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Building the future

Packaged product

Mayville Community Centre is a building within a building – a 19th Century generating station wrapped in Passivhaus polystyrene. Roderic Bunn uncovers the background to the project

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Finding the winning streak

Andrew Eastwell

So, England is now Number 1 in the world of cricket, which is great news in an otherwise rather dismal news period. It was Sir Clive Woodward, coach of the World Cup-winning England rugby team, who coined the phrase “the incremental accretion of marginal gains” that helped him produce winners.

The process of analyzing every minor facet or performance and then extracting the maximum advantage from measured and tested changes is grinding and relentless, but when all the improvements are added together over a long development period, the process does produce the

winning formula.

My guess is that the same logic of “incremental accretion” is going to be needed to screw down energy use in buildings to meet our carbon emission challenges. There will be some new technologies, analogous to Chris Boardman’s revolutionary bike, that will help us.

No doubt some construction Johnny Wilkinsons will emerge, but in the end it will be good design, well-constructed buildings, and crucially, intelligently and properly used technologies that will get us to the ‘nearly zero’ finishing post.



BUILDING PERFORMANCE EVALUATION

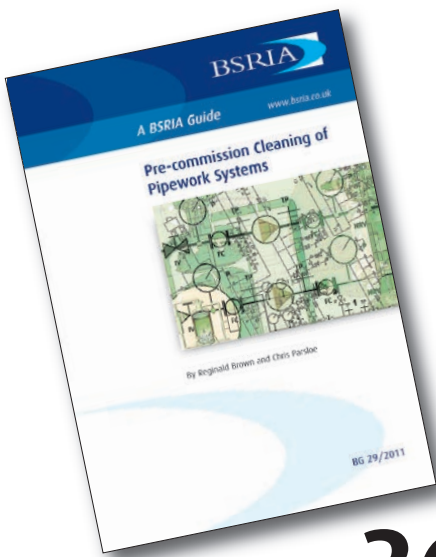
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Month/September

Gove uses private cash to re-boot the schools rebuilding programme

Education secretary Michael Gove has announced the details of the Coalition's privately financed school building programme.

The programme is said to be worth around £2 billion, resulting in up to 300 new schools. The first will open in September 2014.

Gove said that the programme would be "rigorously policed" to ensure it does not incur the excessive costs incurred by Labour's privately-financed schemes.

Gove also promised that an extensive survey of the nation's schools estate would ensure his building programme would focus on the school buildings in greatest need of repair.

In a Commons statement, Gove said he accepted the majority of recommendations



I wish to develop a suite of standardised drawings and specifications for school buildings

MICHAEL GOVE

contained in the *Capital Review*, carried out by Dixons chief Sebastian James.

Gove singled out the need for more standardised design to avoid the cost overruns experienced on Labour's axed Building Schools for the Future programme. "I wish to develop a suite of standardised drawings and specifications for school buildings," he said. "We will also revise school building regulations to reduce unnecessary burdens and bureaucracy."

A consultation process on details and implementation of the building programme will run until 11 October 2011. It will focus on finding the best model for allocating and prioritising capital, and on proposals for better procurement and project management.

Gove has already called for a more centralised approach to capture efficiencies and build expertise.

"In order to allow sufficient time for consultation and to ensure that schools and local authorities have sufficient time to plan for possible changes, we are consulting on whether we should implement these reforms from 2013-14 or wait until a later spending period," said Gove.

He also promised to maintain the current funding system for maintained schools for 2012-13.

More details on the consultation exercise can be obtained via <http://media.education.gov.uk/assets/files/pdf/c/lacseg%20consultation.pdf>

Decline in construction output to last for at least two years

Construction activity will continue to decline for at least the next two years, followed by only weak growth in 2013, before any recovery in 2014, says the Construction Products Association (CPA).

The CPA believes that output for 2011 will fall 1 per cent, followed by a fall of 2 per cent in 2012. In

2013, output will be broadly flat with just 0.2 per cent growth, before a return to some significant growth of 3.4 per cent in 2014.

In August, construction output figures for the second quarter of 2011 were revised upwards by the Office of National Statistics, from 0.5 per cent to 2.3 per cent. The CPA nonetheless believes that despite the

the improvement, the underlying direction "continues to cause widespread concern, as public sector cuts are only just beginning to affect these figures."

Commenting on the ONS revision, Kelly Forrest, senior economist at the Construction Products Association said: "If you examine the figures in detail, they show that while private

sector work has started to recover, it is nowhere near enough to offset the public spending cuts from the Comprehensive Spending Review. This quarter has seen public sector work fall by less than 1 per cent, so there is plenty more contraction still to come."

The CPA says the outlook for the next 18 months is "very poor".

¹ www.ckdesignworks.com/media/CrystalGardens.php



Australian architect CK Designworks has designed a 35-storey residential and commercial mixed use building for Melbourne, Australia as a so-called 'vertical street'.

The building, Crystal Gardens, will contain landscaped 120-square-metre community gardens on every sixth floor. The planted areas are said to be the equivalent to about double the area of the site.

Trees up to 10 m will be housed in purpose-built planter boxes. Special structural supports will hold the weight of the soil and trees.

Rainwater will be collected from the façades and used for garden watering and toilet flushing. Energy efficient lights and water efficient appliances will be used throughout.

Project architect and partner of CK Designworks, Robert Caulfield said "the project will give an excellent financial return, partly because planning approval was achieved for a project more than double the recommended height limit."

The building, which will house shops, offices and 154 apartments, will be completed by 2014¹.

Energy benchmarks on the button, says CIBSE

A CIBSE study has found that the benchmark figures used in Display Energy Certificates (DEC) are fit-for-purpose, with 94 per cent of the buildings studied showing a good correlation between the benchmarks and the actual operational ratings.

The CIBSE has published the results of a study of the first 45 000 DECs lodged on the Landmark register from October 2008 to mid-February 2010. The study focused on Operational Ratings in order to assess the applicability of the CIBSE benchmarks, and to provide evidence to the Department of Communities and Local Government for any changes to the benchmarks or allowances.

The UCL Energy Institute worked with Phil Jones of Building Energy Solutions, Robert Cohen of Camco and Bill Bordass of the Usable Buildings Trust to undertake

the detailed review.

The results show that the benchmarking system works well for those building categories most commonly found in the database. Schools account for 15 335 DECs, equivalent to 52 per cent of the total. The median school DEC Grade is within 2 per cent of the benchmark.

For the 3230 office buildings (11 per cent of the total), the median is almost exactly at the D/E boundary, which matches expectation.

The benchmarks work well for clinics, hospitals and emergency service buildings, while the benchmarks for entertainment halls and theatres, dry sports and leisure facilities appear to be too generous.

Benchmarks for laboratories and operating theatres and for workshops need review. Their special energy uses equipment generally leads to high loads.

Right: Solar installer EOS Energy has received the go-ahead to start work on an installation of a 50 kW photovoltaic array on the roof of Coventry Cathedral. EOS will be working in partnership with the Cathedral and the Renewable Energy Technology Alliance (RETA). The array will consist of 178 panels.



30 SECOND NEWS

The Australian Government has announced the introduction of a carbon tax, progressing to an emissions trading scheme in July 2015. The tax will be levied initially at A\$23 (US \$21.62). Go to www.cleanenergyfuture.gov.au and follow the links.

Partnerships for Schools (Pfs) has announced academy projects worth £800 m to be tendered over the next 18 months. This includes £250 m worth of work in the north of England and £550 m in the south. The academies framework will be run by Pfs until it is replaced by the Education Funding Agency.

The Department of Energy and Climate Change (DECC) has announced plans to simplify the Carbon Reduction Commitment Energy Efficiency Scheme (CRC-EES). Go to www.ukgbc.org/site/news/show-news-details?id=428

The £1.5 million Riccarton Eco-village and Living Laboratory (REALL) project has received funding to investigate the low carbon construction, technology and behaviour of 10 eco-homes on the Riccarton Campus. The project will start on site in May 2012. For more information contact project director Gary Clark via gary.clark@hw.ac.uk

The RIBA has published a guide to good design: *Good Design – it all adds up*. A free copy can be obtained from www.architecture.com/TheRIBA/AboutUs/InfluencingPolicy/Thevalueofgooddesign.aspx



- Domestic
- Post-completion
- Post-occupancy
- Non-domestic
- Under construction
- In operation

Article **1** 09.11

Mayville Community Centre

Roderic Bunn describes the background to a Passivhaus refurbishment project in Islington, London

BUILDING PERFORMANCE

The Technology Strategy Board (TSB) is running a four year £8 million programme to promote Building Performance Evaluation (BPE). The aim is to understand the difference between the anticipated performance of new and refurbished buildings, and their performance in-use.

On energy use alone, there is often a three-fold difference between calculated energy consumption and actual consumption. For buildings heavily reliant on electricity, this under performance can lead to even higher discrepancies on carbon dioxide emissions.

The TSB is funding two types of study for domestic buildings: post completion and early occupation, and in-use and post occupancy. For non-domestic buildings, studies can be for buildings under construction or those in operation and no more than three years old.

If you want more information and application forms go to www.innovateuk.org

The science of climate change is presenting the global built environment with some stark choices. Carry on as we are, and buildings will contribute hugely to the rise in greenhouse gas emissions. Focus on zero-carbon new build, and we'll only improve 1-2 per cent of the buildings every year.

The bare fact is that carbon reduction targets of 60 per cent or more cannot be achieved without a deep retrofit programme of existing buildings. Nearly 90 per cent of those buildings will still be operational in 2050, so tinkering around the edges with new build won't be enough.

A more radical approach to refurbishment is needed, where energy use is driven down so that remaining demands can be easily covered by renewable or low carbon fuel sources. The first step is to reduce heating loads by high levels of thermal insulation and fabric airtightness. The second step is to increase the efficiencies of the heating, cooling and lighting systems, and to ventilate naturally or by mechanical

ventilation with heat recovery where appropriate. The third step is to use low carbon sources of fuel.

This, in essence, is what drives the Passivhaus approach. Widely practised in Europe, Passivhaus is now making inroads in the UK. The key question is whether what works in mainland Europe is appropriate for the wetter, milder UK, with often densely occupied spaces and longer hours of operation.

The Mayville Community Centre project in Islington, North London, is a case in point. The project involves the complete refurbishment of an existing 19th Century brick building into the first non-domestic, fully certified Passivhaus refurbishment in the UK.

Procurement

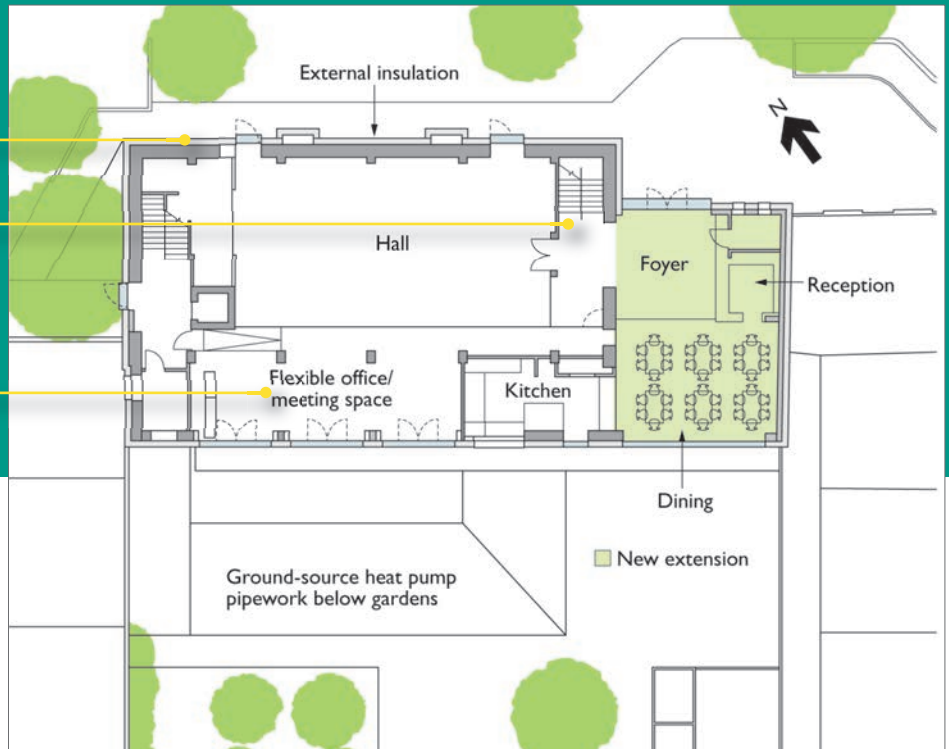
Built in the 1890s as a generating station for London's tram network, the massively constructed building was rescued from dereliction in 1973 by the Mildmay Community Partnership and turned into a community centre for the local Mayville Estate.

Key areas of evaluation

The performance of the Passivhaus standard fabric will be monitored, with thermal transmittance tests

Mayville's wall-mounted user controls need to be intuitive to use and uncomplicated. Information panels will be installed around the building to see whether they help the users make the right decisions

The building's mechanical ventilation and heat recovery will be monitored to see whether the variable volume MVHR system is practical for this kind of building



Right: The ground floor plan of Mayville Community Centre, showing the main public areas.

In 2006 Bere:Architects was asked to refurbish and extend the rundown building. Initial thoughts had been to heat the existing building with a biomass boiler, but Justin Bere quickly calculated that they would need “juggernauts of wood” to cope with a leaky (asbestos) roof, leaky windows, and hardly any insulation.

Rather than simply extend the building, Bere reasoned that more space could be generated through efficient internal replanning and by adoption of Passivhaus principles. The community trust agreed.

Procured under the JCT SBC/Q05, refurbishment works to the building include internal space replanning to create an extra 35 per cent usable space for both local community use and renting to small fledgling businesses.

The building's accessibility was improved and a full upgrade of the fabric and its environmental systems was planned to meet the Passivhaus standard. The construction budget was £1.6 million.

Site aspects

The existing building, orientated due north south, is a three-storey concrete-framed building (basement, ground and first) with a nominal 600 mm-thick solid brick skin, pitched roof and a later single-storey extension. Although the building is situated within community gardens, they were not easily accessible. The rebuild aimed to improve this.

An enlarged single-storey entrance block with reception and dining area was added, along with access to the

south garden. Enlarged openings to the ground floor south elevation also allows access to a south garden (increasing winter solar gain). A south elevation lightwell, down to basement level, allows in natural light, ventilation, and solar gains, and provides access to the basement.

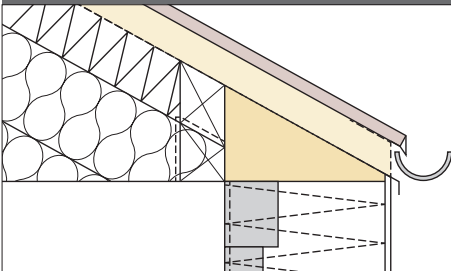
The additions have increased the usable area by about 35 per cent. The treated floor area is 665 m². Work started on site May 2010 and was completed in July 2011.

Right: The Mayville Community Centre prior to the refurbishment: leaky, energy hungry, and run-down – but still playing a vital role for the local community.





With so much riding on the insulation, installation quality had to be very high. A random test of recently installed blocks found that the labourers were not gluing the expanded polystyrene to the building properly, thereby creating gaps and a thermal bypass between the walls and the insulation. The main contractor's site manager ensured that the entire south elevation was dismantled and properly re-attached to the building.



The construction quality of the eaves junctions needed special attention, and a site inspection found that a wedge of insulation had been omitted by the insulation contractor. This left a cavity, (shown) so the contractor drilled holes at 150 mm centres and sprayed in foam insulation to make the insulation continuous and close the cold bridge.



The architect imported the windows from Germany, as it couldn't find a suitable competitive supplier in the UK. Germany has been making quality windows since the 17th century and can supply a highly manufactured product. Good sealing by the contractor was vital.



Left: There's a lot going on in this image of the excavated footings being covered in 200 mm of Permarock polystyrene insulation. At right is a small part of the bitumin tanking, with the parge coat in white. The insulation is being glued and located over the parge coat and sealed with tape. The building was excavated right down to its massive raft slab, but it wasn't practical to insulate beneath it.

The airtightness membrane has been installed to the inside face of the roof insulation, lapped over the top of the wall at eaves level and taped to the external parge coat to create a continuous airtight cover.

Building fabric

The architect took an incremental approach to improving the building. Primarily this involved improving the efficiency of the fabric and a new roof.

As part of the refurbishment works, the external walls were damp-proofed down to the footings. Originally the slab had a damp-proof membrane, with the bitumin carried up the outside of the building. Unfortunately a 20 m drainage trench had to be cut though that membrane. Despite being made good, the replacement membrane remains a slight concern to the design team.

The Passivhaus Institute recommends insulating underneath new buildings, but here that wasn't practical. An alternative is to create what's termed a thermal bubble underneath the building, whereby insulation below the ground is taken out horizontally for a certain distance. At Mayville it was decided instead to carry the external insulation right down to the foundations and add 75 mm of high performance phenolic insulation on the building's basement concrete raft.

The walls above ground level were treated with 300 mm of expanded polystyrene block fixed to the external face of the brickwork and finished with a protective hardwearing Permarock render. Below ground the basement walls are externally insulated with 200 mm of extruded polystyrene insulation.

A replacement zinc pitched roof with 400 mm of insulation was installed over the top of the existing steel trusses. A layer of 300 mm Rockwool insulation

was placed between the joists, with 100 mm of denser Rockwool over the top of the steel structure to avoid cold bridges. The top of the insulation is covered with a Tyvek breathable membrane and finished off with a standing seam zinc roof.

All windows were replaced with high quality, German triple-glazed windows with detailing that avoids thermal bridging. Careful attention was paid to both the detailing and the quality of insulation. The window frames are positioned with inflatable bags, and fixed with screws that locate but do not put any pressure on the frame itself. The window frames were sealed into the openings with continuous tape. To ensure that contractors could follow instructions, the architect generated multiple work stage drawings for complicated junctions.

Two airtightness tests were carried out, the final test showing a value of 0.43 m³(h.m²) @ 50pa – remarkable for a 19th Century building.

Building services

The design team wanted to reduce energy consumption to the minimum, but as always there is a balance to be struck between highly carbon-efficient technologies, their capital cost, and the ease by which they can be subsequently managed and maintained in a building without on-site premises management.

Energy consumption (including unregulated loads) was modelled using the Passivhaus Planning Package (PHPP), a spreadsheet-based design tool

Right: The community centre hall nearing completion. Although this space will generally be ventilated with air from the perimeter offices, it can receive ventilation directly from the air handling unit via a motorised damper controlled by a carbon dioxide sensor.



for those designing to Passivhaus standard. The PHPP predicted a 11 kW heating load for the building over a continuous 24 h period.

There was no money in the tight budget for mechanical ventilation with heat recovery (mvhr) – a fundamental element of the Passivhaus approach – but the architects successfully argued for heat recovery ventilation to be part-funded from the £3 million Islington Climate Change Fund. This was originally intended only to fund heat pumps and photovoltaics.

The variable volume Paul Maxi mvhr unit is sized to deliver 8.3 litres/s per person for the offices, and 5.6 litres/s per person for the hall and cafe. Specific fan power is 1.86 W/l.s for the supply and extract fans combined. Heat recovery is via a corrugated plastics heat exchanger, said to deliver close to 90 per cent heat reclaim. The fan motor is in the airstream, which provides more heat.

In summer the building will be naturally ventilated through openable windows. The entire building will be mechanically ventilated in winter, with volumes based on carbon dioxide readings. The perimeter offices only have a supply, their extract being out to the hall.

In normal day-to-day use the hall will not need its own ventilation. At times of high occupancy, a carbon dioxide sensor in the hall will open up a ductwork damper to supply air directly to the space. The small cafe area will also have boost ventilation.

A simple timer will bring on the

ventilation to provide a base load to the offices, basement and extract from toilets, while other areas will come on with demand. The wet heating system will run 24 h in winter to minimise flow temp and maximise heat pump co-efficiency of performance.

While grateful for the mvhr funding, the *quid pro quo* was a 8.4 kW Viessmann ground-source heat pump (although the services designer, Alan Clarke, would have preferred a simple gas boiler). The heat pump can provide top-up for the hot water storage. The GSHP storage is sized at 200 litres to prevent the GSHP from switching unduly.

Standard radiators, sized for a 45°C flow, have been used for space heating. Decoupling space heating from air supply allows the mechanical ventilation to be turned off, reducing electricity

consumption.

Islington provided 50 per cent funding for 116 m² of grid-connected photovoltaics rated at 18 kWp. The building has limited need for hot water, so the solar thermal system is a modest single 3 kW panel connected to a 300 litre tank.

Two rainwater harvesting tanks will collect water from two small green roofs over the extension, and the roof of the main hall. The water will be used for garden irrigation and WC flushing respectively.

Electric lighting relies on a mixture of conventional T5 and compact low energy fluorescents. Daylight dimming controls and presence detection has been used where applicable. Large motorised south-facing roof-lights have been used to get daylight into the main



Above: Beneath all the polystyrene and render sits a 1890s generating station. There was little dismantling.

DESIGN AND ENERGY DATA V1

Mayville Community Centre, Islington, London, N16 8NA

Client Mildmay Community Partnership
 Architect Bere:Architects
 M&E designers Alan Clarke
 Structural engineer Conisbee
 Lighting consultant GIA Equation
 Quantity surveyor E Griffin
 Builder Buxton Building Contractors
 M&E subcontractor DB Engineering
 Form of contract JCT SBC/Q05
 Occupation September 2011

Floor areas

Gross internal 800 m²
 Treated* 665 m²
 Basement 189.4 m²
 Basement circulation 14.9 m²
 Ground floor usable area 290.3 m²
 Ground floor circulation 29.7 m²
 First floor usable area 107.8 m²
 Ground floor circulation 22.2 m²

*Note that Passivhaus excludes staircases, lifts, and risers, and takes corridors and plant room at 60% of actual floor area

Fabric performance

Wall U-value below ground 0.15
 Wall U-value above ground 0.12
 Flat roof U-value to new reception 0.13
 Pitched roof U-value 0.11
 Base of slab U-value 0.26
 Triple-glazed windows (incl. frame) 0.8
 Velux opening rooflights 1.0
 Airtightness test result 0.43 @ 50 pa

Hours of occupation

Occupancy figures will vary. Average occupancy is anticipated at between 15-25 people.

Ventilation

Air supply rate 2000 m³/h max
 Specific fan power 1.86 W/l.s at max flow

SBEM energy calculations (2006 Part L2B)

Existing building emissions rate
 110 kgCO₂/m² per annum
 As-designed building emissions rate
 13.7 kgCO₂/m² per annum
 Target emissions rate 18.8 kgCO₂/m² per annum

Passivhaus Planning Package estimates

Total primary energy demand
 116 kWh/m² per annum
 GSHP total demand 14.5 kWh/m² per annum
 Heating demand: 11 kWh/m² per annum
 MVHR 3 kWh/m² per annum
 Pumps <1 kWh/m² per annum
 Domestic hot water demand (net)
 5 kWh/m² per annum*
 Lighting 13 kWh/m² per annum
 Kitchen 7 kWh/m² per annum
 IT 6 kWh/m² per annum
 Music studios 5 kWh/m² per annum
 Other electricity 2.5 kWh/m² per annum
 Total delivered energy (all electric)
 43 kWh/m² per annum (A primary energy ratio of 2.7 gives 116 kWh/m² per annum)

Renewable contribution

*Solar thermal 2 kWh/m² per annum (1341 kWh addition)
 Photovoltaics 18 kWp (14 400 kWh)

hall and for summer night-purging.

The design team has paid specific attention to lighting controls, opting for a simple manual on, and auto and manual off approach. This is based on the principle of PIR-based absence detection rather than presence detection.

Energy calculations

The existing building was consuming 581 kWh/m² per annum (delivered energy). Using the Passivhaus Planning Package, it was calculated that fabric improvements will reduce the primary energy demand to 116 kWh/m² per annum.

The building will be certified by the Passivhaus Institute, and exceeds all 2006 Part L2B requirements. Using SBEM, the target emissions rate was calculated at 18.8 kgCO₂/m² per annum, with the as-designed building emissions rate set at 13.7 kgCO₂/m² per annum, an 87.5 per cent improvement on the old building.

The Passivhaus Planning Package does things a little differently, as it takes into account primary energy when calculating overall energy consumption. The building's main energy end-use estimates are shown in the box opposite.

Performance evaluation

With an eye to monitoring the performance of the building under the TSB's Building Performance Evaluation programme (BPE), the designers have installed flow heaters onto pipework, and are considering installing a wireless datalogger so the building's energy performance can be monitored remotely.

Sub-metering is extensive but not over-complicated. There are submeters serving the ground floor and basement lighting, and the first floor lighting. The photovoltaics, air handling unit, heat pump compressor, top-up immersion heater for the heat pump, rainwater and sewage pumps also have sub-meters.

The design team is aware that the mechanical ventilation system might be slightly too complicated for a building with many different zones, such as the offices, meeting rooms, catering kitchen and basement music recording studios. They thought hard about different planned activities through the week in different rooms to get a feel for what airflow rates would be needed.

The operating set point was based on higher rates for offices occupied all day, but fairly low densities and fairly intermittent occupancy for the community spaces. Average occupancy may be between 15-25 people, but the building's refurbishment and increased usable space will inevitably see greater hours of use and more people using it.

For a building with no on-site premises management, the user controls will need to be intuitive to use and well labelled. Highly visible information panels will be provided to help educate the building's users. There will also be a familiarisation programme for all building users.

Funding from the Technology Strategy Board (TSB) will be used to monitor and evaluate the certified Passivhaus refurbishment. The air tightness value of 0.43 is exemplary. It may lead to useful guidance on specialist contractor training, construction drawings, and the design and installation of thermally and air-tight junctions.

Independent comparison and analysis of forecasted energy use (broken down by end use) will be compared with actual and predicted hours of operation using the CIBSE TM22 energy assessment method. Analysis of the Soft Landings handover, with training and long-term support by the professional team, will also be assessed.

BSRIA is part of the Mayville BPE project research team and will be reporting periodically on the building's performance.

The Northern Lights

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Counting on BEAN

BSRIA has set up a network to discuss the use and future development of environmental rating schemes. **James Parker** and **Tracey Tilbry** lay out the plan of action



Environmental assessment and certification has become a routine part of building design, popularised in the UK by the BRE with its seminal BREEAM rating scheme.

The success of BREEAM (the BRE Environmental Assessment Method) may have brought it international recognition, but it is not the only game in town. In North America, the US Green Building Council has forged the LEED scheme (Leadership in Energy Efficient Design). This, too, has gone international.

More recently, rating schemes tailored to specific countries and regions have also been developed, such as Greenstar in Australia and Estidama in the Middle East. All have been designed with the intention of providing third party certification of the environmental performance of a building.

In the past 21 years over 200 000 buildings have been certified using BREEAM. The clients, designers and developers of those buildings have benefited from a scheme that aims to reduce running costs and improve working and living environments. But does a building rated as BREEAM Excellent truly perform more sustainably in operation?

It would seem logical that there should be a correlation between those public sector buildings with high BREEAM ratings, and the energy consumption reported in Display Energy Certificates. However, such correlation does not seem to show in the available data. Energy consumption two to three times the design estimate seems to be normal, despite attempts to reduce consumption through low carbon measures and renewables.

Evidence is also mounting that the very systems designed to reduce energy consumption are often complicated and difficult to understand and operate. If buildings have systems that tax and confuse the building occupants – made worse by lack of training and familiarisation – then is it any surprise that many green-rated buildings rarely deliver on their promises?

The Technology Strategy Board's £8 million research programme for Building Performance Evaluation (BPE) may provide answers. Although not designed to challenge the credibility of environmental assessment schemes, the BPE programme may serve to amplify what we already know from post-occupancy evaluations: that buildings are not performing as well as they could be,

A key strategy will be to shift the focus of assessments so that they concentrate more on building performance outcomes **JAMES PARKER**

BREEAM NEW CONSTRUCTION - THE MAIN CHANGES

One of the main changes in *BREEAM New Construction* is the assessment of energy performance. In BREEAM 2008, the carbon dioxide index (used for Energy Performance Certificates) was used to assess a building's energy performance. The Index is a measure of the building's carbon dioxide emissions compared with a standard emission rate.

BREEAM New Construction (otherwise called BREEAM 2011) requires reductions in energy demand and energy consumption through material improvements. Outputs from the National Calculation Method, SBEM, will be used to determine performance against these three measures, and BREEAM credits awarded accordingly.

The minimum energy credit standard for BREEAM Excellent remains at six credits out of 15. Broadly speaking this requires a 25 per cent improvement in the building's carbon dioxide emission rate (relative to its Target Emission Rate), as well as improvements in the building's energy demand and consumption (relative to the notional building).

Full details of the BREEAM 2011 New Construction scheme, including the manual, can be found at www.breem.org.

nor anywhere near their design teams' ambitions. If so, we need to understand the root causes of the disparity, and changing what we do so that buildings perform closer to the design prediction and meet the standards set by assessment schemes like BREEAM.

In July, BSRIA launched its Building Environment Assessment Network (BEAN) with the aim of supporting assessors, clients and design teams using building assessment schemes. The network will provide an opportunity to discuss relevant issues, share ideas and educate. It is also intended that the network should become an industry voice, providing feedback to the providers of the various rating systems.

Network aims and objectives

At the first BEAN meeting following the network's launch, it became apparent that a key strategy will be to shift the focus of assessments so that they concentrate more on building performance outcomes, *writes Tracey Tilbry*. The network will therefore look at how environmental assessments should develop over the next ten years, what form they should take, and what they will need to deliver in terms of measurable benefits.

This process will need to take on board market drivers, both in the short and long term, such as the seemingly inexorable rise in energy prices, coupled with possible reduced security of supply. Even though current assessment methods do address carbon dioxide emissions, the schemes will need to evolve to ensure there is a closer and

more robust relationship between predictions and targets, and operational energy consumption and consequential emissions.

The network will be chaired by Dave Cheshire from AECOM. "The network is a great opportunity to take a fresh look at environmental assessment methods and see if they are genuinely delivering sustainable buildings that are more comfortable, better for the environment and cheaper to run," said Cheshire.

"The strong feedback from the first workshop was that environmental assessment methods have become too involved and complex," he added. "We need to work harder to communicate the opportunities clearly and in simple language. We also need to demonstrate the environmental and cost benefits of implementing measures."

LEED and BREEAM assessor Eszter Gulacsy of Mott MacDonald will be focusing on LEED and other methods. Gulacsy believes that there are lessons that could be learnt from the way these international methods, including Green Star and Estidama, are developed and applied.

"LEED is possibly the only non-UK assessment method that is used in UK projects, hence the relevance to the network," she said. "Investigation of other international methods may also highlight issues and areas of sustainability that are overlooked in the UK."

James Parker, BSRIA's BREEAM manager and senior research engineer, will provide the technical input from

inside BSRIA, with support from Colin Pearson BSRIA's head of building performance. The BRE will also be represented at the network meetings and events. The Department for Communities and Local Government, which has responsibility for the *Code for Sustainable Homes* and the *Building Regulations*, is also keen on following the outputs of the network.

One of the immediate objectives of the network will be to look at the London Plan, which came into effect in July 2011. The Plan sets out a fully integrated economic, environmental, transport and social framework for the development of the capital to 2031. At one of the first events the network will assess how the Plan is likely to affect the environmental issues of new construction and refurbishment, and the schemes in place to measure it.

The network will also focus on emerging environmental assessment schemes. Ska is one of the newest environmental assessments for refurbishment, providing a focus on existing buildings and their adaptation to new technology and materials.

A greater understanding of the scheme is needed for both assessors and clients. One of the first tasks for the network will be to host an event to discuss the virtues of all the systems, highlighting the strong and weak points of each scheme.

More information about BEAN can be found at www.bsria.co.uk/services/membership/networks/building-assessment-network/, or contact Tracey Tilbry, BSRIA's networks and event manager at tracey.tilbry@bsria.co.uk or 01344 465512



Tick your way green

As international pressure grows to prove environmental credentials in the industry, **Irena Saniuk** draws a global map of the main environmental assessment methods



It all started with BREEAM – arguably the grandee of all building environmental assessment methods. The Building Research Establishment Environmental Assessment Method, to give it its original title, is celebrating its 21st birthday. In its teenage years many similar methodologies for rating building sustainability have popped up. What they all share in common is a delight in acronyms: LEED, DGNB and HQE to name but three.

At least 20 out of the 83 green building councils around the world have developed their own certification schemes. Countries that have not yet finished forming a nationally appropriate system have adapted one or more of the existing schemes. Many of these schemes have gone beyond the original concept laid down by BREEAM. Some have adopted product certification standards, such as the Green Building Product Certification Scheme (SGBC) launched by the Singapore Green Building Council in 2010.

Given that there is now a global mosaic of building environmental rating schemes, we need to know their features, their purpose, and the costs of using them. The main schemes are described below, with associated

schemes in use around the world shown in Figure 1. The figure also shows the LEED International Roundtable members and BREEAM/LEED certified buildings. The best place to start is with the grand progenitor: BREEAM.

BREEAM

Launched in 1990, BREEAM is used to assess buildings of any type. It's been a successful British export and is used all over the world.

Country-specific schemes have been launched in the Netherlands (BREEAM NL) and Spain (BREEAM ES). Schemes for Sweden and Norway (BREEAM SE and BREEAM NOR) are under development and will soon operate under licence from the operating company, BRE Global.

Around 200 000 certificates have been issued since the BREEAM scheme started. At least 633 buildings have been certified under the 2008 or newer versions of BREEAM, of which 73 are outside UK and the majority of those located in France.

The latest version for new construction, BREEAM 2011, is designed to keep pace with improvements in UK construction practice. For example, BREEAM 2011

At least 20 out of the 83 green building councils around the world have developed their own certification schemes IRENA SANIUK

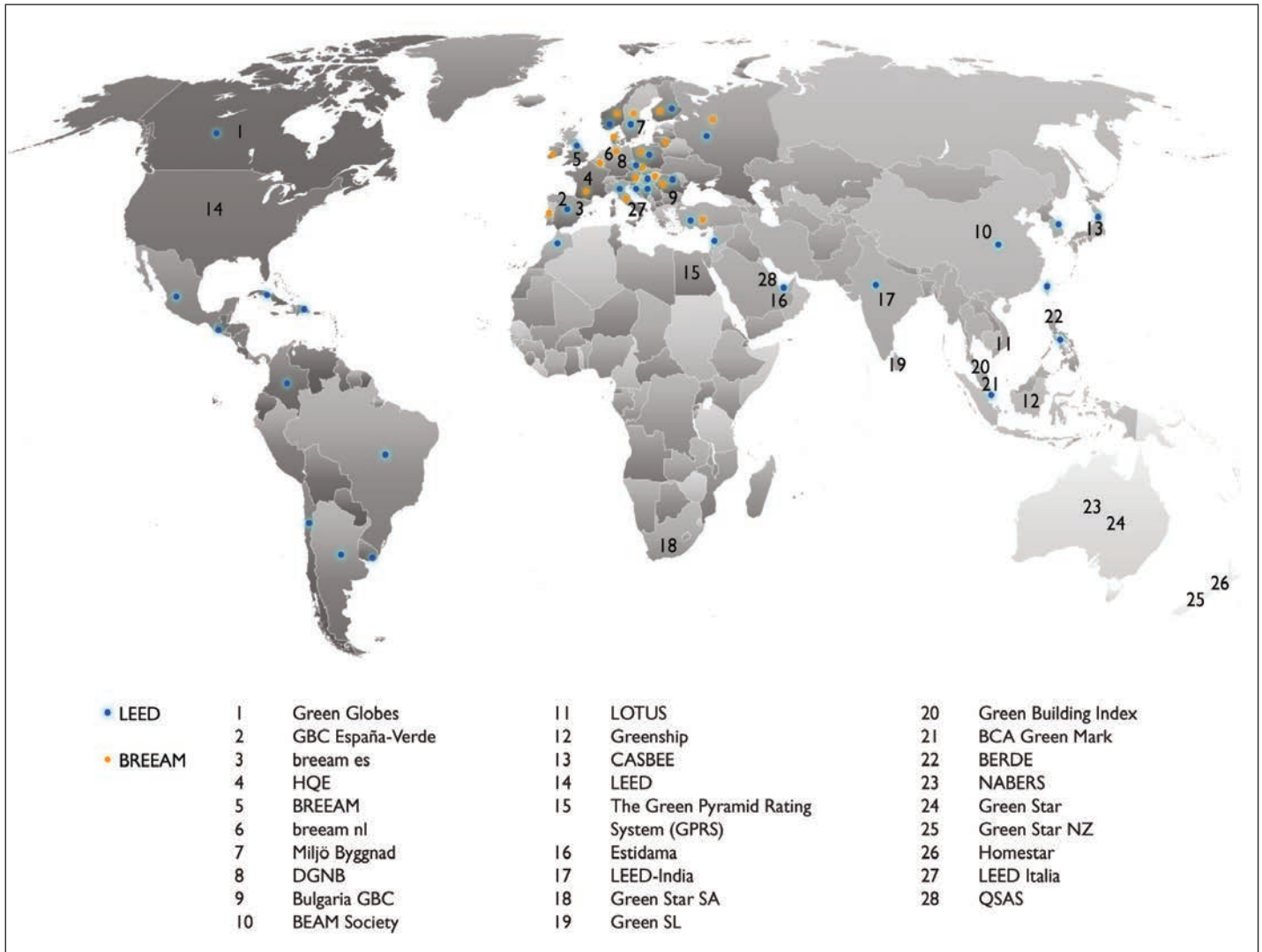


Figure 1: A global map of environmental schemes. For a larger version of this map, go to www.bsria.co.uk/goto/global-schemes.

tightens the targets for construction site waste. It also allows users to demonstrate compliance with sustainable procurement through the use of BSRIA's Soft Landings process, published as the *Soft Landings Framework*.

Certification fees for BREEAM vary from £1170 to £3650 depending on project type. BRE levies additional fees such as registration.

LEED

Leadership in Energy and Environmental Design is a green building certification system, developed by the US Green

Building Council in 1998.

Like BREEAM, LEED certification is available for all building types including new construction, existing buildings, shell and core, and fit-out. Interestingly, it also covers domestic dwellings, which, in the UK, is covered by the *Code for Sustainable Homes*.

The system has been successfully modified and adopted by many countries, including India, Canada, Italy and Brazil. In addition, more than 20 countries have also joined the LEED International Roundtable.

By March 2011, a total of 8579

LEED certificates have been issued worldwide. The certification fee varies from \$2250 to \$27 500 depending on a project's rating ambitions, size, and whether the applicant is a member of the US Green Buildings Council.

Green Star

Launched in 2002, Green Star is a rating system developed by the Green Building Council of Australia and modelled on BREEAM and LEED. Country-specific versions are also used in New Zealand and South Africa.

To date, 345 Green Star certificates



have been issued in Australia, with 92 within the last 12 months. The certification fee varies from AUD 8 000 to 33 000 depending on size of the project and membership of the Green Building Council of Australia.

DGNB

The DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen) certification system was developed in 2009 by the German Sustainable Building Council.

As with the other systems described here, the DGNB covers all the relevant issues of sustainable construction. DGNB is organised around six so-called qualities: ecology, economy, socio-cultural and functional issues, techniques, processes, and the site.

To date, 155 buildings have been certified or pre-certified using DGNB, including those located in Austria, Switzerland and Luxemburg. Some countries, such as Hungary, have developed their own rating based on DGNB. The certification fee varies from €1600 to €20 000. As with BREEAM, other fees such as registration may apply.

Estidama

Estidama was launched two years ago. It is the first assessment scheme specifically tailored to the Middle East.

Estidama is a building design tool to help developers construct and operate buildings and communities more sustainably. The scheme is a key part of Plan Abu Dhabi 2030, the drive to build the city of Abu Dhabi according to innovative green standards.

The scheme is not something that

people do, nor is it a green building rating system like the LEED or BREEAM schemes. Rather, it is a collection of ideals that are imposed in an elective building code format.

However, Estidama does use a green building rating process called the Pearl Rating System. This is used to evaluate sustainable building development practices in Abu Dhabi.

In terms of its present goals, Estidama is focused on the rapidly changing built environment. It is in this area that the Abu Dhabi Urban Planning Council (UPC) is making significant strides to influence projects under design, development or construction within Abu Dhabi.

Differences between schemes

The main difference between the various national assessment systems is the weight they give to different environmental categories. These naturally follow the main environmental and social issues for that region, which results in rating systems tailored to account for climate and local culture. Some systems also give credits for compliance with building regulations.

For example, Japan's Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) is more concerned about land use, while Estidama (sustainability in Arabic) was developed by the Abu Dhabi Urban Planning Council. Not surprisingly Estidama stresses the importance of water conservation.

In some of the systems a building has to score against all the criteria, so a client or designer cannot select the

assessment criteria. So if a building is weak in one category, it will be penalised for not earning a credit.

In some countries the assessment of a building cannot be separated from its local environment. For example, a building will be marked down on its sustainability if local health and educational systems are weak or non-existent.

The future

Most green ratings around the world tend to be voluntary systems. The unanswered question is how quickly they will become an essential aspect of all planning applications contributing to the sustainable development.

Irrespective of the timing, there is one other common trait of global rating systems: a trend for both the process and the assessment criteria to become progressively more demanding and more complicated. This leaves the construction industry worrying about the effect on building development, and, more importantly, what effect it might have on the environment and on building occupants.

For green rating schemes to have a future, construction industries and clients around the world need to be provided with tangible proof from the schemes' operators that increasingly demanding rating systems will actually make a positive difference, not add cost and complication.

Green certification must add value to all, not become a souvenir trinket from hell.

Irena Saniuk MSc is a BREEAM assessor with BSRIA.

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BSRIA



The scope of Ska

The sustainability of fit-out projects can be assessed using the Ska benchmarking and environmental assessment tool. **Sarah Birchall** explains how it works

The origin of Ska goes back to 2005, when the developer Skansen set up a research project with the Royal Institution of Chartered Surveyors (RICS) and consultant AECOM to measure the environmental effects of an office fit-out.

The RICS recognised that tools such as BREEAM/LEED are too large and complex for fit-out projects, and in any case only consider the characteristics of the base building. A system designed purely to assess retrofits led to the Ska method.

Ska, a simple abbreviation of Skansen, provides a means of assessing the refurbishment of existing buildings to ensure the retrofit is carried out in an environmentally considerate way. The process is different to that of other environmental assessment methods, such as BREEAM or LEED, as it solely focuses on the fit-out.

“We’re calling Ska a second generation environmental assessment method as we learnt from the previous generation of methodologies and changed some fundamental principles” said AECOM’s David Cheshire. “For example, the whole assessment is on-line from initial review through to obtaining the electronic certificate. It’s

free to access and use, with only a £50 fee for certification, and it can be started and completed very quickly and simply to match the short timescales of a fit-out project.”

One of the key features of Ska is its flexibility. The assessment topics depend on the nature of the retrofit, as opposed to a rating system where the categories are fixed, and where non-compliance with any particular criterion would automatically generate a negative score.

Ska therefore enables a design team to select the topics that are relevant and which they are able to influence through product selection or improvement of a process.

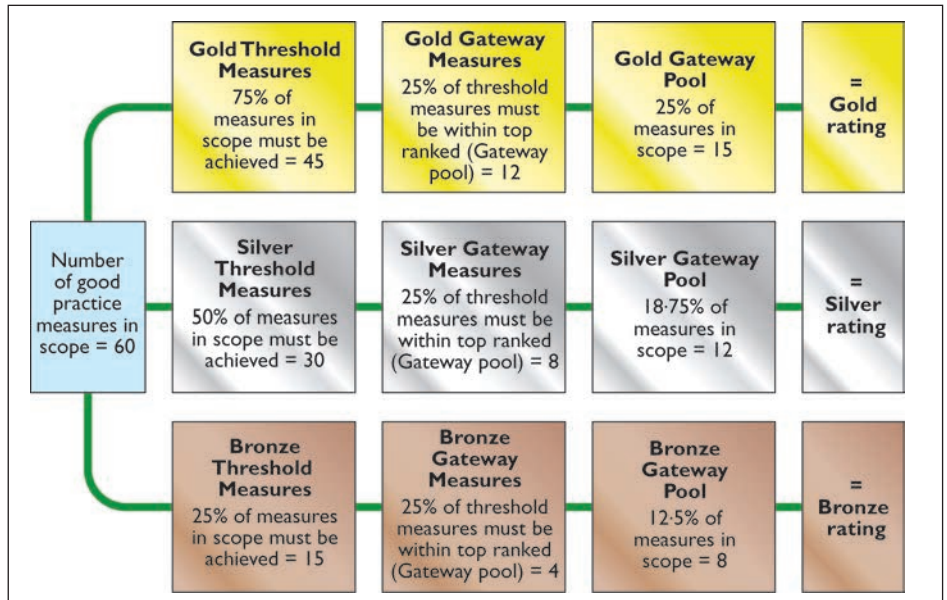
Ska was initially developed to specifically measure and compare the environmental performance of UK fit-outs. Recent developments have increased the scope of Ska, allowing it to be used for pilot projects of other building types and projects, and also outside of the UK. While this is restricted to informal assessments, future development will lead to certification.

Tailored versions of Ska are being planned. For example, Ska’s development team is developing Ska Retail to satisfy demand from the retail sector.



One of the key features of Ska is that it is a flexible system. The assessment topics depend on the nature of the retrofit **SARAH BIRCHALL**

Right: Example of how the scoring works in Ska. In this example project, analysis has identified that 60 good practice measures are in scope.



Ska’s inner workings

Ska has been designed with three assessment stages: design, handover and occupancy. Although assessment can be carried out on all stages, only the handover and occupancy stage assessments can be formally certified.

Introducing Ska early in a project is key to a sustainable fit-out. The design stage assessment is also important, as fit-out contractors cannot be expected to implement environmentally suitable solutions if these are not included as part of the design.

Ska covers 104 good practice measures. A good practice measure is defined as “a single element of the fit-out process that represents best practice from an environmental perspective.” The good practice measures are categorised into eight sustainability issues, including energy use and carbon dioxide emissions, water, waste, materials, pollution, well-being, transport, and other.

The first step in assessing a project is the scoping stage. The assessor will sit down with the design team and establish what the particular fit-out will involve. Only the elements identified will be included in the assessment. This flexible scoping also allows for changes throughout the project.

For the assessment to take place there must be at least 20 measures in scope. From experience the RICS has found that 50-60 good practice measures will be in scope for the average fit-out.

Ska ranks the environmental effect of each good practice measure

differently by giving each measure a ranking (from 1-104) relative to the other existing measures. A ranking of one has the largest environmental benefit, and a score of 104 the lowest benefit. Threshold measures are the number of good practice measures that have to be achieved for a particular target rating.

The system also uses a concept known as gateway measures. The gateway measures are aimed at ensuring that a high rating cannot be achieved without carrying out the most effective measures. It also prevents the teams from getting a good score by just targeting the easiest measures. This is designed to incentivise people to install things that will have the greatest benefit.

There are currently three rating thresholds that can be achieved: Bronze, Silver, and Gold. These are reached by achieving 25 per cent, 50 per cent and 75 per cent respectively. Anything less than 25 per cent will not be rated. An achieved rating will depend on:

- the number of measures that were in scope (threshold measures)
- the number of top-ranking measures achieved (the gateway measures).

To obtain a Gold Ska rating, 75 of

these must be achieved. In addition to this, any 12 out of the top 15 ranked measures (from the gateway pool) within the scope of the project must also be achieved for a Gold Ska rating to be awarded.

A rating can only be published after a formal assessment by a RICS accredited assessor.

Those who are familiar with other environmental assessment methods such as BREEAM and LEED will find Ska very familiar and intuitive. Each good practice measure has an individual data sheet including detail of the criteria, scoping, and detail to help judge whether a measure has been achieved and the rationale behind the measure and guidance.

Where next

As of May 2011 there were 1216 users of the Ska tool, 126 certified assessors, 193 assessment projects and eight certified assessments.

The RICS and AECOM have set up a training programme whereby assessors can be trained and accredited. This currently involves a two-day training course followed by an exam.

Sarah Birchall BEng is an accredited Ska assessor at BSRIA. More details are available at www.rics.org/ska

Recording sales

The UK security and video recording market is growing fast, with convergence between the communications technologies. **Jeremy Towler** and **Lone Hansen** report

The UK security market is mature in comparison with many other international markets. The latest BSRIA report on the world market for electronic security systems shows that the UK market for cctv, access control and intruder alarms was worth over £2 billion in 2010.

Despite the presence of many leading suppliers, the market is still highly fragmented, with many small, local companies. This means that for all its maturity, the UK security market has scope for both greater convergence of security systems and for more amalgamation of the companies that provide them.

CCTV and video surveillance

The UK is the most surveyed country in Europe with an estimated 4.25 million cctv cameras. Despite this, the low quality images delivered by the majority of the installed base of cameras means that only one crime is solved for every 1000 cameras. This is driving demand for technological improvement of all aspects of the systems.

The industry is moving towards digital and networked systems, developing cameras of greater resolution and developing common communication

protocols between different manufacturers' products.

The use of cctv ranges from simple scene monitoring to complex facial-recognition technology. It also covers remote video monitoring, video smoke detection, mobile systems, and automatic number plate recognition (ANPR). The last of these is certainly a growing market: in July 2011, the Hertfordshire town of Royston became the first UK town to install permanent automatic numberplate recognition cameras to record the registration numbers of all vehicles entering the town, with the data being held for two years on police servers.

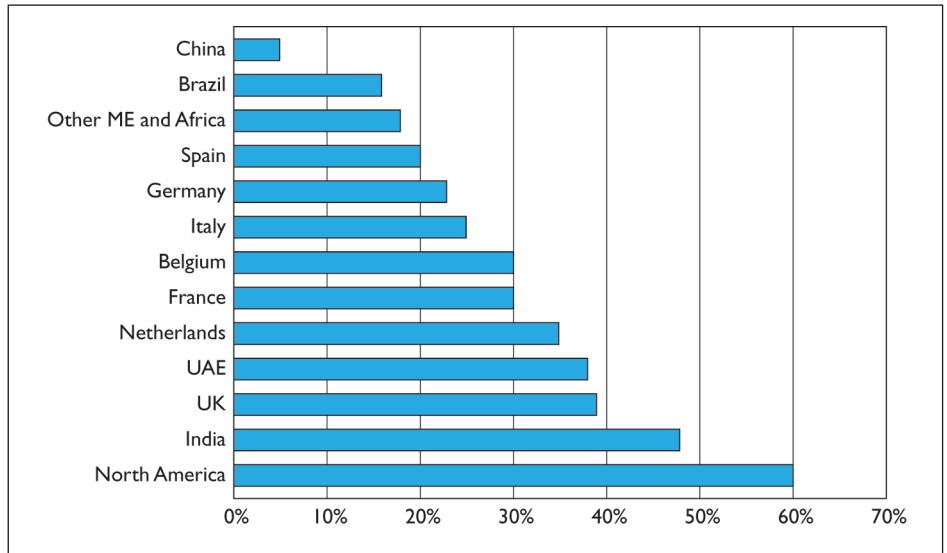
There is a growing trend for video analytic software which can be programmed to intelligently analyse and respond to a changing scene. Not only is the software being developed to create intelligent security systems, it is also being used to improve retail operations, such as queue monitoring, people counting, and measuring traffic patterns to drive sales and customer satisfaction. New, high definition (HDcctv) technology is also expected to accelerate in the next few years.

BSRIA expects the use of 360° panoramic cameras as well as thermal



The UK security market has scope for greater convergence, both in terms of security systems and also in the companies that provide them JEREMY TOWLER

Right: Share of CCTV products converged by value, 2010. Source: Lone Hansen, BSRIA



infrared cameras, based on heat sensitive sensors that can operate in complete darkness, to grow very strongly over the next few years.

There is a trend away from basic digital video recorders towards network video recorders, and hybrid recorders able to accept signals from digital cameras as well as the older, traditional analogue cameras.

The latest IP network-based systems continue to gain share, as they offer enhanced flexibility and versatility, as well as products that enable remote viewing and control of video data from one or more interfaces in different locations.

Access control

The use of smart cards is increasing in offices, education and health sectors. The list of applications is long: cashless vending, personal computer access, library systems and transport payment systems, biometric integration, printing and photocopying privileges, and time and attendance analysis.

There is growing interest in integrating security with building management systems to reduce energy costs. In education, key cards are being deployed to allow access to specific areas for selected periods, with the doors locking at pre-specified times.

Biometric readers ought to have a promising future. Despite having been available for several years, they have only enjoyed a small penetration in the market due to price and doubtful reliability. Although many technologies are available, fingerprint scanners are by

far the most popular choice.

Intruder alarms

The market for intruder alarm products continues to decline as more clients turn to cctv-based solutions. These deliver much of the same functionality as well as the visual evidence of crime incidents. Technological trends include the incorporation of multiple communications technologies and the use of dual sensors that combine more than one detecting technology.

The market for intruder alarms remains large, and supports a very substantial remote monitoring business which is not likely to disappear any time soon.

Wireless products

The penetration of wireless connected security products remains low. They are still considered by many to be insufficiently reliable due to latency in data transfer. In addition, they do not always fulfil data protection requirements.

Wireless systems are limited to the residential sector, and small offices where installation work needs to be avoided.

The future for integration

Integration is the adding of value by

THE NATURE OF CONVERGENCE

Convergence is where systems are linked on a single network, using a single communications protocol and a single user-interface. Other separate networks can be linked at a management level, but currently this is only being done at the control level. Data is capable of being transferred in both directions using the same technology or platform.

Convergence and integration of security is mostly happening between security products (such as cctv) with access controls and, to a lesser extent, intrusion. The uptake of convergence is highest in North America followed by India, UK, UAE and the Netherlands.

Worldwide, most specifiers prefer two separate networks, one for IT and one for the operational/facilities side of the business. However, an increasing number of buildings have just one network. Convergence on the IT infrastructure is mostly seen in North America, UAE, Brazil, India and the UK.

The number of standalone systems installed in the UK is high at between 70 – 80 per cent, with the exception of cctv where half the systems are converged or have some level of integration.

Right Sales of security systems in the UK 2010 by type. Source Lone Hansen, BSRIA.

	BMS	CCTV	Access control	Intrusion
Stand-alone	75%	50%	70%	80%
Integration only	3%	11%	12%	12%
Converged on BMS infrastructure	17%	4%	8%	4%
Converged on IT infrastructure	5%	35%	10%	4%
Convergence (total)	22%	39%	18%	8%

SECURITY FACTS AND FIGURES

Approximately half the security solutions installed in 2010 in the UK were on the IT infrastructure, writes Lone Hansen.

Security networked on the IT infrastructure is mostly prominent in offices, retail and education. Generally, the financial sector does not converge security on the IT infrastructure for security and up-time reasons.

UK sales of internet protocol (IP) products continues to increase, accounting for approximately half the sales of CCTV cameras in 2010. Nearly all new build projects opt for IP cameras, but analogue cameras are still installed in retrofit. However, retrofit solutions are often a hybrid of conventional and IP systems.

Uptake of IP is lower in building management systems, accounting for approximately 50 per cent of the products sold. Most recently cabled buildings are good enough to carry other services. BMS and lighting need very limited bandwidth.

Example projects 2010 – 2011

- Bristol university (designed early 2011. BMS and security)
- Westfield Stratford Shopping Centre
- Olympic station, swimming stadium and other buildings (mostly two networks all services)
- Co-op Manchester (retail)
- Hollow House, London (offices. BMS and CCTV)
- Shard, London Bridge (mixed use completion 2012. One network)

Lone Hansen is a market researcher at BSRIA covering world markets in IT cabling and associated technologies.

linking different building service applications, typically with bi-directional data exchange. Convergence is the bringing together of autonomous systems onto a common communication platform within the business enterprise, to create a single unified solution.

There is an increasing number of applications for integrating security applications. For example, with access control, CCTV can take a snapshot of people entering an area when their card is presented, while the intercom system can be activated to instruct cameras to record a vehicle at an entrance. The ANPR system can then automatically open a barrier to the authorised vehicle.

CCTV can be integrated with intruder alarm systems. Cameras can be set to a higher resolution when intruder alarms trigger, and send live footage or video clips to a mobile device.

HVAC and lighting systems can be activated only when a person assigned to that area enters the building, and turned off when areas are unoccupied for longer periods. Cameras with video analytics can count people and ramp up the HVAC based on occupancy. For lighting, occupancy can be verified before lights are turned on or off.

Fire alarms can be verified by sending a picture of a smoke detector in alarm and video showing whether there is an actual fire. Staff can then be alerted to the precise location of the fire on a graphical floor plan. Fire escape doors can be automatically controlled and occupants can be alerted to the location of the safe exits via voice alarms.

Power can also be isolated from vulnerable equipment, such as server rooms, to reduce the impact of damage

from sprinklers. An access control system can be used to generate a roll-call based on who is in the building.

The perceived security threat from crime, terrorist activity and internal fraud persists. There is also a need to manage and verify processes for regulation and insurance purposes.

The UK government is implementing greater border security. There is increasing demand for the protection of critical national infrastructure sites such as utility installations, government facilities, pipelines and transport hubs.

Continued urbanisation, the expansion of public transport networks and highly publicised security breaches are all driving security spending. This - and the technological innovation and integration of systems - can only drive up demand for skilled labour, and more sophisticated security systems.

Compared with the building automation industry, the security industry has been slow to implement standards, but this is now gaining momentum through global initiatives.

Two industry groups were formed in 2008: the Open Network Video Interface Forum (ONVIF) and the Physical Security Interoperability Alliance (PSIA). The PSIA was founded by 20 member companies including Honeywell, GE Security and Cisco, whereas the ONVIF was founded by Axis Communications, Bosch and Sony.

There is a high degree of alliance and acquisition activity which is expected to continue for quite a few years to come as the security market consolidates.

Jeremy Towler is BSRIA'S principal consultant for intelligent building controls.

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- Percentage convergence of security and other autonomous systems onto a common communication platform within the business enterprise to create a single unified solution

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¹ <https://infonet.bsria.co.uk/legislation-compliance/>

Click, and learn

BSRIA's extensive database of building services legislation is now available on-line. **Clare Sinclair** explains how Members can get access to it

The January 2011 issue of *Delta T* reported on the findings from a consultation exercise with Members on their information needs. BSRIA is now putting its plans into practice.

BSRIA's legislation and compliance resource¹ is an online database of acts and regulations related to building services. This has now been extended to cover compliance guidance. The resource is free of charge to BSRIA members (non-members can purchase an annual subscription).

Here's how it will work. For example, if you wanted to check your statutory obligations in relation to air conditioning systems:

1. Log into the Infonet <https://infonet.bsria.co.uk/> with your BSRIA member username and password
2. Type 'air conditioning' into the search box and click 'go' (you can limit your search to 'legislation and compliance')
3. Your search results may include library and bookshop items, as well as any statutory instruments and compliance information. However, you can just browse selected records of interest such as 'Acts'.

You can click through to relevant regulations, for example, *Energy Performance of Buildings (Certificates and Inspections)* plus amendments. This *Regulation* partly implements the *Energy*

Performance of Buildings Directive, and provides for the regular inspection of air-conditioning systems.

The compliance record for air-conditioning will inform you that air-conditioning system inspections are a statutory obligation to be carried out by accredited energy assessors.

Note that the OPSI and the Statute Law Database (SLD) have been replaced by www.legislation.gov.uk as the official source of newly enacted legislation in the UK – holding records from 1988 (with some exceptions). The Portcullis Archive Catalogue provides access to copies of original *Acts* from 1497.

Government departments can provide useful additional information. The Department for Communities and Local Government outlines revisions to the *Building Regulations*. The Planning Portal (www.planningportal.gov.uk) lists relevant *Approved Documents*.

This upgrade to BSRIA's on-line information resource should reduce the work needed to track down and keeping up to date with statutory obligations. For the immediate future, key updates will be included in BSRIA's monthly Information Centre e-newsletter. Email information@bsria.co.uk to join.

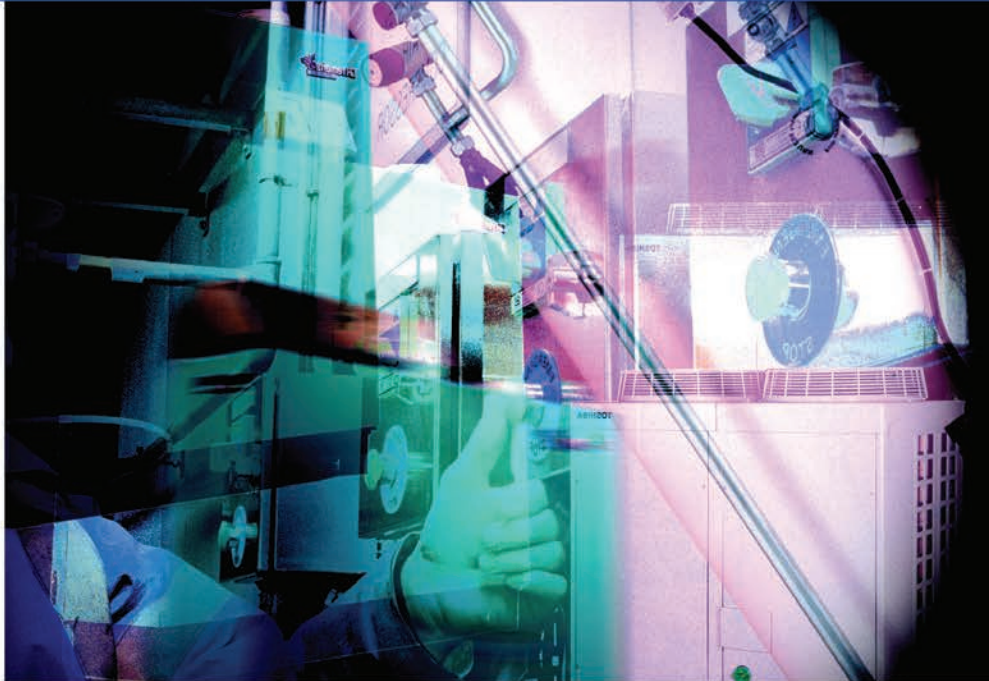
Clare Sinclair is BSRIA's information and knowledge manager. clare.sinclair@bsria.co.uk



BSRIA's legislation and compliance resource...has now been extended to cover compliance guidance

CLARE SINCLAIR

Technical Enquiry Service



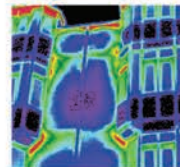
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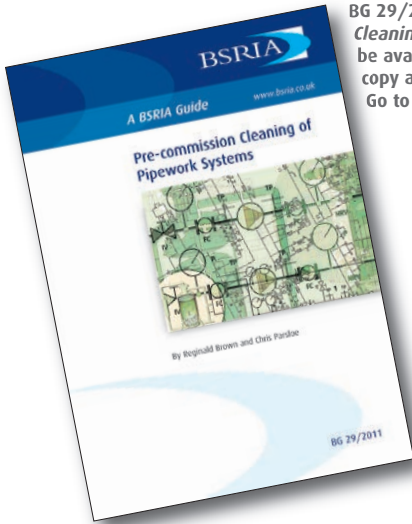
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BG 29/2011 *Pre-commission Cleaning of Pipework Systems* will be available from BSRIA in hard copy and PDF. Go to www.bsria.co.uk/bookshop

Perfect pipework

Pre-commission cleaning of pipework is a crucial part of system commissioning. Alex Goddard reports on the latest update to one of BSRIA's most important guides

A lot can change in seven years, especially in an industry where technologies and systems are in constant development. Although technologies evolve, the core principles often don't. With hydronic systems for example, a non-negotiable principle is: make sure pipework is clean before you hand it over.

AG 1/2001.1 *Pre-commissioning Cleaning of Pipework Systems* has provided the fundamental guidance on the subject since 2004. Enough has now changed for BSRIA to publish an update.

This new guide, *BG 29/2011 Pre-commission Cleaning of Pipework Systems* provides the latest thinking and good practice cleaning techniques. The update also incorporates industry feedback to ensure the guidance is relevant and practical.

The updated guide also clarifies the roles and responsibilities of the parties involved in the design and installation of hydronic systems. *BG 29/2011* also aims to improve the exchange of information between parties on a project in order to promote consistency between service offerings of the pre-commission cleaning contractors.

The guide specifically provides best practice for commissioning engineers and m&e contractors. That said, designers will also benefit from the guide in terms of things they should

consider to enable a pipework system is actually capable of being cleaned.

Design is covered early in the guide, which leads onto an expanded section covering inspection and witnessing. It also explores installation considerations and system dynamic flushing.

BG 29/2011 discusses the chemical cleaning procedures, and the relationship between new and existing pipework systems. The guide also carries updated figures and tables, and a glossary of terms to aid comprehension.

Thorough pre-commission cleaning of pipework has become even more important with the adoption of energy efficient controls strategies that may result in low flow rates, particularly in terminal units with very small orifices in control valves. The new guide also looks at the implications of efficient controls.

Note that additional guidance on the sampling and analysis of system water will be covered in a *British Standard* to be published later in 2011.

BG 29/2011 Pre-commission Cleaning of Pipework Systems will be available in October at £30 to BSRIA Members and £60 to non-members. BSRIA Members will also be able to download a free PDF from www.bsria.co.uk/bookshop.

Alex Goddard is BSRIA'S publications production assistant.



The updated guide clarifies the roles and responsibilities of parties involved in the design and installation of hydronic systems ALEX GODDARD

Time out

BSRIA TRAINING COURSES

For more information contact David Bleicher on 01344 465 589 or david.bleicher@bsria.co.uk

INTRODUCTION TO THE BUILDING REGULATIONS

05 OCTOBER 11

INTRODUCTION TO ELECTRICAL BUILDING SERVICES

06 OCTOBER 11

INTRODUCTION TO BUILDING OPERATION AND MAINTENANCE

11 OCTOBER 11

INTRODUCTION TO RENEWABLES

12 OCTOBER 11

HEAT PUMP DESIGN AND INTEGRATION

19 OCTOBER 11

UNDERSTANDING PART L AND PART F OF THE BUILDING REGULATIONS

20 OCTOBER 11

IMPROVING MANAGEMENT OF BUILDING SERVICES DESIGN

25 OCTOBER 11

PROJECT MANAGEMENT FOR BUILDING SERVICES

09 NOVEMBER 11

INTRODUCTION TO COMMISSIONING

22 NOVEMBER 11

PRE-COMMISSION CLEANING OF PIPEWORK

23 NOVEMBER 11

All training courses are located in our Bracknell offices unless stated otherwise.

BSRIA NETWORK EVENTS

For more information contact Tracey Tilbry on 01344 465 512 or tracey.tilbry@bsria.co.uk

ENERGY AND SUSTAINABILITY NETWORK

A WORLD SERIES OF GREEN BUILDINGS
23 SEPTEMBER 11, BRACKNELL

BSRIA will be supporting the UKGBC World Green Building Week 2011 at this event which includes a case study of the sustainability of the Olympic Park, and presentations from BSRIA.

BUILDING ENVIRONMENTAL ASSESSMENT NETWORK (BEAN)

25 OCTOBER 11, LONDON

Following the success of the first BEAN meeting held in July, Dave Cheshire of AECOM (Chairman of BEAN) will be hosting the next meeting at AECOM's offices in London. Further details regarding this event will be confirmed nearer to the date.

O&M BENCHMARKING NETWORK

MEASURING ENERGY

04 NOVEMBER 11, LONDON

This event celebrates 10 years of the network and will look ahead to the future of energy management. The event will report on how members of the network are saving energy and there will be a keynote presentation given by Mike Smith from BSRIA.

YOUNG ENGINEERS NETWORK

AN AUDIENCE WITH...

09 DECEMBER 11, LONDON

This network event is an opportunity for young engineers to hear from Chris Twinn, director at Arup, about his impressive career in multi-disciplinary building design.

MEMBERSHIP EVENTS & NEWS

BSRIA BRIEFING 2011

BUILDING ON OPPORTUNITY

18 NOVEMBER 11, THE BREWERY, LONDON



This year's Briefing is optimistic in outlook rather than echoing the gloom of recession. BSRIA will be highlighting opportunities, innovation and the value of collaborative working. We will be hearing how others have used the recent fallow time to optimise their position in order to be at the forefront of the industry's recovery and onward to more prosperous times. There will be presentations by manufacturers, architects, designers and engineers.

The Briefing creates an environment for delegates to challenge and debate ideas, share experiences and network with other professionals from the industry.

Confirmed speakers are Tristram Carfrae (principal and Arup fellow), Keith Clarke CBE (director of sustainability, Atkins), Paul Fletcher (co-founding director of Through Architecture), and Tom Paul (director of business development at Kingspan).

BSRIA welcomes the following new Member companies

AEDAS London
Baptist House
Cambridge Assessment
Cancer Research UK
Conex Universal Ltd
DMG Delta
E3 Consulting Engineers
Holloway Partnership
Mason Acoustics Co Ltd
Selanya Consulting Engineers
Telereal Trillium

For more information on the BSRIA Briefing or membership, contact Michael Doig on 01344 465 532 or membership@bsria.co.uk.

BSRIA – the built environment experts

BSRIA gives you confidence in design, added value in manufacture, competitive advantage in marketing, profitable construction, and efficient buildings

- Testing
- Modelling
- Research
- Consultancy
- Instrument hire, sales and calibration
- Troubleshooting
- Information
- Training
- Publications
- Market research and intelligence

Membership is the foundation of BSRIA's expertise and independence

Whatever your building services requirement contact BSRIA:

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