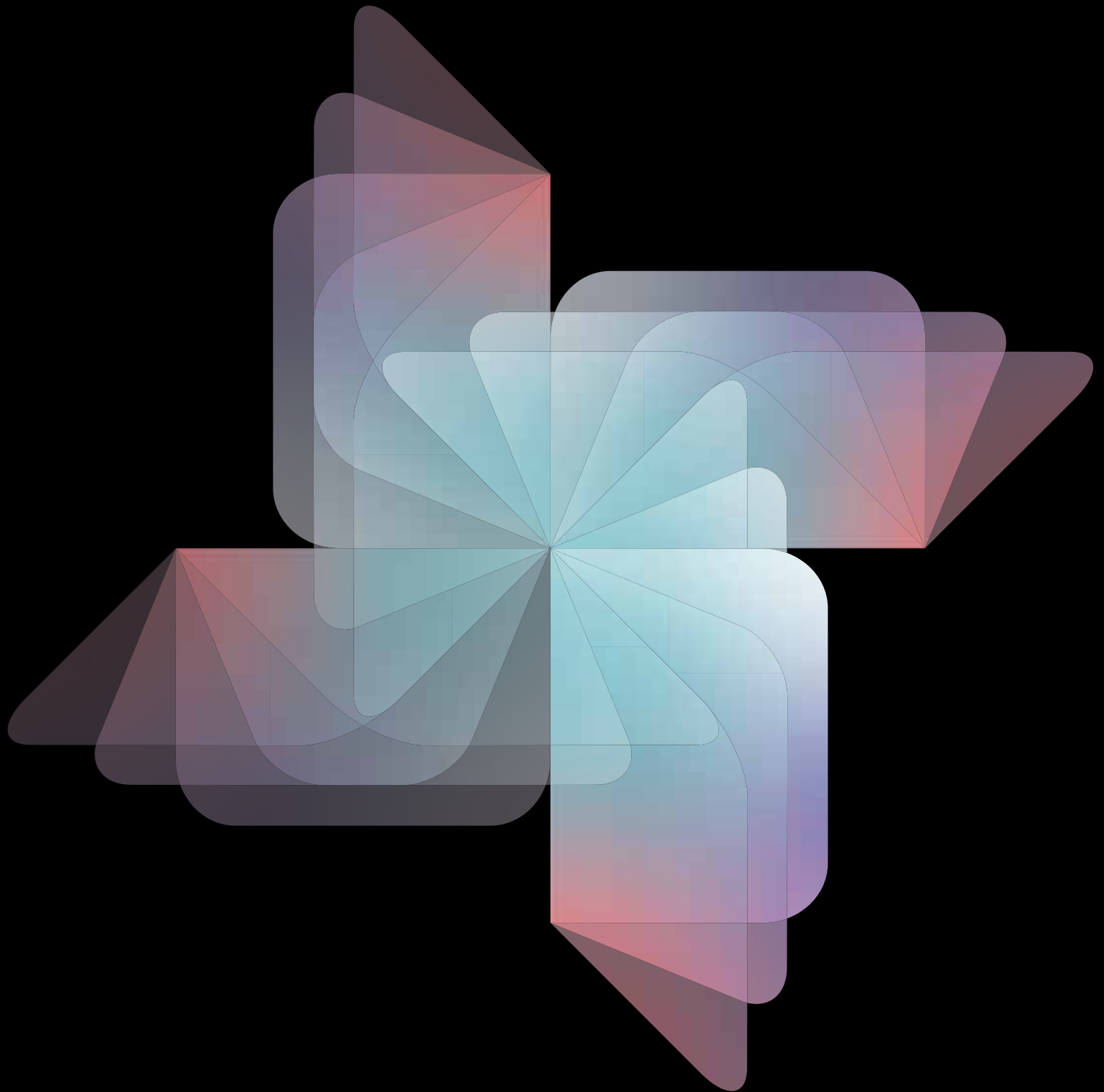


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# Sustainability Survey 2012



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“[Sustainability] is used to cover a multitude of different critical subjects, and it is clear from the survey that many struggle to adequately quantify its definition and scope. The consistency lies in the desire to do and be better”



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## Introduction

### Richard Waterhouse CEO, NBS and RIBA Enterprises

I am delighted to be able to introduce this first NBS survey on the issue of sustainability. This single word is used to cover a multitude of different critical subjects, and it is clear from the survey that many struggle to adequately quantify its definition and scope. The consistency lies in the desire to do and be better - to deliver improvements in the environment (ecological, social and economic) and to make effective use of the resources we have.

The UK Government's commitment to Low Carbon Construction will provide some leadership in this area. The welcome improvements in energy efficiency in the Building Regulations continue to raise the performance bar. Unfortunately, many see achieving Building Regulations approval as the target rather than the minimum requirement. There are more credible steps to increasing sustainable standards and, on the whole, the industry believes that it has appropriate knowledge of the issue and that multiple sources of knowledge and information are easily available.

The Building Regulations improvements are mainly limited to new build and major refurbishment. Hopefully the development of the Green Deal (and other future initiatives) will provide similar improvements for existing building stock. The focus on existing stock is likely to lead to a change in the way we conceive new building projects. As we improve the 'operating carbon' of our buildings, so the 'embodied carbon' in the building materials and processes becomes more of an issue. In the future, we might find that lower carbon design means reworking existing building rather than demolishing to make way for new. However, the report shows that desire to reduce carbon is not enough - the economics must work too. With VAT applied to rework, demolition in many projects is a lower cost but higher carbon option.

It is not surprising to find that challenges remain in achieving sustainability in design and construction. At present, our sustainable objectives must, in my opinion, take second place to economic considerations. However, design and performance requirements are being recognised as adding to the success of a building, both commercially and environmentally. There is also strong support for using various sustainability criteria to judge what makes a good building and the awards that might follow - substance rather than beauty!

So, the report finds progress. Awareness of the issue is in place. Standards are available and many know how to make improvements and achieve them in project delivery. Still, there is much to do if we are to achieve our 2050 emissions targets. Future NBS surveys will chart that progress and we will continue to enhance our knowledge provision to support the industry along the way.

# Getting sustainability embedded into practice

Lynne Sullivan OBE  
Co-founder,  
sustainableBYdesign



In 2013 architects face uncertainty in volumes of work, but steadily increasing demand for more sustainability in outcomes, i.e. built environment projects that deliver economic and social value, and minimise environmental impacts.

The UK Coalition Government reiterated in 2012 that the background to a number of policy initiatives affecting sustainability in the built environment is the Government's Carbon Plan published in 2011, which highlights the crucial role of energy efficiency in meeting the 80% greenhouse gas emissions reduction target for 2050. In the 30 years between 1980 and 2010, whilst UK GDP has doubled, final energy use in the UK has remained broadly at the same level (with domestic space heating and hot water use being responsible for some 25% of the energy total), but to meet 2050 targets it is generally accepted that for buildings we need to halve the demand, double the efficiency and halve the carbon in the fuel supply.

For architects, reducing energy demand in both new and retrofit projects will be a key requirement for sustainability in buildings, but we will also need to design other complementary strategies to achieve sustainability in a holistic sense. In the domestic market, the consumer desire to save money, reflecting concerns about spiralling energy costs and insecurity in the

job market, is driving increased interest in energy efficient homes, but also there is now a substantial body of research demonstrating that corporate clients recognise the value of 'green' buildings. This is because they have been shown to add value in rental returns and valuations, and in 'brand association'.

Architects looking to skill up for sustainable outcomes for their projects can be reassured that the market for low carbon goods and services is set to grow, and that the synthesis of environmental, social and economic requirements for buildings in the design and delivery of projects is our natural territory. Providing knowledge and skills for sustainability is a way of future-proofing our business, and sustainable outcomes are set to be an increasing requirement through planning, building regulations, and through voluntary benchmarking systems such as BREEAM, and LEED.

Taking steps to provide leadership within the practice, and making a commitment to understand and benchmark business impacts as well as project impacts, are important first steps. Beyond that, practices need to consider how day-to-day activities within the practice can be geared to more sustainable outcomes - for example, knowledge management and

## Lynne Sullivan

Lynne Sullivan is a practising Architect and Partner of sustainableBYdesign, an architecture and design practice who were finalists in all three 2010-2012 BRE national Passivhaus Housing Competitions and who specialise in low-energy new and retrofit projects in a range of sectors. The practice was born from the design arm of Inbuilt which Lynne joined as Design Director in 2008. Previously she was Sustainability Director for 9 years at Broadway Malyan, and for 10 years Associate Director at ECD Architects, where she was winner of the UK's first government-sponsored Zero CO<sub>2</sub> housing competition with co-author Nigel Craddock. Lynne is a member of local and national design review panels and part of the multidisciplinary thinktank 'The Edge'.

As a Member of the Government's Building Regulations Advisory Committee, Lynne has chaired the review of Parts L and F since 2008, and has authored and chairs a number of research projects for the Zero Carbon Hub and others. She also chaired the Expert Panel for the Scottish Government whose report "A Low Carbon Building Standards Strategy for Scotland" was published in 2007. She was awarded an OBE for services to Architecture in 2011, and is a member of the Government's Green Construction Board.

### Relevant survey statistics →

This widespread, though partial, achievement of sustainability is complemented by a company level commitment to sustainability. Three quarters of respondents come from companies that have a sustainability policy.

practice CPD and training programmes can be geared to distinct relevant themes. In the recent RIBA Guide to Sustainability in Practice 2012 which I authored, we suggest grouping knowledge resources/CPD under eight simple headings: Climate Change, Resources, Transport, Ecology, Business, Community, Placemaking and Buildings. 'Resources' would include Energy, Water, Materials and under each of these themes there is a potential wealth of knowledge and information which could be of practical use in the daily work of specifying and detailing, which could have a profound impact on eventual operational energy use, embodied energy, limitation and management of waste and water.

Supporting individuals in the practice who have some specialist knowledge or software proficiency in these areas, and encouraging those who wish to develop it, is important for a changing ethos, and using office visits, staff reviews and CPD/discussion sessions helps encourage change as part of a collaborative process.

To move in a more sustainable direction, the practice either needs a sustainable project or makes the choice to upskill sufficiently to differentiate itself in the market with its ability to deliver one. If the practice has one client who demands exemplary sustainability on a project, then this can be used to cascade knowledge in the practice, to forge alliances and develop relationships with other project team members who bring specialist knowledge, e.g. environmental engineers/ecologists/BREEAM consultants. In this way, feedback and lessons learned can inform skills investment and resource planning. To upskill, a practice needs to understand what can help them design sustainably, and the 'Green Overlay to the RIBA Outline Plan of Work' provides a number of valuable prompts. From the earliest stages of design, considering the impact of massing, orientation, glazing percentage, fabric specification, ventilation, daylight levels and renewable energy strategies can make a big impact on building energy consumption, and this requires knowledge, skill and, ideally, integrated software tools. There exist some excellent standalone packages, and increasingly it is possible to integrate environmental design studies with BIM-platform software. This allows architects to test their concepts against stretched environmental targets and building performance outcomes before any design 'fixes', and also to have a more informed dialogue with the project engineers.

“In the 30 years between 1980 and 2010, whilst UK GDP has doubled, final energy use in the UK has remained broadly at the same level... to meet 2050 targets it is generally accepted that for buildings we need to halve the demand, double the efficiency and halve the carbon in the fuel supply.”

Real performance of buildings (and their occupants!) is an area of increasing interest since EU legislation demanded that certain classes of public buildings publicly display their actual energy use in the form of a 'Display Energy Certificate' (DEC), implemented in 2008 in the UK. Previous pioneering work in the mid 1990s for the ECON 19 Energy Consumption Guides had identified benchmarks of real energy consumption for different office types, and surveys of real buildings showed the wide variations between designed energy performance and actual. Over the last few years, a growing number of property managers and landlords have committed to monitoring real versus designed energy performance, and the RIBA have supported the development of an anonymised database (Carbon Buzz) to highlight the 'performance gap' and produce valuable data. Whilst some element of the 'gap' is attributable to the way people use buildings, it has been shown that design and design tools can contribute to the shortfall in performance, and architects can expect increasing scrutiny from clients in this area. One way for architects to minimise their possible contribution to the performance gap is to develop a better understanding of the real performance of their building projects, therefore encouraging clients to invest in monitoring and feedback programmes (even where they do not wish information to be made public) is an important step to addressing and learning from the consequences of the whole life performance of their designs. ●

# High fabric energy efficiency is a priority, not an indulgence

Sofie Pelsmakers  
Co-founder,  
Architecture for Change



Sofie Pelsmakers

Sofie Pelsmakers is a chartered architect and environmental designer with more than a decade of hands-on experience designing, building and teaching sustainable architecture. She taught sustainability and environmental design and led a Masters programme in sustainable design at the University of East London.

She is co-founder of Architecture for Change, a not-for-profit environmental building organisation and is author of 'The Environmental Design Pocketbook' (RIBA Publishing, 2012), which synthesises her practical and academic expertise to support the building industry towards a significant change in its design and building practices. It received commendation for the RIBA's 2012 President's Awards for Outstanding Practice Based Research. She has just completed an MRes in Energy Demand studies at the UCL Energy Institute, where she is also currently a doctoral researcher in building energy demand reduction.

The NBS survey highlights that despite environmental sustainability being clearly on the architectural and construction industry's agenda, operational energy is not the highest priority and was ranked fifth after health risks, water, air pollution and waste.

This ranking is surprising, particularly given that energy bills for building owners and occupants keep rising and are projected to keep rising for the foreseeable future. Every year it is more expensive to keep the lights on and heat or cool our spaces. Additionally, health, which is considered the most important issue by respondents, and operational energy are interlinked: high fabric standards undeniably safeguard occupant health, while reducing energy demand and operational carbon. This is because fabric energy efficiency, combined with careful material specifications to avoid unhealthy finishes, provides occupants with greater thermal comfort now and in a changing climate, buffering occupants from rising energy prices, fuel poverty and associated health risks.

In fact, if the industry fully understood the interconnection between health and operational carbon, one would expect low-energy buildings to be mainstream, though this is not the case. But let's take a closer look at why this may be, what operational carbon means, why it is not considered a priority and why it should be.

## What does operational carbon mean?

'Operational carbon' means the CO<sub>2</sub> emissions associated with the energy needed to light, ventilate, heat and cool a building. Confusingly, this means different things to different people, therefore different levels of priority are attached to it.

For example, if you were to ask environmental architects and engineers how to reduce operational carbon, they will prioritise energy efficiency and passive measures such as passive solar gain, super-insulation, natural ventilation and daylighting. Many other professionals, alongside occupants, clients and developers on the other hand would prioritise highly visible, active low carbon systems as they look 'green'. This latter view has historically been supported by statutory obligations and government grants and incentives, unlike increased insulation or airtightness, for which there are no grants or 'feed-in tariffs'. This has led to a misplaced focus of the role of on-site energy supply, leading to some inappropriate strategies in buildings where money is diverted away from increased fabric

standards to enable active 'bolt-on' systems, while the former would have led to greater CO<sub>2</sub> reductions and occupant protection.

A common and prevailing example among the industry, and often demanded by planning authorities, is the specification of a CHP (Combined Heat and Power) plant to provide a percentage of on-site energy production. Unfortunately, in most cases, this is entirely unsuitable and in fact may not reduce carbon emissions at all. For instance, CHP is unsuitable in well-insulated dwellings due to lack of a continuous heating demand to achieve optimum CHP operational efficiencies. Perversely, a higher heat demand is required to make the CHP plant more viable, so there is a direct conflict with specification of a CHP plant and highly efficient buildings. Yet the latter is the most robust strategy for sustainable building in terms of occupant protection and climate change mitigation and adaptation.

## A mistaken industry view of operational carbon

A large part of industry has mistakenly come to view that operational carbon = priority of on-site renewable energy provision. Many believe that building energy efficiency is unimportant once renewables are deployed. The theory goes that, "if the energy is clean and renewable or low carbon, it doesn't matter how much of it is used". But this is a flawed assumption, because:

- A building's lifespan is usually 60 years or more and most of the building fabric will continue to perform for the building's entire lifespan, while providing occupants with continued thermal comfort and reduced carbon and fuel costs.
- Most active renewable energy systems have a lifespan of around 15-25 years. So if the fabric specification is neglected in favour of 'green' technologies, the eventual failure of the active systems will immediately increase the building's CO<sub>2</sub> footprint, jeopardise occupant thermal comfort and increase fuel bills. At present there is no regulation which requires or guarantees the replacement of renewable energy technology if it stops working or if it is never commissioned.
- The embodied energy of renewables should not be neglected because the greater the energy need, the greater the renewable energy array required, so even 'clean' energy should not be wasted.

### Relevant survey statistics →

We wanted to find out which aspects of sustainability were the most important. Carbon (whether operational or embodied) did not head the list. Instead came concerns such as health, waste, water use and pollution.

Despite these issues, when many people think of sustainability and ‘operational carbon’, they think of on-site renewable energy systems. Nevertheless, the reasons above show that renewable energy supply should only be considered once the building’s fabric efficiency has been optimised. Fabric energy efficiency immediately reduces reliance on (fossil) fuels and it is much easier to meet the remaining energy requirements with renewable energy supply, whether provided on- or off-site. We clearly need a culture where terms such as ‘operational carbon’ and ‘operational energy’ convey an image of energy use, of fabric energy efficiency and of energy demand reduction rather than of energy production using low-carbon or renewable energy systems.

### Why is fabric efficiency currently not considered a priority in industry, and why should it be?

Despite compelling evidence that fabric efficiency is ‘the first renewable’ to consider on any project, this somehow has not filtered through to mainstream practice and industry. The importance of fabric energy efficiency does not just apply to new buildings: the UK has one of Europe’s oldest and worst performing building stocks. Fabric improvements are crucial and could give architects access to a billion pound, 26 million building retrofit market. Around 40-50% carbon reductions can be achieved in most buildings simply by upgrading them to high fabric standards. Yet the industry as a whole has been slow to respond. The role of statutory obligations has already been touched on, but there may be more reasons why fabric efficiency is not (yet) a priority:

**1** Assessment methods such as LEED, BREEAM and Code for Sustainable Homes are useful tools to help the client and design team set aspirations and targets, but their box-ticking nature often blurs priorities. Assessment tools actually tend to be heavily weighted towards fabric efficiency. This is often forgotten because fabric efficiency is just one of many sustainability categories, giving the impression it is of equal or lesser importance than all the other categories such as air pollution, water use and waste. While these are important issues to consider, they are by no means as important as fabric performance in the majority of projects. Sometimes there can also be conflicting demands: for example rainwater harvesting and grey water recycling are high in embodied carbon and also often energy-intensive

to run, leading to increased energy use and bills for only a small gain in water saving. Resources are usually better spent on water-efficient appliances and increased fabric efficiencies, even if fewer credits are awarded. Paradoxically, assessment methods often discourage strategies which do not reward (further) credits.

**2** An integrated and interdisciplinary way of working from the earliest design stages would be beneficial. The modeling of fabric performance and operational energy is usually undertaken by other consultants, often not appointed until much later in the design process. This removes the architect from the direct experience of testing different fabric efficiency strategies and gaining a deeper understanding of their relative advantages. This separation of environmental design and modeling should never be divorced from the actual building design, because it is often too late to make major changes once environmental modeling is undertaken at later stages. For instance, if carbon reduction obligations are not met, it is often easier to ‘add-on’ active carbon reduction measures than change wall depths to accommodate increased insulation.

**3** There is a decoupling between the people who benefit from high fabric efficiencies and those paying for it, who are often not the same parties. Clients and developers may be reluctant to invest in increased fabric efficiency, and they may even favour active measures ‘to be seen to be green’. But this is a short term view as buildings will become a future liability in terms of running costs and may require future upgrades. Optimizing fabric standards avoids future costly and disruptive upgrades, while also ensuring continued operational carbon reductions over the building’s lifespan.

**4** There is the misconception that super-insulation causes overheating, when it actually protects buildings from overheating. Building

overheating is not caused by super-insulation but by bad window design: failure to provide appropriate summer solar shading to transparent building elements, combined with inadequate and insecure ventilation openings in windows, are common causes of summer overheating in well-insulated buildings.

**5** Building regulations are not ‘good practice’, but the absolute minimum standards buildings have to meet. Moreover, due to a host of reasons, such as disparity between models and actual performance, on-site workmanship and occupancy behaviour, many buildings do not meet their design standards once built and occupied. Therefore, aiming to much higher standards than building regulations is key to ensuring a sustainable building legacy and protecting occupants. This also highlights the importance of building performance and post-occupancy evaluation through, for example, the Soft Landings framework.

**6** And lastly, let’s be honest: insulation is just not sexy. Most designers do not get excited about increased airtightness or deeper wall constructions to provide more insulation. Yet, there is potential for using this context as a generator of environmental design and good architecture: we can use more innovative construction techniques to reduce wall depth and achieve increased airtightness. We can also celebrate increased wall depths with interesting window reveals and window placement.

It is clear that building fabric energy efficiency is a necessity and not an optional indulgence. It safeguards occupants’ health and makes good business sense for all parties involved. In fact, all good architecture should also be sustainable architecture, with inherent high fabric standards. We know how to do it and I believe the time is right for the building industry to step up to the challenge of prioritising building fabric standards. ●

“‘Operational carbon’ means the CO<sub>2</sub> emissions associated with the energy needed to light, ventilate, heat and cool a building. Confusingly, this means different things to different people, therefore different levels of priority are attached to it.”

# Sustainability Survey 2012

Adrian Malleson  
Research and Analysis Manager,  
NBS



## Introduction

At NBS, we are continuing our series of research projects into some of the most important topics for the construction industry. Extending our work on BIM, Contracts and Law and Specification, this is our first research project into Sustainability. We hope you find it informative and that it furthers the sustainability debate.

For many years, sustainability has been established as a guiding concept for both the construction industry and government policy. That said, its implementation has been less consistent. Government policy has varied with different administrations and in varying economic climates. Public opinion remains divided (a recent Guardian IBM poll suggested that only 57% of the UK population believe climate change is both real and man-made). In this social and political context, it has fallen to the construction industry perhaps as much as the energy industry to make the real improvements that the UK needs to be both sustainable and an example of sustainability for the rest of the world.

“For many years, sustainability has been established as a guiding concept for both the construction industry and government policy. That said, its implementation has been less consistent.”

So, it makes perfect sense to get a deeper understanding of the beliefs and attitudes of those in the construction industry towards sustainability. Our broad survey into sustainability and the construction industry ran from August to September 2012. The survey targeted a range of design professionals as well as clients and contractors, and this report provides details of their answers. Before we go into the detail, though, we'd like to point out that the responses demonstrated a conviction that, by working together, all parties in the construction industry can significantly contribute to the changes in practice that our shared commitment to sustainability requires.

The survey brought a number of themes to the fore. We found that:

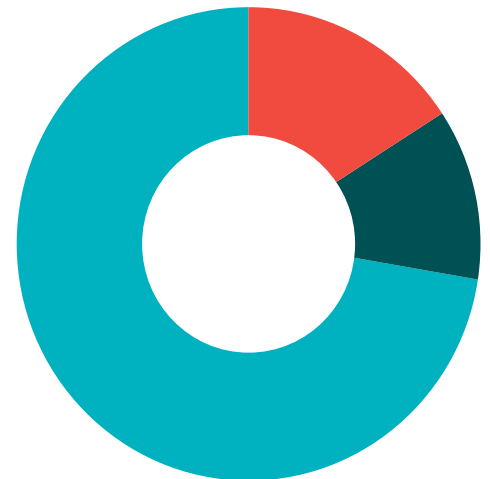
- There is a shared understanding of what sustainability is but a divergence in emphasis when defining and describing sustainability.
- Most people feel that they are achieving sustainability on their projects at least some of the time.
- There are real barriers to achieving sustainability, notably the current economic environment. Achieving sustainability is often seen as an additional, unwanted cost by those procuring buildings.
- Good and reliable information is available. Almost half of the respondents described themselves as 'confident' in issues of sustainable design and only 15% said that they are not confident. However, ongoing education and development in sustainability is important for all and especially, the research suggests, for clients.

This report provides the detail behind these, and other, findings. We hope you enjoy reading it.

## Respondents

We are very grateful to those who took the time to complete the questionnaire and to those who publicised it. As ever, we acknowledge that without people giving up their time to respond to the survey, there would be no findings and no report: thank you.

We received around five hundred responses to the survey. Consultants provided 72% of the responses, contractors 16% and clients 12%.



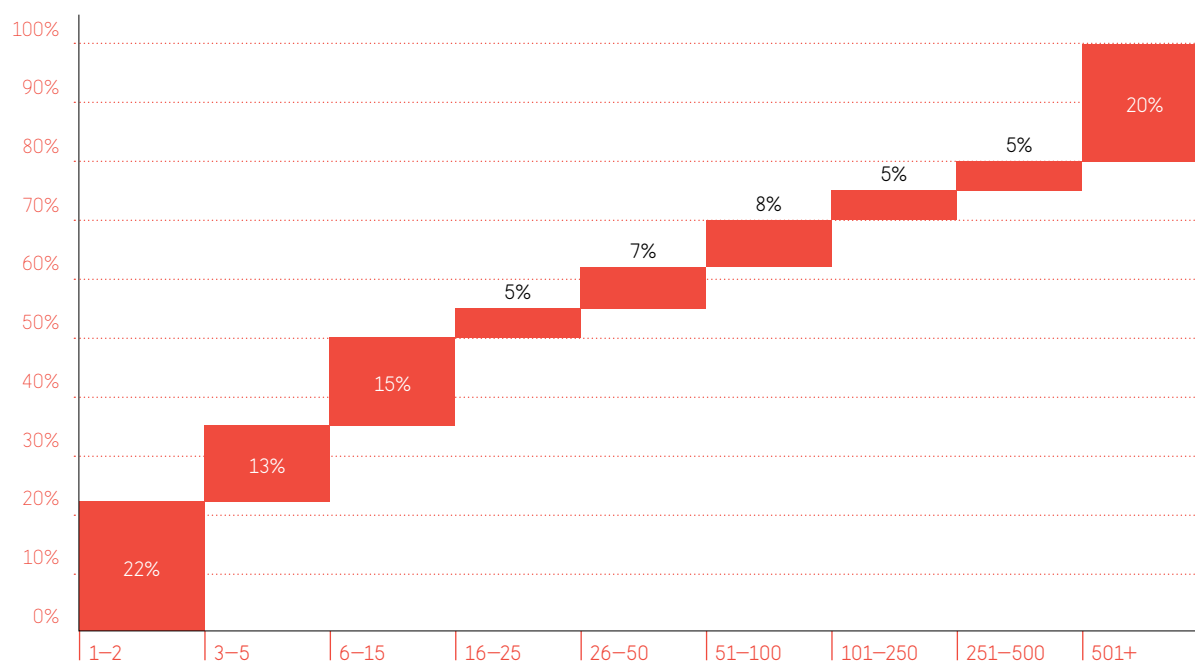
Overall, would you describe your company as being...?

Contractor	16%
Client	12%
Consultant (e.g. architect)	72%

There was also a range of business sizes. Around half worked in businesses with 15 or fewer employees, whilst just over a fifth worked for those with more than 500 employees. Getting this range of businesses is important because it allows us to have a representative sample of responses from across the UK.



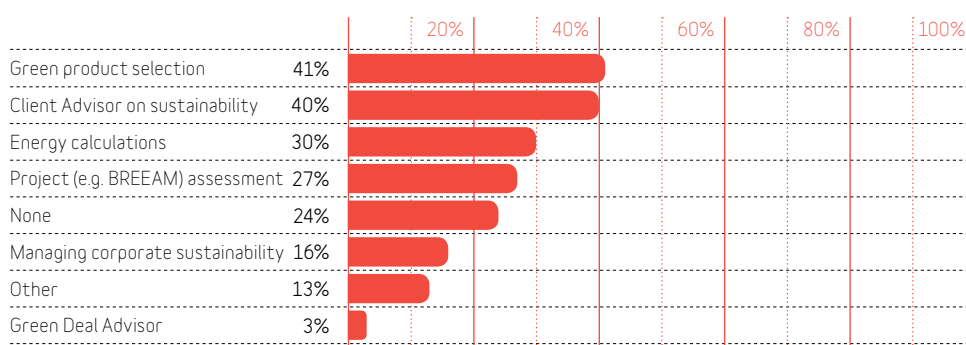
Including yourself, approximately how many people are employed in your organisation?



### The roles and qualifications of respondents

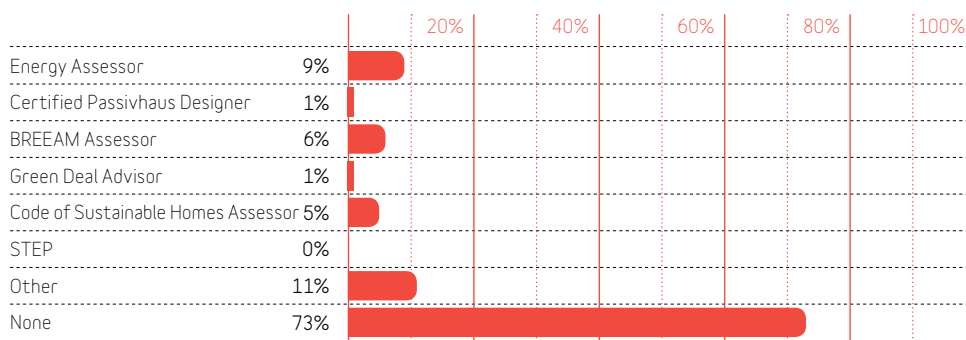
The people who took part in the research told us about the roles that they personally carry out. Over 40% were involved in the selection of green products and a similar number advised clients on sustainability. Nearly a third were involved in the challenging area of energy calculations and just over a quarter were involved in project assessment. On the other hand, almost a quarter had no professional role to play in sustainability.

When it comes to sustainability, what roles do you carry out?



However, we didn't find that the roles people were carrying out were matched by their qualifications. There may be a number of reasons for this. CPD is very often used as a way of keeping up-to-date with issues associated with sustainability so perhaps the knowledge required to design and build sustainably is gained outside of formal qualifications. Indeed, 'Climate - sustainable architecture' is one of the mandatory topics in the RIBA Core curriculum. Perhaps, therefore, we should think of knowledge of sustainability less as a separate qualification, and more as an integral part of being a construction professional.

What qualifications do you have in sustainability?



**Views on sustainability**

People define ‘sustainability’ in different ways and we wanted to find out what people mean when they refer to it. Therefore, we asked people to tell us, in their own words, how they define sustainability. The definitions people gave varied widely, but common themes did emerge. Sustainability was widely understood to be about safeguarding the future:

“Saving the planet for future generations.”

“Balancing the needs of today with the ability to maintain the environment for tomorrow.”

“Managing resources responsibly so that the earth can continue to support human life.”

People strongly associated safeguarding the future with minimising the use of non-renewable resources, particularly energy:

“Reduce the environmental impact and use of finite resources.”

“Less raw material usage, less energy consumption.”

Complemented by the use of recycled or renewable materials:

“To live within the resources we have through reuse, recycling and renewable materials and energy.”

Several people also mentioned the importance of localism and economic sustainability:

“I am more in favour of economic sustainability, for example employing local companies who source materials locally, cutting down on the carbon footprint of a building project, and also maintaining local employment levels.”

Many of the definitions provided gave specific details about sustainable construction:

“It is about delivering as much in the capital stage of the building’s life so as to reduce the material, emissions and revenue impacts during the remainder of the building’s life.”

“In architecture and building, to assess sustainability I think it involves considering the whole life impact of the project from inception to final demolition, or part demolition, and materials recycling.”

And several people mentioned the importance of sustainability in refurbishment rather than new build. Given the age of the UK’s building stock and its slow rate of renewal, there was a feeling that too much emphasis is given to sustainability and new build:

“We have a huge existing building stock. New is easy when it comes to sustainability.”

“Refurbishment of existing building stock is the ultimate in recycling as the original fabric of a structure is retained.”

Some people’s responses were tinged with scepticism based on experience:

“I know what sustainability should mean but in my experience, it has become a box ticking exercise.”

“Clients don’t care about sustainability, they want cheap buildings.”

But it’s fair to say that this scepticism didn’t, in general, mean that people had given up on sustainability: more that they felt others should take it more seriously.

After this, we went on to ask about sustainability as defined by the ‘triple bottom line’: economic, social and environmental sustainability. This is a well accepted definition and we wanted to know whether people saw these elements as important. We found a strong degree of shared understanding here: the clear majority agree on the importance of all three of these to their projects.

For both economic and environmental sustainability, 88% of participants told us that these aspects were either very important or important to the projects that they work on. Whilst there are fewer people who describe social sustainability as important (whether ‘very important’ or ‘important’), a clear majority still do, therefore we can see that those in the construction industry have a broad understanding of sustainability. Generally speaking, members of the construction industry agree that sustainability can’t be defined as (or brought about by) reducing energy use or carbon emission alone (though, of course, these things play a significant part).

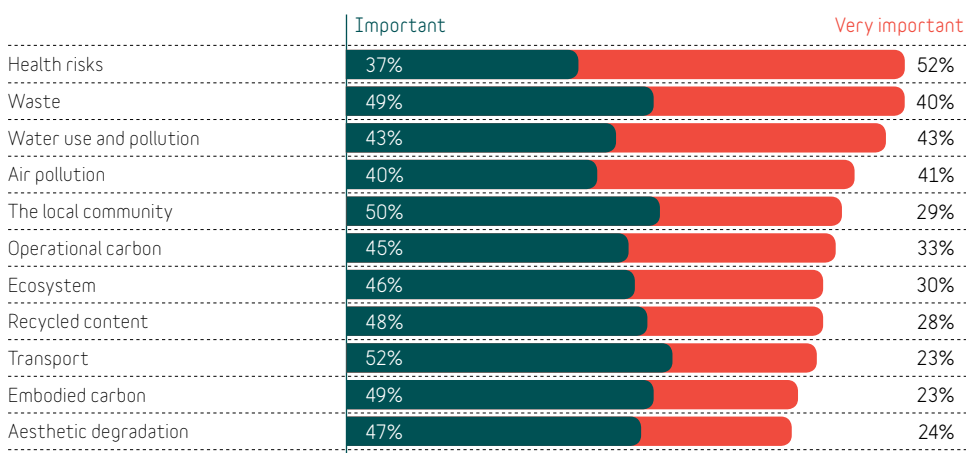
Incidentally, when we analysed the data a little further, we found that large companies (employing over 50 members of staff) are more likely to highlight social sustainability as important. In contrast to this, respondents aged over 55 were the least likely to list this as important.

Thinking about your organisation, generally how important are the following aspects of sustainability to the projects you work on?



We did enter into specifics in the survey though, as we wanted to find out which aspects of sustainability were the most important. Most respondents recognised the importance of all of the aspects of sustainability listed in the graph to the right. Perhaps surprisingly, carbon (whether operational or embodied) did not head the list. Instead came more prosaic, but no less vital, concerns such as health, waste, water use and pollution (89%, 89% and 86% respectively). Bottom of the list came the most subjective concern: aesthetic degradation, although even here, over 70% of respondents rate it as important.

Thinking about your organisation, generally how important are the following aspects of sustainability to the projects you work on?



### Sustainability in practice

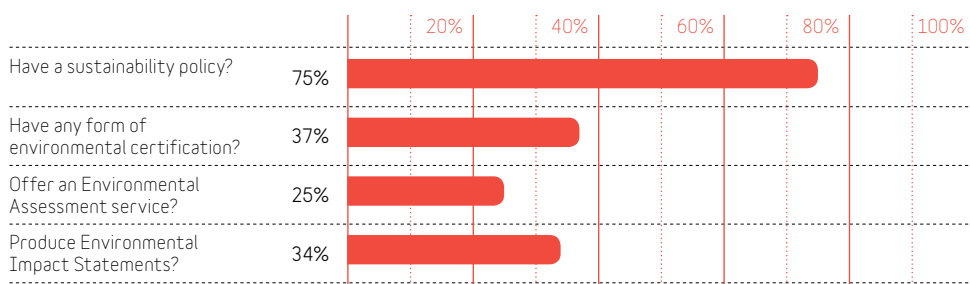
We wanted to find out what people are doing about sustainability now. When we run this survey again, we will see if things are changing. We found that nearly 80% of respondents feel that they are achieving sustainability half of the time or more, while 9% tell us that they always achieve it. Conversely, just over 20% feel that they achieve sustainability rarely or never. Generally, contractors state that they achieve sustainability more frequently than either clients or consultants.

This widespread, though partial, achievement of sustainability is complemented by a company level commitment to sustainability. Three quarters of respondents come from companies that have a sustainability policy, over a third have some form of environmental certification, and a similar number produce environmental impact statements. A quarter of respondents' companies offer an environmental assessment service.

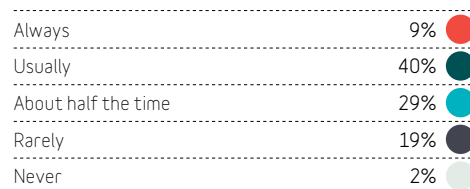
“Scepticism didn’t, in general, mean that people had given up on sustainability: more that they felt others should take it more seriously.”



Does your organisation...



How often is sustainability, as you define it, achieved on your projects?



**Bringing about sustainable buildings: influences on sustainability**

We also wanted to find out how much people know about how sustainable projects come about. The majority believe that it is not a result of clients' altruism. Over 80% feel that clients are only interested in sustainability if they occupy the building long enough to take advantage of the cost saving benefits of sustainable design. Even where clients do require some form of sustainability, this is often viewed as 'green wash': the appearance of sustainability rather than actual sustainability. (To balance this picture, clients themselves are the least likely to agree that they are only interested in sustainability if they can see a cost saving).

It therefore appears that the construction industry, its representative bodies and the professionals within it need to help clients understand the importance of sustainability. This view is supported by an evident shared sense of responsibility. A clear majority see their job as being more than 'just' satisfying the requirements of a brief. Consultants and contractors have a part to play in convincing clients that they should want truly sustainable buildings.

“The construction industry, its representative bodies and the professionals within it need to help clients understand the importance of sustainability. This view is supported by an evident shared sense of responsibility.”

**Barriers to sustainability**

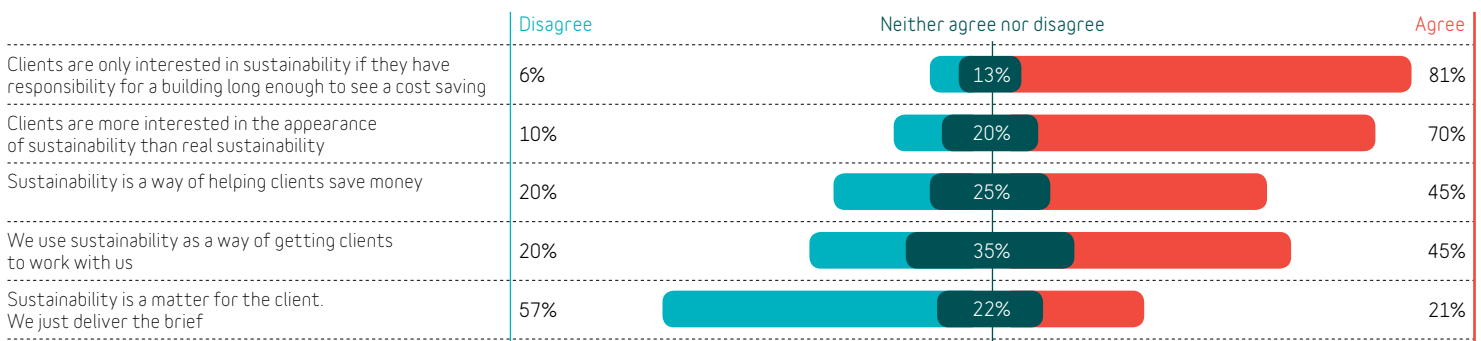
What stands in the way of sustainability? The state of the economy is an important factor, with two thirds saying that given the state of the construction industry, sustainability is less important than getting work, whereas fewer than one in five will only work on projects where sustainability is 'at the core'. Looking forward though, 61% feel that sustainability will become more important as we move out of recession.

And who is leading the way in sustainability? It doesn't appear to be central government, with only around a third of people telling us that they look to central government to tell them how sustainable buildings have to be. Instead,

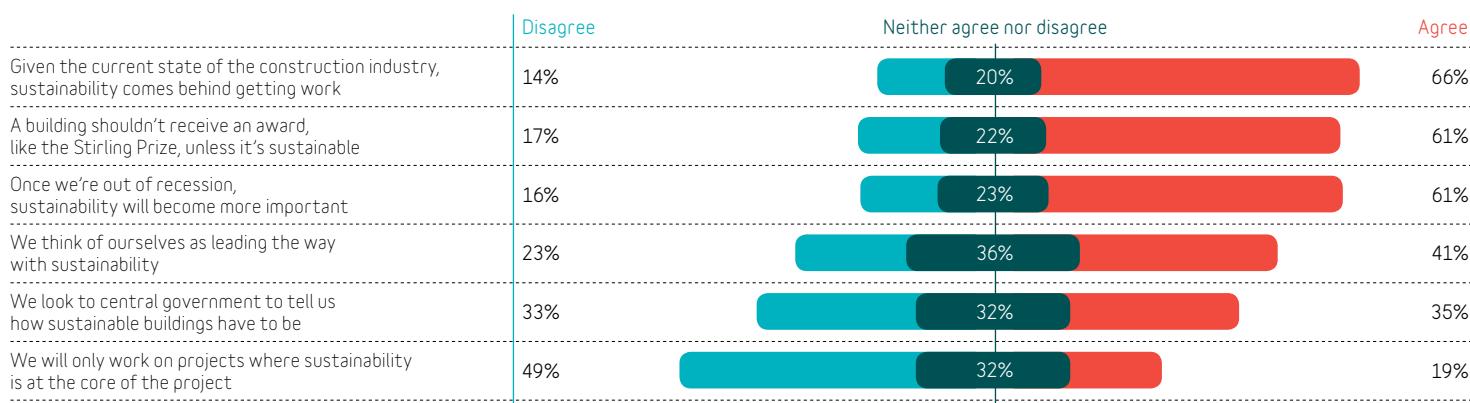
people are looking to the industry itself (with 61% feeling awards such as the RIBA Stirling Prize should be restricted to sustainable buildings). Forty-one per cent see themselves as 'leading the way' in sustainability.

We also asked whether people thought clients, consultants or contractors are 'leading the way' in sustainability. Overall, 69% feel that it is consultants, 35% the clients and only 16% the contractors. Within the respondent groups though, contractors are more likely to identify themselves as 'leading the way' than either clients or consultants; and consultants are less likely to believe that clients are 'leading the way'.

Thinking about your organisation and sustainability, how strongly do you agree with the following statements?



Thinking about your organisation and sustainability, how strongly do you agree with the following statements?



#### When sustainability starts

In the 'Green Overlay to the RIBA Outline Plan of Work', released in November 2011, we learned that we should carry out a 'Strategic sustainability review of client needs' right at the very start of a project, at the Appraisal stage. We wanted to find out whether people start thinking about sustainability at this early stage. We found that most people do, but not everyone does. Whilst 34% start to consider sustainability at Appraisal stage, and 36% at the Design Brief stage, 30% don't start considering sustainability until they have completed the preparation stages of the RIBA Plan of Work.

“When aiming to create sustainable buildings, it's important that the right information and guidance are available. Sustainability is an area that provokes lively debate and, as we've seen, variance in definition and recommended practice.”

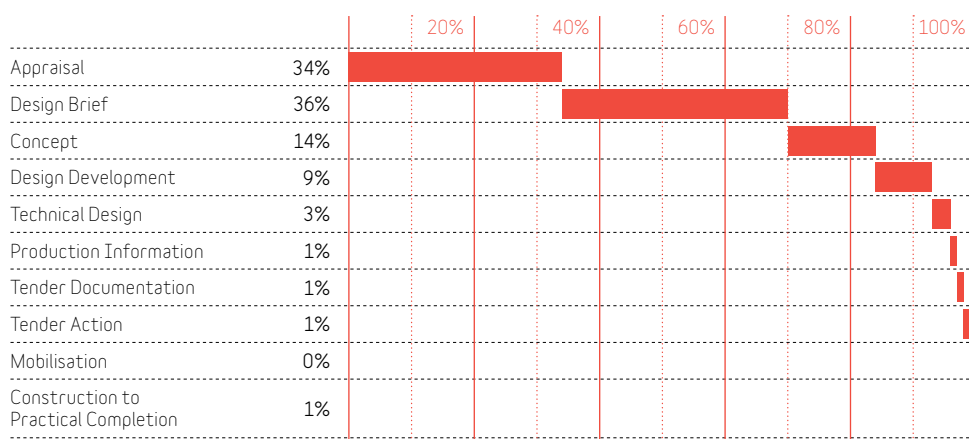
#### Guidance and information on sustainability

When aiming to create sustainable buildings, it's important that the right information and guidance are available. Sustainability is an area that provokes lively debate and, as we've seen, variance in definition and recommended practice. We wanted to find out what assessment methods and information people turn to when designing buildings, and how reliable they find them.

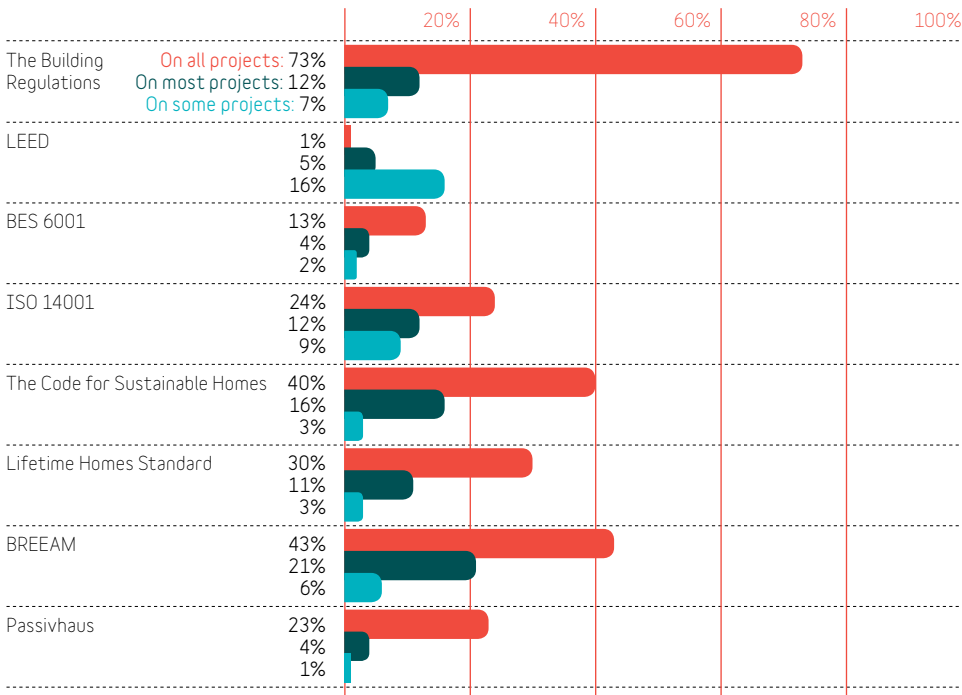
#### Assessment methods

We provided a list of available assessment methods that people might use to help them create a sustainable building and asked which they had used on some, most or all of their projects. The most popular assessment method is the Building Regulations, with over 90% of people using them on at least some projects. This is perhaps unsurprising: they are a legal requirement, and the Approved Documents provide a guide to conformity. Another government source of guidance (though not a general legal requirement) is the Code for Sustainable Homes. It is also widely used: by almost half of respondents. BREEAM is also widely used, with almost 70% of respondents using it on at least some projects. Passivhaus is one of the least used assessment methods, though we are interested to see if its use increases over the coming years.

At what stage in the building process do you start to take into account sustainability?



When working on projects, which of the following assessment methods have you used to help you create sustainable building?



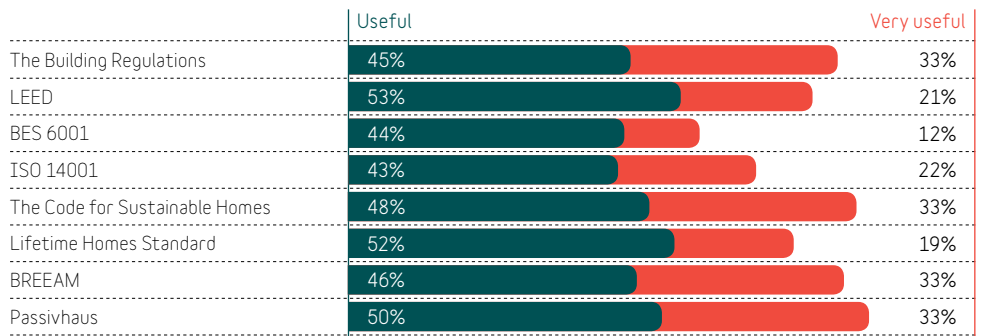
“The picture that emerges is complex and at times subtle, but some things are clear: the construction industry is, overall, committed to sustainable design and building. At times, it seems, we are waiting for others to catch up”

We then went on to ask how useful those particular assessment methods were. All assessment methods were rated as useful (whether ‘quite’ or ‘very’) by a majority of those who used them. Passivhaus emerges as the most useful, with 83% finding it useful. The least helpful was the least used: BES 6001. The Code for Sustainable Homes comes out very well, with a third of those who have used it ranking it as very useful, and almost half finding it useful.

“I need more education on the subject.”

Finally, we wanted to look at how confident people were in their knowledge and skills of sustainable design. Nearly a half, 47%, describe themselves as confident (either ‘very’: 12% or ‘quite’: 35%). Thirty-eight per cent describe themselves as ‘in between’, whilst 15% feel they lack confidence.

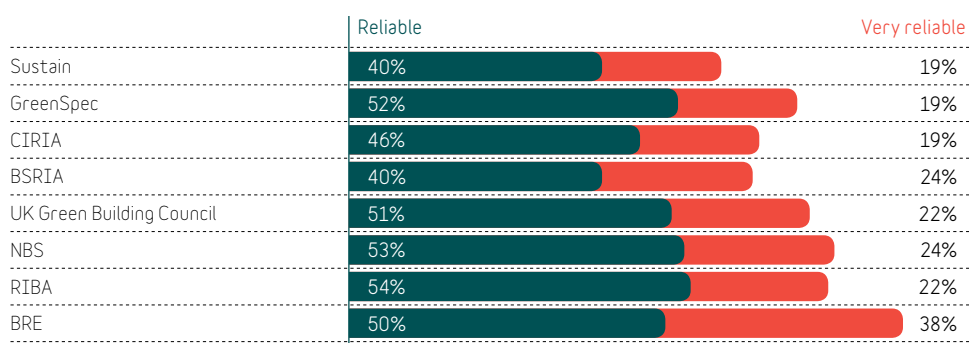
How useful would you rate the methods you have used in terms of helping you create sustainable buildings?



How confident are you in your knowledge and skills of sustainable design?



Please tell us how reliable you find the following sources of information about sustainability



“Education and training for sustainability costs too much and isn't very widespread.”

Naturally people need to be able to turn to reliable sources of information on sustainability. Fortunately, there are a number of reliable sources available. Eighty-eight per cent of people find BRE reliable, 77% NBS and 76% the RIBA.

### Closing remarks

Here is our first set of findings on sustainability in the construction industry. The picture that emerges is complex and at times subtle, but some things are clear: the construction industry is, overall, committed to sustainable design and building. At times, it seems, we are waiting for others to catch up, value and commission the sustainable work that we can now provide.

But there are challenges. Disparate information sources, methods of accreditation and levels of expertise are characteristic of an area of practice and discourse where difference is often emphasised ahead of agreement. The survey showed few turning to central government to ‘lead the way’ in sustainability (though there is widespread use of government legislation and guidance in the design and build process). Those in the construction industry are more likely to say they lead the way more than the Government. Another challenge is, of course, the economic climate. As we move out of years of contraction perhaps we will see sustainability coming to the fore again. We don't have forever.

It does seem that the construction industry in the UK is well placed to bring about sustainability. There is widespread commitment to sustainability and some degree of confidence from professionals in their own ability to deliver sustainable projects. There are reliable sources of information. There is a legislative framework that is both adhered to and which allows for greater degrees of sustainability to be mandated in the future.

As we inch away from recession, we'll see whether our move towards sustainability continues and accelerates. We'll also see which aspects of sustainability are emphasised. We will therefore repeat this survey over the coming years to see what progress is made. ●

“The picture that emerges is complex and at times subtle, but some things are clear: the construction industry is, overall, committed to sustainable design and building. At times, it seems, we are waiting for others to catch up”

# Environmental certification

Richard Hardy  
Director of Sustainability,  
BRE Global



“There is, of course, more to developing sustainable buildings than specifying appropriately certified building products. A wide range of environmental, economic and social issues must be addressed during the design, construction and use of the buildings.”

The choices we make when specifying products and services and designing and developing buildings have major impacts on both the sustainability of our projects and their successes. In order to make the best choices, we need information that we can trust. Richard Hardy, Managing Director of BRE Global, looks at some of the product and building certification schemes that can deliver the quality of information needed.

## Sustainability and trust

The increasing demands from regulators and the market for greater sustainability in building developments has, perhaps inevitably, led to a rash of ‘green’ claims for building products and services. The fact that many of these are not backed up with any credible scientific data or third-party certification can make selecting them for use in a development project something of a lottery.

Achieving a more sustainable built environment depends on specifiers being able to trust the claims made for building products, systems and services. It was therefore very gratifying that the NBS Sustainability Survey 2012 has identified BRE, along with NBS, as a major source of information for architects, specifiers and consultants, and one that is considered to be among the most trustworthy.

Providing impartial, authoritative information that the industry can trust is a key element of the BRE Group’s business. The Group is owned by the BRE Trust, a charitable company that aims to advance knowledge, innovation and communication in all matters concerning the built environment. This ownership structure has enabled the Group to remain independent of specific commercial interests.

## Trusted product and services

One way that specifiers can be assured that products and services can be trusted to perform as claimed is to select those that have been appropriately certified. Expert, independent approval and certification schemes will ensure not only that sustainability claims are substantiated but also that the products and services meet performance standards appropriate for their intended use.

It is important to remember, however, that there are different degrees of certification offering different levels of assurance.

With first-party certification, for example, it is the organisation providing the goods that offers assurance that the products meet particular claims. In second-party certification, an association to which the organisation belongs may provide this assurance. But in third-party certification an assessment is carried out by an independent body – such as BRE Global – which declares that the product or service will perform as required.

This independent assessment allows third-party certification to objectively distinguish products and services from others on the market, and gives customers confidence about their performance.

It is also important to distinguish certification from testing. Certification should ensure that those products and services assessed meet – and continue to meet – appropriate standards, through a robust combination of regular company audits and a schedule of ongoing tests. While testing can deliver a valuable measure of a product’s performance at a given time, certification monitors that performance for as long as the product remains certified.

Whether a product is just tested or fully certified, it must be done against a robust and scientifically-based standard. BRE, through the Trust, conducts research across the full range of the built environment. The output of this research is used both in publications to help industry, consumers and users but also as the basis for sound, technically robust standards. It is often these standards that create the real difference.

## Responsible sourcing

Customer concerns about construction product sourcing often extend beyond purely environmental issues. In fact, the responsible sourcing of materials is often in the headlines. A number of exposés have revealed poor working conditions in some overseas factories, and the extraction of raw materials often occurs with little regard for the environment or the people who live nearby.

The wellbeing of the local workforce is just one of the wide-ranging ethical, environmental and social issues that must be considered throughout the supply chain when determining if a product has been responsibly sourced. A number of schemes such as Fairtrade, Rainforest Alliance and Marine Stewardship Council have been established to enable specifiers to identify responsibly sourced materials.

The BES 6001 Framework Standard for the Responsible Sourcing of Construction Products was launched by BRE Global in 2008 as a means of certifying almost any type of material used in the construction industry. With many clients now including responsible sourcing criteria in their tender documents, the standard has been used to certify a range of common products such as concrete blocks, bricks, cement, cladding, ready-mixed concrete, paving slabs and reinforcing steel.



### Relevant survey statistics →

Disparate information sources, methods of accreditation and levels of expertise are characteristic of an area of practice and discourse where difference is often emphasised ahead of agreement.

If such schemes are to remain effective, they must be continually monitored, improved and updated. BES 6001, for example, is currently undergoing a revision process to ensure that the Standard reflects recent developments in responsible sourcing and procurement practices.

BRE and NBS both have information and listings on web-based platforms. BRE's GreenBookLive.com and RedBookLive.com are free online databases for specifiers and end users.

### Better buildings and developments

There is, of course, more to developing sustainable buildings than specifying appropriately certified building products. A wide range of environmental, economic and social issues must be addressed during the design, construction and use of the buildings.

To help deal with these complexities, a number of schemes for assessing and certifying buildings have been developed in Europe, the USA, Australia and elsewhere. The longest established and most widely used of these is the UK's BREEAM scheme, an internationally recognised quality mark of a building's sustainability. It was very good to see how highly BREEAM and the related Code for Sustainable Homes were rated in the survey.

Using independent, licensed assessors, BREEAM examines scientifically-based criteria covering a range of issues in categories that evaluate energy and water use, health and wellbeing, pollution, transport, materials, waste, ecology and management processes. Buildings are rated and certified on a scale of 'Pass', 'Good', 'Very Good', 'Excellent' and 'Outstanding'.

Since its launch, BREEAM has expanded its original focus on individual new buildings at construction stage to encompass the whole lifecycle of buildings from planning to occupation and refurbishment – and to include whole communities. More than 200,000 buildings have now been certified under the Scheme, with around a million registered for certification. The Scheme's regular revisions and updates, designed to widen its impact on sustainability, are responses to feedback from industry and support the UK's sustainability strategies and commitments. This ongoing evolution has allowed BREEAM to remain at the leading edge of scientific development and innovation.

### Sustainability and quality

Along with quantifiable improvements – for example in carbon emissions, resource

consumption, waste reduction – less tangible improvements in quality are increasingly being noted in buildings that are designed with a strong focus on sustainability.

Achieving the standards required by a scheme such as BREEAM requires careful planning, design, specification and detailing, and a good working relationship between the client and project team. These are also the very qualities that can produce better buildings and better conditions for building users. The guides produced by the RIBA, NBS and BRE are invaluable to help achieve sustainable buildings.

The greater efficiency and quality associated with sustainability are also helping to make such buildings more commercially successful. There is growing evidence, for example, that BREEAM-rated buildings provide increased rates of return for investors, and increased rental rates and sales premiums for developers and owners.

A study carried out by Maastricht University and published by the Royal Institution of Chartered Surveyors (RICS) in March 2012, titled Supply, Demand and the Value of Green Buildings, provides empirical evidence of the value of BREEAM-certified buildings. The study used a sample of office buildings in London, using data from transactions over the 2000–2009 period, and found that these buildings achieved a premium on transaction prices and on rents.

### Looking ahead

By its very nature, sustainability is all encompassing – not limited to any particular sets of products, buildings or issues. Our assessment and certification systems must be widened accordingly if the momentum for greater sustainability in the built environment is to be maintained.

BREEAM has already been expanded from a scheme able to assess office buildings to one that can be used on almost any type of building in any location. The range of issues addressed by the Scheme has also grown, but many more environmental, social and economic aspects need to be considered. The challenge is to broaden the Scheme without increasing its complexity – expansion must go hand-in-hand with efforts to make BREEAM more accessible and transparent. The support and feedback from the industry that we have enjoyed to date will be vital in this process.

The eventual goal is to make sustainability mainstream and routine – involving everybody.

We will need to link tools such as BREEAM to NBS and BIM and a wide range of other databases to allow sustainability information to be quickly and easily accessed. For example, BRE is currently working on a project with NBS to explore ways in which building data can be referenced, used and embedded into helpful tools.

### Richard Hardy

Richard Hardy joined BRE Global in 2006 as a director in the company's Sustainability Business, with responsibility for new product development, research and standards. His role included taking responsibility for a project to set up the BRE Global Microgeneration Certification Scheme and to develop new sustainability assessment schemes in the BREEAM family, a role which developed to include operational responsibility for BREEAM as the Director of Sustainability, a post which he held for five years. On 1 October 2012, Richard took up his current post of Managing Director of BRE Global Ltd. BRE Global's certification activities include BREEAM, Code for Sustainable Homes, LPCB approvals of fire and security products, materials LCA and responsible sourcing and Energy certification schemes. His primary aims in this role are to grow all elements of the business internationally and to bring the sustainability and the fire and security businesses closer together to recognise the role they each play in each other's businesses.

Richard has very considerable previous experience in the fields of certification, testing and directives compliance, having spent 19 years at BSI working on large range of products and services from consumer products to elevators and machinery, pressure vessels and medical devices. He has travelled extensively, conducting assessments; delivering training on certification, European CE marking and other European funded training initiatives; business development; and representing the UK at standards meetings.

# How can we help?

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**John Gelder**  
Head of Content Development  
and Sustainability, NBS



“Many respondents are engaged in green product selection (this would include clients and contractors, as well as consultants)... Manufacturers need to do more, in spite of the cost of third-party certification and the likelihood that certification requirements will continue to evolve.”

This first NBS Sustainability Survey suggests some issues that NBS could help consultants, contractors and clients with through articles, books, CPD, specification text and guidance, software tools and so forth. There is certainly interest in sustainability, with half of respondents rating environmental sustainability as very important, and nearly half strongly agreeing with the statement ‘Sustainability is an integral part of my profession’. Comments on the following would be very welcome.

## Environmental certification

While most respondent organisations have a sustainability policy, most do not have any form of environmental certification (e.g. to Acorn, EMAS or BS EN ISO 14001). One difficulty is that these schemes are not specific to construction consultants, clients or contractors. We could develop something along the lines of the RIBA Quality Management Toolkit (RIBA: 2006) or Tim Jefferies’ Quality Management System (RIBA Publications: 1999), initially for ‘simple’ environmental management systems (e.g. Acorn) applied to construction consultancies. These would be digital tools, with templates and the like that can be applied at company level and at project level, and perhaps integrated with other NBS software tools such as NBS Create and NBS Contract Administrator in due course. They could be supplemented with appropriate training, CPD and articles, which would also support those seeking full-scale certification. This work could be done in association with an environmental certification organization operating in the construction sector, such as BRE.

Many respondents are engaged in green product selection (this would include clients and contractors, as well as consultants), and we could do more to support this. For example, we could develop a ‘register of registers’ for construction sector ecolabels to BS EN ISO 14024:1999 (e.g. EU Ecolabel) and environmental product declarations to BS EN ISO 14025:2010 (e.g. BRE Environmental Profiles). However, not many manufacturers have either in place at present, so such a register would be of limited use. Manufacturers need to do more, in spite of the cost of third-party certification and the likelihood that certification requirements will continue to evolve.

## Education

Three quarters of respondents had some sort of role in sustainability, and nearly half were quite confident or very confident in their knowledge and skills of sustainable design; but, only one quarter had any kind of qualification in this area. There are many events around the UK on sustainability (see our Events diary, which is dominated by events on sustainability, which we track weekly), and a number of formal qualifications are available, e.g. through the BRE. It is not clear how we could usefully add to this mix.

## Aspects of sustainability

Most respondents had done some refurbishment work over the last 12 months, but fewer than half had done environmental retrofits. With the roll-out of the Green Deal, we’d expect the latter figure to change over 2013, and the number of Green Deal advisors to increase. Whilst NBS Scheduler is strong on refurbishment, we need to extend this coverage to our other specification products and services, and we need to develop the NBS Domestic Specification in particular to support Green Deal work. This work has been pencilled in for 2013.

We should specifically support the top six aspects of sustainability: health risks, waste, water use and pollution, air pollution, the local community, and operational carbon (this ranking of carbon, by the way, is supported elsewhere in the survey – only around 30% of respondents strongly agreed with the statements ‘Sustainability is mainly about reducing carbon emission’ and ‘Sustainability is mainly about reducing energy use’). This can be done through appropriate text and guidance in our specification products, and through articles, CPD, publications and NBS TV programmes. Of course, we do publish material on these topics at present, but they should be our priority for further development.

Interest in embodied carbon seems to be growing, with 31% strongly agreeing that it is important to measure embodied carbon, and 28% strongly agreeing that embodied carbon will become more important over the next few years. However, not many measure it – only 5% strongly agreed that they did so. We hope to bridge this gap by bringing together NBS Create (and its ability to link to geometrical BIMs, as demonstrated in our iCIM project for example) and BRE’s IMPACT project, both with IFC import/export capabilities, with work beginning this year.

### Relevant survey statistics →

Naturally people need to be able to turn to reliable sources of information on sustainability. Fortunately, there are a number of reliable sources available. Eighty-eight per cent of people find BRE reliable, 77% NBS and 76% the RIBA.

This will, in effect, deliver BRE's environmental impact data (of which embodied carbon is just one part) using NBS' Uniclass2-compliant data structures – the best of both worlds!

The survey shows that post-occupancy reviews (which respondents might have interpreted to mean either post-occupancy evaluations or post-project reviews – the question was a little ambiguous) are not common. Only 8% of respondents carry them out on all projects, and almost 40% never carry them out at all. We believe that POEs are a very important route to improving designs from project to project, and would like to support them somehow. Taking NBS Create into the occupancy phase (operation and maintenance) and the briefing phase should allow users to 'close the loop' between subsequent projects of a similar nature. Developing survey functionalities in NBS Create will also help with this. These developments are for the long term.

### Sources of information

The survey suggests that the Building Regulations (presumably this was interpreted as meaning the Approved Documents) are the most used 'assessment method' on sustainability (85% use it on most or all projects). Because we publish these in various formats, we are in a good position to integrate the ADs into our

specification products, perhaps through the development of a compliance specification. This will become possible once we have implemented 'tagging' functionality in NBS Create – planned for 2013.

BREEAM is the next most used, with 27% using it on most or all projects. We have already implemented BREEAM in our main specification products, though we still need to roll out the 2011 version (planned for 2013). As NBS Create expands to serve the complete project timeline (work on this will begin in 2013), so our BREEAM coverage can expand to pick up on everything in BREEAM, from early-stage design through to the building in use. This will also help the majority of respondents who start to consider sustainability in the earliest project stages. This in turn creates the possibility of NBS Create being used as a BREEAM compliance tool, with BRE certification to this effect.

We should also develop the NBS Domestic Specification to support the Code for Sustainable Homes (widely used, and over 80% considered it useful or very useful): yet another piece of work planned for 2013. Enthusiasts would like us to focus on LEED and Passivhaus but, at present, their usage is too low to justify this work. However, the Sustainability Survey will allow us to keep

an eye on this, and if usage grows sufficiently then we may decide to implement them as well as BREEAM.

Who should NBS work with when developing material on sustainability? The survey tells us that NBS is already used by over 80% of respondents as a source of information on sustainability, which is very gratifying, but so are the RIBA and the BRE. It would make sense for us to work with them, particularly BRE with its very high reliability rating (88% consider it quite reliable or very reliable). We already have a memorandum of understanding (MoU) in place with the BRE to this effect, and have several joint projects in the pipeline (most are mentioned in this article). On the RIBA side of things, we have been negotiating to bring much of the RIBA Sustainability Hub across to combine it with ours. I hope this will actually happen in 2013.

### Conclusion

You can see that the Sustainability Survey is supporting a lot of our ongoing or planned content development work, while also suggesting other work that we could be doing. We would be very interested in your views on this, but if you don't have time to let us have them now, we'll be running the Survey again in a year or two, and you can use it to let us know then! ●

### John Gelder

John is an architect registered in the UK and Australia, where he graduated in 1978. In 1992 he joined Sydney-based NATSPEC as chief editor, leaving in 1997 to move to Paris where he consulted to NATSPEC and to NBS. John has been with NBS in Newcastle since 2000, and is now RIBAE Head of Content Development and Sustainability.

Since 1991 John has been actively engaged with environmental sustainability in architecture, particularly in specification. He has written and lectured widely on the subject, in Australia, Europe, the US and the UK. Topics range from termite control, to teaching environmentally-sustainable design in schools, to green product selection.

In Australia John helped establish the award-winning Australian Institute of Architects Environmental Design Guide, for which he wrote 17 Notes. For the International Construction Information Society he produced ICIS Report 3 Environmentally-responsible specifying – an international survey. For NBS, John managed the NBS WRAP project (dealing with the specification of recycled content of building materials), and initiated the NBS BREEAM project by organising the training of two technical authors as BREEAM Assessors. He also co-wrote the RIBAE Sustainability Strategy, and managed the production of two reports on environmental sustainability in RIBAE – Current State of Play, and Vision and Scope. John has developed

a comprehensive proposal for the online RIBAE Sustainability Hub, on which work has begun. As a member of the RIBA Sustainable Futures Group, he is working towards the merging of the RIBA Sustainability Hub with the RIBAE Hub.

He was also involved in the TSB-funded iCIM project, developing the content for a prototype tool capable of calculating embodied carbon – and waste, mass, cost, recycled content, and BRE Green guide ratings – for configurable wall (and other) elements. This tool was demonstrated at Ecobuild 2012. We hope that integration of the TSB-funded IMPACT project and NBS Create will commence in 2013. This would, in effect, take the iCIM project to commercialisation.

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