



Uncertainty, Adaptability, Agility

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Tonight I would like to focus on the growing role that CIBSE has in ensuring that as the world around us changes, we, as building services engineers remain at the very centre of providing safe, functional, comfortable and sustainable buildings, and that we do so with foresight and agility. We now hear, quite frequently, that our world is changing faster than ever before and that we face increasing uncertainty, not only in the long term but in the near future too. Population growth, urbanisation, and the continued emergence of megacities; many of them in developing regions, mean that ensuring sustainable development remains an ongoing challenge. Providing housing, a supporting infrastructure and meeting increasingly high energy demands in a sustainable way must be a priority. Alongside this, the evidence of climate change and its global environmental impact is overwhelming. The need for adaptation is already a given, and mitigation must surely be an imperative if we are to limit projected warming scenarios. Direct and clear action is necessary; with much of this impacting upon or being driven by, our built environment sector as last week's Committee on Climate Change report has made very clear.



In the UK and in recognition of this environmental change, we already see progressively more challenging commitments to carbon reduction levels as we move towards our current 2050 target of an 80% reduction relative to the 1990 baseline. In relation to pace of change, the Government's 2017 Clean Growth Strategy clearly stresses the significant acceleration of decarbonisation required to meet the targets set out in the 4th and 5th carbon budget. Although solutions, by definition, will have to be wide-reaching, we also know as building services engineers that a key component of delivering against such targets is that we prioritise design standards applied across the UK's housing stock.

Decarbonising homes is critical to success; both for the existing 29 million homes across the UK and the 1.5m planned by 2022; a point that was first made clear in the UK Committee on Climate Change's Fit For The Future report in February. It was later firmly underlined by Lord Deben, who chairs this Committee, in recent evidence to the Business, Energy and Industrial Strategy Select Committee, before being confirmed as one of the central recommendations in last week's new climate change report. This sets out a compelling evidence base for the UK government to adopt a net-zero carbon target for 2050.

Looking more widely, we recognise the challenges at not only national scale but also international. As we continue to grapple with the new norm of international working, we recognise the need for knowledge, collaboration and innovation that crosses borders, continents and time zones. And we have, of course, yet to fully understand the implications of changing global and European relationships, including China's resurgence and Brexit, on future trade, skills recruitment and retention, and legislation.

We are not short of uncertainty, challenge and change.



Alongside this environmental and political change, technology, especially digital technology, is also evolving rapidly. We are moving towards a future where we rely on wireless sensing, autonomous systems and technologies, big data, Artificial Intelligence, machine learning, smart infrastructure and the IoT. And technologies such as mixed, augmented and virtual realities allow us to see projects in new and exciting ways, and continue to break down barriers between the physical and digital worlds. Embracing such advances in technology, integrating them into our work and even changing the way we work to take full advantage of these new technologies is already a huge challenge, but also offers great potential to the built environment sector; providing us with new ways of visualising and communicating our work before, during and after construction.

In doing so, we might work together with the digital tech giants who see this as an as-yet unexploited opportunity. But there are questions. How do we articulate the value proposition of such technologies? Whose responsibility is it to pursue this change? What kind of governance structure is needed to regulate and monitor the implementation and security of digital technology and the data gathering and sharing that it enables?

In response, there are now calls for digital twins of physical assets and for these to be connected in a way that enables an accessible digital ecosystem to support improvements in building performance, cost and safety. Such provision is strongly supported by government. Bearing in mind that physical assets within the built environment are almost always constructed digitally before physically, we have a huge resource at our fingertips. Can we now deliver an information management framework that is fit-for purpose; that provides safe, secure access to good quality data, and that is properly regulated?

As accessibility to data and digital technology increases, as building services engineers, we must continue to respond to the challenge of providing safe, functional, sustainable buildings who's performance is not only fit for purpose today but that are adaptable to future climate change - all whilst we now target net-zero emissions. Internally – inside the building - we seek to deliver enhanced indoor comfort – thermal comfort, good ventilation, good Indoor Air Quality, indeed Indoor Environmental Quality, and good acoustics and lighting. It is clear that in order to fulfil our potential in this new digital era, CIBSE must be not only adaptable, but we must also show agility in positioning ourselves at the heart of the sector so as to avoid inheriting downstream challenges. In response, the role of CIBSE's recently-established Society of Digital Engineering has never been more important. Here, in recognition of this new reality, we bring together and support technicians and simulation experts whose role it is to design, implement and communicate complex engineering principles using these new digital technologies.



This is a photo of the EDGE building in Amsterdam; a building that is widely considered to be one of the most sustainable in the world. From the outset, the aim was to “Combine smart building design and innovative technologies to improve sustainability, workforce interaction and end-user experience”. It has solar panels (including some on rented roof space nearby), an aquifer thermal energy storage system, and demand reduction through efficient lighting and smart building design. Its energy consumption is net negative – an estimated -0.3 kWh/m²/year versus in excess of 40 for a traditional office building. It allows employees to use their smartphones or tablets to adjust the lighting and heating at each workspace to their personal preference, to reserve meeting rooms or parking places, even to track their progress in the on-site gym and to locate their colleagues within the building.

I believe such examples demonstrate what can already be delivered and help us to frame the opportunities to progress, with many of the required tools already available to us.

We must remember too that in designing buildings that perform well, that are resilient, and that are sustainable and economical, we must also meet the requirements of society both in terms of function, comfort, aesthetic and, and above all else, safety. We have a professional; indeed a moral obligation to reflect on the events of two years ago in London when 72 people died in the Grenfell Tower disaster. Following an Independent Review of Building Regulations and Fire Safety, Dame Judith Hackitt called for fundamental changes that are wide reaching; many of these impacting upon, and dependent upon, the role of the Building Services Engineer. Dame Judith referred to the need for a golden thread of building information, running through design, construction and operation as well as ‘a joint competent authority’ and a series of ‘gateways’ and digital records all designed to ensure much better compliance with regulations. These findings will require radical change within the sector. CIBSE is fully committed to the ongoing implementation activity, contributing to the Competence work of the Industry Response Group as well as the wider response of the professional bodies through the Construction Industry Council.

This is no small task. It is often claimed that the construction sector is somewhat fragmented in a way that impacts on connectivity, productivity and on the opportunities for innovation and ultimately success. As we pick up pace and begin to collaborate more effectively, this requires us to deliver not only the resource but the talent to be able to fulfil our ambition. There is absolutely no doubt we need professionals equipped not only with excellent engineering and design skills but who also understand the business imperative, and the international aspects of a construction sector that is now increasingly global. We also need those with organisational and interpersonal skills to be able to collaborate effectively with fellow professionals, and to engage and communicate with those who commission, use and occupy buildings.



What is very clear is that, in the UK at least, we will face a major shortfall in engineers at CEng, IEng and Technician level by 2023. Both the “Fit for the Future” and “Net ZERO” reports from the Committee on Climate Change highlight the skills deficit as we address decarbonisation. We also have an aging median population. These challenges are common to CIBSE membership. In fact, I believe that the need for the skills and expertise of building services engineers has never been higher. However, I’m pleased to let you know CIBSE is one of only four PEIs within the top 10 by CEng registrants that has seen a positive increase in registrations last year.

In continuing this work, we must draw on all sections of the CIBSE community and beyond as we seek to contribute to building the global skills base.

And our demographic *is* changing. In the past seven years, we have managed to effect a four percent increase in female members of CIBSE. This uplift is spread across all grades of membership but it is worth pointing out that 23% of graduate members and 22% of student members are now female; a significant increase since 2011. The number of female fellows we have has almost trebled within the same timescale. And supported by the work of our Inclusivity panel, we now have a strong focus on increasing the proportion of female members and registrants, and on improving the breadth and quality of the data we hold on our representation through protected characteristics. We also seek to embed an enhanced level of awareness and understanding of diversity and inclusion throughout the Institution; and will commit to this in our forthcoming five-year strategy.



In support of this, we have the knowledge, the expertise and the commitment of over 21,000 members. With societies covering public health, light and lighting, local exhaust ventilation, façade engineering, and more recently, digital engineering and the CIBSE Patrons, alongside 19 special interest groups, the importance and the future potential of CIBSE is clear.

As examples of recent activity, the Society of Façade Engineering has been closely involved in the response to the Grenfell Tower fire and the recent changes in the Building Regulations in England. Our Public Health Engineers focus on hygiene and are working to ensure our drinking water remains safe, our wastewater discharge flows environmentally sensitive and our overall water management practices exemplary. The Society of Light and Lighting continues to produce world class guidance on lighting in and around buildings. And the Local Exhaust Ventilation Engineers promote provision of safe and healthy working environments by providing appropriate workplace exhaust ventilation.

My own connection with CIBSE was made many years ago when, working in the field of public health engineering as a junior academic, my senior colleague introduced me to the Institution, and I was immediately enthusiastic about being part of such an exciting, forward-looking and influential community. I have been involved with CIBSE ever since and passionately believe that what CIBSE has to offer lies at the very core of delivering against some of the biggest challenges the sector has ever seen.

I believe, beyond doubt, that CIBSE has the competencies required to be able to respond to these challenges. That we have the capability, drive and ambition through our membership to ensure that we are able to adapt to uncertainty, and that we can do so with agility. I'd like to quote to you the Institution's statement that relates to our purpose and to our aspirations for development.

'CIBSE members, affiliates and staff work every day to advance the art of the possible. Our product, the built environment, is shared and enjoyed by all. We believe that an inclusive culture brings resilience, creativity and innovation – qualities that deliver both better buildings and a stronger building services engineering community. We are working hard to ensure that our organisation and profession are welcoming to all, for the benefit of all'.

I invite everyone who has some connection with the Institution, and indeed those who work in related professions, to join us.

May I finish by extending a very sincere and heartfelt thank you to every single member, affiliate, employer, industry partner and staff member; indeed every single person who plays a role within or has a connection with CIBSE, and to all of you who are so invested in, and so dedicated to, the advancement of our profession.

Thank you