

CIBSE

JOURNAL



The official magazine of the Chartered Institution of Building Services Engineers

October 2009



Carbon agenda

Client develops energy strategy

YOUNG RECRUITS

Can school diplomas ease the skills gap?

WHAT GREEN SHOOTS?

Company boss warns of more pain to come

INDUSTRIAL HEATING

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Natural History

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From the editor



Sustaining the agenda

Those pessimists who thought that the worldwide economic recession would be an enormous setback for sustainability appear to be being proved wrong. Not only have China and India given a huge boost to hopes for a carbon-cutting agreement at the climate change talks in Copenhagen next month, but the drive for sustainable industry moves on.

When Britain's Business Secretary Lord Mandelson took up his post a year ago, I was highly sceptical about his green credentials – wasn't he a buddy of big business and unlikely to offer environmental leadership? Well, the answer is both 'yes' and 'no'. First with aerospace and manufacturing, and now with construction, he is pushing for a low-carbon agenda that would be driven by cutting-edge technologies – which ultimately would be very good for businesses and the economy (see pages 8, 12 and 18).

This strategy certainly makes sense for manufacturing, for example with greener cars and new fuel technologies such as hydrogen cells. But, when it comes to the construction sector, the task is less clear and probably more tricky. Mandelson seems to want the UK sector to become a world leader, in business terms, through the delivery of new low-carbon technologies. In the face both of the recession and the huge challenge to radically reduce greenhouse gas emissions, the optimists would argue that technology will come to the rescue, by delivering economic growth and beating the climate change challenge.

The problem is, this leads us into crystal-ball gazing. Keith Clarke, the Atkins boss who will initially lead the new task force for developing the construction low-carbon agenda, predicts that, in 10 years' time, building services engineers will be chiefly preoccupied with 'building physics' – designing for low-carbon fabrics and technologies rather than specifying a load of mechanical plant such as fans and pipes. But, of course, what these technologies are and who will pay for their development and installation, lies only within the crystal ball. Existing renewables technology is proving difficult enough to make work and to fund. And Clarke seems to have his eye on

the commercial and industrial property sectors; what about the knotty problem of existing residential properties, which overall have been making little headway with becoming more sustainable?

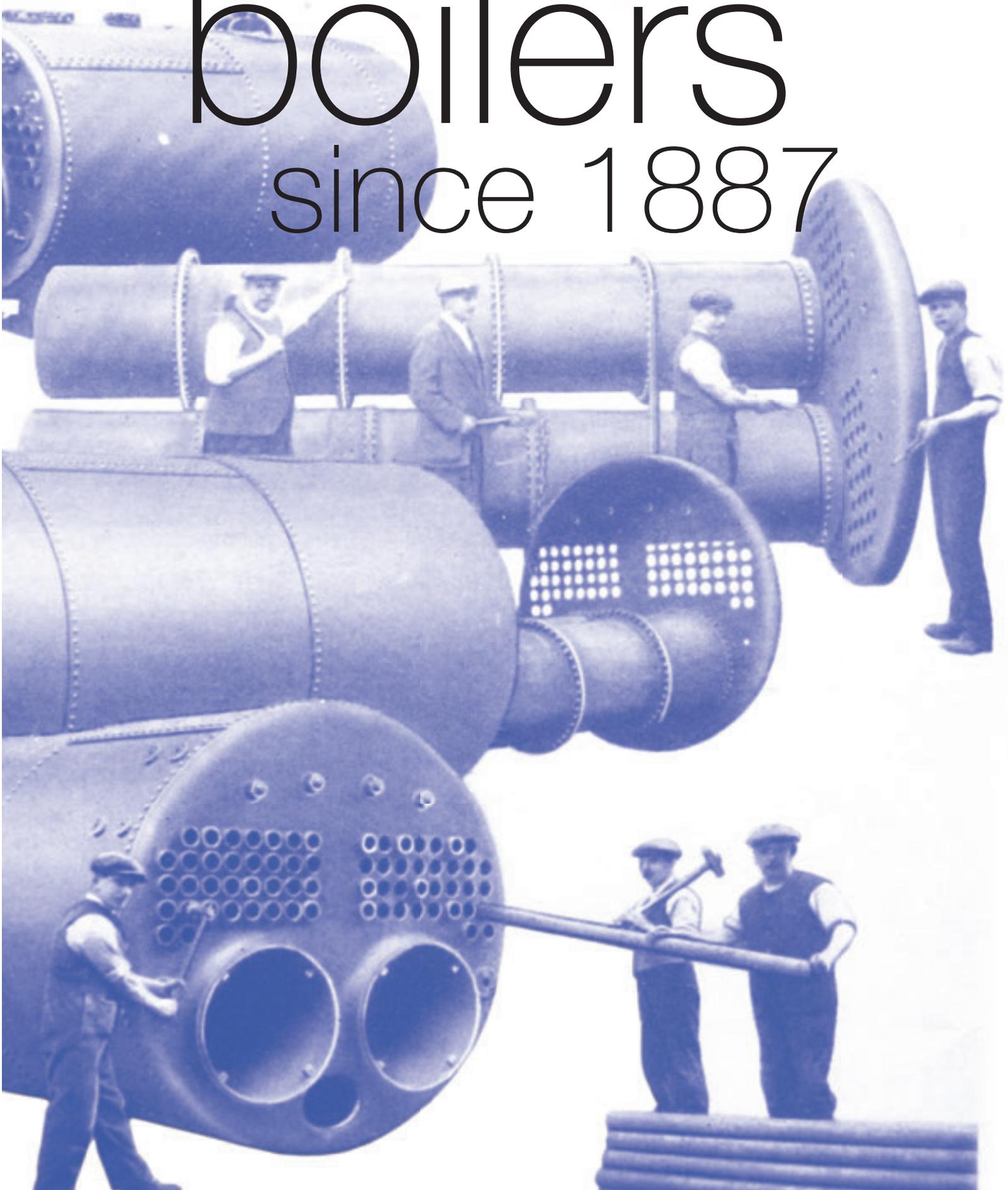
As ever, the best course to steer is between the optimists and pessimists. The creation of the task force – the Construction Innovation and Growth Team, to be led by a new chief construction officer,

when he or she is appointed – is an extremely important development for the sector, and reflects the seriousness with which the UK government regards it. All parts of the sector now need to do what they can to help the task force achieve its aims. Few can now doubt that tackling climate change is becoming the top global priority for world leaders; and it is also clear that the built environment can and should be at the heart of that common goal.

Bob Cervi, Editor
bcervi@cibsejournal.com

It is now clear that the built environment can and should be at the heart of the new global drive to cut carbon emissions

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Conservation of Energy - Protection of the Environment



Rules on low-carbon buildings hit by 'poor enforcement regime'

Key aspects of the government's programme for making buildings more sustainable are being undermined because of poor enforcement of the rules, a trade association leader has warned.

Graham Manly, the new president of the Heating and Ventilating Contractors' Association (HVCA), said that the regimes for awarding energy performance certificates (EPCs) for buildings and for inspecting air conditioning units were not rigorous enough.

Manly used his address to the HVCA president's lunch to call for more robust inspection regimes for these areas, and to highlight a lack of compliance by clients with the regulations.

The HVCA and CIBSE have previously raised questions about the competency of some schemes that train and accredit air conditioning inspectors.

CIBSE has also highlighted similar concerns about the training and accreditation of energy assessors, who conduct inspections of buildings and award certificates.

'The resulting certification of people not fully competent, and the pressure to accept the lowest charges for energy assessments, means that often we are producing valueless EPCs, especially for homeowners, and will lead to superficial air conditioning inspections,' Manly said.

He also criticised client companies for failing to comply with the rules: 'Non-compliance is fast becoming a culture, partly through a lack of enforcement – partly through the paltry scale of the penalties, and partly through the absence of perceived benefit.'

Manly added: 'Although enforcement is only a part of the solution to these problems, without it we stand no chance at all of making the regulations stick.'

Alarm raised over surprise drop in inspection of aircon systems

Concerns have been raised over figures showing a fall in the number of inspection assessments of air conditioning systems, the *Journal* has learned.

The drop comes despite the introduction of mandatory inspection of systems with output of 250kW or above from January this year in England and Wales.

This means that tens of thousands of inspections have still to be carried out nine months after the inspection requirement came into effect.

The figures from energy services companies that are involved in the inspection regime show that fewer inspection contracts were placed in the last few months.

An estimated 50,000 systems came under the inspection regime but less than 1,000, or two per cent, have complied with the rules, according to the data.

Industry commentators have suggested that the fall-off in inspection work contracts being placed reflects a lack of awareness or even willingness to comply with the inspection requirements.

Darren Bryant of Efficient Air, one of the companies reporting this decline, said: 'There are a number of factors stopping companies taking action.'

'Some facilities management companies are not able to convince their clients of the need to act in the face of a lack of enforcement action by trading standards bodies.'

'Furthermore, other companies are unsure how they can find assessors who can provide genuinely useful advice rather than those who have little or no practical experience.'

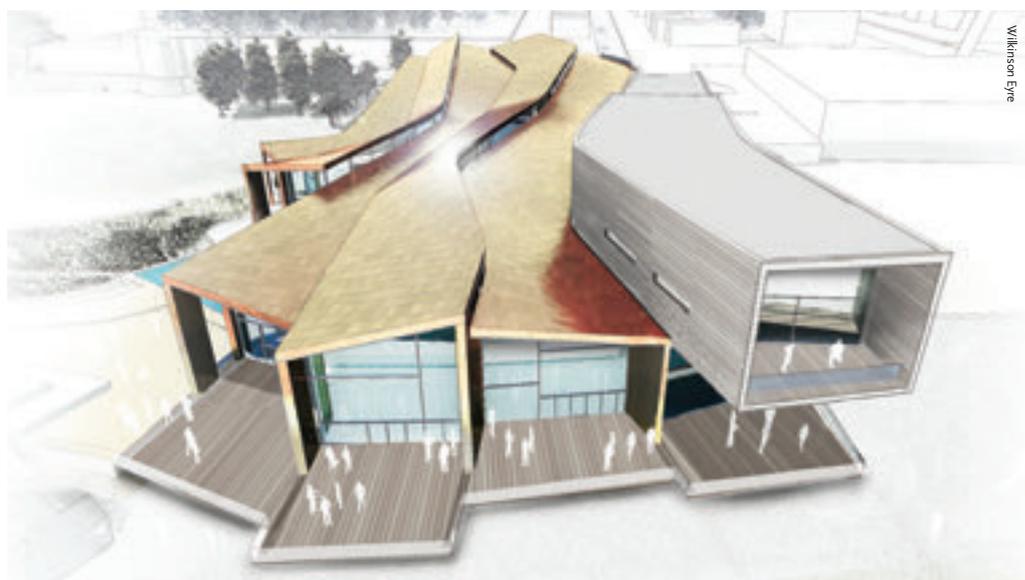
Bryant told a CIBSE seminar at the annual Energy Event that not enough action had been taken by

trading standards officers, who enforce the inspections.

The threat of fines of only £300 for non-compliance, compared with the £2,000 average cost of an inspection, was insufficient, he added.

CIBSE said it planned to launch a campaign to raise awareness among trading standards officers of the need to better enforce compliance with the air conditioning inspection requirements.

Jacqueline Balian, managing director of CIBSE Services, said: 'While we can, and do, keep trying to raise awareness among clients, we are aware that many Low Carbon Energy Assessors, facilities managers and other advisers find it difficult to persuade some clients to act unless there is clear and imminent danger of legal action resulting in a meaningful fine and damage to reputation.'



Swimming pool complex buoyed by RIBA accolade

A new landmark swimming pool complex in Worthing that was designed and engineered by Wilkinson Eyre Architects and

multi-disciplinary engineering consultancy AECOM has won a RIBA-organised competition. The proposed building will be

highly sustainable and incorporate advanced technologies for construction, energy management and recycling.

Sector to get low-carbon health check

The government has announced a major review of the UK construction industry to ensure it is 'fit for purpose' in a low-carbon economy.

Business Secretary Peter Mandelson said the review would assess the sector's strengths and

the opportunities for it to become a world leader, particularly in sustainable technologies.

A new Innovation and Growth Team for construction will conduct the review, and will be led by the government's new chief construction

adviser, due to be appointed next month. Nick Raynsford MP, chairman of the Strategic Forum for Construction, said the new strategy would put construction 'right at the front of the shop window'.

See *News Analysis*, page 18

Plan unveiled to make combustion appliances safer in air-tight homes

The government is trying to plug a potential gap in the Building Regulations over the safety of combustion appliances.

Proposed revisions to Part L of the regulations in England and Wales are expected to lead to an increase of air-tightness in buildings – which could have an impact on the gases arising from appliances.

The Department for Communities and Local Government (CLG), which is consulting on the Part L 2010 changes, has now issued proposals to change Part J, which regulates the installation of combustion appliances in homes.

But the CLG says that only a few changes are needed to Part J, and specifically only to the Approved Document (AD) 2002, which forms part of the regulations.

In the Part J consultation document, CLG says that 'the majority of stakeholders agree that existing AD J guidance is working well'.

However, it says, the air supply provisions in the existing AD J need to be revised. 'The draft AD has been amended such that adventitious ventilation is ignored for dwellings with an air permeability of less than 0.5 cube m/hr/sq m,' the consultation document says.

However, it adds, the proposals will be amended in light of more research being conducted by the department and from responses to the consultation, which closes in November.

Other issues being considered in the document include a 'more flexible approach' to the use of new

technologies such as biomass, and whether carbon monoxide alarms should be provided for all solid fuel appliances.

Separately, CLG has also issued a consultation document and guidance letter for local authorities on the building control service in England and Wales.

The changes, published in a pre-consultation paper in 2007, are aimed at 'putting a stop to builders being subjected to unnecessary inspections by focusing on areas of greatest risk', according to junior minister Lord McKenzie.

The changes also include more stringent enforcement powers for council and more user-friendly guidance and procedures.

www.communities.gov.uk/corporate/publications/consultations



UK's first Code 6 eco-village

These are artist's impressions of Hanham Hall in Bristol, the UK's first large-scale development that will be built to Level 6 of the Code for Sustainable Homes. The eco-village, being built on a former hospital site that is set to accommodate 195 zero-carbon

homes, is a partnership between Barratt and the Homes and Communities Agency. It will be the first Carbon Challenge site in the country. Materials from the existing buildings will be recycled for use in the new development, when Barratt starts work this autumn.

More sector jobs to go

Two engineering firms have announced they are to make hundreds redundant in the latest round of job cuts.

Multi-disciplinary consultancy the Halcrow Group and consulting engineers Arup have both revealed that up to 269 and 99 employees respectively could go.

At Halcrow, staff from 19 offices in both the UK and Ireland have been consulted in response to the 'continuing economic difficulties' within Britain, which Halcrow believes will 'continue to see reduced activity, or perhaps even a further deterioration, through 2010 and beyond'.

This could mean Halcrow losing about six per cent of its 4,200 employees. It has 8,000 staff internationally.

Arup said: 'We continue to operate in a period of significant uncertainty in the global economy. Arup – as with any responsible business – needs to ensure its long-term business health and it is essential that we match our resources to our anticipated workload.'

Final redundancy figures are not yet known, but this latest round of job cuts could take Arup's total this year to 354.

'Sustainable pain',
Interview,
page 30

News in brief

Regulations burden eased

The UK government has changed how often it will make revisions to the Building Regulations, to help business respond to change. From 1 January the Department for Communities and Local Government intends to have a periodic review every three years, with no change to any one issue within two cycles.

UKGBC's call to action

The UK Green Building Council (UKGBC) has called on governments to radically reduce global carbon emissions from buildings during the Copenhagen climate change negotiations in December. The UKGBC launched the call to action at the House of Commons on World Green Building Day last month. It was one of a series of synchronised events around the world.

TSB to invest in technology

A total of £17m is being invested in innovative technologies by the Technology Strategy Board (TSB) and participating companies to help meet climate change targets and secure the UK's energy supplies. The government-funded TSB aims to develop solutions for fuel cell applications in the stationary, transport and portable power markets.

Concern for house prices

The Home Builders Federation (HBF) has expressed concern over the government's new energy efficiency regulations which could see the price of new-build homes rise by an average of £7,000. At present new homes cost £157,934, according to Nationwide. Future higher standards of energy efficiency could see £30,000 added to the cost of a new home, the federation said.

Low-carbon zones unveiled

London Mayor Boris Johnson has revealed the identity of 10 'low-carbon zones', which will share £3m of funding for pioneering alternative energy and lowering carbon emissions. Each of the winning London boroughs will be awarded at least £200,000 to launch measures to deliver a 12 per cent carbon saving by 2012.

News in brief

Public support renewables

More than a third of Britons would be willing to pay more for their homes if some of the energy supply came from renewable resources, according to the Energy Saving Trust. The research also showed that 49 per cent of householders are interested to know whether their homes were suitable for renewable energy. But 53 per cent claimed the price of renewable energy was too high.

MPs unaware of CO2 target

Most MPs are unaware of the UK government's target for all new housing to be zero carbon by 2016. A survey for the All Party Parliamentary Group on Sustainable Housing found that 72 per cent of the 150 MPs in the poll did not know of the target, while 34 per cent believed it was not due to take effect until 2020.

Cleantech set for boost

Clean technologies and renewables are expected to become two of the most important sectors of Britain's economy, according to a government survey of UK business leaders across eight sectors. Nearly half (43 per cent) believe that cleantech will grow at the fastest pace by 2020, followed by science and technology (20 per cent) and media and entertainment (15 per cent).

Masterplan competition

Foster and Partners, PHA and Mobility in Chain have won an international competition to design the masterplan to expand a self-sufficient, sustainable development near Seoul. The 300 sq km Incheon Free Economic Zone encompasses the islands of KangHwa and OnJin-gun, north east of Seoul.

Galliford wins £82.8m deal

Contractor Galliford Try has won four hotel and housing contracts worth £82.8m. The firm has been appointed to build a 186-bed Radisson Hotel in Guildford and a seven-storey student accommodation block in London. It will also redevelop the Coworth Park Estate in Berkshire and the Heythrop Park resort in Oxfordshire.

Raise pupil awareness of energy cuts, says expert

A schools expert has called for more environmental education of pupils to help ensure that sustainability improvements to buildings are more effective.

The government has announced that it is seeking views on ways to cut carbon emissions from the UK schools sector. It says it wants to identify what needs to be put in place to make this happen and determine what can be achieved.

Dr Dejan Mumovic, secretary of the CIBSE School Design Group, said of the move: 'If we had the answers on all technical issues, a school might be built to the most advanced sustainable standards, but if the occupants are not using the school buildings in a sustainable way, then the benefits may not be apparent.

'Apart from offering better incentives to the schools to ensure they are maintained and operated in a sustainable way, the various topics which would educate pupils about how to be more environmentally responsible should be incorporated into the curriculum.'



Schools in the UK account for about two per cent of greenhouse gas emissions.

Mumovic added: 'A sustainable school is not defined by looking at the school building only. A sustainable school is a complex built environment system, it needs a sustainable transportation and energy infrastructure to support it in the right manner.'

The consultation, which closes on November 20, looks at how to reduce CO2 from school travel, cut energy use in school buildings, and reduce carbon emissions from

school procurement and waste.

Schools account for around two per cent of UK greenhouse gas emissions, roughly the same as all the energy and transport emissions of Birmingham and Manchester combined. This is equivalent to 15 per cent of the country's public sector emissions.

The consultation paper, *Towards a Schools Carbon Management Plan*, can be downloaded at www.dcsf.gov.uk/consultations

Fall in planning applications begins to ease

Planning applications made by housebuilders for new housing developments have stabilised in recent months, but are still at a much lower level than a couple of years ago.

Data analysts Glenigan have found that the number of applications may have steadied in the first six months of 2009, but the average number in 2007 was 1,291,

compared to 902 in 2008, and just 494 for January to July 2009.

Allan Wilén, Glenigan's economic director, said: 'The flow of new planning applications has steadied in recent months, but remains a far cry from the number of applications seen a couple of years ago.'

'The latest data demonstrate that housebuilders remain focused

upon building out existing schemes and still have a large pool of sites with planning approval upon which to draw as the market gradually improves. While some housebuilders are now looking to add to their landbanks, the latest data suggests that there will be no rush to bring forward acquired sites for development.'



100 hours to make a difference

CIBSE launched its 'Carbon Off – 100 Hours of Carbon Clean-up' campaign last month with presentations from some leading industry figures (left to right): Andrew Stanton of Transport for London, Will Fellows of the Carbon Trust and Tom Whitehouse of Carbon International. The campaign builds on previous years and invites companies to dedicate 100 hours of staff time to specific energy-reducing activities. A campaign website offers advice and allows participants to record and follow their progress. Go to www.100hours.co.uk

Industry 'left in dark' over delay to Part G

CIBSE has criticised the UK government for keeping the plumbing industry in the dark over why changes to Part G of the Building Regulations have been unexpectedly delayed for six months.

The revisions to Part G, which regulates sanitation, hot water safety and water efficiency, were originally expected to come into force on 1 October. But following receipt of a 'detailed opinion' from Europe, the Department for Communities and Local Government (DCLG) postponed the enforcement of the changes, and has refused to reveal the detail behind the delay, citing 'confidentiality'. However, it is thought the delay may be caused by perceived barriers to trade.

CIBSE's technical director Hywel Davies said: 'What if the detailed

opinion says some aspects of the regulations are unacceptable to Europe? We might even be told they have to be changed completely.

'The industry is now in the dark. Is that right? Is that how you incentivise industry to make preparations for the introduction of new regulations?

'Maybe there is an entirely reasonable argument behind all of this secrecy, but we're not talking about national security here, we're talking about plumbing.'

Davies was also concerned that businesses may be left out of pocket after stocking up on products in order to meet the new requirements.

DCLG now has to decide whether to argue against the European Commission's findings, or make additional changes to Part G. The next 'common commencement



Shutterstock

Water and sanitation fall under Part G.

date' for implementing the changes is April next year.

The changes include a new limit of 125 litres of 'wholesome' water per person per day in new homes, and new rules covering 'non-wholesome' water to flush toilets.

See *Legal column*, September, page 22

Debt talks continue at WYG

Talks to reduce debt at White Young Green (WYG) could result in a loss for existing shareholders and see the multi-disciplinary consultant removed from the main stock market altogether.

WYG began refinancing negotiations with its lenders earlier this year when its debt rose to £91.5m, up from £70.6m in 2007. Now its board, in conjunction with its advisers, is considering options which are likely to result in a 'material dilution' for its existing equity holders. According to the company, the group may not, in such circumstances, 'continue to satisfy the conditions' for listing on the main market.

Talks between WYG and its lenders were continuing, it added.

The company reportedly made several hundred job cuts earlier this year.

New sports centre

Work has begun at a £31m indoor sports centre on the former Ravenscraig steelworks in North Lanarkshire, Scotland. The centre will feature an indoor artificial football pitch, a sports hall, gymnasium and an athletics hall. Buro Happold is providing ground, structural, fire and building services engineering, as well as indoor climate simulations and sustainability assessments.



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FläktWoods

News in brief

University seeks tenders

Birmingham University has started to look for main contractors to design, procure, construct and commission the first phase of its planned city centre campus, the university's 28,000 sq m estates department and a master plan for the wider project, which could eventually be 55,000 sq m.

WSP wins Bond Street

WSP has been selected by Crossrail to be the lead consultant on the detailed design of Bond Street Station in London's West End. The consultant engineer will provide structural and M&E design, environmental management, and planning.

Managing flood risk

A new book to help engineers tackling flood risk management and sustainable development in new construction works is now available from the BRE Bookshop. It is funded by DEFRA as part of the 'Making space for water' programme – The Life Project. www.brebookshop.com

Agency shares out £12m

Seven projects are to share £12m worth of funding to install the infrastructure for an array of new and existing low-carbon energy plants. The Homes and Communities Agency announced the second round of funding through its Low Carbon Infrastructure Initiative. www.homesandcommunities.co.uk

Acoustic accreditation

Research organisation BSRIA is now UKAS accredited to carry out acoustic testing and consultancy on all types of buildings. Under Part E of the Building Regulations, a sample of units in new dwelling developments, as well as refurbishments, may have to be tested to demonstrate levels of sound insulation.

SLL Code on CD

The Society of Light and Lighting has issued its 2009 Code for Lighting on CD, which is available from the CIBSE Bookshop. Visit www.cibse.org/publications or call 020 8772 3618.

Engineers demand new deal at climate summit

Without agreement on climate change at the Copenhagen summit, the world faces starvation, poverty and war over resources, a meeting of engineers has heard.

Engineers' fears were revealed at the FIDIC 2009 conference, hosted by the Association for Consultancy and Engineering (ACE). More than 700 consulting engineers from around the world attended the event in London to discuss environmental problems, including climate change, water shortages and depletion of natural resources.

During the event engineers demanded a meaningful dialogue with governments and urged



FIDIC's immediate past president John Boyd helps debate the issues.



Princess Anne was a guest speaker at the conference.

them to agree on carbon reduction targets at the forthcoming United Nations meeting in Copenhagen in December.

Nelson Ogunshakin, ACE chief executive and host of the FIDIC conference, said: 'Sustainability is the most important issue facing humanity. Failure to act now will condemn many generations to prolonged hardships.'

Other key actions which the conference identified to combat climate change in the built environment included: encouraging more investment in research and development; making sustainability integral to the business culture of consultancies, clients, suppliers, contractors and asset users; working

with governments to encourage more interest in engineering careers; engineers taking initiative in promoting solutions to the world's issues, as well as engaging proactively with the political process; engineers having responsibility to be part of the decision making process; and using the UK's new Chief Construction Adviser model in other nations where it could also be useful.

FIDIC now intends to send an open letter to the governments attending Copenhagen demanding that they reach an agreement on climate change. The letter will also provide examples of how the industry can offer sustainable solutions to these global challenges.

Twelve college schemes finally get green light

Twelve colleges have finally been given approval to begin building works following the funding fiasco by the Learning and Skills Council (LSC).

The LSC told 13 colleges earlier this summer to scale back their projects to make them more cost-effective. The move came after the funding body for the college building programme discovered it did not have enough cash to finance more than 70 projects already given approval in principle to proceed.

The 12 institutions that have now been granted permission to continue are: Barnsley College; Bournville College; Furness College; Hartlepool College of Further Education; Kirklees College; Leyton Sixth Form College; North West Kent

College; St Helens College; Sandwell College; South Thames College; Tresham Institute of Further and Higher Education, Corby; and West Cheshire College.

Proposals for Manchester College's Wythenshawe campus are being finalised. A decision is expected to be announced in the near future.

An independent report into the LSC's handling of the Further Education Capital building programme was conducted earlier this year by Sir Andrew Foster.

Meanwhile the Department for Children, Schools and Families has decided to scrap the £2m sponsorship fee to encourage new academy sponsors for schools opening from September 2011.



Noise-free zone

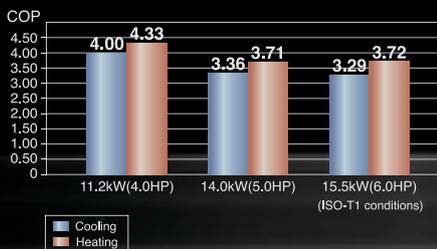
A building claiming to be the world's quietest has officially opened at Bristol University. The £11m Centre for Nanoscience and Quantum Information has specialised laboratories where vibration and acoustic noise levels are among the lowest ever achieved. The building was designed by Capita Architecture.

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ECA criticises 'panic buying' of old lamps

The Electrical Contractors' Association (ECA) has slammed the reported panic-buying of old lamps following the introduction of energy-saving light bulbs.

Sales of conventional incandescent lamps in Germany were reported to be up by 34 per cent in the first six months of this year. Regulations were introduced on 1 September that will mean old lamps will be phased out by 2012.

Giuliano Digilio, ECA head of technical services, said: 'The introduction of energy-saving light bulbs is great news for the environment and for consumers who will enjoy cheaper energy bills.'

'It's not something people should be worrying about and certainly not reason for hoarding old lamps. We have seen significant advancements in lighting technology over the past few years and this is set to continue.'

Sustainable construction strategy progress praised

Good progress has been made by industry and government working together to radically change the way the UK construction sector designs and builds, according to a new report.

The first annual progress report from the Delivery Board revealed that the Strategy for Sustainable Construction had made 'significant achievements' since its launch in June last year, but there still remains 'a great deal yet to do'.

The report highlighted the government's passing of the Climate Change Act, developments under the New Industry New Jobs plan, publication of the Low Carbon Industrial Strategy and the UK Low Carbon Transition Plan for particular praise.

Ian Pearson, economic secretary to the Treasury, said: 'We've made great strides to develop an effective working relationship with industry to deliver our sustainability



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Ministers say the momentum needs to be maintained to improve construction.

objectives. Now our challenge is to maintain this momentum in the face of the current economic climate.'

Ian Lucas, business minister with responsibility for construction, said: 'I am pleased to see we are making steps towards reaching these targets, but there is further

work to be done to build on these achievements and reach the overarching goals of the strategy.'

The delivery of the strategy will be overseen by the newly announced chief construction adviser, who is expected to be in post in November. **See News Analysis, page 18.**



“Working on technical specifications with NICEIC in 2009 will save Southwark Council and its council tax payers thousands. By the end of 2010 the total saving for Southwark could be over half a million pounds!”

Chris Baxter
Head of Engineering Services, Southwark Council



Scottish regs set for refit

■ Ministers are considering industry views on proposed changes to energy standards under the Building Regulations in Scotland.

The Scottish Government intends to reduce carbon emissions from new homes and non-domestic buildings and new building works by 30 per cent beyond current standards.

Issues raised in the consultation include thermal performance of cavity walls, sample air tightness testing for all new buildings, and mechanical ventilation and cooling systems.

The consultation also considers works to existing dwellings, known as 'consequential improvements', where extensions are built to homes. The Scottish government has proposed to introduce two levels of fundamental U-values for walls, floors, roofs, windows, doors and rooflights for extensions to dwellings: the first set would be the U-value levels proposed for the 2010 guidance; and the second set

would be a further improvement on these levels. The deadline for comments was 2 October.

The amendments to the standards and guidance within Section 6 of the Building Standards Division Technical Handbooks are expected to come into force in October 2010. Minor changes were also proposed to Section 3, on the environment and ventilation.

The move to reduce carbon emissions from new homes and new non-domestic buildings was first announced in February this year by Stewart Stevenson, Scottish minister for transport, infrastructure and climate change.

Scottish energy standards and guidance were last revised in May 2007.

www.sbsa.gov.uk



Scottish Parliament... amendments to Building Regulations are expected.

New supervisor training standard announced

The UK Contractors Group (UKCG) will introduce a new supervisor training standard on 1 January 2010.

It is designed to ensure that supervisors working on their sites can demonstrate that they have the necessary knowledge and skills to supervise their workers effectively.

Stephen Ratcliffe, director of UKCG, a new trade body that was launched earlier this year, said: 'UKCG has identified the need to tighten up the competence of supervisors to help improve health and safety performance.'

'This standard is the means by which members will tackle the issue. There are a number of training courses available that will deliver training to the standard.'

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NICEIC, Field Engineering Manager

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President: Mike Simpson FCIBSE, FSLL, FILE, FIET Chief executive and secretary: Stephen Matthews

News in brief

Amendment

The article headlined 'New Improved YEN Site' that appeared in the September issue of the *CIBSE Journal* should have been entitled 'New Improved Young Members Site'.

You can visit the new site at www.cibseyoungmembers.co.uk

Intelligent Building Group stages evolution seminar

The Intelligent Building Group is holding a seminar on 20 October, entitled 'Evolution and the Optimum Design of Buildings'. The seminar will describe the principles of evolution, their encoding in Evolutionary Algorithms, and their application to the optimum design and operation of buildings, at CIBSE HQ, Balham. Attendance is free. Email wwilliams@cibse.org to register. For more information visit www.cibse.org/ibgevent

Façade Design & Engineering 2009

Society of Façade Engineering (SFE), in partnership with *New Civil Engineer*, is holding a one-day conference on 20 October (London venue TBC), on Façade Design and Engineering. It will focus on delivering a cost-effective and iconic façade while also ensuring environmental performance and sustainability. Members of SFE are eligible to receive a reduced delegate rate. For further information visit www.cibse.org/sfe

CIBSE golf day

CIBSE Southern Region will be holding a golf day on Friday 23 October 2009 at the Chichester Golf Centre, West Sussex. The first tee off is at 1pm. Email Doug Price doug@dpconsultants.co.uk

LCEA questionnaire feedback is positive

CIBSE's first survey to CIBSE Low Carbon Energy Assessors (LCEA) has received positive feedback and clear direction on areas for improvement.

CIBSE received a high level of feedback with more than 250 responses from 853 LCEAs and LCCs (Low Carbon Consultant).

Overall it was positive, with 55 per cent believing the CIBSE scheme was of a higher quality than other schemes, and 58 per cent proud to use the LCEA, LCC or AC (air conditioning) logos in their work. And 74 per cent stated that recognition of the CIBSE brand was the most or second most important thing to them.

When we asked what CIBSE Certification did particularly well, 46 per cent said that it provided the highest quality brand and achieved



high levels of brand recognition.

In terms of what CIBSE could do to improve CIBSE LCEA's status, two main issues were highlighted: better customer service and increased awareness of the scheme with clients. In response CIBSE confirmed it will continue to focus on these areas to ensure improvement. Training has

increased across the certification team, and they aim to get back to queries much faster and will constantly endeavour to promote CIBSE LCEA skills to clients.

A dominant message for CIBSE this year, and one which continues, has been to promote their LCEAs to key decision makers within the public sector and local authorities – communicating the legislation, requirement for compliance and the skills of our qualified assessors.

The first survey has given us plenty to help focus us over the next year, and we will now carry out a survey each year to monitor satisfaction and ensure that it continues to rise.



Celebrating graduate success

The 15th annual CIBSE/ASHRAE Graduate of the Year Award, sponsored by Baxi Commercial, will take place at the Institution of Mechanical Engineers (IMechE) on 15 October.

This year the award has attracted a record number of entries and six finalists have been shortlisted, each of whom will give a presentation to a large audience during the evening. ASHRAE president

Gordon Holness will also be giving the annual ASHRAE Presidential Lecture that evening. The awards will be followed by a special reception, sponsored by CIBSE Patrons.

Attendance is free and open to all, but email ewenrose@btinternet.com to attend the lecture, and wwilliams@cibse.org to register your attendance at the Patrons drinks reception.

The shortlisted finalists are: Liam Buckley, Brunel University and IES; Matthew Gittsham, Bristol University and Arup; Francis Li, University College London and Buro Happold; Emma Marshall, Northumbria University and RPS Gregory; Vincent O'Brien, University of Ulster and Willis Contractors; and Christopher Pountney, Bristol University and AECOM.

Aspiring to achieve member CEng status

Have you thought about upgrading your Associate IEng to Chartered Engineer status?

There is an experiential route, meaning you do not necessarily need to meet the qualifications criteria to apply.

Gaining a further grade of

membership would give you the recognition you deserve and, in this economic climate, would be a distinct advantage.

The application process for Member CEng is in two stages. The first involves submitting a report and attending an interview. The

second, to gain registration status, requires a further technical report and interview.

If you would like to discuss the application further and would like more information, contact Bobby Wright on 0208 772 3639 or bwright@cibse.org

CIBSE comments on more policy changes

Thank you to all those CIBSE members and colleagues from other institutions that provided their views on the CIBSE response to Parts L and F of the Building Regulations.

The technical department organised a number of consultation events and joined with some CIBSE regions and Sponge (a network of young professionals in the construction industry) to ensure that a robust and helpful response was submitted. We now await the Department of Communities and Local Government's (DCLG) response and we will be raising many of the issues at our liaison meeting with DCLG. View the CIBSE response at www.cibse.org

Current consultations of

interest to members include the Department for Children, Schools and Families' (DCSF) *A Carbon Management Strategy for Schools*. The school sector is responsible for 15 per cent of public sector carbon emissions and the consultation will gather views on the feasibility and priority of options to reduce carbon and greenhouse gases from the school system, while still delivering core business. The technical department is working with the CIBSE Schools Design Group to compile a response. Comments from members are welcome.

DCLG is now seeking views on proposed changes to the Approved Document for Part J (combustion appliances and fuel storage systems) of the Building Regulations, expected to come into

force in 2010. The department is also consulting on how the recast Energy Performance of Buildings Directive will be implemented in England and Wales. Scotland, Northern Ireland and other European Member States will be consulting separately.

To respond to these consultations visit the Knowledge section of www.cibse.org or contact the technical department at smcdonough@cibse.org

The Professional Practice Committee (PPC) would like to remind members that you are committed to the PPC's Code of Conduct and renewing your membership each year effectively reaffirms that commitment. There will be new wording in your renewal letters this year.

The 'jewel' in CIBSE's calendar

The President's Awards Dinner, one of the highlights in the presidential year, will be held on 16 October at the Tower of London with a private viewing of the Crown Jewels.

Following the dinner there will be a presentation of awards, including:

the CIBSE Undergraduate Awards, which rewards an outstanding building services student, sponsored by Hays Building Services; The Happold Brilliant prize, which rewards a university demonstrating academic

excellence; awards for technical papers published in the *BSE&T Journal*; and the Ken Dale Travel Bursary.

The evening involves a viewing of the jewels and dinner, and costs £120. vwilliams@cibse.org

CIBSE's bookshop grows

CIBSE stocks a large number of publications by other key publishers in the building services field at reduced rates.

New additions include:

The Facilities Management Handbook, fourth edition, £34 members/£49.99 non-members.

Wiring Regulations in Brief, £15.39 members/£21.99 non-members.

CIBSE has negotiated a further discount for members on Elsevier's popular *Building Services Handbook*, priced £15.85 (normal member price £17.60). Offer valid until 31 December 2009. For more information visit www.cibse.org/publications or call 020 8772 3618.

New publications available

A new 12-page supplement to accompany *Knowledge Series KS7: Variable Flow Pipework Systems* (2006) is now available.

The supplement explains how to design re-circulating heating and cooling water systems incorporating variable speed pumps, utilising two alternative valve solutions not covered in the original KS7, centralised valve modules and pressure independent control valves (PICVs). The supplement comes free with any purchase of KS7 or is available to purchase separately at £15 for members and £30 for non-members.

Also new from CIBSE is *TM47: Operational Ratings and Display Energy Certificates*. This manual provides guidance on the requirements for DECs, along with guidance on their preparation,



including what information is needed, who can produce them, what software should be used and what must be done to display them. *TM47* is priced at £35 for members and £70 for non-members. www.cibse.org/publications

Training and Development

Submissions

The closing date for annual submissions to be considered at the January 2010 Training and Development Panel meeting is 18 December.

Training submissions and any queries, plus employers' enquiries and applications for approved company training schemes, should be addressed to Rachel Ravenswood, training and development administrator, on 020 8772 3612 or email rravenswood@cibse.org

CPD directory update

To be added to the *Directory of CPD Course Providers* contact Olwen Williams on 020 8772 3612 or rravenswood@cibse.org. We also accept applications for online courses and we will welcome more e-learning applications. A concessionary rate is available for entries of the following categories:

- Academic institutions
- Not-for-profit organisations offering free or non-profit training courses
- Sole traders who are members of CIBSE and offering free, non-profit training courses
- Sole traders who are members of CIBSE and the training business amounts to less than five per cent of their annual turnover.

For more information on training and development visit the IPD CPD section of www.cibse.org *The Directory of CPD Course Providers* is produced to assist members identify suitable courses in respect of their CPD needs.

Company visits

Is your company benefitting from membership, products and services that CIBSE has on offer?

Let us help you meet the competence levels required by your staff to excel in their workplace. If you would like a company visit, contact Bobby Wright on 0208 772 3639 or bwright@cibse.org

Constructing change

The appointment of a government adviser on the construction industry will herald in a major review of the sector to check it is 'fit for purpose'.
Carina Bailey reports

The appointment of a UK chief construction adviser to government is expected to have a big impact on the role of building services engineers. The Department for Business, Innovation and Skills (BIS) finally announced its decision to create the post last month – more than a year after the position was first mooted for the sector.

The remit for the new role is wide-ranging, and the appointee is expected to influence government policy in the construction industry. It will also provide a senior figure to influence industry.

But one of the adviser's most important responsibilities will be to assess the key barriers to growth in the UK's low-carbon construction sector, as well as leading a low-carbon review of the construction industry to ensure it is 'fit for purpose'.

The Construction Innovation and Growth Team carrying out the review is expected to meet prior to the chief construction adviser (CCA) officially being in post. During the interim period the review will be chaired by Keith Clarke, chief executive of consulting and design engineers Atkins and chairman of the Construction Industry Council (CIC).

It is Clarke's belief that, in the future, technology and the work of the CCA will change the job of the building services engineer, along with CIBSE's role in the sector.

'In the future you can't see any of our buildings having less design work being done on the way they modify the climate,' explains Clarke. 'It might well be that we end up with a lot less capital expenditure on plant as we design our buildings to be less and less energy-intensive.'

According to Clarke, this could see less plant required, with more and more design work conducted on the plant that's left and the building fabric itself, which could go straight to the heart of what CIBSE does.

'Looking ahead, in 10 years' time much of CIBSE's work will be what we would now call building physics, and designing things like fabric and plant in a way that has fewer motors, fans and pipes – fewer things that have to be run. And I don't see that being done without enormous skills from people that understand services.'

'It's absolutely inevitable that many people will be doing different things to what they're doing now. If you believe the construction industry is immune from technological change



The new chief construction adviser is still to be appointed.

you should probably look at the change of emphasis in aerospace and car manufacturing; 10 years ago no one advertised their next plane as being quieter and greener. All the adverts now are about more sustainable, more efficient planes, as opposed to faster and sexier.

'That means a change of skills and change of emphasis. And building fabrics and the way they're run are going to go through that same change of emphasis.'

Clarke says a key benefit of this role will be the CCA's seniority, which will allow him or her to decide what's relevant.

Welcome

CIBSE welcomes the plans to appoint a CCA, particularly in light of the industry's dependence on government for bringing forward construction work during the recession.

Rob Manning of AECOM, and CIBSE president-elect, says: 'The CCA can provide an internal focus for resolving cross-departmental issues and for providing the industry with a single point of contact to seek resolution of matters of concern.'

Similarly, the CIC is equally enthusiastic about the prospect of having a respected industry figure

Looking ahead, in 10 years' time much of CIBSE's work will be what we would now call building physics

– Keith Clarke

influencing government policy. CIC believes the role is vital if the industry is to reduce carbon emissions from construction.

A CIC spokesman says: 'The design and engineering of our built environment is not only vital to our economy, well-being and quality of life, but is also an essential contributor to decarbonising our economy. The role of the adviser is absolutely essential and we welcome this commitment.'

The Confederation of British Industry (CBI) also welcomes the move, but stresses it would like to see certain additional elements addressed, including reviewing the government's current capital programmes with the Public Sector Construction Clients' Forum to help deliver value for money.

Fit-for-purpose sector check

The chief construction adviser will lead a review into the construction industry to determine whether it is fit to deliver a low-carbon future:

- Assess the impact of the New Industry New Jobs agenda (a new plan by government to invest in Britain's economic and industrial future) on industry;
- Assess the strengths, weaknesses, opportunities and threats to the UK construction industry;
- Identify barriers to improving performance, and make recommendations to combat these;
- Consider how the UK

construction industry can take forward the low-carbon agenda and make recommendations to help the UK become a world leader in low-carbon construction and the built environment; and

- Produce an evidence-based report of recommendations for government and industry which can be considered during policy making and help produce an action plan for industry.



Remit

Chief construction adviser to have wide-ranging role

Chair a new Construction Category Board, which will build on the existing Public Sector Construction Clients Forum (PSCCF), to oversee the implementation and further development of best-value government construction procurement;

Chair an enhanced sustainable construction strategy delivery board to help ensure policy regarding the industry is effectively co-ordinated;

Assess the key barriers to growth in the UK's low-carbon construction sector to ensure the UK industry is well placed to serve developing needs and markets;

Work with the industry, through the Strategic Forum for Construction, to deliver the industry improvement agenda, including the Construction Commitments;

Promote innovation in the sector, working closely with the Technology Strategy Board and other funding bodies; and

Co-ordinate the Whitehall response to reports featuring construction.

'The construction industry has been crying out for a strong and effective champion to fight its corner – we are delighted that such a position will now come into being,' says John McDonough, chairman of the CBI's Construction Council.

'Plans to appoint an independent chief adviser on construction are a very welcome step and we look forward to working closely with the new post-holder to make this position a success. Given the scale of the challenges facing the industry we hope that – building on its initial success – the remit of the CCA will expand to cover additional areas of industry concern.

'The council would like to see the reviewing of current capital programmes made an explicit part of the work of the CCA, as the ability to troubleshoot must be a key part of the role of Public Sector Construction Clients' Forum chairman. This will help ensure government projects run smoothly and deliver good value.

'The post-holder will also need to have a strong understanding of construction to win the confidence of the industry.'

The Association for Consultancy and Engineering (ACE) is also pleased with the announcement, but stresses it is essential that the right

person is appointed to the role with the 'energy, knowledge and respect of the industry' to drive through their stated objectives and deliver real improvements within the sector.

Nelson Ogunshakin, ACE chief executive, says: 'I am delighted by this decision. We hope that the CCA will deliver the critical leadership needed to balance the needs of industry with political and economic drivers.'

However, it is vital that the CCA is given sufficient authority and resources to do the job, insists Ogunshakin, adding: 'Strategic leadership will not be enough – the appointee must be in a position to deliver real, positive outcomes. They must have an unconstrained reporting line in order to be an effective advocate for industry stakeholders.'

The CCA will be independent and report to business and Treasury ministers. The role will be part-time, earn the new recruit £120,000 a year and will be filled using a process of nomination and headhunting rather than a traditional recruitment campaign. The applications deadline has now closed. Interviews should take place this month, with the position expected to be filled in November. ●

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Refer to [BS6173/2009](#)

[HSE catering sheet 23 R1 & IGE UP/1A](#).



Letters

Micro-renewables do make sense

The Renewables Advisory Board has suggested that renewables generation should always be done on a large scale because it is more economically viable; it also advises against introducing feed-in tariffs ('Greening Britain', August, page 14).

Modern economics account for life-cycle costs in their widest sense, and the human factor. Perhaps the only way of moving forward with conserving the use of energy and taking on board renewables is to change human behaviour. One way of doing this is to include the micro with the macro – that is, encouraging the small businesses, small communities and the individual householder to reduce energy consumption, install renewable energy systems and claim the feed-in tariff.

In the article, Hywel Davies argues that, if 30 per cent of electricity is wasted in an (existing) building, then generating it from renewables is an extremely expensive way of wasting electricity. However, retrofitting to upgrade existing buildings, which are a very high proportion of the total stock compared with new build, can only go so far. Wasted energy here can be reduced; it cannot be eliminated. If one measure comes before the other what does it matter as long as both are being addressed?

Brian Mark says it would be impossible for Britain to compete with Germany and China in the manufacture of photovoltaic panels as they have a well developed manufacturing industry. What a defeatist attitude! Has he factored in the emissions generated from China's coal-fired power stations to manufacture them and, indeed, the emissions from transporting the panels to Britain? We in this country need jobs for the recently unemployed.

Keith J Moss ACIBSE

Ambiguities in solar thermal advice

It is difficult to disagree with Tim Othen's view on the effects of Health and Safety Executive guidance L8 on the practicality of using solar thermal energy for domestic hot water systems (Letters, September, page 16; 'Keeping the legions at bay', August, page 40).

The only real ambiguity is as to whether the HSE would apply the rules designed for places of work to your or my flat or house if one of us or our immediate families were to catch Legionnaire's disease. I haven't heard of a prosecution of this kind occurring, though one of your readers might know of one. But presumably the HSE would be

within their rights to take action under the various health and safety at work statutes. Will compliance with L8 therefore appear in the home information pack given to a purchaser? This particular problem is typical of several clashes between optimum sustainability on the one hand and statutory H&S legislation plus our civil law on the other. (Optimum future safety vs optimum present safety?). In civil law there is the potential for legal action following leakages of the greenest refrigerants, ammonia and the hydrocarbons. In a civil case, apparently,



there is not merely a matter of negligence to be considered but also a matter of a less intrinsically safe choice of which 'the designer' is aware. Perhaps the HVAC/MEP trade as a whole should make a combined approach to government of the HSE for a ruling as to what normally overrules what. The current view that 'only the courts can decide in these situations' simply is not good enough when one wants to install solar panels or ammonia chillers.

John Moss

Technical director, ICOM Energy Association

Complying with solar advice

Your article on solar thermal systems and legionella does not specifically mention the problem of non-compliance – which is that about 80 per cent of all solar water heating installations in the UK do not comply with Health and Safety Executive (HSE) guidance: heat daily to 60 deg C to the base of the hot

water cylinder. Not part way down. Not once a week. Not to 50C.

An interviewee in the article is factually incorrect by claiming that heating the water to 60C every day completely negates the environmental and economic benefits of solar. The reality is that extensive solar simulation modelling has conclusively demonstrated to us that using back-up heating as HSE L8 guidance requires – in the evening after the sun has heated the water as much as it can – will only negate the benefits by less than 10 per cent.

Most solar thermal installations in the UK are retrofits, and this safer approach often delivers better cost-benefits into the bargain. This is achieved by saving the cost of a hot water cylinder. Unfortunately this safer approach cannot even gain state grants at present because many in the solar industry share the collective delusion about performance which is articulated in the article.

Barry Johnston

Managing director, Solar Twin Ltd

CIBSE's customer rhetoric

Talking the talk of customer satisfaction and then using surveys to measure this satisfaction represents an implicit promise by CIBSE to its members: that the institution will take action to serve them better ('Declare your feelings', CIBSE News, September, page 11). Customer service rhetoric or fancy research instruments fall a long way short of this commitment. The benefits, instead, come from challenging how we do our business, keeping the competition in our customer satisfaction equations and taking the considerable time and effort to design questionnaires that are easy to complete, worth taking the time to do, show members that CIBSE understands their basic needs, cannot be 'gamed' or otherwise rigged by insiders – and then acting to improve the deal to members relative to what our competitors can do or offer.

Ian Brown MSc CEng, FIMechE, FCIBSE

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

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



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Step into the limelight

Engineers need to overcome their natural inhibitions if the profession is to thrive – and awards give them the perfect opportunity, says young engineer **Morwenna Wilson**



'No pain, no gain.' That was the phrase I kept repeating to myself as I stood trembling behind the door to the impressive lecture theatre in the IMechE headquarters last October. My hands shook involuntarily so that the words on my cue-cards started to blur. I was about to enter the lion's den and give a presentation to the judges and a packed auditorium in the final of the 2008 CIBSE/ASHRAE Graduate of the Year Awards.

I have found that there are so many emotions associated with entering an award. It is only natural to worry about what people will think of you for even putting yourself forward: 'Consider yourself to be that good do you?'

And it doesn't seem natural to write about yourself in such a self-congratulatory way that you physically cringe.

As for reading the complimentary account written by your boss; the first reaction is embarrassment followed by a cheeky thought that maybe you should go and ask for a pay rise! The whole process seems strange to such logical creatures as engineers.

In 2004, Michael Kenward, a journalist who often contributes to scientific and technical publications, wrote in an opinion column in *Ingenia*, the magazine of the Royal Academy of Engineering: 'In recent years, a growing cadre of scientists has become, if not media superstars, regular contributors to print and broadcast media ... Sadly, with a few honourable exceptions, engineers, as opposed to inventors who are very different creatures, have yet to make the same impact.'

If we are to keep up with other sectors of industry and engage with the public successfully we need to banish our natural bashfulness so that more of our young engineers have the confidence to put themselves forward. From these we need to find figureheads who can, with the support of their colleagues and institutions, serve in the future as excellent role models and bring their profession to the fore.

And awards that celebrate the success of these

young engineers, such as the CIBSE/ASHRAE Graduate of the Year Award, are the perfect place to find the individuals we so desperately need. It is more important than ever that we continue to support such awards so that we can highlight the future leaders of the industry and actively encourage them to aim high. They are the ones that have the ability to change the face of the industry and the fate of the world.

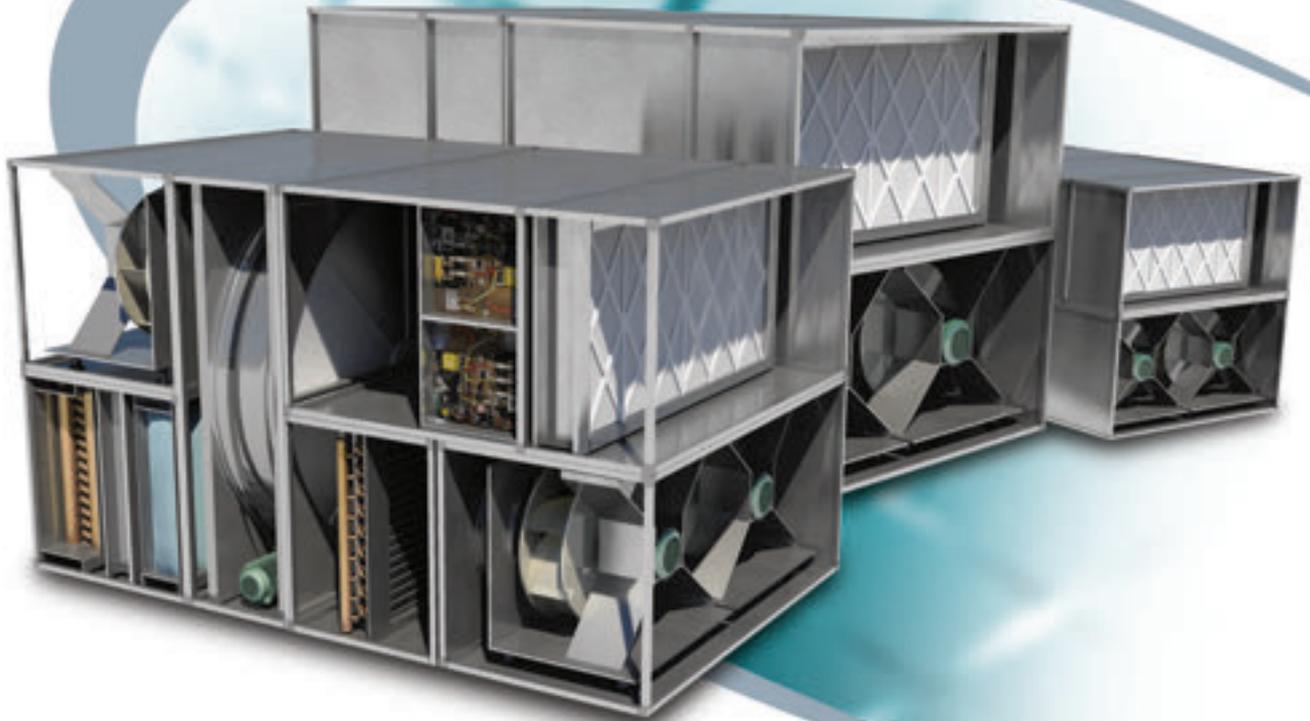
Bringing the pioneering engineering projects and professional individuals to the attention of the public is essential if we are to reclaim the ground last occupied by the extraordinary innovators such as Brunel, and be recognised once again as leaders of society.

Awards can also deliver more immediate results on a more pragmatic level for the applicant. Perhaps the greatest benefit for me has been the regularity of the presentations I have given and the exposure I have received because of the award. Throughout the year the pain has gradually, but significantly, reduced. My feet now tap to a much slower rhythm and I am left, almost exclusively, with the gains.

And, later this month, as the next group of finalists muster all their courage in that picture-lined corridor, I will not be able to stifle a grin. The finalists can only benefit from the experience; and so can you young engineers out there. It is going to be a night of anticipation and celebration as we welcome the next bright hopes for our collective future. ●

Morwenna Wilson, who works for Arup, is the current holder of the CIBSE/ASHRAE Graduate of the Year award. This year's final takes place at the Institution of Mechanical Engineers, One Birdcage Walk, Westminster, at 5pm on 15 October. All are welcome and entry is free. See p16 for details.

We need to keep up with other sectors and banish our natural bashfulness so that more of our young engineers have the confidence to put themselves forward



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It's all in the code

Part L of the Building Regulations is wrong – lighting should be designed around the occupant, not the building, argues **Bob Venning**



Is the UK government seriously committed to reducing energy consumption? How many of you, when asked to design lighting installations to the approved method in Part L of the Building Regulations, or to BREEAM Offices or specified products to attract enhanced capital allowances, have been puzzled by the apparent differences and why there is no consistency in the advice and targets? Even BSEN 12464 is not immune.

The problem, as I see it, is that standards, building regulations and BREEAM are built around buildings – and not people.

It is easy to design an office lighting installation to 7W/sq m, but do the occupants like it? Can they work efficiently, without complaint, and is it a healthy environment? Lighting is not just about energy consumption, it is about the correct lighting for the task, a pleasant visual environment, a healthy workplace and user satisfaction, which should lead to improved performance, increased productivity and lower absence rates.

Part L does not touch any of this, nor does BREEAM, but the Society of Light and Lighting's (SLL) Code for Interior Lighting does. For me, that means that the approved method offered in Part L is wrong. Lighting is so much more than just the lowest installed energy installation; why waste money on installing a lighting installation that does not cater for the people it is meant for?

Part L does not consider visual comfort and health important, while BREEAM requires simple yet nebulous concepts mostly covering energy and control, again without considering the occupant and their working conditions. The Electrical Contractors Association scheme is 'for energy-efficient and environmentally beneficial equipment' and is 'an important role in the government's strategy to combat climate change'. In none of these documents is the occupant of the building mentioned.

Arguably, the health and well-being of the occupants are of prime importance. It is they who generate the wealth, whose productivity generates profits and GDP. If the occupants have good conditions, then it will be

possible to reduce the energy consumption through education.

Let us consider the requirements for daylighting. Part L suggests that you use daylight as much as possible. No targets or guidance is given, except to say that, if 20 per cent of the window wall is glazed, then within six metres of the perimeter good daylighting should be achieved. This may be true for greenfield sites or suburban developments, but surely not for London or any other high-density area. What do we do in these circumstances? Follow the SLL code. Not only is it helpful, it gives targets to achieve so that daylight linking systems can be adopted to save energy. Here, Part L is too wishy-washy.

The key factor is control. Maximise daylight and minimise electric lighting. If we really want to reduce our energy consumption, then we need to control what we use rather than minimise what we install. What we install is somewhat irrelevant, because energy is only consumed (DALI ballasts aside) when the lighting is switched on.

And what does Part L say about control (in the approved document)? Not a lot that is constructive: use manual switching that will comply, and you might also think about automatic switching too.

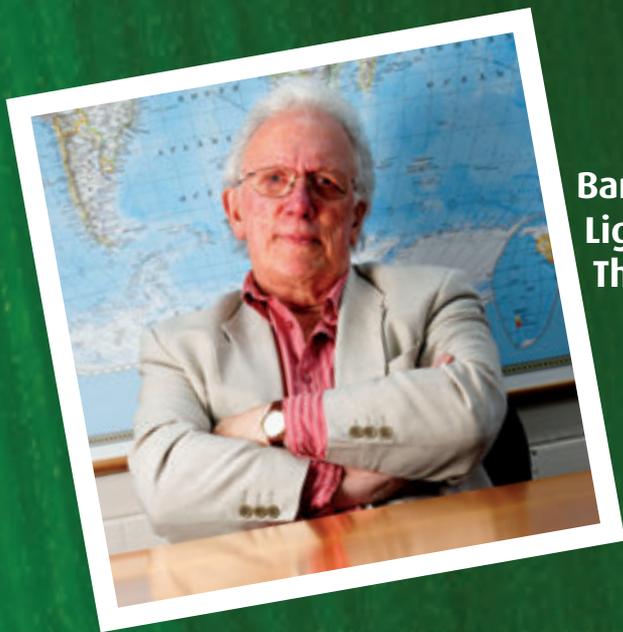
Research papers show that, left to their own devices, people are good at switching on lights but fail to switch them off, so you need an automatic system to do that. Why doesn't Part L start with automatic controls and add something about manual override where appropriate?

Follow the code – not only will you get good lighting conditions for the occupants, but you will get low energy consumption too. ●

Bob Venning, C Eng, MCIBSE, FSSL, is consultant to Arup Lighting

Lighting is so much more than just the lowest-energy installation – it should cater for the people it's meant for

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Standard practice

Engineers are familiar with British Standards and their use in specifications, but what do they tell you and why do they matter? Hywel Davies explains



More than 100 years ago Sir John Wolfe-Barry, designer of Tower Bridge, persuaded the Council of the Institution of Civil Engineers to form a committee to consider standardising iron and steel sections. On 26 April 1901 the Engineering Standards Committee, forerunner of the British Standards Institution, met for the first time. Amongst the earliest standards was one for tramway rails, which reduced the number of gauges from 75 to five.

The work on the tramway standard has a current equivalent in the work of the Association of Ductwork Contractors. They are campaigning for the industry to commit to using the preferred standard ductwork sizes and shapes – and to stop using anything else. Again, the motive is simple – the proliferation of shapes and sizes costs money and doesn't add value. Standardisation saves money and adds value.

Another early standard reduced the number of structural steel sections from 175 to 113. Standardisation had begun and in 1903 the British Standard Mark, now the Kitemark®, was created, to show that products met a standard. After the Second World War the International Organisation for Standardisation, known as ISO, was formed, comprising the BSI and many other National Standards Bodies, with a remit to produce international standards. Finally the European Standards body, CEN, or Comité Européen de Normalisation, was formed in 1961.

Standards are written by committees and represent a consensus view of good practice in the manufacture of the product in question. The committees should reflect the views of all those with an interest in the standard – including manufacturers, designers, contractors and end users. Standards should be performance based and allow new products to develop, if they meet the performance requirements.

There are now many thousands of product standards. A more recent development is process standards such as BS EN ISO 9001, the quality standard; BS ISO 14000, the environmental standard; and BS EN ISO 17024:2003 Conformity Assessment – general requirements, which is for bodies operating certification of persons. This is the personnel certification standard against which CIBSE

Certification is accredited by UKAS for energy assessor accreditation, the only energy assessor body to achieve this. These standards represent what is considered good practice in the operation of the process in question. Many standards are now used as the basis for product third party or process certification.

What do all the numbers and letters mean? It seems a trivial question, but these can get very confusing. A BS is a British Standard, produced by BSI alone. A BS EN is a European Standard, developed by a European standards committee. BSI and all CEN members are obliged to adopt any standard approved by CEN. Since this uses qualified majority voting, even if a member state votes against a standard, unless several others also vote against, the standard will be adopted by CEN and must be adopted by every member. Sometimes ISO adopts a European Standard, as for example with ISO 9001, and it becomes a BS EN ISO standard.

But there is a catch. BSI can also adopt an International Standard, and it becomes a BS ISO. At this point, beware: a BS EN is not the same as a BS ISO. Confusing maybe, but in the arcane system of numbering standards, ISO and CEN can give totally different documents the same number.

In another area of potential confusion, CEN creates ENs, known within CEN as EN1234. But they are only available from CEN members, not direct from CEN. This means that you cannot obtain a copy of plain EN 62305, for example, but you have to buy BS EN 62305 or DIN EN 62305. These must be identical to the EN. Again, this may seem obvious – but confusion about this has led to serious misunderstanding and allegations of anti-competitive behaviour for specifying BS EN 62305 instead of EN62305, the lightning protection standard. ●

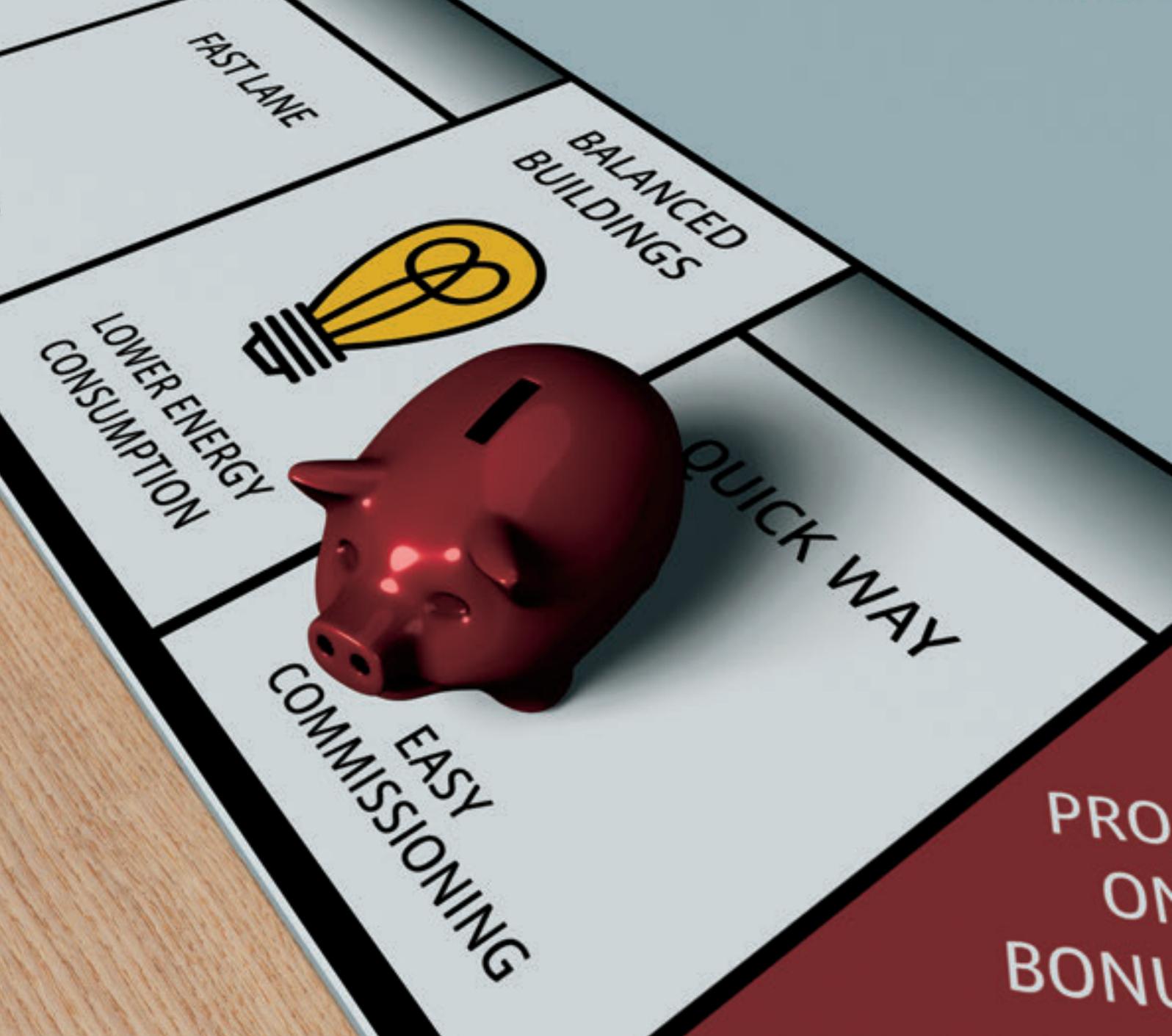
Hywel Davies is technical director of CIBSE.

The motive is simple – the proliferation of shapes and sizes costs money and doesn't add value. Standardisation saves money and adds value

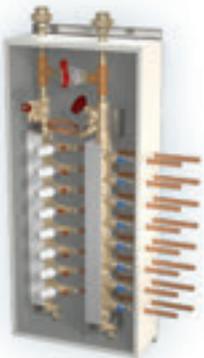


LEGAL NOTE:

Standards are not legally binding, but they are often cited as a means of meeting Building Regulations. Not following a standard will require more of a defence if the work gives rise to a claim.



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Sustainable pain?

Forget economic green shoots – the sector has more pain in store, says Mark Andrews of NG Bailey. But, he tells **Carina Bailey**, not all hope is lost for the sustainability agenda



Mark Andrews is the first to admit he's no ardent greenie. Privately he does many of the small things that he knows will make a difference to saving the planet, such as running a greener car and switching off lights (which, he says, drives his wife and teenage son Tom mad). He is even planning to install a micro-hydroelectric power unit in the stream that runs through his garden at his home in Ilkley, on the edge of the Yorkshire Dales.

But Andrews fears the current recession will have serious implications for the sustainability agenda in the UK, with the prospect of yet more damage inflicted on the construction industry.

'The most challenging issue in the current term is

the whole economic situation, particularly the impact on our industry, which is going to be fairly severe. It's already fairly severe,' he insists. 'The more worrying part is, I don't think we're going to get out of it particularly quickly.'

And Andrews knows a thing or two about financial success. After being headhunted to become chief executive at family-owned and run building services group NG Bailey five years ago, he has just helped steer it to a record £600m turnover.

And, says Andrews, the economists' views that we are currently at the bottom of a U or V shaped recession simply aren't true for the construction industry. Indeed, Andrews believes that it could take years to pull out of it, >

“ It's not a pretty picture, but I don't think we should be throwing ourselves off a cliff ”

Simon Weir www.simonweir.com





Mark Andrews believes the recession will impinge on the sustainability agenda.

“ There’s a complete lack of solid [post-occupancy] data [for buildings]. I don’t think those models are robust enough yet for people to be able to rely on them ”

> and when the sector finally does, it will be on a far less lucrative plane.

‘Anybody expecting to see a rapid bounceback or recovery is unlikely to see that in buildings because the fundamentals aren’t there – overcapacity or supply of commercial offices, oversupply of apartments, and rising unemployment look set to continue into next year.’

Food retailers, Andrews admits, are still building, but commercial office development has all but ceased and he has no reason to believe it’s going to come back any time soon. He adds: ‘And what does that mean? Everybody becomes more dependent on the public sector, and the state of public sector finances is such that I think the government, whichever party is in power, is going to struggle to sustain the level of capital investment seen in the past two years. If you put those two together, where’s the money going to come from? It’s not a pretty picture, but I don’t think we should be throwing ourselves off a cliff.’

New markets

Opportunities do still lie in the rail sector, but the more exciting openings, according to Andrews, are in the utilities and industrial markets – particularly in building new power stations in the UK. He estimates that, in four years’ time, the nuclear programme will potentially be massive, with six to eight power stations needing to be built in parallel.

He is also convinced the future of the UK’s energy generation lies in nuclear and carbon capture, not renewables like wind farms. The investment needed to make these changes happen, though, is so huge that it has to be instigated by government, and not individual businesses.

But Andrews believes the biggest opportunity for the building services engineering industry in particular lies in the retrofitting of existing buildings. About 60 per cent of the buildings in use now were constructed long before Part L was ever even thought about, he says. ‘If we want to make all the building stock in this country energy efficient, there’s a lot of work that’s got to be done and a lot of investment that’s got to be made. It ought to be a real opportunity for the building services industry.’

These economic challenges will continue to have serious consequences for the industry generally, with more redundancies certainly on the cards as firms work to ‘size’ their businesses appropriately. For NG, the magnitude of these cuts is as yet unknown. Andrews can’t say how bad it will be because of the unpredictable nature of the market. The company has already been forced to cut its graduate intake by about a quarter and has scaled back its apprenticeship scheme, although investment in training and development is continuing.

Andrews also fears that the current economic challenge will impact on clients’ ability – and desire – to make any move towards greening their buildings.

'There were many signs that things were moving quite well in terms of end-users of buildings addressing the sustainability agenda and the energy performance issues within buildings. But there is an inevitable temptation when times are tight for people to be reluctant to spend their money on something that requires an upfront capital injection that's got a very long-term payback.'

'So I think that keeping the sustainability agenda alive in these circumstances is going to be a challenge.'

Sustainability

A further issue, which he worries will return to the construction industry because of the current economic climate, is the hostility and confrontation that was prevalent 10 to 15 years ago – as cost pressures force parties involved to focus only on the commercial merits of projects.

Andrews says: 'There is almost an inevitability that in certain parts of the industry there will be a reversion to type as margins get squeezed, everything gets squeezed, people start beating each other up and getting more confrontational rather than working together looking to really add value.'

So can this problem at least be minimised, if not avoided? Yes, he says, but it's going to take team work and understanding: 'It's about getting people to understand what can and what needs to be done, and then committing the resources to do it.'

'I do believe that, if you look at UK plc, a lot of people understand they need to make their businesses more energy efficient and to improve their carbon footprint. They know some of the things need to be done, but when it comes to writing the cheque, that's a little bit difficult in the current circumstances.'

Clients do appear to have a grasp of the 'whole life cost' concept too, but it is something the industry hasn't been very good at proving, admits Andrews.

NG is currently collating a range of post-occupancy data from its own purpose-built green building, Solais House in Scotland, so engineers can look at the real

performance of that building at an almost microscopic level.

'At present there's a complete lack of solid data to be able to actually run the calculations properly. That's what we've collectively got to build up now. There are various models you can use with data that exist at BSRIA, and I'm sure CIBSE have got some data, but I don't think those models are robust enough yet for people to be able to rely on them.'

'At a conceptual level most of the clients do get it, and I think conceptually, certainly some of the more enlightened end-user clients are quite prepared to commit to a higher capital cost if they can see reasonable evidence that they're going to have a lower whole-life cost. But it's about coming up with that evidence.'

So how can business be made to comply, even in a recession? The answer, says Andrews, lies in the legislation; it's about providing a little more carrot and a little more stick, and government not being afraid to enforce the rules.

Andrews concedes that government has reneged on some important regulation regarding the environmental performance of buildings – particularly the dropping of the 'consequential improvements' requirements from Part L 2010 of the Building Regulations, which would have forced homeowners to make energy efficiency improvements to their homes when undertaking major refurbishment works.

But he adds: 'I'm not a legislator, I'm not trying to tell the government what they should be doing, but if they do want to meet their stated agenda for a reduction in the UK's carbon footprint, it's not going to happen by good will alone. In this economic environment we're going to need sound legislation that's enforced.'

According to Andrews, the government has to act decisively in the next year, otherwise it will fail to meet its own carbon reduction targets. Of course, the other side of that coin is instigating behavioural change in society. But no one, he concedes, can predict how long that will take. ●

“ Keeping the sustainability agenda alive in these circumstances is going to be a challenge ”

Mark Andrews

CV

Career: CEO of NG Bailey since 2004. Joined from Pirelli Cables & Systems North America, where he was president and CEO and based in Columbia, South Carolina. Prior to that he ran the power construction subsidiary of Balfour Beatty and held senior positions at BOC Gases and Chicago Bridge & Iron Company.

Activities: He is a Chartered Engineer and a Fellow of the Institution of Engineering and Technology, the Chartered Management Institute and the Chartered Institute of Marketing. He is chairman of the Regional Work and Skills Partnership Board (Yorkshire and Humber) and of the Advisory Board of Bradford University School of Management. He is a member of the Apprenticeship Ambassadors Network, and the CBI Construction Council.

Education: The 49-year-old was born in London and educated at Imperial College, London, where he gained his degree in engineering, and he got an MBA at Cranfield University School of Management in Bedford.



Solais House, the purpose-built HQ of NG Bailey, is undergoing post-occupancy evaluation.



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Uncertain course

The introduction of vocational diplomas into British schools is meant to inspire young people to join the engineering and construction sectors. But, asks **Simon Ellery**, can they provide the skills and learning needed by the building services sector?

It has been described as the most radical reform of British education in decades. The idea behind the range of school diplomas available for 14- to 19 year-olds is to bridge the gap between academic study and vocational skills, with industry heavily involved.

On paper this sounds like a dream ticket that would suit the government's need to limit the numbers of young people not in education, employment or training, and help the construction industry's skills shortage. But the fly in the ointment has been the recession, which has seen the demand for new trainees plummet. The courses have also come in for some criticism.

Not only have the government's own educational inspectors attacked the diploma courses for failing to deliver basic skills in English and maths, but many schools have pulled out, saying they are too academic.

Industry estimates had forecast that construction in the UK needed an average of 37,000 recruits every year between this year and 2013. And it is this demand that partly led to the development of the Diploma in Construction and the Built Environment (CBE), which was introduced a year ago – alongside the Diploma in Engineering – and is now one of 10 vocational diplomas available in schools and colleges.

The diploma is divided into three parts – principal learning, in which students are taught about the

employment sector and work-related skills; additional and specialist learning, in which students can further their learning in a particular area; and generic skills to help them develop their English, maths and IT, as well as thinking and life skills.

But this summer Ofsted, the inspection body, criticised key areas of the diploma courses. It said: 'Work in functional skills lacked co-ordination in just under half the consortia visited and, as a result, the quality of teaching and learning varied considerably.'

Experts involved in the setting up of the courses say the criticism is misplaced, while others say the course needs time to develop.

ConstructionSkills, the sector's skills body, has a mandate to provide training to ensure the industry has the skills for the upturn when, it is hoped, a raft of housing, schools and office developments are expected to be given the green light. ConstructionSkills head of education Nick Gooderson says: 'For the first time in the history of the schools curriculum, construction and the built environment features as a qualification that has national entitlement.

'We believe that, once teachers, parents and learners become familiar with the qualification it will become a popular choice and promote the huge array of career opportunities that exist in the CBE industries.'

" The CBE diploma needs to be adapted to suit the capabilities of students because at the moment it is too academic "
– George Carr



“ We expect the diploma will provide us with a new pool of young people who have the skills to make it in the construction and the built environment sectors ”
 – Tim Forrest

Feedback

There are around 1,100 employers supporting the first 44 CBE delivery consortia – the local groups of companies, training providers and others that work together to offer the service. A key factor for diplomas was to improve retention and provide a new learning experience equivalent to GCSEs or A-levels. Students are also given the opportunity to choose a specialist learning qualification as part of their diploma, and this will allow them to gain more knowledge and skill in a particular vocation.

Gooderson argues that the CBE diploma’s strongest selling point is that it provides a hugely innovative and interesting vehicle for learning; and it prepares learners for either entering employment through mainstream apprenticeships or progressing into further or higher education.

Feedback from teachers and students has been hugely positive, according to Gooderson. ‘The recent Ofsted report on their introduction also reflects this

although, as is to be expected with any such initiatives, there are a few teething problems.’

But more worrying for both ministers and the industry is that student numbers in the CBE diploma have not been as high as expected. The Foundation Course – level 1 – has been criticised by some in the profession for being too academic, and significant numbers of students have quit the course, blaming a lack of practical training.

Stoke-on-Trent College’s programme manager for construction George Carr says two out of three schools have taken their students off the level 1 course.

Other concerns centre on the Foundation Course grading, which is rated as the equivalent of a D grade at GCSE. ‘The fact is that it is a big departure for teachers as well as students,’ Carr says. ‘There needs to be a shift from the old “chalk and talk” style of teaching to more hands-on lessons. The CBE diploma needs to be adapted to suit the capabilities of students because, at the moment, it is too academic.’

He adds that a planned multi-million pound construction centre being built jointly with the Building Research Establishment, featuring business incubator workshops, should inject fresh energy into the course. ‘This will be a major boost in delivering the CBE diploma,’ he says.

Some observers say the government should have been more prescriptive about the practical element of the level 1 diploma, as currently they vary greatly from area to area, while others point out that all vocational diplomas have seen a fall in take-up.

Diplomas: 3-year roll-out for vocational learning

- The CBE and Engineering diplomas were among the first batch of five to be introduced in September 2008. The other three were: creative and media; society and health; and IT.
- The CBE diploma is overseen by 44 delivery consortia and had 1,700 learners last academic year, with a further 3,000 that were expected to start this September.
- Five new diplomas became available this September, taking the total now available to 10: business and finance; environmental; hair and beauty; hospitality; and manufacturing.
- A further four diplomas will be introduced in September 2010 – public services; retail; sport and leisure; and travel and tourism – and another three a year later, in humanities; languages; and science. This will take the total to 17.

Source: Department for Children, Schools and Families

High stakes

But employers involved in the CBE diploma believe it is already making a difference. Tim Forrest, chief executive of construction firm HT Forrest, backs the qualification and urges others to follow suit to avoid a skills shortage when the country emerges from the recession in 2011. He says: ‘We expect the diploma will provide us with a new pool of young people who have the skills to make it in the construction and the built environment sectors.’

Bolton-based GJ Seddon is a leading contractor employing an in-house workforce of 550 people. GJ Seddon's lead for employer engagement for the CBE diploma nationally is Roy Cavanagh. He says: 'Nationally [the diploma] gets a bad press and here we are in the forefront of a major educational change.'

He argues that the CBE diploma is genuinely exciting because it offers interesting views of 'what is all around us every day such as what we live in, our school, where we work, where we watch sport and where we shop. All are involved in construction and the built environment'.

He adds: 'The problem is that those who don't look further just consider the trades. Important as they are, this diploma offers real openings into worthwhile careers [and positions], such as developers, architects, surveyors and building services engineers.'

He thinks that it creates better communicators, and importantly, better problem solvers. 'These are areas which employers are crying out for. We need to encourage more youngsters to realise the pluses of our industry and this also means career teachers being more supportive of the industry.'

Catherine Elliott, development manager for the SummitSkills, the skills body for the building services engineering sector, says: 'It is still very early days but our understanding is that the CBE diploma is being well received by learners. We expect participation to increase as more consortia begin to teach the qualification, and as awareness and understanding grows.'

There was extensive employer consultation over the course and companies have supported the CBE diploma, 'not just by work experience placements but through the design and delivery of learning activities', she adds. This has also meant that the course is informed of the latest developments.

Elliott says the diploma entices young people that would otherwise never have looked at construction. 'For the building services engineering sector this means that more young people might consider careers in the sector from a younger age.'

CIBSE helped plan the content of the principal learning for the level 3 diplomas, and represents the Construction Industry Council on the steering group for the Diploma in CBE. Angela Ringguth, professional development consultant to the institution,

Learning: new online CPD modules from CIBSE

CIBSE is helping support further learning, for both recent graduates and the more experienced engineers who wish to improve their knowledge in a particular area.

The recently launched online learning modules include seven hours of structured learning, along with a bank of material that helps to ensure people finish the module with an excellent grasp of the subject matter.

As part of the new online learning package, the online CPD modules are being launched this autumn. These new modules will help keep people up to date and also help meet CPD commitments. The first four modules are:

- Heating systems update;
- Cooling and ventilation systems update;
- Facilities management update; and
- Lighting update.

For further information, visit:

www.cibsetraining.co.uk

said: 'We have supported the diplomas from the outset and really hope they deliver what they promised.

'Learners will start to understand the multitude of career opportunities in our sector, and how professional bodies like CIBSE set standards and help individuals to progress.'

Both industry and the government have a lot riding on the CBE diploma. In 2010 there are expected to be more than 180 consortia. By the end of 2010, young people in almost 80 per cent of English local authority areas will be able to study the diploma.

There is no doubt that the stakes are high. But if the industry is to avoid a skills shortage like the one that followed the recession in the 1990s, the diploma has to be fine-tuned to be a success. Carr is optimistic: 'As long as the diploma evolves to suit the capabilities of pupils it is aimed at, I think it has a strong future.' ●

www.cbdiploma.co.uk

www.direct.gov.uk/diplomas

www.dcsf.gov.uk/14-19

“ For the building services engineering sector this means that more young people might consider careers in the sector from a younger age ”
– Catherine Elliott



Towering example

The Tower of London was prisoner to rising energy costs, so the head of facilities management called in a qualified HVAC assessor. There followed a series of quick wins that cut costs down to size. **David Arminas** reports



An assessor was brought in to review the HVAC system at the Tower and propose energy-saving measures.

Facilities management at the Tower of London has come a long way since William the Conqueror appointed the first constable there in the 11th century. The prisoners may be gone but Tony King, head of maintenance and facilities, does have the Crown Jewels under his care – not to mention the two million visitors who flood through the gates each year.

King knows the Tower intimately in its present configuration – but also how it has changed over the years. ‘The Duke of Wellington, who was also a constable, could be considered one of the first FM-minded managers of the Tower,’ he says. ‘The Tower’s moat has been dry since 1830 after he deemed it a health hazard and drained it.’

As late as 1960 the Tower still housed Wellington’s original barracks, Waterloo, with 1,500 residing or working within the Tower’s walls. Today, across its numerous buildings, there remain only around 150 residents and 200 staff – but in King’s care are also countless treasures and antiquities.

Priceless exhibits, including the Jewels and regal costumes, require a constant temperature. Ensuring that the plant keeps the building cool is of major importance, and efficiency has a huge impact on energy bills. But King, who arrived at the Tower 10 years ago, had a problem.

‘The plant was last refurbished just before I came here and it was probably installed 15 to 20 years before that. It would break down because there had been certain neglect on the M&E side. If a chunk of the building falls off, I can cordon off the area. But if I have a heating or electrical failure, I usually have to shut the building down.’

Attention to planned preventative maintenance led to an improvement but efficiency of plant was still an issue. As part of a package of initiatives to encourage

and help commercial buildings to increase their energy efficiency, King was determined to steal a march on incoming air conditioning legislation, bringing in an assessor earlier this year – well ahead of the deadline. This gave plenty of time to put efficiency measures in place, and even to reduce energy bills before a heavy tourist season.

‘As a self-funding charity, we are affected by the rise in energy costs and we were aware that inspections of the air conditioning plant could make significant cost savings,’ said King. ‘It’s often thought that there is little to be done in terms of energy savings with older buildings, but we found that basic conservation measures can have a significant impact.’

The building gets its main heating from a range of boilers in the old hospital block basement. An underground constant temperature circuit leads to a header in a roof void, where a constant temperature pump works for the air handling units (AHUs).

The roof void is a far cry from the darkened, respectful exhibit areas on the lower floors. Light filters in from several large windows to reveal AHU pipes and heating ducts – some only inches in diameter, others more than a foot across; all are now well lagged. King says that his M&E team had been operating what they thought was a well-proven preventative maintenance plan, so they would change the roof cavity air filters on a predetermined basis. ‘But we noticed that sometimes they were as black as they could get, and it was all because of recent building works nearby. So we should have changed the filters more frequently.’

This is where the real value of an air conditioning assessment comes in, he explains. Current assessment legislation is the minimum requirement. If you have a lot of plant under building management system control, then you would probably want equipment >

“It’s often thought that there is little to be done in terms of energy savings with older buildings, but we found that basic conservation measures can have a significant impact”
– Tony King

Savings

Big cuts in energy and CO₂ emissions

The Waterloo block’s total electricity consumption in 2007 was just over 1m kWh, costing £75,750 based on a tariff of 7.5p/kWh.

Gas consumed in 2007 was just under 950,000kWh, costing £23,711, based on 2.5p/kWh.

Of the total £99,000 electricity and gas expenditure, it took £60,000 to run the heating, ventilation and air conditioning system.

The HVAC survey from Efficient Air estimated that, by following report recommendations, there could be a 22 per cent saving on kWh to run the HVAC system. This equates to around 37 per cent cost savings and also an annual reduction of carbon dioxide emissions of 236 tonnes.



Shutterstock

The Waterloo Barracks holds priceless exhibits such as the Crown Jewels, and requires a constant temperature.

> performance reviews more frequently. Also, have the assessor put the equipment under a more powerful microscope than legislation requires.

Darren Jones, the assessor from Efficient Air, did just that: ‘There is a requirement to look inside some of the air-handling units. But we went further and did pressure tests. We found that some of the filter medium coils were blocked, making the motor work harder, consume more energy – and possibly, in the short term, burn the engine out.’

It used to be a commonly held view that you would rewind motors in air handling units if you had an engine failure. Some research has suggested that a re-wound motor is around six to eight per cent less efficient than when factory-new. The newer energy efficient motors, rated Effi, can typically save between six and 10 per cent energy over older types, says King.

In effect, a rewind motor means you have a unit of up to 16 per cent less efficient than its new replacement of similar specifications. Value for money for rewinding versus new has to be weighed up from this perspective, says King.

Waterloo’s chilled water system was switched off for the winter so it was not possible for Efficient Air to assess efficiency. But the efficiency of the compressors, refrigeration units and cooling towers, around 25 to 30 years old, is not too bad, says King. New refrigeration systems using the latest inverter technologies generally have up to 15 per cent greater cooling capability and use only half the energy. But replacement, rather than deep maintenance, is being driven more by legislation on HCFCs. The vast majority of quick wins in Efficient

“We found that some of the filter medium coils were blocked, making the motor work harder, consume more energy and possibly in the short-term burn the engine out”
– Darren Jones

Air’s report included cleaning or replacing filters and coils, mending broken door catches and the lagging of ductwork. One AHU needed a recalibration of a temperature sensor to stop the machine running at near full capacity. For the most part, payback is set between two and eight months, certainly well within a year.

But estimates of savings are only that, says King. To turn the estimates into real cash, he urges facilities managers to improve their follow-up procedures; also, they should check to make sure that staff complete their tasks, as his experience has told him that things can get left for another day. There is, however, not likely to be a pot of gold at the end of the assessment rainbow.

‘In a site like this there won’t likely be something that will save you [a large sum of money]. It will be the odd thing here and there that can save a couple of thousand pounds each. But it all adds up. You won’t become rich by changing only one item.’ ●

A version of this article first appeared in *FM World*, the magazine of the British Institute of Facilities Management. www.fm-world.co.uk

Key facts

Waterloo block

Total floor area of the three-storey Waterloo block, including the basement, is 60,300 sq ft, with a conditioned area of 32,300 sq ft.

Ground and first floors conditioned by 10 air handling units (AHUs).

Top floor offices radiator-heated only.

Basement archive storage is conditioned by another AHU.

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Measure for measure

Making lots of small, low-cost improvements across its huge property portfolio was a successful energy-saving strategy for low carbon award winner Leisure Connection. Now it has its eye on even bigger prizes. **Ewen Rose reports**

When Leisure Connection was nominated for the CIBSE Low Carbon Awards 2009, its strategy to deliver energy savings across its huge portfolio of managed sites was to roll out a series of relatively low-cost measures to show its clients that much could be achieved on a small budget.

This approach, which led to it being named Low Carbon Client of the Year in the awards, has borne fruit and the group is on track to reduce utility costs, including water consumption, by its target of 12 per cent. However, since the award, more improvement has been made and, in the second phase of these changes, the company wants to take more ambitious steps and make deeper cuts to its carbon footprint.

Leisure Connection is a building services client with clients of its own. It manages a portfolio of more than 60 properties, including four national sports centres, community and school leisure centres, and an impressive theatre in St Albans, mostly on behalf of local authorities.

Leisure centres are notorious energy consumers, with lots of floodlighting and high hot water demands during long periods of occupancy. Leisure Connection's head of property services Paul Bailey estimates that the sector is responsible for around £700m worth of energy use annually and that this figure is still rising. It is a big target, and even relatively modest improvements can deliver big savings.



> **Heat loss**

Leisure Connection has looked at the fabric of its buildings and several have undergone minor refurbishments in an attempt to improve heat loss and increase the amount of natural daylight. In the past two years, Bailey and his team have worked closely with the Carbon Trust to develop an energy and water conservation strategy. Increased use of automation to control heating and cooling, plus installation of technologies such as water-saving shower heads, led to some impressive results – one site cut its utility costs by 16 per cent, which translated into an annual saving of £32,000.

As a property manager the group bears the energy costs, so the individual clients need to be persuaded that it is also in their interests to make the changes.

‘Some were keener than others, but most of them now recognise that we all have responsibilities,’ says Bailey. ‘We started with the things that didn’t cost anything and were easy to do. Then we built up to the low-impact stuff, like changing pumps and motors.’

‘We try and make a change when the opportunity arises. For example, we will put in energy-saving lamps

Paul Bailey... making changes as opportunities arise.

“ We are setting each of our energy champions some key performance indicators so we can measure progress ”

and movement sensors when a scheduled relamping is taking place.’

Local authorities are also ‘having their collars felt’ by the government, according to Bailey, who says they need help to achieve their compulsory carbon targets. The start of the Carbon Reduction Commitment next year is also ‘concentrating minds’.

‘Because we have been doing this for a while and have experience of most of the available technologies we are well placed to advise them,’ he says.

In its nomination for the award it was praised for taking ‘small steps to make big gains’. Across the country it replicated the use of swimming pool covers to cut down overnight heat losses (which has had a big impact, as 70 per cent of Leisure Connection sites have pools). It also recommissioned the building management system (BMS) and rolled out a programme of sub-metering – with many meters having automatic reading facilities so that data could be gathered and analysed remotely.

Now Bailey is looking to put energy conservation higher up the corporate agenda by putting the spotlight on the group’s 12 largest energy users – the so-called ‘Dirty Dozen’ that are responsible for over 50 per cent of Leisure Connection’s entire energy consumption. This is where the next concentration of effort will be, he says.

Champions

Energy champions have been appointed for each site, and they are responsible for gathering data from the energy meters on a daily basis. Regional champions oversee the process, and the league table approach is seen as an important tool for keeping the different sites on their toes.

‘Measuring and monitoring is absolutely critical,’ says Bailey. ‘And we are setting each of the champions some key performance indicators so we can measure progress.’ He is also applying degree days’ information to the data to produce a robust analysis of how the systems are performing.

Getting this kind of commitment and changing

Deadline looms for CIBSE Low Carbon Performance Awards 2010

There is still time to get your entries in for the 2010 Low Carbon Performance Awards. All entries need to be received by 30 October 2009 – so there’s no time to delay.

The CIBSE Low Carbon Performance Awards recognise and reward proven achievements in delivering carbon saving in buildings. These high-profile awards showcase innovative and inspirational low-carbon solutions and highlight carbon reduction in both the design and management of buildings.

The awards categories are:

- New build of the year;

- Refurbishment of the year;
- Product innovation of the year;
- Low Carbon Consultant of the year (only open to CIBSE LCCs);
- Low Carbon Energy Assessor of the year – EPC (only open to CIBSE LCEAs);
- Low Carbon Energy Assessor of the year – DEC (only open to CIBSE LCEAs);
- Client of the year – energy performance;
- Client of the year – low carbon operation;
- Low Carbon Manager of the year; and
- Training Initiative of the year.

Entry forms and all criteria can be found at: www.cibse.org/awards2010 – so give

your projects the attention they deserve and get your entries in today.

CIBSE Members awards

CIBSE has also just announced two new awards, which will be presented as part of the awards night on 3 February at London’s Grosvenor House Hotel.

The two new awards are:

- Consultant of the year; and
- Contractor of the year

Entries are now invited for these two separate awards – criteria and entry forms are also available at: www.cibse.org/awards2010



Bisham Abbey... one of four national sports centres managed by Leisure Connection.

hearts and minds is the key component of the strategy. Bailey estimates that changing behaviour alone was responsible for a seven per cent drop in energy use.

‘We call it the digital approach; that is, use your finger and turn things off,’ he says. ‘Although the ideal is for people not to turn things on in the first place.’

However, it can be a struggle sometimes to make sure money is spent in the right areas and not on ‘statement’ technologies. ‘Most of them prefer the visible stuff – they want a bit of green bling, but we know that it is often the measures you take behind the scenes that make the big difference and deliver the lorry loads of carbon saving.

‘They don’t know about optimisers and better boilers, but we do, and they need our advice.’

That does not mean that the group is ignoring the bigger investments. In fact, Bailey has already told his clients that if they want to step up their game they will have to invest. But with the credit crunch biting, it has been harder to get investment, especially for technologies with long payback periods.

‘There is funding out there, but we miss out on a lot of it,’ says Bailey. ‘We are bigger than a small or medium company, so don’t qualify for the support they get, and we are not a local authority – we are stuck in the middle, but we still have to pay the energy bills. So we are looking at leasing deals and investments where it might be possible to pay the loans back from energy savings.’

He does feel there should be more coming from the government. Reduced or zero-rate of VAT on energy efficient investments would be a welcome first step, and the Enhanced Capital Allowance system needs improving.

And investment in technologies will play a bigger part in the future. Combined heat and power (CHP) is one area that Bailey and his team are looking at, because they feel the modern systems are better suited to today’s projects. ‘Some of the older systems were too big and the contracts too long. There was also a problem with high servicing costs, but we are actively looking at CHP again. There are also some exciting opportunities for powering CHP with straw or methane gas in rural areas.’

Returns

Reporting is a major concern for most organisations, and several of Leisure Connection’s clients now ask for quarterly energy reports and want to see improvements every period. Bailey explains that it is the law of diminishing returns, and extra investment will be needed if they want to continue to see progress.

Green measures can also lead to other benefits, as the theatre Leisure Connection manages in St Albans discovered. Its underground bar had to be continually illuminated using highly inefficient fluorescent lighting, which was ‘pretty unpleasant’ and generated more heat than light.

‘We switched the whole lot over to LEDs, improved the lighting levels, and the running cost is one hundredth of what it was. This is the sort of result we

“We are hostage to costs like many other organisations, so these improvements are made for the soundest of business reasons as well as to meet our corporate responsibilities”

are keen to share with all our clients,’ says Bailey.

Energy roadshows help spread the lessons learned throughout the group, and these have taken on a greater urgency with the approach of winter. Bailey recalls the particularly harsh winter of two years ago when the group took a huge hit on running costs, which made a major dent in the group’s profits.

‘We are hostage to costs like many other organisations, so these improvements are made for the soundest of business reasons as well as to meet our corporate responsibilities.’

The group also believes that Display Energy Certificates are a useful tool for gauging consumption and progress against their own targets. This was a key aspect of the company’s CIBSE award entry submitted by Richard Hipkiss of i-prophets, who carried out a range of energy assessments for the group.

Bailey believes the award has been a big help in giving their carbon reduction efforts ‘credibility’ with clients. Leisure Connection has also used the CIBSE 100 Hours of Carbon Clean-up initiative to help engage and empower site employees. ●

Leisure Connection

Simple steps to cutting energy

Appointment of site and regional energy ‘champions’

League tables – capture hearts and minds

Energy sub-meters: big sites take daily meter readings

Swimming pool covers: reduce overnight heat loss (70 per cent of sites have pools)

Variable speed drives for air-handling units

Variable speed motors

Relamping with low energy lamps

Changing pumps

Variable speed motors

Recommissioning of building management systems

Roadshows to share experiences



Another LC project... Blackwater Leisure Centre, Maldon, Essex.



A range of heating technology is now available (above and opposite).

Heat is on for raising system efficiency

Excellent energy efficiency lies at the heart of the best industrial and commercial heating design, and how this is achieved poses a big challenge to the building services industry, writes **Ian Vallely**

Energy efficiency has become a major driver in the commercial and industrial heating sector, and is pushing the boundaries of boiler technology. Important technological advances have increased the energy efficiency of commercial boilers over the past decade, to the extent that it is now a given that this established and well-proven technology offers high efficiency and reliable performance.

Recent programmes to improve the quality and energy performance of educational buildings have brought significant – and beneficial – changes to the



built environment. However, some believe the approach to selecting heat emitters hasn't always kept pace.

Says David Shuttleworth, technical director of Dunham-Bush, a supplier of fan convectors and perimeter and radiant heating: 'This is an area that needs to be addressed, both by the manufacturer ensuring that suitable heat emitters are available, and by the specifier recognising the need to address this issue.'

'For example, the move to condensing boilers favours lower water temperatures than traditional boilers if maximum condensing is to be achieved. Similarly, many more projects are now using heat pumps, again with lower flow and return temperatures, to improve their efficiency in cold weather.'

'In parallel, better insulated buildings reduce heat losses, while the thermal mass of the building fabric has remained almost constant, leading to protracted warm-up periods at full load. Once the spaces have reached the design temperature, it's important that the heating system is sufficiently responsive to match the heat loss and accommodate any internal heat gains, with as little overshoot or undershoot as possible, thus conserving energy.'

This implies the need for tight control of the heating system, an area that also concerns Mark Northcott, commercial sales director at Remeha: 'The better the control, the greater the energy efficiency, the higher the fuel savings, and the lower the environmental and

It's important that the heating system is sufficiently responsive to match the heat loss and accommodate any internal heat gains, with as little overshoot or undershoot as possible
 – David Shuttleworth

financial costs of consumption,' he says.

James Parkinson, brand marketing manager at boiler maker Vaillant, agrees that customers are benefitting from huge energy efficiency improvements to heating technology – but not as much as they should be.

For Parkinson, many of the benefits from using improved technologies are lost through poor control strategies, and a failure to understand how the whole heating system works in relation to the building fabric and other services.

He adds: 'The industry now has access to highly sophisticated controls, such as weather compensation, that can keep condensing boilers in condensing mode for most of their operating life. Hopefully, the requirement in the new Part L of the Building Regulations for commissioning strategies to be submitted as part of the initial design will begin to see such solutions specified as a matter of course.'

Yan Evans, technical director of Andrews Water Heaters and Potterton Commercial Boilers, part of Baxi Commercial Division, believes that the single biggest challenge facing the industrial/commercial heating sector in the coming five years is the introduction of the Eco-Design of Energy Using Products (EuP) Directive.

This legislation, which is likely to be introduced in 2010, will impose stringent energy efficiency levels for space heating and hot water generation systems, >



Controls can be crucial to running a system.

> and Evans sees it having a profound impact on the way the industry operates: 'The commercial heating industry can only meet [the minimum performance requirements set by the EuP Directive] if the market players move away from being equipment suppliers to being solution providers, and taking ownership of a broader scope of supply on projects.'

He thinks the minimum system efficiency target of the EuP Directive of 96 per cent in 2013 can only be achieved through the use of a combination of technologies in commercial plant rooms, i.e. conventional commercial boilers and water heaters operating alongside, and in conjunction with, low- and

■ The industry now has access to highly sophisticated controls that can keep condensing boilers in condensing mode for most of their operating life ■ – James Parkinson

zero-carbon technologies, such as solar thermal, heat pumps and combined heat and power (CHP) products, to reduce fuel consumption and carbon footprint.

Peter McCree, director and chief executive of ICOM Energy Association, agrees that the EuP Directive will challenge the industrial and commercial heating sector: 'It has still not been made clear how the EU intends to move forward. It will affect both heating and hot water, and it has taken a mammoth struggle to make the consultants understand that, at the lower end of the UK commercial market, the majority of heating products are sold through merchants as individual items and not as packages,' he says.

He adds: 'At the larger end, it becomes a bespoke package and there are many people involved in the installation. However, this means that legal compliance should be easier. The proposed system approach to ensure that whole system efficiency is raised and meets the required standards cannot be dealt with by the merchant supplying a package.'

Evans says there still appears to be a huge gap in the marketplace when it comes to the detailed knowledge of the application of low- and zero-carbon technologies, and their integration and operation with commercial boilers and water heaters.

Trends The next big thing in industrial and commercial heating is ...

We asked a number of industry figures: 'What will be the "next big thing" in industrial/commercial heating in terms of technology and or "trends"?' Here are some responses:

Yan Evans, Baxi Commercial:

■ Heat pumps appear to be favoured by legislative measures such as the EuP Directive. These could be ground source, air source or gas absorption heat pumps. This is as a result of the potentially high Coefficient of Performance that can be achieved if heat pumps are used in the appropriate applications with suitable load temperatures.

We believe that micro- and mini-CHP products will feature more in domestic dwellings and commercial applications, due to carbon dioxide reduction potential offered by displacing grid supplied electricity. There may also be a trend

towards the use of heat pumps and CHP products working in harmony to deliver ultra-low carbon solutions. ■

Richard Evans, Buderus:

■ There are already two dominant trends – one is for increased energy efficiency of buildings, and the other is the use of greener energy sources. The difficulty comes in predicting, in the long term, which of the many available technologies best fits at the point where these two trends meet.

As no one technology yet offers a single solution, the answer is the next big thing will be hybrid heating systems, with combinations of multiple technologies. The key to the successful integration of these technologies will be the controls, and it is probable that flexible, energy optimising controls will be the most important element until a single technology emerges. ■

Peter McCree, ICOM Energy Association:

■ The next big thing will be the adoption of 'blue flame' burner technology as standard. The incorporation of liquid biofuels may become the norm, providing the government does not overtax the product and allows it to be competitive with fossil fuels, or even advantageous to switch. ■

Mark Northcott, Remeha:

■ The onset of renewable technologies such as solar energy, biodiesel, biomass boilers, heat pumps, etc, has meant that more conventional high-efficiency condensing boilers have been used more for 'top-up energy'.

If renewable sources are starting to act, in effect, as the 'lead boilers', it follows that the boilers supporting them will get smaller. Indeed, I believe that as more commercial projects become renewable-based, the trend towards smaller boiler plant will accelerate. ■

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■ The EuP Directive will affect both heating and hot water, and it has taken a mammoth struggle to make the consultants understand that ■ – Peter McCree

This, he warns, is spread throughout the supply chain, from architect, consultant, and design engineer, to contractor, installer and equipment supplier.

‘The implication is – and this applies to all the technologies – if the solutions are not applied, integrated and controlled appropriately, then the overall solution will not deliver predicted carbon savings. This may lead to disappointed end users and the market losing faith in the technology and those involved in the project.’

Evans predicts radical changes in the way the industry is structured in the next five years: ‘The drive for higher system efficiencies, and the mixture of heat sources being present in the commercial plant room, leads to more complex hydraulic systems and installations, and may result in partnerships forming between key market stakeholders, i.e. design engineers, installers and equipment suppliers, forming some form of alliance to deliver the appropriate systems and required performance.’ ●

Energy New tariff system could revolutionise CHP

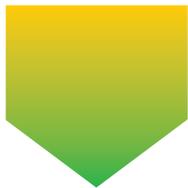
The introduction of feed-in tariffs (FiTs) next April could lead to a significant surge in demand for microgeneration technologies in general and combined heat and power (CHP) in particular, according to David Shaw, business manager for Baxi-SenerTec UK.

Under a FiTs system, electricity companies are obliged to buy renewable electricity at above market rates.

‘While there is still some confusion about the detail, we are working on the assumption that the FIT will consist of two elements: an amount users will receive for the electricity they generate and use on site, and an export tariff for any surplus that they sell back to the grid. The export tariff is likely to be set at 5p/kWh; the generation tariff will depend on the technology used,’ he says.

Shaw says this will make the financial argument for CHP more attractive. ‘It is clearly bonkers to generate all your electricity centrally. Power stations waste huge amounts by throwing all the heat generated by the process away, and then make it even worse by adding transmission losses on top.

‘The grid is in deep trouble, and we face major blackouts in the near future. We must quickly find alternative sources of electricity that offer security of supply using tried and tested technology. The fact that CHP also provides heating puts it in a very strong position, and we expect to see a lot of market activity in the coming year.’



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ELESTA BACnet building management system for Dudley College

An Elesta BACnet building management system has been installed at Dudley College in the West Midlands, where a mixture of JEL and Satchwell controls on four boiler houses around two campuses had largely failed over time, and a control system update was needed.

The 'mother board' controllers were replaced with compact Elesta control modules on purpose-built back plates – utilising the existing controller housings and wiring. Retaining the existing sensors helped a quick changeover, as Elesta modules can accept the vast majority of sensors. The four motor control panels, which by now contained the Elesta RCO-D BACnet controllers, were then connected via site-wide IP addressable communications back to the BMS computer.

● For further information visit: www.elesta.co.uk or call: +44 (0)1628 664 441.



Andromeda at The O2, Dublin

Andromeda's integrated control solution for the renovation of The O2, Dublin, has delivered innovative KNX/DALI colour change functionality and an emergency lighting test system. It includes building-wide lighting scene control for public areas, controllable via local touch screens and a central headend, plus local scene set control and dimming in private bar areas, and local control in all back-of-house areas for override of lighting conditions.

● For more information visit: www.andromeda.uk.com

Keraflo at M&E Exhibition Olympia 7-8 October 2009

Designed to provide an accurate and efficient method of controlling the level of stored coldwater in tanks, Keraflo's top-quality, delayed-action, WRAS-approved float valves, on Stand B132 at the M&E Exhibition: the maintenance-free K Type, for tanks without raised valve chambers, and the KB Type, for tanks with or without raised valve chambers, especially where water demand fluctuates seasonally or where building occupancy varies.

● For further information, please visit: www.keraflo.co.uk or call: 0118 921 9920.



Adelie has landed

Adelie, new from Thorn, is a highly distinctive post-top mounted luminaire, combining a ring of 32 x 1.1W LEDs with a funnel shaped canopy to create soft indirect light in parks and building surrounds. From a distance its lit shape is similar to a classic flying saucer.

Crafted from grey aluminium with a white reflector to direct the cool light (5300K) down without glare, Adelie's Teflon-coated surface is water (IP65) and stain-repellent.

● For further information visit: www.thornlighting.co.uk



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Aircraft Air Handling's 260mm-high classroom ventilation units – silenced to nr25; pate recuperator: 60 per cent efficient; air volume: 0-500 litre/s. Heating: LPHW/ELECTRIC. Cooling: CW/DX. Larger air volumes and bespoke units are available.

● Visit: www.aircraftairhandling.com

Cistermiser at the M&E Exhibition 2009

Cistermiser high quality products and solutions for treatment and cost effective management of water, on Stand B131 at the M&E Exhibition, Olympia, on 7-8 October will include: hydraulic urinal flush control valves, infrared urinal flush control valves, direct flush, infrared sensor controlled urinal valves, Easyflush Wave and Walkaway, no-touch dual-flush WC cistern valves, and hands-free infrared, sensor-activated Novatap and Novaspout taps.

● For more information visit: www.cistermiser.co.uk or call: 0118 9691611.



Schneider electric keeps sellafield ponds chilled and clean

Schneider Electric has bolstered the reliability of Sellafield with the upgrade of the programmable logic controllers and software that control the ion exchange effluent plant. The upgrade enables any future spare or replacement components to be easily sourced and installed. The facility is responsible for safely

carrying out the decommissioning of the UK's nuclear legacy, as well as reprocessing and nuclear waste management.

● For further information visit www.schneider-electric.co.uk or call 0870 608 8608.



Elesta safeguards irreplaceable documents at Huntingdon

Elesta's Worcestershire-based system partners, Clarkson Controls, has recently completed the installation of an Elesta composite BMS control system for the new Huntingdon Library and Archives.

Irreplaceable ancient and original documents are stored in a purpose-built secure strong room, where the temperature and humidity levels are constantly monitored and controlled by the BMS.

Two motor control centres provide control for the main boiler and domestic hot



water services plant, and the archive/office area air handling unit. The boiler plant is demand-based, and low pressure hot water is circulated around the building to provide heat to the underfloor heating manifolds and to the heating coils for the archive area air handling units.

● For further information visit: www.elesta.co.uk or call: 44 (0)1628 664 441.

Thinking Buildings Universe – your information centre

Knowing where to go to access specific information quickly and easily can save incalculable amounts of valuable time. The new Thinking Buildings Universe from Grundfos now offers building services professionals a centralised information point for commercial buildings services pump applications.



Potential users from around Europe gave input on what they expected, needed and wanted to see on the site, which was specifically designed to work as an aide during planning and specification phases, as well as when the selections have been made and the systems are operational.

The Lexicon function on the top bar of the website, offering a key word search to a glossary of pump industry terms, is particularly useful.

● For more information visit: www.grundfos.com/commercialbuilding or call: 01525 850000.

HCP anti ligature radiant heating panels for two Peterborough Hospital PFI projects

HCP, a division of SAS International, recently supplied 1,800 linear metres of radiant heating panels to the City Care community health centre run by NHS Peterborough, and the Cavell Centre Mental Health Unit run by Cambridgeshire and Peterborough NHS Foundation Trust (CPFT).

HCP developed a specially designed panel for the projects, and a mix of 575 standard and anti-ligature panels were used. The design allowed for integration within a Tee grid ceiling and independent suspension as an anti-ligature panel.

As well as reducing patients' opportunities for self-harm, the use of flat ceiling-mounted radiant



heating helps to make wards easier to clean and to reduce cross-infection risks associated with traditional wall mounted units.

● For further information visit: www.hcp-sasint.co.uk or call: 01424 712195.

Fläkt Woods says: use our express way, for delivery next day

Fläkt Woods' new Express Range includes a leading JM High Temperature for life safety system, plus its exciting new products Greasefighter and e-line.

Meanwhile the Express Range catalogue, developed to include all the essential and key technical information required by H&V professionals, is designed to be concise, easy



to use and offer power to make a precise selection at your fingertips.

● For more information visit: www.flaktwoods.com or call: 01206 222 549.

MHIE split systems ideal for no-fuss R22 replacements

With the imminent ban on virgin R22 refrigerant, air conditioning supplier Mitsubishi Heavy Industries Europe (MHIE) confirms that its high-efficiency R410a split systems can be installed in place of most makes of old R22 indoor and outdoor units – without the need for new pipework or wiring.

Conversion sooner rather than later is advised, to avoid the risk of problems during periods of peak demand for heating and cooling.

● For more information visit: www.mitsubishiaircon.co.uk or call: 020 7842 8100.



New renewable energy finance scheme from Dimplex

Dimplex has launched Renewable Energy Finance, a scheme designed to overcome budget restrictions and spread the costs of the full installation of renewable energy systems, covering ground and air source heat pumps and solar thermal systems.

The scheme allows the investment costs of renewable energy technologies to be re-paid over a period of years, and the savings in energy costs used to part fund the scheme.

● For further information visit: www.dimplex.co.uk or call: 01489 773336.

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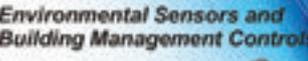
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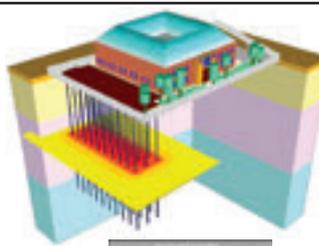
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The Basic Psychrometric Processes

The CPD articles in the April and August editions of the *CIBSE Journal* have considered the main properties of moist air that may be determined from a pair of coincident properties using the Psychrometric Chart and how values may be calculated in the absence of a chart.

This article moves on to develop the core processes that are plotted on the chart as means of illustrating and investigating the changes that take place to the properties of humid air as it is 'conditioned'. Symbols are defined in the box at the end of the article – you may also find it useful to be able to refer to those earlier articles (both are available online at www.cibsejournal.com)

The start of the process

The outline of the chart is as shown in Figure 1 and it may be used for individual rooms or processes as well as describing the changes to properties that take place in a complete air handling system. When illustrating the air condition in a project or job notes it might be clearer to refer to a printed chart (possibly conveniently plastic coated and reusable) to read off the data and then convert that into a sketch similar to that shown in the figure where the data and processes are not lost in the plethora of printed lines. When considering whole processes on a standard CIBSE Psychrometric chart (particularly when considering 'summer' cycles) the individual process lines can be quite tightly bunched and difficult to discriminate. A

photo-enlarged chart (or a specific area from the chart produced by computer software) will improve the resolution.

Plotting the air point

When lines are drawn on the chart they reflect changes in sensible heat or latent heat or a combination of the two. Sensible heat is that added to, (or taken from), moist air without a change in moisture content and latent heat is that added to, (or taken from), moist air without a change of dry bulb temperature. The energy contained in the air (as indicated by Enthalpy, h) relating to both the sensible and latent energy increases towards the right and the top of the chart as each of dry-bulb temperature and moisture content increase. When using the Psychrometric Chart for plotting cycles that

include both latent and sensible change the individual processes are simplified to straight lines. The lines that join the start and end points on 'real world' processes that include latent heat transfer may curve; however, for HVAC analysis it is normally just the start and end points that are important.

Sensible heating is shown in Figure 2. This may be achieved, for example, with a heater battery made up from rows of hot water or steam coils, or electric resistance heaters or as the result of some heat recovery mechanism (such as a flat plate heat recovery device). The opposite process, sensible cooling, is shown in Figure 3. For a cooling coil to provide sensible cooling only (and no latent cooling) the coil surface temperature must be greater than the dew-point temperature of the air. >

> In HVAC it is unlikely that a simple 'latent' only cooling process will be present. However 'combined' latent and sensible cooling will regularly take place in the same piece of equipment - for example in a cooling coil that has a surface temperature below the dew-point temperature of the incoming air. This combined process will produce an off coil temperature somewhat higher than that of the actual temperature of the coil (known as the Apparatus Dew Point, ADP and shown as point X on Figure 5).

How close the dry-bulb temperature of point B approaches the ADP will depend on the effectiveness of the cooling coil. This will relate such parameters as the number and shape of coil rows, the spacing and type of fins on the coil, and the air velocity.

This is commonly combined in the term known as 'contact factor', β - where the contact factor is a measure of how close the air will get to the coil ADP and can be seen as the fraction of the distance between points A and X of the distance A to B ie: contact factor = AB/AX.

By virtue of the way that 'similar triangles' work $AB/AX = (g_A - g_B) / (g_A - g_X) = (\theta_A - \theta_B) / (\theta_A - \theta_X)$.

The term 'bypass factor' is sometimes used and is simply $(1 - \text{contact factor})$.

The process that would typically result from a steam humidifier (almost pure latent heating) is indicated in Figure 4 - it can reasonably be considered as a vertical line following a constant dry-bulb temperature. A steam humidifier will produce a small amount of sensible heating since the higher temperature of the device (the tube) carrying the steam into the air will increase the temperature of the air and there will be a very slight sensible heating effect from the steam itself.

So-called Adiabatic (constant energy) Humidification as shown in Figure 6 practically characterises the processes of atomising spray and ultrasonic humidifiers (as well as the rarely used recirculating spray and wetted pad humidifiers). By convention the process is shown as being along the wet bulb temperature line (for discussions on the validity of this see Chapter 3 of Jones'

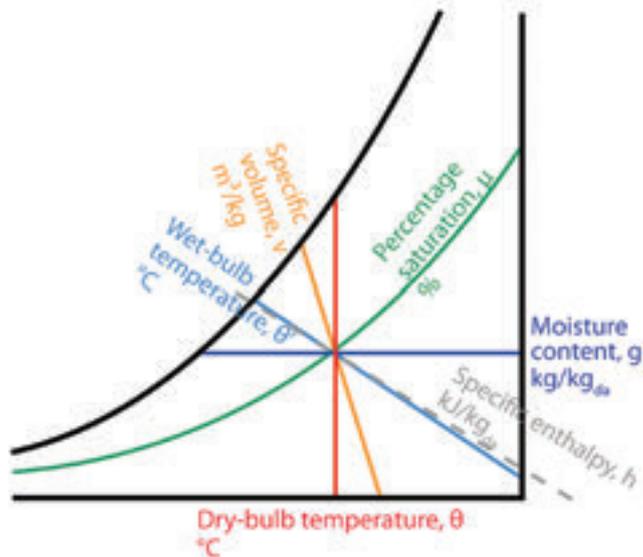


Figure 1 - Outline Psychrometric Chart

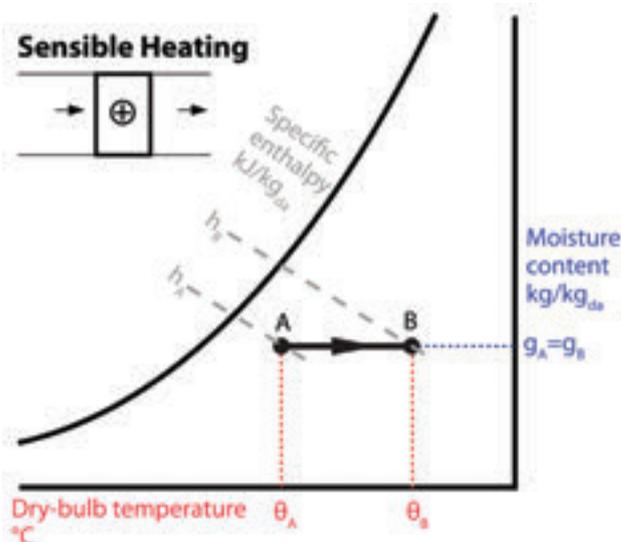


Figure 2 - Psychrometry of Sensible Heating

Air Conditioning Engineering book). The concept of a 'contact factor', in this case known as *saturation efficiency* is still apparent as being the fraction of the approach to the saturation curve.

Where two air streams combine adiabatically (as they normally would) the resulting air will have a psychrometric state that is related to the proportions of each of the combining air mass flowrates. This is indicated in Figure 7 as air stream A mixing with air stream B to produce mixed air at condition M. The ratio of the lengths AM to BM is simply the same ratio as the quantities of air mass flowrates (and in this particular case would indicate that the greater mass flowrate is from branch B, \dot{m}_B).

The resulting psychrometric states may therefore be determined as, for example, $\dot{m}_M \theta_M = \dot{m}_A \theta_A + \dot{m}_B \theta_B$ and $\dot{m}_M g_M = \dot{m}_A g_A + \dot{m}_B g_B$

Process Calculations

To explore the calculations associated with the processes discussed so far consider the cooling coil shown in Figure 8, where all the data has been read off a CIBSE Psychrometric chart. The psychrometric values were based on the on-coil and off-coil dry-bulb and wet-bulb temperatures as indicated in the diagram. For any type of psychrometric process the rate of energy transfer to or from the air may be simply determined from the chart using the relationship

$$\text{Power (kW)} = \text{mass flow rate (kg/s)} \times \text{enthalpy change (kJ/kg)} = \dot{m} \Delta h$$

$$\text{So } P = 0.75 \times (66.0 - 40.5) = 19.1 \text{ kW}$$

This may be split into the power used to provide the sensible and latent cooling and this is given by $\dot{m} (h_Y - h_B)$ and $\dot{m} (h_A - h_Y)$ respectively.

For the same system the Contact Factor, β may be established from $\beta = (\theta_A - \theta_B) / (\theta_A - \theta_X) = (30 - 16.5) / (30 - 10) = 0.67$ (or 67 per cent)

and the Bypass Factor will be $(1 - 0.67) = 0.33$.

The rate of water vapour removed from the air may be obtained from

$$\dot{m} \times \Delta g = 0.75 \times (0.0140 - 0.0098) = 0.0032 \text{ kg/s (or 3.2 g/s)}$$

These calculations may be reorganised to determine unknown

variables for any of the processes illustrated in this article. A future article will combine these processes to examine system psychrometry.

© Tim Dwyer

Further Reading

Air Conditioning Engineering, Jones WP, Butterworth 2001, Chapter 3
ASHRAE Fundamentals 2009, Chapter 1

Symbols

- Δ = difference
- β = contact factor
- g = moisture content $\text{kg} \cdot \text{kg}^{-1}_{da}$
- h = enthalpy $\text{kJ} \cdot \text{kg}^{-1}$
- \dot{m} = mass flowrate, kg/s
- P = power, watts
- μ = percentage saturation %
- θ = dry-bulb temperature $^{\circ}\text{C}$
- θ' = wet-bulb temperature $^{\circ}\text{C}$ (normally sling)

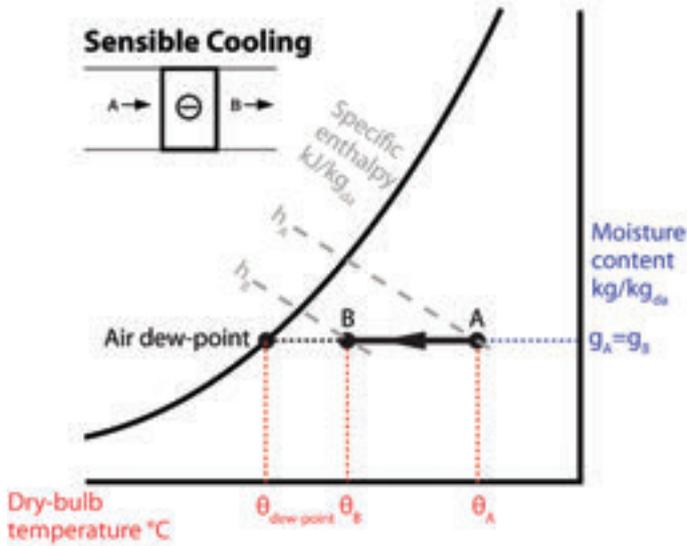


Figure 3 – Psychrometry of Sensible Cooling

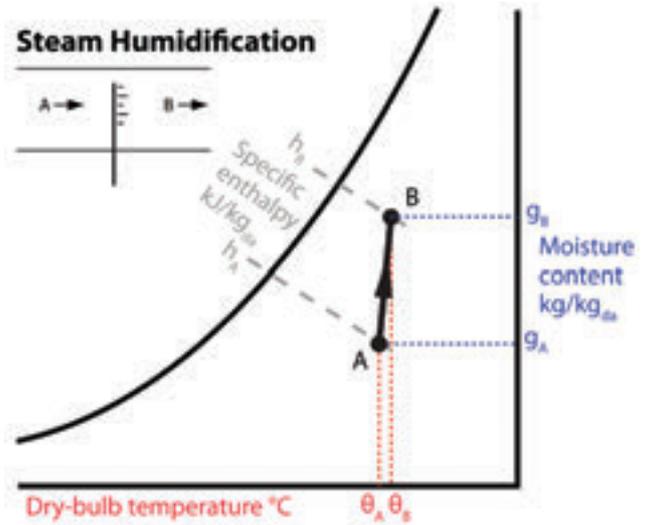


Figure 4 – Psychrometry of Steam Humidification

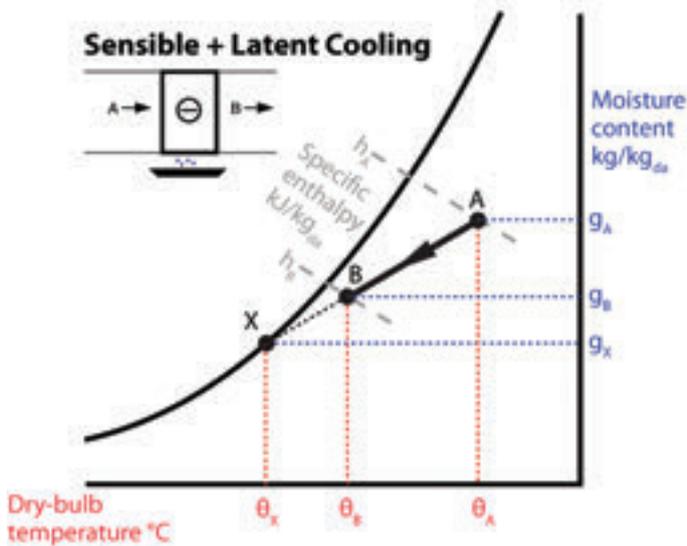


Figure 5 – Psychrometry of Sensible and Latent Cooling

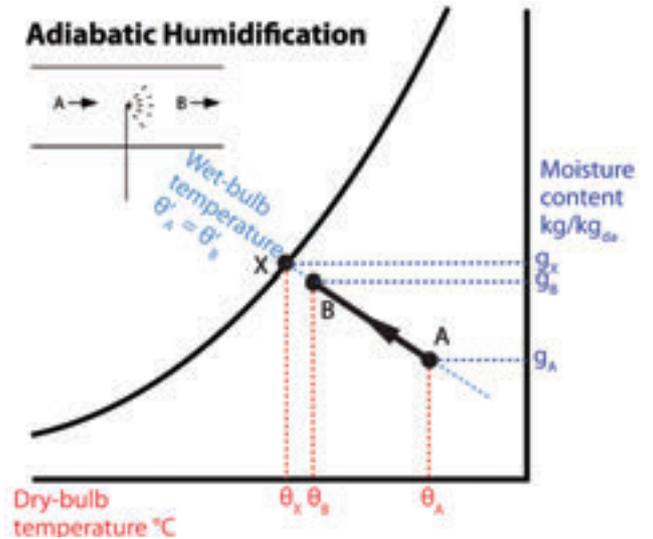


Figure 6 – Psychrometry of Adiabatic Humidification

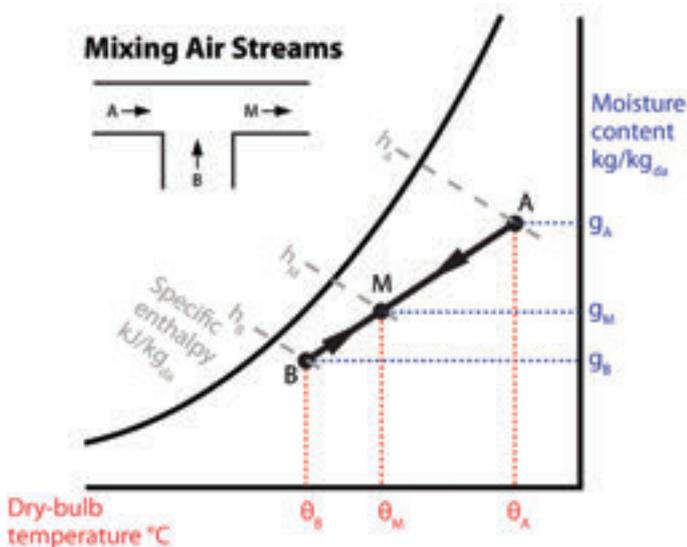


Figure 7 – Psychrometry of Mixing Air Streams

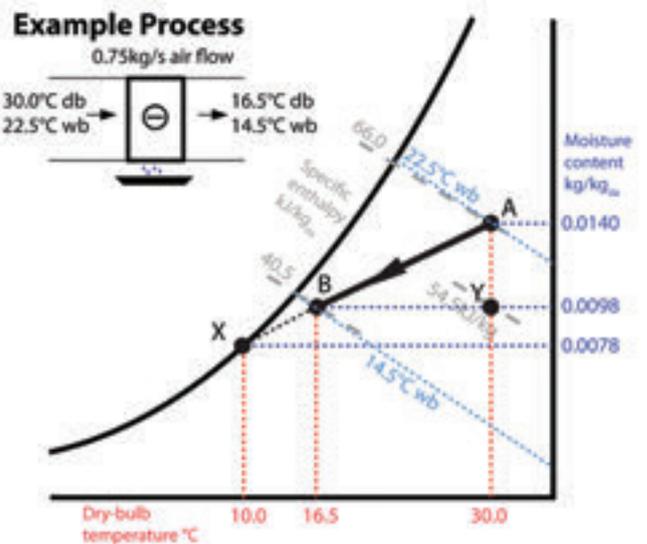


Figure 8 – Example Psychrometric Process

Module 9

October 2009

1. Which of the figures is most likely to illustrate the process for humidification where there is virtually no change in the air's enthalpy?

2. Which of the following is most likely to be a sensible heating process?

- A One that injects dry steam into the air
- B A spray humidifier where the water is at the same temperature as the air wet bulb temperature
- C An air heater battery that is made up of electric heaters
- D Where two air steams mix
- E A process where the enthalpy is kept constant

3. What is the approximate contact factor for the cooling process in figure 5?

- A 10%
- B 0.2
- C 0.66
- D 90%
- E 35%

4. What is the rate of sensible heat removal from the air in the process shown in figure 8?

- A 10.5 kW
- B 14.5 kW
- C 40.5 kW
- D 54.5 kW
- E 66.0 kW

5. What is the temperature of the ADP in figure 8?

- A 10°C
- B 14.5°C
- C 16.5°C
- D 22.5°C
- E 30°C

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How green buildings represent quality building. www.ukgbc.org
- **28-31 Oct** **Professional Lighting Design Convention 2009** Berlin
Examining all things lighting. www.pld-a.org
- **4 Nov 2009** **Annual Seminar & Meeting Point** Manchester
Guidelines and advice for lifts. www.cibseliftsgroup.org
- **5 Nov 2009** **SoPHE Annual Dinner** London
Annual dinner. Tel: 020 8772 3613
email: vwilliams@sophe.org

SOCIETY OF LIGHT AND LIGHTING

- Visit the SLL pages via www.cibse.org
- **13 Oct 2009** **High dynamic range imaging for photometric measurements** London
Lighting measurement. Tel: 020 8772 3622 email: sll@cibse.org
 - **14 Oct 2009** **Towards the third stage of the lighting profession** London
Themes that have influenced lighting sll@cibse.org
 - **15 Oct 2009** **'Joined Up Lighting' seminar series – Lighting Controls Today: increasingly important yet still misunderstood and under-used?** London
The pros and cons of modern controls www.ile-events.org.uk
 - **29 Oct 2009** **Lighting Masterclass** Glasgow
Low carbon lighting and the future of LEDs. eventbookings@cibse.org

CIBSE/OTHER TRAINING

- **14 Oct 2009** **East Midlands Innovation: Code for Sustainable Homes** Nottingham
An overview of the code. www.bre.co.uk
- **22 Oct 2009** **Cost, energy and carbon savings through FM and engineering leadership for existing and future buildings** London
Workshop exploring how to achieve cost, energy and carbon savings in buildings. turtonj@lsbu.ac.uk
- **27 Oct 2009** **Whole-life costing – theory** Bracknell
Important principles. www.bsria.co.uk/training-and-events

CPD TRAINING

To find out more about the courses

Retrofitting Solar Shading

CIBSE is devoting a whole day to exploring solar shading issues this month.

The Retrofitting Solar Shading seminar will delve into topics such as thermal and visual performance of windows, solar control glass and blinds, operational control and maintenance, as well as showcasing two case studies.

Solar shading is an effective and often cheap way of controlling the amount of light and heat admitted to a building. It can be an effective energy saver all year round, decreasing costs of cooling in the warmer months and optimising natural daylight



Speaker Paul Littlefair

usage in the winter, and can prevent glare.

This seminar, on 26 October at CIBSE headquarters in London, examines the various methods of retrofitting solar shading. It will be of particular use to design engineers, façade engineers, energy managers, architects, and property owners. For more information call 020 8675 5211 or email eventbookings@cibse.org

- below visit www.cibsetraining.co.uk, call 020 7675 5211 or email eventbookings@cibse.org
- MECHANICAL SERVICES**
 - **7 Oct 2009** **How to Specify a Ground Energy System (A407)** London
 - **14-16 Oct 2009** **Mechanical Services Explained – three day course (B126)** Leeds
 - **20 Oct 2009** **Air Conditioning Basics 1: Comfort, Climate & Heat Gains (A409)** London
 - **21 Oct 2009** **Air Conditioning Basics 2: The Air Conditioning Process (A411)** London
 - **12 Nov 2009** **Cooling Systems (A425)** London
 - FIRE SAFETY**
 - **6 Oct 2009** **Managing Human Behaviour in Fires and Emergencies (A406)** London
 - **27-29 Oct 2009** **Fire Safety Engineering Design – Principles & Practice, three-day course (A416)** London
 - **27 Oct 2009** **Control of Door Release Arrangements: New BS7273-4 half-day course (A414)** London
 - **10 Nov 2009** **Examination of the new BS9999 on Fire Safety in Buildings (A424)** London
 - PROJECT MANAGEMENT**
 - **22 Oct 2009** **Successful Design Management (A413)** London
 - **27 Oct 2009** **"Hitch Hikers" Guide to Whole Life Costing – Practical Skills for Project Engineers (A517)** London
 - **12 Nov 2009** **Practical Project**

- Management (A426)** London
- PUBLIC HEALTH AND WATER**
- **29 Oct 2009** **Current HSE Guidance on Control of Legionellosis (A418)** London
- **9 Nov 2009** **Variable flow water system design (A423)** London
- **26 Nov 2009** **Unvented and other types of efficient hot water systems (A433)** London
- ELECTRICAL SERVICES**
- **6-8 Oct 2009** **Electrical Services Explained (A405)** London
- **3 Nov 2009** **BS7671:2008 "Requirements for Electrical Installations" (IEE Wiring Regulations 17th Edition) (A419)** London
- **4 Nov 2009** **Introduction to Building Services (A421)** London
- **17 Nov 2009** **Building Electrics basics 1: Choosing electricity supplies (A428)** London
- BUILDING REGULATIONS AND ENERGY EFFICIENCY**
- **15 Oct 2009** **Renewables: Solar Thermal Energy (A408)** London
- **20 Oct 2009** **Introduction to Sustainability (A410)** London
- **22 Oct 2009** **Building Regulations Part L2: How to Demonstrate Compliance (A412)** London
- **27 Oct 2009** **The Carbon Reduction Commitment – new course (A415)** London
- **28 Oct 2009** **An Introduction to Energy Efficiency (A417)** London
- **24 Nov 2009** **NEW COURSE – Building Regulations Part G (2009) explained (A432)** London

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Tender for the Provision of Water Management Services

Wakefield College, Margaret
Street, Wakefield WF1 2DH



Wakefield College is seeking expressions of interest from suitably qualified suppliers to provide management of water hygiene, (L8 Compliance), at its Wakefield, Thornes Park and skillsXchange Campuses.

The contract will commence on 1 March 2010 and will terminate on 28 February 2013.

Interested parties should request a Pre-Qualification Questionnaire from:

Helen Johnson, Estates Administrator
Tel No. 01924 789720
Email h.johnson@wakefield.ac.uk

Please note that PQQ's are only available in hard copy and will not be supplied electronically.

Completed Pre-Qualification Questionnaires must be returned by 12.00 noon on Friday, 13 November 2009.

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Application forms and further particulars are available on our website: <http://www.aston.ac.uk/jobs>, by email: recruitment@aston.ac.uk or by telephoning: 0121 359 0870 (24 hour answerphone). (CVs will only be considered if accompanied by a completed application form). Reference number R090275.

Closing date: Friday 16th October 2009.

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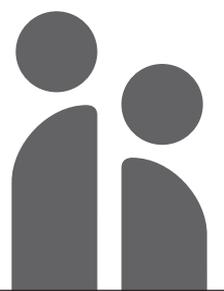
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Moving to the 'dark' side

Grant James has always been a contracts manager at heart, but his latest role at ABS London has opened his eyes to 'the dark side' of pre-contract and estimating

Grant James has spent nearly 30 years living in the 'fairly well insulated world' of building services.

He started his career at Haden Young as a technician engineer, progressing to contracts manager before joining ABS London and specialising in the London fit-out market. Now, as mechanical contracts director, his role is varied to the extreme. Never knowing from one day to the next where he'll be – or, indeed, which project will divert his attention next, he splits his time between the office, site visits and client meetings.

And, although he admits there is no such thing as a 'typical' day, he is always in the office for 7.30am. His clients' demands can involve meetings to discuss a potential new project to reviewing a submitted tender.

But the time he does spend in the office is used to 'realise' the promises he has made. Typically it consists of analysing tenders, preparing the packages that go out to potential sub contractors and suppliers, and preparing prices for the client on time. Most days his time is also spent dealing with queries on tenders, which are at various stages.

'I must admit, us contract managers have always had a healthy disregard for the sales, pre-contract and estimating side of the business,' concedes James. 'After all, we were the top guns at completing projects to suicidal programmes, within ludicrous budgets, resolving estimating oversights and endeavouring to live up to outrageous promises made by the sales Johnnies.'

'However, for the last six months I have been charged with overseeing estimate preparations with a view to securing projects in a difficult market place. A far more



"I have gained a greater respect for the estimator manfully working away at the coal face"

challenging and diverse role than you might think.'

The recession forced ABS to diversify, and is what led James to alter his role, moving from the 'cosy cuddly world' of contracting to the 'dark side' of pre-contract and estimating.

One of his recent projects began with a phone call asking him to visit a building in Portsmouth at short notice to price up the installation of heating and air conditioning units. Ideas were discussed before James priced the project and wrote a specification. Once the price was agreed, ABS was able to process the order and work started on-site.

'I thought this role would be a breeze after contract management. How wrong I was. It's interesting how, in a short space of time, my view of this side of the business has changed; I have gained a greater respect for the estimator manfully working away at the coal face.'

Email your latest people appointments and role profiles to cbailey@cibsejournal.com

Movers & Shakers



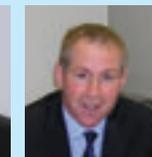
Real estate company Hammerson plc has announced that its chief executive of

almost 10 years is stepping down. John Richards will be replaced by **David Atkins**, who has been with the company for 11 years. He leaves his position of managing director of Hammerson's UK business to take on the role.



Paul Finch has been appointed as the new chairman of CABE, the Commission for

Architecture and the Built Environment. Finch is currently programme director of the World Architecture Festival and will take up the post officially in December.



Weatherite Building Services Limited (WBS) has announced two key appointments. **Mike Turton** is now the company's managing director, and **Martin Thomas** has been promoted to sales director. It is anticipated that the move will strengthen the senior management team following the retirement of former managing director, Clive Evans.



Mark Bone has joined BG Controls as operations director for its new office in West

Sussex. Bone has 15 years' experience in managerial and engineering roles, and will now be responsible for sales and business development at BG.



Marcus Levy has been recruited as area sales manager – south at Coolmation. The chillers

distributor hopes the appointment will help to develop closer links with the specification and contractor market. Levy has almost 20 years' experience in the HVAC sector.



Stuart Brear, C.Eng; MCIBSE joins Wise Management Services (WMS) as director for

business development. Brear is a chartered electrical engineer and has considerable experience in building and engineering services and systems. He joins engineering and services expert, WMS, from Carillion IT Services where he was regional director.

Jeff Gatlin, MCIBSE, PE, LEED AP, an American member of CIBSE, has been appointed to the ASHRAE Members Council PAOE Subcommittee. He also recently accepted a four-year appointment to the City of Hernando (Mississippi) Historic Preservation Committee. He holds many other volunteer committee roles within the industry, as well as being vice president and co-owner of Thompson Engineers, Inc, in Memphis, Tennessee.



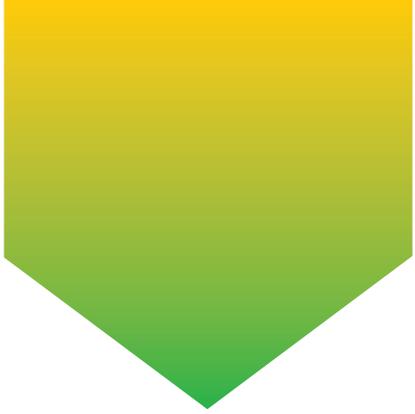
A renewables energy company has recruited **Sharlene Wilson** as technical consultant.

Wilson joins Perpetual Energy from Sustainable Energy Installations Ltd, where she was a project engineer. In her new role she will be responsible for projects across Europe.



A heating, air conditioning and refrigeration company has recruited **David Roberts** to the

role of commercial director at Carrier. Roberts has been with the company for more than 27 years, during which time he has held positions in industrial refrigeration, sales, marketing and service, both in the UK and overseas.



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- Low Carbon Energy Assessor of the year – EPC (only open to CIBSE LCEAs)
- Low Carbon Energy Assessor of the year – DEC (only open to CIBSE LCEAs)
- Client of the year – Energy performance
- Client of the year – Low carbon operation
- Low Carbon Manager of the year
- Best Carbon Saving Programme (only open to 100 Hours participants)
- Best Carbon Saving Programme - SME (only open to 100 Hours participants)
- Champions of Carbon Saving Champions (only open to 100 Hours participants)
- Training Initiative (new category)
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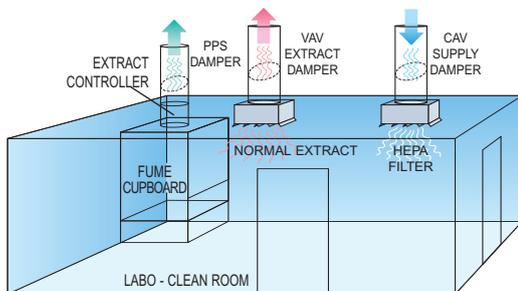


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