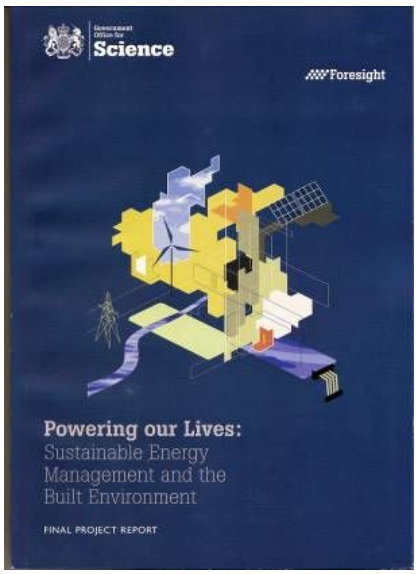
Government Office for Science

Foresight

Foresight Project Sustainable Energy Management and the Built Environment (SEMBE)

One-Year Review

November 2008 to December 2009



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Executive Summary

"Given that our buildings are responsible for almost half of the UK's carbon emissions, we need to be taking action now if we are to succeed in hitting our targets. Today's report provides valuable advice on the roles which both government and the general public can play in tackling one of the most pressing issues facing the entire world."

The Rt Hon Margaret Beckett MP, accepting the Report, 26 November 2008.

The Foresight **Sustainable Energy Management and the Built Environment** (SEMBE) Project (the Project) published its findings as the report **Powering Our Lives: Sustainable Energy Management and the Built Environment** (the Report) on 26 November 2008, the day the Climate Change Act became law. This one-year review (the Review) sets out the Report's impact, in particular, in government and other organisations' policy development and strategic thinking; the work of the research community; and in business. **Importantly, the main body of Review comprises statements from the national and international stakeholders concerned.**

Sponsored by the **Department for Communities and Local Government** (CLG), the SEMBE project analysed how the UK's built environment could evolve to help manage the transition over the next 50 years to secure sustainable low-carbon energy systems that meet the needs of society, the requirements of the economy and the expectations of individuals.

The main forces driving this change were a growing consensus about the scale and importance of climate change, and the need to ensure secure energy supplies for the UK in the face of rising global demand. There is an urgent imperative to reshape policy in order to decarbonise the energy we use and to secure sustainable supplies for the long term. By the time of publication, acceleration of interest in this area had led to many developments, not least the creation of a **Department for Energy and Climate Change** (DECC). Tackling the challenges laid out in the SEMBE report falls within the remit of this department.

The culmination of two years' work, the Project combines a significant scientific evidence base (200 experts and around 60 peer-reviewed State-of-Science papers) with a 50-year forward view in the form of four credible future narratives. The Report has achieved a wide range of impact through government policy development and strategic thinking, and with other stakeholders.

The Project has attracted strong interest from CLG, DECC, and other government departments and stakeholders facing the challenges of the government's target of an 80 per cent cut in carbon emissions by 2050. The Report has enjoyed the continued support of the Minister of State for Housing and Planning and interest of the DECC Secretary of State.

A Plan of Stakeholder Engagement (PSE) was published alongside the Report, and outlined a range of departmental and other stakeholder commitments to engage with the Report's findings. These commitments formed the starting point for Foresight's dedicated Follow-up team. However, by developing and exploiting new opportunities and initiatives, the Report's impact goes significantly beyond the scope of the PSE

In the 12 months since the Report's publication, Foresight has capitalised on strong interest from a broad range of stakeholders by running more than 20 high-level, cross-departmental and cross-sectoral policy workshops, seminars, and presentations for several government departments including DECC, CLG, the **Foreign and Commonwealth Office;** the **Scottish Government;** as well as many of the organisations highlighted below.

The Report's resonance and impact with multiple stakeholders is derived from the combination of a comprehensive evidence base with challenging futures thinking. The Project found that, with 50 per cent of emissions coming from the built environment:

- The UK is "locked in" to a centralised energy infrastructure that hinders other solutions, particularly decentralised options at different scales.
- How people behave in buildings is as important as the design of those buildings.
- There are concerns about standards being implemented, enforced and monitored, and related problems regarding energy efficiency data collection.
- At least 70 per cent of 2050's buildings have already been built, creating a retrofit imperative.
- Area-based pilot schemes are required for testing innovative technologies, commercial models, and policies. For this to work, the public sector will need to overcome fear of failure and negative auditing.

Recognising that these findings emerge from the "co-evolution" of interrelated factors, the Report calls for simultaneous change to behaviour, energy systems and the built environment, and identifies specific areas for urgent government leadership in estate procurement, energy infrastructure regulation, and energy efficiency data collection.

Government

SEMBE's relevance to government departments initially focused on the coincidence between the Project's 50-year futures scenarios and the Climate Change Act's target of 80 per cent decarbonisation by 2050. These scenarios depict four possible 2050 futures in the UK in which society has adapted to new energy systems, behaviours and building practices. The Project does not downplay or dismiss the risks of climate change. However, it does anticipate some of the key findings of DECC's **Big Energy Shift**, which show that people prefer a positive message over dystopian visions that threaten to create a vicious cycle of fear and helplessness.

The Project achieved impact among government departments, mainly through high-level, cross-departmental policy workshops, or through seminars and presentations. For example, in Scotland, the Report informed the Scottish Government **Energy Efficiency Action Plan** and continues to influence the futures thinking on energy and the built environment. These connections served to link **DECC's Big Energy Shift** to the Scottish Government, and led to a further link to the **Northern Ireland Assembly**.

In Whitehall, Foresight Follow-up action helped departments achieve important cross-departmental linkages. **CLG's Eco-towns programme** was linked with the **Technology Strategy Board** (TSB) and to various **Department for Business Innovation and Skills** (BIS) groups. Subsequent meetings between CLG, TSB, and Foresight led to the TSB undertaking to develop an initiative to align £200 million of current investment from its Innovation Platforms with the CLG's Eco-towns programme.

Similarly, Foresight identified area-based initiatives in DECC and the **Commission for Architecture and the Built Environment** (CABE)-**Sustainable Development Commission** (SDC), and facilitated a joining of forces that led to the DECC Secretary of State's announcement of the **Low Carbon Community Challenge.** Foresight then used support from the DECC Secretary of State and the Government's Chief Scientific Adviser to help the Low Carbon Challenge team interact with **Research Council** officials to discuss the monitoring and evaluation of these proposed pilot schemes.

Local government was an important focus of follow-up activity, as the Report indicates that local scale – and locally appropriate – initiatives in building, retrofitting and energy systems are essential to achieving successful decarbonisation. Particular progress was made with the **Improvement and Development Agency for local government** (IDeA) and with the **Core Cities Group**, the network of England's major regional cities with an active **Climate Change Working Group**. Both have undertaken to apply the project's findings and its long-term futures thinking to their work.

Third Sector

Specialist commissions and professional associations represent an important range of stakeholders in this area. They include the CABE, the SDC, the **Town and Country Planning Association** (TCPA), and the **Royal Institute of British Architects**. The Project's findings and futures analysis have informed ongoing work across these organisations. Their dissemination was supported through high-level seminars and publications. The Report informed the **TCPA/Friends of the Earth-led Climate Change Coalition**, consisting of around 50 planning sector stakeholders and led by the Chair of the SEMBE Lead Expert Group. They have been working to inform the development of CLG's Planning Policy Statements on climate change (1 and 22). The Project also supported **CABE's sustainablecities.org.uk** initiative by soliciting international case studies from the FCO's **Science and Innovation Network**.

Research and academic communities

Foresight has been developing two important opportunities which are ongoing:

- A national 'observatory' on energy efficiency data for the built environment. The Report concluded that "a major problem with energy performance standards is that there is little empirical evidence on their actual impact". It argued that a lack of good data "is likely to lead to a progressive widening of the gap between theory and practice and ultimately to failure to achieve difficult but essential strategic goals". Accordingly, the Report "encourages consideration of an observatory on energy and the built environment to capture, produce, and hold consistent and comprehensive data on all the different dimensions of energy use within buildings". This initiative aims to link existing data sets and data-gathering initiatives, such as DECC's **National Energy Efficiency Data Framework** programme.

- A **Toolkit for 2050** for officials from local and central government. The Toolkit is intended to help them shape their vision and understanding of the threats and opportunities of 2050, and how they might address the resulting policy, technology and funding challenges. The value of such a toolkit was identified during the Project's follow-up activities and might be of particular interest to officials from local government. It includes:
    - a positive vision of the opportunities and benefits of low carbon transition, against the backdrop of the threats posed by climate change, requested by the Secretary of State for DECC at a meeting with the Government Chief Scientific Adviser on 22 July 2009;
    - a means of addressing local authorities' National Indicators, especially 186 (carbon dioxide reduction) and 188 (climate change adaptation).

The Report is influencing research funding in IT, behaviour, data, skills and other topics for the **Research Councils Energy Programme** by informing calls such as *Transforming Energy Demand through Digital Innovation* and *People, Energy and Buildings*, and through the **Sustainable Urban Environment Programme.** The Project's lead experts are already developing their work on the Report into at least two books, articles, and a joint research proposal to monitor and evaluate the Low Carbon Community Challenge that they helped to develop in SEMBE workshops. The Report is also being used to support research and teaching at **University College London and at Cambridge, Loughborough, Coventry Universities** and at **Warwick Business School**.

In 2011, Foresight plans to commission a mid-term review will capture the SEMBE Project's continuing impact on government initiatives, on research and on other areas.

1. Introduction

This Review records the impact which the Sustainable Energy Management and the Built Environment (SEMBE) report (the Report) has made in the 12 months since its publication in November 2008. The Report has informed government and other stakeholder initiatives by providing a robust and comprehensive evidence base for action. It has identified evidence-based policy interventions to stimulate discussion and to catalyse action in how government tackles the challenges set out in the Report.

Foresight has set aside resource to disseminate its reports and to facilitate impact. This 'Follow-up Team' works with government and other organisations, particularly in the year following publication, to help ensure that its evidence base and key messages are used to inform policy making, strategic thinking, research, and investment in technology development. This Review is a record of those activities and that impact. The Review is intended to be reasonably comprehensive, recognising that some impact will be indirect or intangible and not clearly attributable to the Foresight study.

Impact has been achieved in a number of ways. Some early impact occurred when the Project was in its concluding stages and when the findings were beginning to emerge before publication. Around the time of launch, members of the Project's High-level Stakeholder Group were asked to consider how they might use the Report to inform their activities. These commitments were set out in the 'Plan of Stakeholder Engagement' document. This Review records progress against those commitments, and other initiatives which have been developed separately. These have been taken forward by a wide range of organisations including government departments, the third sector, business and research, all of whom were invited to submit summaries which, using the **contributors' text for the main part, have been drawn together to develop much of the main body of this document.**

It is important to note that the Report does not make policy recommendations as such; rather, it seeks to develop the evidence to inform them, as do all Foresight reports. The Report's breadth and depth mean that it cannot be aligned with just a single initiative within government. Importantly, there have been multiple impacts involving single departments, and inter-departmental collaboration.

The Review provides an overview of the project, including its background, aims, process and its principal outputs in Chapters 2 and 3. It also sets out the range of impact which it has had in the year since publication, particularly within government departments and the academic and research communities, the third sector and business in Chapter 4. Details of its launch and dissemination through the media and some key events such as conferences and other events are laid out in Chapter 5.

2. Project Overview

2.1 Background

The Sustainable Energy Management and the Built Environment (SEMBE) project is the tenth published by the Foresight programme in its current phase.

The Project combines a comprehensive, multi-disciplinary scientific evidence base with a 50-year forward view, a combination that quickly attracted the attention of CLG, DECC and other government departments which are addressing the many challenges of the 2050 carbon reduction target.

The Project's analysis calls for simultaneous change to behaviour, energy systems and the built environment, and identifies specific areas for urgent Government leadership in estate procurement, energy infrastructure regulation and energy efficiency data collection.

Professor John Beddington, the Government Chief Scientific Adviser and Head of the Government Office for Science, was the Project Director. The Project was sponsored by CLG's Minister for Housing and Planning, the Rt Hon Margaret Beckett MP, who received the Report on behalf of the government on 26 November 2008. Her successor, the Rt Hon John Healey MP, chaired the SEMBE Project High-level Steering Group for the One-Year Review.

2.2 Aim

The Project aimed successfully to explore how the UK built environment could evolve to help manage the transition over the next five decades to secure sustainable, low carbon energy systems that meet the needs of society, the requirements of the economy, and the expectations of individuals

2.3 Scope

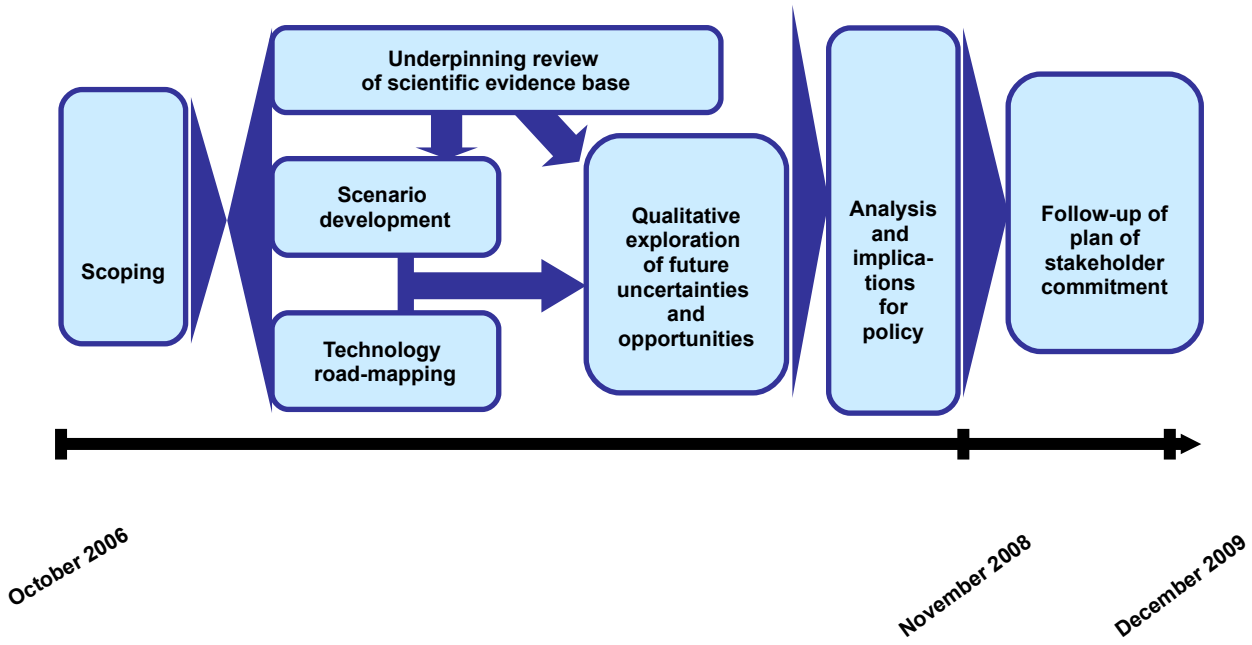
The Project combined a multidisciplinary, evidence based approach with futures thinking to develop a challenging cross-sectoral approach.

- It developed the scientific evidence base from across a wide range of disciplines to identify the broad range of factors that influence energy generation and use in the built environment, and to look beyond obvious, conventional understanding.
- It created a shared understanding of the relationships between factors influencing energy, the built environment and human behaviour, and their relative importance.
- It built on this analysis to identify effective interventions.

2.4 Structure and Process

The Project's structure and process follow a broad template developed in this and other Foresight projects and is set out in Figure 1.

Figure 1: SEMBE – Project structure



3. Project outputs

3.1. Main Report

The main Project Report, *Powering Our Lives*, and its Executive Summary contain a synthesis of the project workstreams and set out its findings and key messages. The Report sets out the scale of the future problem, its causes, and the evidence base for the underlying factors and their uncertainties. It describes the complexity of the relationship between energy systems, the built environment and human behaviour. The Report also describes how potential policy options were identified using a scenario-based analysis, and how they might be developed to address the mitigation and adaptation challenges that climate change poses to the UK.

3.2 Science Reviews

In common with other major Foresight studies, the Project identified and commissioned reviews of the science in a broad range of areas. Most of these were short reviews which summarised current science knowledge and considered potential future developments. The Project also commissioned a series of extended reviews in specific areas where Foresight could fill a gap in understanding.

60 Science Reviews provided much of the underpinning science for the Project. The reviews were published as a special issue of *Energy Policy* (Volume 36, Issue 12, December 2008, ISSN 0301-4205)

The ten separate areas covered by the Reviews included:

Electricity generation
Energy distribution and storage
Renewable energy
Energy demand management
Energy efficient buildings
Decentralised systems
Innovative construction and built form
The regulatory context
The economy and business
Living in the built environment

Figure 2: Co-evolution of energy systems in society

3.3 The concept of “co-evolution”

The SEMBE project was underpinned by a framework of “co-evolution”. This term describes the interdependencies between the social, political, economic and technological aspects of energy generation and use. These aspects and the connections between them determine the development of energy systems, the demands on those energy systems and, eventually, the climate impacts of our energy use.

The concept of co-evolution recognises that technological innovation must address both the social and the economic expectations of its intended users, and requires appropriate governance arrangements. It also acknowledges that carbon reduction cannot be separated from the processes of energy production and consumption, which in turn are affected by developments in infrastructure and in built environments.

There are distinct benefits that come from framing the problem in this way. Firstly, it helps to explain why some policies, which take an overly simple and one-sided view of the challenge, fail to achieve their objectives. Secondly, understanding the complex interrelationships involved in energy systems and the built environment can help identify reasons why barriers to change often predominate over drivers of change. The most important examples are referred to as ‘lock-in’ and ‘path dependency’. Thirdly, the framework allows policies to be designed that tackle the multiple dimensions of a problem. Finally, an understanding of the depth of inertia in a situation can help identify the scale of change that is needed and the level of action that is required to prompt change.

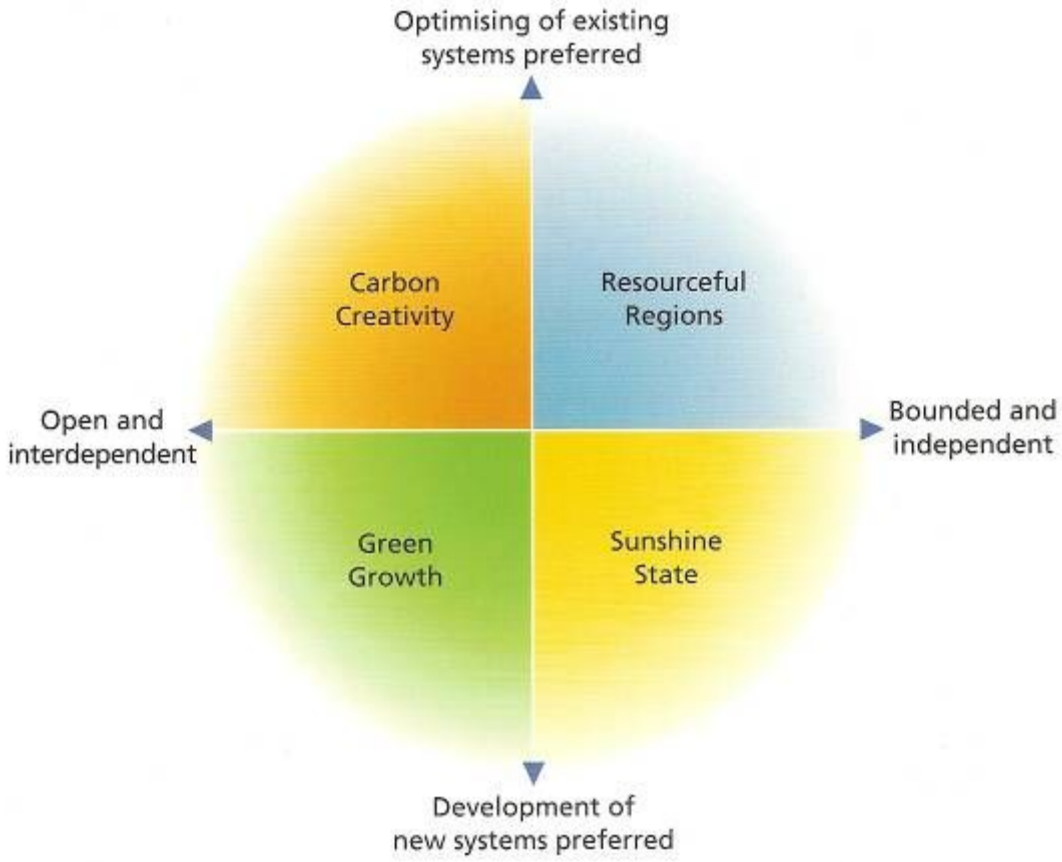
Table 5.1: The spectrum of energy system scales

	Geography	Example Technologies	Example Institutions	Example Regulations and Incentives
Centralised	International	Gas pipeline linking Norway and the UK	International Energy Agency; European Union	EU Emissions Trading Scheme
	National	Central power plants; centralised electricity and gas grids	Central government; Ofgem (the energy regulator)	Electricity market rules (known as BETTA); Renewables Obligation
Decentralised	Regional/City	City-scale heat and power systems (e.g. Mitte CHP plant in central Berlin)	London Climate Change Agency; Regional Development Agencies	Regional spatial strategies; financing for South West 'Wave Hub'
	Town/Neighbourhood	CHP schemes (e.g. Elephant and Castle regeneration area).	Local authorities	'Merton rule'[6] to encourage renewables; local grants
	Building	Building insulation; efficient appliances; microgeneration (e.g. solar hot water and micro-CHP)	Community organisations; building owners and managers	Low carbon buildings programme; Going for Green

3.4 Scenarios

The Project's four future scenarios were built around two axes. These mapped the possible development of the geo-political environment against the direction of investment and technological innovation in new or existing energy systems.

Figure 3: SEMBE Future Scenarios



Foresight scenarios are neither predictions nor forecasts and nor are they comprehensive critiques. They are informed, coherent narratives, developed to support a systematic exploration of possible futures with the aim of helping to make current policies robust and resilient to future change.

The four scenarios developed for the Project are designed to stimulate thinking about alternative ways in which energy systems and the built environment could evolve. The full scenarios have been designed to act as a tool for use in strategic policy-making. They are framed by uncertainties in the wider geopolitical environment: will the world be open, interdependent and multilateral in outlook, or will fragmentation occur, with strongly independent states or regions engaging in bilateral approaches? Will the focus of future investment and innovation in the UK favour disruptive new technologies which stimulate new systems or the exploitation of existing systems?

4. Project Impact

This section reports on some of the principal actions that have taken place since publication. Some of these actions fulfil commitments set out in SEMBE's Plan of Stakeholder Engagement, while others were developed separately. Some have been completed and others are ongoing. The breadth and volume of the activity stimulated by the Report reflect the timeliness of the study. Stakeholders might reasonably anticipate that there will be further initiatives catalysed by the SEMBE report in the next year.

Importantly, this section comprises statements from the national and international stakeholders themselves.

4.1 UK Government Departments and Agencies

Communities and Local Government

The key findings of the SEMBE Project were much in line with CLG thinking. We were already working towards the transition to a secure, sustainable, low carbon built environment that meets the needs of society, the requirements of the economy, and the expectations of individuals.

In July 2009 we announced details of the definition of Zero-Carbon Homes. Homes meeting the new requirements will be cheaper to run because of high energy efficiency requirements, and their occupants will be less vulnerable to rising gas and electricity prices. These homes will have better controls, including smart meters, so that people can more easily manage and reduce energy use. Technology for people to generate their own low carbon heat and electricity, with payments for surpluses, will be designed and built into new Zero-Carbon Homes or developments as a matter of course.

Through the planning regime, and in particular the Planning Policy Statement *Planning and Climate Change*, the government requires new developments to be located and designed to reduce carbon emissions. The government is also piloting new developments which meet the highest environmental standards on a large scale, for example with the Eco-towns, the Thames Gateway eco-region and the London Olympic Park. These approaches will provide learning and help to point the way in decarbonising existing communities. The government will shortly publish its Planning Policy Statement on Eco-towns, which sets out the high standards that they must achieve in tackling climate change and delivering affordable housing.

Energy efficiency and water efficiency have been central to the design of the Olympic Park in East London. The aim is to reduce carbon emissions from the built environment in the Olympic Park by 50 per cent by 2013. This will be achieved by:

• making the Athletes' Village 44 per cent more energy efficient than 2006 standards and reducing water consumption by 20 per cent compared to the London average;
• using an innovative combined cooling, heat and power plant to supply the Park and Athletes' Village with energy, resulting in a 20-25 per cent reduction in carbon emissions in the longer term, as defined in the standard E1 carbon reductions scenario;
• using on-site renewable energy sources during and after the Games to reduce the call on conventional energy sources by 20 per cent;
• transporting 50 per cent of construction materials by rail or river; and
• a target to reclaim 90 per cent of demolition waste materials for reuse or recycling.

The planned Eco-towns are so large that they can be used to test a wide range of innovative and emerging technologies. We are working with the Technology Strategy Board to ensure that we make the most of these opportunities and to support business innovation in the Eco-towns. The TSB has agreed to align over £200 million of its activities with the development of Eco-towns. This involves work being carried out through Innovation Platforms in the areas of Low Impact Buildings, Intelligent Transport Systems and Services and Low Carbon Vehicles, and the TSB's programmes in the area of Energy Generation and Supply and Advanced Materials.

As part of the action plan resulting from the SEMBE project, CLG and Foresight held a workshop in May 2009 to support the development of the Eco-towns programme and to explore ways of raising interest levels and increasing cross-governmental participation. The workshop attracted widespread attendance from across government and was informed by presentations from several members of SEMBE's expert panel. It was an important step forward in ongoing work between CLG and SEMBE to capture the potential of the Eco-towns programme to drive sustainable, low-carbon development.

CLG has also agreed to work with other government departments and agencies on retrofitting, to address the challenges posed by the decarbonisation of the existing building stock. This work is ongoing. One existing output is the Technology Strategy Board's "Retrofit for the Future" competition. CLG worked with the Technology Strategy Board to set the parameters for the competition, and the Homes and Communities Agency is an active partner.

CLG officials have been exploring plans to bring the public and private sector organisations with the largest portfolios of properties and procuring power together. The aim is to research, develop and procure the highest standard of energy efficient and low or zero carbon materials, technologies and services. Such large-scale procurement could drive innovation, incentivise upskilling, and create a retrofit market faster than would happen otherwise, and reduce the cost of action for everyone in the long term.

In addition, the Homes and Communities Agency has a Carbon Challenge programme which aims to accelerate the home-building industry's response to climate change by building homes that reach level 6 of the Code for Sustainable Homes. Four new communities are planned which will together provide around 1,700 zero carbon, highly sustainable demonstration homes. Part L of the Building Regulations specifies the minimum energy efficiency requirements for new buildings and certain categories of work to existing buildings in England and Wales. The current version came into effect in 2006, and improvements are proposed for 2010, 2013 and 2016.

CLG recognises that improving the building stock and facilities for local energy saving and energy generation is only part of the task. The way in which we live, travel and use buildings is also critical. CLG is therefore working to ensure that application of technology is as robust as possible to variations in users' behaviour, and that policies and technology positively support changes in behaviour that will reduce energy demand.

Department of Energy and Climate Change

The Foresight report: Powering our Lives: Sustainable Energy Management and the Built Environment proved to be an invaluable reference work in moving the DECC's work forward in developing policy proposals for distributed energy solutions. It had particular influence on three critical pieces of work in 2009.

Heat and Energy Savings Strategy (HES)

The Foresight work assisted DECC in understanding better some of the issues concerning decentralised energy and the role local networks can play in the future. The HES consulted on the emerging policies for energy efficiency coupled with deployment of micro and community technologies. The issue of local heat networks featured for the first time as a policy area which the Department is keen to drive forward, particularly due to their critical role in driving local low carbon and renewable solutions and energy security. The Foresight report was used as reference work to substantiate many of the emerging policy options.

Low Carbon Community Challenge (LCCC)

DECC has recently announced the Low Carbon Community Challenge, a two-year 10m capital support programme to provide financial and advisory support to 20 'test bed' communities in England, Northern Ireland and Wales that are seeking to cut carbon emissions and create more sustainable neighbourhoods. The challenge is supported by and undertaken in collaboration with the UK Research Councils.

The LCCC developed from recommendations from two pieces of research: The Big Energy Shift, a Sciencewise-funded dialogue run by DECC with households and communities (www.bigenergyshift.org.uk) and the Foresight report.

Together, these two pieces of research pointed for the need to overcome ‘lock-in’ –“in systems, regulatory frameworks, business models and behaviours"– to enable decarbonisation to occur. The LCCC seeks to address this issue of ‘lock-in’ through area-based, citizen-led experimentation on the ground across a spectrum of energy and technology systems and scales.

Building on the findings from the Foresight report and Big Energy Shift, the Government believes that an integrated approach, involving both technological solutions and community and household-level behaviour change, will be critical to achieving the carbon emission cuts we need within communities. However as yet there is no blueprint for effective, integrated action or clear sense of how much can be achieved through this route - hence the Challenge, which is designed to test the success of different plans.

The Challenge is focused on communities already taking action, or facing change, in the area as a result of low carbon infrastructure development to tackle climate change – they may be a Warm Zone, Eco-town or Transition Town, or a potential site for a wind farm, electric cars or community-scale retrofitting of homes – and with an interest in using this to spur broader cuts in carbon emissions within the area. It will allow the experiences of people living and working in communities that take part to be shared publicly, along with the quantitative data on carbon and energy savings. The information will be used to offer continuous learning and improvement, and the lessons learned will be made available to other communities across the country. The learning will also inform government's wider delivery plans on energy and climate change.

Officials in the Department have continued to liaise with the Foresight team as the Challenge developed. This included a joint Foresight/DECC workshop in April, a meeting between John Beddington and Ed Miliband MP, and a meeting between Brian Collins, the UK Research Councils, Foresight and DECC. It also includes personal advice from the Project's Lead Expert team in the scoping of the Challenge.

Low Carbon Transition Plan

The work of the Foresight report also defined the scope of the departmental Low Carbon Transition Plan published in July 2009. It had particular impact on Chapter 8 of the White Paper ‘Developing a Roadmap towards 2050’.

Business Innovation and Skills (BIS)

- ***Low Carbon Skills***

Three groups were formed to inform policy development on low carbon skills in the run-up to publication of the Low Carbon Industrial Strategy in July 2009:

1) A Strategic Advisory Group, consisting of leading edge employers from a wide range of sectors, has met 3 times;

2) A wider stakeholder reference group, consisting of sector skills councils, unions, expert bodies and skills providers is planning its third meeting to test emerging policies;

3) A high-level, cross-government forum to ensure joined-up policy has met four times (a fifth meeting is in discussion).

- ***Innovation***

BIS Innovation welcomes the SEMBE report, particularly the call for area-based pilot schemes for retrofit, low carbon technologies, planning and design solutions, study of energy behaviour and innovative funding mechanisms. SEMBE Follow-up has subsequently informed ongoing work in BIS Innovation to identify initiatives and opportunities for partnership and to share learning among the many pilot schemes that have been, or are about to be, started

Scottish Government

In May 2009 the Scottish Government and Foresight arranged a seminar in Edinburgh on the SEMBE project. Given the scope of the project and our belief that many disciplines would be interested, we deliberately invited people from a wide range of backgrounds, both government and external. Attendees included representatives from the Scottish Government's Strategy Unit, Energy Divisions, Housing, Building Standards, Fuel Poverty, Transport, Planning, and Climate Change, as well as external members from Scottish Enterprise, Local Authorities, Strathclyde University and the Scottish Institute of Advanced Studies, the Sustainable Glasgow project, the Sustainable Development Commission Scotland, regional enterprise partnerships, RIAS, and private architecture practice.

Response to the presentation from Foresight and the SEMBE project was universally enthusiastic. The event worked at two levels – the subject matter of the project, and the transferable methodologies used (horizon scanning, foresighting, scenario planning etc). Owing to the diverse backgrounds of the attendees, a major benefit for many was to take away the very useful source material and the new perspectives from their discussions into their individual work areas. The *Energy Policy* Special Issue was very useful for many in this respect). The event was also valuable for bringing together people from different areas to discuss a subject in which they are all involved and need to work together on. It was a useful networking event that forged permanent working relations, both internal and external, and the lunch provided a good opportunity for further fruitful discussion. Many participants made contact with people from different organisations with whom they had a common interest, e.g. on CHP projects, and we know of some new partnerships that were formed with external stakeholders.

For my own area, the event also proved valuable in helping me to draft the Scottish Government's wide-ranging consultation on its Energy Efficiency Action Plan, which covers all the represented areas. Not only did I manage to bring together all the people with whom I later needed to work, but the subject

matter of the academic reports proved highly useful. Time constraints mean that I have not been able to use as many of the horizon scanning and futures methodologies as I would have wished whilst drafting the consultation paper. However, I hope to return to them during this next consultation phase as a way of opening up the debate on energy efficiency.

DEFRA

Adaptation to Climate Change (ACC) team

The report is primarily focused on energy and the built environment from the perspective of carbon mitigation. This approach, combined with its focus on theoretical future scenarios, and the limited consideration of how the impacts of climate change might affect future energy use in the built environment, limits its usefulness as a tool in developing climate change adaptation policy. However, it contains some useful background data and references, particularly on things such as changing rates of house-building and the age distribution of existing buildings.

4.2 Stakeholders outside government, including Non-Departmental Public Bodies, Agencies, Professional Associations and local government

Commission for Architecture and the Built Environment (CABE)

Not only has CABE benefited from the rich evidence base in the SEMBE Project; we are also most grateful for the contacts and networks it has established, bringing together key parts of government to discuss joint initiatives.

Following the launch of the Report, CABE held a high-level event on 28 January 2009 to promote the Report to the built environment sector. The event focused on using small-area programmes to explore an area-based approach to energy management. This would involve retrofitting existing property and linking this process to new infill and adjacent new development, to integrate decentralised energy, heat networks and other innovative approaches to energy management. The audience included key figures in the architectural and construction sectors, senior decision-makers from key government departments, non-departmental public bodies (NDPB) and agencies, and civic leaders. We witnessed a high level of consensus in favour of a policy initiative that would test neighbourhood and area-based approaches to energy management through a number of pilot programmes.

CABE has pursued this recommendation together with the Sustainable Development Commission, and is now working on a jointly-funded project bringing together DECC, CLG, CABE and the Homes and Communities Agency. The project will investigate how community infrastructure is delivered in existing neighbourhoods, and the potential to configure its delivery and management differently to produce a more sustainable outcome. This work will look at the potential for local delivery and funding mechanisms to integrate energy and wider resource efficiency with quality of place and life. The report will explore the interesting opportunities for finance which the combination of energy and other utility services with area-based renewal provides. These are not available to regeneration initiatives alone. We hope that the report's findings will influence subsequent delivery in this area.

We are also grateful to Foresight for promoting CABE's sustainable cities initiative across its networks and for helping CABE to gather further evidence and good practice internationally through the Science Information Network.

I hope that the legacy that the Foresight programme leaves for other stakeholders is as strong as it is for CABE.

Sustainable Development Commission (SDC)

The Sustainable Development Commission welcomed the Foresight *Powering Our Lives* report in the light of our own work on existing housing

(Stock Take 2006), as all four of the scenarios included the need to upgrade existing building stock. The Foresight report produced an excellent evidence base and future scenarios, which the Sustainable Development Commission is using to inform our work on improving the resource efficiency and overall quality of existing neighbourhoods. The SEMBE report has also stimulated debate on area-based approaches to upgrading the efficiency of our built environment. Following the Report's publication, the SEMBE Follow-up team has worked with us to bring together organisations interested in exploring how we can deliver the following recommendations:

• 'There is scope for area-based policies led by local government to lead to improvements in the energy efficiency of the built stock in specific local areas' (p136).
• 'Build on the lessons of area-improvement policies from the 1960s and 1970s to develop area-based retrofitting schemes with energy efficiency in mind' [box 8.5].

The Sustainable Development Commission is now undertaking research in this area, with backing from CLG, DECC, HCA, CABE and EEPFH. We are exploring ways of retrofitting our existing physical infrastructure at the community scale. The aim is to promote local delivery and management which reduce carbon emissions and other resource use, and which attract investment and improve quality of place and of life for residents.

Improvement and Development Agency (IDeA)

The SEMBE project has provided a very useful stimulus to local government thinking about the nature of a low carbon future for the UK, and the potential role of local government in helping to deliver that future.

I am very grateful to Foresight Follow-up for taking the time to describe the work of the Foresight Programme and the SEMBE project to the key, 120-strong local government audience at IDeA's Positive Future conference in May 2009, and to join in the debate that followed with Jonathon Porritt, who I know had been a member of the project's Steering Group.

The future scenarios projected by the project, and its findings, present a real challenge to how local Councils might shape their own role in delivering a low energy future. The Report is also right to stress the leadership role of the government estate in managing its own buildings, and key services such as procurement. The SEMBE project is a really useful tool in communicating these messages to local government and we shall continue to use the project report to help get these ideas across

Core Cities

- ***Climate Change Working Group***

The Foresight SEMBE Project is an important piece of work that has provided good insight and a coherent evidence base for the future energy challenges faced by cities.

We have welcomed the engagement the Foresight Team has taken upon itself to ensure that the learning and outcomes of the Report are shared widely. In particular, we were pleased to speak with the lead authors at an event in London in early 2009 and to invite discussion at our Core Cities Climate Change Working Group in June 2009.

We support further efforts to communicate and disseminate the outputs of the programme and to facilitate discussion between the key stakeholders locally, regionally and nationally as part of the transition to a low carbon economy.

- ***Sheffield City Council***

The outcomes of SEMBE presentations and conversations have been helpful at a number of levels.

The Report has shaped our thinking on the role which local authorities should play in planning long-term energy strategies. This has guided our strategic thinking on planning policy and on engagement with utilities and energy generation and distribution organisations. As a consequence of the SEMBE work, we have undertaken a review of our energy infrastructure within the City of Sheffield to help us understand better what strategic interventions may be necessary to deliver the planned investment in the built environment.

It has also signalled the range of approaches that might be adopted and the technical solutions that may be available. This will help build confidence in policy shaping and place shaping.

In addition, it is an excellent reference point against which decision making can be supported.

- ***Bristol City Council***

We are currently looking at how the SEMBE project might feed into the work which our PhD student Rose Bailey is doing on 'Carbon management at the city scale: Exploring carbon futures for the Bristol Region' . This is a joint project between Bristol City Council, University of the West of England, University of Bristol and CSE.

Town and Country Planning Association (TCPA)

The SEMBE project continues to have a positive impact on the policy development of the Town and Country Planning Association.

The TCPA was involved in the Project in the following ways:

• Stakeholder role: Gideon Amos OBE, TCPA Chief Executive, was a member of the Project's high level steering group and Kate Henderson, TCPA Communications and Energy Policy Manager, attended scenario testing workshops

• Press release: The TCPA warmly and publicly welcomed the final report *Powering Our Lives* in November 2008 by issuing a press release to trade sector publications.

News coverage included:

26.11.09 – 24dash 'TCPA helps advance the case for renewables and energy efficiency' http://www.24dash.com/news/Housing/2008-11-26-TCPA-helps-to-advance-the-case-for-renewables-and-energy-efficiency?utm_source=24dash+newsletter+subscribers&utm_campaign=8516e75811-UA-31909-1&utm_medium=email

27.11.08 - B legal Limited 'TCPA: Govt report welcomed' http://www.b-legal.co.uk/news-story.php?itemid=508

05.12.08 – Institute of Environmental Management and Assessment 'Powering our Lives' http://www.iema.net/news?aid=18606
d. December 2009 – Town & Country Planning (TCPA Journal) 'TCPA helps to advance the case for renewables and energy efficiency' (available in hard copy)

• **TCPA member seminar**: TCPA worked in partnership with Foresight to deliver a seminar on June 1, 2009 to disseminate key aspects of the SEMBE project to the TCPA's membership base. The half day seminar was entitled 'Planning for sustainable energy - are we on the right pathway to meet the climate change challenge?' It was attended by public bodies, local authorities, companies, charities and not-for-profit organisations (see: http://www.24dash.com/news/Environment/2009-05-12-Are-we-on-the-right-pathway-to-meet-the-climate-change-challenge).

Two leading academics from the SEMBE project spoke at the seminar. They were Professor Yvonne Rydin, Professor of Planning, Environment and Public Policy, University College London, and Co-Director of the UCL Environment Institute, who presented the Project's ideas on new and existing buildings and future decarbonisation, and Dr Jim Watson, Director, Sussex Energy Group, SPRU, University of Sussex, and Deputy Leader of the Energy Programme at the Tyndall Centre, who presented ideas for Transitions in Energy Systems and the Built Environment.

• **Planning and climate change coalition**: The second session of the seminar involved an interactive panel debate, drawing upon the lessons from the Foresight project, and looking at whether we have the right planning policy framework to create a clear strategic pathway for renewable and low carbon energy provision. Identifying the weaknesses and opportunities from this discussion, the TCPA launched a Planning and Climate Change Coalition

which is chaired by Professor Rydin. Discussions at the two coalition meetings - each attended by approximately 50 stakeholders from across the public, private and third sectors – have included recommendations in the SEMBE final report. The aim of the coalition is to make recommendations for new strategic planning guidance on climate change in England, to build consensus amongst a wide range of stakeholders on the benefits of new guidance, and to work with government to ensure the fastest possible implementation of the new guidance.

The campaign got off to a flying start, with government's commitment in the Renewable Energy Strategy published in July 2009 to consult on a new combined climate change PPS by the end of 2009. This is a clear indication that the government is listening to this important coalition. A joint position statement was launched by the coalition in the House of Commons on October 27 2009.
See http://www.tcpa.org.uk/resources.php?action=resource&id=593.

The TCPA is very grateful for the input of the Foresight SEMBE project to our policy and campaigns agenda.

The Royal Institute of British Architects (RIBA)

I am pleased to report on the contribution of the Foresight project on Sustainable Energy Management and the Built Environment to the work of the RIBA. We were fortunate to extend our partnership with Foresight at the RIBA/Building Futures 'Futures Fair 09'. This involved a series of seminars attended by architects, futurists, and a range of other professionals, and included direct input from the SEMBE team and leading commentators, and provoked discussion and media coverage. In addition, many of those who attended are involved in the special interest groups of the RIBA and the issues raised have gone on to be discussed in a number of these forums.

This has helped to inform the Institute's policy and research programme, through the work of the RIBA Sustainable Futures and Planning Groups, and has helped us to develop stronger positions in our responses to Government consultations and in our COP15 discussions and our Combating Climate Change initiative. The Futures Fair material continues to be available through the well-visited Building Futures website. See
http://www.buildingfutures.org.uk/outputs/projects

Royal Society for the encouragement of Arts, Manufactures and Commerce (RSA)

The RSA takes a citizen-centric approach to social progress. We are particularly interested in how advances made in behavioural science contribute towards a better understanding of how people make decisions. So our interest in the SEMBE report stems largely from Chapter Four, "Behaviours, values and interventions for change".

The SEMBE report's emphasis on the importance of human behaviour in energy consumption in buildings provides a useful review of the literature and current policies. Particularly helpful are the evidenced examples of the limitations of providing information. and of making the costs and benefits of choices more clear, as behaviour change strategies. It is also helpful that the Report emphasises the complexity of changing behaviour and the need to think of behaviour through psychological, economic and policy-driven lenses, and at individual, regional and national scales.

The Report provides an excellent reference point for work on energy behaviour which we hope to start in the near future. It is arguable that because of the significant theoretical behaviour change research already carried out by DEFRA, Government Social Research, the Department of Health and others, there is now a need for much more action research. We hope that initiatives such as the Technology Strategy Board's sandpit on "User centred design for energy efficiency in buildings" will provide a first step towards much-needed, large-scale and quantitative data on the effectiveness of various behaviour change interventions.

4.3 Research

The Research Councils and RCUK

Impact of the SEMBE Report on the Research Councils Energy Programme (RCEP)

The Project findings have been instrumental in helping develop the RCEP strategy to increase investment in research into Energy Demand Reduction. Specific activities that owe their genesis, at least in part, to the SEMBE project are:

The call for proposals entitled *Transforming Energy Demand through Digital Innovation*: here RCEP and the Research Councils' Digital Economy programme are seeking to support joint research projects concerned with the application of digital technologies to transform energy demand reduction. SEMBE highlighted the need to exploit the IT revolution and this alerted RCEP to the need to encourage research in this area.

SEMBE reinforced the need to better understand what determines energy behaviours and the need to ensure that research results are linked to policy development, deployment and evaluation. Two initiatives have drawn on this.

People, Energy and Buildings is a joint call supported by EDF and the Research Councils' Energy Programme in the general area of the social science of energy efficiency in buildings. The second is an initiative focusing on *Energy and Communities*, now being developed between ESRC and EPSRC. It has four overarching themes:
• Energy Literacy and Visibility;
• Lifestyle, Behaviours and Practices;
• Communities, Ownership and Social Movements; and
• Policy, Governance and Legislation.

The lack of data on energy consumption and building energy performance was raised in the SEMBE report. RCEP has funded a project at UCL to ensure academic input into the development of appropriate energy data collection and storage.

The need for better skills training in the building and construction industries, highlighted in the report, was instrumental in RCEP considering what might be needed at a higher level to ensure that university level training and research were supported in future. A Centre for Doctoral Training distributed between UCL and Loughborough University was consequently funded.

Apart from these specific examples, the involvement of RCEP personnel in the workshops was a very useful learning and networking experience and led to the inclusion of other attendees in RCEP workshops, and to a better comprehension of the problem of energy demand reduction in buildings.

Finally, the third phase of the EPSRC-funded *Sustainable Urban Environment* (SUE) Programme was announced in September 2009. This is looking to seed and support significant new research directions, addressing the grand challenges associated with integration and connectivity across different spatial and temporal scales within the urban environment to deliver a sustainable future. As noted in the SEMBE report, this research will need to take account of uncertainty about future routes to sustainability and the need to foster experimentation and innovation. It will result in an increased body of multidisciplinary research to help tackle key issues, build better understanding, and strengthen the evidence base to inform future decision-making.

Energy Research Partnership (ERP)

The Energy Research Partnership has been designed to give strategic direction to UK energy research, development, demonstration and deployment (RDD&D). Its overall aim is to increase the level, coherence and effectiveness of public-private investment in innovation and commercialisation to achieve energy policy goals. It brings together major public and private sector funders of energy RDD&D in the UK to promote a coherent approach to addressing UK energy challenges in an international context, and to increase long-term energy-related activity and investments in the UK.
ERP is co-chaired by Willy Rickett, Director General for Energy Markets and Infrastructure at the Department of Energy and Climate Change, and Nick Winser, Group Director (Transmission) National Grid, supported by a dedicated Analysis Team and Secretariat.

The ERP has been using the SEMBE project's outputs in our Innovation Milestones for 2050 work. We have been drawing together the outputs from a wide range of scenario building projects from government and the private sector, with the aim of generating a shared vision of the energy system and its innovation challenges in 2050. The SEMBE work has been analysed alongside other scenarios to explore its findings and assumptions on the development of the future energy system. A meta-analysis of all similar scenarios will then discuss the areas of consensus and the assumptions and inputs that drive uncertainty in energy system development.

The SEMBE project was valuable because it was aligned to the 80 per cent carbon dioxide reduction target set by the Climate Change Committee report. So its findings are relevant to present-day discussion of policy and RDD&D. The evidence base for the Report was drawn from a wide range of academics and experts, providing something of a consensus from this community. Furthermore, the SEMBE report is widely recognised and promoted across government departments, making it an important resource that government departments are using to guide decision-making. For the purposes of the ERP project, the SEMBE work is already finding consensus in a complex area in both the academic and public sector arenas.

Cambridge Centre for Energy Studies (CCES)

A personal view: Dr Theo Hacking, Centre for Energy Studies:

Cambridge Centre for Energy Studies (CCES), based at the Judge Business School at University of Cambridge, has embarked on a research project with a major property company into energy efficiency in the built environment. The research will explore the most appropriate responses to the future challenges of energy management in buildings and property developments, and the interventions needed to facilitate their achievement.

A review with our research project's main sponsors and advisers in March 2009 threw up the following questions: Is the research focusing too much on what we can see right now? Is the research taking a sufficiently long-term and strategic view? And is the research focusing on flexible and adaptive solutions? This prompted us to look into the potential offered by various futures techniques for framing the research within a long-term perspective and for accommodating the uncertainties that accompany this long view. It was at this point that we looked closely at the futures component of the SEMBE project and were inspired by the potential that explorative scenarios could offer. We were unsure whether to focus our efforts on applying the SEMBE scenarios or to initiate our own scenario planning process. We decide on the latter, for the following reasons:

● The futures specialists we consulted impressed upon us that the 'journey' is as important as the 'destination', i.e. much of the benefit that could be gained comes from the learning that results from participating in the process.

● Our research is more narrowly focused on buildings and property developments, especially by commercial developers, than SEMBE had been. We were wary of trying to extrapolate the SEMBE findings to our area of interest.

● From the published SEMBE documents, we had some difficulty following some of the intricacies of the process that had been followed (and which we are sure most readers would happily avoid) and thought it might be advisable to experience some of these first hand. For example, the published SEMBE reports mention the OPM and IfM work, but it is difficult to follow the link between these inputs and the final outputs.

● The SEMBE scenarios may not cover a sufficiently broad spectrum of plausible futures, since they all assume futures that will be carbon- or energy-constrained. They may also tend towards being overly normative and optimistic. We hope that our experience might reveal whether these concerns are justified.

The SEMBE futures work has been of considerable value to us as a case study which demonstrates that scenario planning can provide helpful insight for planning related to energy management, and which gave us the confidence to attempt a similar process.

Personal perspectives of the SEMBE project Lead Expert Group

Lead experts on the project were asked to comment on their experience of working with Foresight:

“I have been impressed by the quality of both the work and the people involved”; “The SEMBE project has had a range of positive influences on my research and career”; “The experience of working in a multi-disciplinary team over this length of time has been instructive”.

For each of the lead experts, the experience of working with Foresight has been hugely informative and has led to some very productive relationships. It has also significantly advanced their understanding of the policy making process from ‘the inside’. Additionally, it has built a multi-disciplinary approach which was, at times, surprisingly productive: “I have come to realise that inter/multi-disciplinary work rarely works at the cutting edge of each discipline but that the search for a common ground need not be a rush to the lowest common denominator. “

Foresight’s position at the nexus between academia and Government also proved beneficial, providing “opportunities to network with policy makers and practitioners across Government and beyond”. The lead experts also benefitted from the opportunity to create new and enduring networks which could be used to disseminate the findings widely, and for future collaboration.

This collaboration has been productive with the academic members of the panel applying for funding to “pick up where SEMBE left off.” These include a bid to the Joseph Rowntree Foundation. This proposed project would help to inform the DECC ‘community test beds’ announced in the Low Carbon Transition Plan – partly a response to the SEMBE report. Other research includes a bid to the EPSRC Sustainable Urban Environment programme based heavily on Foresight thinking.

The findings and techniques have also informed the lectures of many of the academics both to their students, and at conferences such as the Singapore Energy Convention (2008). For those students who have engaged with SEMBE, it was often the first time they had been asked to think so many years into the future thus helping to ensure that these techniques reach the next generation of scientists.

4.4 Business

The Chartered Institute of Building (CIOB)

The project identifies and expands upon the areas of Sustainable Energy Management and the Built Environment and provides a good overview of these subjects for policy makers. The final Project Report could allow a possible policy direction to be identified whilst highlighting the potential implications of following it.

We feel that the Report highlights areas where the CIOB is actively involved, can demonstrate continuing commitment, and can contribute positively in the future. This is especially exemplified in the demand for high quality skills and high calibre construction professionals across a range of disciplines in the built environment.

We hope that the strategic challenges identified in this report are noted, explored further and acted upon by those developing future policy on a national and local scale

The Technology Strategy Board (TSB)

The Technology Strategy Board is a non departmental public body set up to promote innovation in UK business. To focus on areas where we can have the greatest impact, the Technology Strategy Board has identified a number of key technologies, application areas and innovation platforms where we will invest. An innovation platform is characterised by a well-understood societal challenge where UK Government is acting to shift the market, and where the Technology Strategy Board can intervene to help business to serve the changing market.

The Low-Impact Building Innovation Platform has the objective of helping UK industry to supply the emerging market for low-impact buildings which will be created by the government targets for zero carbon homes from 2016, zero carbon non-domestic buildings from 2019, and refurbishment of the existing housing stock by 2030. There were obvious links to explore between the objectives of the Low-Impact Building Innovation Platform and the analysis and thinking being carried out in the SEMBE project.

Collaborating with SEMBE gave us two advantages. First, participating in the SEMBE workshops and debates at the same time as we were formulating our own strategy enabled us to check our thinking against other perspectives and to stress-test our emerging strategy. The strategy that has resulted from this wide engagement has been recognised and supported by stakeholders as a sensible route to supporting the innovation that will be needed to deliver a low-carbon built environment.

The second benefit came from the publication of the SEMBE report and the four scenarios described in it. The focus of the *Low-Impact Building*

Innovation Platform had always been on delivering individual buildings. Working with the scenarios, we have now begun to extend our strategy to communities and districts. We are now working with other themes in the Technology Strategy Board, such as Energy Generation and Supply, Intelligent Transport Systems and Services, Digital Britain, and Assisted Living, to create an integrated approach to the Eco-Towns being promoted by Communities and Local Government.

4.5 International

Science and Innovation Network

On the 18th of November 2009, the government's Science and Innovation Network (SIN) in Switzerland organised a **Future Green Buildings** seminar, at the **BRE** in Watford, in collaboration with the *Modern Built Environment Knowledge Transfer Network* (KTN) and with a helping hand from the UK Energy Research Centre UKERC. The event presented renowned speakers from the UK and Europe with a unique opportunity to exchange ideas and experiences on retrofitting the urban environment.

Housing accounts for around 30% of the UK's total energy use and 27% of carbon dioxide emissions. While the environmental footprint of new housing schemes has been improving in recent years, there are still many barriers to overcome in the supply of energy and design for homes. In order to reduce the environmental impact and to enable the UK industry and wider community to meet the standards of the "Code for Sustainable Homes", there is a need to increase energy efficiency in existing buildings. Low/zero carbon homes technologies that reduce energy use are therefore more and more in demand.

The **Future Green Buildings** seminar provided 60 UK house-builders, experts and policy makers with an opportunity to exchange knowledge with leading-edge European technology developers and researchers from France, Germany, Sweden and Switzerland.

The aim of the meeting was to:

- Increase UK research capacity in low carbon technologies for house-builders.
- Provide knowledge to the UK to reduce the environmental impact of existing buildings.
- Facilitate contacts and report on funding available from bodies such as the European Union (FP7) and national research councils.
- Disseminate information on programmes and incentives.
- Help participants identify opportunities and develop beneficial relations between UK and European scientists and experts.

Topics for discussion included:

- Development on environmental friendly/sustainable houses and communities.
- How to adapt existing buildings to climate change (retrofit)?
- Energy-efficient systems and technologies.
- Behaviour

The discussion highlighted some of the main issues currently faced in the UK: The lack of relevant information available about technologies and funding possibilities; the lack of incentives associated to the costs of retrofitting; and, finally, the lack of training, skills and education that affect the industry and UK population alike.

The seminar was an overall success, opening up to great networking opportunities amongst the high-level speakers and participants.

More information on the programme, the speakers, the outcome of group discussions and the presentations will be made available on the website of the British Embassy in Berne, Switzerland

China

Professor Fulong Wu, Cardiff University

This Project is very informative, especially from an international perspective to understand the change needed to foster sustainable development. Colleagues from China, for example, are very interested in the publication of the Project. The final Report is prepared to disseminate to a wider audience and hence is a great achievement. Overall, from international development perspectives, this Project has achieved its user impacts and will continue to be a useful reference for both researchers and policy makers in developing and emerging economies

4.6 Education and Training

Warwick Business School Global Energy MBA

The set of four scenarios developed by the SEMBE project has been used by participants in Warwick Business School's Global Energy MBA to consider what paths companies in the energy industry may take in the future.

The Warwick Global Energy MBA is a unique programme among the world's top business schools. It combines the usual management education provided by an MBA with a focus on the challenges and opportunities faced by the world's energy industry. Participants were asked to select a set of scenarios, including those from the SEMBE project, consider the strategic and operational impact it would have on a firm in the energy industry, and then discuss the different paths the company might take if the future followed each of the scenarios in their selected set. As well as the SEMBE project scenarios, participants could choose the Shell 2050 scenarios or the Forum for the Future's Climate Futures scenarios. The three sets of scenarios were selected to offer the perspectives of government, business and a sustainable development organisation.

"The advantage with scenarios that reach as far as 2050 is that they challenge people to look beyond the situation today and think creatively about what might happen." commented David Elmes, academic director of the Warwick Global Energy MBA. "The interaction between governments and the energy industry will increase in the years ahead and so the Foresight scenarios were particularly useful in helping our participants consider what different forms that relationship may take in the four alternative scenarios presented in the SEMBE project." Although the SEMBE scenarios were developed with the UK in mind, participants used them to consider companies across the world, including Centrica, National Grid, ENI of Italy, Nexen of Canada, Areva of France and Peabody of the US.

It was great to have a set of scenarios developed with a government perspective and that had such extensive background documentation. We are glad to see the scenarios put to use in considering the future of the energy industry.

5. Dissemination

The Foresight team of officials and lead experts sought to maximise the opportunities to disseminate the findings of the Project, and continues to do so actively a year after publication.

The communication and uptake of the Project's findings are key contributors to the Project's impact.

Examples of dissemination activities are set out below.

5.1 Networks

One of the outcomes of the Project was its capacity to bring together leading experts and organisations who may not have previously been in contact. This network has helped to foster new and innovative ways of thinking.

Experts from the Project have gone on to champion the Report and thereby to inform the work of government departments and other stakeholders

5.2 Conferences and Other Events

The Project's findings have informed many conferences, workshops and other events in business, government and academia. Foresight is grateful to the many technical contributors to the Project and to its stakeholders, who have presented the Report at a wide range of events before and since the Project launch in 2008. Foresight would particularly like to thank Professor Yvonne Rydin, Dr Jim Watson, Lorna Walker, Dr Chris Goodier, Professor Patrick Devine-Wright and John Loughead for their contributions.

It is important to note that many of the dissemination events were ones where the experts involved in the Report were actively sought out by the organisers. The breadth of these events reflects the diversity of the audience informed by the Report.

Examples include:

Parliamentary Office of Science and Technology (POST) presentation	November 2008
CABE "Low Emission Neighbourhoods" workshop	28 January 2009
DECC (two workshops)	22 April 2009
Foresight Horizon Scanning Centre FAN Club seminar	24 April 2009
Inside Government Environment and Sustainability conference, “Striking the balance between Sustainable and Affordable Housing”	28 April 2009
IDeA annual conference “Positive Future 2009”	06 May 2009
RIBA “Building Futures: Futures Fair 2009” seminar	12 May 2009
Scottish Executive workshop	28 May 2009
CLG (eco-towns) workshop	29 May 2009
TCPA seminar	01 June 2009
Strategy Unit seminar	02 June 2009
Natural Capital Initiative / British Library presentation	15 June 2009
Core Cities Climate Change Working Group presentation	25 June 2009
DECC-BIS presentation	30 June 2009
Foresight/FCO Science and Innovation Network (SIN) conference	02 July 2009
Sustainable Development Research Network Advisery Committee presentation	14 September 2009
Sustainable Development Committee “Delivering Neighbourhood Retrofit” workshop	26th October 2009
FCO/BRE Modern Built Environment (MBE) KTN "International Future Green Buildings" conference	18 November 2009
Inside Government Environment and Sustainability conference, "Higher Education and the Sustainability Challenge"	10 December 2009

5.3 Media Coverage

Media coverage around the time of the launch involved both specialist and mainstream print and broadcast media. The Report was launched at a press conference on 26 November 2008. It received a range of coverage during the month of its launch. The following list is not exhaustive but provides a reflection of the impact the Report made in the first few days:

- Guardian

Homes and offices should take 'green MoT', says thinktank Failure in energy efficiency tests could mean increases in council tax or buildings insurance, say government advisers
http://www.guardian.co.uk/environment/2008/nov/26/energy-efficiency-climate-change

- Daily Telegraph

MoT energy check for homes proposed Homes and factories in the future may have to pass an energy efficiency test in the same way that a car has to pass an annual MoT inspection, a government think tank states.
http://www.telegraph.co.uk/earth/businessandecology/energyefficiency/3519931/MoT-energy-check-for-homes-proposed.html

- BBC

Think tank calls for 'home MOTs' The government's science think tank has proposed that homes in the UK should have regular MOT-type energy check ups. http://news.bbc.co.uk/1/hi/sci/tech/7748959.stm

- Press Association

Small-scale power generation urged (Press Association) More small-scale and local power generation from renewables is needed as part of moves to make homes and businesses greener, a report for the Government said.
http://www.google.com/hostednews/ukpress/article/ALeqM5gySAB0to95IZCxCT0yRF7PsnU7zA

- inthenews.co.uk

UK stuck in energy past, govt thinktank warns Britain will struggle to make the transition to greener energy sources because it is "locked-in" to using traditional energy sources, a government thinktank has claimed.
http://www.inthenews.co.uk/news/politics/uk-stuck-in-energy-past-govt-thinktank-warns-$1251235.htm

- BusinessGreen.com

Government think tank calls for green building "MOTs" Businesses could be made to undertake annual "green MOTs" for their buildings and offices, under new proposals being considered by the government.

http://www.businessgreen.com/business-green/news/2231323/government-think-tank-calls

- Green Consumer Guide

Major report demands energy rethink A major new report released this week on energy use in the UK has revealed that the drive towards sustainable power is being 'hampered' by outmoded ways of thinking.
http://www.greenconsumerguide.com/index.php?news=3666

- PlanningResource (sic; online home sector titles *Planning* and *Regeneration & Renewal*; also linked with Royal Town Planning Institute)

Old buildings 'key to energy saving' (accessible via subscription only) Boosting the energy efficiency of older buildings offers "quick-wins" in the fight to cut carbon emissions, according to a report by a government think tank.
http://www.planningresource.co.uk/news/ByDiscipline/Housing/login/865216/

- Devono (commercial property industry publication)

Commercial property could face green MOT test Commercial property could be subjected to green MOT-style tests if the advice of a government think-tank becomes law. http://www.devono.com/News/Commercial-property-could-face-green-MOT-test/18896140/

Later articles

"Report urges 'decarbonising'" (*The Psychologist*, Vol 22, no 2, February 2009)
http://www.thepsychologist.org.uk/blog/11/blogpost.cfm?threadid=646&catid=48

Specialist articles

There have also been a number of articles written by the Foresight Team and key scientific experts involved in the project. Notable examples include articles in *Prospect* and the *Financial Times* written by John Beddington, the Government Chief Scientific Adviser and head of the Government Office for Science.

John Beddington “Focus on the wallflowers” (*Financial Times*, guest column, 16/01/09)
http://www.foresight.gov.uk/Energy/SEMBE_PJB_FT_Jan09.pdf

John Beddington “Getting our houses in order” (*Prospect,* Issue 154, January 2009)

Yvonne Rydin “thinking through the energy uncertainties” (*Town & Country Planning Association Journal*, May 2009; subscription only)
http://www.tcpa.org.uk/resources.php?action=resource&id=452

Yvonne Rydin, Sandy Thomas, and John Beddington. (*Proceedings of the Institution of Civil Engineers: Urban Design and Planning*, Issue 4, December 2009)

Annex

The SEMBE Plan of Stakeholder Engagement

Organisation	Action
Department for Communities and Local Government	Communities and Local Government will work with the Foresight Follow-up team and project experts to hold an external workshop in early 2009. The workshop will support the development of the Eco-towns programme and explore ways of raising interest levels and increasing cross-governmental participation.
Department for Communities and Local Government and Department for Innovation, Universities and Skills	Foresight will work with: the Chief Scientific Adviser and policy officials in Communities and Local Government; the Technology Strategy Board; and the Innovation Policy Directorate in the Department of Innovation, Universities and Skills, to develop thinking on stimulating innovation and exercising leadership in the deployment of retrofitting to address the challenges posed by decarbonisation of the existing housing and building stock.
Department of Energy and Climate Change	The Department of Energy and Climate Change welcomes the Foresight *Powering Our Lives* project evidence base, report findings, and futures scenarios, which will inform and support the development of policy especially on heat and energy savings issues. Over the coming months government will discuss the UK's strategy for achieving an 80% overall reduction in carbon emission by 2050 and will shape the vision for how individuals and communities can heat and power their homes and businesses in an affordable, secure, low carbon way.
Department for Innovation, Universities and Skills	The Adult Skills Directorate in the Department for Innovation, Universities and Skills notes the Project's findings and will blend them with their own work on Low Carbon Skills with the aim of establishing a high-level forum from across industry and across government departments. The forum will produce a high level delivery plan for the cross sector skills effort needed for the transition to a low carbon, resource efficient economy, with a view to handing this work to the Sector Skills Alliance on a date to be agreed.
Department for Business, Enterprise and Regulatory Reform	In developing the Low Carbon Industrial Strategy the Department for Business, Enterprise and Regulatory Reform will consider the findings of Foresight's *Powering Our Lives* project.

Organisation	Action
Sustainable Development Commission	The Sustainable Development Commission welcomes the Foresight *Powering Our Lives* project report in light of the Commission's own publication, *Stock Take, Delivering improvements in existing housing* (2006). The Sustainable Development Commission will continue to work with government and stakeholders on policy solutions for achieving substantial improvements in the existing housing stock. The findings of Foresight's *Powering Our Lives* project and the scenarios it has produced will help stimulate debate.
Commission for Architecture and the Built Environment	The Commission for Architecture and the Built Environment will host an event in early 2009 to provide a forum to launch the Foresight *Powering Our Lives* project research and to debate the contribution it can make in tandem with Commission for Architecture and the Built Environment's Sustainable Cities programme due to launch in March 2009. This event will be specifically for architects, local authorities, planners, core cities and other built environment organisations. Key representatives from government and academia will be invited to speak, capitalising on the popularity of previous joint Commission for Architecture and the Built Environment/Foresight events.
Research Councils UK	Representatives from the research councils, including the Energy Programme, will discuss the Project's findings and the implications for the future research agenda.