Chartered Institution of Building Services Engineers (CIBSE) – Written Evidence (BEN0102)

CIBSE is the primary professional body and learned society for those who design, install, commission, operate and maintain the systems and services both mechanical and electrical, which are used in buildings. Our members therefore have a pervasive involvement in the performance of buildings in the UK which makes a key contribution to a sustainable built environment. Our focus is on adopting a co-ordinated approach at all stages of the life cycle of buildings, including conception, briefing, design, procurement, construction, operation, maintenance and ultimate disposal.

CIBSE is one of the leading global professional organisations for building performance related knowledge. The Institution and its members are the primary source of professional guidance for the building services sector on the design and installation of efficient building services systems to deliver healthy, comfortable and efficient buildings.

Policymaking, integration and coordination

1 Are the decisions that shape England’s built environment taken at the right administrative level? What role should national policymakers play in shaping our built environment, and how does this relate to the work and role of local authorities and their partners?

1.1 National policymakers should work closely with local decision makers, helping to set the strategic framework but allowing communities to have an influence on how their built environment develops. There should be more considered decision making across geographical boundaries, focusing on the best outcomes rather than what is possible constrained by bureaucratic / administrative / financial boundaries. For example, community renewable energy networks can be very effective if supported appropriately.

1.2 It is important that there is a distinction between planning requirements and technical standards relating to buildings and structures. Planning requirements should be sympathetic to local situations and needs, but technical standards should very largely be consistent across the country.

2 How well is policy coordinated across those Government departments that have a role to play in matters such as housing, design, transport, infrastructure, sustainability and heritage? How could integration and coordination be improved?
2.1 Currently there is fragmented responsibility between Government departments which leads to significant gaps in implementation, enforcement and maintenance of policy related to the built environment.

2.2 Integration and coordination could be improved by taking a systems thinking approach. With any system, the whole is different to the sum of its individual parts. If the desired outcome of a sustainable built environment balancing the economy, society and environment is the whole, then the policy parts shouldn’t be developed in isolation without regard for the relationships between them. There is a history of a disjointed policy landscape in the UK which has led to poor outcomes e.g. energy and carbon reduction policy. Coherency is required to provide appropriate market signals to developers, and to provide the public with confidence that the Government is taking a long term view.

2.3 A stronger voice is needed within Government to champion a high quality built environment. Giving existing scientific staff within departments a built environment brief reporting to a Government Chief Built Environment Adviser (similar to the Chief Scientific Adviser model) would help to improve coordination across Government.

National policy for planning and the built environment

5 Is there an optimum timescale for planning our future built environment needs and requirements? How far ahead should those involved in the development of planning and built environment policy be looking?

5.1 Those involved in the development of strategic planning and built environment policy should be looking at least 20 years ahead. In particular, the issue of climate change demands this scale of activity. A timescale in decades rather than years or political electoral cycles is more appropriate. The creation of the National Infrastructure Commission indicates that there is recognition of the need for a long term view when it comes to the built environment.

Buildings and places: New and old

6 What role should the Government play in seeking to address current issues of housing supply? Are further interventions, properly coordinated at central Government level, required? What will be the likely effect upon housing supply of recent reforms proposed for the planning system?

6.1 It is difficult to predict the impact of the most recent changes, some of which have only just come into force. In theory the streamlining of technical standards for housebuilding should reduce costs for housebuilders, enabling them to build out existing consents more efficiently. But it is too early to know whether this will actually be the outcome. Some of the exemptions for small scale developments of a few homes may prove to provide a significant loophole for piecemeal
development to less demanding standards, particularly for energy efficiency. Again, this needs to be monitored as the new requirements take effect.

7 How do we develop built environments which are sustainable and resilient, and what role should the Government play in any such undertaking? Will existing buildings and places be able to adapt to changing needs and circumstances in the years to come? How can the best use of existing housing stock and built environment assets be made?

7.1 Finite resources will require careful management, and part of developing sustainable and resilient built environments will be embracing the age of limits. Resource security is becoming more of an issue, with risks affecting the availability and price of materials essential to industry. Construction clients are becoming increasingly interested in resource efficiency, particularly in terms of the embodied energy of buildings. Energy efficiency is a core principle of sustainable development that should be promoted, doing more with what we have rather than using up further valuable resources.

7.2 “Resilience is the ability of assets, networks and systems to anticipate, absorb, adapt to and / or rapidly recover from a disruptive event. In its broader sense, it is more than an ability to bounce back and recover from adversity and extends to the broader adaptive capacity gained from an understanding of the risks and uncertainties in our environment.” (Cabinet Office). The Government needs to ensure that the whole definition cascades through all their work on the built environment so that everyone has a shared understanding of what resilience means and can embed it in their area of activity.

7.3 Climate change has already, and will increasingly in the future impact on the built environment, for buildings in particular with regard to cooling and ventilation, leading to implications for the quality of the indoor environment, energy consumption and carbon emissions.

7.4 Assessment of these factors at the design stage is essential to evaluate how buildings will cope the demands that future climate will place on their envelopes, interior spaces and systems. The following adaptation measures are likely to be requiring attention: thermal performance and dealing with overheating; water conservation and dealing with flooding risk; and material durability.

7.5 There are also important questions regarding existing buildings; how, when and to what extent they will need to be adapted to cope with future climate change. Existing housing stock and built environment assets should be upgraded, at least half of the existing building stock will still exist in 2050. There have been numerous practical projects and research studies focusing on retrofit of different types of buildings, both domestic and non-domestic. These need to be brought together and the findings used to inform a scaled up national programme of retrofit to improve both sustainability and resilience of buildings.
7.6 A key focus is energy efficiency which should be made a national infrastructure priority. Our energy system is wasteful, costing consumers money as well as harming the natural environment. Reducing energy demand in existing buildings through better facilities management and retrofit is an effective way to reduce consumption and costs. We have the experience and knowledge to improve the performance of building stock, but need Government to provide an appropriate policy and legislative infrastructure to support and implement this on a national scale.

7.7 For new buildings, there has been a growing awareness for some time that many ‘low energy buildings’ use more energy than the designers thought they would. The performance of low energy designs is often little better, and sometimes worse, than that of an older building they have replaced, or supplemented. The difference between expected and realised energy performance has come to be known as the ‘performance gap’.

7.8 There are two main reasons for this performance gap. The first is that the method of calculating energy use for the purposes of compliance does not take into account all the energy uses in a building such as energy used by lifts and escalators, for catering facilities, or for server rooms. The second is related to site practice. To deliver a building that uses as much energy as expected requires that the design is built as intended, the engineering systems are commissioned effectively and the operators and occupiers of the building understand how to operate and maintain the building so that it delivers the expected performance. Making an accurate estimate of the operating hours and likely occupancy of the building is key.

7.9 Prioritising value rather than cost, and long term operational expenditure and environmental impact rather than just immediate capital expenditure will help to make the built environment more socially, environmentally and economically sustainable. There are many examples of people, products and projects that demonstrate engineering excellence in the built environment, as recognised by the CIBSE Building Performance Awards. The focus is on actual, measured performance, not design intent or performance specifications.

7.10 Again, a systems approach is required, considering the interconnectedness and inseparability of components of the built environment. For example, the interplay of buildings and existing underground infrastructure or the multiple benefits of both building level and site-wide green infrastructure. Standards are required to ensure a consistency of approach in developing the built environment (see also 9.4 and 9.5).

Skills and design

9 Do the professions involved in this area (e.g. planners, surveyors, architects, engineers etc.) have the skills adequately to consider the built environment in a holistic manner? How could we
begin to address any skills issues? Do local authorities have access to the skills and resources required to plan, shape and manage the built environment in their areas?

9.1 There needs to be a significant increase in both trans-disciplinary education and working in the built environment. The Edge Commission Report on the Future of Professionalism, Collaboration for Change highlights that the siloed nature of the built environment’s education system needs to be reviewed, demonstrating relevance, encouraging greater integration and preparing future professionals for work in a multi-disciplinary environment.

9.2 For example, four Centres of Excellence in Sustainable Building Design have been set up in collaboration with Royal Academy of Engineering. They aim to enhance the curriculum for engineering students, enabling them to experience interdisciplinary, collaborative problem solving to help them unlock the potential for innovation. This should be the norm rather than the exception. Without the different built environment professions working together and understanding each other’s skills and roles, a holistic approach won’t be possible.

9.3 There is little understanding of the built environment professions amongst school children which means that few will aspire to a career in this sector. Programmes such as Design, Engineer, Construct! which applies pure academic subjects to the latest construction industry practices, providing secondary-school age children with real world practical experience and employability skills, are valuable but unfortunately not widespread.

9.4 There is also a need for craft and technician level skills. Many tradespeople are competent in the areas that they have been trained in but for newer technologies that require integration with traditional services e.g. solar thermal systems, there is a significant training need. Training should be linked to common standards which in most cases do not exist. Setting minimum standards is a key step to provide greater confidence for specifiers and clients and these can also be included in the tendering/contracting process.

9.5 For example, the Heat Networks Code of Practice which has been produced as a joint project between CIBSE and the Association for Decentralised Energy (ADE) seeks to provide clear and measurable outputs which will ensure that a heat network operates effectively and meets client and customer expectations. If heat networks are to form a significant part of our future low carbon energy infrastructure in the UK then they need to be designed, built and operated to a high quality to deliver customer satisfaction. A programme of training and registration of heat network professionals has been developed to ensure that the skills necessary to implement the Code of Practice are available across the sector. The Code of Practice, supported by these trained professionals, should provide a step change in the heat network sector.

9.6 Local authorities need to be properly resourced to plan, shape and manage the built environment in their areas. The 2013 Farrell Review highlighted the longstanding and systemic skills gap in the
public sector. A lack of capacity will hold back the delivery of a sustainable and resilient built environment for the UK.

Community involvement and community impact

11 Do those involved in delivering and managing our built environment, including decision-makers and developers, take sufficient account of the way in which the built environment affects those who live and work within it? How could we improve consideration of the impacts of the built environment upon the mental and physical health of users, and upon behaviours within communities?

11.1 Those involved in delivering and managing our built environment should really focus on how they would feel working and living in the spaces that they are creating. Rather than classifying people as stakeholders and users, we need to think of them as people who aren’t separate from the built environment, they completely shape each other.

11.2 We can’t treat people as components with predictable properties that can be incorporated into a system. People just don’t behave in the ways that designers, planners and policy makers expect.

11.3 The Royal Academy of Engineering’s recent report, Built for Living, notes that the design of the built environment, in combination with other factors has the potential to influence human behaviour and therefore have a significant impact on health and wellbeing, performance and productivity and the stewardship of resources. Behavioural considerations need explicit consideration from the very beginning of any project and throughout its lifecycle.

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