



**Department for Business, Energy and Industrial Strategy
call for evidence**

The Future of Heat: Non-domestic buildings

Submission from CIBSE

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The Chartered Institution of Building Services Engineers (CIBSE)

- CIBSE is the primary professional body and learned society for those who design, install, operate and maintain the energy using systems, both mechanical and electrical, which are used in buildings. Our members therefore have a pervasive involvement in the use of energy in buildings in the UK with a key contribution to sustainable development. 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, installation and maintenance of energy efficient building services systems to deliver healthy, comfortable and effective building performance.

Consultation Response

- We have submitted many responses to consultations which address various aspects of this topic and will not repeat those points again – they are publicly available and can be accessed easily. We have the experience and knowledge to improve the performance of existing building stock on a national scale, but need an appropriate legislative infrastructure and policy support to deliver this. To date there has not been a sufficiently coherent policy landscape to provide appropriate market signals to encourage industry, business and the public sector to make savings.
- Alongside others, CIBSE has demonstrated that working on energy efficiency in existing buildings through better facilities management and refurbishment / retrofit is an effective way to reduce energy consumption and costs.
- Decades of market-led activity supported by modest regulation has led to some successes e.g. domestic new builds now use significantly less energy, but there has been a disappointingly small impact on the existing building stock. If we require an 80% reduction by 2050, and a 57% reduction to comply with the 5th Carbon Budget in 2032, we cannot achieve this using the current approach.
- The then Chief Construction Advisor, Paul Morrell, identified the need to refurbish one building a minute to achieve the targets established by the Climate Change

Act, in 2010. However, progress with the existing stock has been painfully slow, and the challenge is now significantly greater.

- We should take the view that the building stock is a significant part of the nation's infrastructure and asset base, and invest accordingly. But even if this was to occur, it is difficult to imagine that the required resources can be mobilised in the time available without a Herculean effort.
- The only likely way forward to achieve the emissions reductions proposed is through much greater use of a decarbonised electricity supply. This could be achieved through a combination of renewable generation, energy storage and demand reduction, provided that commitments are made to take that route now. There should be careful consideration of the wider infrastructure implications if there is a significant shift to electric heating due to decarbonisation of the grid, along with a consideration of the implications of this approach alongside growing uptake of electric vehicles. An infrastructure impact assessment is required to investigate the potential increase in electricity demand.
- In parallel, demand could be reduced by a range of building design measures, through peak pricing to reduce peak demands and incentivise storage, and by a greater focus on actual building performance rather than design compliance with Building Regulations. To achieve the levels of carbon emissions reduction set out in the 5th Carbon Budget will also require a move from a cost optimal to a least cost approach that can achieve the required targets.

Examples and Case Studies

CIBSE provides leadership on building performance in a number of ways including examples and case studies, which provide numerous examples of what can be achieved already using available technology, design approaches, skills, materials and systems. Greater uptake of these approaches will help to address the need for greater emphasis on demand reduction and energy efficiency.

As the UK starts to respond to the Winter Energy Package from the EU, and to meet the requirement to draft an emissions reduction plan in response to the Committee for Climate Change and the 5th Carbon Budget, the examples contained below will be invaluable.

CIBSE will be happy to provide additional information if required on any of these projects.

- [Knowledge and guidance](#)

CIBSE publishes Guides, Codes and other guidance material which are internationally recognised as authoritative, and sets the criteria for best practice in the profession. Building performance is a common thread that runs through all of our material and some publications tackle specific elements of the performance gap, for example [TM54](#) looks at evaluating the operational energy performance of buildings at design stage.

- [Building Performance Awards](#)

The CIBSE Building Performance Awards recognise the people, products and projects that demonstrate engineering excellence in the built environment. The Awards focus on actual, measured performance, not design intent or performance specifications.

- [Building Performance Conference and Exhibition](#)

The efficient and effective design, construction, maintenance and operation of buildings and the systems that support them is of ever increasing importance. The annual CIBSE Building Performance Conference and Exhibition will identify and focus on developments, innovations and best practice that will materially assist the full supply chain in improving both new and existing buildings – to deliver, not just promise, better building performance.

- [Technical Symposium](#)

CIBSE holds a technical symposium each year, encouraging the participation of both young and experienced industry practitioners, universities, research organisations, industry, CIBSE groups/committees/societies and others to share experiences and ideas regarding total building performance.

- [Carbon Buzz](#)

Carbon Buzz is based on a collaboration between CIBSE and RIBA to help close the gap between actual and delivered energy use in buildings. The free, online platform allows organisations to share and publish building energy use data, on an anonymous basis, in order to increase the evidence base for low energy design solutions.

- **Other resources**

Innovate UK's [Building Performance Study](#) and the Zero Carbon Hub [Performance Gap project](#) are also very informative.

- **Design for Performance**

Evidence has shown that for the office sector in Australia, the NABERS (National Australian Built Environment Rating System) has been particularly successful improving the efficiency of building stock. The energy efficiency of new offices in the UK is subject to Building Regulations Part L and represented in market transactions by Energy Performance Certificates (EPCs). Developers, owners and occupiers of new and refurbished buildings might reasonably expect that these mechanisms will produce a building that is energy efficient in operation. However, both focus on design and technology that improves predicted building performance, not on achieving directly measureable improvements in performance in-use. The consequence has been a design-for-compliance culture, and a disconnect between the regulatory framework and the influence it has on the energy use and associated carbon emissions it is supposed to be limiting – the so-called ‘Performance Gap’. Voluntary environmental design rating schemes such as BREEAM and LEED reinforce this mentality, with only BREEAM Outstanding requiring performance in-use to be considered. This approach is further exacerbated by a fragmented industry with stakeholders focusing only on what they need to deliver, not on what the building needs to deliver to the end user and investor.

By contrast, the NABERS office energy rating scheme targets the actual in-use energy performance of the so-called Base Building (services typically under control of the landlord i.e. the heating, hot water, ventilation and air-conditioning of the whole building, light and power in common areas, and the lifts). For new office developments, a framework has been established whereby clients, developers and their teams sign up to – and then follow - a “Commitment Agreement” protocol to design, construct and manage buildings to achieve agreed levels of actual in-use performance. Since its introduction in 2002, its effect has been transformational and as a consequence created a design-for-performance culture, with typical new office Base Buildings using about half the energy they did when the system was introduced and the very best one-fifth as much.

A feasibility study in May 2016 assessing whether such a Commitment Agreement Protocol (CAP) and the design-for-performance culture could be applied in the UK and has now entered into an 18-month pilot to test the ingredients of such a protocol on real office developments. See <http://www.betterbuildingspartnership.co.uk/our-priorities/measuring-reporting/design-performance> for further information.