

CIBSE

JOURNAL



The official magazine of the Chartered Institution of Building Services Engineers

February 2009

GREEN BLING

SHIFTING THE FOCUS TO
WORKING BUILDINGS

HIDDEN PROFESSION

A YOUNG ENGINEER
CALLS FOR CHANGE

THE HEAT IS ON

CAN THE BOILER MARKET
SURVIVE THE RECESSION?

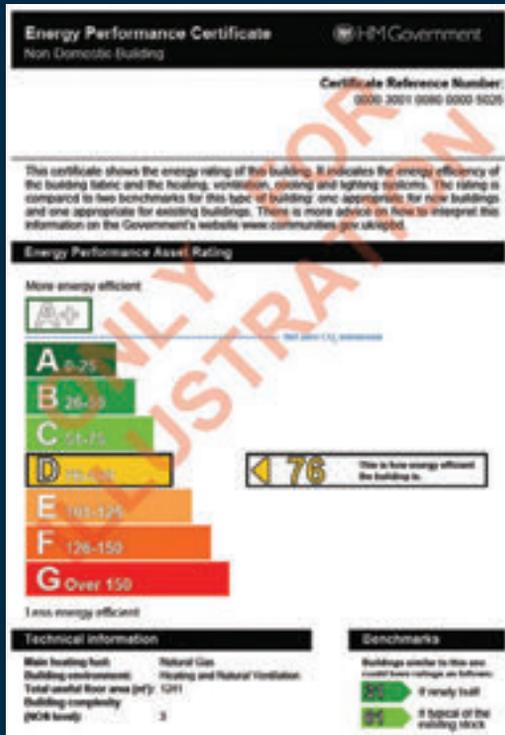
CO₂ beater

Low carbon champion reveals all

ATTENTION ENERGY ASSESSORS:

Bentley's HEVACOMP Can Help You Achieve Peak Performance

Geometry Land Development Design Geomtr
Sustainability Components
Generative Architecture Generative
Geometry Components Sustainability
Design Buildings Geometry
Sustainability Architecture Generative
Components Architecture Architect
Geometry Design



Energy Performance Certificate



Software Menus



Easy to use CAD Input

BENTLEY HEVACOMP EPC SOFTWARE HAS RECEIVED FULL GOVERNMENT ACCREDITATION FOR THE PRODUCTION OF LEVEL 3 AND 4 ENERGY PERFORMANCE CERTIFICATES.

EPC and PartL Results for Energy Assessors

In April 2008 legislation came into force requiring that new buildings, major refurbishments and large public buildings throughout England, Wales and Eire must produce an energy certificate rating the energy performance of the building.

The mandated Energy Performance Certificate (EPC), is required to be submitted for all buildings when they are constructed, sold or rented.

Accredited Building Energy Assessors (non-dwelling) will produce these energy certificates. Becoming an accredited Energy Assessor requires joining an Accredited Energy Assessor Scheme and using accredited software. The government has licensed several scheme providers, including Bentley.

Bentley Hevacomp offers a number of, Government approved software solutions to meet the needs of Energy Assessor professionals.

For more information, visit www.bentley.com/CIBSE

Hevacomp Quick EP Cert for Level 3

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Hevacomp Pro EP Cert for Level 3 and 4

Uses a full CAD interface as well as a simplified data entry interface. Designed for both Level 3 and larger Level 4 buildings.

Bentley **HEVACOMP**



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Individual copies are also available at a cost of £7 per copy plus postage.

From the editor



Welcome to *CIBSE Journal*, the new magazine for all members of the institution and the broader building services industry internationally. As I hope will be clear from this launch issue, we are a publication that aims to offer an unparalleled breadth and depth of coverage, giving readers plenty of insight and food for thought. As our letters and opinion pages this month demonstrate, we welcome your contributions to help keep the

Journal lively and relevant – so please don't hesitate to send us your thoughts and article suggestions, and do tell us what you like and dislike about what we're doing or not doing.

The *Journal* is a CIBSE publication but, you will also notice, we are not an 'in-house' magazine for the institution: we are an editorially independent title for the wider profession. But, of course, we will continue the tradition of providing CIBSE members with institution-related information. We will also naturally want to call on CIBSE's expertise at head office and among its many members' groups to provide comment, analysis and viewpoints on industry matters.

However, we are first and foremost an industry magazine, and it will be industry issues, developments and innovations that drive our content. As Bill Bordass's article on page 42 and our Low Carbon Performance Awards

coverage starting on page 30 demonstrate, there are few topics as important as energy conservation. As we all know, the focus given to all those spanking new high-tech buildings that have sprung up around the world tends to detract from the hard truth that, if we are truly to help save the planet, we need to do something about the carbon footprint of the established building stock.

There is no quick fix for this particular problem, although industry bodies and some policy-makers in government are trying to take us forward with energy assessment regimes and certification of buildings. Bill Bordass rightly lays down the gauntlet to the profession on this topic, and I would like to echo his call for a "new professionalism".

I hope that, through the pages of this magazine, our readers will contribute to the debate and offer up ideas for change.

And, in the same spirit, help us to inject more humour into the *Journal*. We would welcome light-hearted snippets from readers for possible inclusion in the magazine. After all, we're in a hugely positive and valuable industry, so let's celebrate it, too.

Bob Cervi, Editor
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www.cibsejournal.com

We need a new professionalism and I hope that readers will offer up ideas for change

Securing the environment for future generations



The NEW Remeha Gas 110 Eco

Broag-Remeha have designed the Gas 110 Eco to fit into the footprint of one of the most popular traditional boiler designs. The customer's carbon saving pound can go even further because the installer will be fitting the latest boiler technology directly into the space in which the old, inefficient boiler used to stand.

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Faber defies gloom as school building scheme hits buffers

A leading building services consultancy says it is not worried about the threat of further delays to the school-building programme in the UK.

The government was last month forced to appoint a troubleshooter to sort out problems with Building Schools for the Future (BSF), the government initiative for renovating school buildings.

BSF has suffered delays partly because of difficulties faced by colleges raising funds amid the credit crunch.

Many proposed schemes rely on either the sale of land or other assets and on the ability of colleges to gain financial support from the banks.

The consultancy Faber Maunsell | AECOM said it remained confident that it was "business as usual" with the school buildings programme.

Its director of education, Valerie Bragg, said: "We are busy on the sixth-form colleges, colleges of further education and the secondary school and academy programmes, and we are looking forward to our involvement in the primary capital programme which is starting now. All this will keep us busy well into the future."



One of Faber's success stories: St Christopher's School in Letchworth, which was built through a PFI deal

Skills Secretary John Denham has appointed Sir Andrew Foster to lead an independent review into the BSF.

The Learning and Skills Council admitted: "There are early signs that the ability of colleges to raise their own funds to help pay for proposed projects is being affected by the downturn."

However, it said that nearly 700 BSF projects had been agreed at 330

colleges, and only 42 colleges had not yet benefited from investment.

There is concern in the construction industry that some hospital and local authority building schemes could also be affected by the downturn, which is making it more difficult for funds to be raised under the Private Finance Initiative (PFI), the government's joint public-private funding programme.

A Treasury spokesman said: "PFI deals are still going ahead but like all private sector investment projects, the global credit crunch is affecting PFI projects."

"The government has been working for some time with individual projects to help them close and is working to push forward all the projects currently in the pipeline."

Obama cash 'coming to industry'

Billions of dollars will be spent on tackling the energy efficiency of US buildings as part of the Obama administration's \$825bn stimulus package.

Delegates at the Chicago meeting of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) late last month welcomed the new president's proposals.

President Obama made repeated references to energy conservation in buildings as part of his strategy for tackling America's creaking infrastructure.

All federal government buildings will be made more energy efficient and household energy bills will be slashed by a programme of "weatherising" 2.5m homes. The President also said the US would double its capacity for 'green'

energy generation, from sources such as wind, sun, and biofuels, over the next three years.

ASHRAE president Bill Harrison said: "The new US administration is creating a lot of optimism – a greater focus on energy efficiency and sustainability is guaranteed. Billions of dollars will help to stimulate the building economy and it's coming right at ASHRAE members, whose expertise will be in greater demand than ever."

Executive vice-president Jeff Littleton said 2009 would be a "pivotal year" as the industry faced "daunting challenges and great opportunities" in equal measure. But he warned the financial crisis would get worse before it got better.

There will be a full Ashrae conference report in the March issue.

More builders opt for high-level energy surveys

A growing number of property professionals are seeking more detailed assessments of their buildings' energy efficiency, despite the higher costs involved.

While most property professionals requiring commercial energy certificates intend to obtain a low-cost standard survey, more than a quarter want to obtain the most detailed survey.

The findings are revealed in two informal CIBSE internet surveys of property professionals and energy assessors conducted last December to learn more about their views on energy performance certificates (EPCs) and display energy certificates (DECs).

Of the property professionals questioned, 82 per cent wanted a

standard certificate, while 28 per cent intended to get a detailed survey too, and a fifth aimed to implement some or all of the recommendations.

More than half found an energy assessor through recommendation, and 50 per cent believed energy certificates were "very" important. Overall, 53 per cent said they would implement recommendations.

John Field, a CIBSE low carbon energy assessor and director of Power Efficiency Ltd, said: "At this stage of Energy Performance Certification roll-out, if more than 20 per cent of property professionals have progressed EPC and DEC improvement measures I would say that is extremely positive."

Many buildings have worst energy rating, figures reveal

More than a fifth of public buildings with display energy certificates (DECs) have the worst energy rating available, according to government figures.

The ratings of nearly 9,000 public buildings show that 1,514 were classed as category G, while a further 1,799 were in the middle range of E.

Data on the energy ratings of public buildings is being compiled for the Department for Communities and Local Government (DCLG), which found that 8,849 DECs had been completed in England and Wales by December 2008.

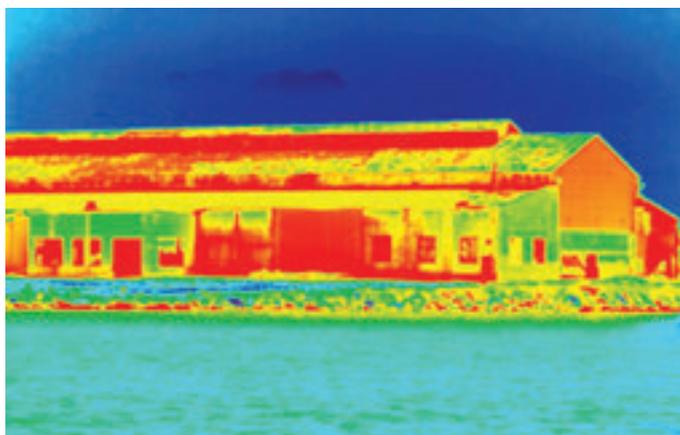
Under regulations brought in last year, larger buildings over 1,000m squared that are regularly visited by the public must have a DEC on prominent display.

However, industry experts warned against interpreting the high level of G ratings too negatively at this stage.

"I think it's profoundly unhelpful to have people running around looking at a range of certificates and saying 'Oh, isn't this awful' because all that's doing is creating a culture in which people are afraid to acknowledge poor performance," said CIBSE technical director Hywel Davies.

"What's important is that these buildings get ratings. If you don't measure how public stock performs you can't manage it."

The real issue, according to Davies, is getting action taken on



Nearly 9,000 DECs were completed by the end of 2008

DEC ratings of 8,849 buildings

Rating	No. of buildings
A	55
B	401
C	1,633
D	2,634
E	1,799
F	813
G	1,514

Source: DCLG, Dec 2008

each certificate's findings. As yet there is no requirement for action to be taken once a DEC has been done.

The first year's results from the energy ratings also cannot be fully relied upon to reveal the true scale of CO₂ emissions, as any building

which failed to have its energy data to hand at the time of assessment was automatically rated as a G, Davies added.

He said the real test will come when all buildings are reassessed this year and next, revealing whether action has been taken to improve energy performance.

CIBSE provides training for energy assessors who visit buildings and provide energy ratings. Davies admitted that the A to G rating system didn't take account of aspects such as intensive occupancy – with numbers of staff going well beyond what was intended for the building – but he said this issue was likely to be addressed as more buildings received their DECs.

Bill seeks major boost to small-scale renewables

Details of proposed legislation to encourage the use of microgeneration schemes have been seen by *CIBSE Journal*.

A private members' bill, due to be published as the *Journal* went to press, would cut red tape from the planning process to enable householders to install micro-renewables, including sources of combined heat and power.

The bill, put forward by Peter Ainsworth, Tory MP for East Surrey, also seeks to review the government's renewables strategy with a view to making 'feed-in' tariffs a reality.



Peter Ainsworth MP

The Green Energy (Definition and Promotion) Bill would also make it easier to create biogas from farm waste and feed it into the national grid – something that Ainsworth says isn't yet being exploited in the UK.

The bill would also stop council tax bills increasing if a property is improved by having wind turbines or heat pumps installed.

Ainsworth told the *Journal*: "I wanted to do something to help move forward the whole renewable energy sector and get rid of bureaucracy blockages.

"I feel Britain is lagging woefully behind other developed countries in exploiting the potential small-scale low carbon energy and the potential not only to cut CO₂ emissions, but also to create huge numbers of new jobs."

The draft has already been sent to the Secretary of State for Energy and Climate Change, Ed Miliband, and is believed to have cross-party support. CIBSE was also expected to pledge its own support to the bill as the *Journal* went to press.

The bill is expected to go through to its second reading in Parliament on 8 May.

EU energy ratings revamp comes under fire

Plans to widen the scope of European rules on the energy efficiency of buildings have raised concern among industry experts.

The European Energy Performance of Buildings Directive currently requires new buildings, major refurbishments and large public buildings in England and Wales to have a certificate to rate their energy performance.

However, the latest draft changes to the directive, published online last November, have "changed the definition of a building", says one industry expert.

Under the existing rules, a building that comprises several

separate parts normally requires an Energy Performance Certificate (EPC) for each part. But the draft changes remove the definition of a building as having "a whole or parts ... that have been designed or altered to be used separately" – suggesting that a multi-part building would in future need only one EPC.

Hywel Davies, technical director of CIBSE, said this change would make it harder to get a meaningful rating for a multi-part building. "This is a huge move away from measuring real energy usage to influence real behaviour and make real energy savings," he said.

Davies was also concerned at the draft's proposal to widen the definition of air conditioning to mean any form of mechanical ventilation, which would bring many more buildings within the directive's scope.

As expected, the draft also replaces the requirement that any public building bigger than 1,000m² would need an energy certificate. It now stipulates that all public buildings over 250m² need an energy certificate.

The draft changes to the directive were due to be discussed in Brussels this month, as *CIBSE Journal* was going to press.

News in brief

Cash aid for SMEs

Small and medium-sized businesses look set to benefit from a multibillion-pound government package to ease cash flow and credit problems.

Secretary of State for Business Lord Mandelson unveiled loan guarantees and a new Enterprise Fund aimed at helping companies struggling to access finance for working capital and investment.

It includes a £1.0bn Working Capital Scheme; an Enterprise Finance Guarantee Scheme, securing up to £1.3bn of additional bank loans to small firms with a turnover of up to £25m; and a £75m Capital for Enterprise Fund to invest in small businesses that need equity.

Positive steer for 'compass'

An online tool to incorporate weather and climate change-related information into building design has started to receive positive feedback after its launch two months ago.

The Design Compass is a detailed guide for building services professionals helping them design buildings to adapt to and mitigate against the changing climate.

The Design Compass was funded by the Technology Strategy Board, a government body, and by CIBSE and the Engineering and Physical Sciences Research Council. www.cibsedesigncompass.org.uk

Congress papers sought

Abstracts and papers for the international CIB World Building Congress 2010 Building a Better World conference are now being sought. CIBSE Intelligent Buildings Group, in collaboration with CIB W098: Intelligent and Responsive Buildings, is appealing for papers and abstracts for the event, which will be held from 10 to 13 May 2010 at the University of Salford, UK. The abstract submission deadline is 16 March 2009, while full paper submissions are due in on 19 October 2009. Visit www.cib2010.org or contact Kaushal Keraminiyage at kaushal@cib2010.org

Bovis seals £18 million affordable homes deal

An £18m project has been agreed between the government and Bovis Homes to take hundreds of families off housing waiting lists and stimulate the industry.

The deal was done through the National Clearing House programme, which enables builders to sell their stock to housing associations as affordable homes.

It will provide 379 affordable homes across the country – the biggest deal yet achieved through the programme. In total, 4,800 homes have now been brought into use at a cost of £160m.

It is hoped the move will help stimulate development in the sector.

Meanwhile, consultations have started into whether councils should be given greater freedom to build homes to help stimulate the ailing construction sector.

Under the proposals announced by housing minister Margaret Beckett in January, councils would be able to keep all the rental income from any homes



Councils could receive more freedom to provide social housing

they build, as well as retaining the receipts from any homes sold. The extra money could free councils to invest in building more

accommodation.

Local authorities are invited to discuss their ideas with the Homes and Communities Agency.

Climate change largely irreversible, says study

Climate change is largely irreversible, according to a report which says it will take more than 1,000 years for carbon-reduction projects to have an impact.

The claim comes in a new scientific study led by the National Oceanic and Atmospheric Administration (NOAA).

It shows how changes in

surface temperature, rainfall and sea levels are largely irreversible for more than 1,000 years after carbon dioxide emissions are completely stopped.

The study examines the consequences of allowing CO₂ to build up to several different peak levels beyond present-day concentrations of 385 parts per

million and then completely halting the emissions after the peak.

The authors found that the scientific evidence is strong enough to quantify some irreversible climate impacts, including rainfall changes in certain key regions, and global sea-level rise.

Firms urged to turn to biomass

A lack of understanding about the benefits of biomass heating is preventing business and public sector use of the technology, says advisory body the Carbon Trust.

Organisations could benefit by switching from oil, gas and electric heating to biomass, according to *Biomass Heating, A Practical Guide*, published

by the Carbon Trust.

Using wood or straw can provide cost savings of two to four pence per kilowatt hour, compared with the use of heating oil.

Carbon Trust director of innovations Mark Williamson said: "We've become so reliant on oil, gas and electricity that many

businesses just aren't aware of the cost and carbon benefits of turning to biomass."

Heating currently accounts for almost half of the UK's carbon emissions. Biomass can reduce carbon emissions by about 90 per cent relative to fossil fuel heating systems, the Carbon Trust argues.

'Magic' long-life LEDs could massively cut UK energy bill

Scientists claim they have discovered a new way of making LEDs (light-emitting diodes) that could slash production costs and also cut household electricity bills by up to 75 per cent in five years.

The researchers at Cambridge University say they have found a new way of making gallium nitride (GaN), a man-made semiconductor that emits a brilliant bright light using very little electricity.

The technique, developed at Cambridge University Centre for Gallium Nitride, could produce LEDs for one-tenth of current prices by growing GaN on silicon wafers rather than sapphire – improving costs and efficiency by 50 per cent.

Based on current results, GaN LED lights in every home and office could cut the proportion of UK electricity from 20 per cent to 5 per cent, equivalent to the output of eight power stations, says the university.



Existing LEDs could be transformed, say Cambridge scientists

Lead scientist Professor Colin Humphreys said: "This could be the holy grail in terms of providing our lighting needs for the future."

GaN LEDs can burn for 100,000 hours – lasting 60 years – contain no mercury, can be turned on instantly and are dimmable.

Research is also continuing into how GaN light could help people with seasonal affective disorder (SAD), aid water purification and disease control in developing countries, identify the spread of cancer tumours and help fight hospital 'superbugs'.

News in brief

Concept homes plan

The University of Nottingham is developing a project to build two low-cost, low-carbon concept houses with the aim of establishing a blueprint for future homes. Tarmac is building the two concept masonry homes together with project partners Lovell and Bill Dunster Architects, to Level 6 and Level 4 of the Code for Sustainable Homes.

Zero-carbon living plan

Plans to build the largest zero-carbon development in the UK with its own sustainable living and energy centre have been created as part of the first Carbon Challenge project in the country.

Consultant HTA has designed the site, near Bristol, to be able to generate clean renewable energy for 195 homes. Carbon Challenge aims to accelerate the house-building industry's response to climate change.

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Hurleypalmerflatt acquires Glasgow consultancy

Engineering consultancy hurleypalmerflatt has acquired Glasgow-based ATCO Consulting.

It is envisaged the move will further broaden hurleypalmerflatt's scope of services and existing regional presence in Scotland.

Mark Arthur will continue to manage the building services as a director, while hurleypalmerflatt's sustainability consultancy in Glasgow will relocate into ATCO's existing premises. ATCO provides building services engineering and project management, as well as low carbon consultancy.

Hurleypalmerflatt chairman Paul Flatt said: "By combining the resources of ATCO Consulting and hurleypalmerflatt, we are able to provide unrivalled multidisciplinary consultancy business in this market, while also delivering projects in the UK and Europe, with a focus on sustainability across the business."

Mark Arthur added: "We are delighted to be part of the hurleypalmerflatt group, as this both strengthens our position in the UK and gives us access to hurleypalmerflatt's resources and expertise."

Hoare Lea opens Oxford office

Consulting engineer Hoare Lea has relocated to a new office in Oxford.

The premises, in Great Clarendon Street, provide a base for 15 engineers, lighting designers, support staff and other management group personnel. There is also space for an additional 10 employees.

Many of the firm's projects will now be within walking distance. Showers and bike storage have been incorporated to encourage cycling and Hoare Lea has purchased company bikes for employees to use around the city.

Projects on which Hoare Lea is working include the Department of Earth Sciences with Wilkinson Eyre Architects for Oxford University; the Research Complex at Harwell for the Science and Technology Facilities Council; and projects with various Oxford colleges.

High Court rejects eco town challenge

A High Court judge has ruled that the government's consultation on building eco towns was lawful.

Mr Justice Walker made the ruling last month after a residents' action group, the BARD (Better Accessible Responsible Development) Campaign, took the government to court to try to quash its decision to build an eco town at Long Marston on a brownfield site between Stratford-upon-Avon in Warwickshire and Evesham in Worcestershire.

The BARD Campaign was formed by residents from across

Warwickshire, Worcestershire and Gloucestershire in December 2007 in response to plans to build at least 6,000 houses, plus retail and leisure facilities, offices, an incinerator and a guided busway on a 600-acre rural site. If built, the new eco town would be called Middle Quinton.

After the hearing, David Bliss, chairman of the BARD Campaign, said: "We are disappointed but this is by no means the end of the road for BARD's challenges to the Middle Quinton proposal.

"Labelling objectors 'nimbys' is a lazy government response to

well thought-out opposition to the current eco-town programme.

"No less than 47 national, regional and local representative bodies agree that poorly-sited new towns will neither meet their promised eco-agenda nor provide affordable housing in places where people want to live."

He added: "In short, poorly-sited eco-towns will lead to soulless commuter-based dormitory towns becoming expensive white elephants of the future. We do not intend to stand by and watch this happen."

Project aims to cut refrigerant leakages

A project to cut refrigerant leaks has been launched by the Institution of Refrigeration (IOR) and the Carbon Trust.

Their REAL Zero (Refrigerant Emission and Leakage) scheme provides practical assistance to those involved in purchasing, designing, installing, servicing, maintaining and owning refrigeration equipment.

The project aims to show those using refrigeration equipment that, by reducing leakages, they will save

energy, maintenance, gas use and reduce carbon emissions.

The project will encourage equipment owners to think of refrigerant as being part of their asset base, rather than as a consumable. Most halocarbon refrigerants have a high global warming potential and some have significant ozone depleting impact too.

A free seminar is being held in London on 19 February for interested parties to learn about leak reduction and prevention.

There are also five guides: a pocket guide to good leak testing for service engineers; an illustrated guide to 13 common leaks for service engineers; designing out leaks and design standards and practices for designers and specifiers; the equipment owner's responsibilities; and a guide to the service and maintenance contractor's responsibilities.

A carbon cost calculator and a monitoring spreadsheet are also available at www.realzero.org.uk

Science building adopts DNA shape

Work on a £58m centre to accommodate 500 scientists from the Roslin Institute and the Scottish Agricultural College has started in Midlothian, Scotland.

Designed by HDR CUH2A, with engineering design by Faber Maunsell | AECOM, the building will be shaped to resemble a pair of chromosomes, with coloured panels representing the DNA 'fins' to link the office and research laboratory blocks.

Faber regional director Phil Hunter said: "A major challenge was integrating the building services with the complex shape of the architecture of the building."

The building will provide a focal point for the Easter Bush Research



The Faber Maunsell building's 'fins' link office and research blocks

Consortium (EBRC), which forms one of the largest groups focused on the biology of companion and production animals in the world.

The new building will allow the streamlining of research on animal diseases and its implications for human health.

The building will contain many sustainable design features to help

meet the client's BREEAM Very Good aspirations. These include modular lab spaces with cascade ventilation systems for economic running costs, and naturally ventilated offices using stack effect ventilation through ventilation towers.

Faber has also designed a new site infrastructure including off-site sewers and on-site stormwater attenuation and a new site entrance roundabout. The company is providing civil, structural and building services engineering, geotechnical engineering, sustainability, acoustics and fire engineering.

Building works should be completed in 2011.

Brown sets challenge to retrofit UK's buildings

Prime Minister Gordon Brown has thrown down the gauntlet to building services companies across the UK to help improve the green credentials of existing buildings.

In a speech last month, Brown unveiled a competition to encourage suppliers and designers to bid for a share of £10m worth of government funding.

The aim of the initiative is to develop innovative solutions to improve the long-term environmental sustainability of existing buildings.

Called 'Retrofit for the Future' and run by the Technology Strategy Board, the competition will consider projects that could provide a minimum of 50 new prototype technologies.

Those that are successful could then be adopted by the government through public



Gordon Brown wants companies to bid for a share of £10m

procurement to help meet climate change goals.

The competition is being launched next month, when companies will be invited to bid for contracts to work with social

housing providers, to refurbish 'test' buildings and then to evaluate their environmental performance.

Science and Innovation Minister Lord Drayson said: "Low-carbon technology is just one of the areas in which Britain will need to succeed if we are to emerge from the downturn stronger, build a new economy and create the jobs of the future.

"Today's challenge to companies across the UK underlines the opportunities that exist in responding to global challenges like climate change.

"And, by showcasing the key industries that will build a greener, healthier Britain for the digital age, we underline just how important science and innovation are to the economy and also to future job creation in this country."

www.innovateuk.org

News in brief

Apprenticeship boost

An extra 35,000 apprentices will be created next year by the government in a £140m drive to strengthen the country's competitiveness and help beat the downturn.

More than 250,000 apprentices are expected to begin their training in the next financial year.

Member wins £200

A CIBSE member has won £200 worth of vouchers after taking part in an online survey of CIBSE members, their reading habits and online usage.

Chris Cummings, an associate of Hilson Moran in London, was the lucky winner of the Marks & Spencer vouchers after his name was selected at random from more than 2,500 responses.

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Solar heating fitters 'are wrong on payback costs'

Fitting solar-powered heating systems without updating boilers and water heaters is just "being seen to be green" and won't save money, according to a manufacturer.

Steve Addis, from solar system manufacturer Lochinvar, said there were too many companies trying to convince customers they could earn their money back on energy savings delivered by solar thermal systems.

"Most people seem to fit solar systems because they want to be 'seen to be green'," Addis told delegates to a recent CIBSE/AHSRAE meeting.

"But they often forget about the primary heat source. There is no point putting in a renewable and then adding a standard efficiency water heater or boiler. A condensing boiler will save far more carbon than the solar ever will."

Despite the lack of payback, Addis said there were still a large



A lot of solar projects are being specified without enough attention to cost, it is argued

number of solar projects being specified – mainly because they are not being selected on cost.

The grants being provided by the Low Carbon Buildings Programme can improve the economics of a solar installation,

with not-for-profit organisations able to claim back up to 50 per cent of the total installed cost, but payback would still be around 20 years, Addis claimed.

Addis also warned specifiers to be wary of flat plate solar

collectors, saying that only evacuated tubes would deliver the required performance in Northern Hemisphere countries.

"Evacuated tubes are lighter, higher efficiency and work well even on cloudy days, but they can be a bit delicate so require more maintenance," he said.

Collectors should be certified to BS/EN 12975 and should be installed at 30 degrees off the horizontal facing south to capture maximum solar energy.

He said users could bank on an average of 800 watts of solar energy per square metre of collector on a sunny day, falling to about 200 watts in overcast conditions. However, he added that there was a huge difference in solar irradiation levels between the south and the north of the UK, with installations requiring greater surface area in the north.

www.cibseashrae.org

'Smart' study published

A study on how 'smart' technologies could help cut carbon emissions in new dwellings has been compiled.

The document offered industry professionals the chance to add their comments about the way smart home solutions could help to meet the performance levels of the Code for Sustainable Homes.

Compiled by ibexcellence, Smart Home Systems and the Code for Sustainable Homes provides evidence of how smart technologies, such as smart meters and fabric-mounted heat flow sensors, have already been used to improve the social, economic and environmental performance of homes.

Mike Perry of BRE, who co-wrote the report, said: "This report aims to open up a dialogue about incorporating smart home systems into the code and mainstream practice."

The code aims to minimise the use of energy in new builds and uses a scale of one to six to rate efficiency: one is the poorest and six is the best. The study is free to download at www.ibexcellence.org



York goes green in effort to cut CO₂ by 25 per cent

City of York Council's property services are going green by installing carbon-free technologies in an attempt to cut emissions by 25 per cent by 2013.

Buildings account for 70 per cent of City of York Council's carbon emissions, and the authority proposes to use new technologies in three new developments.

Joseph Rowntree School will

have a biomass boiler to provide 10 per cent of the school's energy. It will be fuelled by pellets made from wood-processing waste.

The Park and Ride ticket office at the McArthur Glen Designer Outlet will be heated by a ground source heat pump, the ground loop being in the same trench as a new drainage system.

And the new pool at Oaklands

Sports Centre will have an 82 megawatt annual yield from its solar panels, with biomass boilers making up the shortfall.

Sustainability engineer George Sands said: "Many of these applications are expensive to install and have higher energy purchase costs than fossil fuels, but offer huge annual carbon savings – and that's the long-term benefit we want."



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President: Professor John Swaffield FRSE, FCIBSE Chief executive and secretary: Stephen Matthews

CIBSE is well placed to unite voices, says CEO

Welcome to the new look *CIBSE Journal*. The first edition of a new magazine is always an exciting time and we strongly believe that this venture will provide plenty of positive opportunities and challenges for CIBSE, the *Journal* and the profession as a whole.

The Institution is at the crossroads of engineering and construction, and is uniquely placed to deal with some of the most significant issues facing society today. We are a broad organisation representing many facets within the built environment and the engineering profession, with diverse interests and views. Yet we can also unite these different voices when needed, and have a significant influence when it comes to informing, raising professional



Stephen Matthews: CIBSE needs member participation

standards, driving research and sharing knowledge and information.

A vibrant, dynamic and confident *Journal* is a key element of our development. Editorial freedom is crucial and we offer a warm welcome to the new editor Bob Cervi and the team at Cambridge Publishers, as well as our new publishing co-ordinator, Nicola Golledge, at CIBSE HQ. We also need the participation of CIBSE members to ensure that the *Journal* fulfils its readers' needs. Let us know what you think.

This is a new start after a publishing arrangement that has been in place for 30 years and we look forward to seeing what the future holds for *CIBSE Journal*.

Stephen Matthews
Chief executive, CIBSE

News in brief

Special Interest Group members

Please be aware that CIBSE reviews Special Interest Groups' membership regularly. CIBSE may contact you to confirm that you wish to remain a member of a group.

If you do not respond, your details will be removed from the group's membership, although you will be free to rejoin. You can log onto www.cibse.org and visit "Update your contact details" to amend your details and join, or re-join, a group at any time.

50 years a CIBSE member

Congratulations to all those members who have just completed 50 years as a CIBSE member.

You can view the list on the CIBSE website at:
www.cibse.org/50years

Launch of EngTech scheme

CIBSE is pleased to announce the inclusion of EngTech into the Training and Development Scheme that, up to now, was only open for IEng and CEng.

Professional engineering technicians contribute to the design, development, manufacture commissioning or maintenance of products, equipment, processes or services. They are required to apply safe systems of work and are a vital part of a team. They are found in every branch of industry, playing a crucial role in the development, production, plant and processes.

The Engineering Council's UKSPEC emphasises the progression possibilities for those entering the profession to achieve their career goals.

By applying yourself at the level of Licentiate EngTech, it enhances your chances of further applications at higher grades

and gives you the opportunity to hone your report-writing skills. It also bestows the title of LCIBSE EngTech as a post nominal, and gives you professional status. A company that employs chartered engineers, incorporated engineers or engineering technicians will enhance its ability to win potential business. In many cases, evidence of employing registered engineers is necessary to the award of contracts in the UK and overseas.

To gain registration, each engineer or technician must submit evidence of education, training and professional experience. Implementing a CIBSE Approved Company Training Scheme will provide that training and professional experience in a structured format.

For more information contact Olwen Williams on 0208 772 3605 or email owilliams@cibse.org

Seize the opportunity to respond to key proposals

CIBSE is trialling a web-based system to make it easier for members to comment on government proposals.

The government is required to consult on policy and on measures to implement policy. However, it is not easy for busy professionals to find the time to contribute.

The web tool is being tried out on the current consultation from the Department of Communities and Local Government (DCLG) on the Definition of Zero Carbon Homes and Non-Domestic Buildings. This proposes a definition of a zero-carbon new home and also sets out current government thinking on zero-carbon new non-domestic buildings.

The European Commission is currently developing proposals to revise the Energy Performance of Buildings Directive, and CIBSE is in

discussion with DCLG over aspects of this. The Health and Safety Executive has recently consulted on its strategy to further reduce the incidence of injury and ill health in the workplace, and CIBSE has contributed a response.

The next major consultation, the forthcoming set of changes to Part L of the Building Regulations, will arguably have the greatest impact on the day-to-day work of most CIBSE members.

Contact Samantha McDonough, policy manager, with any suggestions for other policy issues for CIBSE to cover, at smcdonough@cibse.org

To comment on the zero carbon proposals, go to the consultation section in the Knowledge Bank on the CIBSE website, call Alexander Burford on 020 8772 3631, or email aburford@cibse.org

Training and Development

Submissions

Trainees on approved employer-based training schemes are respectfully reminded to submit their objective achieved reports and covering annual overview on an annual basis (on anniversary of training commencement date).

The closing dates for submissions to be received in time for consideration at forthcoming meetings of the Training and Development Panel have been announced. Submissions for the May T&D Panel meeting need to be in by 30 April, and 20 June is the closing date for the July meeting.

Training submissions and any queries, plus employers' enquiries and applications for approved company training schemes should be addressed to Olwen Williams, training and development administrator, on 020 8772 3605 or at owilliams@cibse.org

Forum – February 2009

A training and development forum will take place at CIBSE HQ during February 2009. This is open to all companies with training schemes leading to EngTech, IEng or CEng – whether they have, or are applying for a CIBSE-approved scheme or have trainees following an individual, employer-based scheme. Contact Olwen Williams owilliams@cibse.org or 020 8772 3605 for further details.

CPD monitoring

Members are advised that other institutions are taking CPD very seriously. At present we continue to sample members randomly for CPD but all members should be evaluating and reviewing their CPD even if they have not been selected. Previous CPD monitoring exercises undertaken indicated that several members who returned questionnaires did not have a plan for their CPD. We recommend that requirements for CPD are reviewed at least annually. The results of this review should be developed into a plan that enables the CPD requirements to be addressed in an effective manner.

Free access to research journals for members

CIBSE and SLL members are now able to access two new journals.

The *Building Services Engineering Research and Technology Journal* (BSER&T) is now freely available to CIBSE members, while SLL members can get free access to *Lighting, Research & Technology Journal* (LR&T).

Both journals are peer reviewed and research focused, and feature papers on a range of topics. The journals will provide members with an invaluable resource of in-depth knowledge and information.

BSER&T publishes high-quality original research relevant to today's built environment. It covers the full range of energy and environmental services in buildings including heating, ventilation, air conditioning, electrical services and water supply, to name just a few.

LR&T publishes papers on

all aspects of light and lighting, ranging from the human response to light, to all aspects of the science of light generation, light control and measurement – making it essential reading.

Members will be able to access the full archive of each journal – 40 years of publications for LR&T

and 30 years for BSER&T.

Access to both journals is available online from the members' area of the CIBSE website (www.cibse.org). Simply log in to the Members Area – using your CIBSE, or SLL membership login as appropriate – via the links to the journals.

What if I am having problems with getting access to CIBSE Journal?

It could be that your safety settings are not allowing you to get access; try adding the following URL's as a 'trusted site': bse.sagepub.com or lrt.sagepub.com. Please ensure you do not include "http" or "www" in the URL. If you continue to have problems please email Richard Howard at rhoward@cibse.org

How to order the print version of BSER&T or LR&T

Members should contact the subscriptions department: email subscription@sagepub.co.uk tel: +44 (0) 20 7324 8701 and state they are CIBSE members to receive the volume at the highly discounted rate of £50.

How do CIBSE members gain access to LR&T as well as BSER&T?

CIBSE members wanting to order an additional LR&T online-only subscription for £10 should email Marie Dignan at mdignan@cibse.org

The Ken Dale Travel Bursary

Applications for the 2009 Ken Dale Travel Bursary, which will see one member travel to another country to carry out research for the industry, are being sought by CIBSE.

The Ken Dale Travel Bursary was first launched in 2008. It is offered to those CIBSE members in the developmental stage of their careers who wish to spend three to four weeks outside their own country researching areas connected to their field of work and that will benefit CIBSE, their employer, their clients, and the profession in general. The bursary offered is between £1,500 and £4,000.

Darren Robinson was the winner of the bursary in 2008. His research study was titled "Sustainable masterplanning: evaluation of cutting-edge studies", which focused on describing and



Darren Robinson is presented with his certificate by CIBSE president, John Swaffield

Denmark and Finland.

Robinson described the experience as: "A once-in-a-lifetime opportunity, during which I discovered many interesting aspects of urban sustainability in different countries."

His presentation at the CIBSE Council in October 2008 was enthusiastically received by council members and he was later presented with a certificate at the President's Awards Dinner.

If you would like to apply for the 2009 Ken Dale Travel Award, further information and an application

form are available at www.cibse.org

The closing date for applications is 31 March 2009. If you have any questions please email Chloe Lacey at clacey@cibse.org

form are available at www.cibse.org

The closing date for applications is 31 March 2009. If you have any questions please email Chloe Lacey at clacey@cibse.org

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Shedding little light

Energy-saving bulbs have come under fire from a national newspaper campaign. **Carina Bailey** reports on the myths surrounding the issue and the challenges these pose to lighting professionals

Last month, amid the dark days of early January, one British national newspaper hit on a bright idea. "Stock up now. We've got 25,000 to give away", ran the strap line on the front page of the *Daily Mail*. What the paper was keen to hand out to its readers were "traditional" incandescent 100W light bulbs. Why? Because these "beloved" incandescent bulbs are soon to disappear after a 130-year history of lighting up our residences.

The *Mail's* complaint over the European Union's decision to replace 100W incandescent bulbs with low-energy compact fluorescent lamps centred on the potentially "harmful" affects of compact fluorescent lamps (CFLs), as well as their apparent higher cost. But, says Peter Hunt, chief executive of the Lighting Association: "The *Mail* gave away 25,000 100W lamps, but did they put a warning on saying 'every one of these will cost you £7 more per year than a low-energy bulb'? They've just cost their readers

£175,000 in energy costs."

According to the *Daily Mail*, CFLs can cause health problems such as skin rashes, migraines and epilepsy – but, so far, the evidence is only anecdotal, says Hunt. Despite this, his association is working closely with groups dealing with conditions such as Lupus in order to try to help them find light sources best suited to their needs.

Hunt insists the mercury content in CFLs is not "dangerous" to dispose of, as the *Mail* claimed. Most of the bulbs contain just 5mg, with recycling sites available for disposal.

But surely we all have to agree they are more expensive compared to filament bulbs? Apparently not. CFLs last 10 times as long as an ordinary tungsten bulb, making them cheaper in the long term, and their price is set to



drop once their popular tungsten cousins are no longer available.

The accusations that CFLs don't work with dimmer switches and take too long to warm up are also misleading, according to Hunt. He says that this may have been the case about 20 years ago, but technology has leaped forward since then, with full light possible within five seconds. And, even though lamps for dimmer switches are expensive now, they are expected to fall in price in the next 12 months as more solutions hit the market.

Hunt admits that CFLs did have a tendency to flicker when they were first developed, but this is a problem dating back to the early 1980s, when they used to run at just 50 hertz. Now they can operate at 30,000 to 50,000Hz, according to the Society of Light and Lighting.

But there are still a few problems

to resolve, including their size and the number of CFL candle bulbs that are currently available to match a

tungsten's 60W output. Hunt sees this as a genuine issue but, with so many new products appearing regularly, he expects that by the time incandescent bulbs are phased out there will be more choice on the market. He also concedes that there are only two types of dimmable CFL bulbs available now, which is why they are more expensive.

Mike Simpson, president-elect of CIBSE, says: "The only reason incandescent bulbs are being banned is the take-up of CFLs has been abysmally slow. We have had the choice; now we are going to be forced to do it. Maybe people don't like their choice being taken away. But the government can't allow people to make choices that are going to ultimately be harmful."

Continuing to use incandescent bulbs at the rate that we will undoubtedly emit more CO₂, but

Phasing out the bulbs

The government, major retailers, lighting associations and power companies agreed to begin a voluntary four-year phase out of incandescent light bulbs from January 2007 in the UK.

In January 2007, stocks of 150W bulbs were no longer displayed on major retailers' shelves. This year was the turn of the 100W bulb; next year it will be the 60W; and by 2011 stocks of the 40W and 25W bulbs will no longer be replenished.

The move precedes a wider EU initiative to phase out incandescent lights and less energy-efficient lamps in homes across Europe. A draft EU decision to implement this initiative will now be scrutinised by the European Parliament and is scheduled for formal adoption by the European Commission in March 2009. Should it be passed, all clear lamps involved should be phased out by 2016.

Myth-buster

Myth: CFL bulbs are too big

Reality: The latest generations of CFLs offered by major manufacturers are no longer very large. In some cases they are slightly smaller than their incandescent bulb equivalent.

Myth: Frequent switching reduces the life of CFLs

Reality: Not any longer. The current standards for 'Energy Recommended' accreditation requires more than 3,000 switching cycles per 8,000 hours of tested life, which is many more than would be necessary for normal domestic use.

Myth: CFLs need to be left switched on for more than 45 minutes because they consume so much energy when first switched on

Reality: There is no reason to keep a CFL switched on for longer than a normal incandescent lamp, as they do not consume any greater energy during start-up and run very efficiently after two or three seconds.

Myth: CFLs cause epileptic-type fits and mental disturbances

Reality: They give a flicker-free, non-stroboscopic light.

Myth: The light intensity of energy saving lamps could damage my retina

Reality: Energy-saving lamps do not present any risk to the retina. Studies have examined this and concluded that looking at energy saving lamps does not damage the eye.

Source: Society of Light and Lighting



■ It's great that we have debate because a lot of people are badly informed. There's no doubt CFLs could be used an awful lot more by the general public ■

what harm do campaigns like the *Mail's* have on the lighting industry?

Simpson, who also works for Phillips Lighting, says: "I don't think it does, apart from perhaps giving the general public the impression that the lighting industry has railroaded this sort of thing through.

"This is happening across Europe and across the world. Australia is one year ahead of us on this. This is a European Union initiative but at least a dozen countries around

the world are already going down the same route. China is now considering it as a means to help reduce its power demands.

"It's not something that is happening just in the UK; it is happening across the world."

Simpson expects new LED lights to be available on the market in the next 12 to 24 months, which should offer even greater energy savings and last longer than CFLs. "What this ban will do is speed up the alternatives to what's currently available," adds Simpson.

Patrick Baldrey, president of the Society of Light and Lighting (SLL), says the society supports the use of all types of energy-saving lamps – but where appropriate. "For example, where an elderly person wants a hall light not on all the time but just when he wants to go to the bathroom at 3am, a CFL may not be appropriate."

He points to the fact that new houses are built with tungsten halogen lights to comply with

building regulations, as they are twice as efficient as normal tungsten bulbs. "There are other alternatives out there," says Baldrey, "CFLs are just one of them."

And far from believing articles like the *Mail's* damages the lighting industry, he believes that it is actually good to stimulate debate. "It's great that we have debate because a lot of people are badly informed. There's no doubt CFLs could be used an awful lot more by the general public."

Leading lighting company OSRAM Ltd agrees information is the key. Its retail marketing and communications manager Lee Dryden says: "The challenge in terms of communications that we all face in the industry is to positively educate the market about the real truths on the performance, appearance, quality and benefits that modern energy efficient lamps – be it CFLs, halogen or LED – can offer, to bust any out-of-date or negative myths that may come to

the surface as we progress through the biggest technological transition in the history of lighting."

Simpson adds: "As an industry I think what we did more than 12 months ago was to anticipate what would happen when the banning process started, looking at all the arguments for and against and we made sure we had all the answers.

"All the answers are there; all we can do is just rehearse and bring out the facts – the balanced story – to people as they ask the questions." ●

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Let's act now to make existing buildings efficient

With the introduction of Energy Performance Certificates (EPCs) and Display Energy Certificates (DECs) it is becoming apparent that buildings in operation are failing in terms of energy efficiency. If we are to meet the set targets for zero-carbon buildings within the next decade, urgent action is required to remedy this.

Most buildings are designed to meet the minimum energy efficiency requirements of the Building Regulations. This compliance approach does not take into account actual energy use and, indeed, how buildings are used in real life – which can account for 50 per cent of carbon emissions. In addition, commissioning periods are frequently put under pressure to allow buildings to be completed on time. If the building is not set up to operate within the correct parameters then it will be at a disadvantage from day one. Moreover, overly complex control strategies and systems may not be fully understood by the facilities company and as such the systems are not operated in accordance with the design.

Occupants can also be unaware of energy wastage, with out-of-hours energy usage being too high. And yet building performance in terms of comfort and efficiency is not fed back to the design team, so the ability to gather feedback for future designs is greatly reduced.

But there are some remedies to all of this. The performance of all buildings should be recorded on a national database and made available to all. By providing some basic information about the building as well as the energy breakdown, realistic benchmarks

could be generated for a range of building types. This would highlight poor-performing buildings to the owners which could then be remedied.

We should also provide designers with a better understanding of where additional effort should be focused on future buildings; and draw attention to the many examples where significant energy savings can be made through small additional capital cost or by

 **The performance of all buildings should be recorded on a national database and made available to all** 

occupants changing their behaviour. These changes could also highlight any weaknesses in designing to minimum Building Regulation standards.

There should be greater input from the services engineer after Practical Completion to ensure that the facilities company and the occupants understand how the building has been designed to work. Finally, there should be an ongoing role for the commissioning engineer in the first year to fine-tune the building to account for different seasons.

Alan Fogarty
Partner, Cundall

We need much more debate on the EuP directive

The logic behind the European Energy Using Products Directive (EuP), which is to look at products over their life cycle rather than just emissions emitted during serviceable life, is to be applauded. But all of the restrictions coupled to the lifecycle have to be realistically obtainable using the best available technology.

Let us take, for instance, the issue of nitrogen oxide (NO_x). The focus in the UK has been on energy efficiency driven through Building Regulations and the Energy Performance of

Buildings Directive, leaving NO_x as a secondary factor when it comes to the energy efficiency of manufacturers' research and development programmes. The working document of the EuP states that a NO_x limit of 35mg/kWhr must be met by 2013.

The hardest hit industry will be the UK domestic compact oil boiler manufacturers, whose current NO_x levels are around 200mg/kWhr.

Another proposal is that the heating system should be considered as a whole by inputting data into a model in much the same way we attempt

to do within the Simplified Building Efficiency Model. However, serious thought needs to go into the methods for modelling and labelling such a system, including the rating of individual system component efficiencies and the fact that these components can be used in various systems with modulating outputs.

Therefore, a system component should be labelled with an operating range wide enough not to necessitate multiple label requirements for single system components. The overall system component efficiencies can then be averaged to give a system rating. The current proposal states that the heat generator manufacturer is responsible for labelling the system but, unless we move to a market of fully packaged heating systems, how is the manufacturer to know what goes into the system as built?

I believe that, if the averaging method is not used, then the designer and installation companies will need to sign off on overall system efficiencies. This would be even more complex on refurbishment projects.

So let's hope for some more lively debate before the proposed regulatory implementation of the first quarter 2009.

David Hughes
*Technical director,
ICOM Energy Association*

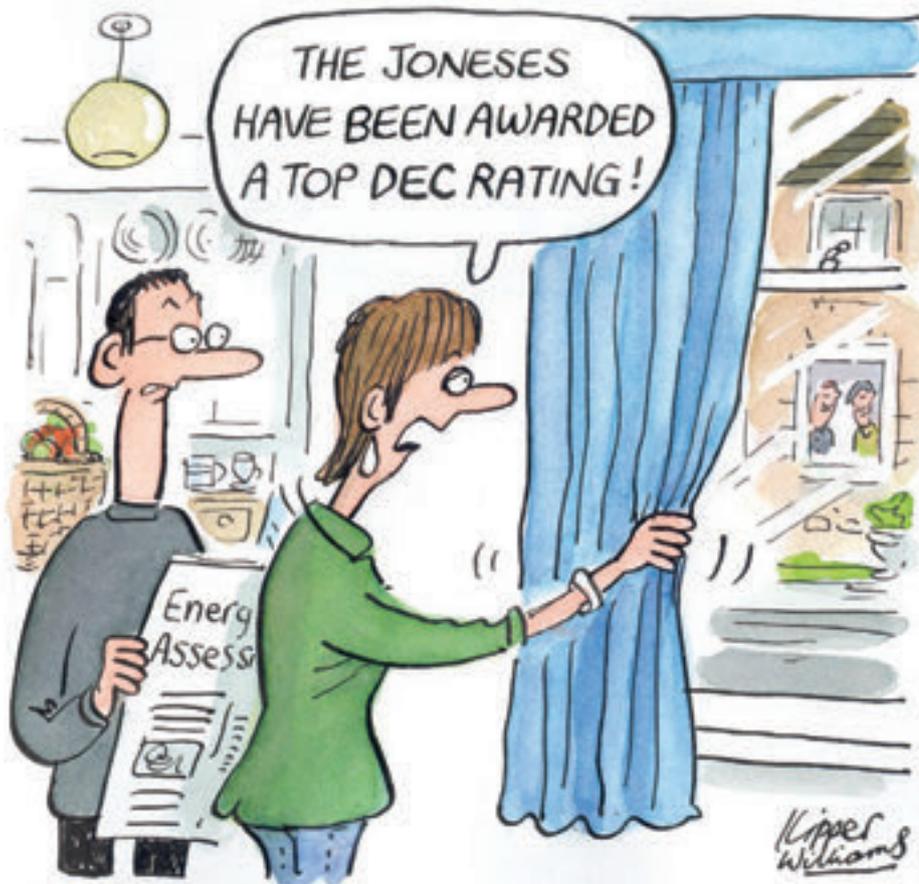
Heat pumps are the key to boosting renewables

Over the last few months there has been much activity in the Heat Pump Association (HPA) regarding the Directive for the Promotion of Energy from Renewable Sources (RES), the EU policy directive which has been in development during 2008.

An EU definition of RES was required to permit individual member states to select and prioritise their plans for achievement of EU targets for up to 20 per cent of energy from renewables by 2020.

The European heat pump industry position, which the HPA helped to develop, dealt with several key issues in the RES regarding heat pumps.

Prior to Christmas, the EU parliament voted in favour of including air source and water source – as well as ground source, which had been already included – and also agreed that the renewable formula would be based upon delivered energy. Importantly, the Ecolabel requirement was also removed; however, there will be a minimum Seasonal Performance Factor applicable for heat pumps to qualify.



This outcome constitutes a major success for the heat pump industry and a major boost for the EU states in achieving their renewable obligations. Now it is time for the UK to embrace this established technology as an important element of the building services contribution to both the renewable agenda and the reduction of carbon emissions.

TR Seward

*Commercial manager
HPA (Heat Pump Association)*

Target the clutter and contradiction of government policy

Congratulations on the launch of the new *CIBSE Journal*. Sustainability is clearly a priority challenge for the profession, despite the economic climate, and I'm sure this will be a prominent feature of the publication.

Times are undoubtedly tough, but we remain convinced that sustainability can go hand in hand with profitability and that there is a strong business case for sustainable buildings. The benefits for those who design, construct, manage, own and occupy them can come from increased future value, new business opportunities, compliance with future regulations and a growing understanding that sustainable buildings can offer a more productive and enjoyable working and living environment.

However, in order for this to be realised, we must have a clear and consistent policy landscape. It will be particularly important for this publication to address, on an ongoing basis, the coherence of both government regulations and industry initiatives. There is arguably far

too much contradiction and clutter. We must ask the tough questions – what adds value, what duplicates effort and what needs to be improved? It's vital to tap into the knowledge and expertise of services engineers to inform this analysis.

Paul King

*Chief executive,
UK Green Building Council*

Employers must help us train our future engineers

I welcome the publication of the new *CIBSE Journal*. As a former CEO for CIBSE (until 1997), I have watched the institution continue to grow and flourish as the importance of building services engineering has become more apparent both in sustainability terms and as a significant component of the modern economy. It is clearly time for a new publication, to provide a modern vehicle to communicate the value and constraints of building services engineering to its users, and to share the burgeoning knowledge base accumulating in the profession.

As CEO of the Engineering Council UK, I am committed to addressing the gap between the aspirations of those qualifying in engineering in further and higher education, and the demands of employers. We are uncomfortably aware that training and internships for engineers are among the first things to suffer in a recession. Yet they are the means to give graduates and apprentices the opportunities to gain the experience they need to enter professional employment and gain professional recognition.

We are working with a number of engineering professional bodies and universities to build on

our Gateways to the Profession project to facilitate this ladder of opportunity. It is a particular pleasure for me to see that CIBSE is participating and that South Bank University is one of those seeking to develop an MSc in Professional Engineering under this programme, specifically designed for the building services industry.

In order to make this a reality, and indeed to develop more similar work-based programmes aimed at employed engineers aspiring to become professionally qualified, we need employers to take an interest. The programmes are a good investment in the future, developing professional engineers with a commitment to the employer who creates the opportunity to develop, and with clear business benefits because of the nature of the programmes.

I urge employers to get in touch with Deborah Seddon at the Engineering Council in order to secure their link with the future.

Andrew Ramsay

*Chief executive,
Engineering Council UK*

How do we remove waste from the tendering process?

At a time when it is even more vital for all business processes to be efficient and economical, is it now appropriate to review the wasteful practices that have emerged in tendering?

For example, a specialist sub-contractor will receive the full project specification in electronic format for him to print and review, then identify the specific elements relevant to his specialism in order to cost them, and subsequently return an estimate against a tight time-line.

Multiply this across all components of the building services sector and the prolific duplication and waste is shameful. There has to be a better way. But what is it?

Cedric Sloan

*Director General
FETA (Federation of Environmental Trade Associations)*

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.

A hidden profession

How can we hope to attract school children to our industry when the public still do not know the benefits we bring them, asks young engineer **Morwenna Wilson**



Naturally, people like to be praised. The police seek to be commended for maintaining law and order, chefs applauded for rustling up tasty delights, architects congratulated for designing aesthetically pleasing spaces. There is a theme and it is this – the majority of professionals are in the fortunate position that, when they do their job well, it is obvious for all to see and therefore to praise. We, however, as building services engineers are one of the unlucky exceptions.

When a building services engineer has done a good job the heating, ventilation and air conditioning systems work without the occupants even noticing that they are there. The concealed power cables and wiring ensure that when the switch is flicked the lights turn on and the hidden pumps and pipework guarantee that when the tap is turned the water gushes out. These, just a small number of examples of our everyday triumphs, remain largely undetected or are simply taken for granted.

Surely the introduction of sewers and treatment works with their positive impact on sanitation has done the most to prevent disease and improve the health of modern man? However, once again, we remain almost anonymous.

From my personal experience, people can be genuinely interested in building services and about its contribution to the built environment. While conducting walking tours around London for the general public, where my colleagues and I described the services strategies for iconic places such as the Lloyds Building, I was pleasantly surprised by the curiosity of the attendees. The tours quickly turned from programmed two-hour events to three or more hours due to the sheer number of questions from the public who clearly wanted to know more. As a result I cannot help but conclude that it is not that people are uninterested in what we do, it is that they do not yet know that they are interested.

It must therefore be the duty of every one of us in the profession to reach out to people, not only to obtain the recognition we all deserve, but to strengthen the future of our industry by encouraging new recruits. I believe

that education of young people is the key. It is only through touching and influencing the imaginations of children that we can encourage them to engage with technical subjects at school and at the very least have the opportunity to keep a career in building services engineering in mind. Otherwise we simply rely on the majority of people falling into the job, as I and many of my fellow peers have done.

On first appearances, the promotion of services engineering does not seem to be the easiest of tasks. If we are being brutally honest, it is not the most glamorous of jobs. It is not even the most glamorous type of engineering! However, services engineers are in the privileged and highly important position of being able to directly affect the lives and comfort of millions of people wherever they are; whether that is a house, classroom, office, hospital, factory, sports complex, theatre or shop. And how many other jobs involve practical, logical thinking, analytical, creative and communication skills?

Do we really want to deny future generations the opportunity to be involved with such a varied and rewarding industry just because we find it difficult to communicate what we are about?

There are certainly no overnight solutions, or perhaps even definitive ones, to the difficulty of improving our status as services engineers or encouraging people to join our industry. But at least, as engineers, we are armed with one momentous advantage, when have we ever shied away from solving a problem? ●

Morwenna Wilson has been part of Arup's multi-disciplinary building engineering team since graduation. She is the current holder of the CIBSE/ASHRAE Graduate of the Year Award and a member of the CIBSE Young Engineers' Network.

“If we are being brutally honest, it is not the most glamorous of jobs. It is not even the most glamorous type of engineering! However, service engineers are in the privileged and important position of being able to directly affect the lives of millions”





LG at Star City, probably the biggest ever VRF installation in the world



The LG Multi V Space units are hidden out of sight behind louvered panels.



LG

Life's Good

THE WORLD'S BIGGEST VRF AIR CONDITIONING INSTALLATION?

Star City is the name of a residential development in Seoul which is billed as being "a benchmark of construction projects for many years to come".

Due to its sheer scale the project is breathtaking and it will be a huge reference point in Seoul, a city full of stark landmark buildings.

The site consists of four separate buildings, each being used for both commercial and residential needs. Building A is the smallest of the four structures yet even that dwarfs all that surrounds it, as it has 35 storeys above ground and a further three storeys below ground.

Building B has 45 storeys above ground, and Building C has 50 storeys – both also have three floors below ground level.

Finally there is the largest which is Building D. This stands 58 storeys above ground with a further three below street level. One of the biggest tasks when the structure was completed was the installation of the air conditioning.

As it is a new-build, air quality is vitally important as the number of people that will be occupying the buildings will be huge. There are 1,310 dwellings that will be constantly in need of high quality air and air conditioning. LG won the task to create the entire air conditioning system for the whole project.

The air conditioning system had to meet many criteria. It must function of course; however, it must enable the modern and sophisticated appearance, which Star City undoubtedly has, to remain so.

To ensure this, LG has constantly been checking construction quality, and has been persistently trying to keep the huge site as clean as possible, as 'dust is the enemy of the air-conditioner'.

LG already have high standards in all installations, with this site being no exception. They constantly

LG is the world's biggest manufacturer of air conditioning products, so it is appropriate they are completing what is probably the biggest ever job of its kind in the world. The site in Seoul, South Korea, comprises four separate buildings rising to 58 – yes, 58 storeys!!

push for the highest safety standards both whilst under construction and post construction. On such a huge construction project it is only natural that such a large and progressive company be involved to ensure only the highest installation standards.

The company installed 1,314 systems, comprising of 7,654 indoor units to achieve summer cooling and winter warmth. The total value of the job was just over £6m - so, is it the world's biggest VRF air-conditioning site?

LG utilised their new Multi V Space system on this site. Multi V Space is an energy efficient, space saving, and quiet VRF system. It is suited to any site where optimum performance is required to deliver summer cooling and winter warmth. Also the outdoor unit can be sited indoors – ideal for this type of high rise application.

Multi V Space is entirely inverter driven – both compressors and fan motors. Hence it is extremely quiet in operation (up to 10dB quieter than equivalent capacity conventional systems), and highly energy efficient.

LG's Multi V Space can be sited inside a cupboard or a plant room with the fans facing outwards on a louvred wall or exterior grille. The sirocco fans reject the heat away from the outdoor unit to the left and the right which prevents short cycling between the air off and air on.

The Multi V Space systems are currently available in heat pump, and system capacities of either 6Hp or 8Hp.

The outdoor unit only needs access to the front for servicing – thus allowing it to be mounted inside a cupboard in the living area of an apartment block (as was the case in Star City). The minimum installation space requirements are 900mm front access (service space), the rear of the unit can be fitted flush against a louvred wall, or ducting can be fitted if required (ESP can be increased if necessary up to 140 Pascals).

Side access is not required so the units can be placed alongside each other.

One Multi V Space unit can control up to 16 indoor units including Art Cool, cassettes, ducted, wall mounted etc. It can be controlled via the internet, a PC, a deluxe or simple central controller, and local remote controllers.

Despite being designed with internal installation in mind, this product may also be installed outdoors if required.

All products in the LG range benefit from the advanced technical R&D back-up, investment and expertise of the giant LG Group – the world's number one producer of air conditioners.

Disaster management

A good engineer does not equal a good manager and we ignore this truth at our peril, says **Nick Mead**



Here is the news: we have a skills gap. OK, I hear you say, so what's new about that? But I'm not referring to technical skills here – although there's no doubt we have a pretty glaring shortage in a number of disciplines – but to our shortage of management or leadership skills.

As a former director in the building services industry, I'm willing to put my hand up first – I was conscious of my own deficiencies in the role but can also claim in my own defence that I sought to address them. The problem is that we like to promote the best engineers into positions of leadership – and that is not always the best strategy.

Here's a startling statistic from the building services sector skills council, SummitSkills: 60 per cent of companies in the sector do not see it as a problem if their management has not had any formal management training. The implication being, at least for a significant number of firms, that the best person to manage a building services engineering firm is a good building services engineer. While that might work for many companies, it is also a glaring weakness in others.

We are also told that, even before the recession diminishes our resources further, contractors do not have the right level of technical skills to cope if the renewables market grows to anything like the extent it must to meet our low-carbon goals.

"The sector's engagement with skills competence in environmental and renewable energy technologies remains very low," according to Tony Thomas, professor of work-based learning at London South Bank University.

"Most firms wait for market development or government intervention before considering investing in renewables and low-carbon training," he adds. "Failure to engage in the renewables market will damage the industry's profitability and encourage foreign competition to enter the market. We will fall further behind foreign competitors as our craft operatives become less skilled compared with their overseas counterparts."

Yet, fewer than 50 per cent of employers are prepared to release students for college-based training because of short-term thinking. This leaves the growing renewables market at the mercy of 'rogue traders' because, I would argue, across the whole sector we have not had the broad

level strategic vision to see challenges coming or to know how to plan properly for them.

The fact is that without quality leadership and management training, our industry lacks the ability to adapt and survive. This damages our prospects, makes it difficult to attract and retain quality individuals and harms our productivity. So, we have a 'leadership problem'. What should be done about it?

Some have tried to address the issue, but the general experience of building services firms with outside 'experts' is not a happy one, according to Prof Thomas. He estimates that about 80 per cent of the management training courses commissioned by building services firms are of little or no practical use to them.

Gareth Vaughan, of the Heating and Ventilation Contractors Association, believes that the problem lies in "the plethora of courses and providers", which causes confusion and makes the problem worse. "If we can get the right management and leadership skills, we will be able to cope more easily when new technologies come along," he says.

We need something that will both appeal to employers in this sector and suit their particular needs. And, with that in mind, the CIBSE Patrons – a membership group of companies and organisations in building services – aims to work with CIBSE to champion and help take forward a management training programme specifically tailored to our industry.

We would welcome any feedback from people within our sector about the specific management challenges they face as this will inform the content of our programme. You may not agree with any of the above – perhaps you are one of the 60 per cent who feel lack of management training is not a problem – if so, both the Patrons and this magazine will be pleased to hear from you. ●

 **The problem lies in the plethora of courses and providers. If we can get the right management and leadership skills, we will be able to cope more easily when new technologies come along** 

Nick Mead is chairman of CIBSE Patrons. Contact the Patrons via their co-ordinator Chris Brown, cbrown@cibse.org

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Down to zero

In the first of a regular column on regulatory matters, **Hywel Davies** looks at the questions surrounding the current drive for carbon-neutral buildings



The UK government is committed to the target of zero-carbon new homes by 2016, and is currently working towards a goal of zero-carbon non-domestic buildings by 2019. The main mechanism for delivering this commitment is the Building Regulations – although the planning system, in particular the London Plan, is also being used to drive a low-carbon agenda for new buildings.

This goal is part of a wider web of regulations governing emissions and energy use in the commercial sector, in particular the building stock. This includes the European Energy Performance of Buildings Directive and its associated regulations, the Energy Using Products Directive, aspects of the Energy Services Directive and the Carbon Reduction Commitment (CRC).

The original idea behind a zero-carbon home was that it should generate sufficient power for the appliances within it. This is currently Code Level 6, according to the Code for Sustainable Homes. In effect, every home would become a power station. This idea has prompted some considerable debate about what exactly a zero carbon home, or building, should be.

Questions arise such as, should power for appliances be included? Should the building have to generate its own electricity for them, from within its own site? Could it come from a localised generation facility within a development, such as a combined heat and power scheme; or be generated by a turbine at the top of the nearby hill, and delivered to the development by private wire?

These questions all point to different servicing strategies for the homes of the future. These strategies could include homes full of renewables, such as photovoltaics, solar thermal, micro-CHP (combined heat and power) or heat pumps. There's also the alternative prospect of a low-carbon development with localised energy generation.

But what exactly is meant by 'zero carbon'? That definition is currently the subject of a consultation by government that closes on 18 March. This consultation leads into the next round of amendments to Part L of the Building Regulations, along with the guidance in the Approved Documents and the various Compliance Guides and other supporting guidance documents.

Current expectations are that the consultation on Part L

will start in early April this year, and that the final version of the new Part L will appear later this year, to come into force next year – possibly as early as April 2010. But, needless to say, these timetables can be subject to alteration or delay during the process of consultation, review and parliamentary scrutiny.

However, the aim of meeting the 2016 target for homes, or 2019 for other buildings, requires some fairly significant steps to be taken. The initial steps will be set out in the forthcoming revisions to Part L.

The government has accepted the industry view that there needs to be a clear programme for changes to the Building Regulations, so that all those affected can plan for the longer term. Manufacturers need to plan to invest over realistic product cycles, while contractors and consultants will want to look ahead at the skills needs that future changes to the Regulations will demand. Further revisions to Part L are expected in 2013, 2016 and 2019 – making four key stages on the path to zero carbon.

However, while 2016 may seem a long way off, the 2010 target could mean a 25 per cent cut in carbon emissions for new builds, compared with 2006 levels. Details still have to be worked out, though, on how the 25 per cent target is to be set, what the notional building will look like, and whether all buildings will have to meet the same target, or whether it will be an average across the stock. These details will all be the subject of the Part L consultation, expected to start in early April.

Once again, CIBSE will be looking at these proposals very carefully, and asking members to contribute to the preparation of our response to government. As well as using the website for this, CIBSE's technical department will also be organising a series of events to hear what our members think of the proposals, and how they see them working out in practice. ●

Hywel Davies is technical director of CIBSE

 **Manufacturers need to plan to invest over realistic product cycles, while contractors will want to look ahead at the skills needs that future changes to the Regulations will demand** 

If you wish to be involved in the zero-carbon consultation, details can be found at www.cibse.org – go to the 'consultation' link on the 'knowledge bank'. Alternatively, contact Alexander Burford at CIBSE on 020 8772 3631 or aburford@cibse.org. We need your comments by 6 March.



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Measuring



up

This year's winners of the CIBSE Low Carbon Awards provide plenty of grounds for optimism that the profession is firmly on the right sustainability path



LOW CARBON
PERFORMANCE
AWARDS 2009

From individual houses to large infrastructure projects, the entries for this year's Low Carbon Performance Awards provided evidence that the energy performance of existing buildings is finally getting the attention it urgently needs.

CIBSE's 100 Hours of Carbon Clean-up campaign during 2008 placed the focus firmly on the 'nitty-gritty' of energy efficiency and carbon cutting. The idea was for individuals to feel empowered to take decisions, and to feel that their efforts were making a difference.

The campaign took place against the backdrop of the government sleepwalking away from where the main focus for combating climate change needs to be. While the building services industry continues to argue for a major focus on existing buildings to dramatically cut energy demand, politicians are fixated on new nuclear power stations and offshore wind farms to try to plug our ever-widening energy gap.

However, this year's awards suggest that the industry's efforts are starting to pay off. A perfect example of this is Sigrid Stagl and Peter Kaufmann's work that won **Refurbishment Project of the Year**. This innovative project takes the energy fight right to the front line by showing that real improvements can be made in the thousands of typical Victorian houses around the country.

Latterly they won the attention of the Energy Minister, but initially they had to battle the hostility of council planners because the house is in a conservation area. Despite everything, Sigrid and Peter were still able to reduce carbon emissions by around 72 per cent while also delivering a comfortable and attractive refurbishment.

The biggest challenge was finding suitably skilled contractors to implement the type of work they wanted to do, so they ended up using different firms for separate stages. And they devised a project webpage to disseminate what they learned to help improve skills levels across the industry: <http://home2.btconnect.com/eco-refurbishment>

The **Best Carbon Saving Programme** during the 100 Hours campaign went to Simons Group of Lincoln. It was particularly congratulated for demonstrating the importance of measuring and monitoring patterns of energy

consumption to make the most effective improvements.

Simons used its on-site facilities team and sub-metered distribution boards in their headquarters building, which demonstrated that the group was wasting up to 40 tonnes of CO₂ a year through poor management of 'small power' (lighting, PCs, and so on). The campaign enabled Simons to promote different patterns of use throughout the staff, which led to the building rising from a probable D rating to a B on the Display Energy Certificate (DEC) the firm is about to voluntarily commission.

Similarly, BDP in Belfast, which won the Best Campaign Award for an SME (small to medium-sized enterprise) set about using the campaign to "permanently change employee behaviour" on the back of an innovative '12-a-day' message: 12 sustainable actions for each member of staff, with each action averaging one minute.

Actions included reusing and recycling paper/plastic cups; adopting the 'cardigan culture' (putting on another layer of clothing rather than turning up the heating); and taking the bus to work or car sharing. BDP actually exceeded a number of its targets, including reducing heating fuel consumption by 12 per cent – above expectations.

The advent of new regulatory tools, although launched amidst much confusion, should eventually make the industry's task of measuring energy usage much easier – assuming people can be persuaded into making proper use of them. This was strongly reflected in this year's awards with strong entries for the EPC and DEC categories.

Low Carbon Energy Assessors are nominated for these awards and **Energy Performance Certificate (EPC) of the Year** was won by Richard Hipkiss of i-prophets energy services based in Coventry. He was able to persuade his

“ The campaign took place against the backdrop of the government sleepwalking away from where the main focus for combating climate change needs to be ”

CIBSE Awards

And the winners are...

Best Carbon Saving Programme

Winner: Simons Design
Runners-up: BDP London; MPS; Natural History Museum; Royal Household; TfL; UBM

Best Carbon Saving Programme – SME

Winner: BDP Belfast
Runners-up: HLM Architects; Wilo UK

Champion of Carbon Saving Champions

Winner: Quinten Babcock, TfL
Runners-up: Glynnan Barham, Natural History Museum; Brian Spires, HLM Architects

New Build Project of the Year

Winner: Faber Maunsell, ZEBRA Project
Runners-up: BDP, Leigh Academy; NG Bailey, Solais House

Refurbishment Project of the Year

Winner: Sigrid Stagl and Peter Kaufmann, Brighton House Project
Runner-up: Faber Maunsell, BBC Broadcasting House

Innovation of the Year – design or technical

Winner: i-prophets, digitalenergy
Runner-up: HLM, HLM Space

Product Innovation of the Year

Winner: PV Systems
Runner-up: Venture Lighting, Natural White

Client of the Year

Winner: Leisure Connections
Runner-up: Somerfield

Low Carbon Energy Assessor: EPC of the Year

Winner: i-prophets, Alexandra House
Runner-up: Faber Maunsell, ZEBRA project

Low Carbon Energy Assessor: DEC of the Year

Winner: TfL
Runner-up: i-prophets, Alexandra House

Low Carbon Operator / Manager of the Year

Winner: Philip Belton, Medway Hospital
Runner-up: Quinten Babcock, TfL

Low Carbon Consultant of the Year

Winner: Andrew Gardner



client to go beyond doing what they are forced to by the legislation to actually use the EPC and see if they could improve their building.

This head office housing 170 people scored D on its EPC – fairly typical for that type of building – but Hipkiss explained that the challenge wasn't the design intent, but the energy management in operation. He was able to convince the occupier to look at the recommendations for improvements that come with the EPC, and to have a voluntary DEC carried out, which brought the 'actual performance' message over very clearly and prompted a number of improvements – many focused on occupant energy consumption behaviour.

Hipkiss also received a special commendation in the DEC category because of his promotion of voluntary DECs as a way of highlighting real energy performance.

Quinten Babcock of Transport for London won the **DEC of the Year Award** as well being named **Champion of Carbon Saving Champions** – see the Big Interview feature on page 34 of this issue for more details of his impressive portfolio of work in this area.

The **Client of the Year** category showed that the penny has dropped with many building owners and operators, and that energy certificates have helped to highlight issues in a way that resonates with occupants. This year's winner is Leisure Connection, which operates a portfolio of 80 properties for various public sector clients including a number of major sports centres.

Head of property services Paul Bailey implemented a number of small-scale projects, but secured maximum return by replicating them across as many properties as possible. Initiatives included the installation of swimming pool covers to reduce heat loss from the water; fitting variable speed drive controls to air handling equipment; recommissioning the BMS; and the installation of sub-metering.

He also set up an education programme to ensure that energy "forms a part of every employee's role". Many of the staff now enthusiastically explain energy issues to visitors. All of these initiatives paid dividends as the organisation is subject to mandatory DECs.

The importance of DECs in taking buildings on to the next level of carbon reduction was a theme that ran throughout this year's awards. The online wizard developed by i-prophets to help with the roll-out of DECs

■ **The Client of the Year category showed that the penny has dropped with many building owners and operators, and that energy certificates have helped** ■

was judged to be the **Low Carbon Innovation of the Year – Design or Technical** because it significantly simplified and eased the process of information collection, so making the energy assessor producing the DEC up to 50 per cent more productive.

The **Low Carbon Innovation Award – Product** went to the Heritage Solar Slate developed by PV Systems because, again, this is aimed at making it easier for engineers to integrate low carbon technology into an existing building. The solar slate looks identical to conventional slate, and so can blend into the roof, but it also produces valuable, low carbon solar energy – a perfect marriage of old look and new process to deliver carbon savings to a wider range of buildings. Its 'fit and forget' approach also chimes well with the desire of the industry to make renewable technologies simple and accessible.

Despite all this focus on existing buildings, there were still some marvellous things being done in the world of new build. Faber Maunsell took the accolades this time with its ZEBRA Project that won **New Build Project of the Year**. ZEBRA stands for Zero Emissions Building Renewing Alnwick, which was designed by Faber's Leeds office. It achieved the highest-ever BREEAM rating at design stage of 80.72 per cent and an A+ for its EPC (-14). Appropriately, it houses part of the Department for Environment, Food and Rural Affairs, and showcases natural and passive design measures that offset the carbon emissions from its electricity, gas and biomass, making it one of the first zero-carbon office buildings in the country.

These prize winners and the many other entrants give us just a flavour of the energetic work going on in the field to tackle emissions from existing buildings, deliver energy certificates and ensure that the building services industry is spearheading the drive for a low carbon built environment. And they give us considerable hope for the future. ●

Unsteady times inspire steady thinking

"The AET Hiross Flexible Space underfloor air conditioning solution reduces overall costs, whilst improving net lettable area. It also affords greater diversity and sustainability in tenant configuration."

Mr. K T Heng, Project Director, Chinachem

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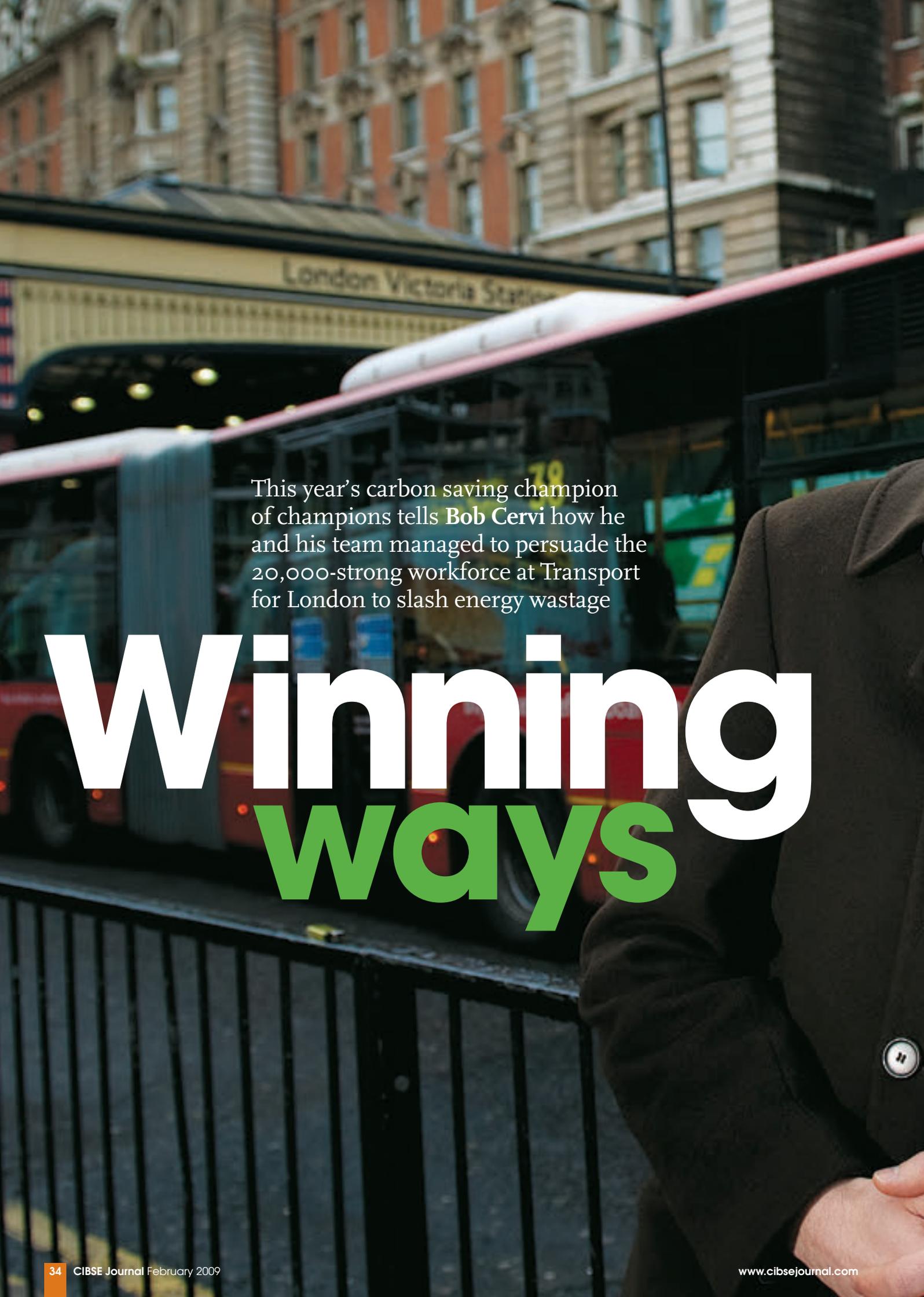
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This year's carbon saving champion of champions tells **Bob Cervi** how he and his team managed to persuade the 20,000-strong workforce at Transport for London to slash energy wastage

Winning ways



Back in the mid-1990s, when green issues were far less prominent, Quinten Babcock had the apparent foresight to steer clear of motor manufacturing as a career choice. Now that car makers are in the doldrums because of the economic downturn and a slowness to offer more environmentally friendly vehicles, that decision turns out to have been a prescient one.

Babcock, this year's winner of the CIBSE Champion of Carbon Saving Champions Award, says he can trace the decision back to a visit to a Ford car plant in Spain when he was doing an engineering degree with a focus on manufacturing. "Seeing 1,500 cars come off a plant in eight hours tends to reinforce your feelings about the negative environmental impact that the car industry has. I then decided to target an environmental aspect of engineering for my career."

Turning his back on Ford, Babcock joined building services consultancy Faber Maunsell where, he says, he went into research because "I didn't want to just size pipes, I wanted to influence others to size them better. But I then realised that you don't really save the carbon until you manage the utility budget and make it [the carbon footprint] smaller." >



Energy efficiency improvements to TfL's offices at 25 Eccleston Place helped it to win two CIBSE awards

■ Getting people to switch off their PCs is a challenge. We created a calculator tool to work out how many slices of toast could be made from the energy saved in turning off office PCs at night ■

> And that's exactly what he and his current colleagues have done at Transport for London (TfL), the body that oversees public transport in the capital. Babcock is an environmental manager within the TfL sustainable buildings team, which has taken control of the facilities management budgets for 25 out of 50 head office 'buildings' that house 12,000 staff in central London. All 25 have a Display Energy Certificate (DEC), and the team is now working with landlords to produce DEC's for some of the remaining 25, which include not only buildings but newspaper stands, car parks, mini-offices and areas of TfL-owned land.

Babcock has had what is perhaps one of the most challenging tasks when it comes to making office buildings more energy efficient – persuading the workforce to make it happen. As he puts it: "Your core role is ensuring that the occupants of the buildings are comfortable, in the most energy-efficient manner possible."

While the sustainable buildings team as a whole has been working on increasing energy efficiency to meet the Mayor of London's target of a 60 per cent cut in carbon emissions by 2025, Babcock's role has focused on trying to change TfL staff's behaviour. And, in 2006, when he started his current job, the CIBSE 100 Days campaign for cutting energy usage in offices was a significant help to him, he says. "We still send out some

of the posters [from the 2006 CIBSE campaign] to some of our environmental champions."

These champions have been recruited by Babcock to be in the front line of trying to persuade TfL staff to conserve energy. The champions are made up of around 200 volunteers as part of the aim of getting "a champion on every floor", as Babcock puts it. But don't these do-gooders get up the noses of their colleagues?

"Getting people to switch off their PCs is a challenge," Babcock retorts. "So you have to provide some tools [to the champions] to demonstrate the benefits to staff. For example, we created a calculator tool to work out how many slices of toast could be made from the energy saved in turning off office PCs at night.

"This year we're working on developing some training for the volunteers about engaging with colleagues. We want to help our champions develop the confidence to go out and persuade their colleagues that they can 'save' slices of toast and cups of tea."

The information tools now at the champions' disposal also include monthly data posted on the TfL intranet showing, in simple terms, how much equipment is being left on at night as well as out-of-hours energy consumption savings. More than 90 separate office floors have been ranked against each other, prompting occupants to compete for higher league table positions. >

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“There needs to be some sort of public relations campaign on this. The public needs to know that getting an A-rated building is really hard”

“There needs to be some sort of public relations campaign on this,” insists Babcock. “The public needs to know that getting an A-rated building is really hard. We’ve put a ‘how to read your DEC’ poster next to our DEC’s to try to get our occupants up to speed with the ratings.”

Babcock also argues that giving buildings that do not have any energy assessment an automatic G rating is letting them off the hook. This default rating gives an efficiency score of 200 but, says Babcock, they should be getting a 999 “emergency” score.

On the wider industry front, Babcock – who at 33 perhaps still counts as one of the younger generation of building services engineers – is convinced that key players can do more to improve the nation’s, and not just London’s, building stock. “What gets me about the Building Regulations is all this work has been done to affect 1 per cent of the building stock, while there are 22 million buildings out there already [that need to improve efficiency].”

Babcock’s answer to this lack of activity for existing buildings is getting both designers and contractors “on board” to take responsibility for energy efficiency. “Consultants like to lord themselves with their designs, but unless they show that those designs work in practice and take more responsibility for that energy consumption in practice, we’re barking up the wrong tree.

“Contractors and facilities managers have to take on this responsibility too. Good design is needed, but if people don’t run the buildings afterwards correctly, then all the good design in the world won’t save energy.”

Likewise, Babcock believes that the government’s aim of having zero-carbon new homes in the future is pointless when so much more energy could be saved on improving a small percentage of existing stock. It’s quickly apparent, in talking to Babcock, that his zeal and passion for reducing energy has proved crucial in recruiting that army of volunteer champions that is making such a difference to the carbon footprint of TfL’s buildings.

Babcock, who has a baby daughter and is clearly thinking about the future, confesses that he has another incentive for driving forward TfL’s energy saving strategy. Some years ago, he toured the world for 18 months with his wife. So he now feels he owes rather a lot of carbon ‘credits’ to make up for all those air miles – and his mission to save energy at work must help to ease his conscience. It seems fair to say that, in winning two CIBSE awards for TfL, he has gone a long way to making amends – as well as setting the professional bar already very high for himself. But watch this space. ●

> “It’s about trying to get [the environmental message] down to the team level – trying to be as simple and resourceful as possible, such as giving the environmental champions monthly feedback,” Babcock enthuses. “It’s about us being as simple and as supportive as possible [with the champions]. It’s not their day job, and it is a challenge for them.”

Babcock is also an energy assessor of buildings for TfL and, in this role, he submitted TfL’s winning application for the CIBSE DEC of the Year Award, which recognises the effectiveness of a certificate in actually reducing carbon emissions. Babcock points to innovations made at two TfL sites in particular, 25 Eccleston Place and Albany House, and speaks proudly of their DEC ratings of E and G respectively.

For Babcock, who represented the Greater London Authority on a government forum on the roll-out of DEC’s, there is a danger that people won’t appreciate why an E rating for a building is good rather than bad. “Big commercial property landowners in London are trying to benchmark their buildings now [for future energy ratings], and they get very scared when they see figures showing the number of public buildings that have G ratings.

“The biggest challenge for the industry, when it comes to DEC’s, is persuading the public that an F rating is not so bad for an air conditioned building. People are too used to having an A-rated fridge, but this does not mean it’s zero carbon, whereas the DEC A rating does allow for truly zero-carbon buildings.

The Display Energy Certificate on show at TfL’s 25 Eccleston Place offices means the building is running at a good level of efficiency, says Quinten Babcock

Quinten Babcock

CV

1994-98: BEng (Hons), first class, in management with mechanical and manufacturing engineering

1999-2004: Faber Maunsell applied research department

2004-06: Career break to travel the world

2006: BDP sustainability team

2007: Environmental manager, Transport for London (TfL) group property team

2009: Winner of Champion of Carbon Saving Champions Award and EPC of the Year Award, both for TfL

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Siren call

Sustainable building is also crucially about water conservation, says a group of young engineers who are sorting out their own back yard. **Ewen Rose** reports

Building services engineers are heavily focused on energy efficiency and carbon saving issues in the battle to make our built environment more sustainable, but as a result another equally important area has not received the attention it deserves. For many, water conservation is the critical challenge for engineers.

Many building services engineers do realise that this has to be a key component of the service they provide and that their clients are becoming increasingly concerned about patterns of water consumption and waste in their buildings.

As part of this shift in emphasis within the profession, a team of three young engineers from Buro Happold has been honoured by the Society of Public Health Engineers (SOPHE) for a project they developed at their offices in Bath to try to establish best practice in water management.

Dubbed the Water Sirens, Lara Brook, Celia Way and Laura Crawford said they had set out to provide “leadership in water conservation in existing buildings”.

“We want to make water efficiency the norm [and to] implement appropriate technologies and stimulate behavioural change through empathy, initiative and enthusiasm,” they said in support of their winning entry for the SOPHE Young Engineers’ Award.

They believe that efforts need to be centred on existing buildings because around 80 per cent of the buildings that will still be in use in 2050 are already built. The Sirens also wanted to show that Buro Happold was prepared to put its own house in order to better advise clients, so they decided to explore how the company’s head office could be an “exemplar” for other buildings.

However, by deciding to tackle an existing building they were highlighting a major problem: retro-fitting water systems can be particularly challenging, and many possible engineering solutions are likely to be constrained.

Buro Happold’s headquarter comprises two buildings: Camden Mill and the Bayer Building. They presented particular problems due to the fact they were converted into offices from their original purpose as mills and have

Above: The ‘Sirens’ have helped to make changes at their employer Buro Happold’s headquarters, a converted mill on the Avon river at Bath

fairly high water consumption patterns as the buildings include shower facilities and a canteen. The offices have a total floor area of nearly 4,000m² and support around 300 occupants.

Outside space is limited because the buildings border the River Avon and local planners were “known to be very stringent”, according to the Sirens. They also had to face a “seagull problem”. In other words, local birds heavily contaminated the roof with faeces, making rainwater harvesting difficult.

The first step was to hold a ‘Water Workshop’ with the building occupants to talk about patterns of use and how the engineers could look beyond “the usual boundaries of technology”. A number of valuable insights were gained from this exercise, including that some occupants had reservations about using certain fixtures. For example, low flush toilets had been fitted in the Camden building, but sometimes users were avoiding those and using alternative (full flush) facilities in Bayer. This could have skewed the water use patterns in Camden because apparent lower water consumption was often really due to ‘avoidance of use’.

Behaviour

A number of users admitted to being profligate with water as it was perceived as an abundant and cheap resource. The workshop showed that, to be successful, the water conservation strategy would have to be shared fairly among the staff and its benefits well communicated. It also highlighted the need for incentives until good habits became a normal part of day-to-day use.

The Sirens also identified that marketing was important, in terms of educating and influencing the target audience. They concluded that messages should be positive and users should not be subjected to “guilt trips” to force behaviour change. The company should also be fully engaged, for example by investing in leak detection equipment; so staff felt it was a fair and even-handed approach to water conservation.

A brainstorming session was held and all the various ideas, changes and initiatives suggested were collated. Employees were then asked to categorise the suggestions as either ‘safe’, ‘challenging’ or ‘radical’. Safe changes were things like installing water efficient appliances along with metering and sub-metering, using leak detection and targeting user behaviour through an education campaign including posters on doors.

Challenging changes included rainwater harvesting, greywater and blackwater treatment and a green roof, while the more radical measures would be the installation of female urinals, composting toilets, plastic pot plants, a ban on alcohol consumption – and even collecting the dew from local trees and the sweat from local people.

But, of course, not all the measures could be adopted and the three engineers focused on technical feasibility and long-term environmental impact as the main criteria in a weighted decision-making matrix. As a result, reusing china cups, replacing older fittings with more water efficient versions and education and reward schemes came out on top.

The Sirens then came up with a series of proposals that could be technically achieved today, acceptable to most of the building occupants and lead to an overall reduction in water use of 15 per cent (see box). Refurbishment specifications for the Bayer building, for example, were revised for the toilet

and shower facilities and are due to be refitted in the next two years. They then measured the improvements these would make using the BREEAM rating scheme that evaluates the overall sustainability of a building. This showed that the new measures would quickly and relatively painlessly improve the buildings’ ratings by four BREEAM points.

The next aim would be to reduce water use by 60 per cent by 2012, which could be done through the addition of waterless urinals, and using an alternative water supply for toilet flushing. Eventually they would like to see a water neutral office, where water use is reduced to only essential use, with the remainder offset by supporting local community initiatives.

“Overall the engineers believe there needs to be less reliance on technology and more emphasis on people to promote change through altered behaviour”

The Sirens also looked at how they could make better use of the River Avon – a natural resource running right past the Buro Happold office and a “golden opportunity for innovation”. They proposed a micro-river water treatment plant – abstracting less than 10m³ per day, treating it to non-potable standard in a small membrane treatment facility on the ground floor, and using it for toilet flushing.

Overall, the engineers believe there needs to be less reliance “on technology and more emphasis on people to promote change” through altered behaviour. This makes it very important to communicate goals clearly and to encourage building occupants to see that their actions make a measurable difference – water use needs to be made visible and accessible. In the long term, the Sirens hope to develop their work into a water conservation toolkit or standard that Buro Happold can apply across all of its offices and use to inform clients. ●

www.burohappold.com

Water saving in action

PIR urinals fitted throughout

Pulsed meters to allow better water usage monitoring

Leak detection to prevent water wastage

Reusing cups to reduce collection and cleaning by staff

Engagement of occupants via posters in toilets encouraging more efficient water usage

Alcohol gel supplied in toilets to reduce water usage for hand washing and improve hygiene

Tagging equipment that indicates how much water is used

A water meter fitted in reception to raise awareness of the issue

The Sirens (left to right), Laura Brook, Celia Way and Laura Crawford, receive the Society of Public Health Young Engineers’ Award for their water-conservation project from SOPHE’s Ian Fellingham



Building a better future

Too many buildings fail to meet designers' goals or users' expectations. **Bill Bordass**, who has assessed many new projects, calls for urgent changes to make low-energy and low-carbon buildings more of a reality

UBT's findings

Why buildings often fail to deliver

The design intent has not been managed through the procurement process and into use

Buildings are being used more than the designers anticipated

Systems are too complicated and baffle the users and management

Controls don't work and things are left switched on

The basis for the design is often flawed; we just don't have the right type of guidance

Continuity of delivery has been fragmented, with work packages, partial services – or should that be “incomplete services”?

Too often interfaces between the parts are handled poorly – with outsourcing and value engineering reducing resilience and stripping away finesse

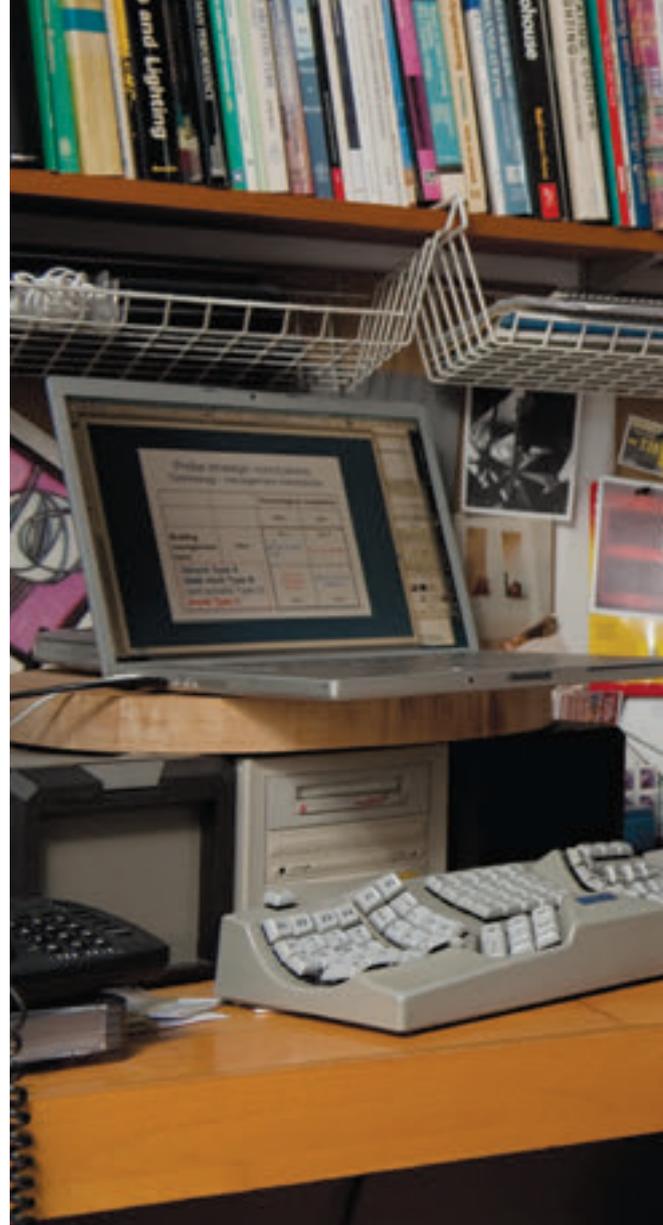
The UK government is committed to improving the sustainability of new and existing buildings but seems to be going about it in a less than effective way – strong on rhetoric but less well based on evidence of what works and what needs to be improved, and with initiatives from different departments that are not very well connected. Can we achieve improvement when, as Kipling said, “How very little, since things were made, things have altered in the building trade”?

We ‘rethought construction’ 10 years ago and, since then, have had initiative after initiative. We have a challenge to design more sustainable buildings, and to improve the existing stock. However, what should be an inspiring challenge seems to be turning increasingly into a bureaucratic obstacle race, full of box-ticking distractions. Not to mention a continuing trust in carbon trading, even after the financial traders have gambled away our futures.

We at the Usable Buildings Trust (UBT) visit new buildings and assess how they are working. We have found that even the good ones seldom perform nearly as well as the designers intended, particularly in terms of energy use. And, often, not by small margins – it is not at all unusual to find the electricity use of a ‘low-energy’ building to be three times as high as the design estimates.

The reasons for this general failure are many (see box). They include over-optimism in the design calculations, problems with the design-management process, underestimation of building usage, and poor continuity of delivery.

What have we learnt? If you want to put the conclusions from our studies into a sentence, I would say: “Keep it simple, do it well, follow it through, and learn from the experience.”



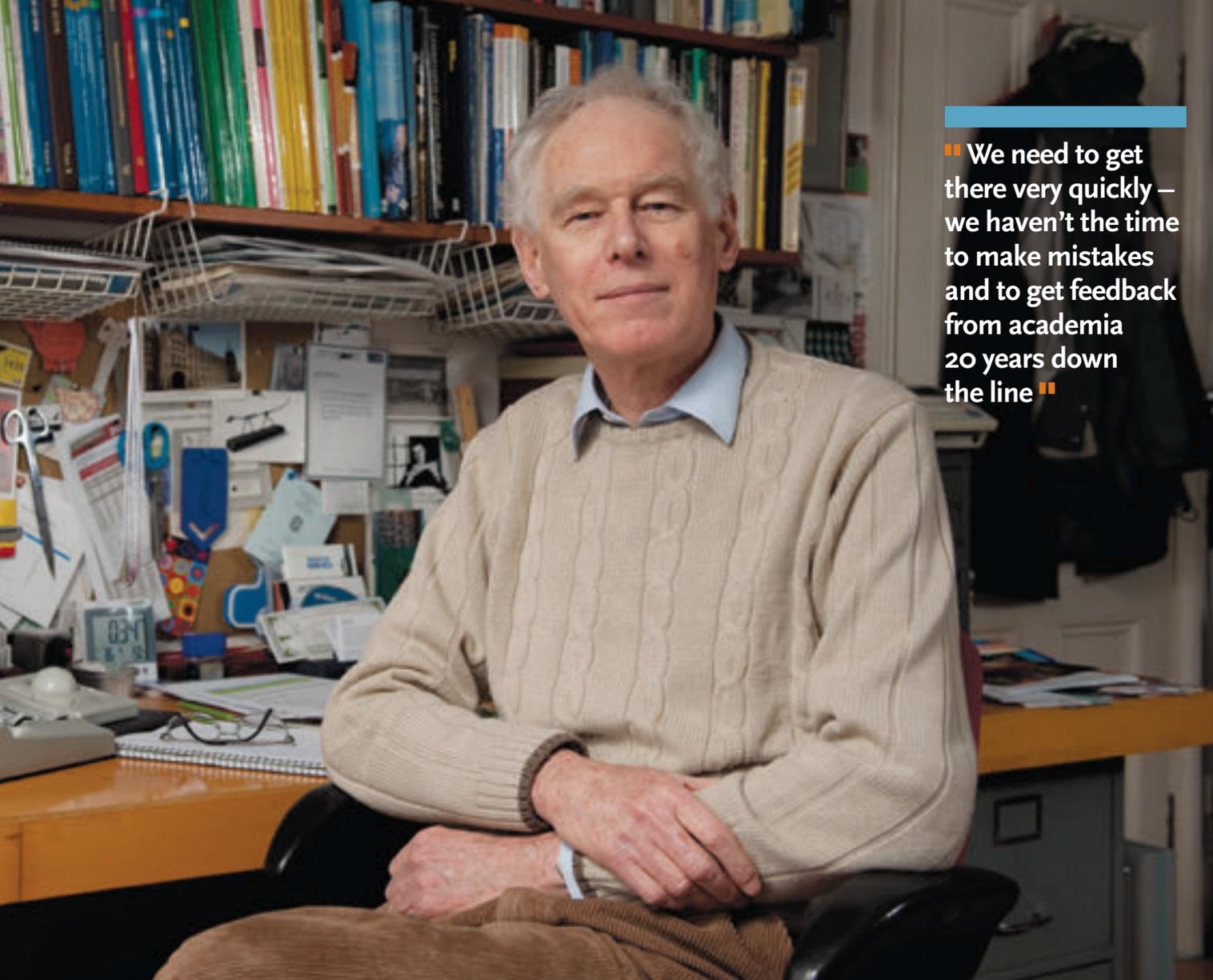
Only after that should one begin to be clever. But instead we are being required to pile on the complexity – the ‘green bling’ as Howard Liddell calls it – in the name of sustainability.

It is all likely to end in tears. For most purposes, we are not going to be able to afford high-maintenance solutions. We need robust and resilient ones.

There is now pressure to apply this flawed process to bring our existing building stock up to new low-carbon standards – and this when we can't even get new buildings right. Do we really understand what we are doing? We can't afford to throw sackloads of money at what may prove to be spurious improvements, some with technical risks.

Our shame

We need to improve building performance radically, and very quickly. How can we do it? I think the most important thing is for us to tune into outcomes, and get much more closely involved with the consequences of our actions. That way, we will understand what works and what we really need to improve. As the architect and workplace specialist Frank Duffy has pointed out: “Unlike medicine, the professions in construction have not developed a tradition of practice-based user research, preferring to outsource almost entirely to universities.



“ We need to get there very quickly – we haven’t the time to make mistakes and to get feedback from academia 20 years down the line ”

“Plentiful data about design performance are out there, in the field ... our shame is that we do not make anything like enough use of them.”

We urgently need a ‘new professionalism’ that can respond to the problem identified by Duffy: professionals don’t just do a job, they exercise particular skills, and there is a public-interest dimension. Part of today’s public interest is making buildings more sustainable, low-energy and low-carbon. Politicians and the public

are expecting design and building teams to provide the answers but, at present, we are not sufficiently skilled or knowledgeable to do so effectively and reliably.

We need to get there very quickly – we haven’t the time to make lots of mistakes and to get feedback from academia 20 years down the line, when things will be very different anyway. We need much closer engagement between all the levels of feedback. Practice also needs to be closely coupled to research >

Bill Bordass is concerned about a “bureaucratic obstacle race”

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“ This is a huge task. We could have started long ago but we can’t change everything with a snap of the fingers ”

> and development and to the more reflective processes of institutions and academics, so that we can all learn as quickly as possible.

How can we transform the industry? Principally, I see it as a change in the attitudes we all bring to our work. It is no longer acceptable for design engineers simply to walk away at ‘practical completion’. We have to get more engaged in the outcomes of what we do: communicating design intent to users and managers, understanding what they do, examining what really happens, tuning it up where we can, and carrying back the lessons.

This is a huge task. We could have started long ago, but we can’t change everything with a snap of the fingers. How do we get there from here? One brick in the wall is a process known as Soft Landings. This was initiated by the architect Mark Way, when at RMJM London, and researched in 2002-04 by Mark with a team put together by the Estates Department at Cambridge University, which included designers, contractors, and project managers working there at the time.

Soft Landings can run alongside and complement any procurement system, so one can make a difference without changing everything. It places an increased emphasis on five main areas: briefing; managing

expectations during design and delivery; preparing for handover; initial aftercare in the weeks immediately after handover; and extended aftercare and feedback over the first three years of occupancy. Professionals will no longer regard ‘practical completion’ as the end of the project, but an event in the middle of a broader ‘finish’ stage, which links completion and commissioning with occupation and aftercare.

UBT is currently working with Mark Way, BSRIA and a project group of industry practitioners to develop a published framework for Soft Landings, to allow the approach to be adopted on a much larger scale. We hope this will help evaluation and understanding of performance in use to become a routine activity for building professionals, helping us to learn rapidly from our experiences, to reduce credibility gaps between expectations and outcomes, and to move post-occupancy evaluation from post-mortem to life support. ●

Bill Bordass is research and policy adviser for the Usable Buildings Trust, an independent charity that promotes better buildings through the more effective use of feedback on how they work.

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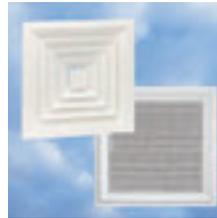
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Excellence

A new campus for the University of Wales in Newport will be a key element in the regeneration of the city centre. The building services design has achieved a 14.5 per cent improvement on Part L and a BREEAM 'excellent' rating – all without renewables

The new £35m Newport city centre campus project, due to open in 2010, is widely seen as a flagship for kick-starting the cultural regeneration of Newport. The project is the first phase of an intended £50m, two-phase development for the University of Wales with partnership funding from Newport City Council and the Welsh Assembly Government (WAG).

The first-phase campus project is a collaboration between the university, Newport City Council and Newport Unlimited, the urban regeneration company for the city. It is situated on the west bank of the River Usk, between the new tree-lined Usk Way Boulevard and the existing riverside walk. Its northern end borders

a new pedestrian city square at the western end of the new £5m foot and cycle bridge that dominates the city skyline, standing 70m (229ft) high and spanning 145m (476ft) across the river.

As existing framework consultant to the university, Faber Maunsell AECOM had early involvement in the project, advising on BREEAM and sustainability issues. The company then stepped back but was later selected, from a shortlist of five major consulting engineers, to carry out the design of M&E services, fire engineering, acoustics, ICT, advanced security and sustainability consultancy. The company was also appointed as approved BREEAM assessor.

Sustainability is a key consideration underpinning the whole design, and a condition of the funding from the WAG was that the campus building should achieve a Building Research Establishment Environmental Assessment Method (BREEAM) 'excellent' rating.

"We took the BREEAM issue on board right from the



Above, the new University of Wales Newport campus, on the banks of the River Usk. Right, project director Chris Lynn



embodied

start,” says project director Chris Lynn (below, left). “On some projects the BREEAM assessor can be rather passive with a tendency not to get too involved in some of the key design decision-making.

“We took a very different view and involved our in-house sustainability consultants from day one. They were instrumental in influencing the conceptual thinking of the design team and held workshops to communicate the key elements for consideration. In this way sustainability was always a high agenda item and integral to every design decision.”

There was also an aspiration to exceed the requirements of the current Building Regulations Part L by at least 10 per cent. In the event, the design has achieved a 14.5 per cent improvement on Part L through simplicity of design and avoiding the need for renewable energy sources to meet the targets.

The decision about renewables was only taken after Faber Maunsell undertook a detailed feasibility study. For example, use of ground source heat pumps was considered, but there was a danger of causing damage to existing underground ties running from the river’s retaining bank wall. Similarly, solar thermal heating was not deemed appropriate, due to the high cost of

integrating the units into the building fabric in order to maintain the high quality chic designs of the roof and west elevation façade of the building. Biomass fuel was also considered – but discounted due to concerns over the reliability of a local fuel supply.

“There are some projects where clients wish to include renewables as a visual token gesture even though they may bring very little real practical added value,” explains Lynn. “In contrast, the university took a very honest view and was adamant that renewables should only be included if they offered real added value and benefits to the project.

“The simplicity and effectiveness of the integrated design solutions negated the need for renewables. However, the design does include some provision for future retrofitting of renewables, if required.”

A further limitation was the wedge-shaped site for the campus, which restricted the building orientation options. To address this issue Faber Maunsell carried out many iterations of dynamic thermal analysis modelling, using real weather data to model the temperature profiles of all internal spaces. The company then worked closely with architects Building Design Partnership (BDP) to arrive at a design that would achieve the right >

“We took the BREEAM issue on board right from the start and involved our in-house sustainability consultants from day one. They were instrumental in influencing the conceptual thinking of the design”



> balance of natural daylight and solar heat gains, using a novel roof design combined with solar-controlled glazing and *brise soleil*.

The integrated design approach led to extensive glazing that takes advantage of the desirable effects of solar gain from early morning sun while, at the other end of the scale, selecting appropriate shading techniques for reducing solar overheating during peak summertime conditions.

It was clear to the designers from the computer modelling that a simple low-energy ventilation system would be one of the key elements in achieving the required energy performance, while helping to reduce potential maintenance cost – a key consideration for the university's estates team. However, the proximity of a main road, with recorded noise levels of up to 80dBA, obviated the use of natural ventilation as sound levels in many teaching spaces were predicted to reach around 50dBA during the day with open windows.

Project manager Kevin Searle says: "Because of these influences we've

Above, the stunning interior of the campus. Below, project manager Kevin Searle and mechanical engineer Sarah Gealy



■ We worked very closely with the university to understand the usage and occupancy patterns of the various spaces and to set permissible peak temperatures ■

opted for a displacement ventilation system in teaching spaces, using the floor space as a supply air plenum and introducing the supply air through swirl diffusers at 19°C and low velocity to avoid draughts. In lecture theatres the diffusers are located under the seating.

"Air is extracted at high level and heat is recovered at the air handling units, using a number of energy-saving measures including a thermal wheel. There will be some mechanical cooling in areas with high IT usage and in the sound studios. Ceiling heights were kept to an optimum level for cost reasons, which prevented the use of chilled beams so, where necessary, we will be cooling supply air from the air handling units supplying these areas."

Assessing usage

To further optimise the performance of the ventilation system, any spaces with variable occupancy will also be fitted with carbon dioxide sensors to provide demand controlled ventilation. In addition, the design team developed an understanding of the projected use of the various spaces so they could carry out more fine tuning.

"We worked very closely with the university to understand the usage and occupancy patterns of the various spaces, and to set permissible peak temperatures based on this information," says mechanical engineer Sarah Gealy.

"This enabled us to raise set point temperatures in areas where temperature wasn't critical and in teaching spaces that will not be in use during the summer months. In other areas, such as lecture theatres, temperature was considered critical and strict limitations were placed on peak temperatures."

Heating will be provided by gas-fired condensing boilers serving a combination of trench heating and low-level radiators. Using flow and return temperatures of 65°C and 45°C respectively, this will provide good condensing and optimise the efficiency of the heating plant.

Due to the architects' approach, the internal spaces will enjoy the benefits of high levels of natural daylight and the lighting design takes full advantage of this. Lighting in teaching spaces uses dimmable T5 linear fluorescent light sources, which are controlled in relation to daylight levels and occupancy to minimise electricity consumption. Where decorative lighting effects are required, light emitting diodes (LEDs) have been used to provide accent lighting, again with minimum energy consumption.

"Budgetary constraints meant that we had to give very careful thought to the >

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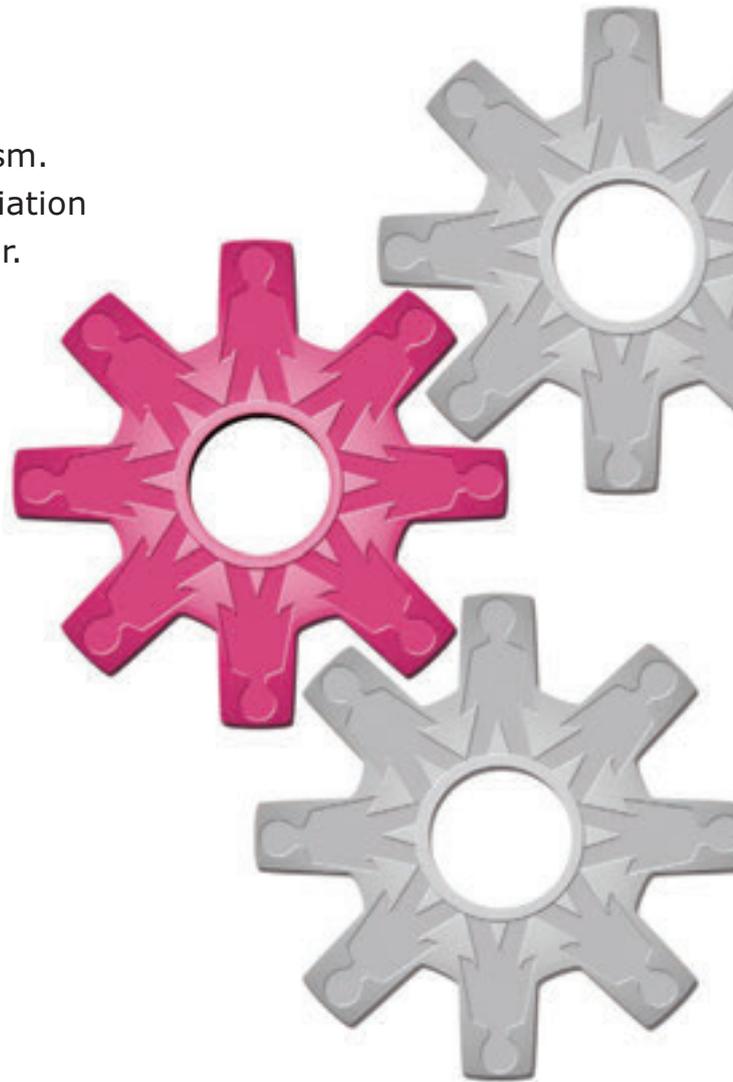
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HVCA



Above, layers of light within the building create a 'high-class' feel at a low cost. Below, an aerial shot of the campus

> lighting system," Searle adds. "Working with BDP we have created layers of light using a minimum number of fittings, providing a 'high-class' feeling at a relatively low cost – a happy compromise."

The campus provides a focus for learning, creativity, innovation and enterprise. The heart of the building's design philosophy is providing an environment which supports the creative process through research and engagement with the community.

In order to achieve a synergy between creativity and enterprise the new campus will be home to two schools – the digital media, film and design elements of the Newport School of Art, Media and Design, and the Newport Business School. The latter also provides expertise in the application of computer-based technologies, which underpin the design process. The two schools have different cultures, and the design of the building supports their integration, a particular feature of the building being the 'hothouse' which will be a focal point for research.

The university wants the building to boast strong elements of flexibility to meet the aspirations of a diverse student population, and it also wants it to be physically transparent and open to the city to reflect its ambition to be a community university with no barriers. The building will be open to the public, has an exhibition and gallery space, and areas for visitors to relax and enjoy the building.

The campus is a key part of the regeneration of the whole of Newport's city centre and developing cultural quarter bringing vibrancy to the area – an effect which has already been seen in Cardiff. For this reason, and given the current economic conditions, it was important that the project continued unabated. Except for some initial enabling works, the main works began onsite in December 2008 and are due for completion in 2010.

"A crucial element of this project so far, and moving forward, has been the positive engagement of our engineers at every stage of the process with project managers Mott MacDonald led by Mark Smith, the university's estates team and, in particular, the end-users," says Lynn. "We have been keen to ensure that our ideas have been articulated to the university and others in a way that everybody understands, thus providing the opportunity to debate any key design issues constructively.

"Quality, cost and time have to balance on every project and, in the city centre campus, I believe we have achieved that balance. The campus will be a development that the city of Newport can be proud of for many years to come." ●

“Quality, cost and time have to balance on every project and, in the city centre campus, I believe we have achieved that balance”

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Project Team	
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Architect:	Building Design Partnership
Civil and structural engineer:	Opus International
Main contractor:	Wilmott Dixon Construction
Cost and risk consultants:	Edmond Shipway
M&E services engineer:	Faber Maunsell AECOM
Acoustics:	Faber Maunsell AECOM
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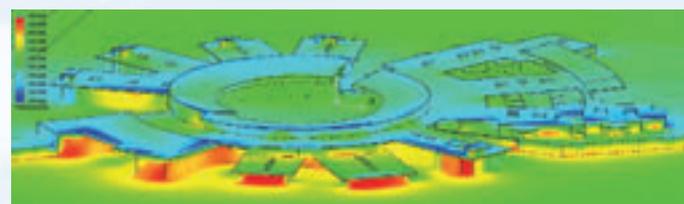
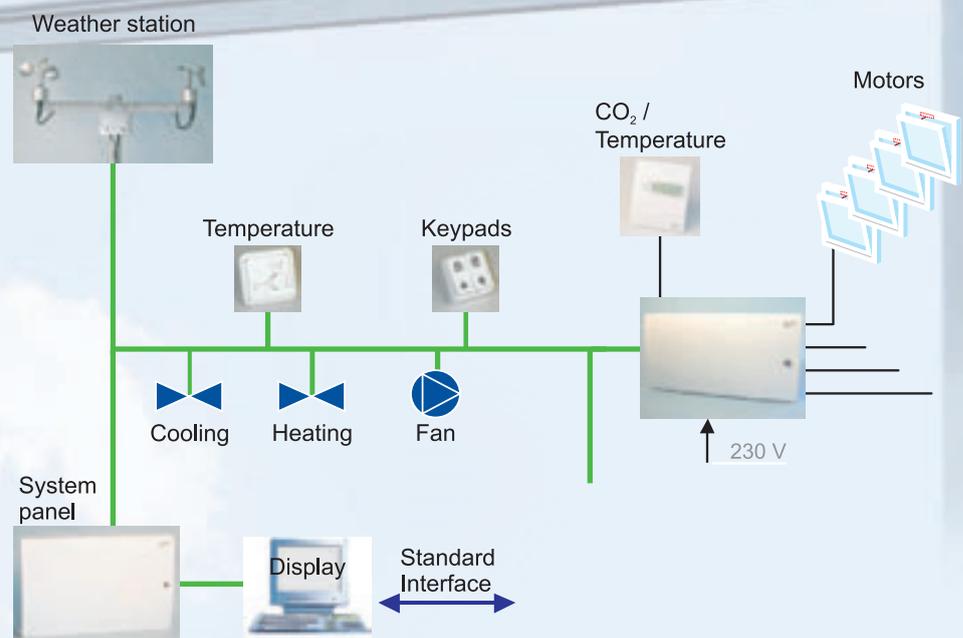
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Breath of fresh air

The home of British golf wanted a clubhouse for its planned new course, but this meant tackling the challenge of overheating in a highly-glazed building

Ever-increasing demand for more facilities at St Andrews Golf Course has been met with the arrival of a new 220-acre site close to the Scottish town. The Castle Course development is the most recent addition to the golfing facilities run by St Andrews Links Trust, which manages the famous Old Course and six other courses in the area.

The focal point for visitors to Castle Course is the striking clubhouse, built almost precisely where Kinkell Castle stood during the Middle Ages. It is a circular design, with glazing around most of the façade to exploit the panoramic views of the sea and St Andrews.

The extensive glazing used in the other Links Trust

clubhouses had created problems with overheating, which had seen them try various air conditioning solutions. The challenge for the services designers and architect Fraser Smart was to manage this heat-gain issue while also providing an underfloor heating system for the times of year when mechanical heating would be required.

Dundee-based mechanical services consultant Specialist Mechanical Services was appointed to deliver a system capable of meeting these twin challenges while also keeping environmental impact to a minimum.

With a large constant cooling load from the kitchens and a regular heating load required for the changing rooms, the design team selected two Mitsubishi Electric ground source variable refrigerant flow (VRF) heat pumps. These supply heating to the underfloor system via two heat pump boilers at a constant temperature of around 50°C, and heating and cooling via various ducted, cassette and wall unit air conditioners.

The heat pumps also provide almost total heat recovery, as the cooling units transfer their heat either



directly within the VRF circuit to parts of the system with a heating load, or indirectly through the combined ground source system.

For ventilation, they used four Mitsubishi Electric Lossnay Heat Recovery Units, strategically placed around the attic to serve all areas of the building apart from the kitchen. These recover about 80 per cent of the heat from the exhaust air by transferring the heat back into the fresh air supply.

The entire ventilation and air conditioning system is protected by high-quality washable filters to eliminate waste, and is operated from one central controller located in the plant room to prevent staff from adjusting the setpoints and so pushing up energy consumption unnecessarily.

The ground source water loops are fed through a manifold located under the practice driving range. This, in turn, feeds 10 boreholes that provide the cooling or heating source as required. The ground source loop is filled with a water-and-glycol solution to protect the system from freezing.

The traditional method of heating this building would have been using gas boilers serving either radiators or underfloor pipework, or a combination of both, but Graeme Fox, managing director of Specialist Mechanical Services, believes this is a far more satisfactory solution.

“The location and type of building makes it ideal for ground source heating and cooling,” he says. “This is not the right approach for every building but, in this case, there was ample space around the building to install the ground loops and boreholes.

“The result is an installation with a much smaller carbon footprint than a traditional system, which



is also discreet and in keeping with the stunning surroundings.”

A ground source water loop provides steady water temperatures at around 6°C throughout the year and, therefore, does not require defrost cycles. This allows the heat pump system to work effectively at all times, using very little energy compared with traditional systems. Tests carried out by Mitsubishi at its UK headquarters in Hertfordshire showed that energy use could be around one quarter that of a traditional heating and cooling system.

The installation was handed over last June. The system had been running in various stages for about a month prior to that date and tests were carried out by taking amperage readings, which showed an average of less than 14 amps per phase for the entire cooling, heating and ventilation system – equivalent to less than 10 watts per square metre.

Fox says that monitoring equipment was about to be installed to measure the performance over a longer >

The Castle Course's striking new clubhouse





Variable refrigerant flow (VRF) systems such as that employed in the Castle Course clubhouse are popular for heating and cooling simultaneously with heat recovery. An additional benefit is that ground source heating and cooling is widely accepted as a low-carbon technology

fears and those of design engineers will be dispelled so that this type of system will become more widely used in the UK," Fox says.

Many clients remain reluctant to take the plunge with ground source systems because of the capital cost. The groundworks required for boreholes can make ground source heating and cooling far more expensive than traditional systems, mainly due to the high surveying and drilling costs.

Similarly, the installation costs are higher than with heating-only systems. Where heating and cooling are required, however, particularly where these are required simultaneously, the installation costs of this type of system are comparable with split cooling and gas heating – even cheaper in some instances.

Air source VRF systems can also be specified as an alternative to ground source, providing there are no planning, noise or footprint restrictions. This would have cut the Castle Course installation cost of £320,000 by around £90,000, according to Fox, although the course owners will benefit from better long-term running cost savings with their ground source system.

"Due to the modular nature of the VRF equipment, coupled with the controls philosophy built into modern systems, this type of installation can be used for virtually any new build project," says Fox. "Using heat recovery ventilation, and heating and cooling plant in a fully integrated package, matched the customer's precise requirements but is flexible enough to be altered if the use of the building changes over time." ●

> period of time to build up an accurate picture of the carbon footprint.

"The clients seem to be generally happy," Fox says. "They are happy with the low running costs, but are still a bit confused about how the system operates – this is often a problem with new technology and new ways of doing things. There is often a perception that there is a problem when, in fact, it is just an unfamiliar system.

"For example, the maintenance staff took a little while to get to grips with the underfloor heating system because it does not behave in the same way as more conventional heating. However, they are used to it now and can see the benefits both in comfort and energy saving."

This approach, while clearly innovative for the UK market, makes use of well-known technology that is already tried and tested worldwide. VRF is a popular method for heating and cooling simultaneously with heat recovery; and ground source heating and cooling is widely accepted as a low-carbon technology.

"I hope that, by using this installation as an example of best practice in building techniques, the wider public's

Using heat recovery ventilation, and heating and cooling plant in a fully integrated package, matched the customer's precise requirements but is flexible enough to be altered if the use of the building changes over time

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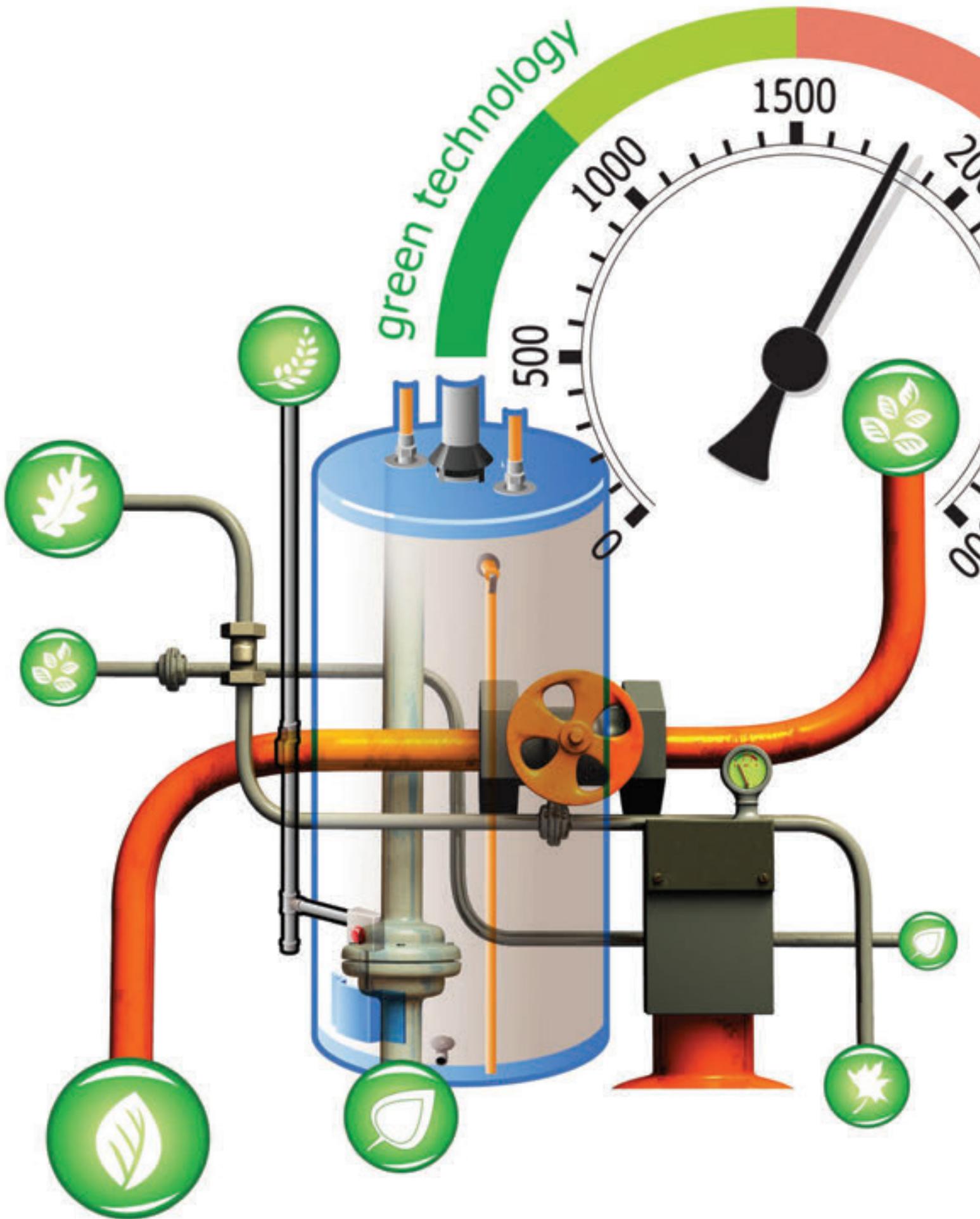
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The heat is on

The boiler market faces a downturn this year but pressure from Europe for greater efficiency means that condensing technology will remain key to a greener future. **Ewen Rose** reports

Condensing boiler technology has the greatest potential of any of the low-carbon heating solutions available, many experts believe. Because renewables will take a long time to take off, established high-efficiency heating technologies have a real opportunity to make a difference.

Replacing an ageing standard-efficiency boiler with a high-efficiency condensing version will deliver immediate savings and improved comfort – and it is a quick and affordable way of improving a building's score on its Energy Performance Certificate (EPC) or Display Energy Certificate (DEC).

And, while both the domestic and commercial boiler markets are expected to fall this year, condensing boilers are still seen as having a key role in cutting emissions amid a sluggish move towards renewable forms of energy generation.

"Unless we see some major moves from manufacturers and the UK government, we will not see a big shift into renewables in the commercial market," says Andrew Giles of the Building Services Research and Information Association (BSRIA). "The UK is in the lead in implementing EU directives, but we are way behind on incentives for investment in renewables – we don't offer enough at any level, compared with other countries," Giles told a recent CIBSE seminar, 'Getting the Best out of Boilers'.

One key fillip for condensing boilers is the European Energy Using Products (EuP) Directive. This will promote wider use of condensing technology and it is likely that, over the next decade, the rules will change so that only condensing boilers can be specified in Europe. The directive also places the emphasis on the performance of the whole heating system.

"The directive has the potential to have the biggest single impact ever on the UK heating market," says Yan Evans, technical director of Baxi Commercial Division.

Currently very few installations – even in new-build projects – are designed to extract the maximum energy saving potential from condensing boilers, according to the ICOM Energy Association. "There's no point continually pushing up boiler efficiencies if the overall system does not match," says the association's technical director David Hughes.

"However, when the EuP directive comes into force we will have no choice but to design the whole system properly."

Under the directive, from 1 January 2013 heating systems will have to be 96 per cent efficient and meet very tough NOx levels restrictions of 20 parts per million (35mg/kWh). Boilers that cannot meet the efficiency figure will have to display a warning label, stating they can be installed in a system only with components that >



“ Unless we see some major moves from manufacturers and the UK government, we will not see a big shift into renewables in the commercial market ”

– Andrew Giles (above), Building Services Research and Information Association

Under threat... future legislation will profoundly effect the sector

> can bring the overall efficiency up to that level. However, a NOx limit of 40ppm will be allowed if 30 per cent of the system capacity is delivered by renewables – an apparent attempt to drive up the use of renewables.

Threat

The whole oil-fired boiler industry is under threat from the directive because its products cannot achieve the NOx limits at all, according to Hughes.

“This will have a profound impact on the whole boiler market,” he says. “Even condensing boilers can’t meet the NOx limits, so all systems in the future will have to have a renewable element. Product labelling is going to be very complex and manufacturers will have to be very

clear about where their products are being applied.”

Mark Northcott of manufacturer Broag-Remeha argues that the EU is setting unrealistic NOx limits for political reasons. “The NOx targets are not achievable,” he told the seminar. “This is an attempt by the legislators to make nuclear energy more attractive. It is politically driven and there is very little the heating industry can do about it, even though we keep pointing out that these levels are just daft.”

However, he also believes that focusing on NOx, in principle, is the right thing for the EU to do because NOx has become the “forgotten greenhouse gas”. He points out that it is many times more effective than CO₂ at trapping heat and remains in the atmosphere for more than 150 years. NOx has serious implications for human health and has been linked with respiratory diseases, lung damage and heart attacks. It also contributes to acid rain, ground-level ozone and smog.

“We are ignoring a big problem with NOx,” Northcott concedes. “However, we could make serious inroads by replacing ageing boilers with modern condensing alternatives. Condensing technology should be regarded as a sustainable strategy – not just a product.”

Northcott insists that condensing boilers can reduce >



Downturn... but the domestic market will start to stabilise in 2010

High efficiency has a chance to take off

Both the commercial and heating markets are going through radical changes brought on not just by the recession, but also by technology changes and new approaches to system design. Future legislation is also likely to have a profound impact on this sector.

The general slowdown in consultants’ workload as the recession bites is reflected across all market sectors, but there is a greater air of optimism around heating.

There is also a feeling that, because renewables will take a long time to really take off, established high-efficiency heating technologies have a real opportunity.

The Building Services Research and Information Association (BSRIA) reports

that the domestic boiler market shrunk by five per cent in 2008, while commercial boilers remained fairly resilient and actually grew by three per cent. However, both are set for a sharp downturn in 2009, according to the research body’s head of worldwide market intelligence Andrew Giles. He predicts a nine per cent fall in domestic and an eight per cent drop in commercial boilers.

In 2010, the domestic market will start to stabilise, falling by just two per cent, while commercial sales will continue their downward path by a further seven per cent. But after that things start to look much healthier.

The UK still has by far the largest domestic boiler market in the world with more than 1.8

million units sold in 2007. It also has the most mature condensing boiler market thanks to the transformation brought about by the changes to the Building Regulations in 2005.

Almost every domestic boiler now sold in the UK is condensing – and forthcoming changes to European legislation mean that pattern will be repeated in the commercial sector. The commercial boiler market – anything above 50kW is classified as commercial – has hovered around the 30,000 units per annum mark for some time now, which makes it the fifth largest in the world. Now, however, the nature of the market is changing with a major shift away from traditional pressure jet burners to pre-mix and wall-hung products.

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“In Germany the tariffs were generous enough to help people offset the cost of investing in CHP so the market took off. We could really do with something here” – Yan Evans (above), Baxi

> onsite NOx emissions by 90 per cent compared with installed standard-efficiency boilers. They will also cut CO₂ emissions by as much as 50 per cent and deliver substantial fuel bill savings to end-users.

“The secret is making it easy for people to replace their boilers,” Northcott adds. “You can put condensing boilers into exactly the same space as the old plant, which means the customer’s carbon-saving pound goes further – they are spending their money directly on reducing emissions and not wasting it on extra pipework and fittings.”

Ironically, commercial boilers were not included in the first draft of the EuP directive because the EU initially set the threshold at products that sell more than 200,000 units a year. Commercial boilers don’t reach this figure, but are responsible for half of the carbon emissions from buildings, so were brought into the scope of the directive at the last minute.

Marriage

Many manufacturers see the combination of condensing boilers and solar thermal systems for hot water as the simplest and most viable way to cost-effectively reduce a building’s carbon footprint – and to meet the NOx provision of the EuP. But in the UK we fitted just 69,900 square metres of solar collectors in 2007, compared with more than 1.3 million sq m in Germany and 278,000 sq m in France.

This is a happy marriage between two low-carbon technologies. There are a number of other combinations that have been tried with limited success, but this one is relatively easy to do and can cut annual hot water bills by an average of 25 per cent.



Solar panels: a cost-effective way to reduce carbon footprints

Microgeneration alternatives like combined heat and power (CHP) are developing and have real potential to replace boilers in many applications, but only a few hundred micro-CHP systems have been fitted so far and the market will take several years to reach anything like critical mass.

Feed-in tariffs that guarantee CHP users a generous price for excess electricity that they sell back to the grid could grow this market, but the UK government has not been specific about when these will be introduced and how generous they will be.

“In Germany this proved extremely positive for CHP,” Baxi’s Evans points out. “There, the tariffs were generous enough to help people offset the cost of investing in CHP so the market took off. We could really do with something similar here.” ●

Biofuels need local source

Delegates at the CIBSE seminar also discussed the role of biomass and biofuel, which seem to be developing into something of a niche heating market that will always be held back by problems of supply. It is not sustainable to ship a ‘low carbon’ fuel source halfway around the world to meet demand, therefore biomass will only develop on a long-term basis where there is a healthy local source, the meeting heard.

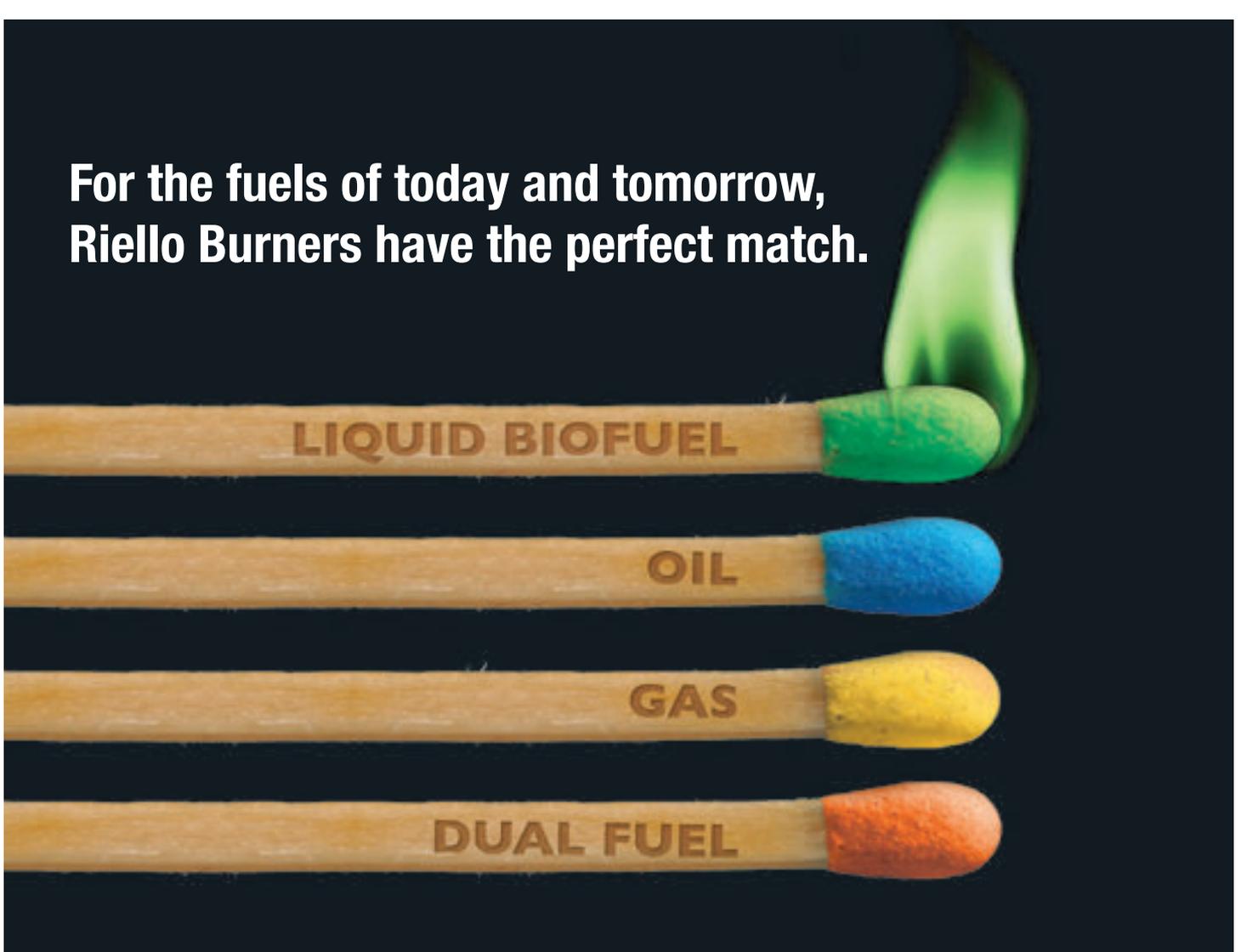
The heat pump market will develop over time – particularly the air-to-water types, thanks to their relative ease of installation, but again our market was only around 5,000 units in 2007 compared with France’s 108,000, according to BSRIA.

The French market is very different because its wider use of electric heating, due to its greater use of nuclear power, makes it more receptive to heat pumps – but we also remain well behind Germany.

In short, according to the experts at CIBSE’s boiler seminar, our renewable and micro-generation markets will mature slowly – particularly if the Government gets it act together on incentives like feed-in tariffs. In the shorter and medium term, once the current financial storm abates, the high-efficiency condensing boiler remains the key to unlocking energy savings.



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Switching to remote

A new approach to commissioning fan coil units and chilled beam systems, which includes remote positioning of control valves, is said to offer a number of advantages.

Paul Haddlesey reports



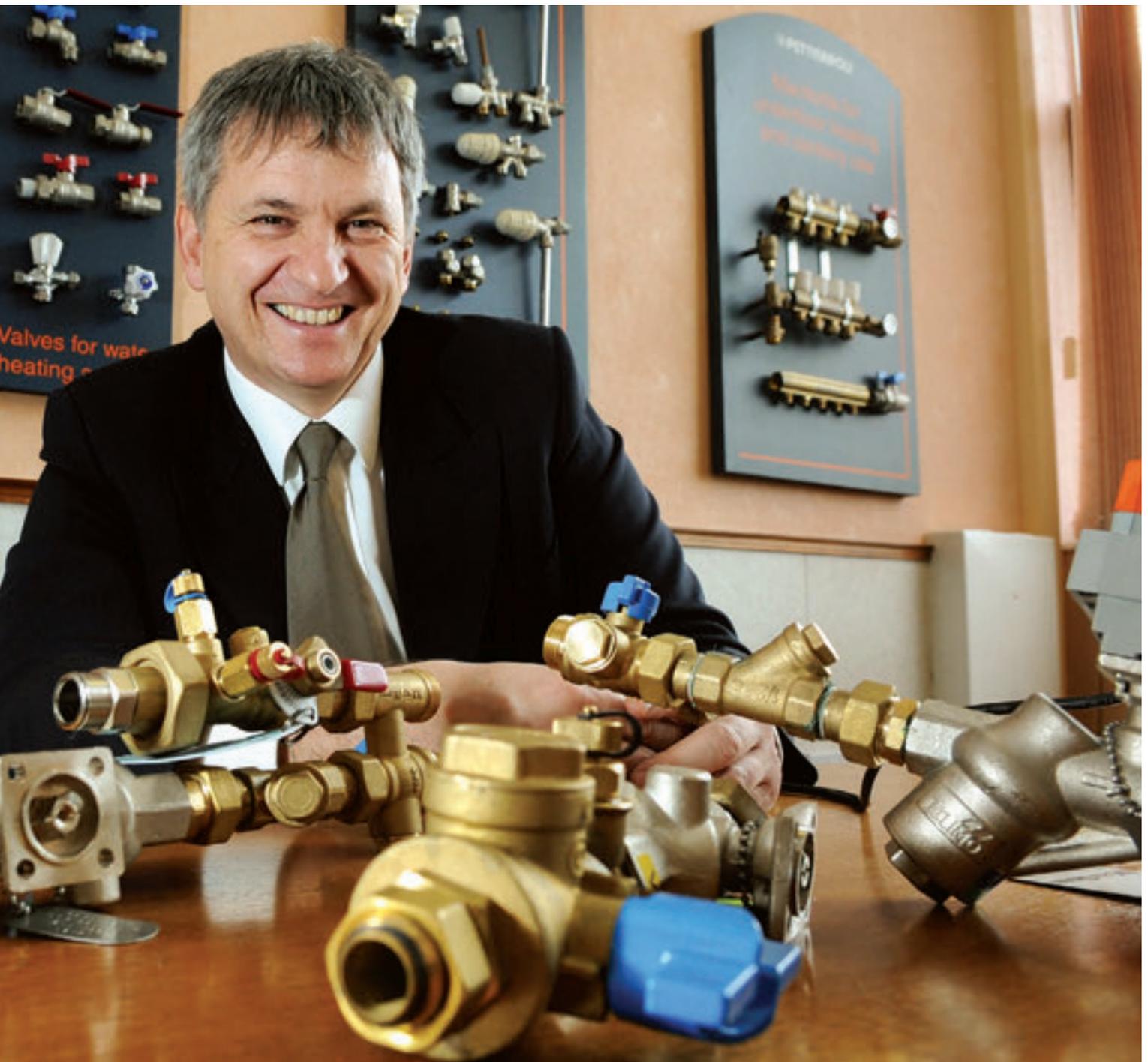
It is sometimes said that, with the exception of a few high-profile projects, building services engineering is a conservative discipline that is slow to adopt new methodologies over more familiar approaches. While this may be an exaggeration, there are certainly instances where new developments have yet to be fully exploited.

A case in point is the commissioning of variable volume chilled and hot water systems. Here, it appears, a novel approach using new pressure-independent valves and remote control technologies could simplify installation and commissioning, reduce costs and improve system performance. At least, that's the view of Martin Lowe, technical manager with Marflow Hydronics.

"We have to recognise that design, installation and commissioning practices in many projects have failed

to keep pace with key developments in the industry," he suggests. "These developments include the growth of design and build, skills shortages and the increased use of multinational labour forces, as well as the opportunities provided by modern valve technologies. As a result, this outdated approach is failing to deliver the best result for the end client in many projects."

One key reason for this is that the installation of hydronic air conditioning systems is characterised by a fragmented approach, with a range of components being sourced from different suppliers and arriving on site at different times for unpacking, assembly and installation. This is in contrast to variable refrigerant flow (VRF) systems, often chosen as an alternative, where a single supplier takes responsibility for developing the system



as a whole and taking it forward. These issues have led Lowe and his colleagues to introduce what they call the 'remote commissioning concept', following several years of development, experimentation and field testing. It is based on several key ideas.

CIBSE code

First, there is the suggestion that proportional balancing methods developed for commissioning constant volume water systems are not suitable for increasingly popular variable volume systems. "The current CIBSE commissioning code does not take into account the 'remote commissioning concept' and, as a result, the consultant will automatically demand tolerances that have become less important as the ability to alter the

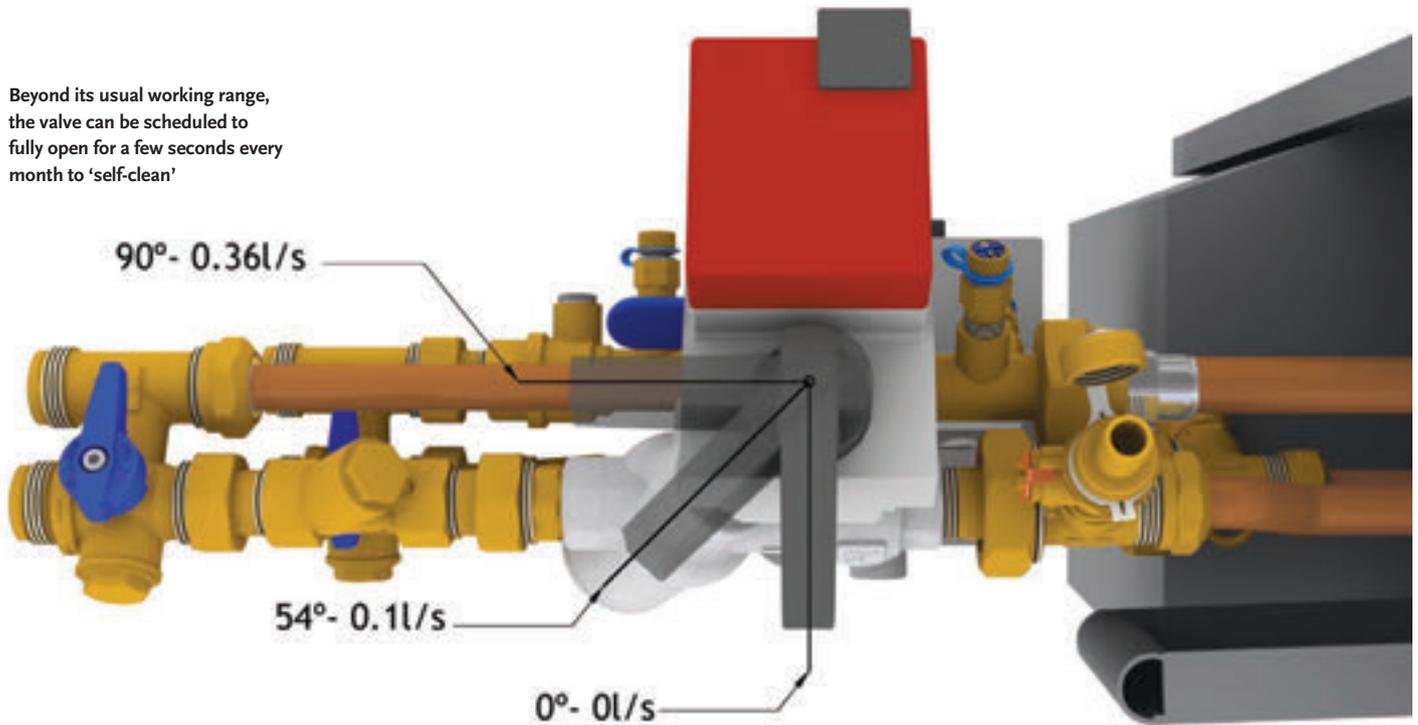
flow remotely is achieved without entry into the ceiling," Lowe argues.

Second, he points to the increasing sophistication of prefabrication techniques. "Prefabrication is no longer just a way of transferring site work to another location. It has evolved into an engineered solution where assemblies are produced under controlled conditions, bringing many trades together under one roof to produce something that is far more effective when installed on site. Plus, everything required is delivered to site at the same time, ready for installation, complete with pictorial instructions so language isn't an issue."

Third, Lowe promotes the adoption of an intelligent approach to valve regulation, which uses the fan coil unit controller (soft regulation) – for example, to set the >

Martin Lowe of Marflow Hydraulics says an intelligent approach to valve regulation can allow for further design increases if these are required

Beyond its usual working range, the valve can be scheduled to fully open for a few seconds every month to 'self-clean'



■ Prefabrication is no longer just a way of transferring site work to another location ■

> maximum opening to achieve design flow. Limiting the amount by which the pressure-independent, two-port control valve opens allows for further design increases, if required.

A major benefit of this on very low flows is to allow the pressure-independent valve to be cycled to fully open once a week, for a few seconds, to allow the flushing of air and dirt particles. Moving to an intelligent approach also gives control of variable speed fan motors, providing a highly energy-efficient system. It also provides the opportunity to remotely change parameters without entering the ceiling void.

In parallel, the company has developed a spreadsheet package that brings all valve information and hydronic performance data into a single location, so any changes can be quickly distributed to all relevant parties.

Remote access

“What makes the remote commissioning concept possible is the ability to program the valve characteristics or the valve performance curve into the fan coil unit controller,” Lowe says.

“Once the performance curve is in the controller, design flow values can be entered on the front end [PC] and downloaded to the appropriate controller. The processor-controlled valve actuator ensures that the disc moves to the correct position. Any discrepancies between the design flow and actual flow can be made by entering the percentage adjustment calculated remotely.

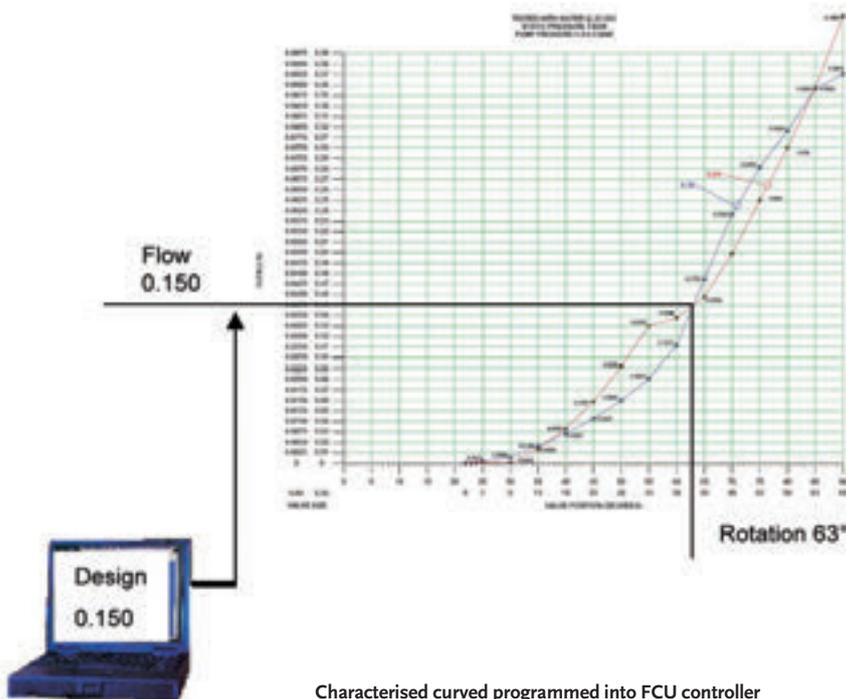
“However, having remote access means that further adjustments can be made when the building is occupied and the environmental conditions are known. The most important issue at commissioning time is that more flow is available if required.”

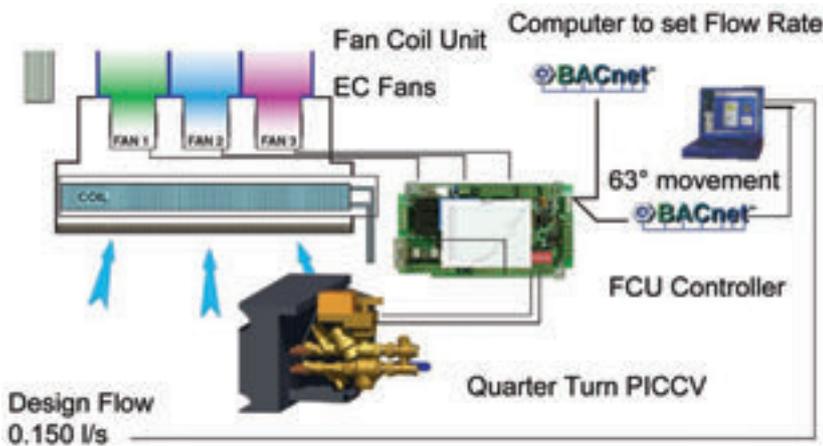
The BMS/BACnet controller, housed in its own case, can be wired to the actuator via pluggable leads and sockets within the assembly to reduce installation time and the risk of connection errors. A power plug socket is provided for mains power to the controller, and to allow switched power to the fan on the fan coil unit. A plugged cable is also provided from the controller to the fan coil unit supplying power and the temperature sensor. The communication cable to the BMS is also a pluggable connection.

“The controller used by the system provides two accurately time controlled outputs to control the valve actuators within 1/900th of a second,” explains Lowe. “It communicates with other controllers via a BACnet MS/TP network, which also enables communications with a PC, so that system software can be configured and updated without directly accessing the controller.”

Balancing

The remote commissioning approach uses what Lowe refers to as a single station balancing (SSB) method of commissioning.





“With conventional proportional balancing, the commissioning engineer needs to balance the entire system before problem circuits can be identified. Once those problems have been resolved the whole system then needs to be balanced again, leading to a lengthy process that can impact on the whole construction schedule.

“The SSB method is different because it uses a subtraction technique to identify problem valves. This is based on knowing the design flow rates for each individual valve and, therefore, the total flow rate for that group of terminal units. Assuming all the valves are functioning correctly, isolating each valve will have a predictable effect on the total flow

“ The scope of the remote commissioning concept provides considerable food for thought ”

rate for the remaining valves. Where an unexpected result is observed it is a simple matter of elimination to identify the valve that causes this, enabling the commissioning engineer to ‘home in’ on the problem area.”

Lowe adds: “It is only a short stretch of the imagination to a situation where remote control valves are used in conjunction with electronic flow measurement, allowing all of this to be done from a PC. It would then only become necessary to enter the ceiling void if problems are encountered.”

One important issue that arises is the impact this approach has on witnessing procedures, as CIBSE Code W was written before the advent of pressure-independent valves and the increased use of variable volume systems.

“Code W’s tolerances of $-0,+10$ l/s for actual flow rates, compared with design flow rates, aren’t really necessary or, indeed, suitable for variable volume systems using pressure-independent valves,” Lowe says. “With pressure-independent valves it’s no longer necessary to focus on the accuracy and tolerance to achieve design flow because of the ability of the system to provide higher flows. The focus should be redirected to the environmental condition being provided at the most economic and energy efficient savings.”

There’s no doubt that the scope of the remote commissioning concept provides considerable food for thought. And, if Lowe’s ideas are widely adopted, they could impact on the overall cost of construction as well as making hydronic systems more competitive with VRF. ●

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Burns monument rises from the ashes

2009 is an important year for Robert Burns fans as it marks the 250th anniversary of his birth in 1759. Around Scotland the anniversary will be acknowledged by many commemorative events, including the re-opening of one of Scotland's focal points – the Burns Monument in Kilmarnock.

This monument was originally opened in 1879 at an elevated site in Kay Park. However, in recent years the site was left to decline and in 2004 much of it was badly damaged in a maliciously started fire, especially the museum section. In 2006 planning permission was granted and work started to restore the monument.

Grundfos Pumps worked with

East Ayrshire Council and contractors James Frew to develop a solution that will service all the needs of this newly refurbished building, which will house a permanent Burns exhibition, including *The Kilmarnock Edition*, one of the few remaining original copies of Burns' first book.

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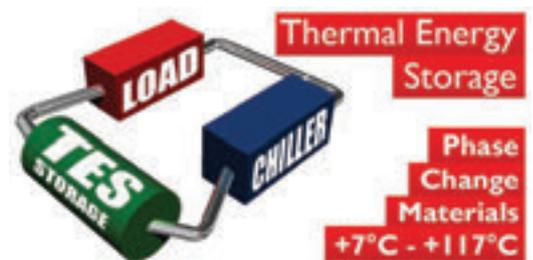
But it is the innovative approach to flexible end-user operation that further sets PleinAir apart. The maintenance operation associated



with office churn – an increasing occurrence with the proliferation of short-term lets – has essentially been deskilled. Dave George, PleinAir sales manager at AET said: "Co-ordinating the PleinAir system to match its surroundings and tenant requirements is simple enough and a building's onsite maintenance staff can reconfigure the air conditioning for different floor plans. PleinAir's Cable Control (PCC) wiring system combines with the moveable PTU floor tiles to allow simple disconnection and reconnection."

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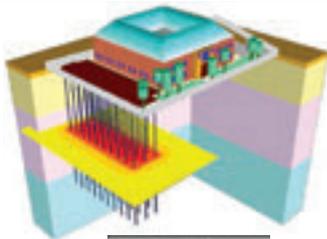
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Solar thermal – solar hot water heating

Regulatory and advisory requirements for the application of LZC (low and zero carbon) technologies in buildings, and increased public demand for higher environmental performance, have contributed to a significant increase in the adoption of solar thermal water heating for the commercial sector as one of the technologies applied to reduce carbon dioxide emissions – particularly where hot water demand is the dominant load

This CPD article will cover some of the issues surrounding the design and selection of commercial solar thermal solutions.

Using solar energy to heat water has been commercially available in the UK in a variety of forms since the mid 1970s. The UK can offer a good climate for solar thermal solutions, benefiting from around 60 per cent of the solar energy received at the equator, and the UK is comparable with the European countries better known for their solar applications (see Figure 1).

In the UK the average annual available solar irradiation varies between around 1,200 kWh/m² on the south coast of England and up to 900 kWh/m² in Scotland – only 55 per cent of the sun's light is visible, the balance being ultraviolet and infra-red, and only around 25 per cent of the sunlight is direct, with the remainder being diffuse. A properly designed and installed solar thermal system

can maximise the capture of this power and translate 60 per cent of it into useful energy for hot water systems.

Roof-mounted solar collectors with high transmission and absorption efficiencies typically capture energy from incident solar irradiation, passing the heat into a transfer fluid – usually a pre-prepared mixture of 60 per cent water and 40 per cent glycol to prevent freezing during periods of low outdoor air temperatures. Different specifications of heat transfer fluid are available for different types of solar collectors. The heat transfer fluid is usually pumped through a coil located in the lower section of an unvented indirect cylinder and, in so doing, heats the stored water that would normally be used for domestic hot water.

A well-designed commercial solar thermal system may be able to satisfy around 30 to 40 per cent of the annual hot water load, known as the solar fraction (SF). To try and achieve a higher solar fraction may lead to solar thermal system >

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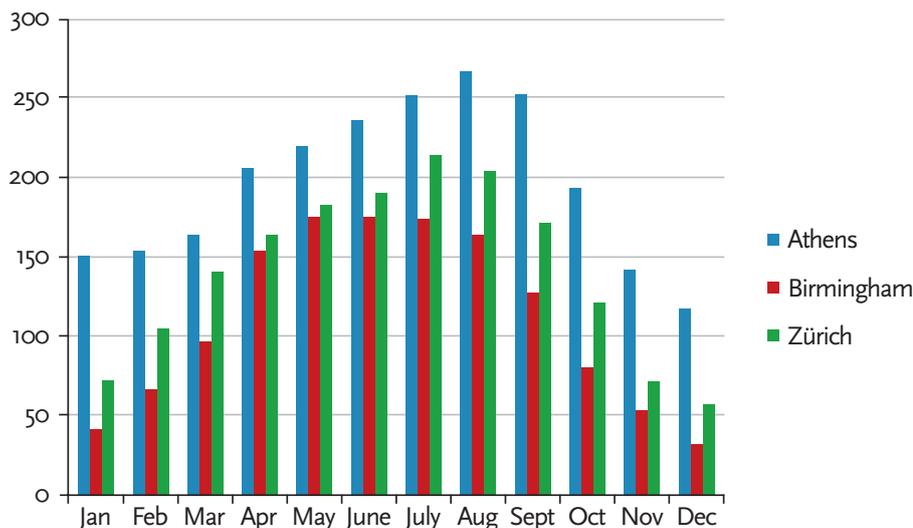


Figure 1: Monthly solar irradiance on a flat plane facing south with a tilt angle of 45° for Athens, Birmingham and Zurich (Data from BS EN 15316-4-3:2007 Part 4-3: Heat generation systems, thermal solar systems)

> operational issues. In the summer months, an appropriately designed solar thermal system should be able to satisfy almost all of the hot water demand in many cases.

The SF is much lower during the colder winter months, when the available solar irradiation is a lot lower, resulting in SF levels of around 20 per cent. To increase the annual average SF in the winter months, a larger number of solar collectors would be needed – but the array would be oversized for the summer period and this could lead to stagnation resulting in possible long-term, irreparable damage to the solar collectors.

Principal types of solar collector

There are two main types of solar thermal collectors currently being used in the UK commercial building services sector. These are glazed flat plate and evacuated tube collectors.

The typical construction of a glazed flat plate collector comprises a lightweight aluminium tray or frame, which contains a layer of insulation to prevent heat loss via conduction through the rear of the collector. A series of copper pipes is laid in a 'harp' or 'serpentine' arrangement within the insulation, to carry the heat transfer fluid through the collector. A very thin copper absorber is ultrasonically welded to the copper pipes. The absorber has a selective coating in order to maximise solar irradiation absorption.

Finally, the collector has a transparent glass cover with a low thermal expansion coefficient such as borosilicate glass (Pyrex), and high transmission efficiency to minimise convection losses. Transmission efficiencies for good-quality products are more than 90 per cent, absorption efficiencies 95 per cent, emissions (losses) five per cent, and maximum thermal efficiencies around 78 per

cent. An installation of flat plate collectors is shown in Figure 2.

The construction of an evacuated tube collector is entirely different to that of a glazed flat plate collector, although materials used are common to both types – copper tubes to carry the heat transfer fluid, a copper absorber with a selective coating, and tubes manufactured from glass with a low thermal expansion coefficient.

Evacuated tube collectors generally comprise a manifold and a series of glass tubes (20 or 30) connected in parallel. A vacuum is created within each tube during the manufacturing process; this effectively acts as an insulator for the absorber and reduces convection losses, particularly during colder winter periods. While transmission efficiencies, absorption efficiencies and emissions are comparable to those offered by glazed flat plate collectors, the thermal efficiency is higher as a result of the presence of the vacuum, with values of around 83 per cent. An installation of evacuated tubes collectors is shown in Figure 3.

Whether glazed flat plate or evacuated tube collectors are used, the optimum angle of orientation is south facing and the optimum angle of inclination between 30 and 45 degrees from the horizontal. Direct flow evacuated tube collectors, where the heat transfer fluid is pumped through each tube effectively connected in parallel, offer greater flexibility with regard to the positioning of the collector array. These collectors can be placed flat on the roof or vertically on a façade, giving the ability to rotate each tube to optimise orientation and inclination by about +/- 25 degrees. So, even if the location is not directly facing due south, the tubes can be adjusted accordingly to maximise solar energy absorption.

Indirect solar cylinders

Frequently in winter the balance of energy required to satisfy the demand is supplied by the primary heating appliance – a heating boiler or direct-fired water heater. During the summer period, the solar energy absorbed by the collectors and transferred into the hot water can negate the need for any energy at all being provided by the primary heating appliance – this can have a significant impact on reducing carbon dioxide emissions and reducing energy bills.

For example, consider the system in Figure 4, a direct-fired water heater system to raise the incoming cold water supply at 10°C to a legionella-safe water temperature of 60°C (ie a separate boiler is being used for the space heating). A pre-heat cylinder served by an array of roof-mounted solar collectors can be used to supply pre-heated feed water to the direct-fired storage water heater, so requiring less fuel to raise the water to the required set point of 60°C.

In the summer months there may be sufficient solar irradiation over prolonged periods of the day, such that the water in the pre-heat cylinder is able to reach temperatures in the region of 75°C to 80°C. In such circumstances, depending on how the pre-heat cylinder and collector array have been selected, the solar



Figure 2: Application of roof-mounted flat plate solar collectors – each panel has a 2.55m² gross area, 2.21m² absorber surface area, 90.8 per cent transmission efficiency and 95 per cent absorption efficiency



Figure 3: Evacuated tube solar collectors installed on a mixed-use university building on the south coast. The gross area of each collector (each with 30 tubes) is 4.25m² (3m² absorber surface area). This collector array heats an indirect solar cylinder with capacity of 1,500 litres used to pre-heat water for two direct-fired water heaters

energy could be sufficient to supply the required water temperature at the outlets. At these water outlet temperatures it would be necessary to install a thermostatic mixing valve between the hot outlet of the pre-heat cylinder and the storage water heater, unless there are point-of-use mixing valves used within the building.

Another example is where commercial boilers are being used for space heating and the generation of hot water via an indirect calorifier. For boiler applications, the main principle of generating the solar thermal energy and the use of an indirect cylinder are the same as for direct-fired water heaters.

The difference is in the design of the cylinder, in that it frequently would have two indirect coils (although some systems do use a separate pre-heat cylinder) as in Figure 5.

At times when there is insufficient solar energy to heat the water to the set point (eg 60°C) the commercial boilers would provide the additional energy required to raise the water temperature to the required set-point.

The control of the transfer of energy from the collector array and the indirect cylinder is conducted in the same manner, whether the primary heating appliance is a direct-fired water heater or a commercial boiler. There is a differential temperature control via a sensor at the outlet of the solar collector array and a sensor located in the lower portion of the cylinder. When the temperature differential is greater than, typically, 7K the control unit switches on the pump, allowing the energy captured within the solar collectors to be circulated and transferred into the water via the indirect cylinder coil. When the temperature differential is typically less than 3K, the pump is switched off.

For commercial applications, the issue of development of legionella bacteria in the solar cylinder is often the subject of much concern as the water could be stored at temperatures at which the bacteria can develop (20°C to around 45°C favour growth). This can be overcome with appropriate design and properly informed operation. For example, cylinder pasteurisation can be conducted through the use of shunt connection between the storage water heater and the pre-heat cylinder and, for twin coil cylinders, a destratification pump can be used.

Cylinder selection and design

There are a number of issues to consider when selecting the capacity of the solar cylinder and the design of the indirect coil. The issues apply

to both direct-fired water heater and commercial boiler applications.

In order to maximise the SF, the capacity of the solar cylinder should be matched to the daily hot water demand. In so doing, during the summer months when the available solar irradiation is at a maximum, it may be possible to satisfy the whole hot water load, depending on the demand profile of the property. This could

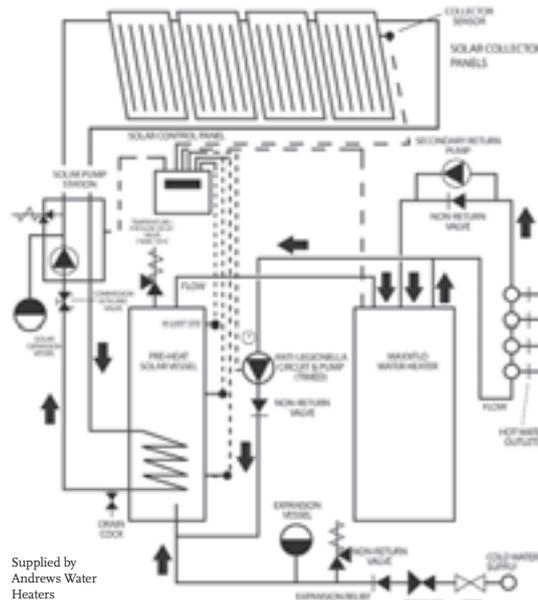


Figure 4: Schematic of an example solar thermal system integrated with a direct gas-fired water heater

entirely offset the need to burn fossil fuel in the primary appliance to generate hot water.

For glazed flat plate collectors, the rule-of-thumb measure is 50 litres of stored water per m² of solar collector array (the active area rather than the gross physical area). Evacuated tubes are more efficient than glazed flat plates, particularly during the colder winter months, as this type of solar collector is less prone to heat loss via convection. For a given surface area the evacuated tube collectors can hold more than twice as much heat transfer fluid. As a consequence, the rule of thumb on sizing and selection is 70 litres of stored water per m².

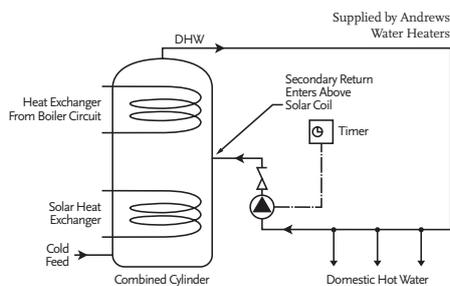


Figure 5: domestic hot water cylinder with two indirect coils (Solar heating design and installation guide, CIBSE 2007)

This ratio between collector array surface area and the volume of stored water is one of the key factors in delivering the optimum SF but, at the same time, ensuring the collectors do not enter into frequent and prolonged periods of stagnation. Even if the correct volume of storage is selected for a given solar collector array, there is still the need to be able to discharge this useful energy into the water stored within the indirect cylinder. The relationship between the surface area of the indirect coil and the absorber surface area of the collector array is critical with regard to dissipation of the solar energy into the water. Very much like a burner, heat exchanger and water flow through a boiler, the solar collector array is the heat generator. If the heat is not discharged into the water, then the heat transfer fluid will return to the collector array and this will affect collector performance and could result in collector stagnation.

Conclusion

The application of solar thermal systems employs traditional skills with readily available technology. On new-build projects there is activity on the roof of the building, during which the solar collectors may be installed. Beyond the collectors, and in the plant room, the work is predominantly hydraulic and

can be carried out by the mechanical contractor installing the remainder of the equipment. The presence of the solar collectors on the roof also offers a visible indication that the end-user has taken positive action and invested in a technology that reduces the carbon footprint of the building.

Solar thermal solutions offer an opportunity to significantly reduce carbon dioxide emissions – approximately 100 kg CO₂/m² of collector array per annum when compared with a natural gas primary heating appliance (based on a gross thermal efficiency of 80 per cent with gas 0.193 kg CO₂/kWh) – contributing to the renewable energy commitment required by local authorities and the increased requirement to include LZC technologies. The impact is particularly marked as domestic hot water becomes an increasingly dominant load as building air tightness and insulation levels improve and space heating loads reduce.

Further Reading

- Solar heating design and installation guide, CIBSE 2007*
- Solar heating systems for the UK – BRE 1979* (old, but still very useful)

Module 1

February 2009

1. Compared with the location on the equator, what is the highest percentage of annual solar energy that the UK can expect?

- A 0 to 15%
- B 16 to 30%
- C 31 to 45%
- D 45 to 70%
- E Over 70%

2. When discussing the percentage of hot water that can be produced using solar thermal means the term used is...

- A Solar efficiency
- B Solar fraction
- C Sun factor
- D Storage function
- E Standard fraction

3. Which of these is unlikely to be part of a flat plate solar collector?

- A Borosilicate glass
- B Copper pipes bonded to the main collector
- C Manifolds of glass tubes
- D Insulation on the rear surface
- E Selective coatings that maximise absorption of solar radiation

4. What is the stated rule of thumb for the amount of stored water per m² of evacuated tube collector?

- A 30 litres
- B 40 litres
- C 50 litres
- D 60 litres
- E 70 litres

5. Roughly how much annual operational CO₂ might be saved in a properly installed solar thermal system compared with a traditional gas-fired indirect hot water system per m² of collector?

- A 0.1 kg CO₂/m²
- B 1 kg CO₂/m²
- C 10 kg CO₂/m²
- D 100 kg CO₂/m²
- E 1000 kg CO₂/m²

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Roderick Pettigrew

HVCA selects new deputy chief executive

Roderick Pettigrew has been appointed as HVCA deputy chief executive.

Under the arrangement Pettigrew will continue to fill his current post as head of the commercial and legal department, but will also deputise for chief executive Robert Higgs, and have the authority to act on Higgs' behalf.

"Rod will progressively take an interest in, and make a contribution to, the work of other departments, as well as to the association and the HVCA Group as a whole," Higgs said.

Pettigrew's remit will focus on the development of the association's knowledge and customer relations management, as well as its intranet programmes.

Cundall UK snares green champion

Cundall has a new partner stationed at its Manchester office after David Clark relocated to the UK.

Comar appoints new managing director

Peter Dziurzynski has been appointed managing director of the Board at The Parkside Group Limited – the largest distributor of Duco sun control and ventilation products in the UK.

Dziurzynski took up the role at the group, which includes Comar Architectural Aluminium Systems and Axim Architectural Hardware, in January.

The business has enjoyed record turnover in 2008 and Dziurzynski's appointment is seen as an 'excellent strategic move' to continue this into 2009.

He brings a wealth of

Outstanding service awards for Hunt and Lyon

Outstanding services awards have been presented to two HVCA members.

John Hunt, formerly of Axima Building Services, and Stuart Lyon of MITIE Engineering Services were presented with the awards by HVCA president Gareth Vaughan.

The awards recognise individuals' contributions which have had a positive and significant impact – but who had not necessarily received the recognition they deserved.

Throughout his career Hunt has been a member of the association's Technical Committee and the Heating and Ventilating Joint Safety Committee, as well as making an "enormous" contribution to the "library of specifications and good practice guides".



(Left to right): HVCA chief executive Robert Higgs, outstanding service awards recipients Stuart Lyon and John Hunt, and HVCA president Gareth Vaughan during the presentation ceremony.

Lyon, meanwhile, was chairman of the HVCA in Scotland, of the association's Education Committee and of the HVACR National Training

Forum. He was described by Vaughan as a serious contender for the title of "the best president the association never had".



David Clark

Clark has spent the last 14 years in Australia at the multidisciplinary consulting engineers' Melbourne office, where he was a director delivering sustainability consultancy and building services engineering on a wide range of green buildings. Now he will concentrate on

championing sustainability at Cundall; both on its project work and to further reduce its own environmental footprint.

Originally a structural engineer, Clark is now an award winner in engineering sustainable projects, with a \$1billion PFI hospital – set to be Australia's greenest – just one of his ambitious enterprises to date.

MPS chooses head of mechanical and electrical engineering in Scotland



Ken Hall

Engineering, design and project management company Morgan Professional Services (MPS) has appointed Ken Hall as head of mechanical and electrical engineering in Scotland.

Ken joins MPS from engineering services design specialist Rybka, where he was regional director.

Based at the company's Glasgow offices, Ken has expertise in the

leisure, healthcare and commercial sector and in working on education framework agreements. His previous career has included working as an associate with Buro Happold Consulting Engineers and as lead engineer for Foster Wheeler Energy.

Morgan Professional Services appoints national design and operations director

Design, engineering and project management specialist Morgan Professional Services (MPS) has appointed Enzo Adamo as national design and operations director.

He joins MPS from multidisciplinary engineering and environmental consultancy Waterman International, where he was a director based at the company's Dubai office.

In his new role with MPS in Stratford-upon-Avon, Adamo will be responsible for growing the business into a major market leader in the design consultancy field.



Enzo Adamo

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CIBSE is now seeking a knowledgeable, enthusiastic and ambitious Certification Manager to take overall responsibility for the operation of CIBSE Certification and its registers

Responsibilities will include:

- Service quality
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- Managing a team of seven.

The person appointed will have the experience and aptitude to be accredited as a Low Carbon Energy Assessor as well as the communication skills and competence in building services to be able to negotiate with government and other senior stakeholders on behalf of CIBSE Low Carbon Experts.

The role is a permanent one based in CIBSE's Balham offices but frequent travel around the UK will be required.

Remuneration will be set according to experience and potential.



www.cibsecertification.co.uk



For a full job description and person specification please e-mail Kerstin Egger kegger@cibse.org

Director – Renewable Energy Built Environment



Energi Recruitment has been retained, by one of the Country's leading Multi-Discipline Engineering Design Consultants, to source a Director – Renewable Energy.

The successful candidate will provide the necessary expertise and drive to advise the company's clients to meet the UK's target of 15% renewable energy by 2020 which, is legally binding as dictated in the EU's 2020 Directive.

Although the home base for this operation is the Midlands, the company's clients are located across the length and breadth of The UK.

Responsibilities:

The client concerned is already market leader in the renewable energy market. Currently they are advising major PLC's on their energy strategies as well as providing detailed design and project management of the recommended energy projects.

The company's CEO currently advises the Government, at ministerial level, for renewable energy strategy and implementation. This post therefore carries the opportunity and potential to help shape Government thinking.

The successful candidate will not only take on board the current workload but will be expected to locate new clients and build up a working rapport with senior individuals.

Skill-set and Experience required:

It is essential the successful applicant is a Chartered Engineer and qualified to Degree level in a relevant Engineering/Scientific subject.

From a career perspective, you will have previous high level experience in the energy sector (Built Environment) and your track-record will include building a business or department both from a business and team building recruitment/selection perspective.

You will be a leader and have the necessary gravitas to engage Board Directors and, potentially, Government officials. An inbuilt level of diplomacy and knowing when not to back down is essential.

An innovative thought process will put you in the upper quartile of individuals implementing future energy savings potential

Package:

Basic salary will be in the region of £75k to £85k per annum. A very generous car allowance, full medical cover, professional fees, relocation allowance In addition to this company equity ownership is available.

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All communications will be dealt with in the strictest of confidence.

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Here at Camden, we're committed to providing our diverse community with excellent services across the board. We're seeking outstanding people who will focus on our customers, take personal responsibility, work together and find better and cheaper ways of doing things. So, if you share these values, think about joining us.

Technical Officer (Electrical and Mechanical)

£32,118-£34,605 p.a.

We are seeking a talented M&E Engineer to join our team of professionals keeping Camden's schools and children's centres in top operating condition. Working in a diverse range of 100+ buildings, you'll engage contractors to carry out reactive repairs, planned maintenance and improvement projects in all aspects of M&E works, ranging from rewiring, installation of security or fire alarm systems, to ventilation for catering or IT areas.

You will also play a key role in planning and liaising with colleagues on robust management systems for example covering legionella, and electrical safety.

This is a varied role, covering both electrical and mechanical works, and you will be part of a strong multi-disciplinary technical team.

We're proud of our comprehensive professional service levels and friendly, cooperative working. Plus you'll have the satisfaction of helping to maintain and improve the built environment in Camden's schools and children's centres.

You'll need a recognised qualification in electrical or mechanical engineering and some experience of specifying works and managing contracts, plus a detailed knowledge of regulations, environmental sustainability and health and safety legislation.

These are exciting times to be working in schools and children's centres - and where better to do so than at 4-star Camden? We offer all the benefits of public sector employment including good holidays, flexitime, training, and a local government pension.

Camden Council values the diversity of its community and aims to have a workforce that reflects this. We therefore encourage applications from all sections of the community.

Camden is committed to the protection and safety of children and vulnerable adults and expects all staff to share this commitment. This position is subject to an enhanced CRB check.

For further information and to apply online 24 hours a day, please visit www.camden.gov.uk/jobs

Please quote job ref: IRC4261.

Closing date: 9 March 2009. Interview date: w/c 30 March 2009.

East Kent Hospitals University NHS Trust

Senior Building Services Design Engineer

Ref: 344-9876FZE • Band 7 £29,091 - £38,352

Enthusiastic mechanical & electrical engineer required to join in-house design team involved in a variety of new-build and refurbishment schemes based at Ross House, Folkestone. As a member of a multi-disciplinary team you will be responsible for the design, specification and project management of engineering works up to £1.5 million in value.

Qualified to degree or equivalent standard, you should be a member of a relevant professional body and have a good understanding of statutory requirements and Health Service standards. Good IT skills (AutoCAD and Microsoft Office Suite) are essential.

Please apply on line via the NHS website at www.ekht.nhs.uk (click on the Careers Tab then Vacancies and then NHS Jobs website)

Closing date: 28 February 2009.

For other job opportunities within East Kent Hospitals University NHS Trust go to our website www.ekht.nhs.uk and click on vacancies.

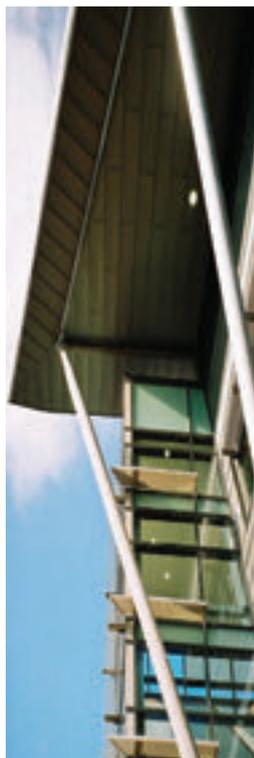
East Kent Hospitals University NHS Trust is exempt from the Rehabilitation of Offenders Act 1974. All positions within the Trust require a Criminal Records Bureau check, for posts working regularly or unsupervised with children or vulnerable adults an enhanced check will be carried out. All other posts will require standard checks.



We positively promote flexible working practices. To ensure that our workforce reflects the population we serve, East Kent Hospitals University NHS Trust welcomes applications from all sections of the community. The Trust operates a complete smoking ban on all sites and grounds.

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Award winning multi-disciplinary consultancy requires a Chartered Mechanical Engineer to head up their M&E team in the North West. You will have responsibility for the delivery of a wide range of design commissions across a diverse range of sectors.

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Senior Mechanical & Electrical Design Engineers

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Our client is seeking to appoint a Senior Electrical and a Senior Mechanical Engineer to join the existing team. They have a full orderbook of work and therefore you will need the ability and skill to come on board and hit the ground running, working on a variety of projects including hospitals, offices and a number of Government-funded projects. These are live vacancies and our client is in a position to interview and start the right individuals immediately. If you are interested in these or any other design roles, please contact Tracy Marler – tracy@henryrecruitment.com or Russell Easterbrook – russell@henryrecruitment.com

Mechanical, Electrical, Public Health & CAD Design Engineers
South East – To £Neg

Henry Recruitment is pleased to be working with a number of established design consultancies based in the South East, assisting in their search for teams of highly skilled Mechanical, Electrical, Public Health and CAD Design Engineers. Our clients will consider all levels of Engineers on a permanent or freelance basis and are willing to pay above market rates in order to attract the market's best. They are currently engaged on a variety of high value projects which includes a mixture of recession-proof public and private sector projects. If you have a solid background in mechanical, electrical, public health or CAD building services design then please forward an updated Word CV to Russell Easterbrook – russell@henryrecruitment.com or Tracy Marler – tracy@henryrecruitment.com

Mechanical Estimator

Middlesex – £DoE

Operating within a number of market sectors, this reputed name in the M&E services industry seeks a Mechanical Estimator to join and strengthen their estimating department. Reporting to the Estimating Manager, the successful candidate will be required to construct and manage estimates on projects valued up to approximately £10m within the commercial, pharmaceutical, retail and public sectors. Ideally candidates will be qualified to HNC level or have completed and progressed from an indentured apprenticeship. An excellent salary and benefits package is on offer as well as the opportunity for long-term career progression. Contact Chris Chell – chris@henryrecruitment.com

Mechanical Project Engineer

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To the historical launch of the CIBSE Journal

– **BSV says good luck to all**

Energy & Sustainability Manager – London, £neg ref: 10911

This very busy M&E consultant and Building management company has an excellent opportunity for an experienced Low Carbon Consultant/Assessor to manage and build this thriving division. Good prospects for an experienced ambitious client facing engineer.

Electrical Contracts Director – Scotland, £neg ref: 10907

A hands on role within this busy contractor, you should be qualified and have experience of managing commercial projects to £5m. Experience of branch management is a plus. Relocation package available.

An astute, out-going Senior Electrical Design Engineer also required.

Senior Mechanical Engineer – M4 Corridor/London, £neg ref: 10898

Our client requires a, preferably Chartered, Mechanical Engineer with a real interest in Low Carbon Sustainable design. Ideal experience will include commercial refurbishment with knowledge of HVAC systems and controls. Will manage their own work load and clientele.

Senior Electrical Design Engineer – South London, £neg ref: 10903

A Senior Electrical Design Engineer is required for this multi-disciplinary organisation to support their expanding project base. You will provide a comprehensive professional technical service, Degree qualified and Chartered with a wide breadth of experience and knowledge in the consultancy field.



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MEP QUANTITY SURVEYOR ABU DHABI Negotiable tax free salary and benefits SGP3447

This large M & E Construction Company based in Abu Dhabi requires an MEP Quantity Surveyor. You will need to have a Degree / Diploma in M & E Engineering gained from a recognised University with previous experience gained with a reputed Electrical Mechanical Construction Company.

MECHANICAL OR ELECTRICAL DESIGN ENGINEERS BERKSHIRE Negotiable salary SGP3478 - SGP3479

This Building Services contractor in Berkshire requires one Electrical and one Mechanical Design Engineer. For both roles, you will be expected to work independently with the minimum amount of supervision to design contracts within budget and time constraints. You will need to be capable of carrying out design packages and able to produce drawings in AutoCAD.

M&E DIVISIONAL BID MANAGER COVENTRY Negotiable salary + benefits SGP3484

This large M & E Building Services Contractor in Coventry requires an M & E Divisional Bid Manager. You will need to have a strong background in Estimating or possibly Quantity surveying with previous experience of Bid Management gained in the construction industry.

MECHANICAL DESIGN ENGINEER YORK Negotiable salary + benefits SGP3491

This large M & E Building Services Contractor in York requires a Mechanical Design Engineer. You will be part of a large team who provide a high standard of design on a wide range of building services projects.

M & E QUANTITY SURVEYOR CENTRAL LONDON Negotiable salary + benefits SGP3492

This large M & E Building Services Contractor in London requires an M & E Quantity Surveyor. You will need to provide and deliver high quality cost and contract management support along with the procurement for tendering. Preparation of budgets, forecasts, and valuations for payment is also essential.

This is a small selection of our current Building Services roles. We also have many other PERMANENT and CONTRACT roles. Please email your CV or call Sue Gregory for more details.

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Low Carbon Consultants

North West & North London £30,000 - £40,000 + Excellent Benefits Package

Our Client delivers a range of high quality sustainability services on all aspects of sustainability to a diverse range of public, private and healthcare sector clients. Currently with a particular focus on developing capacity to deliver services around energy management & assessment (with an initial focus on delivering DECs / EPCs)

The ideal candidate will be a registered Low Carbon Energy Assessor, certified to produce DECs & EPCs to level 4/5 for commercial / non-domestic buildings and be familiar with using thermal modelling software. With a good degree in an energy / environmental discipline and 2 years + experience in delivering energy / environmental assessments you will be committed to working with organisations to improve their environmental and sustainability performance in ways which are compatible with their overall organisational aims.

This is an excellent opportunity for a motivated self starter with excellent interpersonal and decision making skills to join a young, vibrant & dynamic organisation which offers the right candidate prospects for organic promotion in the future.

For a full job specification or confidential discussion about this unique and exciting opportunity please contact James McNeaney on 01282 777 414 or via email: James@serlimited.com This is an exclusive position and all correspondence will be in the strictest of confidence.

Mechanical Design Engineers

Manchester & North London £40,000 - £45,000 + Excellent Benefits Package

My client, an industry leader within Building Services, are actively looking to expand their keen and dedicated team of design engineers both in the Manchester and Surrey areas of the UK.

The successful candidate will be experienced in Mechanical Design Engineering within the M&E building services arena. Design experience is essential together with good people skills, a hard working attitude and dedication. Working on single and multi disciplined projects within the commercial sector these positions offer long term job security and present a good opportunity for organic promotion within the company.

As a Design Engineer within Building Services you will ideally have broad based experience across a range of sectors with good computer & communication skills. Familiarity with TAs, Cymap, AutoCad (M&E) would give a distinct advantage but are not essential.

Whatever your circumstances, if you are interested in this role I would very much like to speak to you. If you would like a confidential and informal chat about your options please feel free to call me, Carl, on 01282 777 414 or via e-mail: carl@serlimited.com This is an exclusive position and all correspondence will be in the strictest of confidence

Sales Manager - Building Management Systems

Berkshire £45,000 - £60,000 + Commission & Benefits Package

Our Client is one of the market leaders in the provision, development and maintenance of Building Management Systems (BMS) and high value open system integration for the Building Services industry. Due to further planned growth they are now actively looking to recruit a Sales / Operations Manager to be based from the Berkshire office.

You will ideally come from a BMS Controls background and have strong market experience of systems such as Trend, and Satchwell. You must be strong, technically minded and have a proven track record in man management & sales development within Building Services.

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Events & Training

NATIONAL EVENTS/ CONFERENCES

- **18 Feb 2009** Building Control Systems and Guide H, one-day event, CIBSE, London
Contact CIBSE events: 020 8675 5211 or jrussell@cibse.org
- **24 – 26 Feb 2009** RAC and H&V '09 Exhibitions Birmingham NEC
For more information, visit www.handvexhibition.com
- **4 Mar 2009** Concrete Elegance: Museums and Galleries Camberley
For more information, visit www.buildingcentre.co.uk/events
- **11 Mar 2009** Humidification, one-day event, CIBSE, London
Contact CIBSE events: 020 8675 5211 or jrussell@cibse.org
- **17 Mar 2009** EPCs 2009 – the real effect on the market London
For more information visit www.cibse.org/events
- **31 Mar – 1 Apr 2009** BIFM Annual Conference 2009 Keble College, Oxford
For more information, visit www.bifmconference.com
- **22 Apr 2009** Concrete Elegance: Education Buildings, Camberley
For more information, visit www.buildingcentre.co.uk/events
- **28 – 29 Apr 2009** CIBSE National Conference 2009, two-day event Hotel Russell, London
Contact CIBSE events: 020 8675 5211 or lpenson@cibse.org
- **18 – 21 June 2009** 2009 Building Services Engineering Football World Cup Liverpool
For more info, go to www.buildingservicesworldcup.com

CPD TRAINING

- For more information about the courses visit www.cibse.org/midcareercollege. To book call 01223 880016 or email: courses@cibse.org
- **26 Feb 2009** Managing Human Behaviour in Fires & Emergencies London
 - **02 Mar 2009** Mechanical Services Explained – special three-day course London
 - **10 Mar 2009** Examination of the new BS9999 on Fire Safety in Buildings Leicester
 - **19 Mar 2009** Mentoring Skills London

OTHER TRAINING

- **26 Feb 2009** NATIONAL SEMINAR: Building Regs Part L2: How to Demonstrate Compliance, a CPD course offered by CIBSE Birmingham, Course code B108
For more information visit www.cibse.org/midcareercollege or call 01223 880016.
- **21 Apr 2009** NATIONAL SEMINAR: Building Regs Part L2: How to Demonstrate Compliance, a CPD course offered by CIBSE London, Course code A282
For more information, visit www.cibse.org/midcareercollege or call 01223 880016

ASHRAE

- **19 Feb 2009** CIBSE ASHRAE Group Fishergate Hill, Preston, PR1 8XB
Contact Gary Shaw 01253 738 516
- **13 May 2009** Urban wind turbines – saviours or statues London South Bank University, SE1 0AA
Email ewenrose@btinternet.com

DAYLIGHT

- **12 Mar 2009** Research Review London Metropolitan University, London
Email graham.philips220@ntlworld.com
- **13 May 2009** AGM and Daylight Group Forum University of Greenwich, London
Email graham.philips220@ntlworld.com

ELECTRICAL SERVICES

- **25 Feb 2009** The myths of clean earths University of Surrey, Guildford
Contact 020 7803 3749 or email leon.markwell@ecovetfm.co.uk
- **01 Apr 2009** Solar engineering University of Manchester, Manchester
Contact 020 7803 3749 or email leon.markwell@ecovetfm.co.uk

FACILITIES MANAGEMENT

- **04 Mar 2009** Lightning protection – the new EN standards WS Atkins, Surrey

CIBSE National Conference

CIBSE's annual National Conference returns to London, where a set of expert speakers will take us through two days of talks on sustainability: both sustainability in building services and, crucially, how to create a more sustainable business.

The agenda will begin with a look to the future of the industry, forecasting major changes, updating our knowledge of new legislation and focusing on the social, economic and technological realities that will have a major impact on the way we do our work. This will be followed by a series of papers focusing on practical applications.

Day two will begin with an update on the new Part L 2010 and EPBD 2010, before focusing on the concept of zero carbon: what it really means, and how we can achieve it. Sessions

- Contact 0207 803 3749 or email leon.markwell@ecovetfm.co.uk
- **12 Mar 2009** 'BORM' Managing the risks – one year on London South Bank University,
Contact 0207 803 3749 or email leon.markwell@ecovetfm.co.uk
 - **07 May 2009** CIBSE FM Group AGM and visit/discussion Location tbc
Contact 0207 803 3749 or email leon.markwell@ecovetfm.co.uk

INTELLIGENT BUILDINGS

- **25 Feb 2009** Hospital buildings – the healing aspects of design in healthcare RIBA, 66 Portland Place, London, W1B 1AD
Contact CIBSE: 020 8772 3613 or vwilliams@cibse.org. For more information and booking details, visit www.cibse.org/ibg
- **21 May 2009** How can intelligent buildings challenge sustainability location tbc
Contact 0208 774 2705 or email eve.dsouza@mottmac.com

THE SOCIETY OF FAÇADE ENGINEERING

- **5 Mar 2009** seminar: Delivering the Architecture, and AGM RIBA, London
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Kent Peterson at last year's conference.

will look at low-carbon refurbishment and other low-carbon solutions so that, as an industry, we can make the most of available workstreams.

A look at EPCs and DEC's will uncover the real effect they have had on property, while a focus on robust design and operational excellence will show how to get it right first time.

For details on the conference, on 28-29 April, call 020 8675 5211 or email lpenson@cibse.org.

SOCIETY OF LIGHT AND LIGHTING

For more information on the events listed below, please visit the SLL special interest group via www.cibse.org

- **17 Feb 2009** 100 Years of Lamps and Luminaires – Institution of Structural Engineers London
- **25 Feb 2009** Lighting Masterclass Science Museum, Birmingham
- **12 Mar 2009** Lighting Masterclass Clontarf Castle, Dublin
- **17 Mar 2009** Light Pipes – Institution of Structural Engineers London
- **18 Mar 2009** Ready Steady Light Rose Bruford College, Sidcup
- **16 Apr 2009** Lighting Masterclass York Racecourse
- **21 Apr 2009** Office Lighting – Institution of Structural Engineers London
- **13 May 2009** Lighting Masterclass HMS Belfast, London
- **19 May 2009** AGM, Presidential Address and Awards Reception Royal Society of Arts, London
- **18 June** LR&T Centenary Symposium location tbc

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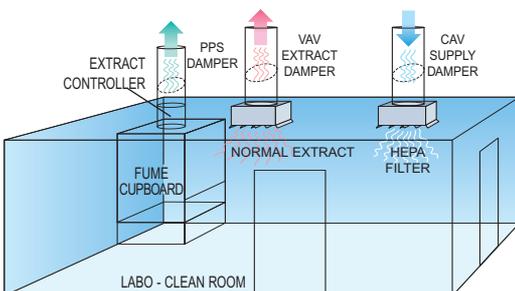


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