

# Inventing the Future

Rowan Whimster, *Editor, Conservation Bulletin*

**Traditional buildings have a huge part to play in the battle against climate change – but first we need to understand much more about how they work.**

## Facing up to the facts

Our houses (or more accurately their energy-consuming occupants) are responsible for more than a quarter of this country's CO<sub>2</sub> emissions – roughly the same proportion as transport and industry. And of those 22.7 million homes, nearly a fifth were constructed before the end of the First World War. It is therefore hardly surprising that carbon economists and policy-makers have begun to ask hard questions about the traditionally built houses, hospitals, schools and factories that give our urban and rural environments so much of their special character. In the face of global warming is it true, as some experts have argued, that older traditionally constructed buildings are fundamentally inefficient in terms of their energy efficiency and will therefore need to be knocked down and replaced by so called 'zero-carbon' houses?

Rather, is the problem more to do with us, the people who live in the houses – who turn up the thermostat when we feel chilly and then open the windows when we get too hot; who never quite get round to improving the draught-proofing of our windows and doors? And if we are prepared to make some modest changes to our personal lifestyles, how much effect will that have on the energy consumption of the national stock of buildings in which we live, work and entertain ourselves? Finally, when it does come to new development, what lessons can be learnt from the past about more sustainable ways of constructing, heating, lighting and ventilating buildings?

To answer these questions, English Heritage invited more than 100 delegates from across the spectrum of the built environment to meet at the Royal Society in London on 24–25 January 2008. Their shared purpose was to learn about the challenges facing the nation's traditional building stock and to sketch a vision of how those buildings, far from being a dangerous liability, have the potential to serve as a model and catalyst for new and more sustainable ways of low-carbon living. Assisting them in this task a panel of distinguished historians, economists and researchers introduced some of the issues relating to the energy efficiency of traditional and contemporary buildings and

construction materials. Stimulated by this evidence, the summit participants were then asked to explore the role that the built environment could and should be playing in the battle against climate change.

Opening the summit, **Margaret Hodge** (Minister of Culture, DCMS), laid down three powerful challenges. The first is that our sector's unique understanding of the sustainable building techniques of the past needs to play a crucial part in planning for the future. The second is that familiar and cherished buildings are of huge positive value to people – in her own words: 'The more you destroy old housing, the more you destroy communities and social cohesion.' The third and arguably most important message was that government is looking to the historic environment sector to robustly challenge the simplistic and unproven argument that old buildings are by their nature inefficient.

In his own welcoming address **Simon Thurley** (Chief Executive, English Heritage) responded to the Minister's challenges with two more of his own. The first is that our sector has no option but to accept that 'the journey from a high to a low-carbon world must be as straight and direct as possible'. The second is that, as the stewards of the historic environment, we are 'not wanting to idealise the past, but to learn from it'.

Margaret Hodge MP, Minister of Culture, opens the Inventing the Future summit by reminding delegates of the central importance of local buildings and places to communities and social cohesion.  
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Little Hall,  
Lavenham, Suffolk:  
vernacular timber-  
framed, earth and  
stone buildings can  
all teach us impor-  
tant lessons about  
sustainable living.

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'Are traditionally constructed buildings *really* energy-inefficient? You must challenge those who still argue that the historic environment is a threat to the future.'

Margaret Hodge, Minister of Culture

Invited to set the summit's discussions in a global context, **Martin Parry** (Intergovernmental Panel on Climate Change) began by reminding delegates of two inescapable facts: that anthropogenic warming is now an unequivocal reality, and that if average global temperature rise cannot be contained below 2°C the planet and its human communities will be in for a very rough ride. For the UK, however, the impacts of climate change may at first sight seem modest, and perhaps even welcome: warmer winters, sunnier summers and for farmers and gardeners a longer growing season. Behind this superficially comforting picture there nevertheless lie some much harsher realities: increasingly frequent extreme weather events, flooding due to rising sea level and storm surges, and above all the indirect social and economic consequences of much more extreme climate changes in other parts of our small and crowded planet.

Looking ahead, the messages from the IPCC for society are equally stark: unless it is prepared to rapidly and radically adapt from its present path of accelerating global economic and population growth to one of more sustainable low-energy local stewardship there will be no way in which we will fend off the precautionary 2°C rise in global temperature. More positive, though, was Professor Parry's concluding reminder that '90 per cent of the difference between the scenarios

is due to differences in future management, *not* differences in the amount of climate change'.

### Learning from the past

Introducing the first full session of the summit **Edward Impey** (Director of Research and Standards, English Heritage) reminded delegates of the rich diversity of building techniques that had evolved during the centuries when energy was a scarce and expensive commodity. The past may not always have been a comfortable place, but in their struggle to buffer the surrounding environment its inhabitants learnt some practical lessons that we would be foolish to ignore in our own battle against climate change.

Going back to the world of medieval and post-medieval England, **Oliver Rackham** (Cambridge University) painted a more detailed picture of a pre-industrial society whose vernacular dwellings were usually constructed of locally sourced and often recycled materials. Timber, mud, thatch and stone all offered good structural and thermal properties at the cost of little but human energy; by contrast, the newly fashionable brick and tile depended on much more expensive carbon energy for their firing. Another example of cultural taste overriding practicality is the way in which some medieval town-dwellers insisted on building elaborate timber-framed houses even in parts of the country without easy access to local wood. **Paul Oliver** (Oxford Brookes University) explained that it was during these centuries that the sophisticated masonry, wood working, bricklaying and plastering techniques that give our historic towns and villages their distinctive character were evolved, along with the repertoire of familiar personal craft-names that go with them – Mason, Carpenter, Carver, Smith, Straw, Thatcher and the rest.

It was only with the dawning of the Industrial Revolution in the late 18th century that the low-carbon economy of the prehistoric, Roman and medieval periods finally and dramatically gave way to the high-carbon economies of the coal and oil ages. As **Barrie Trinder** reminded us, the rise of coal-fired steam power led to a rapid decline in the use of the traditional renewable resources of wind and water. At the same time, carbon-hungry brick and iron quickly replaced more traditional materials for the construction of the millions of dwellings and thousands of factories, offices and public institutions demanded by the new urban industrial society – a construction boom whose legacy is the vast amount of



environmental capital locked up in the bricks and mortar of our Georgian and Victorian terraces, mills, warehouses, schools, hospitals and town halls.

Returning to the social and economic realities of the pre-industrial age, **Christopher Dyer** (Leicester University) emphasised two important truths. The first is that it is only a tiny minority of medieval houses that have survived to the present day – those that were built with good-quality materials at times of relative economic stability. The second is the way in which 17th-century builders adapted promptly to the challenges of their own Little Ice Age by providing their houses with smaller rooms, draught-proof glazed windows and efficient integral chimneys. By contrast, as **Geoff Clifton** (Gifford Ltd) noted, it was the failure of other great historic city-based cultures, such as those of Harappa and Angkor Watt, to adapt to changing conditions that led to their cataclysmic social and economic collapse.

Reiterating the theme that it is human behaviour as much as the behaviour of buildings that will be the key to a low-carbon future, he concluded the session with two important messages. The first is that having evolved from a high-human/low-carbon society to a low-human/high-carbon one we now have to re-learn

the lessons of an intermediate stage in which a reduction in the investment of human energy is offset by increased use of non-carbon renewable energy. The second concerned the recent discovery that court buildings constructed before 1900 outperform their 20th-century counterparts in terms of energy efficiency (see p 28) – another invaluable reminder that the past has many important things to tell us if we are only prepared to listen.

### Understanding the new pressures

Moving from the past to the present, **Roger Bowdler** (Head of Territory Designation, English Heritage) identified one of the key challenges facing the historic environment sector: how do we protect our heritage while simultaneously taking action against climate change?

Conservation has necessarily shifted from trying to prevent change to managing it appropriately and proportionately. In the coming months the government will be publishing its new Heritage Protection Bill – an unrepeatable opportunity for us to adopt a more positive and constructive way of placing the inheritance of the past at the service of the future. But for that to happen we have first to ask some serious questions: just which buildings do we want to designate for the future, which ones are we prepared to adapt, and which may we be willing to see disappear altogether?

Moving on to the nation's contemporary building stock **Tony Travers** (London School of Economics) outlined the powerful economic pressures that will confront housing policy-makers in coming years. In a crowded country facing the realities of climate change, the most important priorities will be to make more efficient use of land and greener use of our new and existing buildings. In turn, it is through the planning system, linked to higher standards of urban design and greater public participation, that government can bring about the major changes to the supply and maintenance of the built environment that are so urgently required – though in the process we should not forget that in the end it is communities that make themselves, and not urban designers.

Another priority will be to make sure that the country has access to the building and craft skills upon which successful maintenance and adaptation of its stock of traditional buildings will depend. Those same skills will also be in increasing demand as we seek to make greater use of sustainable techniques and materials for new buildings. As **Mark Farrar** (ConstructionSkills) observed,

A tale of two centuries: Denys Lasden's recently refurbished Grade II\* Keeling House (1959) rises above a terrace of traditional 19th-century houses in Tower Hamlets – very different kinds of housing that each have a vital role to play in the battle against climate change.

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the United Kingdom has been unable to meet the demand for skilled labour in a construction industry that has actually witnessed something of a renaissance in certain traditional skills such as thatching. To make good the shortfall and to avoid the demographic time bomb of an ageing specialist workforce, better training provision is a top priority. More seriously, the construction industry as a whole has yet to be persuaded of the true importance of craft skills, not only for maintaining the nation's millions of older buildings but to allow a new generation of energy-efficient houses to make better use of traditional sustainable construction techniques.

Turning from the construction of buildings to the way in which they perform, **Philip Steadman** (University College London) showed that we now have the benefit of a robust body of statistical data dating back as far as the early 1970s. Altogether, housing is responsible for a quarter of national CO<sub>2</sub> output, roughly the same as the industrial and transport sectors. Of the UK's 23 million dwellings, 90 per cent now have roof insulation, 70 per cent are double-glazed but only 33 per cent have insulated cavity walls. Since 1974, domestic heat-loss has been falling, but overall

household energy consumption remains constant due to an inexorable growth in the use of energy-hungry electric lighting and appliances.

### Informing the future

Having examined the past and present, the summit turned its attention to the future. **Bill Martin** (Conservation Director, English Heritage) began with the blunt reminder that we have no choice but to use the stock of buildings we already have – even though 3.6 million of our 4.6 million pre-1900 buildings do not have cavity walls. Adapting these buildings as best we can is an unavoidable necessity, but we must also remember that ill-considered and unsustainable adaptation can sometimes be worse than no adaptation at all. Before rushing to act we also need to be sure how much of the problem really lies with the buildings themselves rather than with the energy-consuming behaviour of the people who occupy them.

In response to this challenge **Sarah Staniforth** (National Trust) described some of the ways in which the National Trust is using its diverse portfolio of historic sites as a testbed for innovative local responses to climate change. However, mitigation on its own will not be enough to solve all of the problems facing the country's inheritance of historic buildings. Storms and exceptionally heavy rainfall are making unprecedented demands on original drainage systems. To cope with these pressures there is sometimes no alternative but to adapt existing water management systems to meet the much greater volumes of water that are likely to be thrown at them in future. For this to happen, all those involved in making decisions about the adaptation of historic buildings will need to have the confidence to use the inherent flexibility in the current system to mediate creative and sensitive reconciliations between the competing demands of conservation and climate change.

Moving on to the 4.7 million pre-1918 buildings that make up a fifth of the nation's housing stock, **Chris Sanders** (Glasgow Caledonian University) described the dilemma of an enormous inheritance of environmental capital that would take many decades to replace, even if we should wish to do such a thing. In particular, a widely held assumption that houses built in the 1960s to 1980s are in every instance more efficient than their older counterparts now needs to be challenged. The system of SAP ratings used by government to measure energy-performance argues that older buildings are intrinsically less

36 Beaufort Gardens, Chelsea. The Royal Borough of Kensington and Chelsea's 'flagship home' has shown how a 63 per cent reduction in CO<sub>2</sub> emissions can be achieved without compromising a building's special character.

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Even the most important historical buildings can be amenable to sensitive adaptation. Photo-voltaic panels installed on the hidden roof of the Grade I St James's Church in Piccadilly.  
© Simon Dawson, St James's Church, Piccadilly

efficient, but real-life empirical studies consistently show that better insulation saves less energy than the SAP models predict. This is partly due to the faulty way the models predict the behaviours of real buildings, but it also has a great deal to do with how people actually *use* their homes.

Continuing on this theme, **David Shipworth** (Reading University) described some of the analytical methods being developed to assess the whole-life energy costs of buildings – in other words an evidence-base that takes account not only of the environmental costs of their original construction, but of their subsequent occupancy, adaptation and eventual demolition. We also need to remember that traditional methods of SAP rating take no account of the embodied energy locked into a building, or of the additional energy needed to adapt or demolish it.

At the heart of his argument is the challenging fact that in the decades in which the SAP ratings of buildings have been steadily rising, so too has their actual energy usage. Though more research is still needed, this again seems to reflect how people have been using their living spaces in a world of cheap domestic energy. Instead of applying precious heat selectively to particular rooms at certain times of day, as was the practice in the past, they have adapted to a more lavish open-plan style of living in which every room in the house is heated day and night to the same high temperature.

'The historical diversity of energy practices is the gene-pool from which new ways of operating our buildings can evolve – we need to record them and creatively adapt them to the present.'

David Shipworth, University of Reading

### The creation of consensus

Having listened to the provocative messages of the speakers, delegates were invited to map out their own scenarios for the way in which our built environment will be affected by the challenges of climate change. Encouraged to look ahead to 2038, they were first asked to imagine the state of our towns and cities assuming that for thirty years it had been 'business as usual', with no strong commitment to adaptation by government or industry. Almost without exception the picture was of urban degradation, energy poverty and an overall decay in the condition of the built environment, especially the newer building stock. Little of this was due to the direct local impacts of climate change but was instead the consequence of social and economic breakdown at a much wider national and international scale.

When asked to imagine what those same urban and rural environments would be like if all the desirable adaptations had been made, the



Delegates in the Inventing the Future summit working together to envisage how the built environment can contribute to the battle against climate change.

© Mac Andrews, Quantum Steps

vision was once again quite universal but this time much more up-beat: an enhanced public domain with reduced traffic, stronger local community hubs, local energy generation and above all a well-maintained stock of traditional buildings making a positive contribution to a more sustainable future.

Having completed this first exercise in looking ahead, the delegates then moved on to start mapping out some of the practical next steps that will need to be taken in the months ahead. This summit was never meant to be about instant solutions. On the contrary its purpose was to allow the participants to gain a better collective understanding of what we know – and just as importantly do not yet know – about the primary and secondary impacts of climate change on the built environment. Above all, it was to be about building a consensus of opinion – not only concerning the direction of the road ahead, but the part that government agencies, industry and the voluntary sector would each need to play in its successful navigation.

As everyone packed their bags it was clear that the summit had already begun to reach some important shared conclusions. Amongst the big messages that this particular delegate took home with him were:

- There is now positive evidence that traditional buildings and materials *do* make energy sense
- Traditional buildings can also last a *very* long time – provided they are properly maintained and adapted
- The historic environment also has vital things to teach the future, not only about building more *densely* but more *sustainably*
- Theoretical SAP ratings are distorting the picture – it's *people* not *houses* that waste energy
- Engaging people and communities is vital, it's not just about *regulation* but *participation*
- Playing to the different strengths of the academic, public and voluntary sectors is also vital – partnership is not an *option*, it's *essential*
- Time is *not* on our side – to catch up we urgently need a prioritised programme of technical research and wider engagement.

Over the next couple of months, English Heritage will be assimilating the mass of information that was debated over the two days of the summit. They will use this material to produce a series of proposed next steps that will be widely circulated to everyone who participated and all other interested parties.

Key messages and more detailed feedback from the summit will be published on English Heritage's website ([www.english-heritage.org.uk/climatechange](http://www.english-heritage.org.uk/climatechange)). English Heritage will also use the insights from the summit to inform its other climate change initiatives such as its major Hearth and Home research project (see p 36). At the same time, it will make sure that the summit's immensely valuable findings are fed back to government at the highest possible level. ■

Carrying on the theme of the summit, a new *Climate Change and Your Home* web portal will help owners of traditionally constructed homes to understand more about the impacts of climate change and ways to save energy.

