Building Performance Evaluation

- £8m funding between 2010 & 2014
- Individual buildings & developments
- Identify factors that encourage good performance
- 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 dwellings)
• 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
Key themes
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 not getting the benefit of the measures they are paying for

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Modeling discrepancies and confusion

- Non-standard hours
- Unregulated loads
- Client expectations
  - misleading promises?
  - disappointing reality?
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

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

• Attention needs to be given to implementation of new technologies

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

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Bluebell – hot water

- Hot water is provided by a combination of a solar thermal system, dedicated heat pump, immersion heater
- Almost no BMS control and no metering so limited operational information
- Low demand, system performance and storage losses resulted in higher energy consumption
- In practice the study determined that almost 100% of the demand satisfied by the immersion heater
- An instantaneous design would have been a simpler more effective solution
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

Poor placement of hot water meter
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Improving performance - interventions pay

- Progressive build up of data and better understanding of operation enabled the Bluebell team to make interventions to improve performance, particularly over the heating season.
- Over two years the energy demand was reduced by 26% giving a saving of £11.5k (€15.5k / $17.4k)
Thank you

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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