

# PROJECT REPORT

## IMPLEMENTATION OF EMERGING GOVERNMENT AND OTHER URBAN REGENERATION SUSTAINABILITY POLICIES

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[www.urbanbuzz.org](http://www.urbanbuzz.org)

**UrbanBuzz**  
Building sustainable communities

## FOREWORD

UrbanBuzz is a two-year practical, evidence-based programme designed to share knowledge, stimulate new thinking and bring the ideal of building sustainable communities within our grasp. The £5million programme, funded by HEFCE and DIUS, comprises a number of interlocking mechanisms including 28 knowledge-exchange projects, establishing and maintaining human networks, providing training and material for training and education, and an active and evolving dissemination strategy.

Construction and the use of buildings represent a very significant element in achieving sustainable communities—for example, 49% of CO<sub>2</sub> in UK comes from building construction and use. The construction industry in the UK is large and fragmented, and there is an urgent need for clear policy requirements and implementation of sustainable construction. Public opinion has swung considerably in favour of achieving more sustainable buildings, so now is an especially good time to review how clear and well-understood are existing policies, how well these are being implemented around the country, and what are the views and recommendations of senior members of the construction and development industries, policy makers and senior academics.

Hence, one of the UrbanBuzz projects approached the implementation of emerging government and other regeneration sustainability policies around the regions of England and Scotland. Some findings were encouraging; others challenging for all those who have responsibility for creating more sustainable communities and reducing environmental impact either by development of policy, by setting resource priorities, by implementing construction, or by achieving a skills base that allow these in a cost-effective manner.

In November 2005, the Public Sector Construction Clients' Forum (PSCCF) presented a summary of its current work, much of which relates to sustainable construction. It was decided that there would be value in setting out and getting responses to that work and other emerging Government policies relating to sustainable construction through a series of seminars around the regions. Between May and December 2007 eight seminars were held around the regions of England and Scotland, each for up to 20 invited senior representatives from the demand and supply sides of the construction industry, the public and private sectors, and from academia. The aims of the seminars were:

- to promulgate and facilitate the adoption of recent and emerging Government policies relating to sustainability in the built environment sectors;
- to identify and comment on practical difficulties in implementing Government sustainability policies;
- to help feed emerging Government sustainability/construction policies into universities to inform and stimulate their research and teaching;

- to input relevant academic thinking into development of Government policies in this area.

Each seminar lasted for a day, after which there was a report of the main conclusions and recommendations. These reports have been consolidated into this Final Report. The draft Final Report was launched on 15 January 2008 following a speech on sustainable construction by Stephen Timms MP, the then Minister for Construction. Thereafter a number of meetings were held with senior officers of Government and the professional institutions to discuss the draft findings and recommendations, and their responses have been subsequently incorporated into the Final Report.

This report is now circulated for response from those who can make things better— Government Departments, professional Institutions and HE/FE, the construction industry decision-makers and investors, and those who set regional policies and grant planning applications.

Responses would be welcomed by David Adamson using [dma23@cam.ac.uk](mailto:dma23@cam.ac.uk). An update on the responses to the conclusions and recommendations in this report will be issued at the end of the summer 2008.

Front cover photos:

Showing the final consultation event held on 15<sup>th</sup> January 2008 at UCL. Guest speaker shown is Rt Hon Stephen Timms MP, the then Minister of State for Competitiveness, Department for Business, Enterprise & Regulatory Reform



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## EXECUTIVE SUMMARY:

### BACKGROUND AND AIMS

This UrbanBuzz project - Implementation of Emerging Government and Other Urban Regeneration Sustainability Policies – consisted of a series of seminar-based discussions on how recent Government sustainability initiatives for construction could best be implemented or effected. The aims of these seminars were to share knowledge and critique how best in practice:

- to promulgate and facilitate the adoption of recent and emerging government policies relating to sustainability in the built environment sectors;
- to identify and comment on practical difficulties in implementing government sustainability policies;
- to help feed emerging government sustainability/construction policies into universities to inform and stimulate their research and teaching; and
- to input relevant academic thinking into development of government policies in this area.

Seminars were held in several regions: the South West (Bath), the East (Cambridge), Scotland (Dundee), the South East (London), the North East (Newcastle), the East Midlands (Nottingham), and the North West (Salford). As a result of these original seminars a series of follow-on events, locally funded, have been, or are due to be, held within the regions.

175 people attended the seminars, drawn from the senior levels of local, regional and national government, industry (developers, consultants, house builders, contractors and suppliers), and academia.

The principal conclusions of the seminars are as follows.

## CONCLUSIONS: POLICIES, STANDARDS

- There should be a shift of emphasis to reducing CO2 emissions from built stock rather than having such a considerable focus on 'new-build'; greater emphasis on the role of Building Regulations vis a vis achievement of requirements via planning requirements; affirmed idea behind HIPS.
- An emphasis on Whole Life Costing and Post Occupancy Evaluations was widely welcomed but the lack of progress in implementation is considerably reducing the opportunities to meet Government sustainability targets; this largely follows from a delay in introduction of Government requirements and from a lack of censure of those public sector clients that do not follow current regulation/guidance.
- Government and Planning Authorities should give similar policy priority to reducing requirements for potable water as to energy.
- Legislation for utilities' regulators needs updating so as to allow them to act more in the public interest regarding collaborative proposals by renewable utility provision, especially electricity generation.
- The recent transport White Paper was welcomed.
- There is a need to improve assessments of embodied energy/carbon in sustainability decisions especially in whole-life evaluation. This will require promulgation of research on embodied energy in construction materials.
- Renewables – on-site urban restraints make cost-effectiveness and practicability very hard to achieve; there should be a market in off-site generated power analogous to the carbon market.
- Knowledge of Government sustainable construction policies was patchy and limited, especially in regions further from London.

## CONCLUSIONS: POLICY IMPLEMENTATION

- There was a widespread call for greater focus and leadership at national Government level – greater consistency and clarity of policy and legislation. This requires a much clearer definition of roles for the three levels of Government. There was considerable support for

reinforcing the role of the Regional Development Authorities (RDAs) , and a strong opposition to differences between standards set at the different levels of government. RDAs were seen as best placed both to set standards and provide advice on the great (most think excessive) amount of policy and rules about grants. These matters should be discussed with the appropriate parts of Government, including Cabinet Office, DCLG, DBERR, and HMT.

- Government should urgently enforce in practice the standards it has already agreed for sustainable, whole-life based procurement (it was widely seen as not now doing so), and issue the Supplement to the Green Book quickly. The ambiguity between ‘targets’ and ‘requirements’ was seen to be damaging in all Regions, especially among those considering investment in products or training— investment follows requirements rather than targets.
- Fiscal incentives to encourage homeowners investing in sustainability measures would now be timely to encourage the market which was seen as having shifted considerably and increasingly quickly towards the position where purchasers are beginning to pay a differential for enhanced sustainability; the most appropriate measure cited was capital allowances which should be adjusted, albeit temporarily recent changes were seen as running counter to Government policies for sustainable construction.
- The roles of insurance (PI, performance bonds) and the reluctance of property surveyors and funders to give credit for sustainability measures are crucial and need to change. The impact on land values of higher sustainability standards is complex and needs to be better understood; this should be addressed with professional bodies such as the RICS.

#### CONCLUSIONS: SKILLS

- The serious skills capacity shortages are of universal concern, and are already seen as a significant obstacle. Shortages at all levels in government (especially local) need to be addressed, possibly in the way of the successful grants to increase effectiveness in Local Planning Authority officers. It was shown how universities could help. The shortage of mechanical/electrical engineers is already resulting in design work and specifications which are often not properly cost-effective, and not adequate in sustainability; more emphasis should be

given to stating and following Key Performance Indicators from project inception.

- Further Education (FE) is being very successful as far as resources allow in training critical skills in Modern Methods of Construction (MMC) and this will help to address the skills shortages; however, there is a need for better support for accreditation of courses and of trainers. It is recommended that an MMC cluster is set up.
- Professional Institutions are doing well in their own sustainability programmes (research and CPD) but are losing effectiveness by lack of collaboration between them so as to encourage and achieve the integrative thinking and teamwork needed for sustainable construction. Professions especially important in this include building service engineers, architects, planners, building surveyors and valuers.
- All six construction Skill Sector Councils should work much more closely together, especially regarding sustainable construction; there is a strong case for coalescing ConstructionSkills and SummitSkills.

#### CONCLUSIONS: HIGHER EDUCATION

- HEFCE and EPSRC should give more weight to construction management in the sustainability context.
- There was a view in all regions of England that the Professional Institutions must move quickly, more decisively and in better collaboration to update their criteria for assessing course-content for undergraduate courses in design/construction in both Higher Education and FE. This should be discussed soon.
- There was general appreciation for the benefits of the increases in resourcing of Visiting Professors and, crucially, support staff for them, and it was recommended that industry and HEFCE should seek to continue to increase such support. Support for FE by the industry was often found to be abortive, largely because of short-term policies and fragmentation in the industry; it was thought that greater sharpness in Government policies would help in this. There should be discussion of these issues with appropriate professional bodies, including CIOB.

## CONCLUSIONS: TECHNOLOGY

- There was general confidence that the technology base in UK is capable of meeting the challenges of clearly-set Government sustainability construction targets, although overheads and time-scales associated with grant applications are onerous. There was a widespread view that the construction industry is not well enough aware of the commercial potential in the sustainable construction markets internationally.
- There are many good examples of sustainable construction and renewable energy generation but awareness of these is still poor despite some good best-practice work by Constructing Excellence, OGC and Professional Institutions. Promulgation should have a higher priority. This includes promulgation of research on metrics which increasingly are needed in defining and specifying sustainable construction through Design Quality Indicators or otherwise. Dispersion of responsibility between Government Departments and lack of collaboration between professional institutions should be addressed in this context.
- All involved in sustainable construction policy and implementation should divert some of their efforts to learning from successful work in other countries. It was also noted that it should be more widely realised that many decisions relating to sustainable construction are in fact made overseas.
- DBERR, EPSRC, and HEIs should commission more research on actual energy use in new public sector buildings, e.g. schools, including how well actual use reflects design and investment option appraisals. The results should be widely promulgated despite professional/contractual barriers.

## FINDINGS AND RECOMMENDATIONS FROM REGIONAL SEMINARS

### INTRODUCTION

- 1 This UrbanBuzz project consisted of a series of seminar-based discussions on how recent government sustainability initiatives for construction could best be effected and what needs to be done in practice to create a more sustainable urban environment. The aims of these knowledge sharing events were to share and critique how best in practice:
- To promulgate and facilitate the adoption of recent and emerging government policies relating to sustainability in the built environment sectors;
  - To identify and comment on practical difficulties in implementing government sustainability policies
  - To help feed emerging government sustainability/construction policies into universities to inform and stimulate their research and teaching;
  - To input relevant academic thinking into development of government policies in this area.
- Seminars were held in the South West (Bath), East England (Cambridge), Scotland (Dundee) South East (London), North East (Newcastle), East Midlands (Nottingham) and North East (Salford) regions. A series of follow-on seminars locally funded has started. In total, over 100 people attended, drawn from the senior levels of local, regional and national government, industry (developers, consultants, house-builders, contractors and suppliers), and academics.
- A full list of those attending is given in Appendix 1

## PRINCIPAL FINDINGS

- 2 The principal findings of the seminars were as follows.
- Two areas are strongly in need of clarification:
    - Whole Life Costs/ Whole Life Value/ Whole Life Procurement/ Whole Life Performance
    - Renewables
  - The difference between Targets and Requirements needs to be much clearer. People will invest in the latter but not necessarily in the former.
    - Confusion exists as to where and how responsibility for setting Requirements lies: at the National, Regional or Local levels: the matter of relative roles should be clarified; there was most support for Regions having a greater leadership role and greater guidance capacity.
  - The professions need to act in a more interdisciplinary manner to address the challenges that arise in trying to achieve improved sustainability.
  - The Sector Skills Councils relating to the construction industry should be combined into one body, especially Construction Skills and Summit Skills
  - The commercial opportunities and 'best practice' relating to sustainable construction need to be promulgated more effectively in UK.

FINDINGS		RECOMMENDATIONS
POLICIES/TARGETS/REQUIREMENTS		
3	There was considerable support for differentiating more clearly between requirements and targets.	All policy makers should make this distinction.
4	There was a strong view that as much policy as practicable should focus on a specific time-scale so as to help the construction industry make investment decisions. Around 2016 was suggested as an important period for the UK Government in terms of sustainability targets and focus on a year such as that should help bring focus to its targets and programmes.	Government and its agencies should focus as far as is justifiable on a year such as 2016 in promotional sustainability campaigns.
5	There was wide agreement that there should be a shift of Government priority towards enhancing sustainability of the existing built stock (through retrofit/refurbishment, through changing human behaviour in the use of buildings, and by curbing the wasteful aspects of electrical devices, notably 'infotainment'). It was appreciated that there are political and PR benefits to giving high priority to sustainability in new construction, but as that represents only about 1% of the built stock annually, emphasis on existing stock and on human behaviour is more cost effective.	Government and other policy makers to switch emphasis from new build to refurbishment, and to human behaviour.
6	There was endorsement of building regulations as the primary means of enforcing sustainability standards, rather than the planning system. Though both are required, building regulations are	Building Regulations should be setting rising standards for

	capable of more straightforward enforcement (with the Local Planning Authority [LPA] being able to recover costs), albeit at the risk of public opposition to overzealous enforcement. The planning system responds more to local democracy but leads to a patchwork for requirements. There was a call, welcomed by LPAs, for greater dialogue between developers and local planning authorities/RDAs on the strategic priorities for the use of S106 money in the medium and longer-term future.	sustainability, and should be enforced.
7	There was call for further appraisal on how effectively Part L of building regulations is being implemented and how it could better be enforced.	Conduct appraisal studies.
8	There was general supports for HIPS (Home Information Packs), There was, however, criticism of those who carry out valuations for houses and commercial buildings who are reluctant to give due value for sustainability measures which reduce running costs (particularly energy) and help owners/occupiers to afford the additional costs of being sustainable.	Discuss with RICS
9	There was a unanimous call for closer focus, clarity, consistency and cohesion between the statements of Government departments. Many called for a more unified focus of responsibility and stronger leadership for sustainability within Central Government (e.g. Cabinet Office, or the new French Government model). The fact that there is now unprecedented agreement among the political parties for sustainability means that clarity, cohesion and leadership should be easier to achieve, with public support.	The Cabinet Office should give consideration as to how best to improve cohesion and consistency in formulating and promulgating Government sustainability policy.
10	Too many clients pay lip service to the need for sustainable construction and the principles of whole life costing. There was universal welcome for the measures set out in the forthcoming supplement to the Green Book; there was wide disappointment over the delay in launching it, and the absence of reference to the Green Book and Whole-Life Costing in the current Government consultative	HMT should issue the Green Book supplement without further delay.

	<p>document on sustainable construction.</p> <p>There was welcome for the new ISO (15686-5) on Whole-Life Costing.</p>	
11	<p>There was little adverse comment about potential difficulties in carrying out option appraisals on a Whole-Life Cost basis, beyond the general concern about skills shortages. (See below.)</p> <p>There was a widespread call for stricter imposition of Common Minimum Standards (CMS), especially regarding the achievement of BREEAM (Very Good): this matter will in large part be subsumed into implementation of the new Green Book.</p>	CMS should be enforced.
12	<p>At all seminars there was a call for more routinely carrying out Post-Occupancy Evaluations (POEs). (They are already Government policy under Gateway and Common Minimum Standards.)</p> <p>There was support for PROBE (<a href="http://www.usablebuildings.co.uk/">http://www.usablebuildings.co.uk/</a>) programme of evaluating recent construction and providing feedback, and a hope that the programme will continue.</p>	Information from POEs, particularly relating to the management [procurement] of the project, should be more easily and widely available. This is especially true of Government projects - PFI and others.
13	<p>Efforts should be made to fund and complete the Pearce Report which has begun to provide more evidence to support economic arguments for the intangible benefits of a good quality environment and for more appropriate value to be put on construction.</p>	Resources should be found to continue the research work started by the Pearce Report.
14	<p>There was widespread appreciation of policy and implementation of waste management reduction in the construction industry, although there is still much to be done.</p>	Government waste management support should continue.

15	<p>There was welcome for the Government's recent White Paper on transport, particularly regarding carbon management for new projects.</p> <p>There was agreement that the power of labelling is strong. Reference was given in relation to the white goods industry, and that the labelling of buildings could have an important impact.</p> <p>There was also a general welcome for the benefits already being achieved through Building Labelling systems.</p>	Energy labelling should be introduced as quickly and comprehensively as possible.
16	There was an extensively held view that the priority given by Government to water conservation was insufficient in relation to energy-related matters.	Government should give a higher priority to water conservation.
17	It was noted in several Regions that regulatory legislation concerning utilities dated from the early 1980s and should be reviewed: for example in many other countries, utility companies play an important role in providing district energy systems, guaranteeing sufficiently robust tariffs for sale of electricity onto the grid, and communication of consumption data comparisons with previous and average consumption figures to householders and building managers through their invoicing systems so as to alter consumers' behaviour.	Utilities' deregulation legislation should be re-visited.
18	There was a consistent view that it was often impracticable and/or not cost-effective to achieve a high level of on-site renewable energy generation in the urban context (and there was some criticism of the Merton requirement for on-site energy generation).	Research is urgently needed to examine the implementation and effectiveness of the Merton Rule.
19	There was a clear view from senior managers in the supply side that it would be extremely helpful to have a commercial market in off-site renewable energy generation (analogous to carbon trading).	The Government should commission a study into the

	This would require a framework for agreement between Local Planning Authorities to enable a developer to offset a shortfall in renewable energy generation in a particular planning proposal against renewable energy generation in another local authority area. By this mechanism, projects that over-achieve could get credit which could be used in other projects.	practicability of establishing a renewables market acceptable to local authorities and the City.
<b>IMPLEMENTATION OF SUSTAINABILITY POLICIES, TARGETS AND REQUIREMENTS</b>		
20	There was a range of views regarding the current [dis]advantages of having considerable differences in requirements between the three tiers of government – Central, Regional, Local. The majority of participants favoured clear differentiation of responsibilities between national, district and individual building targets. Sustainability specifications should be functional rather than prescriptive, focusing not on the “how” but on the “what”. In this way, there is scope for the supply chain to use its ingenuity to create sustainable developments.	There should be more debate on the challenges and benefits of allowing separate sustainability requirements to be set democratically at different levels.
21	There was strong consensus that in England the Regional Development Authorities (RDAs) represent the best level of government for setting requirements within a clear and concise, but not over-prescriptive framework set by Central Government.	RDAs should be made the focus of sustainability policy implementation.
22	<p>The capacity at all levels of Government, particularly Local, to assess and follow through the sustainability aspects of planning applications was universally thought to be significantly deficient, both in terms of the numbers and the quality of planning officers qualified (formally and informally) in sustainable construction.</p> <p>It was thought particularly helpful to have units in the RDAs capable of giving advice on sustainability policies, targets, requirements, rules for grant applications, and best practice regarding sustainable construction; this would raise levels of expertise and improve the efficiency of progressing planning</p>	Government should seriously consider repeating the successful grant awarded to LPAs to strengthen their planning staff capacity in the context of their increased sustainability workload.

	<p>applications. It was extensively proposed that the very successful grant to local authorities to enhance the capacity of planning officers should be similarly be available to support of sustainability-qualified officers/units in RDAs.</p>	
23	<p>It was widely and strongly agreed that Government at all levels should do more to promote shorter and more integrated supply chains in order to achieve sustainability; there are real advantages in bringing in product manufacturers, specialist and subcontractors in at an early stage – they have the most practical knowledge about the challenges of sustainable construction, and this needs to be brought into client decision-making at an early stage. Common Minimum Standards of procurement require this, and is agreed throughout Government, but are not seen as being widely implemented.</p>	<p>Procurement of government construction should be tendered on the basis of CMS.</p>
24	<p>In several Regions it was seen that there are very effective associations within metropolitan areas for handling problems such as waste or transport; there was general confidence that such existing bodies could very often deal with city-wide sustainability issues such as building standards (including refurbishment and house extensions) and district heating and/or energy generation installations.</p>	
25	<p>There was widespread agreement about the importance of markets in assessing the extent of voluntary acceptance of enhanced sustainability standards, and in all Regions there was some evidence of a limited but growing willingness to pay a cost premium for high sustainability standards in new houses and other buildings: estimates in like-for-like costings of higher sustainable standards ranged from 0.4% of construction costs up to £45k for larger houses.</p> <p>There were three main strands of opinion:</p> <ol style="list-style-type: none"> <li>1. very little shift in public opinion can be expected without Government subsidy</li> <li>2. there are early signs of a shift in public opinion and willingness to pay a premium for higher sustainability standards, but this shift is not fast enough to meet Government targets; hence</li> </ol>	<p>Government should take note of Option 2.</p>

	<p>some fiscal subsidy, at least on a temporary basis is justified. Re-introduction of sustainability-targeted capital allowances was the most frequently recommended means of fiscal leverage.</p> <p>3. The market for sustainable construction could well tip fairly soon after which there would be no need for subsidy: comparison was drawn with the later stages of public opinion shifts regarding seat-belts, drink/driving, and smoking.</p> <p>Option 2 had the most widespread support (and is analogous to the thinking behind the Stern report.)</p>	
26	<p>In all the regions there is an active and important debate about the effect of additional sustainability requirements on land values, both for land already in the land bank and yet to be bought. The effect is not entirely proportional or clear; a useful report from the South West Region is awaited. Clearly, the funding gap depends much on the extent to which the cost of adding sustainability requirements is discounted from land price for future projects and for projects on land already bought.</p>	<p>Better research is needed on the relationship between sustainability cost premium and land value.</p>
27	<p>There was a view in nearly all regions that all levels of government need to have a relatively high level of resources committed to PR if sustainable construction targets are to be met with sufficient public support.</p>	<p>PR efforts are needed to support sustainable construction.</p>
28	<p>Although programmes like 'Grand Designs' are very helpful they don't reach the mass market. Also the garden etc make-over programmes do not promulgate good practice as they often promote wasteful consumption. We also need the mainstream programmes, e.g. Eastenders, to address new sustainable lifestyle issues. It is important to have best practice supported by media and 'celebs'.</p>	<p>Part of the PR campaign should ensure that lifestyles portrayed in the media are a model of sustainability. (Compare achievements on smoking.)</p>

29	Interestingly, although invitations to participate in the seminars were almost invariably accepted by a wide range of public/private, client/supplier, academic/non-academic professions, no one senior from the media industry accepted. Though sustainability often is a story, sustainable construction is not: this was thought to be mainly because of a lack of preparation of 'stories', and not just the media preference for failure/blame stories. There was confidence that good sustainable construction stories could in fact be found, especially for local media.	Efforts should be made to find and promote stories featuring sustainable construction
30	As market-creation for sustainable construction products is easier to establish in times of high activity level, it was thought that now is a good time to stimulate markets by convincing industrial product investors that Government requirements really will be enforced, and by (even temporary) tax incentives and more specific priority for allocation of applied research grants.	Applied research grants and tax incentives should be provided for sustainable construction products. Product investors should be targeted by promotion.
<b>SKILLS</b>		
31	There was agreement on the urgency of bringing together all six of the Sector Skill Councils (SSCs) that relate to construction, especially ConstructionSkills and SummitSkills.	Government to note.
32	Quantitative forecasts of skill requirements are useful (to avoid working in a largely reactive manner) and are to be welcomed from the SSCs. ConstructionSkills' forecasts were accepted with only relatively minor comment.	
33	The roles of the Strategic Forum for Construction in England and the Scottish Construction Forum in Scotland are important especially re the big players and building services. However SMEs are in practice largely left out, and they employ most of the industry!	All to note. Renewed efforts should be made to engage SMEs in sustainable construction.

34	<p>There is a serious lack of staff capacity for sustainable construction in central government departments – indeed for construction management generally; there is too much dependence on consultants who are often more short-staffed than they appear to be.</p>	<p>All to note. Training schemes should be provided to increase capacity.</p>
35	<p>There is a more generally acute and long running shortage of planning skills especially in relation to sustainability. The public sector cannot compete with private sector salaries and ends up with lower end of quality. These shortages are exacerbated by the complexity of the planning process impeding project implementation.</p>	<p>See 20 above. Training schemes should be provided to increase capacity.</p>
36	<p>The achievement of sustainability objectives in Local Government is often very successful when current and future requirements are sufficiently clear, but if sustainability is to feature. the costs of re-allocating staff from elsewhere to enhance sustainability capacity must be faced.</p> <p>Lack of Human Resource (HR) capacity in LPAs for sustainable construction assessment is a crucial barrier to achievement especially in regard to: 1) development of sustainability policy; 2) technical appraisal of application; 3) procurement</p>	<p>See 20 above.</p>
37	<p>The sustainability skills of elected members are often significantly deficient.</p> <p>CPD for Councillors and developers (together) to off-set their skills shortages was seen as attractive. CPD is crucial, especially as the professional institutions are under-performing in regeneration and sustainability, despite their own programmes. Help from Higher Education (HE), Further Education (FE) and/or RDAs would be welcome</p>	<p>DCLG to note. CPD courses should be supported to counter skills shortages.</p>

38	There are serious deficits amongst technologists in 'soft' skills especially managerial and planning.	Professional institutions, HEIs and HEFCE to note.
39	The skills shortage in building services engineers is already causing a drop in the quality of specification and design to the detriment of sustainability and value for money.	Professional institutions, HEIs and HEFCE to note.
40	Delivery of sustainability depends on the weakest link in the supply chain in achieving sustainable communities, and that was seen most widely as being the skills gaps. More training on Modern Methods of Construction (MMC) is urgently required. Best practice examples would be very helpful to transform human behaviour. Establishment of an MMC 'cluster' would be helpful.	DBERR and LSC (Learning Skills Council) to note. RDAs should consider supporting MMC clusters in their regions.
41	As more firms move into service provision – going from front-end requirements management to Facilities/ Operations Management, the necessary knowledge base is expanding beyond that of any of the traditional professions. As a result there is an increasing tendency for firms to work with universities (HEIs) on CPD and research	Strategic Forum to note.
42	SummitSkills are driving FE to include sustainability, e.g. Solar Heating, other renewables and modular construction, etc. and the challenge is being taken up.	
43	Most large contractors have an intensive training programme but their supply chain partners often do not because of their smaller scale and because they are further from seeing the benefits and investment justification.	Support for training should target second and third tier organisations.

44	The professional institutions have good sustainability programmes but do not work together enough.	The CIC should be encouraged to bring together the professional institutions to engage in a common programme in support of sustainable construction.
45	<p>Awareness-raising and skills-training are needed at every level – clients, project managers, design consultants, contractors, sub-contractors, right through to facilities managers. A significant shortage amongst artisans/tradesmen was noted especially among those capable of implementing new technology. The technical challenges of achieving high tolerances in construction using new technologies, for example, were slower in being taken up in the UK market than competitor European markets.</p> <p>This is particular a challenge for FE and providers of CPD. It was agreed that there is a need for renewed call for apprenticeships and a need to look at the perception of career growth.</p>	LSC and professional institutions to note.
46	There is an urgent need for certification mechanisms for trainers and trained; professional Institutions (e.g. RIBA, ICE, RICS) need to give more attention to MMC at the FE, HE and CPD levels.	All to note.
47	There was widespread concern over the lack of resources needed for teaching sustainable construction at NVQ2 level in schools from 2009.	Government (DFES) to note and act
48	Some see the biggest barriers to integrated sustainability training as the professions and universities. Professional Institutions are following sustainability agendas but are not collaborating in shaping undergraduate courses. Responsibility for sustainability needs to be across the team.	All to note.

	Schools of Architecture are producing good students but the culture is very individualistic, particularly in prize-giving. The lack of training to work collaboratively between disciplines increases the likelihood of failure to achieve targets. One result is the poor quality of user manuals on building hand-over, causing inefficiency and waste. Much more should be done in this area; it should be stressed more heavily in Government guidance.	
<b>HIGHER EDUCATION</b>		
49	Increase in 'visiting' Professors and support for them welcomed – the more the better. This should help 2-way flow of knowledge and ideas.	Universities with significant construction research and teaching portfolios to note.
50	There was a variety of views as to whether there is a need for specialist posts for sustainability in design teams. There are still very few dedicated sustainability courses available in British Universities.	HEFCE to note.
51	All Construction Managers should have sustainability as a core part of their education and training.	CIOB to note and to include in core syllabus requirements.
52	There has been a good increase in HE teaching of sustainability, and of interdisciplinary basis at post-grad level, and there is good supply of undergraduate level sustainability teaching, partly because of student demand.	

53	There was a view that the time has come for degrees specifically in sustainability at undergraduate level, but this view was not universally supported	HEFCE to note.
54	There was some concern expressed that EPSRC and HEFCE need to give even higher priority to sustainable construction per se.	EPSRC and HEFCE to note.
55	There was a consistently high level of confidence that both the construction industry ('the built environment industry') and the HEIs are very capable of meeting the technical challenges associated with sustainable construction requirements, provided the policies and requirements are clear.	
56	There was frustration at the EPSRC's IMRC (Integrated Manufacturing Research Centres) policy whereby four UK universities receive nearly 90% of UK construction management research funds on a pre-paid, non-competitive basis. This makes it very hard indeed for other universities to find EPSRC funds in this area and is killing research talent outside of the IMRCs.	EPSRC to note and action.
<b>TECHNOLOGY</b>		
57	There was general view that metrics should be more widely promulgated and used, with performance outputs being better co-ordinated nationally.	Government, academia and the professional institutions to note.
58	Metrics for development should better assess and correlate transport sustainability implications within wider planning considerations.	Government and Highways Authority to note.
59	There are good examples of the successful use of renewable energy including bio-mass: these need	Decide who should take the lead

	a higher priority in best practice promulgation.	on this. Carbon Trust?
60	Need realisation about how much implementation of sustainable construction by the supply side is decided by international companies; there is more effort in researching sustainable construction in other countries e.g. Finland, Norway, Germany, USA	Government and EPSRC to sponsor research in this area.
61	The damaging trend for all rooms to be space heated (especially in houses), and even lit, while unoccupied should be countered and reversed by public promulgation of the consequences of cost, and environmental damage.	All to note and encourage appropriate PR.
62	The higher productivity and cost-effectiveness of district generation were noted, but there is still restraining public resistance concerning lack of confidence about reliability, and loss of personal control: these should be better addressed both in design and in PR. There are many examples of success and these should be more widely publicised. Mandatory option appraisals of the costing and viability of on-site generation will help, but it was agreed that there needs to be a more vigorous debate about off-site generation as a trading market, analogous to the strengthening carbon trading market. It was felt that the power aspect should be treated separately from heat, especially given the use of standby functions.	DEBERR and CIBSE to note.
63	HE/FE/Professions/CIBSE should now concentrate more/ as much on cooling of buildings than heating because of climate change.	All to note.
64	The relationship between embodied energy, energy used in the construction of new buildings, and energy used in their operation was considered; it would be helpful if academic research could better show relationships between these, e.g. for schools.	EPSRC and HEIs to note.

65	The BSF programme should focus on Whole Life Costs rather than capital costs and this should be reflected in the tendering process.	Government to note. [DFES]
66	There were concerns expressed about the problems and the need to have confidence in getting insurance and performance bonds for relatively new technologies.	CPA (Construction Products Association) and RICS to note.
67	UK could do a lot better in identifying the market opportunity for sustainable energy technology, metrics and display technology. This will be decisive in winning the sustainable construction technology market. Close liaison between HE and leading producer companies is vital.	DBERR to note.

## SOME INITIAL RESPONSES TO THE DRAFT REPORT

1. After the roll-out of the draft report on 15 January 2008, discussions were held with, *inter alia*:
  - DBERR
  - OGC/HMT
  - CIC
  - RIBA
  - ICE
  - RICS
  - SSC Construction Skills.
2. Comments on recommendations at paragraphs 26, 38, 39, 44, 46, 48, 64-65.
  - a. There was genuine support in CIC and the professional Institutions for recommendations calling for better collaboration regarding influencing the syllabi relating to multidisciplinary teaching and research for sustainable construction, getting better priority for research grants, and addressing issues around MMC, and curricular/organisational problems in transitioning from FE to HE. The President of CIC has arranged an 'Away Day' in May 2008 for current/incoming Presidents of the professional Institutions with sustainable construction as the main agenda topic. A meeting was held with the President of the RIBA.

The RIBA fully accepts the need for more integrative skills in the industry, is addressing the related issues, and is enthusiastic to enhance collaboration with other Institutions and with LSE.
  - b. A meeting was held with the President of the ICE. The independence of the draft report was noted and welcomed. Several ICE initiatives relevant to the recommendations are in progress. ICE is looking to enhance collaboration with CIC and with other professional Institutions, and looks forward to receiving and commenting on the Final Report.
  - c. Meetings were held with several officers of the RICS. RICS is fully committed to ensuring issues of sustainable development are incorporated into its qualifications for surveyors, the practice support given to its members and its public policy work. For example on valuation, the RICS has undertaken a

large amount of work to consider issues around the valuation of sustainability in property at both the UK and EU level, looking at energy costs and other factors. This work has involved the funding of new research and the promotion of discussion of such issues including the holding of an event as part of the EU Sustainable Energy Week in January 2008. The RICS' Valuation Faculty has a Valuation and Sustainability working group which will continue to consider these matters.

Regarding training in whole-life costing and option appraisals, many property practices have already developed specialist skills and services for whole-life costing and appraising options on wider sustainability criteria. Government's purchasing power is a major influencer on the property sector and so as wider sustainability criteria feed through into Government contracts, leading companies will react quickly to address these issues. The RICS would certainly welcome any initiative by HMT/OGC to disseminate to the industry how Government will be further incorporating sustainability into its future purchasing of construction contracts. One way forward might be a seminar with key industry players.

The RICS confirmed that the rules related to valuation methodology reflect current market conditions. Other comment noted that valuation practice already creates a differential in value as increasingly property with high energy costs is marked down: in a sense, for funders or purchasers this has the effect of encouraging investment in new buildings or refurbishment to higher sustainability standards.

3. Comment on recommendations at paragraphs 35, 25, 31, 40, 60, 7, 9, 10-13, 16, 18-19.
  - a. On fragmentation/the focal point in Government in Construction, Stephen Timms said to the BERR Select Committee on Tuesday 22 January: "I think it is absolutely essential that we hold this wide range of interests together and I believe that we can, and the way for us to do it is for my department to work very closely with the other government departments involved. A very good current example is the work on the Strategy for Sustainable Construction where we have a project board that is chaired by my department and that involves senior figures from the other departments you have mentioned, including Defra, OGC and Communities and Local Government, plus industry, plus the Sustainable Development Commission, and that in that way we make sure that the strategy reflects the needs of industry and of all the government departments involved. I think that is the only way we can do it and I think if we organise ourselves in that way we can do it successfully." The findings of this UrbanBuzz programme , in particular on the need for more focus on the existing stock, are reflected in the responses to the formal BERR Consultation exercise. BERR has noted the recommendations of this

report and stated that they will be borne in mind in the drafting of the Strategy this spring.

- b. Some of the above recommendations are new, others provide evidence or reinforcement for recommendations suggested in other comment; for example, the key level of governance or guidance at Regional Level, the shift in priority towards existing rather than new-build, and clear note of the importance of sustainability of potable water consumption (now in paragraph 10.19 of consultative draft "Strategy").
  - c. Regarding the Green Book (the rules about use of public funds), OGC notes that HMT have said that the best practice aspects of the Green Book Supplement as approved by PS CCF in December 2006 should be separated from the text which deals more specifically with whole-life cost evaluations to address sustainability requirements. It has been elsewhere suggested that the widespread comment voiced during and after the seminars would be largely met by the addition to the Green Book of the sentence: 'Those commissioning public sector construction/refurbishment projects must show evidence of carrying out an option appraisal that includes both the running costs out to 10 years, or another period if demonstrably appropriate, and also the notional costs of carbon dioxide and other emissions at costs advised by Defra (currently the cost of CO2 emission is £75 per tonne per year); these costs should all be discounted back to NPV in the normal manner.'
  - d. Regarding capital allowances and other recent fiscal changes, OGC would welcome evidence concerning any adverse effects on Government sustainable construction requirements or targets (the important difference between these having been noted).
  - e. Regarding creating an MMC cluster (paragraph 40), three possible contenders have been noted – Cambridge, Loughborough and Advantage Offsite in Shrewsbury.
4. Comment on recommendations at paragraphs 31 and 48.

There has been active response in SSC and there is agreement that "all six Built Environment Sector Skills Councils should work much more closely together, especially regarding sustainable construction, building on the collaborative work they took forward in developing Sustainability Skills Matrix for the Built Environment Functions". This should go a long way towards meeting the calls for amalgamation of ConstructionSkills and SummitSkills.

- 5. Re Recommendation at paragraph 13 (re Pearce Report) it is hoped that ESRC funding to be made available to take forward this work.
- 6. Recommendations concerning RDAs at paragraphs 21 and 22.

- a. Some recognition is needed about the Sub National review and the change in regional planning to bring together spatial planning and economic planning. Some have a fear that the RDAs will push for a "growth at all costs" agenda. That is not the case.
  - b. There is understanding of the point around the RDAs leading on sustainable development (Regional Spatial Strategy and Regional Economic Strategy - these two soon to come together); recognition needs to be made of RDA's lack of powers. This rests with the local authorities, and a partnership between the RDAs and local authorities is what is required.
  - c. The finding in paragraph 22 was found very interesting among RDAs. It was noted that there is no recommendation associated with it-- it is suggested the recommendation is considered by DCLG. Consistent advice and knowledge sharing is important. Regions seem to be the right level. An RDA is exploring this at present. The RDA Sustainable Development/One Planet team, led by SEEDA, should be alerted to this.
7. Further discussion on matters relating to Modern Methods of Construction has been positive; aspects relating to housing have been briefed to the Minister for Housing, and a case for a cluster for MMC is being drafted.
  8. A package of CPD for designers and constructors, and for local Government councillors and officers has been developed by the University of Bath.
  9. More data on the capital cost differential for enhanced sustainability is circulating through follow-on discussions.,

## APPENDIX 1 – PARTICIPANTS IN THE DISCUSSION

### ATTENDEES AT THE ROLL OUT EVENT, 15 JANUARY 2008

Forename	Surname	Organisation Name
David	Adamson	University of Cambridge
Chris	Anderson	UrbanBuzz
Stuart	Barlow	3DReid
Tim	Barnes	UCL Advances
Malcolm	Bell	Leeds Metropolitan University
Ian	Bentley	Oxford Brookes University
John	Betty	Bath & NE Somerset Council
Robert	Biel	UCL - Bartlett

Peter	Bishop	Constructing Excellence - LGTF
Krystyna	Blackburn	Constructing Excellence
Lambros	Antoniou	Action Acton
Terry	Boniface	Department for Business, Enterprise and Regulatory Reform
Iain	Borden	UCL - Bartlett
Penny	Bramwell	Government Office for London
Allan	Brimicombe	University of East London
Dan	Brown	Meganexus
Tim	Broyd	Halcrow
John	Canton	Institution of Civil Engineers
Jane	Carlsen	Greater London Authority
Alain	Chiaradia	Space Syntax

Chit	Chong	London Borough of Camden
Barry	Clarke	Newcastle University
Paul	Coates	University of East London
David	Cobb	UrbanBuzz
Roger	Courtney	Building Connections
Tina	Crombie	UrbanBuzz
Adam	Cunnington	Land Securities
Carol	Dair	Oxford Institute for Sustainable Development
Jon	Davis	UrbanBuzz
Magda	Devaris	Independent
Ava	Fatah gen.Schieck	UCL - Bartlett
Max	Fordham	Max Fordham Associates

Steve	Gawthorpe	English Partnerships
Bill	Gething	Fielden Clegg Bradley Studios
Daniel	Gilbert	UrbanBuzz
Malcolm	Grant	UCL Provost
Christoph	Hadrys	University of East London
David	Hall	Platinumlinks
John	Hall	Constructing Excellence
Phil	Harris	Miller Construction
Julian	Hart	Lancefield Consulting
Guy	Hazelhurst	Construction Industry Training Board
Robin	Hickman	Halcrow
Bill	Hillier	UCL - Bartlett

Sandra	Hoisz	Groundwork
Malcolm	Horner	University of Dundee
Martin	Howe	Bevan Brittan
Tony	Iles	Atkins
John	Ioannou	Office of Government Commerce
Shalini	Jayasinghe	London Sustainability Exchange
Mike	Jenks	Oxford Institute for Sustainable Development
Tony	Kay	Lovell Partnerships Ltd
John	Kelsey	UCL - Bartlett
Judit	Kimpian	Aedas
Rudi	Klein	Heating and Ventilating Contractors' Association
Michael	Kohn	Slider Studio

Pauleen	Lane	University of Manchester
Steve	Lane	Middlesex University
Bob	Lowe	UCL - Bartlett
Sebastien	Macmillan	University of Cambridge
Anna	McCrea	Consultant
Gemma	Moore	UrbanBuzz
Roy	Morledge	Nottingham Trent University
Peter	Morris	UCL - Bartlett
Dejan	Mumovic	UCL - Bartlett
Nadia	Nath-Varna	Royal Institution of Chartered Surveyors
Robin	Nicholson	Edward Cullinan Architects
Tadj	Oreszczyn	UCL - Bartlett

Simon	Payne	Cambridge City Council
Alan	Penn	UCL - Bartlett
Peter	Reid	London Technology Network
Stuart	Robinson	CB Richard Ellis
Elaine	Ryder	Northumbria University
Yvonne	Rydin	UCL - Bartlett
Andrew	Shaw	Department for Business, Enterprise and Regulatory Reform
Michael	Spyer	UCL - Enterprise
George	Stevenson	Active Plan Solutions Ltd
Christina	Stone	Consultant
Tiannii	Tang	Meganexus
Cengiz	Tarhan	UCL Business

Stephen	Timms MP	Minister of State for Competitiveness, BERR
Simon	Tonks	Rogers Stirk Harbour + Partners
Chris	Tucker	
Paula	Vandergert	CABE
Laura	Vaughan	UCL - Bartlett
David	Walker	Bowmer & Kirkland Limited
Chris	Ward-Brown	East Midlands Development Agency
Jeremy	Watson	Arup
Neil	Webster	GVA Grimley
Paul	Wheeler	Gateway Magazine
Bob	White	Mace
Barrie	Wicklen	Cambridge Regional College

John	Wilson	Civil Engineering Contractors Association
Jez	Wingfield,	Leeds Metropolitan University
Gesche	Wuerfel	Goldsmiths
Simon	Wyke	London Development Agency

#### MATRIX OF ATTENDEES AT REGIONAL SEMINARS

Seminar	Date	Name	Organisation	Level	Category
UEL	03.07.07	David Adamson	University of West England	Consultant/Visiting Professor	Architect/Consultant
UEL	03.07.07	John Anderson	Berkeley Homes	Regional Managing Director	Developer
UEL	03.07.07	Simon Challen	Berkeley Homes	Sustainability Manager	Developer
UEL	03.07.07	Peter Bishop	Constructing Excellence	Programme Manager	National Bodies

UEL	03.07.07	Penny Bramwell	Government Office of London	Head of Sustainable Development	Regional Government
UEL	03.07.07	Andy Brown	London Borough of Southwark	Regeneration Manager	Local Government
UEL	03.07.07	Roger Courtney	UrbanBuzz	Reviewer	Independents/Others
UEL	03.07.07	Andrew Edkins	University College London	Facilitator	Academic
UEL	03.07.07	Roger Flanagan	University of Reading/CIOB/SKANSKA	Professor/President /Non-Executive Director	Academic/National Bodies/ Contractor
UEL	03.07.07	Max Fordham	Max Fordham Associates	Managing Director/Partner	Architect/Consultant
UEL	03.07.07	Guy Hazlehurst	CITB/SSC	Deputy Director Skills of Strategy	National Bodies
UEL	03.07.07	Robin Nicholson	Edward Cullinan Architects	Senior Partner	Architect/Consultant
UEL	03.07.07	Neil Pennell	Land Securities	Engineering Director	Developer
UEL	03.07.07	Yvonne Rydin	University College London	Professor	Academic
UEL	03.07.07	Clive Young	[DTI] DBERR	Director for Energy Policy in DBERR	Central Government
UEL	03.07.07	Ella Sivyer	University College London	Administration	Independents/Others

Newcastle	14.09.07	David Adamson	University of West England	Consultant/Visiting Professor	Architect/Consultant
Newcastle	14.09.07	Kevin Anderson	Watson Burton Law firm	Associate	Lawyer
Newcastle	14.09.07	John Burns	Mackellar Architecture	Director	Architect/Consultant
Newcastle	14.09.07	Barry Clark	Newcastle University	Professor and lead	Academic
Newcastle	14.09.07	Jonathoin de Souza	Constructing Excellence	Director of Regions and Demonstrations	National Bodies
Newcastle	14.09.07	Barry Errington	GONE	Senior Advisor	Regional Government
Newcastle	14.09.07	Steve Gawthorpe	English Partnerships	Area Director North East	Developer
Newcastle	14.09.07	Guy Hazlehurst	CITB/SSC	Deputy Director Skills of Strategy	National Bodies
Newcastle	14.09.07	Steve Hill	TaylorWimpey, George Wimpey North East Ltd	Commercial Director	Contractor
Newcastle	14.09.07	Douglas Kell	Civil Engineering Contractors Association	Director and Secretary	Contractor
Newcastle	14.09.07	Ian Larnach	Ian Larnach Associates Ltd	Company Owner	Architect/Consultant
Newcastle	14.09.07	Adrian Leaman	Usable Buildings Trust	Education Director	Architect/Consultant
Newcastle	14.09.07	Catriona Lingwood	Regional Director	Constructing Excellence in the North East	National Bodies

Newcastle	14.09.07	Elaine Ryder	Northumbria University	Administration	Academic
Newcastle	14.09.07	Hedley Smyth	University College London	Monitor	Academic
Newcastle	14.09.07	Kirsteen Thomson	ONE North East	Sustainable Regeneration Manager	Regional Government/RDA
Newcastle	14.09.07	Jon Watson	Jon Watson Consulting	Company Owner	Architect/Consultant
Newcastle	14.09.07	Phil Young	Esh Group	Executive Director	Developer
Newcastle	14.09.07	Paul Younger	Newcastle University	Professor	Academic
Nottingham	30.10.07	David Adamson	University of West England	Consultant/Visiting Professor	Architect/Consultant
Nottingham	30.10.07	Roger Courtney	UrbanBuzz	Reviewer	Independents/Others
Nottingham	30.10.07	Phil Harris	Public Private Partnership, Miller Construction	Associate Director	Contractors
Nottingham	30.10.07	Peter Hewlett	British Board of Agreement	Principal Consultant	Architect/Consultant
Nottingham	30.10.07	Dave Inskip	Experian Business Strategies (Representing Construction Skills)	Economist	Consultant
Nottingham	30.10.07	David Jupp	Britspace Modular Buildings	Director of Sales and Marketing	Contractors

Nottingham	30.10.07	Tony Kay	Lovell Partnerships Ltd	Business Development Manager	Contractors
Nottingham	30.10.07	Julian Marsh	Marsh:Grochowski Architects		Architect/Consultant
Nottingham	30.10.07	Martin Mayfield	ARUP	Director	Architect/Consultant
Nottingham	30.10.07	Mike Meech	GOEM		Regional Government
Nottingham	30.10.07	Roy Morledge	School of Architecture Nottingham Trent University	Associate Dean and Professor	Academic
Nottingham	30.10.07	Oliver Novakovic	BRE, Innovative Housing		National Bodies
Nottingham	30.10.07	John O'Brien	Laing O'Rourke Construction North Limited	Director (for half of England)	Contractors
Nottingham	30.10.07	Celia Payne	East Midlands NTI Construction Network	Network Co-ordinator	Academic
Nottingham	30.10.07	Saffa Riffat	University of Nottingham	Head of Institute of Building Technology and the Institute of Sustainable Energy Technology Professor	Academic
Nottingham	30.10.07	George Stevenson	ActivePlan Solutions Ltd	Managing Director	Contractors/Consultant
Nottingham	30.10.07	Roger Upton	Nottinghamshire County Council	Head of Design and Procurement	Local Government
Nottingham	30.10.07	David Walker	East Midlands Centre for Construction the Built Environment	Chairman	Regional Government

Nottingham	30.10.07	Chris Ward-Brown	East Midlands Development Agency	Construction Policy Advisor	Regional Government
Nottingham	30.10.07	Neil Webster	GVA Grimley		Architect/Consultant
Cambridge	08.11.07	David Adamson	University of West England	Consultant/Visiting Professor	Architect/Consultant
Cambridge	08.11.07	Paul Ashley	Mott Macdonald	Head of Sustainable Development (Main Board Director)	Architect/Consultant
Cambridge	08.11.07	Trevor Butler	BDP	Head of Sustainability (Main Board)	Architect/Consultant
Cambridge	08.11.07	John Canton	Institution of Civil Engineers	Regional Manager for East of England	National Bodies
Cambridge	08.11.07	Roger Courtney	UrbanBuzz	Reviewer	Independents/Others
Cambridge	08.11.07	Kate Haigh	East of England Development Agency	Senior Executive, Sustainable Development	Regional Government
Cambridge	08.11.07	Rob Hammond	Cambridge City Council	Chief Executive	Local Government
Cambridge	08.11.07	Guy Hazlehurst	CITB/SSC	Deputy Director Skills of Strategy	National Bodies
Cambridge	08.11.07	Graham Hughes	Cambridgeshire County Council	Director of Sustainable Infrastructure	Local Government
Cambridge	08.11.07	Chris Lang	Cambridge Regional College	Vice Principal, Director of Finance & Resources	Academic

Cambridge	08.11.07	Sebastian Macmillan	University of Cambridge	Course Director	Academic
Cambridge	08.11.07	Sue Manns	Arup	Associate Director	Architect/Consultant
Cambridge	08.11.07	John Onslow	Cambridgeshire Horizons	Director for Development	Regional Government
Cambridge	08.11.07	Simon Payne	Cambridge City Council	Director of Environment and Planning Facilitator	Local Government
Cambridge	08.11.07	Sian Reid	Cambridge City Council	Executive Councillor for Climate Change & Growth	Local Government
Cambridge	08.11.07	Tim Richards	Hewitsons Solicitors	Partner and Head of Property & Construction	Lawyer
Cambridge	08.11.07	Annti Roose	Estonian lecturer	Visiting Scholar	Academic
Cambridge	08.11.07	Paul Thwaites	Ashwell Property Group plc	Chief Executive and Owner	Developer
Dundee	04.12.07	David Adamson	University of West England	Consultant/Visiting Professor	Architect/Consultant
Dundee	04.12.07	Jan Bebbington	University of St Andrews	Professor of Accounting & Sustainable Development	Academic
Dundee	04.12.07	Tim Broyd	Halcrow/University of Dundee		Contractors/Academic

Dundee	04.12.07	Roger Courtney	UrbanBuzz	Reviewer	Independents/Others
Dundee	04.12.07	Jonathan Fair	Homes for Scotland	Chief Executive	Developer
Dundee	04.12.07	Dave Farebrother	Land Securities Group PLC	Environmental Director	Developer
Dundee	04.12.07	Noble Francis	Experian	Senior Economist., Business Strategies	Consultant
Dundee	04.12.07	Douglas Forbes	University of Dundee	CMRU	Academic
Dundee	04.12.07	Rob Goodburn	RMJM	Senior Architect	Architect/Consultant
Dundee	04.12.07	Malcolm Horner	University of Dundee	Emeritus Professor of Engineering Management	Academic/Consultant
Dundee	04.12.07	Paul Jowitt	Heriot Watt University/Scottish Institute of Sustainable Technology	Professor of Civil Engineering Systems/Director	Academic
Dundee	04.12.07	Jo Long	SEPA	Senior Conservation Policy Officer	Local Government
Dundee	04.12.07	Alastair Pearston	Sir Robert McAlpine	Regional Chief Engineer	Contractors
Dundee	04.12.07	Rod Pettigrew	Heating and Ventilating Contractors' Association/Sustainability Sub-Group, Cross Parliamentary Group for Construction	Head of Legal Department/Convenor	Consultant
Dundee	04.12.07	Colin Proctor	Davis Langdon LLP	Partner	Consultant

Dundee	04.12.07	Gordon Smith	Communities Scotland	Procurement Implementation Director	Regional Government
Dundee	04.12.07	Paul Stollard	Scottish Building Standards Agency	Chief Executive	Consultant/Regional Government
Dundee	04.12.07	Alan Tough	Scottish Construction Centre (Observer)	Regional Co-ordinator	Academic/Developer
Dundee	04.12.07	Wayne Ward	BRE Scotland	Commercial Director Highlands and Islands	Consultant
Salford	07.12.07	David Adamson	University of West England	Consultant/Visiting Professor	Architect/Consultant
Salford	07.12.07	Mustafa Alshawi	BuHu, The University of Salford	Research Institute Director	Academic/Consultant
Salford	07.12.07	Erik Bichard	BuHu, The University of Salford	Professor in Regeneration and Sustainable Development	Academic
Salford	07.12.07	Les Brown	Countryside Properties	Regional Project Director	Developer
Salford	07.12.07	Roger Courtney	UrbanBuzz	Reviewer	Independents/Others
Salford	07.12.07	Steve Curwell	Professor of Sustainable Urban Development & Director of the Urban Quality Research Centre	BuHu, The University of Salford	Academic/Consultant
Salford	07.12.07	Emma Gardner	Faber Maunsell	Sustainability Consultant	Consultant

Salford	07.12.07	Guy Hazlehurst	CITB/SSC	Deputy Director Skills of Strategy	National Bodies
Salford	07.12.07	Brian Holmes	Government Office for the North West	Deputy Regional Director	Regional Government
Salford	07.12.07	Pekka Houvilla	VTT (Technical Research Centre of Finland)	Chief Research Scientist	Academic/Consultant
Salford	07.12.07	Michael Joroff	Massachusetts Institute of Technology	Senior Lecturer	Academic/Consultant
Salford	07.12.07	Pauleen Lane	NWDA and EP	Board Member	Regional Government
Salford	07.12.07	Peter Morris	Bartlett, UCL	Professor of Construction and Project Management	Academic/Consultant
Salford	07.12.07	Andrew Platten	ELEVATE-East Lancashire	Head of Constructing the Future	Developer
Salford	07.12.07	Giles Simon	Cooperatives UK Limited	Communication and Development Officer	Developer
Salford	07.12.07	Monty Sutrisna	BuHu, The University of Salford	Director of Training and Outreach	Academic
Salford	07.12.07	Steve Weaver	Chief Executive	Blackpool Council	Local Government
Salford	07.12.07	Barrie Wicken	Cambridge Regional College	Associate Principal – Sustainable Development	Academic
Salford	07.12.07	Chris Woods	Wates Group	R&D Director	Contractor

Bath 1	02.05.07	Chris Baines	Urban Regeneration Panel		Regional Government
Bath 1	02.05.07	John Betty	B&NES	Strategic Director, Development & Major Projects	Local Government
Bath 1	02.05.07	Krystyna Blackburn	Housing Forum	Project Director	Central Government/ Consultant
Bath 1	02.05.07	Mike Butters	B&NES	Commercial Manager	Local Government
Bath 1	02.05.07	Peter Clegg	Feilden Clegg Bradley	Senior Partner	Consultant/Architect
Bath 1	02.05.07	Craig Frost	SWRA	Regional Policy Manager - Environment, Waste, Energy & Minerals	Regional Government
Bath 1	02.05.07	Stephen Green	Future Heritage	Managing Director	Developer
Bath 1	02.05.07	Ron Humphreys	University of Bath	Special Projects Manager	Academic
Bath 1	02.05.07	Andrew Maltby	Deeley Freed	Director	Developer
Bath 1	02.05.07	Prof Peter Morris	UCL	UrbanBuzz representative	Academic
Bath 1	02.05.07	Alan Mossman	Constructing Excellence		Central Government/ Consultant
Bath 1	02.05.07	Trevor Osborne	The Trevor Osborne Property Group	Chairman	Consultant/Developer

Bath 1	02.05.07	Richard Parnaby	University of the West of England	Professor	Academic
Bath 1	02.05.07	Chris Paterson	Morley Fund Management	Fund Manager, Retail	Developer
Bath 1	02.05.07	Mark Pearson	Creating Excellence	Head of Design, South West	Consultant
Bath 1	02.05.07	Ian Piper	South West RDA	Director of Sustainable Communities	Regional Government
Bath 1	02.05.07	Rhodri Samuel	B&NES	Regeneration Manager, Development & Major Projects, Bath & North East Somerset	Local Government
Bath 1	02.05.07	Chris Tinker	Crest Nicholson Projects	Divisional Director	Developer/Contractor
Bath 1	02.05.07	Mike Twomey	GOSW	Head/Sustainability & Environmental Technologies	Regional Government
Bath 1	02.05.07	Jane Wildblood	B&NES	Corporate Sustainability Manager	Local Government
Bath 2	23.10.07	David Adamson	University of West England	Consultant/Visiting Professor	Architect/Consultant
Bath 2	23.10.07	John Betty	B&NES	Strategic Director, Development & Major Projects	Local Government
Bath 2	23.10.07	Tony Gayle	COPROP Construction (Property) Programme South West Centre of Excellence	Programme Manager	Developer

Bath 2	23.10.07	Terry Gazzard	B&NES	Councillor	Local Government
Bath 2	23.10.07	Bill Gething	Feilden Clegg Bradley	Partner	Architect/Consultant
Bath 2	23.10.07	Stephen Green	Future Heritage	Managing Director	Developer
Bath 2	23.10.07	Martin Howe	Bevan Brittan (National Legal Practice)	Partner	Lawyer
Bath 2	23.10.07	Ron Humphreys	University of Bath	Special Projects Manager	Academic
Bath 2	23.10.07	Kaoru Jacques		Planning Policy Team Leader	Local Government
Bath 2	23.10.07	John Kelsey	UCL	Lecturer	Academic
Bath 2	23.10.07	Alice Marsh	B&NES	Sustainability Representative, Development & Major Projects	Local Government
Bath 2	23.10.07	Trevor Osborne	The Trevor Osborne Property Group	Chairman	Consultant/Developer
Bath 2	23.10.07	Mark Pearson	Creating Excellence	Head of Design, South West	Consultant
Bath 2	23.10.07	Dickon Robinson	Urban Regeneration Panel		Regional Government
Bath 2	23.10.07	Rhodri Samuel	B&NES	Regeneration Manager, Development & Major Projects	Local Government
Bath 2	23.10.07	Mike Twomey	GOSW	Head/Sustainability & Environmental	Regional Government

				Technologies	
Bath 2	23.10.07	Jane Wildblood	B&NES	Corporate Sustainability Manager	Local Government
Bath 2	23.10.07	David Mellor	Alec French Architects	Senior Partner	Architect

## APPENDIX 2: GLOSSARY

BSF	Building Schools for the Future
BREEAM	BRE (Building Research Establishment) Environmental Assessment Method
CIBSE	Chartered Institution of Building Services Engineers
CIC	Construction Industry Council

CIOB	Chartered Institute of Building
CMS	Common Minimum Standards
CPD	Continuing Professional Development
CPA	Construction Products Association
DBERR	Department for Business, Environment and Regulatory Reform
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
DFES	Department for Education and Skills
EPSRC	Engineering and Physical Science Research Council
FE	Further Education
HE	Higher Education

HEFCE	Higher Education Funding Council for England
HEIs	Higher Education Institutions
HIPS	Home Information Packs
HMT	Her Majesty's Treasury
ICE	Institution of Civil Engineers
IMRC	Innovative Manufacturing Research Centres
ISO	International Standards Organisation
LPA	Local Planning Authority
LSC	Learning Skills Council
MMC	Modern Methods of Construction
NVQs	National Vocational Qualifications

OGC	Office of Government Commerce
PI	Project Insurance / Professional Indemnity
POE	Post-Occupancy Evaluation
PROBE	Post-Occupancy Review of Building Engineering
PSCCF	Public Sector Construction Clients' Forum
RDA	Regional Development Agency
RIBA	Royal Institute of British Architects
RICS	Royal Institution of Chartered Surveyors
SEEDA	South East England Development Agency
SME	Small Medium Enterprise
SSC	Sector Skills Council

