The Green Construction Board

Three Years On Report

March 2015

Reducing Carbon Reduces Cost

Context

80%
the reduction in greenhouse gas emissions by 2050 as required by the Climate Change Act 2008.

50%
the ambition to reduce greenhouse gas emissions by 2025 contained within Construction 2025.

22.8%
the estimated annual growth in green and sustainable construction to 2017.

Opportunity

£1.5 billion
the potential economic benefit through reducing capital carbon in infrastructure.

7,700,000
the potential number of homes in the UK that require solid wall insulation to ensure they are energy efficient.

75,000
the number of UK commercial premises that have an EPC rating of F or G therefore requiring an update to meet the minimum energy performance standard.

22
the number of equivalent power station outputs that energy efficiency could deliver in terms of reductions in energy use.

£1 billion
the construction industry's landfill tax bill between 2008 and 2012.

Contents

Foreword

Reducing Carbon Reduces Cost

The last twelve months have seen a continued recovery in key construction markets in the UK. Provisional figures indicate that construction contracting output grew by over 7% in 2014. This has brought with it some key challenges, particularly around skills and capacity. It has also brought with it some key opportunities.

As recovery takes hold businesses and individuals are starting to take a broader view of value. That creates new opportunities. We believe that this is particularly the case for sustainable construction, particularly on a whole life cost basis.

These challenges and opportunities are central to *Construction 2025 – the industrial strategy for construction*. The Green Construction Board leads on the strategy's ambition of reducing greenhouse gas emissions from the built environment by 50% by 2025.

The Green Construction Board's defining message is that there are real business opportunities and growth prospects arising from this ambition. That is the central theme of this Three Years On Report.

It contains a number of examples of Government and industry working together in partnership to realise those business opportunities and demonstrate that reducing carbon reduces cost. Through the Board's commitments on infrastructure and the wider built environment, we are pleased that companies are taking the opportunity to show real leadership.

We believe that the prospects for growth in demand for low carbon and sustainable construction are stronger than they have been for some time.

Nick Boles MP
Green Construction Board Co-Chair
Minister of State for Skills and Equalities with responsibility for the Construction Sector

Mike Putnam
Green Construction Board Co-Chair
President and CEO, Skanska UK

About the Green Construction Board

The Green Construction Board was established in October 2011 as a consultative forum for government and the UK design, construction, property and infrastructure industry.

Its key priority is to provide improved focus, direction and clarity to the business and growth opportunities which are being created by the shift to a green economy.

This focus was reinforced in 2013 with the publication of ***Construction 2025 – an industrial strategy for construction*** which had at its heart the ambition to reduce greenhouse gas emissions in the built environment by 50% by 2025.

The purpose of the Green Construction Board:

1. **To provide co-ordinated leadership across government and industry on the issues contained in the Low Carbon Construction Action Plan**
2. **To monitor the delivery of that action plan and, through its development, ensure it remains relevant and appropriate**
3. **To act as a sounding board for government departments for new or challenging green construction issues, to facilitate effective policy making and better informed commercial decisions**
4. **To advise on the implementation of policies related to green construction, identifying sector specific implications and consequences**
5. **To promote UK achievements in the field of green construction and provide a strong public voice on its wider value to the economy, to exports, to society and to the environment.**

Work streams
A number of work streams have been established to consider key issues and deliver a comprehensive programme of activity.

- ***Infrastructure***
- ***Buildings***
- ***Retail and Lighting***
- ***Valuation and Demand***
- ***Knowledge and Skills***
- ***Greening the Industry***
- ***Promotion.***

Running through the core of all the GCB work is the message that ….

Reducing Carbon Reduces Cost

The membership of the Green Construction Board represents both Government and senior representatives from industry.

George Adams
Spie

Nick Boles MP
Co-Chair
Minister of State for Skills and Equalities

Mike Putnam
Co-Chair
Skanska UK

Mark Bew
UK BIM Task Group

Mark Clare
Barratt Developments

Colin Courtney
Consultant

Alan Couzens
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Louise Ellison
Hammerson

David Hancock
Cabinet Office

Peter Hansford
Chief Construction Adviser

Paul King
Lend Lease

Rob Lambe
Willmott Dixon

Peter Maskell
Philips Electronics UK

Chris Newsome
Anglian Water

Mark Oliver
H+H UK

Robert Pearce
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David Purdy
DECC

Neil Sachdev

John Sinfield
Knauf Insulation

Peter Schofield
DCLG

Lynne Sullivan
SustainableByDesign

Robin Webb
BIS

Steve Wignall
Crown House Technologies

The 2050 Low Carbon Routemap and Priorities

The Green Construction Board's (GCB) central objective is to identify steps which can be taken to deliver the ambition of a 50% reduction in greenhouse gas emissions by 2025.

To inform its approach, the Board draws extensively on the ***2050 Low Carbon Construction Routemap***. As well as providing the a visual tool to help stakeholders understand the policies, action and key decision points to meet the ambition, the Routemap drew the following conclusions:

1. Meeting the (2050) 80% carbon reduction target is challenging, but technically possible
2. There are strong opportunities to drive carbon reduction and promote ownership of carbon in specific sectors
3. There are key issues that need to be monitored and addressed across the building sector to enable carbon reduction to be realised
4. Capital carbon must start to be addressed in tandem with operational carbon
5. The drive to 80% carbon reduction represents an economic opportunity.

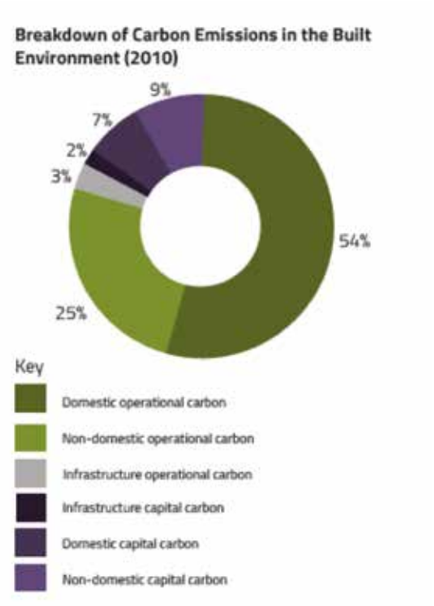
Building from the Routemap, the GCB has identified the following priority areas for action:

- Infrastructure
- Retail and lighting
- The public sector
- Existing commercial buildings
- Solid wall insulation in the domestic sector.

And the following cross-cutting issues:

- Skills
- Measurement and reporting
- Demonstrating the business case
- Supply chain, including small and medium sized business engagement.

Reducing Carbon Reduces Cost

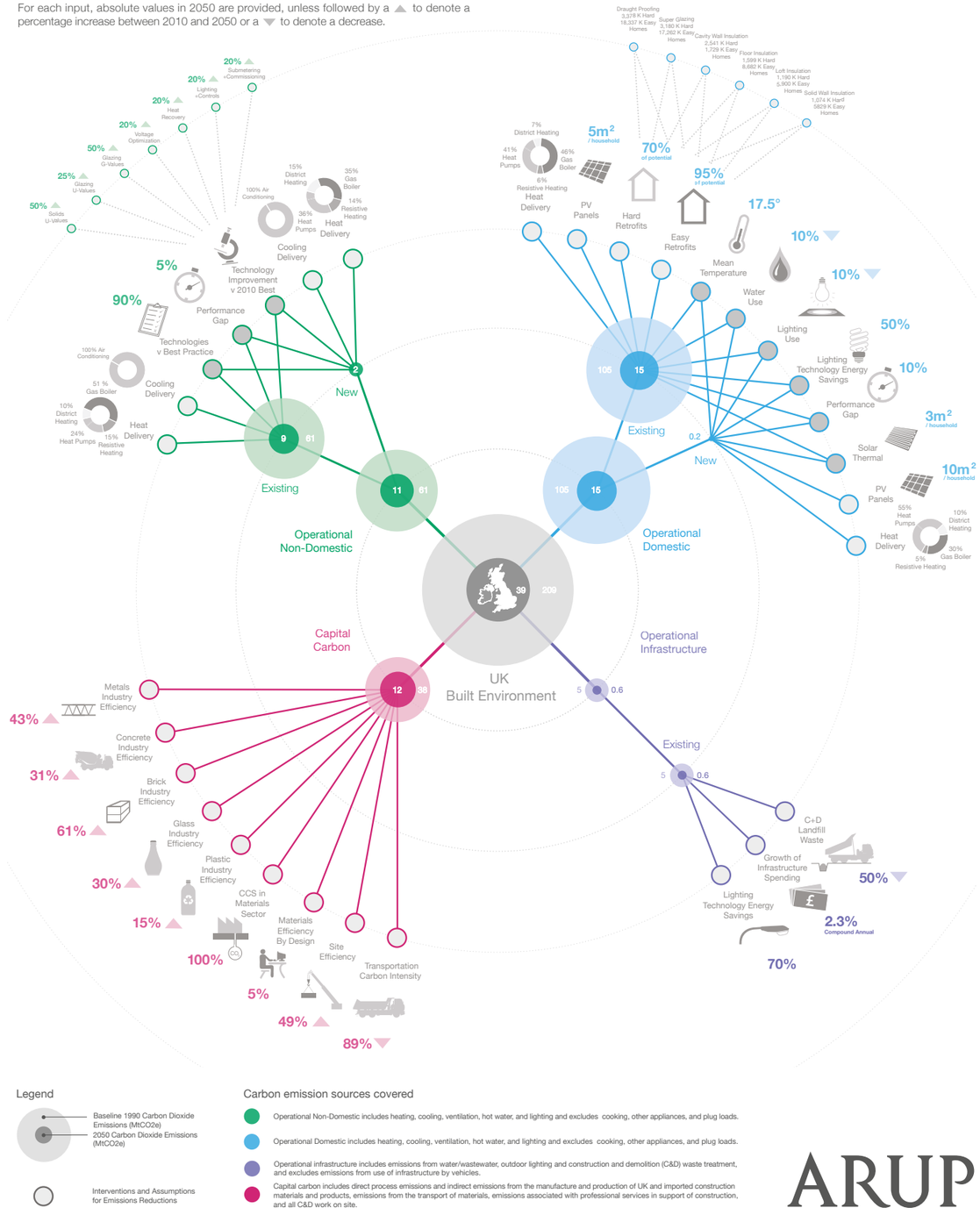


Carbon Emissions in the UK Built Environment

Achieving 80% Reduction by 2050

This infographic is based on the Green Construction Board's Low Carbon Routemap for the Built Environment, for which Arup and the Climate Centre provided technical support. The carbon emission sources included in the analysis and their values are based on the Routemap. For more information visit www.greenconstructionboard.org.

For each input, absolute values in 2050 are provided, unless followed by a ▲ to denote a percentage increase between 2010 and 2050 or a ▼ to denote a decrease.



Legend

- Baseline 1990 Carbon Dioxide Emissions (MtCO2e)
- 2050 Carbon Dioxide Emissions (MtCO2e)
- Interventions and Assumptions for Emissions Reductions

Carbon emission sources covered

- Operational Non-Domestic includes heating, cooling, ventilation, hot water, and lighting and excludes cooking, other appliances, and plug loads.
- Operational Domestic includes heating, cooling, ventilation, hot water, and lighting and excludes cooking, other appliances, and plug loads.
- Operational infrastructure includes emissions from water/wastewater, outdoor lighting and construction and demolition (C&D) waste treatment, and excludes emissions from use of infrastructure by vehicles.
- Capital carbon includes direct process emissions and indirect emissions from the manufacture and production of UK and imported construction materials and products, emissions from the transport of materials, emissions associated with professional services in support of construction, and all C&D work on site.

ARUP

Infrastructure Carbon Review

The ***Infrastructure Carbon Review*** (ICR) is a key initiative launched by the Green Construction Board in November 2013 to demonstrate and encourage industry to embrace the link between lower carbon and lower cost across the supply chain.

The ICR highlighted three key actions to incentivise and release the value offered by carbon reduction
- strong leadership to drive cultural engagement with the low carbon agenda;
- innovation to identify and implement new thinking and;
- procurement that incentivises the whole value chain to collaborate and outperform client targets.

"We agree that where it can reduce costs to the taxpayer and consumer, Government and industry clients should work together to incorporate carbon reduction objectives within their infrastructure projects and programmes by 2016"
Infrastructure Carbon Review

Since its launch, the ICR has been endorsed by a range of organisations responsible for delivering many of the UK's largest infrastructure capital projects, including government, clients, major contractors, consultants and professional services firms.

This rolling strategy is aimed principally at infrastructure leaders with the power to implement real change in their own organisations as well as influence change in their wider value chains.

The evidence from the ICR is clear: client organisations need to take the lead in demanding carbon reductions from their supply chain and, in return, be responsive to the opportunities they offer.

The ICR indicates that such an approach could save as much as 24M tonnes of carbon by 2050 and deliver a net benefit to the UK economy of up to £1.46bn a year.

Going forward, we are now working towards securing further signatories, many of whom will be responsible for some of the country's largest infrastructure projects and their supply chains.

Currently 48 signatories have pledged to pursue lower carbon solutions that also cost less and, through a series of defined actions and activities around leadership, innovation and procurement, have committed to "releasing the value of lower carbon".

In addition, we will also focus on challenging individual supply chains - getting them to integrate sustainability into strategies to widen and deepen the spread.

While many companies have already embarked on a low carbon journey, some have only been considering it.

This initiative galvanises them into making a step-change from considering it, discussing it internally, or doing it randomly, to delivering low carbon by formalising their approach and delivering actions to achieve it.

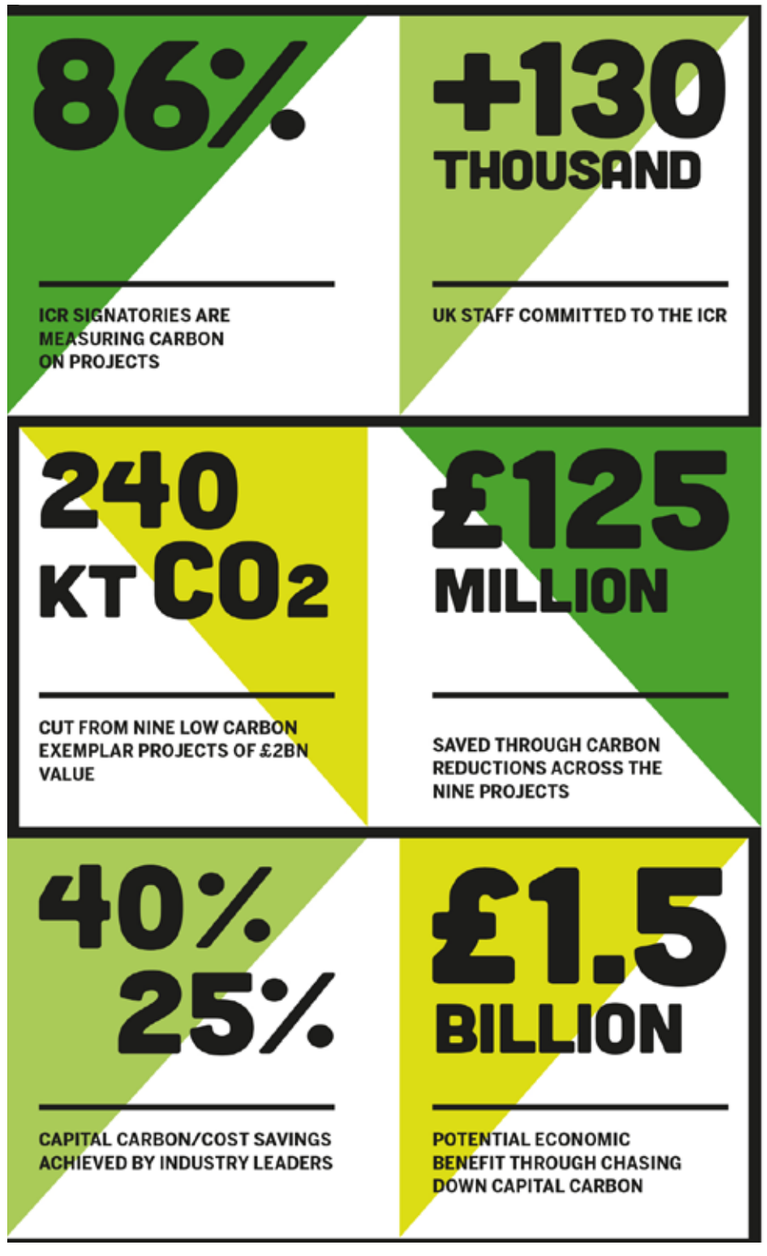
It prompts them to get on and identify their carbon hotspots; and helps achieve efficiencies and cost savings as they set priorities for carbon reduction.

A number of companies have carbon reduction as one of their key performance metrics.

By doing this, some industry leaders have reported reductions in capital carbon emissions of up to 40% and associated reductions in Capex of 22% since 2010.

The *Infrastructure Carbon Review* has now been embraced by 48 signatories from across the UK construction supply chain.

BIS • HM Treasury • Infrastructure Working Group • Government Chief Construction Adviser • @ One Alliance • Anglian Water • Arup • Atkins • Balfour Beatty • BAM Nuttall • Barhale • Barhale Trant Utilities • British Precast • Carillion • Cemex (UK) • Costain • Crossrail • David Ball Group • Defence Infrastructure Organisation • EDF (New Nuclear) • Galliford Try • UK Green Building Council • Grontmij • Heathrow • Highways Agency • HS2 • Institution of Civil Engineers • Invennt • J N Bentley • Kier Infrastructure • Lafarge Tarmac • Laing O'Rourke • London Underground and London Rail • Mott MacDonald • Murphy Group • National Grid • Network Rail • NG Bailey • Saint-Gobain PAM UK • Skanska • Temple Group • Thames Tideway Tunnel • Thames Water • The Clancy Group • Tony Gee and Partners • UK Power Networks • Vinci Construction UK • WSP UK



Forward look

Carbon Measurement and Management in Economic infrastructure British Standard Publicly Available Specification (PAS).

To support the ICR ambition, we will also focus this year on developing a new British Standard PAS, Carbon Measurement and Management in Economic Infrastructure.

Until now this has been lacking; and the aim is to provide clear guidance on the measurement and management of carbon for practitioners – to facilitate consistency across sectors and through the value chain, improve infrastructure performance and help design for a sustainable future.

Further information on the principles and objectives of the PAS can be found at www.greenconstructionboard.org

We have focussed on discussing and scoping 'how to' guidance to measure and manage carbon from concept to on-site build in economic infrastructure in line with BSI guidance.

The scope of the new standard mirrors that of the ICR and will encompass:

- UK economic infrastructure (Communications, Energy, Transport, Waste, Water).

- Whole life carbon (including Capital, Operational and End-user Carbon).

- Carbon that is under the control of UK economic infrastructure.

The aim is to have an Infrastructure Carbon PAS in place by the end of 2015.

Buildings

The *Low Carbon Construction Action Plan* contained a large number of commitments relating to buildings. Our work on this subject has therefore focused on where we can add value to the very many actions already in train.

Two immediate priorities emerged:

1. The potential for an **existing homes/buildings hub** to mirror the existing Zero Carbon Hub

2. The so-called **performance gap**: the gap between design performance and performance in use.

Reducing Carbon Reduces Cost

Existing Homes/Buildings Hub
The purpose of this project was to explore the case for creating a 'hub' to assist in the delivery of the zero carbon target for new homes, for the existing housing stock.

The key challenge here is, perhaps, not the absence of activity but the amount and diversity of it. We therefore looked at how a "hub" might add value to existing organisations and activities. The report has been used to inform DECC's work in this area.

The Performance Gap
We focused on the issue of communicating and seeking to help close the so-called performance gap – whereby buildings typically use significantly more energy in use (sometimes 2-3 times) than was expected or predicted at the design stage.

We looked at the key causes of that gap. A report and communications graphics were produced and disseminated at key industry events and were subsequently presented to the DECC convened Retail Energy Efficiency Taskforce to help inform their work going forward.

In addition, communication of the performance gap has been picked up through our knowledge and skills work, and is now part of key citb training material (see Knowledge and Skills section).

Understanding the performance gap is a key reason for considering how to tackle the question of getting bigger and better data.

Closing the Performance Gap – infographic demonstrating the extent of the performance gap.

Forward look

Building Better Data

A key priority over the next 6-12 months will be a project called Building Better Data.

Sweett Group, the National Energy Foundation, Verco and University College London were commissioned to carry out a scoping study of options for driving 'bigger better data' on operational energy use in non-domestic buildings in the UK.

While energy used in non-domestic buildings accounts for close to 20% of the UK's carbon emissions, with several key policy drivers intended to reduce these emissions, there is no standard protocol for the measurement and reporting of operational energy consumption.

There is a widely held view that unless we can better measure it, we won't effectively begin to manage our operational energy use, and cut waste that is expensive in both monetary and carbon terms.

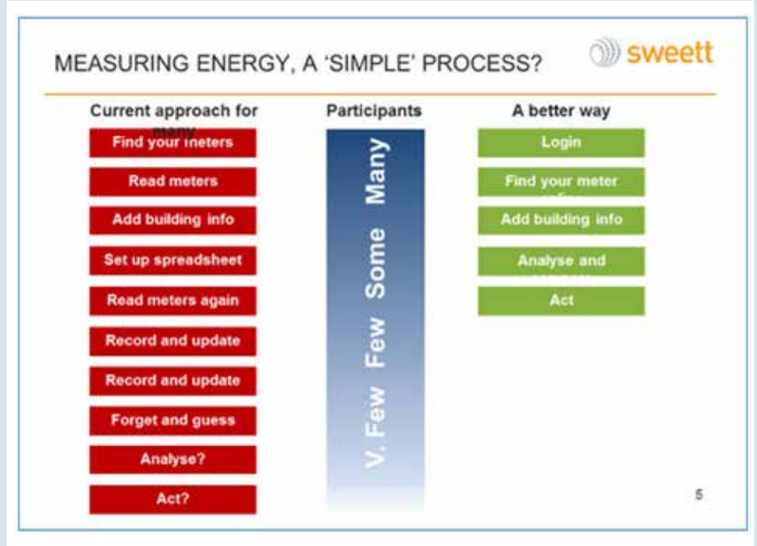
What more might be done to unlock demand, to improve affordability and increase the attractiveness of Solid Wall Insulation as a solution?

According to the Committee on Climate Change, 3 million solid wall homes require treatment by 2020 if we are to remain on track to meet our Climate Change Act commitments.

As well as making a significant contribution to carbon reduction, this also represents a significant business opportunity.

Through the Government's Chief Construction Adviser, Peter Hansford, we will be undertaking an informal review of the opportunities and challenges reaching this target might create. It will broadly tackle the following questions:

- Cost reduction and innovation
- Skills and standards
- Potential
- Market.



Building - Retail and Lighting

The ***Switch the Lights Campaign*** is an initiative to help smaller retailers understand and grasp the opportunities and benefits of switching to energy-efficient, low carbon lighting, such as LED.

It seeks to provide tools and information to parts of the industry where there may be insufficient awareness and/or resources available to engage in energy management, or where expertise or financial capital are not readily available.

Retail is the second highest energy consuming industry in the UK, with a total cost of energy to retail of £3.2bn in 2013.

This is part of a wider initiative from Government to accelerate energy efficiency within the retail industry. It supports activity including work being taken forward annually by the British Retail Consortium, BCSC (British Council of Shopping Centres) and others; and by the DECC Retail Energy Efficiency Task Force in 2014.

Lighting accounts for 43% of electricity use in retail. Information gathered from large retailers highlights that fitting energy-efficient lighting such as LED can deliver a 40-45% energy saving.

The Low Carbon Construction Routemap indicates that if LED lighting were to be fitted across the retail estate this would generate significant CO2/cost savings. While many bigger retailers are convinced of the arguments and benefits for switching, smaller retailers – without the same resources – remain hard-to-reach and difficult to convince of the benefits and ease of changing.

Marks & Spencer's largest and most carbon efficient store to date opened in August 2012 at Cheshire Oaks between Chester and Liverpool (right and below). The operational energy is predicted to be 30% lower and carbon 35% lower than a peer store, achieved using low carbon measures.

The Switch the Lights Campaign is an initiative to help the wider retail industry to identify the opportunities and benefits of switching to energy-efficient, low carbon lighting.

Forward look

Switch the Lights Campaign 2015

Principal activities and outcomes planned for 2015 include:

- Campaign documents including lighting case studies, reports, tool kit, Lighting Industry Association generic LED information and other reference material will be included on the British Retail Consortium's energy management hub (launch in spring 2015).
- As part of the GCB's Three Years On Ecobuild event, the 'Switch the Lights' campaign will demonstrate the retail experience with LED with a 'Switch the Lights' theatre in the lighting section and a number of seminars to support the theme, with the lighting sector.
- The BCSC, in partnership with BRC and supported by major project retailers and the LIA, will host a series of workshops at shopping centre locations to share best practice with occupiers and small and medium sized businesses. These included an event at Birmingham Bullring in February and at the Manchester Trafford Centre in April.
- The Grocer magazine is supporting the campaign with a year-long series of articles aimed at encouraging all retailers away from current standard lighting to LED or better, by end of 2020.

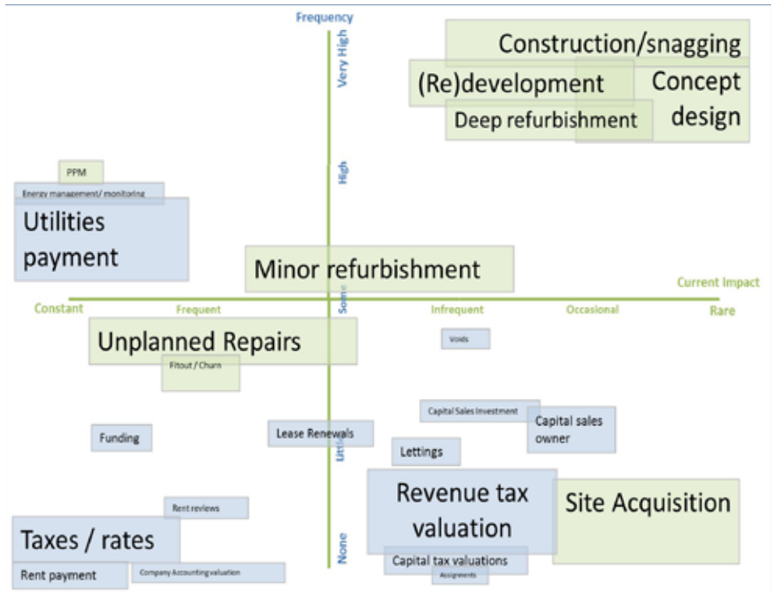
Valuation and Demand

A series of research projects have been produced that review the effectiveness of existing policy in the domestic and non domestic sectors, including the proposed minimum energy performance standards.

Work has also been undertaken to examine in detail events within the property life cycle, their significance in terms of carbon and the key motivating factors driving the behaviour of participants at each point within that cycle. This provides important intelligence for policy makers regarding where to focus policy instruments to achieve the most effective outcomes.

We commissioned three research projects in Spring 2013 and jointly commissioned a fourth.

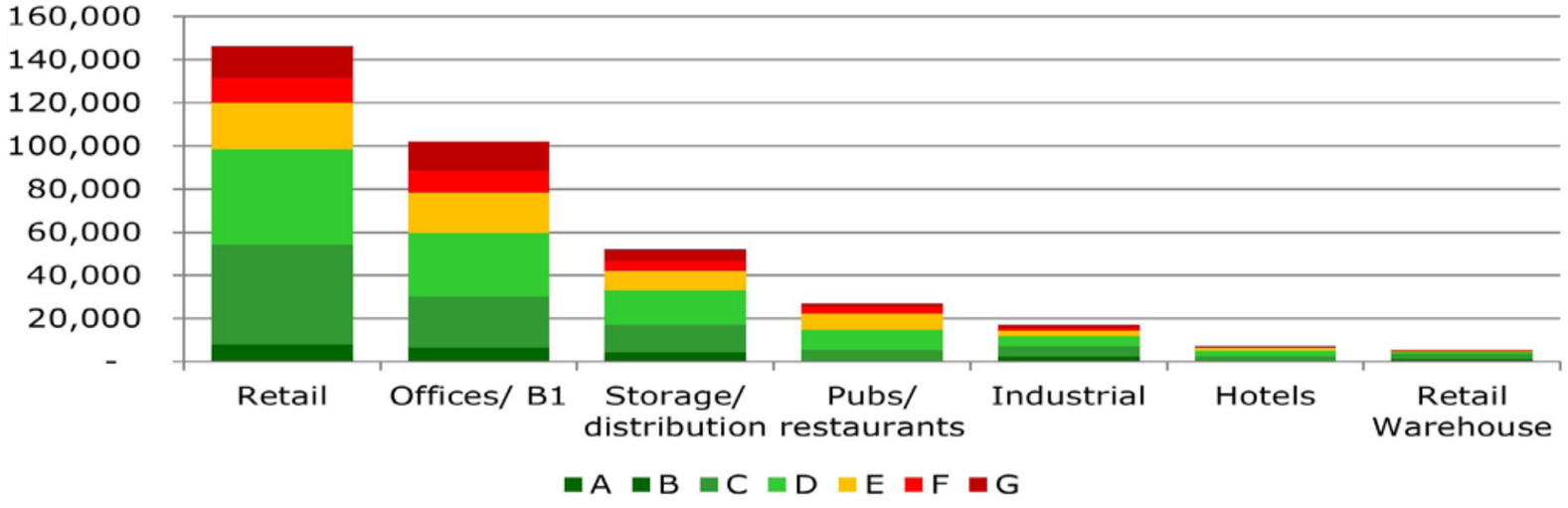
- **Mapping the real estate lifecycle for effective policy interventions**
- **Energy efficiency policies in the domestic real estate sector**
- **Mapping the impacts of minimum energy efficiency standards for commercial real estate**
- **Carbon penalties and incentives.** This work is 50% funded by the GCB in collaboration with Deloitte LLP and the Green Property Alliance.



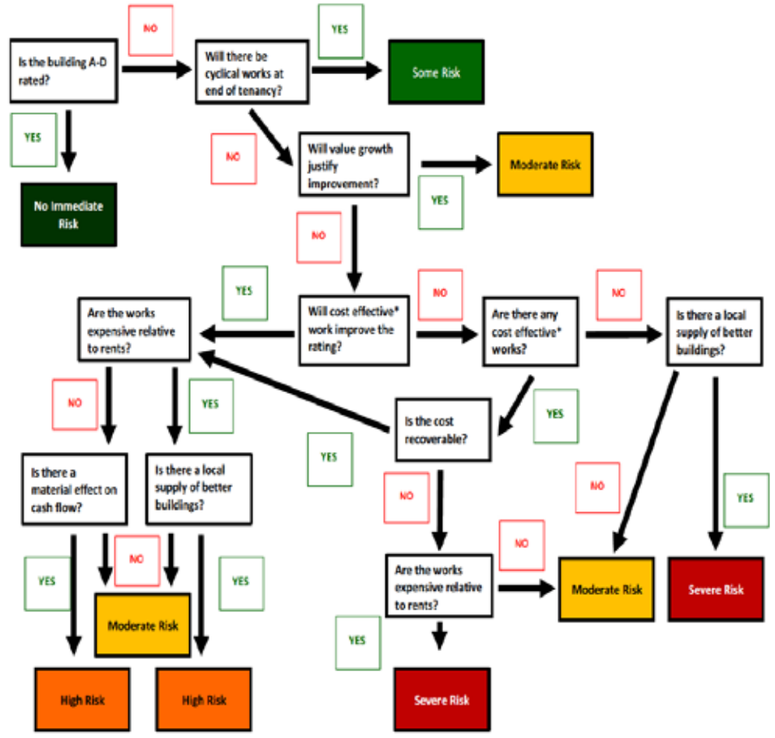
The work focused on the real estate lifecycle identified activities within the lifecycle of an asset – rare or regularly recurring – and their current impact on carbon. This provides a unique insight into where policy might focus for impact. The figure above shows a key output of the work, a map of the events occurring within the lifecycle of a property cross referencing frequency with carbon impact.

The research outputs have reached a wide audience and been well received. Engagement through launch events, government Construction Summit, industry press and workshops have reached a wide audience in both industry and Government.

Over 300 people have been directly engaged with this work through the development of the research and its launch and dissemination. Indirect contact through media and online coverage will far exceed this.



Number and grade of EPCs by sector



Minimum Energy Performance Standards (MEPS).

Decision tree for categorising the value risks presented by MEPS to different property types

The MEPS research provided significant intelligence to the market including for example the number and grade of Energy Performance Certificates (EPCs) by sector (see bar chart below).

It also demonstrated that for the majority of commercial building types, upgrading to achieve an EPC grade D is more cost effective in terms of energy savings and investment than a decision to upgrade to an EPC grade E.

The key point is that MEPS is entirely manageable and will drive investment and innovation if there is a clear undertaking that it will be implemented and an accompanying time line. Lack of certainty brings additional risk that hinders both prudent investment and good asset management.

In the downloadable report each box has an accompanying data set and commentary.

Forward look

Understanding how we can most effectively stimulate demand and generate value is essential if we are to make real progress towards our 2025 ambition.

The focus is to develop a better understanding of how policy and regulation can use existing market mechanisms to leverage demand for more carbon efficient property.

Over the next 12 months we will concentrate on:

- Developing an education and training package to ensure policy makers across departments have a clearer understanding of property investment, asset management and valuation processes. The objective here is to enable them to develop policy that works with the market in a timely and efficient way to create more optimised carbon outcomes whilst supporting investment in innovation.

- Reinforcing the dialogue between industry and policy makers on carbon policy in particular in relation to existing commercial buildings. Existing industry organisations such as the Better Buildings Partnership and Investment Property Forum will be used to establish a regular flow of communication and constructive discussion with a range of policy makers and departments.

Reducing Carbon Reduces Cost

Greening the Industry

If we are to achieve the ambition of 2025, it is essential that the construction industry demonstrates strong performance in terms of its products and performance on site.

Building from the 2008 *Strategy for Sustainable Construction*, the premise of our work stream is that carbon emissions are a function of wasteful and inefficient practices.

This has resulted in an array of projects and initiatives looking at waste and resource efficiency, water use management, “on site” carbon emissions and improving the understanding of embodied carbon.

We have developed a range of measurement methodologies and data sources. For waste, water and carbon we have five years of performance data measured against 2008. The methodology for measuring construction, demolition and excavation waste to landfill in Britain is supported by Defra as part of its annual submission to the EU under the Waste Framework Directive.

Alongside that, key outputs have included:

• The short and punchy “Top 20 Tips”
• A guide to understanding embodied impacts.

The Built Environment Commitment

The Built Environment Commitment provides an easy and practical framework for organisations involved in the built environment to share and showcase their plans to lower carbon and improve resource efficiency in their everyday activities.

The benefits for companies and organisations are:

• Bring together your existing commitments and actions
• Demonstrate leadership and become a champion of change
• Provide a mandate for action
• Communicate your environmental commitment
• Increase your corporate profile.

You can position your business as an exemplar organisation and send a clear message that your business is a champion for change.

Visit the GCB website to make your commitment.

Forward look

Commitments
Promotion to industry groups to publicly commit to actions they will take to contribute to delivering the low carbon, resource efficient built environment. Capturing the good initiatives going on within the industry.

Measurement and Performance
Building on the achievements especially measurement of performance, learning and recommendations from the work on water, waste and carbon on construction sites. Ensuring that mechanisms are available for companies to report their annual performance in these areas.

Materials and Embodied Carbon
Help to provide a better understanding of how to use the embodied impact information, including embodied carbon, generated by manufacturers in an Environmental Product Declaration (EPD) produced in line with European standards (BS EN 15804 and BS EN 15978). Guidance will be produced to facilitate this as well as how this can be used within BIM.

Waste and Resources
Between 2008-12, the construction industry paid an estimated £1bn in landfill tax. Efforts will continue to promote more efficient use of resources, in particular by:

• Understanding why construction waste persists and the carbon implications
• Examining the business opportunities and benefits of implementing circular economy principles in construction
• Lesson learning from a review of the Material Sector Resource Efficiency Action Plan programme.

Water
Water must also be considered as a finite resource. Parts of the UK are now considered under significant water stress. Can we gain a better understanding of this risk? The provision of mains water has carbon implications and industry needs a way of assessing how to decrease this carbon.

Reducing Carbon Reduces Cost

Action Plans

Knowledge and Skills

One of our key aims is to embed green knowledge across construction learning.

In taking this forward we have devised new content relating to the 'performance gap' for the GE700 Construction Site Safety publication. Published by citb, the publication brings together current health, safety and environment issues in one place and is a key document for site and project managers, and Site Management Safety Training Scheme (SMSTS) candidates. The inclusion of the performance gap will help raise this issue to a wider audience and influence practice.

We have had early engagement with the apprenticeship 'Trailblazer' work – the new approach to skills following The Future of Apprenticeships in England Review. New apprenticeship standards are under development as part of the programme, and the group has engaged to influence their development to promote energy efficiency and sustainability.

We have helped to develop a bank of energy awareness questions to sit within citb's Health, Safety and Environment (HS&E) test. The HS&E Test helps to raise standards across the industry and ensures workers have a minimum level of health, safety and environmental awareness before going on site.

It is a mandatory requirement for various industry competency card schemes and has a wide reach, taken by approximately 500,000 operatives each year. The addition of energy to the question bank should raise energy efficiency awareness to a broad range of skilled and un-skilled workers, supervisors as well as managers and professionals.

We have supported the development and progress of the 'supply chain sustainability school' which is providing support to thousands of organisations, particularly small and medium sized businesses and specialist contractors, to understand the risks and opportunities associated with a more resource efficient, low carbon construction sector.

Being clear about what is considered competent and setting minimum standards is an important step in encouraging the development of necessary knowledge and skills. The UK Contractors Group members, who account for about a third of construction output in the UK, have agreed an Environmental Training Standard which will take effect from March 2015.

The standard sets a minimum requirement of environmental knowledge for those working on UKCG member sites, and builds on the successful Site Environmental Aware Training Scheme (SEATS) which has been developed by UKCG members and supported by citb.

Reducing Carbon Reduces Cost

Forward look

The knowledge and skills gap across all roles within the industry presents the biggest single barrier to achieving Construction 2025's 50% carbon reduction ambition.

Our overarching objective therefore is to continue to work with others to ensure we have a workforce that is capable and able to meet the current and future challenges facing our sector, and particularly the knowledge and skills required to meet the carbon reduction target set out within the industrial strategy.

Over the next 12 months we will:

- **Engage** with the skills Trailblazer work – the new approach to skills following the The Future of Apprenticeships in England Review, where employers will directly set future standards for apprenticeships and vocational qualifications.
- **Identify** further opportunities to embed low carbon and low energy knowledge in learning materials.
- **Influence** graduate programmes by engaging with professional institutions, Higher and Further Education.
- **Make clear recommendations** on the level of attainment necessary at all levels on the skills required to derive knowledge and benchmarks from performance data. The Board's *Bigger, Better, Operational Data* programme identifies the need for consistency in the collection and type of building performance data but there is acknowledgement that in-depth data is not currently useable by the majority due to skills limitations.
- **Influence** learning materials in schools and enhance the understanding and image of construction for those beginning their careers.

Promotion

Promoting the strong business case for green construction and sharing best practice is essential if we are to reach the ambition of Construction 2025. The key message that we want to get across in all our promotional activity is that ***Reducing Carbon Reduces Cost.***

Particular focus has been on the encouragement and sharing of best practice in sustainable construction and promoting the expertise of UK construction overseas.

We use a range of platforms and media including live events, case studies hosted on the GCB web site, awards ceremonies and presentation sessions at Ecobuild. We work closely with UK Trade and Industry – UKTI, on overseas promotion.

Some examples of Promotional activity that we have been engaged on includes:

- **The British Construction Industry Awards (BCIA) including the Prime Minister's Better Building award.** In 2014 the award was won by the Medmerry flood defence project in Sussex. We also provide support to the BCIA Sustainability Award won by the Bridge, Glasgow in 2014.
- **The Infrastructure Carbon Review (ICR) One Year On Conference.** The event attracted around 150 delegates. Construction Minister Nick Boles delivered the keynote speech and a further five companies signed up to the ICR commitment.

Engaging with small and medium sized businesses (SMEs)
An important element of our promotional work revolves around engagement with SMEs which represent more than 90% of the construction industry. They are critical for delivery of a low carbon economy to enable Britain to be at the forefront of global construction.

Over the last 3 years the GCB has been collaborating with industry to better understand and overcome the barriers that SMEs face and to support them so that they can capitalise on the business case opportunities that exist.

Responding to the challenges confronting SMEs, the GCB has hosted a number of events such as the one at Nottingham University's Creative Homes Project, and has also been supporting other organisations to effectively share and demonstrate examples of the benefits to SMEs from acting on carbon, and the rewards available.

At the Nottingham event the emphasis of the day was on the business case for sustainable housing and highlighted ongoing industry work to unlock potential from the supply chain and key lessons learned.

Examples of support that we are providing to other organisations include:

At Ecobuild 2015. The GCB will support a variety of campaigns, such as the Zero Carbon, citb; Know How small builders' campaign, closing the Performance Gap CPD training programme and new research into the cost of building zero carbon homes from a SME perspective.

The Government recognises meeting the zero carbon homes standard continues to be a major challenge to small house builders and they must be supported.

Over the last 25 years, the number of SMEs contributing to the construction of Britain's new housing stock has plummeted and the economic downturn in 2008 reduced delivery even further.

We are also endeavouring to promote the good work that others are doing in supporting and driving the sustainability agenda. Examples include:

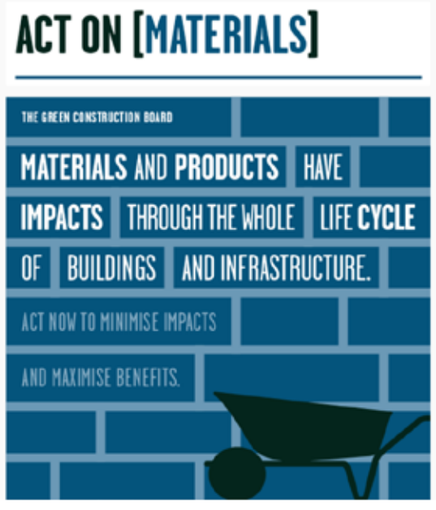
Building Research Establishment (BRE) is working with Letchworth Heritage Foundation to pilot a local champion's model for developing local supply chains around green energy efficient refurbishment.
The BRE Academy has also developed a new Level 3 Certificate with City & Guilds that up-skills construction site workers and managers on sustainable site practice.

The Site Sustainability Manager (SSM) course provides skills, experience and knowledge, offering a key mechanism for helping to close the gap between design and in-operation performance. Approximately 50% of the delegates places allocated to date have been taken up by SMEs.

Retrofit Coordinator training
In Stoke a local electrician is qualifying as a Retrofit Coordinator through the Centre of Refurbishment Excellence (CoRE) and diversifying into renewable energy.

The Hive Library in Worcester won the inaugural GCB-backed Sustainability Award at the 2013 British Construction Industry Awards

SME engagement: Energy Efficient Breakfast at Nottingham Creative Energy Homes Project



The Green Construction Board's top tips are available for all stakeholders to use along with further materials developed to engage SMEs in the business case benefits of sustainability.

Forward look

Developing skills at all levels through behaviour change, education and training is essential for SMEs to be more competitive and sustainable – to deliver this transformational change requires significant improvements of how the benefits are communicated and resourced throughout the supply chain.

Over the next year we will target and support on-going initiatives to improve SME access to information. GCB and other activities will be utilised to help SMEs access the business opportunities the green economy others.

Other activities that we will be helping to support include CoRe, BRE, National Energy Foundation, The Carbon Trust, Energy Saving Trust, Institute for Sustainability and the Zero Carbon Hub.

The strong business case for green construction, global promotion and in particular the capability that exists within the UK construction industry will continue to be a key priority going forward. We will work with UKTI in this regard.

We would be delighted to hear from organisations (large, medium and small) who have green, expertise, product, service or a project that they believe worthy of promoting overseas.

Key Green Construction Board Reports and Outputs

Strategic

Construction 2025 - The Industrial Strategy for Construction

Green Construction Board members ensured that sustainable and low carbon construction was central to the industrial strategy for construction. The GCB leads the low carbon workstream.

www.gov.uk/government/uploads/system/uploads/attachment_data/file/210099/bis-13-955-construction-2025-industrial-strategy.pdf

"The transition to a low carbon economy presents the UK Construction industry with terrific opportunities for growth"

The 2050 Low Carbon Construction Routemap for the Built Environment

A visual tool to understand the policies, actions and key decision points required to achieve 80% reduction in greenhouse gas emissions in the built environment by 2050 (vs 1990 levels). Supported by a modelling tool, report and infographic.

www.greenconstructionboard.org/index.php/resources/routemap

"Having a clear Routemap is critical to provide the framework and enable progress to be communicated"

GCB Priorities - Future Focus

A summary of priority work streams for the Green Construction Board agreed with the Construction Leadership Council in full. Work includes building on the Infrastructure Carbon Review and developing plans in other markets to achieve cash savings and economic benefit.

www.greenconstructionboard.org/index.php/resources/

Built Environment Commitment

A practical framework of action to lower carbon and improve resource efficiency in everyday activities. Allowing businesses and sector bodies to plan their own journey of improvement, contributing to a more low carbon, resource efficient built environment.

www.wrap.org.uk/content/built-environment-commitment-sign?utm_source=wrap&utm_medium=email-footer&utm_campaign=construction-email-footer

"Committing to take action that contributes to a lower carbon, resource efficient built environment"

Top Tips for Green Construction

Concise fact sheets to help green our industry - 20 steps covering, carbon, water, materials, waste and biodiversity.

www.greenconstructionboard.org/index.php/resources/top-tips

"Act on water, waste, carbon, materials and biodiversity"

The Low Carbon Construction Action Plan

Government response to the recommendations of the low carbon construction innovation & growth team (IGT), in their final report (URN 10/1266). Sets out a joint industry and government action plan to deliver low carbon construction.

www.gov.uk/government/publications/low-carbon-construction-innovation-growth-team-report-on-low-carbon-construction-government-response

Action Tracker

Fulfilled the Green Construction Board's commitment to monitor the implementation of the joint Government / Industry 'Action Plan' contained in the Government Response to the Low Carbon Construction Innovation and Growth Team Report. Recorded actions against 8 key themes.

www.greenconstructionboard.org/index.php/resources/action-tracker

Key Green Construction Board Reports and Outputs

Infrastructure

Fundamental Truths of Low Carbon Construction

A tool developed to provide an interactive diagram linked to a series of sustainability case studies. It aims to share experience gained in developing and delivering low carbon designs with enhanced business case benefits. It sets out a series of concepts and enablers related to key stakeholders.
www.greenconstructionboard.org/index.php/resources/fundamental-truths

"To share experience gained in developing and delivering low carbon designs"

Infrastructure Carbon Review

A joint initiative launched in conjunction with industry leaders, HM Treasury and BIS. It sets out a series of actions for government, clients and suppliers that have the potential to reduce up to 24 million tonnes of carbon from the construction and operation of the UK's infrastructure assets by 2050. At the same time delivering a net benefit to the UK economy of up to £1.46 billion per year.
www.greenconstructionboard.org/index.php/resources/infrastructure-carbon-review

"Reducing Carbon, Reduces Cost"

Infrastructure Carbon Review - Statement of Endorsement

As of March 2015, 48 organisations delivering many of the UK's largest infrastructure projects have endorsed the ICR. They have pledged to work together to implement, monitor and review progress against these objectives.
www.greenconstructionboard.org/index.php/resources/infrastructure-carbon-review/statement-of-endorsement

Infrastructure Carbon Review - Workshops

Through 2014, a number of presentations were made to a range of stakeholders and sector bodies raising awareness and encouraging organisations to endorse the review.
www.greenconstructionboard.org/images/resources/ICR%20Presentation%20Pack.pdf

"The greatest benefit comes from joining up the value chain, with the client taking the lead in defining clear 'low carbon' targets"

Crunching Carbon, Cutting Costs - Masterclasses

Under the banner of the GCB, Mott MacDonald organised two carbon masterclasses in August 2014 aimed at influencers, decision-makers and practitioners in all parts of the infrastructure industry.
The first masterclass focused on leadership and skills and a second on measurement, management and reduction.

Infrastructure Carbon Review - One Year On Conference and Report

One Year On Report was launched at a conference held in November 2014 to review progress against commitments, celebrate its success, raise awareness and encourage other organisations to commit. The conference attracted around 150 people and generated great enthusiasm for the commitment in reducing carbon, also sharing a series of exemplar case studies from signatories.
www.greenconstructionboard.org/images/resources/ICR_v6_pdf_web.pdf

"Engaging with the carbon reduction agenda will force changes in your organisation and supply chain that will sharpen your competitive edge"

Infrastructure Carbon Review - One Year On Summary

Snapshot and key statistics on achievements.
www.greenconstructionboard.org/images/resources/Mott_MacDonald_leaflet_web.pdf

Key Green Construction Board Reports and Outputs

Buildings

Energy Performance Gap

This report and supporting documentation looks at the cause of the Performance Gap between initial calculations carried out in the design of a building (non-domestic) compared to the actual energy used and how this gap may be closed.

www.greenconstructionboard.org/index.php/resources/performance-gap

"The solution to bridging the performance gap lies in closing the 'feedback loop'. This can be done in two important ways – feedback to briefing and feedback to operation"

Exploring the Case for an Existing Buildings' Hub

A report exploring the case for creating a 'hub', for existing housing stock, which is similar to the Zero Carbon Hub for new homes. Now part of the wider Department of Energy & Climate Change evidence base.

www.greenconstructionboard.org/images/stories/pdfs/performance-gap/Scoping%20study%20for%20low%20carbon%20existing%20buildings%20support%20mechanism.pdf

"Scoping study to analyse the need for a coordination and delivery support mechanism to remove outstanding barriers to the delivery of low carbon solutions in the refurbishment sector and to develop a suitable approach to implementation"

Retail and Lighting, Switch the Lights Campaign

A current initiative to help smaller retailers to understand and grasp the opportunities and benefits of switching to energy-efficient, low carbon lighting, such as LED. It seeks to provide the tools and information to parts of the industry where there may be insufficient awareness and/or resources to engage in energy management, or where expertise or financial capital are not readily available.

www.bcsc.org.uk/Article/2451/Switch-the-Lights-Workshop-Birmingham

"The fitting of energy-efficient lighting such as LED can deliver a 40-45% energy saving"

Valuation and Demand

Valuation and Demand - Reports

A number of reports looking at the policy framework and its impact on demand for more sustainable buildings.

"Together these reports provide significant insight into the drivers behind the demand for low carbon, energy efficient real estate"

Energy Efficiency - Commercial Real Estate

This report maps the impacts of minimum energy efficiency standards for commercial real estate.

www.greenconstructionboard.org/images/stories/Valuation_and_Demand/GCB%20630%20final%20report.pdf

"Compliance with the new regulations will be affordable for most property types and, in many circumstances, the existing value of F and G rated buildings will be largely unaffected"

Energy Efficiency - Domestic Real Estate

A report on energy efficiency policies in the domestic real estate sector, together with interactive toolkit.

www.greenconstructionboard.org/images/stories/Valuation_and_Demand/GCB620%20Summary%20Report.pdf

"It is hoped that the COMPASS toolkit will be used by policy-makers on the national scale, but also by other relevant stakeholders, to guide the design and implementation of effective policy on domestic energy efficiency"

Real Estate Lifecycle

A presentation on mapping the real estate lifecycle for effective policy interventions.

www.greenconstructionboard.org/images/stories/Valuation_and_Demand/GCB610%20Launch%20Slides.pdf

Carbon Penalties and Incentives - Commercial Real Estate

A review of policy effectiveness for carbon reduction and energy efficiency in the commercial buildings sector. (50% funded by the GCB in collaboration with Deloitte LLP and the Green Property Alliance).

www.greenconstructionboard.org/images/stories/Valuation_and_Demand/Carbon%20Penalties%20and%20Incentives%20Main%20Report.pdf

Key Green Construction Board Reports and Outputs

Knowledge and Skills

Support for the Build Up Skills Report

Supported by Sector Skills Councils to understand the current state of the UK workforce - specifically craft and technical workers - and it set out a Roadmap to illustrate skills gaps and barriers to training.
www.buildupskillsuk.org

The Knowledge and Skills Challenge for UK Green Construction

A report on knowledge and skills challenges to deliver sustainable outcomes in the built environment.
www.greenconstructionboard.org/images/stories/Knowledge_and_Skills/Sweett%20Report.pdf

"There is a gap in the knowledge and skills required to meet the government's future Carbon budgets"

Standard Protocols for Data Collection and Knowledge Acquisition

In conjunction with BSRIA, a report on the tools commonly used in the industry to measure performance and the extent to which protocols and common metrics are used to enable output requirements to be set and performance benchmarked.
www.greenconstructionboard.org/images/stories/Knowledge_and_Skills/BSRIA%20Report.pdf

"Measurements can be made, systems tested and processes studied but without agreed protocols and methods the value of the understanding that can be developed is lost to the wider industry"

Knowledge Capture and Dissemination

Report on the current position on sustainability data capture, availability and accessibility in construction and property.
www.greenconstructionboard.org/images/stories/Knowledge_and_Skills/SDF%20Report.pdf

"Most data sets do not complete the journey from data collection through to behaviour change"

Contribution to citb GE700 Construction Site Safety

New content relating to the 'performance gap' for the GE700 Construction Site Safety publication, to raise the issue to a wider audience and influence practice. It is a key document for site and project managers, and Site Management Safety Training Scheme (SMSTS) candidates with over 30,000 units sold each year.
www.ge700.co.uk/

Contribution to the citb Health, Safety and Environment Test

Help to develop a bank of energy awareness questions to sit within CITB's Health, Safety and Environment (HS&E) test.
www.citb.co.uk/cards-testing/health-safety-environment-test/

Greening the Industry

Five Years of Focus On Water - 2008 to 2013

A summary of achievements on progress of the construction industry in reducing the volume of water used on construction sites. Part of a suite of focussed outputs to support this topic.
www.greenconstructionboard.org/index.php/working-groups/greening-the-industry/water

"We have achieved a reduction in water use of 19% in 2012 against the 2008 baseline"

Five Years of Focus On Waste - 2008 to 2013

A summary of the key trends in construction, demolition and excavation waste to landfill in the 5 year period, achievements and recommendations. Part of a suite of focussed outputs to support this topic.
www.greenconstructionboard.org/index.php/working-groups/greening-the-industry/waste

Carbon on Construction Sites

Focus on reducing carbon emissions during the construction phase of the project. A suite of outputs to support this topic.
www.greenconstructionboard.org/index.php/working-groups/greening-the-industry/carbon

Materials

Improving understanding across the construction industry of the embodied impacts of construction products. A suite of focussed outputs to support this topic.
www.greenconstructionboard.org/index.php/working-groups/greening-the-industry/materials

"The quest for a more sustainable and more recently a low carbon built environment, has meant that the demand for information on the impact of construction products has increased dramatically"

Biodiversity

Considerations for conserving and enhancing plants, animals and habitats. A suite of outputs to support this topic.
www.greenconstructionboard.org/index.php/working-groups/greening-the-industry/biodiversity

Key Green Construction Board Reports and Outputs

Promotion

Green Construction Board - One Year On Event and Report

One-Year-On report sets out the progress of the Green Construction Board on a range of issues, highlighting achievements and future priorities.
December 2013

"It is essential that UK construction harnesses its competitive advantage, and makes the most of the genuine opportunities in this growing sector. This is precisely the guiding ethos of the Green Construction Board – to ensure a sustained high level dialogue on the issues that really matter"

Green Construction Board - Two Years On Event and Report

A second anniversary report to outline progress of the Green Construction Board and announce continuation of work for a further 2 years, focusing on a reduction in industry carbon emissions.
www.greenconstructionboard.org/index.php/resources/two-years-on-report

"The global green and sustainable building industry is forecast to grow at an annual rate of nearly 23% between now and 2017 - This represents a tremendous opportunity"

Green Construction Board - Three Years On Event and Report

Seminar and launch of third annual report at Ecobuild 2015. Highlighting achievements and Green Construction Board priorities going forward.
www.greenconstructionboard.org/index.php/resources/three-years-on-report

Case Studies

An expanding suite of case studies to illustrate projects and products that have demonstrated the business case for reducing carbon reduces cost.
www.greenconstructionboard.org/index.php/resources/case-studies

British Construction Industry Awards- Sustainability Award

The Green Construction Board worked closely with the British Construction Industry Awards (BCIA) to develop this annual award to encourage and promote industry best practice across the sustainability agenda. Awards feed into the suite of case studies.
www.bcia.nce.co.uk

Small and Medium Sized Businesses Engagement - Breakfast Seminar

Breakfast event at Marks & Spencer's Cheshire Oaks award winning store. Engaging with SME's to better understand their challenges, whilst raising awareness of the green agenda.

"We are being asked to deliver against specifications that are 20 years out of date"

Small and Medium Sized Businesses Engagement - Breakfast Seminar

A breakfast event held at the Creative Energy Homes Project, Nottingham University, to provide valuable insights into low carbon and energy efficiency issues for housing.
www.greenconstructionboard.org/index.php/2012-09-05-09-17-39/item/2356-energy-efficient-breakfast-seminar-held-at-the-creative-energy-homes-project

"We are not being asked to build these low carbon homes"

Overseas Presentations

On-going programme of events, seminars and presentations, arranged in conjunction with UKTI helping to promote UK Green Construction expertise.

To find out more about the work of the Green Construction Board, please visit:
www.greenconstructionboard.org