Westminster sustainablebusiness Forum

A collection of essays from the
Westminster Sustainable Business Forum

Building Better

Recommendations for a more sustainable UK construction sector

Chaired by Bob Neill MP

“…with a General Election looming, the spotlight will inevitably fall on planning reform and the construction sector’s ability to deliver large-scale, sustainable development.”

Bob Neill MP
Project Chair

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Executive Summary

The UK's built environment needs to become more sustainable if we are to reap the benefits from the contribution that the construction industry is making to the long-term success of the UK economy while tackling the challenges posed to our society and environment.

This collection of expert essays explores a range of ideas aimed at improving sustainability across the construction sector. The authors have each tackled a different theme, offering one recommendation designed to influence the terms of current and future debates around sustainability in the construction sector.

Recommendation 1

With research showing that companies that export become more productive, more innovative, and more efficient than those that do not, UK construction companies of all sizes should take steps towards exploiting the benefits of exporting or developing their existing international business further.

Dominic Jermey
Chief Executive, UK Trade & Investment

Recommendation 2

Government should set long-term commitments for improving the environmental performance of all buildings, across their life cycle and beyond zero-carbon. This will create long-term incentives and policy certainty for the UK construction sector to invest in related R&D and innovation; thus developing standards, products and services for the growing global market.

Gilli Hobbs
Strategy Director, Building Futures, BRE

Recommendation 3

To achieve sustainable long-term solutions, it is imperative that people and communities are brought into the sustainability agenda at an early stage. Businesses need not think of sustainability as a 'nice to have' public relations measure, but as a 'business critical' part of a balanced corporate strategy which incorporates business ethics, financial responsibility, green policy and recruitment.

David Picton
Chief Sustainability Officer, Carillion

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Managing Director, Willmott Dixon Energy Services Limited

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Government should focus on developing a UK Cities Act, which places a devolved city policy centre-stage, embeds longer-term, low carbon visions and spatial planning within our cities and encourages cooperation between the public and private sectors.

Professor Tim Dixon
School of Construction Management & Engineering, University of Reading

Introduction

We are all only too aware of the pressures currently being exerted on the construction industry in order to keep pace with housing demands across the UK. Just in London alone, various estimates predict that between 50,000 and 80,000 new homes will be required every year, or, to put it in starker terms, the equivalent of 18 new Olympic Villages annually. Taken together with the infrastructure which will be needed in parallel to support this growth – like roads, hospitals and schools – sustainable construction, more now than ever before, must undoubtedly be at the forefront of how we think about development.

When it entered office in 2010, the Coalition Government sought to reform the planning system by creating a more efficient, responsive and legitimate planning framework. Through the Localism Act and the National Planning Policy Framework it has, I believe, by and large succeeded in ensuring that the legislative landscape is fit-for-purpose.

Nevertheless, with a General Election looming, the spotlight will inevitably fall on planning reform and the construction sector's ability to deliver large-scale, sustainable development. With this last point in mind, we all have a responsibility to make sure the planning system is as conducive as possible to sustainability, and that the construction sector, and those operating in it, are firing on all cylinders in order to meet the growing needs of our towns and cities.

As this collection of essays stands testament to, the term 'sustainable' is a complex yet flexible notion, comprising of a diverse set of definitions and integral issues which span a number of key policy areas, as well as the work of several Whitehall Departments. Each individual area – be it an immediate aspect like the need for more zero-carbon homes, or indeed longer-term considerations like instilling apprentices with the knowledge and skills base to carry out sustainable projects in the future – will need to be looked at separately and with equal attention.

From a policymaker's perspective, one of the main challenges facing any Government is the fine balancing act it must make between continuity of policy and new initiative. Recent reforms to the planning sector have broadly been welcomed, but in my discussions with industry leaders I am told time and time again that a period of policy stability is required, importantly creating an environment in which reforms can 'bed-in', whilst also allowing market confidence to be maintained. Equally, however, we must not risk complacency, and it is recommendations like those in this publication, effectively from experts on the ground, which should in part dictate the direction of future policy initiatives.

The wide-ranging and informative essays that have been collected in this publication are extremely timely, not only because of the impending General Election, but also in light of the ongoing debate on devolution – and the opportunity this creates for the further transfer of powers from central government to local communities – as well as the very recent publication of the Communities and Local Government Select Committee's Report on the Operation of the National Planning Policy Framework. Clearly, we are at a juncture in which important policy areas will be decided, and the Government, other policymakers, and industry leaders would do well to take on board the recommendations enclosed. I

very much hope that many of the points raised will generate genuine discussion, both in Westminster and beyond.

This has been an ambitious project, and one that I am delighted to have been asked to Chair. I would like to thank all that have been involved, particularly those who have participated in writing and have helped in the compilation of these essays. Economically, environmentally, and socially, sustainability is a critical issue, and the following essays form a strong message. Ultimately, a change of mindset is required with regards to sustainability, and now is the time to reassess how we practically and theoretically approach this issue, one which will be of the upmost importance over the coming years.

Bob Neill MP
Member of Parliament for Bromley and Chislehurst, London
Former Parliamentary Under Secretary of State for Communities and Local Government

January 2015

Essay one

Global markets: constructing a sustainable future - worldwide

Dominic Jermey
Chief Executive, UK Trade & Investment

After four years supporting UK businesses as Ambassador to the United Arab Emirates, I was delighted to join UK Trade & Investment (UKTI) as Chief Executive Officer at a time of unprecedented challenge and opportunity. We are leading a whole-of-Government effort to deliver a step-change in overseas trade by British companies to support sustainable economic growth and rebalance the UK economy.

> **"Construction is one of the main pillars of the UK economy, employing three million people in 280,000 businesses."**

To achieve our targets we are focusing on three things: priorities, partners and people. On priorities, promoting and supporting the global ambitions of the UK construction sector is high up on the agenda. Construction is one of the main pillars of the UK economy, employing three million people in 280,000 businesses. It covers a wide range of areas where the UK has a strong competitive edge and it underpins almost all of the international projects in our High Value Opportunities programme.

On partners, we are working with the Department for Business, Innovation and Skills in delivering the Construction 2025 Industrial Strategy trade targets; with the Foreign and Commonwealth Office in identifying the most promising high value opportunities in global markets; and with other Whitehall departments – including the Department for Communities and Local Government, the Department for Transport, the Department of Energy and Climate Change, and the Department for Environment, Food and Rural Affairs – in promoting internationally the UK's capability in leading the low-carbon transition to sustainable urbanisation. Further, and most importantly, we are working with UK construction firms of all sizes to connect them to the global opportunities available.

Our staff and partners, working on the ground in every part of the UK and in more than 100 countries, have a unique ability to support and advise UK companies at home and abroad and encourage and support companies investing in the UK. Our people are our greatest asset and I am absolutely committed to nurturing talent and diversity across our global network and ensuring access for all our people to the best learning and development opportunities we can provide and empowering them to be creative and innovative in supporting UK businesses internationally. Part of that includes supporting secondments by staff into construction businesses, and from the private sector into UKTI – fostering a better understanding of our customers' needs.

The Chancellor's 2014 Autumn Statement announced an additional £20m for UKTI to support and develop more first-time exporters. This was a great vote of confidence in our work and our ability to deliver.

The Big Picture

The global construction market is expected to grow at an annual rate of 4.3 per cent until 2025 with substantially larger growth opportunities in emerging markets. The unprecedented urbanisation taking place in countries like China, India and Brazil means that for the first time in human history more than 50 per cent of the world's population now live in cities. This rural migration is set to accelerate over the coming decades. We are working with national and municipal governments to help them find sustainable solutions to the pressures on resources and social infrastructure that come with rapid urbanisation.

> **"The unprecedented urbanisation taking place in countries like China, India and Brazil…is set to accelerate over the coming decades."**

Our exports in construction contracting and design services are growing fast and were worth over £3.5 billion in 2013. In construction products, UK exports are currently over £6 billion per annum. We are aiming to double that as part of our 2020 Export Drive.

UK-based businesses have a global reputation for architecture, design and engineering, competitive whole-life costs, and sustainable construction. Our strengths in these areas are aided by significant recent advances in exploiting digital design techniques, while our manufacturers are renowned for producing some of the most innovative products in the world. Further, we have a very good reputation for our collaborative forms of contracting, including through Public Private Partnerships. This is a terrifically strong base on which to build.

But there are challenges too. Very few of our major construction firms have the scale or risk-appetite to lead on overseas projects as prime contractors. This makes it harder for smaller UK companies to access supply chain opportunities. To address this we have initiated a programme of relationship management with some of the largest foreign prime contractors to ensure they understand what the UK has to offer and for us to better understand their procurement methodologies.

> **"Very few of our major construction firms have the scale or risk-appetite to lead on overseas projects as prime contractors."**

The Key Messages

Innovation
The UK is a world-leading provider of construction goods and services, working in partnership with private- and public-sector clients across the globe. It is a true pioneer in construction innovation, offering world-class expertise and leadership in addressing the growing global demand for low-carbon and sustainable building. Globally recognised for its experience in city planning and development and urban regeneration, the UK is the ideal partner for major urbanisation projects worldwide.

Sustainability
UK design and planning firms are well placed to help countries across the globe in their shift to low-carbon economies. The UK Government, through Innovate UK, has been

supporting the UK construction industry over recent years to enable the UK to be a world leader in the design of green and sustainable buildings that deliver greater energy efficiency both in their construction and operation.

Green and Smart

The UK has strong practical experience of working on green and smart city projects both at home and across the globe, bringing the know-how, technology and business models necessary to achieve sustainable development of liveable cities. The UK has a proud track record in the provision of sustainable architectural and design services, as well as in the professional engineering services that are essential to achieve high-quality building performance. To be successful, smart cities require smart buildings. The UK provides the world-class building management and control systems needed to make this a reality.

In conclusion, we have high ambitions for the UK construction sector in global markets. We have a great story to tell. I hope everyone who reads this will help us by passing the messages on. I would urge any construction company thinking about exporting for the first time, or about developing their existing international business further, to get in touch with UKTI[1] to find out how we can help.

Recommendation 1

With research showing that companies that export become more productive, more innovative, and more efficient than those that do not, UK construction companies of all sizes should take steps towards exploiting the benefits of exporting or developing their existing international business further.

Dominic Jermey

Chief Executive, UK Trade & Investment

[1] www.ukti.gov.uk.

Essay two

Global sustainability standards and targets: promoting innovation in the construction sector

Gilli Hobbs
Strategy Director, Building Futures, BRE

The UK has a good reputation around the world for construction services, including architecture and technology support, such as Building Information Modelling (BIM). Further, UK exports in construction contracting provided a trade surplus of around £590 million in 2011.[1] According to a recent report by the Department for Business, Innovation and Skills (BIS) on the potential to increase global opportunities further, the critical factors for achieving this included people and skills, supply chain development, and – crucially – innovation capability.

> **"…the UK construction sector's investment in R&D is generally low compared to other sectors."**

Innovation is well recognised as being essential to driving growth and long-term business sustainability. However, the UK construction sector's investment in Research and Development (R&D) is generally low compared to other sectors. This is thought to be owed to issues such as high levels of fragmentation in the supply chain, low levels of collaboration, lack of awareness of the benefits of innovation, and poor knowledge transfer from project to project. More than a quarter of construction businesses surveyed by BIS do not innovate because they do not see any need to do so in the current market conditions.

Therefore, it is important to provide stimuli to innovate in order to continue to have a world class industry capable of increasing the export of its products and services in the global market. A good example of such a stimulus can be seen in BIM. In order to improve the efficiency of the construction process, the UK Government has committed to the use of collaborative 3D BIM on all centrally-procured government projects by 2016, including electronic access to all project and asset information, documentation, and data. This has led to remarkable progress regarding the awareness of BIM, capacity building, and software product innovation.

[1] Department for Business, Innovation and Skills. (2013) 'UK Construction – an economic evaluation of the sector'. Available online: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/210060/bis-13-958-uk-construction-an-economic-analysis-of-sector.pdf.

There is now a great deal of information layers that can be produced in relation to the 3D design, including modelled energy performance and the environmental impact of one design versus another. Despite having been a relatively rarely applied concept only a few years ago, BIM development is now one of the UK construction industry's expert domains. This entails the competence to build better buildings more efficiently, increase profitability, and improve whole-life performance of buildings. Being at the forefront worldwide, such expertise is also clearly exportable.

> **"Along with progressive tightening of the energy efficiency building regulations…the CSH effectively set out a road map to incrementally improve performance."**

In a similar vein, the standards and targets set for sustainability within the UK have driven innovation. These include the Code for Sustainable Homes (CSH), the Building Research Establishment Environmental Assessment Method (BREEAM), and specific minimum performance targets for energy, water, and waste. In support of the overarching target to reduce greenhouse gas emissions by 60 per cent by 2050, which was set in 2004 and increased to 80 per cent in 2008, the UK Government announced a zero-carbon target for all new housing by 2016 (applicable to all buildings from 2019). Announced in 2007, this set a ten-year timescale for the house-building industry to carry out the necessary R&D to reach this binding target. Along with progressive tightening of the energy efficiency building regulations – up by 25 per cent from 2010 and by 44 per cent from 2013 – the CSH effectively set out a roadmap to incrementally improve performance.

Prior to the 2016 deadline for carbon, interim performance targets were effectively put in place in relation to CSH level 3, which needed to be met by all new housing funded by the Homes and Communities Agency, all new housing promoted or supported by the Welsh Assembly Government, and all new self-contained social housing in Northern Ireland. In addition, some local authorities also require CSH standards to be met as a condition of planning approval.[2] Outside of these requirements, the CSH is a voluntary standard; notwithstanding, driven by and large by social housing requirements, innovation activity aimed at achieving the broadest range of sustainability performance improvements possible has accelerated massively.

> **"It is important to emphasise the benefits of setting 'performance' standards rather than 'prescriptive' standards…"**

The Innovation Park on BRE's Watford site is a highly visible outcome of some of this CSH-related innovation. The Innovation Park comprises a number of prototype building systems and products, which demonstrate the various approaches that can be adopted to achieve performance-based targets. It is important to emphasise the benefits of setting 'performance' standards rather than 'prescriptive' standards as these can be inflexible due to their pre-determined character and hence leave little headroom for innovation. The Innovation Park has showcased over 500 different construction innovations and attracted over 60,000 visitors, including school children, visiting dignitaries, and overseas delegations. Such exposure is good for UK plc with specific cases of large-scale overseas housing contracts being developed as a result of advertising UK expertise and UK products that are affordable, efficient, low-carbon, and aesthetically pleasing.

[2]There are levels 1 to 6 in CSH, with 1 being just above building regulation standards and 6 being the highest level of performance across a range of impact categories, including Energy and CO_2 Emissions, Water, Materials, Surface Run off, Waste, Pollution, Health and Wellbeing, Management, and Ecology.

Another standard, BREEAM, has become well-established in the UK, helped by certain procurement requirements in central and local government.[3] Prime examples of these are the London Olympic venues that achieved the level 'Excellent' and the Department for Environment, Food, and Rural Affairs' requirement for all new buildings on Government Estate to achieve a minimum rating of 'Excellent'.

BREEAM is now the world's foremost sustainability standard for buildings with over 1.9 million buildings registered for assessment in over 60 countries. This economic success story also lays the foundations for the UK construction industry to thrive in the growing global market for sustainable building.

So whilst there may be those that clamour for deregulation and slowing down the rate of progress in improving our built environment, there are many others that are getting on with innovating and collaborating to build a better world together.

Recommendation 2

Government should set long-term commitments for improving the environmental performance of all buildings, across their life cycle and beyond zero-carbon. This will create long-term incentives and policy certainty for the UK construction sector to invest in related R&D and innovation; thus developing standards, products and services for the growing global market.

Gilli Hobbs
Strategy Director, Building Futures, BRE

[3] BREEAM covers a range of issues including 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'. Standards exist/are underway for new construction, refurbishment, communities and infrastructure.

Essay three

Creating lasting social value through employability

David Picton
Chief Sustainability Officer, Carillion

There has rarely been a better opportunity for young people to come into the construction and engineering sector to develop 'long haul' careers more inspiring and successful than they could ever have imagined. The sector lost up to 200,000 employees under the age of 20 during the financial crisis and, with double that number set to retire in the next five years, there is both a clear skills gap and an opportunity to be grasped. Moreover, with the increased focus on added community benefit through the Social Value Act, and its recent government-wide review, there is a fundamental need to create lasting social value through employability.

> **"…community development, recruitment and training should be integrated into the wider sustainability agenda…"**

Carillion is currently the largest provider of apprentice training places in the sector, with 2,000 training in our 13 UK centres at any one time, and we have now committed to providing at least 5,000 apprentice training places over the next five years. Former apprentices are contributing their skills, experience and innovation to Britain's built environment. They are building a road, rail, and social infrastructure which not only benefits the UK economy, but also provides them with rewarding career paths. Apprenticeships are about starting from basics, but are no longer just about hard hats and cement trowels – there is a key need for diversified training to reflect the demands of a modern Britain and harness the energy and interests of today's young people.

Carillion has collaborated with the Ministry of Defence Royal School of Military Engineering and is leading the way on environmental technology apprentices. Just last year, we launched the UK's first green energy trainee programme at Telford College, which is helping to tackle fuel poverty and enabling households to benefit from the Green Deal. This particular example cuts to the heart of Carillion's belief that community development, recruitment and training should be integrated into the wider sustainability agenda in order to increase both social and economic value.

> **"The best progress is made through collaborative efforts across the industry…Results are best measured by our direct involvement with…communities…"**

Perceptions of sustainability can focus solely on environmental issues and, whilst clearly fundamental, this can miss the wider value of a truly balanced set of initiatives. Carillion's 2020 sustainability strategy brings environmental, social, and economic issues together – delivering Six Positive Outcomes and specifically incorporating skills, education and

recruitment into two of those outcomes. Supporting sustainable communities and building better prospects for our people are the two outcomes which deliver Carillion's social responsibility.

The best progress is made through collaborative efforts across the industry, and we have been part of this through our support of initiatives such as the high profile 'Your Life' campaign and the Construction Industry Training Board's (CITB) 'Born to Build'. These inspire young people to take their first step into construction and engineering, but we also believe that this helps to create lasting social value in the communities where we live and work. Results are best measured by our direct involvement with those communities, which is why Carillion implements Community Needs Plans for our contracts and projects. These take into account what local people need from a service or building, and also provide employment and training opportunities for those living nearby.

With more than three million visitors expected every year, the new Birmingham City Library is one of Carillion's biggest community based projects and is the largest facility of its type in the world. Leading the way in terms of its environmental performance, reducing energy usage by 50 per cent compared to the previous facility, the library also helped to create significant employment opportunities. Working closely with Birmingham City Council's Employment Access Team, the project helped to generate 308 jobs, created 82 apprenticeships and provided 30 work placements for homeless people. With more than 50 work experience places for children, and 600 school activity resource days, the project was truly integrated into its local community.

> **"It is through holistic strategies…that businesses can build positive legacies and demonstrate the value of community-based careers to young people."**

Further, a legacy structure was put in place from the outset, employees were linked with opportunities in other Birmingham City projects and ongoing support was given to the city through the Carillion Apprentice Training Centre. It is through holistic strategies such as this, which incorporate sustainability and recruitment, that businesses can build positive legacies and demonstrate the value of community-based careers to young people.

Businesses will naturally offer work opportunities, but there is a deeper need also to support and encourage children to gain those early skills which will enable them to achieve future career success. Carillion's ten-year contract with Oxfordshire County Council led employees to volunteer as Science, Technology, Engineering, and Maths (STEM) ambassadors and encourage the study of Mathematics, Science and Technology through classroom visits, extra-curricular science clubs and career days. With input like this, industry can really get on the front foot and sponsor positive change to help drive a sustainable pool of well-educated and highly skilled talent for both the present and the future.

Celebrating the achievement of the Government's 2009 target to create two million new apprentice positions, Chancellor George Osborne visited Carillion to view the learning first-hand. As part of a reinvigorated drive to improve employment prospects for young people, the latest Autumn Statement also cut employer National Insurance contributions for all apprentices under 25 – a move which will save businesses an estimated £1,000 a year when they employ an apprentice on £16,000.

There has rarely been a better opportunity for young people to come into the construction and engineering sector to develop 'long haul' careers, and it remains the responsibility of business itself to offer authentic, robust pathways to employability. That is what we are

trying to drive at Carillion, and the future – whilst challenging – looks ever more promising with every apprentice place we manage to create.

Recommendation 3

To achieve sustainable long-term solutions, it is imperative that people and communities are brought into the sustainability agenda at an early stage. Businesses need not think of sustainability as a 'nice to have' public relations measure, but as a 'business critical' part of a balanced corporate strategy which incorporates business ethics, financial responsibility, green policy and recruitment.

David Picton

Chief Sustainability Officer, Carillion

Essay four

People power: skills, knowledge and training

Stephen Radley
Director of Policy and Strategic Planning, Construction Industry Training Board

Ensuring the right blend of skills in the construction workforce is a central challenge in the development of a sustainable construction industry. Adequately skilled people are vital in order for the sector to deliver consistently high quality, future-proof products, characterised by low embodied energy and within a circular economy. For construction to become truly sustainable some underlying industry challenges need to be addressed, from over-reliance on cost-based procurement through to addressing the image of the industry in order to attract the best talent. The skills issue, however, is of paramount importance for the entirety of the sector.

Green skills – or sustainability skills – have become one focus of attention; it is, however, still very difficult to pin down what exactly these are and what changes are required to embed them in practice. While such a movement is partly driven by Government policy, some of the needed changes to the industry's skills mix will also originate from developments in technology and an increased need for the workforce' ability to analyse and interpret data and communicate its meaning. Collaboration with clients and customers will become increasingly important, particularly as buildings become more complex.

> **"…the key to unlocking progress…lies with achieving better integration and coordination between different trades on site."**

We argue that a critical success factor for firmly embedding sustainability in the construction sector will be establishing a base of individuals equipped with a broader range of skills as well as a better understanding of how their role interacts with others. A growing body of evidence has shown that the key to unlocking progress in markets such as energy efficiency retrofit, low-energy new build and offsite construction lies with achieving better integration and coordination between different trades on site.

To take one example, a CITB study on a social housing energy efficiency improvement programme, found that as many as twelve occupations were involved in the refurbishment of a single small domestic property, and as many as five occupations were active in one property on a single working day. Our study further showed that a large proportion of productivity issues on site occurred at the interface between these different trades.

The drive for low-energy buildings increasingly focuses our attention on how interactions between trades can impact on building performance as a whole. A classic example is the service penetration left unsealed in the insulated building fabric following the installation

of building services. Such a small opening in insulated fabric may seem innocuous but it can have a massive impact on the thermal performance of a building. Both for the assured comfort of occupants and to meet our global commitments to reduce energy demand we need to consistently construct buildings which perform as intended, and a key element to achieving this will be to get a better understanding and communication between trades.

Another argument for better integration comes from a recognition that building technology is evolving from an elemental approach (looking at foundations, walls, windows, roofs, and services separately) to a more integrated one. Low-energy buildings need to operate holistically, with integrated building elements working together to achieve higher performance and reduced energy demand. This shift towards technological integration will naturally require more collaboration and integration between different skill sets. In addition to this technological driver, some sectors may need better trade integration to access market opportunities and stay competitive, while others may be driven to do so because of increased automation on site, the growth of offsite fabrication and digitalisation, or as a result of skills shortages.

> **"New areas of understanding and competence must be built on the platform of industry-recognised skills, knowledge, training, and experience."**

Whether better trade integration is derived from closer collaboration or multi-skilling is up to industry to decide. For some, the solution lies in increasing supervision and introducing a 'coordinator' role to tie the process together, for others the answers are to be found in reducing complexity, introducing efficiency, and opening up market opportunities by developing a cross-skilled or multi-skilled workforce. However, talk about 'multi-skilling' also creates fears of the dilution of competence standards, with the risks of lower quality and safety. Therefore, a minimum competency threshold for multi-skilled individuals needs to be maintained. New areas of understanding and competence must be built on the platform of industry-recognised skills, knowledge, training, and experience. We need to embrace a new definition of multi-skilling and refrain from seeing it as a jack-of-all-trades. Instead we need a focus on the combination of in-depth skills in one particular function, with a strong understanding of the adjacent key skills that complement it.

Currently, there is no shortage of vocational qualifications to support the multi-skilling of workers, but employer uptake remains relatively low. In part, we need to overcome problems of image and identity. An occupation is like a badge and divides between professions are reinforced by the supporting infrastructure of career pathways as well as by trade and professional bodies, many of which are based on single occupations.

> **"This highlights a major challenge around how to bring in new skill sets…while maintaining a strong basis of traditional building skills."**

This highlights a major challenge around how to bring in new skill sets and support for the digital and technological revolution, while maintaining a strong basis of traditional building skills. We should not forget that some 60 per cent of buildings that will be in use in 2050 have already been built and in the UK alone six million of those were built before 1919 using traditional building techniques and materials. The skills and knowledge needed to repair, maintain, and improve the performance of these older buildings will be derived from occupations such as brickworking, structural carpentry, stone masonry, and lime plastering and these skills must be secured for the future. The question is then how

to get the right blend of skills, design training, and qualifications that prepares individuals for a very different future as well as present needs.

Government can help industry to find the way forward by providing it with stability on policy, clarity on its requirement, and predictability on its pipeline of work. But ultimately, it is down to the industry to take the lead.

Recommendation 4

The different professions and trade associations must come together to co-design new programmes and pathways to create the fully integrated workforce the construction industry needs to become truly sustainable.

Stephen Radley

Director of Policy and Strategic Planning, Construction Industry Training Board

Essay five

Too good to be true? An energy efficiency programme that pays for itself

Rob Lambe
Managing Director, Willmott Dixon Energy Services Limited

Whatever your view of the Government's approach to the issues affecting our country is, there can be no doubt about the extent of the challenges it faces. The economy, unemployment, wealth inequality, the deficit, burgeoning National Health Service (NHS) costs, energy security, stringent carbon emissions targets: these are issues to make any bureaucrat tremble. So just imagine for a moment that you are in Her Majesty's Government, and that someone hands you a document proposing a way to successfully address all of these. Too good to be true, you would probably think: the policy equivalent of an email from a Nigerian prince seeking to transfer a six figure sum into your bank account.

> **"…an ambitious home energy efficiency investment programme would bring huge benefits – to the health, wealth, and wellbeing of communities, our public services, and our economy."**

Actually, in late 2014, a report was issued which made precisely those claims. *Building the Future*[1] contains compelling evidence that an ambitious home energy efficiency investment programme would bring huge benefits – to the health, wealth, and wellbeing of communities, our public services, and our economy. And no, it is not too good to be true.

There is a strong environmental case for making homes more energy efficient. The UK has committed to reducing its greenhouse gas emissions by 80 per cent by 2050 (compared to 1990).[2] Over a quarter of the UK's total carbon emissions come from our homes. New technology and better regulation mean that those being built today are well insulated and easy to heat. But most are old, and around 80 per cent will still be in use by 2050. If we are to meet our targets, we absolutely have to address our old, cold, and draughty housing stock.

[1] Washan, P., Stenning, J., and Goodman, M. (2014) 'Building the Future: Economic and fiscal impacts of making homes energy efficient'. Available online: http://www.energybillrevolution.org/wp-content/uploads/2014/10/Building-the-Future-The-Economic-and-Fiscal-impacts-of-making-homes-energy-efficient.pdf.
[2] Department of Energy and Climate Change (2014) 'Reducing the UK's greenhouse gas emissions by 80% by 2050'. Available online: https://www.gov.uk/government/policies/reducing-the-uk-s-greenhouse-gas-emissions-by-80-by-2050.

It would take a hard heart to deny the humanitarian arguments. One in five households currently lives in fuel poverty. In the UK around 8,000 people die each year because they live in cold homes – that is four times the number that die on our roads. We all know of the devastating impact that cold homes can have on older people, but they also affect the young, for example making children twice as likely to develop asthma. The impact on our services is massive: cold homes are reckoned to cost the NHS £1.3bn every year.

> **"…cold homes are reckoned to cost the NHS £1.3bn every year."**

The *Energy Bill Revolution*[3] has successfully raised awareness of the plight of those living in fuel poverty and the importance of making our housing stock more energy efficient: nearly 40 per cent of all Members of Parliament have signed up to their campaign. But the barrier between words and deeds has always been, of course, the money. Successive governments have introduced a range of initiatives, including funding solutions and Energy Company Obligations, but the truth is that an energy efficiency programme of epic proportions requires serious cash. And at a time of austerity, we simply cannot afford it.

At least, that is what we always used to think. But Building the Future's pioneering research demonstrates that a radical insulation programme would pay for itself – as well as yield huge economic benefits for households and our country. It would increase UK Gross Domestic Product by £13.9bn per year by 2030 – around £3.20 for every £1 invested by the Government – and the treasury itself would receive £1.27 in tax revenue for every £1 invested. Under the Government's own guidelines for infrastructure return on investment, such a programme would be deemed 'high' value for money. The proposed programme would create up to 108,000 new jobs, and significantly reduce the burden on our NHS. It would save householders an average of £372 a year on energy bills.

> **"Our country has an unhealthy reliance on natural gas imports and is vulnerable to volatile energy markets."**

If those arguments are not sufficiently compelling, then the issue of energy security might just sway you. Our country has an unhealthy reliance on natural gas imports and is vulnerable to volatile energy markets. A programme of energy efficiency would reduce the amount of natural gas we would need to import by around 26 per cent by 2030, helping us to create a more resilient UK economy, and address what Energy and Climate Change Secretary Ed Davey described as "an historic legacy of underinvestment and neglect that threatened to undermine the whole economy".[4]

All things considered, making energy efficiency a major infrastructure priority, alongside road- and rail-building programmes, might seem a no-brainer. But insulation is not a crowd puller and a programme to lag homes up and down the country is not exactly a vote winner. At least until you consider the alternatives. Renewables are expensive and cannot currently meet our energy needs. Other sources of energy – nuclear power or shale gas, for example – are not going to be the solution in the short to medium term. And politicians might consider whether a lukewarm public response to a programme of energy efficiency is preferable to the placards, marches, and sit-ins, which are mobilised at the slightest suggestion of fracking.

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[3] http://www.energybillrevolution.org.

[4] Davey, E. (2014). 'Boost for business energy efficiency and electricity sector investment'. In: Department of Energy and Climate Change, Press release, 17 July 2014. Available online: https://www.gov.uk/government/news/boost-for-business-energy-efficiency-and-electricity-sector-investment.

Willmott Dixon is one of the UK's largest privately-owned construction, housing and property groups. We were the first construction and support services company to become carbon-neutral and harnessed our low-carbon expertise to create an Energy Services Business. We part-funded and contributed to the report Building the Future.

Benefitting householders, communities, our economy and our security, we believe that making energy efficiency a UK infrastructure investment priority makes strong business, environmental and ethical sense. We are about to experience one of the most open-ended General Elections in living memory and every Member of Parliament needs a silver bullet. The money is there and the case is compelling. So the question is: Will the next Government seize the opportunity?

Recommendation 5

The next Government should make home energy retrofits an infrastructure spending priority. Under strong leadership and accompanied by effective communication, such a programme can make a huge impact on the doorstep and beyond.

Rob Lambe
Managing Director, Willmott Dixon Energy Services Limited

Essay six

Future cities: urbanisation and the impact on the construction and property sector

Professor Tim Dixon
School of Construction Management & Engineering, University of Reading

We live in the age of the city. More than 50 per cent of the world's population lives in cities – a figure which is set to grow to 66 per cent by 2050. Much of this growth is occurring in developing countries and through an increasing number of mega-cities. England, as part of the United Kingdom (UK), already has a heavily urbanised population, with more than 80 per cent of the population living in primary urban areas.

> **"…as urbanisation continues rapidly, more GHG emissions are created, more resources are depleted, and more energy is being consumed."**

On the one hand, this unprecedented urban growth presents us with huge opportunities, because cities can act as vibrant hubs of innovation, enterprise and jobs growth, and as places which create economies of scale in technology deployment. On the other hand, however, this development can also present us with substantial challenges, because, as urbanisation continues rapidly, more greenhouse gas (GHG) emissions are created, more resources are depleted, and more energy is being consumed. Moreover, urban sprawl is often accompanied by socio-economic polarisation as some cities struggle to create jobs and economic growth.

Today, more than ever before, there is a strong practice and policy focus on cities, not only in the UK, but internationally as well. Over the last few years, for example, we have seen the emergence of the UK Department of Business Innovation and Skills' (BIS) Smart Cities initiative, the UK Government's funding of the Future Cities Catapult, and the UK Government Office of Science Future Cities Foresight programme. Further, we have also seen an increasing policy focus on providing greater devolved funding powers for cities across the political spectrum.

> **"…the recent report on climate change by the IPCC pointed to the key role that cities will play in tackling future climate change..."**

Internationally, the recent report on climate change by the Intergovernmental Panel on Climate Change (IPCC) pointed to the key role that cities will play in tackling future climate change, and initiatives such as the Rockefeller Resilient Cities and the C40 Cities

Climate Disclosure programmes have placed city actions centre-stage. The cities at the international forefront of this agenda of 'smart and sustainable development' are those which have developed a clear, forward-thinking and participatory vision for the future. Although every city is different, for each of them this means developing an integrated approach to tackle climate change, linked with long-term planning for the future. It also means developing cohesive partnerships for action, new and 'scaled-up' financing mechanisms (for example, city carbon bonds) as well as setting clear targets for emissions by sector, including the built environment.

Cities such as Vancouver and Copenhagen have developed clear future visions based on these principles. In the developing world, China has developed a low carbon city initiative which brings together five provinces and eight cities, while India has plans to develop more than 100 smart cities. In the UK, cities such as London, Bristol, and Birmingham have developed their thinking around setting city level carbon emission targets, and are working in partnership with the private sector to create smart innovations which use technologies (usually information and communications technology-based) to help tackle a city's economic, environmental, and social challenges. For example, Smart City Bristol aims to use smart technology to reduce GHG emissions by 45 per cent by 2020 by focusing on smart transport, smart energy, and smart data.

> **"…cities have the potential to grow into major procurers in their own right."**

These developments open up two possibilities because cities have the potential to grow into major procurers in their own right. Firstly, the UK's expertise in construction and smart city technologies offers a real global growth opportunity in both smart construction (including offsite) and digital engineering (including Building Information Modelling), not only in existing cities but in new city development projects as well. For example, it is estimated that at least $40 trillion will need to be invested in urban infrastructure worldwide over the next 20 years. This is also in the context of a global construction industry set to grow by 4.3 per cent per annum until 2025, with much of this growth in the emerging economies.

Secondly, given the fact that in the developed world the majority of existing buildings will still be standing in 2050, there is also a valuable potential retrofit market in our cities. Recent research by the Institute for Sustainability, has, for example, suggested that there is a £500 billion market of UK domestic retrofit involving 20 million homes over a 40 year period. Further, the Department of Energy and Climate Change's Low Carbon Innovation Coordination Group recently highlighted that the low carbon design services and low carbon materials and components sectors, are set to be worth approximately £488 billion by 2050.

> **"Despite some pockets of innovation…city-wide retrofit on a grand scale continues to elude us."**

Although there is exciting potential around 'future cities', there are also concerns about the proliferation and fragmentation of 'bottom-up' experiments in both smart thinking and retrofit projects in the UK. For example, market weaknesses (which include a lack of risk financing, problems in working across departments as well as privacy and security concerns) are inhibiting the growth of smart city thinking in the UK, where the current market-led approach needs better co-ordination and direction. Moreover, scaling up retrofit actions at city scale involves substantial challenges, including the reconciliation of disparate stakeholder perspectives (both public and private), as well as developing new

access to green finance which takes us beyond the relative failure of the Green Deal.[1] Despite some pockets of innovation in terms of neighbourhood and community retrofit programmes in the urban arena, city-wide retrofit on a grand scale often continues to elude us.

The policy changes to help tackle these big issues require a much stronger focus on long-term, 'city-thinking' from national and local government as well as the construction and property industry. This will require improved partnering and engagement from both the public and private sectors, but offers the potential to strengthen and underpin the UK's perceived excellence in smart and sustainable city thinking.

Recommendation 6

Government should focus on developing a UK Cities Act, which places a devolved city policy centre-stage, embeds longer term, low carbon visions and spatial planning within our cities and encourages cooperation between the public and private sectors.

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[1] Engineering and Physical Sciences Research Council .'Retrofit 2050 project'. Available online: www.retrofit2050.org.uk.

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The views expressed in these essays are those of the authors and do not necessarily represent the views of the WSBF's individual member organisations.

The WSBF

About the Westminster Sustainable Business Forum

The Westminster Sustainable Business Forum (WSBF) is a high level coalition of leading businesses, parliamentarians and public sector organisations working to promote effective sustainability policy in the UK.

The WSBF brings together leading businesses who share a belief in the need to operate in an environmentally, socially and economically sustainable way, and who understand that these concerns need to be incorporated into core business practices in order for companies to prosper in the long-term. The WSBF is independent, cross-party and not-for-profit.

The Westminster Sustainable Business Forum's Advisory Board

The WSBF has a cross-party and cross-departmental Advisory Board to strengthen the robustness and advise on the work that the WSBF performs. The Board is made up of membership from Parliamentarians and the Civil Service with the principal aim to examine, advise and discuss the merits, outputs and any potential barriers to core WSBF activity, including the WSBF research inquiries and events programme. Members of the Board are as follows:

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