Building Performance Evaluation

- £8m funding between 2010 & 2014
- Individual buildings & developments
- Identify factors that encourage good performance
- Case study investigations
- Domestic & non-domestic
- Explore lessons learnt
- Expose activities that contribute to poor performance

https://connect.innovateuk.org/web/building-performance-evaluation
Domestic: 53 projects (350 homes)
  • 23 “Early occupation” projects
    - 6 months assessment post construction & initial occupation
  • 30 “In-use” projects
    - 2 years detailed performance monitoring and occupant assessment

Non-domestic: 48 projects (55 buildings)
  • 8 “Early occupation” projects
    - 6 months assessment of handover
  • 40 “In-use” projects
    - 2 years detailed performance monitoring and occupant assessment
Energy consumption is often much higher than design calculations suggest

- A lot of data has been gathered
- Design teams have been reformed to investigate the building
- Occupants have been involved
- Procurement methods have been reviewed
- We can now look beyond the numbers

Where is the performance gap occurring? And who is responsible?

https://connect.innovateuk.org/web/building-performance-evaluation
Where is the performance gap occurring?

2013 RIBA Plan of Work

0 & 1 Strategy & brief

2 - 4 Concept to technical design

5 & 6 Construction & handover

7 In use

Modelling to practical completion?
Where is the performance gap occurring?

2013 RIBA Plan of Work

- 0 & 1: Strategy & brief
- 2 – 4: Concept to technical design
- 5 & 6: Construction & handover
- 7: In use

Modelling to 1st year of operation?

https://connect.innovateuk.org/web/building-performance-evaluation
Where is the performance gap occurring?

2013 RIBA Plan of Work

End of design evaluations to operation?
Where is the performance gap occurring?

2013 RIBA Plan of Work

0 & 1
Strategy & brief

2 – 4
Concept to technical design

5 & 6
Construction & handover

7
In use

Beyond years 1, 2, 3, 4 ...?
Where is the performance gap occurring?

2013 RIBA Plan of Work

0 & 1 Strategy & brief

2 - 4 Concept to technical design

5 & 6 Construction & handover

7 In use

Procurement?
Where is the performance gap occurring?

2013 RIBA Plan of Work

- Early occupation projects
  - Capture of design intent
  - Arrangements for managing delivery of design intent
  - Review of design data & metering strategy
  - Review of commissioning plans & procedures
- In use projects
  - Review of handover process & data
  - Inspection of build quality (photos & tests)
  - Review of arrangements for aftercare, operation & maintenance
  - Structured reviews with occupants & management
  - Assessment of annual energy use
  - Investigation of issues arising

https://connect.innovateuk.org/web/building-performance-evaluation
Key themes

Innovate UK
Lack of client engagement

Activities occur throughout the build that can adversely affect the final building performance

• procurement tends to focus on cost not value
• value engineering
• tends to see certain key items removed without fully recognising the consequences
• certification planned at design is not achieved in use

Clients are not getting the benefit of the measures they are paying for

https://connect.innovateuk.org/web/building-performance-evaluation
Commissioning and handover activity is inadequate or overlooked

• Commissioning and reconciliation of systems rarely carried out
  – strategies not fully understood, implemented or reconciled
  – meters not functioning
  – no seasonal commissioning

• Handover time is often squeezed or sacrificed for other activities

• Inadequate training in what handover is supposed to achieve

Sub-meters installed for chillers in Petchey academy are not wired up and do not report the electricity intake of the chillers

https://connect.innovateuk.org/web/building-performance-evaluation
Low energy aspirations influence system complexity

• There are many conflicting factors at play that are outside of the “teams” control
  – carbon/ energy targets
  – policy related to planning
  – conditional funding

• Attention needs to be given to implementation of new technologies

POE work to review, fine tune and feedback on findings is vitally important

https://connect.innovateuk.org/web/building-performance-evaluation
Disconnection of the building from the end users

- In-use strategies are not thought through
  - no consideration of occupants’ energy-related behaviours and the way they might interact with the building
- BMS systems impenetrable and confusing
- Complex controls - now with added bespoke protocols

Lack of post occupancy consideration means projects may not achieve operational outcomes

https://connect.innovateuk.org/web/building-performance-evaluation

Poor placement of hot water meter
Programme outputs

- CarbonBuzz
  - carbonbuzz.org
- BUS methodology
  - busmethodology.org.uk
- DomEARM
- CIBSE TM22
- https://connect.innovateuk.org/web/building-performance-evaluation
The next stage

Research, develop & deliver datasets and lessons for industry from Innovate UK to stimulate the crossover of digital technology into the built environment

https://connect.innovateuk.org/web/building-performance-evaluation
Innovating with Built Environment Data

The Building Data Exchange is a platform designed to make built environment data accessible and available to the built environment community, digital innovators, designers and entrepreneurs. Our vision is to unlock innovation, empower new business and technological approaches that can then address built environment issues, challenges and opportunities such as carbon neutrality, building efficiency and ergonomics.

Developed by The Digital Catapult the Building Data Exchange forms an online platform to open up built environment data, thus making information accessible and discoverable to all. Our mission is to increase the exploitation of innovation in the built environment for demonstrated business benefit.

Register Your Interest
Enter your details below to pre-register.

FULL NAME

ORGANISATION

EMAIL ADDRESS

SEND
To join the BPE community and be kept up to date go to: connect.innovateuk.org and search for Building Performance Evaluation

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