



Better Buildings Seminar

Hosted by UCL and AHR Architects

13th April 2016

Introduction

The development of building projects has been the subject of work and research undertaken by AHR, Max Fordham and UCL into the gap between the expected versus achieved performance of buildings. The results are in the public domain and are available at <https://buildingdataexchange.org.uk/>. Participants brought insights into the barriers of improving building performance in HE estates and the workshop introduced potential ways of addressing these.

Several issues associated with briefing, procuring and monitoring building projects were identified at the workshop, including:

- Ambitious carbon reduction targets with no clear consensus on how to achieve them
- Sustainability ratings and regulations not delivering expected performance in use
- Using data in a constructive manner
- The unpredictability of how buildings will be used and planning for this
- How to apply new design ideas to old buildings
- Dealing with individual feedback – with some occupants liking and others disliking a building
- The unreliability of benchmarks
- Challenges of measuring performance
- Ensuring lessons learnt are included in future briefings
- Recent rise in demand for 24 hour opening of buildings
- Short term goals often dominating without consideration for long term impacts
- Life cycle analysis of architecture
- Achieving sustainability across the entire estate, including existing portfolio

A number of presentations highlighted aspects of these issues.

Performance Standards

The drivers for good building performance include climate change, legislative or regulatory considerations (e.g. Display Energy Certificates, CRC, ESOS), value for money and meeting end user needs. The three distinct pillars of building performance are measurable and include indoor environmental quality, occupant satisfaction and the natural resources required to achieve these. Few projects currently target all three pillars and in the absence of regulatory requirement to validate performance outcomes post completion, there is little incentive to do

this. Research indicates that as a result there is often a mismatch between design stage targets and operational outcomes. Quantitative KPIs updated at key project stages deemed essential to address this.

Energy-Use Patterns and Benchmarking

There are various benchmarks used in HE, CIBSE TM46 being one of the most commonly referenced. Feedback on these benchmarks highlighted the following:

- Currently used benchmarks are often out of date
- Design stage benchmarking of a building's energy performance potential uses different carbon factors from operational ratings
- Changes to 24/7 operation is not reflected adequately in benchmarks and deserves more extensive study
- Classification of buildings is not standardised – the CIBSE TM46 benchmark categories should be compared to the HEFCE classification of use type
- The diversity of activities within a building is not currently taken into account and benchmarks are top-level only and used as a reference point and not for setting targets

Building Performance Evaluations

There are different approaches to evaluating building performance, BSRIA & Institute for Sustainability have issued industry guidance while Innovate UK has set out its methodology used as part of its funding scheme but as yet no industry-wide standards exist. Evaluations usually focus on measuring detailed energy consumption, indoor environmental quality indicators and occupant satisfaction. Different approaches provide different data and can make comparisons difficult. Feedback from Innovate UK's BPEs indicate a sizeable gap between expected and achieved performance of buildings amounting to a capital cost of between 2-3% on average and energy costs of about 30% higher than necessary. Setting operational targets and validating achieved performance in use has been shown to effectively close the performance gap.

- There is a need for HE procurement guides to support pilots.

Procuring Better Building Performance

AHR introduced the model of energy performance contracting design projects. This iterative approach has resulted in large savings in energy costs. The key contributors to its success are:

- Strong brief and leadership from the client
- Clear project KPIs updated at each stage
- Building performance risk assessment at each stage
- KPIs are embedded in the contract
- Strong after care and monitoring of the build to ensure systems are working optimally
- Case studies are needed to share lessons learned and to refine the process of procuring building performance

Outcomes of the day

After discussing the presentations and issues from the day, key outcomes were agreed to be pursued by EAUC:

- Production of a paper expanding on a summary of the day to be circulated to participants
- Most found it useful and would like to engage with follow-up actions, particularly sharing presentations and best practise case studies and the link to Innovate UK BPE programme reports <https://buildingdataexchange.org.uk/>
- Many are keen to try performance contracting and prefer trialling these through case studies with EAUC support
- Collaboration on procuring building performance, in the form of a sector guide should be produced
- Use case studies to investigate how to assess occupancy and satisfaction through research on qualitative aspects

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