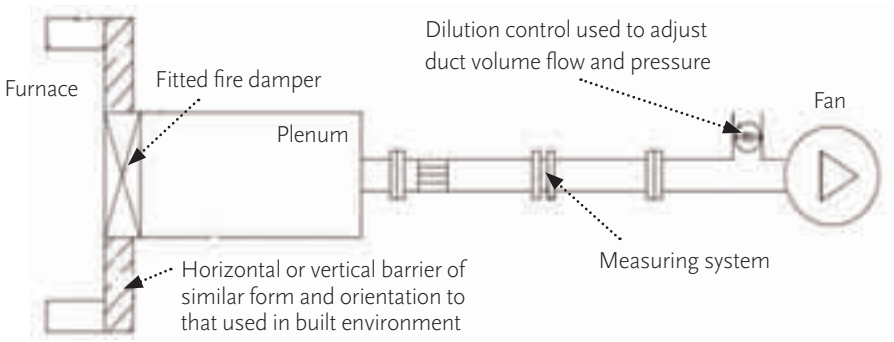

Figure 2: A simplified representation of the setup for testing fire dampers to BS EN 1366

Damper supply – Dampers must be supplied with dimensionally detailed guidance on how the damper assembly is to be installed and evidence that the method has been appropriately fire tested.
Fire separating elements/barriers – A responsible person must ensure that fabric, including fire barriers, have appropriate penetrations formed to accommodate dampers, in accordance with tested specifications.
Penetration seals – Any seal that is applied around the damper should be in accordance with tested specifications, and the installer must be clearly aware of the required standard of work.
Compliance with Building Regulations – Building control authorities must be satisfied that the design shows compliance with Building Regulations. The methods of installation must have been successfully fire tested by an independent body on behalf of the damper manufacturer.

Managing the installation process

The Building and Engineering Services Association's (B&ES) DW/145 *Guide to Good Practice for the Installation of Fire and Smoke Dampers* highlights the role of the CDM (construction, design and management) coordinator (as required by the 2007 CDM regulations) and the principal contractor, who have key roles in the planning and management required to assure a coherent and compliant installation. Resources such as the BSRIA Design Framework[4] may be employed to help schedule the designated responsibilities of, and actions for, individuals. The CDM coordinator will clearly identify specific responsibilities for appropriately competent members of the team, which may include, for example, project manager, building control, fire consultant, damper manufacturer and installation contractor.
Specifically, for successful damper installation, the principal criteria are:

- Installation should meet design specification;
- Dampers must be installed in accordance with tested methods; and
- Dampers should be fixed either directly in, or immediately adjacent to, the fire barrier and must be supported independently of the duct work.

By meeting these criteria, untested ad-hoc installations will be eliminated.

Specifying an assured installation

DW/145 provides a list of technical information that the system designer should provide to the damper installation company. This includes:

- Manufacturers' test data sheets and dimensions with detailed technical illustrations;
- Performance characteristics and associated controls specification;
- Materials' specification and critical dimensions;
- Project-specific detail including relationship of damper with fire barrier, connection to ductwork, damper supports, and expansion arrangements around damper. This would include detailed fitted drawings, such as the example in Figure 3 (note that this is an incomplete extract of a example full drawing from DW/145);
- Overall system design drawings, with cross-reference numbering system identifying dampers; and
- Programme identifying installation sequence, installation and hand over (DW/145 has indicative programmes).

Practically, there will be issues on site that require some deviation from the expected design detail. Although the whole team have responsibility, any variations are likely to require approval of building control and/or the local fire authority. Damper manufacturers are not empowered to provide that approval. Requesting approval after the event is not acceptable.

To ensure a smooth transition, the whole team must complete a list of information at the handover – DW/145 provides generic checklists that can be used as the basis for this. The completed checklist is likely to form part of the legislative requirements in the future, as part of the evidence trail that appropriate processes have not only been followed, but also properly monitored. The building owner/operator has responsibility for continuing fire safety, and requires handover information for both the initial installation and commissioning details, to allow future testing and inspection.

Although out of sight, fire and smoke dampers cannot be out of mind.

Further reading:

DW/145 – *Guide to Good Practice for the Installation of Fire and Smoke Dampers*, B&ES, 2010.
BRE Good Building Guide 81– *Installing fire-resisting ductwork and dampers*, BRE 2011.
Disjointed Approach – CIBSE Journal, September 2011 p55-57

- Thanks to Kevin Munson at Ruskin for assistance with this article.

References

1 *Fire Statistics, Great Britain, 2010 – 2011*, DCLG, November 2011, p44.
2 The Building Regulations (England & Wales) 2000, Approved Document B – Fire safety (2006 rev 2007 & 2010), Vols 1 & 2. DCLG.
3 **www.ec.europa.eu/CEmarking.**
4 BSRIA BG6/2009 Design framework for building

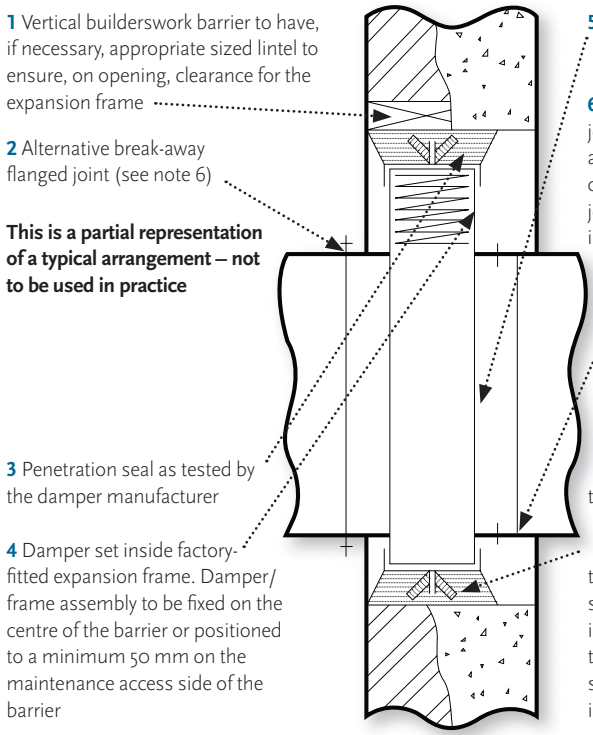

Figure 3: Partial extract of fire damper installation detail (Source: DW/145)

Module 44

September 2012

Ruskin Air Management Limited

1. At approximately what temperature would a multi-bladed fire damper be set to close?

- ☐ A 72°C
- ☐ B 100°C
- ☐ C 120°C
- ☐ D 270°C
- ☐ E Flame temperature (>1000°C)

2. Which classification standard is most appropriate for smoke dampers?

- ☐ A EN 1366: Part 2:1999
- ☐ B EN 1366: Part 10:2011
- ☐ C EN 12101: Part 8:2011
- ☐ D EN 13501: Part 3:2005
- ☐ E EN 13501: Part 4:2007

3. From what date must all new fire and smoke control dampers used in UK buildings be CE marked?

- ☐ A 1 October 2012
- ☐ B 1 January 2013
- ☐ C 1 March 2013
- ☐ D 1 July 2013
- ☐ E 1 September 2013

4. Which of these is not likely to be included in the primary list of key tasks for assuring building fire protection?

- ☐ A Compliance with building regulations
- ☐ B Damper procurement
- ☐ C Fire/smoke compartmentation
- ☐ D On-site fire testing of dampers
- ☐ E Programme of activity

5. What is recommended as a particularly useful source of check lists for the information to be passed to the operator at project handover?

- ☐ A Construction Products Directive
- ☐ B DW/145
- ☐ C prEN 15882: part 2
- ☐ D Regulatory Reform (Fire Safety) Order
- ☐ E UK Building Regulations, AD B

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A QUESTION OF EFFICIENCY

There is a new standard you should be aware of for the implementation of energy management systems. **Chris Bowser** looks at how it can help businesses cut both energy use and costs

The European Standard BS EN ISO 50001:2011 covers the legislative requirements for implementing Energy Management Systems (EnSM), and organisations using the standard will benefit from energy and cost efficiencies.

It replaces the short-lived standard BS EN 16001:2009, which was withdrawn in April this year.

Both documents essentially cover the same ground, enabling organisations to establish the systems and processes necessary to improve energy performance, including energy efficiency, use and consumption. Both standards use the ubiquitous Plan, Do, Check, Act process of continual improvement, common to all modern management systems standards.

BS EN ISO 50001:2011 is a 'one size fits all' standard, applicable to all kinds of businesses and organisations. This can sometimes lead to situations where a level of interpretation and pragmatism is required to ensure that the energy management system is implemented

and meets all of the requirements. The European standard does not specify how to manage energy, nor what criteria should be used to judge performance; this is down to the organisation implementing the EnMS.

Here is a brief summary of BS EN ISO 50001 using the Plan, Do, Check, Act process:

Plan

- Think about which parts of your business could be improved by better use of energy and define the scope and boundary of your energy management system (EnMS)
- Write an energy policy to demonstrate top management commitment to that EnMS – remember, top management commitment is vital to success
- Appoint someone as the focal point and ensure they understand their role as well as have the authority to perform their duties in that role
- Assign the necessary resources to establish the EnMS
- Determine any legal requirements that apply, and also any other requirements that you subscribe to, such as trade body schemes
- Perform an energy review for the scope and boundary of the EnMS that you have set to determine energy sources and uses; determine energy baselines and energy performance indicators
- Determine who does what within the boundaries of the EnMS and determine their impact on energy use
- Identify opportunities for improvement and make plans to prioritise and achieve those improvements. For example, set objectives, targets and implement improvement plans.

Do

- Use the information from the planning phase to implement the EnMS
- Ensure all people with an influence on energy performance are trained and/or made aware of their impact. Don't forget to tell suppliers, contractors and other visitors about your plans
- Prepare and control the EnMS documentation (see 4.5.4 of BS EN ISO 50001:2001)
- Ensure operations and activities such as maintenance are related to significant energy uses that have defined operating criteria for control. For example, set parameters for control and ensure they are adhered to
- Design all processes and energy-using systems, and purchase services, equipment and energy supplies, to help ensure best energy performance for your budget.

Check

- Check your energy use for areas and functions within the scope and boundary of your EnMS – is it as expected?
- Make sure any equipment you use is accurate and suitable for the measurements you are making.
- Take action to correct any serious variation from energy use and performance expectations. Determine the cause of any variation before taking action.
- Are you complying with any applicable legislation identified in the planning stages, and how do you know? Record what was checked and how you checked compliance.
- Perform internal audits of your EnMS to ensure that all systems are working as you planned them to. Record any that are not and take action to correct deviation, determine why there was a deviation and take action to prevent recurrence.
- Control and protect records generated by your EnMS, without records you cannot demonstrate that your EnMS is working as expected.

Act

- Review the EnMS at regular intervals with top management. It is always advisable to review the EnMS more regularly at the start of your EnMS implementation, to ensure that things stay on track. In any case never have these reviews more than 12 months apart.

Plan, Do, Check and Act is a simple but effective approach that is easy to understand and to implement and might just save you a lot of energy and money.

It is early days for third-party certification to BS EN ISO 50001, perhaps because energy is also covered in the more widely known BS EN ISO 14001 Environmental Management Systems standard.

As of January 2012, about 100 organisations in 26 countries had already achieved certification to ISO 50001, and are clearly happy with the cost savings and improved energy performance they are achieving.

Perhaps BS EN ISO 50001:2001 will continue to come into its own, either as a standalone management system or as a complementary system to the environmental management system.

● **CHRIS BOWSER** is a chartered engineer, chartered quality professional and chartered environmentalist. He is also the owner of Blue Rock Associates, which specialises in all kinds of management systems and certification processes for systems, products and personnel.

● Supplementary information is available on the CIBSE Certification website at **www.cibseenergycentre.co.uk**

> Plan, Do, Check and Act is a simple but effective approach that is easy to understand and to implement, and might just save you a lot of energy and money

ISO 50001:2001 CPD questions

Monitoring of key characteristics of energy performance is an important requirement of BS ISO 50001:2011. Which of the following would you include?

- ☐ A Significant energy uses and other outputs from the energy review
- ☐ B Energy performance indicators, baselines and effectiveness of action plans in achieving objectives
- ☐ C Analysis of actual energy consumption against expected consumption
- ☐ D Variables related to significant energy uses within the scope and boundaries set for the EnMS
- ☐ E All of the above

The energy policy is important because it is used as a tool, or reference point, to help indicate and communicate the organisations' intent regarding energy performance. Which of the following statements are true in terms of the intent of ISO 50001:2011?

- ☐ A The energy policy is a tool for communicating to customers that the organisation is trying to be 'green' by saving money on energy use
- ☐ B The energy policy is used to communicate internally to all staff to ensure they remember to turn off their computers before leaving work
- ☐ C The energy policy is a statement by the organisation of its overall intentions and direction related to its energy performance, as formally expressed by top management
- ☐ D The energy policy provides a framework for action and for the setting of energy objectives and energy targets
- ☐ E The energy policy is a marketing tool to help ensure the organisation is invited to tender and is also used to help display environmental credentials in prequalification questionnaires

Records are a requirement in many clauses of BS EN ISO 50001:2011 They are important for which of the following reasons?

- ☐ A Records are important because they allow analysis if data and determination of compliance with objectives, targets and operational and legal requirements, as determined by the organisation
- ☐ B Records are maintained to allow the organisation to ensure that internal auditors can see that effective actions have been taken for any nonconformity or preventive actions identified
- ☐ C Records are important to help ensure that information is available for review by top management, to indicate that all required inputs to such reviews have been made and to record any outputs, such as changes or resource needs
- ☐ D Records are important to help demonstrate that staff in roles that can influence energy use are competent on the basis of appropriate education, training, skills or experience
- ☐ E All of the above

Documentation is required in clause 4.5.4.1 of BS EN ISO 50001:2011 and there are specific requirements for this. However, there are reasons that would allow the extent of documentation to be varied. Which of the following would not be a valid reason for this?

- ☐ A The size and scale of the organisation
- ☐ B The cost of generation and maintenance of documentation
- ☐ C The type of activities undertaken by the organisation
- ☐ D The complexity of the processes and their interactions
- ☐ E The competence of personnel

Operational control is used to help ensure that:

- ☐ A Top management is informed about energy wastage and uncontrolled uses of energy
- ☐ B Any problem areas are identified so that the energy manager can take appropriate corrective action
- ☐ C Problems are prevented before they occur by taking and implementing preventive actions
- ☐ D Activities relating to organisations' significant energy uses are identified and planned to ensure they are carried out under specified conditions
- ☐ E Monitoring is of actual energy use against expected energy use for emissions to air, water and land is measured

Please go to **www.cibsejournal.com/cpd** to complete this questionnaire online. You will receive notification by email of successful completion, which can then be used to validate your CPD records in accordance with your institution's guidance.

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N Hurley, CIBSE, 222 Balham High Road, London, SW12 9BS

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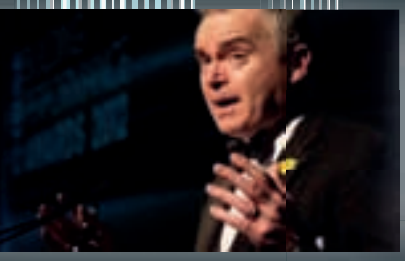

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For **sponsorship enquiries** please contact jim.folley@redactive.co.uk or 020 7324 2786

Telephone: 020 7880 7614 **Email:** Patrick.Lynn@redactive.co.uk

JS Air Curtains meets heating demand

JS Air Curtains has installed two vertically mounted stainless steel Rund air curtains at Exchequer Court, a multi-storey office block in London. The air curtains are keeping the draughts out and providing the main heating source within the large, open atrium of the reception area. JS Air Curtains supplies an extensive range of air curtains – as well as bespoke solutions – for all commercial and industrial applications. Its in-house project management division also provides a smooth, hassle-free installation service.

● **For more information, call 01903 858656 or visit www.jsaircurtains.com**

ebm-papst: Confusion over ErP regulations made simple

There has been a lot of noise in the fan industry over the past couple of months surrounding the impending 2013 ErP regulations, but ebm-papst, Europe's leading manufacturer of fans and motors and a pacesetter for the ultra-efficient EC technology, has been compliant for many years. Robert Harness, business development manager at ebm-papst UK, says: 'From 2013, new efficiency targets for fans come into force, which will mean that some types will have to be taken off the market. We've been good to go for years.'

● **For more information, visit www.ebmpapst.co.uk and click on the 'News' tab**

Schneider Electric begins new chapter

Schneider Electric, the global specialist in energy management, has won a prestigious contract with Emcor to supply Birmingham City Council with an array of products and solutions for the new city centre library. The contract, worth more than £2m to Schneider Electric, will see the company specify and install a bespoke building management system (BMS), as well as CCTV and access control – aimed at maximising the building's security. Part of the contract also involves developing numerous solutions designed to enhance disabled access to the library.

● **For more information, call 0870 608 8 608 or visit www.schneider-electric.com/uk**

Celebrating two decades of CableCalc level P with a free version of new twin and earth calculations

To celebrate 20 years of CableCalc, Castline Systems has released a new, free version of its popular CableCalc program, which will calculate single-phase radial and ring circuits wired in twin and earth cable. It even includes free technical support by email. CableCalc level P is a fully working, unlimited use version and provides far more than just simple volt drop calculations. CableCalc level P can be downloaded from **www.castlinesystems.com** free of charge.

● **For more information, call 01293 871751 or visit www.castlinesystems.com**

Multipurpose BACnet temperature controller from Titan

The BACnet enabled CCM-204 multipurpose temperature controller is designed to offer complete control flexibility for ventilation and air conditioning systems. With a vast array of inputs and outputs, the advanced application-specific controller can offer control strategies ranging from single-stage heating or cooling to three-stage heating, venting and cooling. Designed and manufactured in the UK, the CCM-204 multipurpose controllers can be used stand-alone, as part of a master/slave group or as part of a building management system.

● **For more information, call 0161 406 6480 or visit www.titan products.com**

Cool-Therm launches ultra-green Turbomiser chillers

Cool-Therm is introducing a new generation of ultra green Turbomiser chillers based on HFO refrigerants. The ultra-efficient chillers run on HFO1234ze, which has a global warming potential (GWP) of just six, compared with 1,300 for the popular refrigerant R134a, making it much more environmentally attractive. Trials to date suggest that the energy efficiency of the new HFO systems compares favourably with Turbomiser systems running on R134a. The company will launch the HFO solution at the forthcoming CIBSE Conference and Building Services Exhibition in London.

● **For more information, call 0117 961 0006 or visit enquiries@cooltherm.co.uk**

Telephone: 020 7880 7614 **Email:** Patrick.Lynn@redactive.co.uk

Waterloo supplies air distribution for leisure centre

Scunthorpe's award-winning leisure centre is benefiting from excellent thermal distribution, thanks to air distribution products supplied by Waterloo Air Products. Built by main contractors Bowmer & Kirkland, the 'pods' are constructed from glass and steel using an unusual design that features five intersecting geodesic domes covered in natural materials. Waterloo's Aircell polymer grilles and aluminium louvred-faced diffusers were specified throughout to deliver a well-designed air distribution system that combined the needs for aesthetic requirements with energy-efficient air movement.

● **For more information, call 01622 717861 or visit www.waterloo.co.uk**

New product catalogue for all metering needs published by MWA Technology

Independent meter specialist MWA Technology, based in Birmingham, has launched a new 52-page product catalogue featuring a wide range of its metering and associated products. The handy A5-sized publication has been designed to assist with the correct specification and selection of equipment for all metering needs. Divided into 14 sections, products are depicted alongside, descriptions, features, model range and other vital information. Copies of the free brochure can be obtained from MWA Technology.

● **For more information, call 0121 327 7771 or visit www.mwatechnology.com**

Solatube launches Energy Care Optima range delivering exceptional thermal performance

The Solatube Energy Care Optima range meets the strict criteria set for Passivhaus construction and is available as an upgrade for the Solatube Brighten Up series. Independent tests show the Solatube Energy Care Optima range now meets the stringent criteria set by Passivhaus standards, with outstanding U-values. Independent testing was carried out to BS EN ISO 12567-1 2000 for windows and doors. The Solatube 160 DS Energy Care Optima produced a U-value of 0.5W/m²/K.

● **For more information call 01234 241466 or visit www.solatube.co.uk**

iVector commercial outputs without compromising style

Myson has recently launched iVector, the first in a new generation of intelligent fan convector products. Outputs range from 2 KW to 10 kW in compact sizes between 800 mm and 1,600 mm, all with a standard height of 600 mm. Sound levels as low as 24 dBA make iVector silent when operating at normal fan speeds. iVector is an excellent choice for traditional boilers and renewable systems with low water temperatures. The solid one-piece casing has a decorative design as standard on all models, bringing a domestic look to the commercial arena.

● **For more information visit www.myson.co.uk or email ivector@myson.co.uk**

Modupak multi-boiler package

The new R40 wall-mounted boiler from Stokvis Energy Systems incorporates the latest gas heating technology providing maximum efficiencies and minimum environmental impact. With five models ranging from 65 kW to 145 kW, all small commercial requirements can be accommodated, along with larger commercial properties when modules are combined to form the 'Modupak'.

The Modupak is a frame-mounted combination of up to eight boiler modules in a back-to-back configuration, or up to six boiler modules as an in-line formation.

● **For more information, call 020 8733 3050 or visit www.stokvisboilers.com**

Danlers top energy-saver now available pre-wired

Danlers best-selling ceiling flush-mounted passive infra-red occupancy switch is now available pre-wired with three and four pole connectors to suit most leading modular wiring systems. This cost-effective, reliable automatic lighting control is available with connectors for Wieland, Metway, Flex Connectors, Wago, Modular Wiring, Ensto, and Apex systems, saving not only on energy but also on installation costs. Danlers is offering the standard 230 volt mains supply model alongside low voltage versions (12 V or 24 V) and versions with volt-free contacts.

● **For more information call 01249 443377 or visit www.danlers.co.uk**

Polypipe Terrain selected for exhibition

Above ground drainage products from Polypipe Terrain feature in a new exhibition celebrating plastics' contribution to sporting achievement and the part they have played in London 2012's sustainability agenda. Now open to visitors, the Plastics for Gold Exhibition at the Museum of Design in Plastics (MoDiP) is part of the Cultural Olympiad and has been awarded the London 2012 Inspire Mark. It runs until 20 November 2012. Polypipe Terrain's Hydromax Siphonic roof drainage system and FUZE Gravity Drainage for soil and waste management feature in the display.

● **For more information visit www.modip.ac.uk/exhibitions/gold**

Telephone: 020 7880 7614 **Email:** Patrick.Lynn@redactive.co.uk

New heating systems for Stokvis at The Energy Event

Stand E01, NEC Birmingham, 11-12 September 2012 – Stokvis Energy Systems will feature an evacuated tube solar collector which, when coupled to a solar store and linked to a plate heat exchanger, saves money by utilising free solar energy. The new R40 wall-mounted boiler from Stokvis Energy Systems incorporates the latest gas heating technology providing maximum efficiencies and minimum environmental impact. Also featured on the Stokvis stand will be the Econo-Air heating system for commercial and public buildings and an extended range of pressurisation units.

● **For more information, call 020 8733 3050 or visit www.stokvisboilers.com**

Roadshow demonstrates how to decarbonise social housing

Mitsubishi Electric is launching a series of free, one-day seminars focusing on how air source heat pumps can help housing associations and social landlords combat carbon emissions and battle against fuel poverty. Events are being held at London's Building Centre in Store Street on 25 September; Mitsubishi Electric's headquarters in Hatfield on 27 September; The Build Store, Swindon, on 6 November; the Mercure Hotel, Exeter, on 7 November; and the Mitsubishi Electric factory in Livingston on 15 November.

● **For more information, call 01707 282880 or visit ecodan-roadshow@meuk.mee.com**

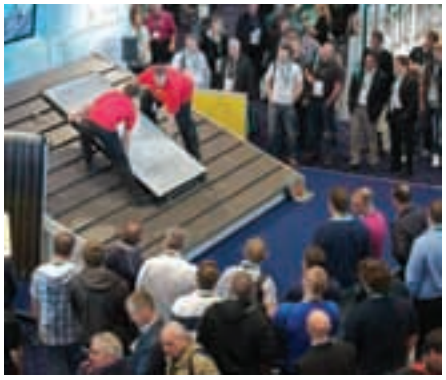
Renewables Roadshow returns

For the people you need to see, the presentations you need to hear and the energy-efficient products you need to touch, the 2012 Renewables Roadshow has everything energy-efficient under one roof, and will be touring the UK in September.

You can book your free tickets at **www.renewables-roadshow.co.uk**

Ricoh Arena, Coventry	*13 September*
Westpoint Arena, Exeter	*18 September*
International Centre, Harrogate	*20 September*
SECC, Glasgow	*26 September*
Event City, Manchester	*28 September*
Wembley Stadium, London	*3 October*

● **For more information, visit www.renewables-roadshow.co.uk**



HumEvap MC3 provides evaporative cooling to OptEvent

JS Humidifiers' HumEvap MC3 evaporative humidifier has been selected by Air Handling Systems (AHS) to provide evaporative cooling in the innovative OptEvent air handling unit (AHU). The humidifier cools the return air with low energy, cold water humidification in this packaged heat recovery system that has been independently verified by BSRIA. The HumEvap MC3 has a modular design and can deliver more than 500 kg/hr of moisture to an AHU from a single unit operating on just 550 W – the potential for low-cost cooling is massive.

● **For more information, call 01903 850200 or visit www.jshumidifiers.com**

Ultimate in heating system protection launched by Eclipse Magnetics

Eclipse Magnetics has launched BoilerMag, a high performance domestic heating system filter. BoilerMag removes black sludge from circulation, increasing heating efficiency and protecting the system. Black sludge build up reduces boiler heat transfer, causes blockages, radiator cold spots, corrosion and can cause boiler failure. BoilerMag removes almost 100% of both magnetic and non-magnetic debris. The unique circuit design ensures it never blocks. It has no running costs, installation and maintenance is simple, and it comes with a three-year warranty.

● **For more information, visit www.boilermag.com or contact service@eclipsemagnetics.com**

CP Electronics launches new addresser for easy DALI control

Controls expert CP Electronics has launched the D-Mate Addresser, an innovative, low-cost device that simplifies DALI installations. It is the latest addition to the company's sophisticated D-Mate lighting control system. The D-Mate addresser complements the functionality of the D-Mate lighting control system, making it very easy to address the other elements of the system using simple but reliable DIL switches. The addresser is available in three versions, DALI, DALI to DSI and DALI to 1-10V, with an additional relay option for supplying switched mains.

● **For more information, call 0333 900 0671 or visit www.cpelectronics.co.uk**

Aquatech Pressmain launches Aquapack AP pressurisation units

The Aquapack AP Series pressurisation unit is designed to maintain a minimum set pressure in a sealed heating or chilled water system. Should the system pressure fall below the cold fill pressure, the unit operates automatically to restore that pressure. If high- or low-pressure conditions should occur, the boiler/chiller operation can be interrupted via the volt free contacts provided. Available in twin pump format with microprocessor control, this compact cabinet pressurisation unit is designed for floor or wall mounting.

● **For more information, call 01206 215121 or visit www.aquatechpressmain.co.uk**

Telephone: 020 7880 7614 **Email:** Patrick.Lynn@redactive.co.uk

DuPont Energain maximises energy-efficiency at Wealden District Council

To maximise savings and energy efficiency, Wealden District Council consolidated its administration into a single structure, refurbished so the building's fabric better controls ambient heat. To manage thermal gains and comfort, DuPont Energain phase change thermal mass system was specified for its superior performance, reliable service and transparent costing. In total 650 m² of Energain, in lightweight panels of 1.0 m x 1.2 m x 5.26 mm, now provides a heat storage capacity of 9,1000 Wh (temperature window: 18-24°C) and up to 5° - 6° passive reduction of peak temperatures.

● **For more information, call 01275 337 660 or visit www.energain.co.uk**

Another inventive design from MHS Boilers for multi-dwelling developments

MHS Boilers has launched a new floor-standing, self-contained heat interface unit with an integrated, stainless steel, unvented hot water storage cylinder: Nexus S-FS. Providing independent control of heating and hot water in multi-dwelling developments, the new unit is available with cylinder capacities from 80 to 305 litres, making it ideal for properties of different sizes. All units are fitted with a pump to serve both the heating and hot water circuits. Nexus S-FS can also be fitted with heat and water meters.

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

Solcos helps meet Code Level 3 at social housing development

Solcos solar thermal packages have been installed at 12 new, affordable homes in Bishop Stortford, contributing significantly to their Code 3 sustainability compliance. Each house incorporates two Oventrop OKF CK 22 solar flat plate collectors of 2.02 m², which are integrated into the roof. The anti-reflective glass will increase transmission by an additional 5% over regular glass. Roof integration also provides additional cost savings for the builder in terms of roof tiling and associated labours costs, while offering a more aesthetically pleasing solution.

● **For more information, call 01256 330441 or email info@oventrop.co.uk**

Hamworthy Heating introduces new biomass brochures

In its ongoing commitment to customer service, Hamworthy Heating has introduced a suite of new brochures, which provide extensive technical content on its biomass boiler solutions. The new literature provides comprehensive details on Hamworthy's Pelletstar, Firematic, BioMatic and BioFire biomass boiler ranges, with outputs from 30 to 1,000 kW. Detailing product specifications, as well as outlining the benefits of each range, the brochures also feature unique 3D plant room images, which have been included to aid customers in realising projects involving biomass boilers.

● **For more information, call 0845 450 2865 or visit www.hamworthy-heating.com**

Excellence award for Danfoss

The living eco programmable radiator thermostat from Danfoss has won the International Award for Excellence at the 2012 Institute of Domestic Heating and Environmental Engineers (IDHEE) Conference and Exhibition in Loughborough. Danfoss' pioneering heating control earned top marks for its innovation, contribution to energy efficiency, and ease of installation and use. The thermostat has been specially designed to be both installer- and user-friendly. It features an intuitive digital display and simple push-button programming for cost-effective control of energy consumption, without compromising comfort.

● **For more information, call 0845 1217400 or visit www.danfoss-randall.co.uk**

Turn the heat on with touch-screen

DEVI, a global leader in high performance electric floor heating systems has launched the DEVIreg Touch, a new simple touch-screen thermostat for floor heating. Gaia Climate Solutions, as the only authorised UK Projects Partner of DEVI, has now added the product to its portfolio. The DEVIreg Touch boasts a two-inch screen with a quick and easy 'click-fit' design. The thermostat is easy to install and is also compatible with a range of other electric floor heating systems.

● **For more information, call 0845 434 9488 or visit www.gaiacs.com**

DORMA fit for a former palace

The Crown Estate's £1 billion redevelopment of lower Regent Street has made a significant leap forward with the conversion of the former Regent Palace Hotel. DORMA was the natural specification choice with their range of high performance door hardware, automatic doors and glass fittings at such a landmark building. In keeping with this Grade II listed building, architectural ironmongers Scott Beaven Radius and architect Dixon Jones were able to select DORMA door closers and ironmongery that were both aesthetically pleasing and compliant with the latest legislation.

● **For more information, visit www.dorma-show.com**

Elta secures place in Midlands business league table with £81m turnover

A report by the *Wolverhampton Express & Star* has seen global ventilation manufacturer Elta Group placed in the top 100 businesses in the Black Country region. Using detailed research by the University of Wolverhampton, the report's findings were based on turnover for the last business year, seeing Elta Group placed 41st with a turnover of more than £81m, an increase of over £11m on the previous year. The research also broke down the statistics by sector, with Elta achieving seventh in the 'general manufacturing' sector.

● **For more information, call 01384 275760 or visit www.eltaselect.com**

Marco Power Poles stand up at Old Trafford football stadium

Marco, a leading uPVC cable management company and the UK's largest manufacturer of Steel Wire Cable Tray, has supplied a series of power poles to contractors at work in Manchester United's football stadium, Old Trafford. As part of a wider alterations programme at the ground, the Power Poles have been specified by Alard Electrical, which is carrying out electrical works. The Power Pole is ideal in situations where the power supply must be introduced and contained in an open area.

● **For more information visit www.marcocm.co.uk**

Royal Bolton Hospital refurbished with FP200 Gold from Prysmian

A total of 5,000 metres of Prysmian's FP200 Gold has been installed to refurbish the fire detection and fire alarm system at the Royal Bolton Hospital. The cables will connect the fire alarms in crucial areas of the hospital. All materials were carefully selected to bring the facility up to the required standards. The £70,000 M&E upgrade of the fire safety system was installed by Hayvern Electrical. The FP200 Gold complies with the requirements of fire alarm standard, BS 5839 and is BASEC and LPCB certified.

● **For more information, call 023 8029 5029 or visit www.prysmian.co.uk**

CO_2 detectors for commercial kitchens and schools developed by S&S Northern

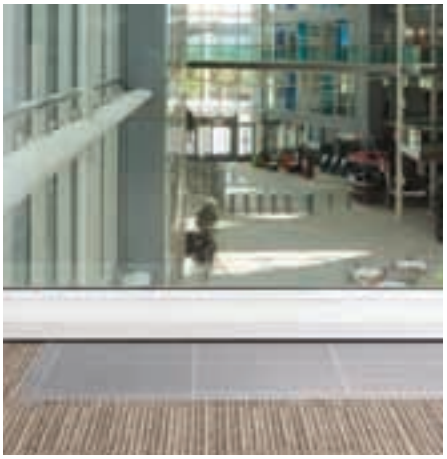
S&S Northern has launched new carbon dioxide (CO2) detectors that can be used in commercial kitchens, school and food technology classrooms. The detector's traffic light system of green, amber and red allows the air quality to be monitored, so ventilation can be increased if CO2 levels become too high. The CO2 detector has been developed in response to the recent Technical Bulletin 140 for commercial kitchens and supports the standards of ventilation and CO2 in classrooms recommended by IGEM/UP11 and Building Bulletin 101.

● **For more information, call 01257 470983 or visit www.snsnorthern.com**

Network Rail's new HQ, The Quadrant: soon to open in Milton Keynes

More than 1.25 km of Jaga's Mini Canal trench heating system were installed at Network Rail's new headquarters, adjacent to the large glass panels that feature on all floors. The placement of the Mini Canals prevents condensation and unwanted draughts. Jaga's Mini Canal uses Low-H2O technology – a low-mass, low-water content system, equipped with an efficient fin tube element that complies with present and future building codes. The light, thin sheets of aluminium and copper – 181 fins per metre of radiator – react faster, meaning the Mini Canal consumes less energy and cuts carbon emissions by 10%.

● **For more information, call 01531 631533 or visit www.jaga.co.uk**



Manufacturing Sustainability Conference brings experts together

EMSc (UK), manufacturer of the Star range of energy-saving solutions, will be hosting its inaugural Manufacturing Sustainability Conference at the Magna Science Adventure Centre in Rotherham on 18 September 2012. The free-to-attend conference, delivered in partnership with Made in Sheffield, is aimed at promoting innovative British manufacturing while providing the manufacturing sector with comprehensive information relating to sustainability and ways to improve energy efficiency. The conference will also bring together insights from industry leaders and professional bodies.

● **For more information, call 01709 836200 or visit www.ems-uk.org**

ems
ENERGY MANAGEMENT SYSTEMS

Top marques for Foamglas Floorboard

Foamglas Floorboard F from Pittsburgh Corning has been used to insulate the floors of the new Porsche Centre in Solihull. The cellular glass insulation was selected for its compressive strength – 1600 kPa/m² – which makes it ideal for concrete floors. The project will see 2,500 m² of Foamglas Floorboard F installed in the 36-car sales showroom, 12-bay workshop and valet building. The site opened in early 2012 and is thought to be one of the largest Porsche Centres in the UK.

● **For more information call 0118 950 0655 or visit www.foamglas.co.uk**

Telephone: 020 7880 7614 **Email:** Patrick.Lynn@redactive.co.uk

Shard points towards the future

At 310 m and with 95 floors, the London Bridge Tower forms part of one of the UK's most ambitious developments to date. A combination of Grundfos' experience in supplying to other skyscraper projects in London, coupled with their track record in delivering a complete and complex pump solution, were important factors in their success in winning this business. Other aspects that helped to secure this landmark project were Grundfos' reputation, and the reliability and breadth of their product portfolio.

● **For more information, call 01525 850000 or visit www.grundfos.com**

Updates to Switchtec's sounder beacons bring greater versatility

Distributed by Switchtec, Sirena's M-Line range of beacons and sounders truly represents the state-of-the-art in signalling. Important updates have been introduced to the range that expand its potential uses and even further hones the units to the specific tasks and apps in which they are asked to perform. New colours for the units' bases have been added: allRED, allWHITE and allBLACK. This will guarantee each market has a customised product to exactly match its specific needs and demands.

● **For more information, visit www.switchtec.co.uk**

Tinytag Data Loggers: energy measurement in domestic properties

Tinytag temperature data loggers have recently been used by consultants Green Energy Partners and housing association Castle Rock Edinvar to assess energy usage and comfort before and after an energy-related retrofit scheme. Tinytag Ultra 2 loggers gathered data to identify comfort levels (temperatures) in eight properties, and to estimate spending on electric heating. Results will be used for comparison against a planned new heating system, to identify how tenants control the new system, and to compare comfort levels and energy costs.

● **For more information, call 01243 813000 or visit www.tinytag.info**

SMI for KNX automated solar shading

SMI (Standard Motor Interface) is a standardised system for electrical connections between solar shading products and their drives. The interface allows complete compatibility between the motors and actuators from different blind manufacturers with the SMI logo, indicating these have been tested and certified as compatible. SMI is now available on the KNX platform in ranges of roller and venetian blinds available from Better Blind Company, and in controllers available from WAGO. Both companies are members of the KNX UK Association.

● **For more information, call 0845 869 5908 or visit www.knxuk.org**

Hot news online – H_2O Technology

H2O Technology (**www.hotwatertechnology.com**) is a new website that carries all the information installers, specifiers and end users need to know about hot water for all commercial and domestic applications. The website shows how hot water can be delivered in the most cost effective and energy efficient manner. The site covers the technology of hot water provision, including continuous flow water systems along with other methods, and also reviews renewables technology, giving the latest news on legislation and regulations, and discusses overall system design.

● **For more information, visit www.hotwatertechnology.com or www.rinnaiuk.com**

Toshiba Air Conditioning becomes a carbon neutral business

Toshiba Air Conditioning in the UK has been officially recognised as a CarbonNeutral business. The announcement follows an intensive programme of carbon reduction and supporting certified carbon offsetting projects with The CarbonNeutral Company, the leading verification and certification body in the field. The pioneering project required a detailed assessment of energy consumption and carbon emissions across all the company's activities, including journeys to and from work by employees. Toshiba worked with sustainability consultant Ecometrica to carry out an audit of all its activities.

● **For more information, call 0870 843 333 or email general.enquiries@toshiba-ac.com**

Toshiba's headquarters, United Technologies House, in Surrey

Vectis network video software combines performance with scalability

Designed to meet the need for high performance network video surveillance systems that combine versatility and scalability with crisp HD image quality, the Vectis HX NVS software package from Siemens' Security Products allows monitoring and recording of images from up to 64 IP cameras per installed network system. For Siemens IP cameras, this innovative software also provides full remote control facilities, including PTZ control and, in addition, ONVIF support allows the connection of third party cameras that are compliant with this widely used open standard.

● **For more information, call 01291 437920 or visit www.siemens.com/buildingtechnologies**

PRODUCTS & SERVICES

Telephone: 020 7880 7614 **Email:** Patrick.Lynn@redactive.co.uk

Klima-Therm installs HFO-based Turbocor chillers in UK store

Klima-Therm has installed the world's first Turbomiser chillers equipped with Turbocor compressor, running on low global warming potential HFO refrigerant, in a department store in Milton Keynes. It has also received a second order for an installation of HFO Turbomiser machines for a major retail development in south west England. The first HFO Turbomiser project involves the installation of two chillers as part of a store refurbishment. The HFO Turbomisers will supply all the cooling needs for the store.

For more information, call 0208 947 1127 or visit www.klima-therm.co.uk

Air filtration makes sense in Abu Dhabi

Trion, the air purification specialist for commercial kitchens, has recently supplied a number of its AIR BOSS Model 75 electrostatic air cleaners to Abu Dhabi's new Central Business District (CBD) on Al Maryah Island. The Trion air cleaners handle air cleaning for a variety of restaurants. Supplied to HVAC contractors by the specialist SAT Group, Trion's equipment features in numerous prestigious air cleaning and filtration projects throughout the United Arab Emirates. What makes the CBD scheme unique is the level of sophistication that this particular extract solution demanded.

For more information, call 01962 840465 or visit www.trioniaq.com

Vent-Axia's Kinetic mechanical ventilation with heat recovery tops SAP Appendix Q

Vent-Axia, leaders in low carbon ventilation, has launched its new, high-efficiency Kinetic Plus E, the best performing mechanical ventilation with heat recovery (MVHR) system listed on SAP Appendix Q. Offering exceptional performance, the Kinetic Plus E boasts a specific fan power (SFP) as low as 0.4W/l/s, combined with 94% heat recovery, thus providing housebuilders and developers with valuable reductions in dwelling emission rates (DER). Manufactured in the UK, the flexible Kinetic Plus E is a whole-house heat recovery system.

For more information, call 0844 856 0590 or visit www.vent-axia.com

DIRECTORY

Your guide to building services suppliers

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Air Handling

CAD Services

Controls/BMS/Controllability

LST Radiators

Energy Efficiency

Pump Packages

Senior Electrical Engineer

£34,549 to £38,961 a year. **Ref: 505076**

37 hours a week at County Hall, Preston, Lancashire PR1 8XJ. An experienced electrical design engineer is required to fill the post of Senior Electrical Design Engineer within Lancashire County Council's Building Design and Construction Unit. The post forms part of the Mechanical and Electrical Design Section and is one of a team 10 design engineers.

The role requires a degree qualified engineer with a minimum of seven years post qualification experience. Candidates should ideally be Chartered or at least actively working towards Chartered Engineer status. An additional qualification in a specialist area of electrical building services is desirable.

Good knowledge and experience in design of electrical building services is essential as are skills in preparation of contract documents, project management and the ability to work quickly and accurately. The role requires the non-managerial supervision on a team of three design engineers and a trainee engineer.

Essential: You must have a degree or equivalent in Building Services Engineering with an electrical bias; and Chartered Engineer (or actively working towards Chartered status), membership of CIBSE. You must have: substantial experience in Electrical Building Services Engineering; preparation of designs and contract documents; and experience of project Management of Electrical Building Services installations.
Informal discussion: Matthew Tidmarsh on 01772 533243.
The post you are applying for is covered by the Rehabilitation of Offenders (Exceptions) Act 1975. If successful you will be required to apply to the Criminal Records Bureau for a 'disclosure'. You will be required to provide a car for use in connection with the duties of this post and must be insured for business use. However, we may consider you if you cannot drive because of a disability.
Interview date: 9 October 2012.

For more information and to apply online visit: www.lancashire.gov.uk/vacancies or tel: 0845 053 0008.
Closing date: 25 September 2012.

Lancashire County Council

Some schools are excluded as commitment is on an individual basis.

Apply online at: **www.lancashire.gov.uk/vacancies**

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Interested in the bigger picture?
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Building Services Engineer

Newcastle upon Tyne

Competitive salary + bonus + excellent benefits

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- Work in a lively and professional atmosphere and be part of a technical team who are passionate about promoting best practice in the construction industry.
- Be one of the experts behind our market leading products, relied upon by over 5000 organisations.
- Make decisions that will have a positive impact on thousands of projects and millions of people.

If you're a Building Services engineer educated to a minimum of HNC level or equivalent with strong mechanical knowledge, good communication, research and writing skills, and are looking for a new challenge, make the right decision - join NBS.

For full details visit **www.theNBS.com/careers** or for an informal chat with a member of our technical team contact Bill Clark on 0191 244 5576.

To apply send your CV and covering letter to
recruitment@theNBS.com
Closing date: Sunday 23 September 2012.

INVESTORS IN PEOPLE

b-a-r beeby anderson recruitment

MFD

Building Services Manager (Mechanical bias)

Romsey, Hampshire, £50 - £65k (DOE) + benefits

Beeby Anderson Recruitment is working in partnership with MFD International on an exclusive basis to secure a Building Services Manager for their offices in Romsey, Hampshire.

MFD is an international security engineering firm of independent, multi-disciplined, consulting engineers and project managers. Established in 1975 they currently employ 50 staff; they are world leaders in their field and have successfully delivered military and civilian projects in 40 countries worldwide.

The successful person will lead, and most importantly, develop a department of mechanical and electrical engineers. You should be a degree qualified or equivalent chartered mechanical engineer with a building services design background. You will be willing to work across the UK and overseas as and when required. You will be deployed on technically challenging and unusual projects and ideally you will possess similar project experience from within the nuclear, defence, pharmaceutical, process, or laboratory containment sectors.

This represents a fantastic opportunity which has the potential to develop into a directorship/equity stake. As such, and in addition to a solid technical expertise, you should be ambitious and self-motivated with an entrepreneurial outlook and have the ability to demonstrate marketing and management experience coupled with excellent interpersonal and business development skills.
BAR910/PA

For a confidential discussion, please call Peter Anderson at Beeby Anderson Recruitment on **020 3176 2666** or forward your resume to **cv@b-a-r.com** quoting the reference number above

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www.optimabes.com

MECHANICAL SERVICES ENGINEER (Senior), London and Home Counties and clients nationally.

Optima is a small mechanical and electrical services consultancy business specializing in high-end residential, renewable technologies and commercial installations.

As part of a growth plan and substantial new business Optima seeks to appoint a senior level Mechanical Building Services Design Engineer.

Preferably qualified to minimum HND level in Building Services or Mechanical Engineering, the successful applicant will be able to demonstrate first class technical knowledge backed up by a commercial awareness and the ability to interact effectively with clients, architects & contractors.

Working closely with the principal, responsibilities will include: lead HVAC Mechanical Services design; prepare drawings and specifications; design project management; client contact; assisting in general business development in support of directors; involvement in the preparation of fee proposals, invoices etc. A large variety of projects are available in a flexible, energetic and professional company. Competitive remuneration.

Please contact Des for Further information on 07768 277 929 / 01923 267107 or optimabes@aol.com

No agencies please.

Fulcrum Infrastructure Management Limited is a Public Private Partnership development company that specialises in providing high quality buildings and services for the provision of health care and community facilities across London and the North West.

Fulcrum requires a **Building Services Engineer** to provide a single central building services engineering resource to ensure the engineering components of our operational assets are designed, commissioned, operated and maintained in line with good engineering practice and ensure that our customers and clients enjoy efficient and comfortable environmental conditions, leading to high levels of customer satisfaction.

The ideal candidate will be able to demonstrate qualification (either an electrical, mechanical or building services degree) and experience in the design of modern healthcare facilities and the use of design software. The successful candidate can be based at our London office in Piccadilly or at our North West office in Warrington and must be prepared to travel to our different sites and offices to meet the needs of the business.

Salary: Up to £30k + benefits.

Send CV & covering letter to jgrundy@fulcrumgroup.co.uk
Closing date: 15th September 2012

Service Contract Monitoring & Reactive Maintenance Engineer (Legionella)

£30,011 to £34,549 a year. **Ref: 505081**

37 hours a week, required from 6 March 2012, based at County Hall, Preston.

A suitably qualified building services engineer is required in the Building Design and Construction Unit to take responsibility for the monitoring and management of the Corporate Policy for the Control of Legionella and Water Hygiene Risk Management within County Council establishments.

The post is required to provide specialist technical support within a team of Building Services Engineers and contribute to the team's effectiveness across Lancashire.

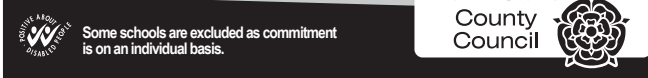
A degree or equivalent in Mechanical Building Services Engineering, or a related water hygiene discipline along with a minimum of 5 years post qualification experience in a responsible demanding role is essential. In addition candidates should possess a BOHS P901qualification in Legionella - Management and Control of Building Hot and Cold Water Services and be an Associate Member of the Water Management Society (actively working towards Full Membership).

Candidates must have experience of Legionella control in water services and awareness of health and safety issues relating to the proliferation of Legionella along with experience in the building services engineering sector, particularly the project management of building services maintenance and monitoring the activities of maintenance contractors.

Informal discussion: Matthew Tidmarsh on 01772 533243.

You will be required to provide a car for use in connection with the duties of this post and must be insured for business use. However, we may consider you if you cannot drive because of a disability.

For more information and to apply online visit: www.lancashire.gov.uk/vacancies or tel: 0845 053 0008.
Interview date: 8 October 2012.
Closing date: 24 September 2012.



Some schools are excluded as commitment is on an individual basis.

Apply online at: **www.lancashire.gov.uk/vacancies**

Specialists in Building Services Recruitment

Consultant/Senior Fire Engineer | London | £NEG! | ref: 2757
An international multi-disciplined consultant is looking for an IFE Chartered Engineer. You will have experience in preparing and providing fire strategy reports and fire engineering solutions. Ideal candidates will have knowledge in system design of sprinklers, wet/dry risers, gaseous fire suppression, water mist & fire detection to British Standards and system designs based on NFPA codes.

Electrical Team Leader | London | to £65K | ref: 2660
A blue-chip M&E consultancy is looking for an Electrical Team Leader to join and run the existing team. Ideal candidates will be Chartered and have excellent experience within the commercial office market.

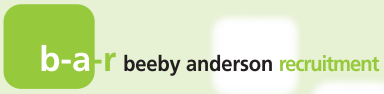
Int Electrical and Mechanical Engineers | Londonl to £35K | ref: 2576
Our client is looking to add two Intermediate Engineers to their existing team. Ideal candidates will have a mixed project background with a few years post graduate experience. Current projects include education and healthcare.

Mechanical Engineer/Thermal Modeller | London | to £35K | ref: 2688
We are looking for a solid Intermediate Mechanical Engineer who is a skilled and experienced user of IES-VE. Ideal candidates will be CIBSE qualified LCC for 2010 building regulations and LCEA for level 3, 4 & 5 buildings and produce Part L EPC certificates. Knowledge of BREEAM is essential.

Snr Mechanical Design Engineer | Surrey | to £50K | ref: 2723
Our client is blue-chip multi-disciplined consultancy with offices in the UK and abroad. We are looking for a Chartered Mechanical Engineer to join the team in Surrey. Ideal candidates will have experience working on major rail station projects, have a track record of project delivery and leading and mentoring intermediate and junior engineers.

Senior Acoustic Engineers | London & Berkshire | £NEG! | ref: 2600
We are searching for Senior Acoustic Engineers for a number of clients who are looking to build their in-house capabilities. Ideal candidates will have experience working in a multi-discipline environment and be able to lead projects as well as small teams. Excellent opportunities!

t: 02392 603030
e: cv@blueprintrecruit.com
www.blueprintrecruit.com



Intermediate Mechanical Design Engineer

North London, £25-30k + benefits

Our client currently has an excellent opportunity for an Intermediate Mechanical Design Engineer to join their well-established building services consultancy. The successful candidate will have worked previously within a building services consultancy for a minimum of 5 years and have the desire and ambition to develop and grow within an expanding consultancy. This position offers career development/progression, as well as the opportunity to work on a varied portfolio of projects including commercial, residential, mixed-use developments and estate regeneration projects.
BAR884/JA

Principal Electrical Design Engineer

Surrey, £45-£50k + benefits

Our client is an international building services engineering design consultancy. Due to an increase in workload they require a highly motivated and ambitious Principal Electrical Design Engineer. The role will involve leading a team of engineers through complex projects in the commercial, leisure and infrastructure sectors. Candidates should possess a building services design background with previous experience in a client facing role at this level, they should be able to demonstrate strong business development skills and be competent users of industry specific software.
BAR 909/JA

For further information and to apply, please call us on **+44 (0)203 176 2666** or email **cv@b-a-r.com**

Thinking of your future www.b-a-r.com

Events & training

NATIONAL EVENTS AND CONFERENCES

The Energy Event
11-12 September, Birmingham
Headline speakers include Alistair Campbell and Prof Brian Cox.
www.theenergyevent.com/PR

Renewables Roadshow
13 September, Coventry
The first of six exhibitions across the UK aiming to make energy-efficient technologies more accessible.
www.renewables-roadshow.co.uk

Second Symposium on Lift and Escalator Technologies
27 September, Northampton
A detailed, academic study of engineering and related management issues.
www.liftsymposium.org

Building Services – the CIBSE Conference and Exhibition
10-11 October, London
Bringing together the entire building services supply chain to debate the challenges, identify the most successful business strategies, and forge and renew relationships.
www.buildingservicesevent.com

The FM Event
10-11 October, London
A new event focusing on facilitated networking, increasing knowledge-sharing and making new business connections – the three top priorities identified by the senior FM community.
www.thefmevent.com

CIBSE Young Engineers Awards 2012
11 October, London
The Young Engineers Award and the Employer of the Year award take place together for the first time. ASHRAE president Tom Watson will also be presenting.
www.cibse.org

Energy Performance Group Seminar: Regulated vs Unregulated
16 October, London
Can we bridge the performance gap between regulated and unregulated?
www.cibsetraining.co.uk/conferences

Retro Expo – Fit for the Future
30 October, Birmingham
New three-day exhibition and conference on sustainable retrofitting.
www.retro-expo.co.uk

Building Engineers: Professionals with a Common Goal
8-10 November, Buckinghamshire
The Association of Building Engineers' 50th Annual Conference and Exhibition.
www.abe.org.uk/conference

CIBSE GROUPS AND REGIONS

For more information visit
www.cibse.org/events

Building Simulation and Optimisation
10-11 September, Leicester
The first IBPSA (International Building Performance Simulation Assocation) England conference in association with CIBSE.
www.bso12.org

Water Economy: Water Conservation and Controls
11 September, London
Presentation by Reliance Water Controls.
Steve.vaughan@aecom.com

Smoke and Green Deal Roadshow
17 September, London
Home Counties North East regional event with Flakt Woods.
James.bourne@atkinsglobal.com

Water Efficiency in Domestic and Commercial Bathrooms
19 September, Manchester
A Society of Public Health Engineers evening seminar.
m.atherton@dssr.co.uk

Rehabilitation of Existing Pipework and Ductwork Systems
20 September, High Wycombe
With increasing emphasis on rehabilitating existing buildings in the current economic climate, duct cleaning and water treatment are important considerations when re-using existing systems. This seminar will cover both aspects.
www.cibse.org/events

Coolphase
25 September, Chelmsford
Home Counties North East region joint event with B&ES and Monodraught
Robert.harness@ebmpapst.com

CHP Group Conference – CHP/DH Delivers! Especially in a Credit Crunch
27 September, London
Real case studies reviewed and questions answered.
www.cibsetraining.co.uk/conferences

East Midlands Region Autumn Ball
29 September, Castle Donington
Drinks reception followed by a four-course dinner, then dancing to live music.
densel.davy@ntlworld.com

SoPHE Technical Evening
2 October, London
Details to be confirmed.
Steve.vaughan@aecom.com

Young Engineers Network Autumn Ball
6 October, Manchester
Details to be announcement.
www.cibse.org/yen

CPD TRAINING

For more information visit **www.cibsetraining.co.uk** or call the events team on 020 8772 3660

Air Conditioning Inspection for Buildings
4 September, London

Energy Survey
11 September, London

Part L Building Regulations
18 September, London

AC Lodgement Update
18 September, Birmingham

Fire Detection and Alarm Systems for Buildings – BS 5839 Part 1 2002
19 September, Birmingham

Design of Ductwork Systems
20 September, London

Energy Performance Certificate Training (two days)
24 September, London

LEED 201 Core Concepts and Strategies
24 September, London

LEED 251 Core Concepts and Strategies
25 September, London

Electrical Distribution Design
25 September, London

How to Specify a Ground Source Energy System
26 September, London

Lighting Design: Principles and Application
26 September, London

Low and Zero Carbon Energy Technologies: Undertaking Feasibility Studies and Understanding Design Considerations
27 September, London

Energy Performance Certificate Training (two days)
2 October, Birmingham

HSE Guidance on Control of Legionellosis Explained
2 October, London

Introduction to Biomass Design
3 October, London

Biomass Maintenance
4 October, London

Electricity at Work Regulations Explained
4 October, London

Sanitary and Rainwater Design using BS EN 12056:2000
9 October, London

Energy Monitoring and Targeting
10 October, London

Gas Safety Regulations
11 October, London

The Carbon Reduction Commitment
11 October, London

Lighting and Energy Efficiency
16 October, Sheffield

Society of Light and Lighting Masterclass series revealed

11 October 2012 to 23 May 2013

The Society of Light and Lighting Masterclass series returns this autumn to provide essential information for those involved professionally in lighting. Whether as your mainstream activity or as part of a wider range of disciplines, it has never been more important to keep up to date with changes in lighting technology and application.

Covering locations across the UK, the Masterclasses this year will be going 'Beyond the Code', celebrating the latest edition of the *Code for Lighting* and showing how it can be applied and improved upon. Lighting experts from Holophane, Philips, Thorn, Trilux and Wila, together with a guest speaker from the SLL, will be talking about up-to-date installations and technologies and how they provide great lighting for people while saving energy.


Mike Simpson... one of the masters

For further details, specific dates and venues, and to book, visit **www.sll.org.uk**

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CMR Controls manufactures low air pressure and air volume measurement sensors and control systems for standard air conditioning, clean rooms, sterile laboratories, containment facilities, and fume cupboard extract systems.

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Fast and accurate controls to drive high speed dampers or invertors. Full PID stand alone controls with BMS interface.

DPM PRESSURE SENSOR

Panel Mount Pressure or Velocity Transducers with remote alarms, analogue and digital interfaces. Traceable calibration certificates supplied as standard.

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Accurate air flow measurement with the unique CMR Venturi built into the airtight shut-off damper to control room pressure or constant volume.

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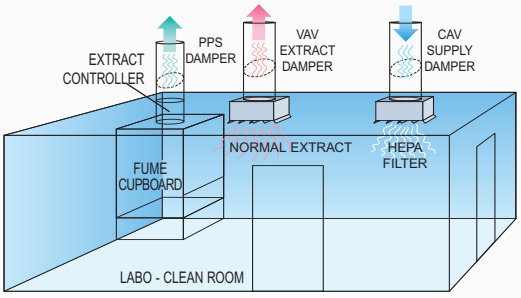
AIR MANAGEMENT SYSTEM

A complete turn-key system to control room pressure to +/-1Pa. Fume cupboard face velocity to 0.5m/s at high speed and provide constant air changes into the labo - clean room.



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Poly-propelene control and shut off valve incorporating the CMR Venturi Nozzle. This is essential when dealing with corrosive extract air especially from fume cupboard systems.

PPS Damper

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