



Education & Skills
Funding Agency

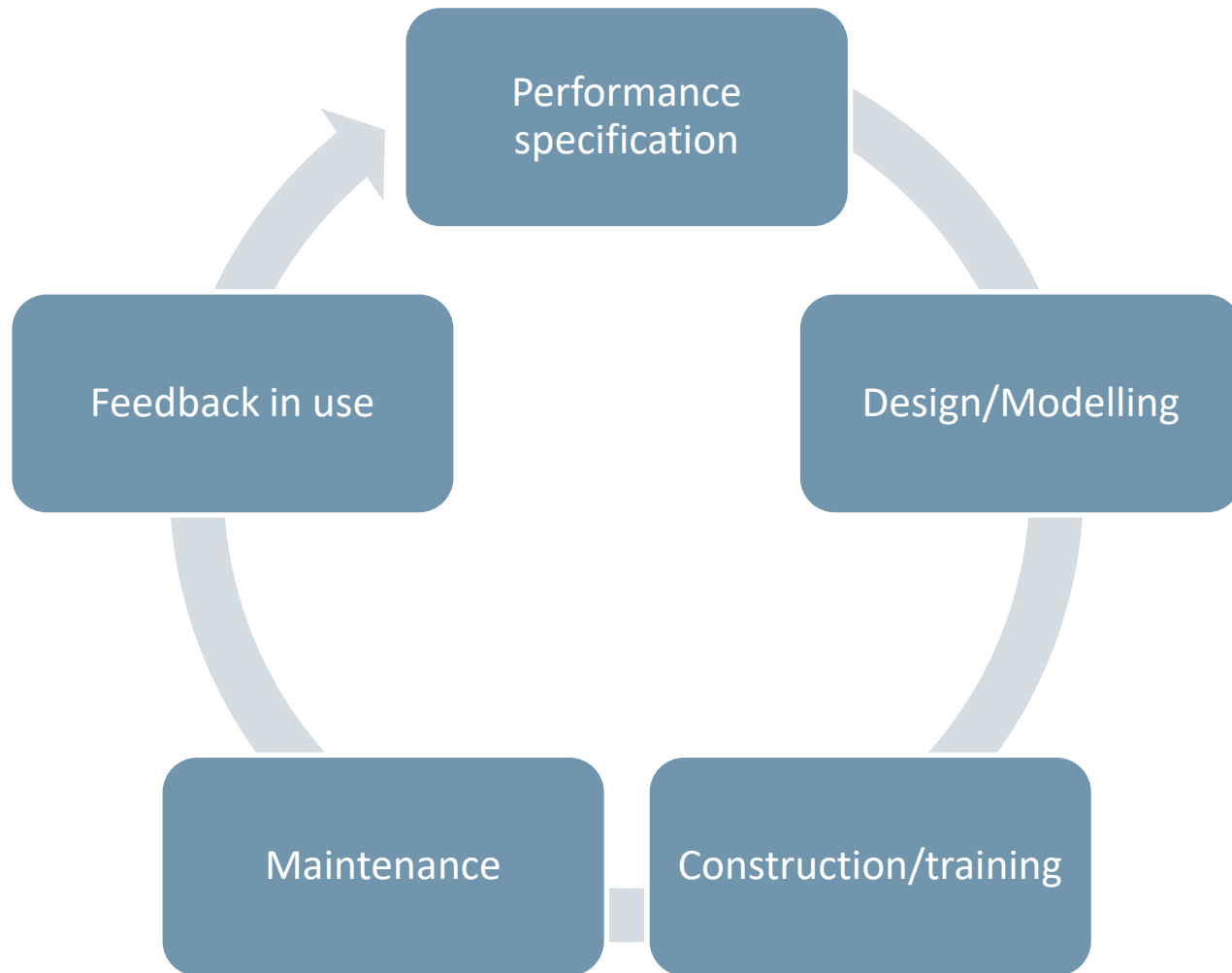
Closing the building performance gap

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What makes a successful building?

- On time
- On budget
- Performs as expected
- Enhances the education environment

Making sure a building performs well takes effort...



Professional aftercare

Soft Landings, Feedback in use, PoE, BPE...

- Feedback to clients, designers and building team: – what works; what doesn't & what needs to be improved
- Reducing running costs and energy
- Improving system performance and occupant satisfaction

Building Performance Evaluation Methodology

Building Performance Evaluation Methodology

May 2017

Stage	When undertaken	Activities
Stage 1 - Data collection setup	Commissioning	<ul style="list-style-type: none"> Ensure data monitoring and sub-metering systems are correctly collecting data and automatically reporting
Stage 2 - Initial performance review	3-6 months post occupancy	<ul style="list-style-type: none"> Site visit and walk round with school management team and contractors Collect and review initial building performance iSERV data and BMS energy consumption data (electricity, gas, water, temperature, CO₂) and compare against design prediction Conduct structured interview of facilities staff/questionnaire Complete teaching staff questionnaires Collate all information into the initial report template and provide commentary on the findings Develop action plan to address any issues identified, e.g. further training, seasonal adjustments and fine tuning Report findings back to the school
Stage 3 - Final performance review	9-12 months post occupancy	<ul style="list-style-type: none"> Collect and review longer term building performance iSERV data and BMS energy consumption data (electricity, gas, water, temperature, CO₂ in classrooms) Conduct structured analysis of data collected accounting for any unexpected results Collate all information into the final report template and provide commentary on the findings Develop any further action plan Report findings back to the school



BPE methodology

Scope

- To provide an objective understanding of what is successful and what are areas for improvement
- To monitor the result of fine tuning the building performance through seasonal adjustments to the building controls
- To establish across the range of schools where there are common issues in order to learn lessons for future school building projects

Structure of BPE

3 stages:

- Stage 1 - Data collection set up during design, handover and pre occupancy
- Stage 2 – Initial performance review at 3-6 months post occupancy
- Stage 3 – Final performance review at 9-12 months post occupancy

Stage 1

At Design/Handover/pre-occupancy

Includes:

- Straightforward design and systems
- Data collection systems – meters/sub meters/BMS remote monitoring
- Testing/commissioning and calibration
- User training and demonstration

Stage 2 Initial BPE

At 3-6 months post occupancy

- Structured approach looking at key elements
- Establishes the initial use and understanding of the building and its systems

Analysis of project information before the visit



Site visit and walk round/mtg with the school

- Headteacher
- Site manager/Bursar
- Contract manager
- M&E sub contractor
- Controls specialist



Site visit/mtg

Buy in from all stakeholders

- Helps with completion of supporting questionnaires
- Allows early indication of school's management behaviour to building performance
- Contractor sees ability of school to operate its systems successfully

Building trust and engagement with the school

Interview survey with the school caretaker/FM team

Quickly establishes

- Responsibility for the building
- Heating
- Ventilation
- Lighting
- Cleaning and maintenance issues
- Success of training



Teaching staff questionnaires

Classroom comfort feedback:

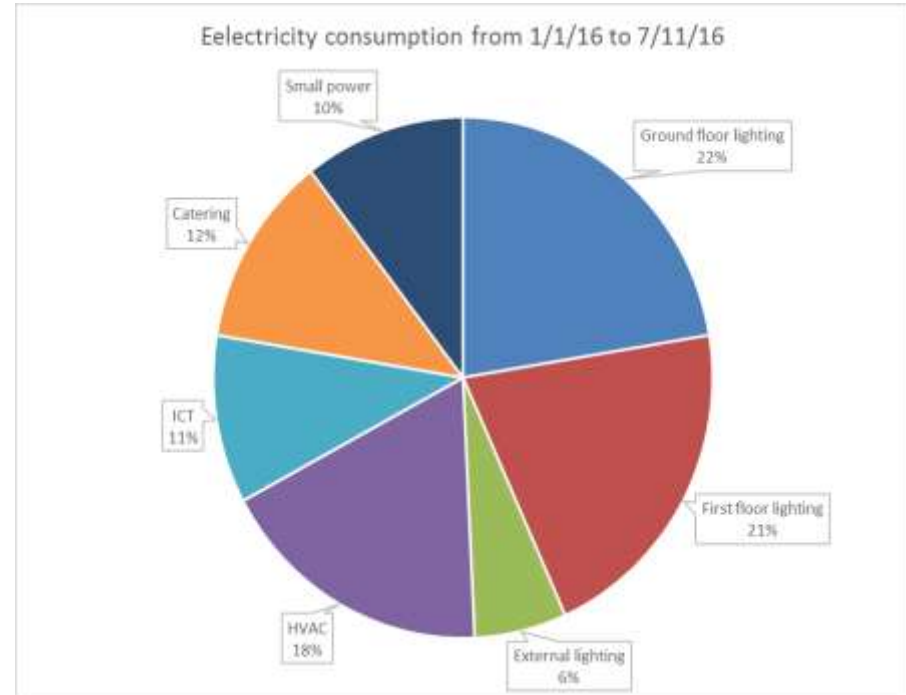
- Winter temperature
- Summer temperature
- Ventilation
- Lighting
- Noise

**Effective through:
Staff meetings at primaries
and coordinated through
heads of departments for
secondaries**

Energy data collection and review

Quickly establishes

- Use by the school
- Calibration issues
- Initial performance
- Success of training



Initial BPE report

Feedback to the school:

- Standard template
- Summary of findings and analysis
- Supporting photos and commentary
- Energy data and commentary
- Action plan in preparation for final BPE at 9-12 months

**Effective through:
Workshops/continual
monitoring/additional
training/calibration/seasonal
commissioning**

Final performance review

9-12 months post occupancy:

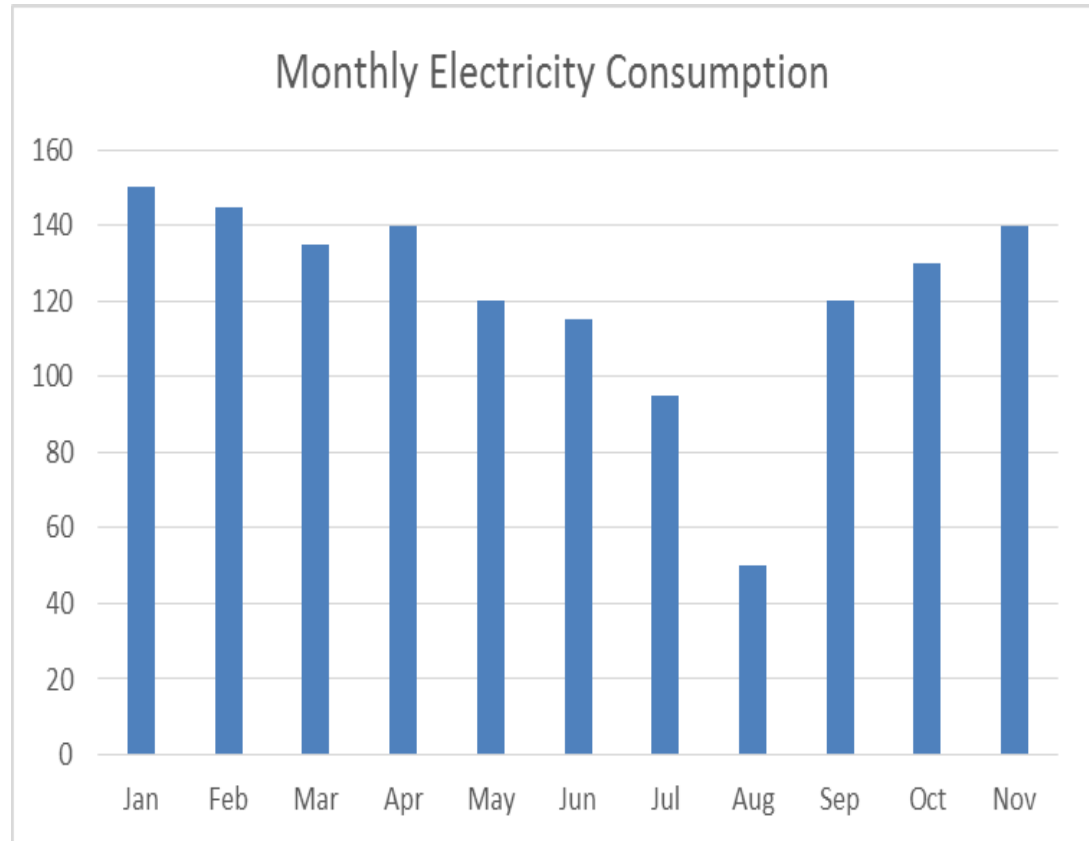
- Effectiveness of initial BPE action plan
- Results of seasonal adjustments
- Further energy data collection to allow annual reporting
- Overall summary of findings and performance

**Extent depends on initial BPE findings but may include:
further site visit; additional interviews; further questionnaires**

Annual energy reporting

Establishes

- Benchmark comparison
- Electric
- Gas
- Water
- Success of seasonal adjustments and training



Final BPE report

Feedback to the school:

- Standard template
- Summary of findings and analysis
- Supporting photos and commentary
- Annual energy data and commentary
- Any further actions planned

**Effective through:
continual
monitoring/changes to future
projects and benchmarks**

Next steps

- Contractors to undertake BPE's on all schemes as part of post handover monitoring – with the results being applied to the other schemes in the batch.
- Monitoring of the building performance over 12 months defects period using continual reporting of energy provides consistency in reporting and looks to have big potential benefits.
- Longer term adjustments to benchmarks to reflect actual practice once >200 samples
- BPE requirement is reinforced in the 2017 FOS/GDB.

Summary

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Summary

- Review and feedback post handover by a proactive project team can be invaluable in delivering a new building that performs.
- BPE provides a structured way to do this – at 3-6 months to reinforce initial handover and calibration and at 12 months to collect annual energy in use and ensure the benefits of seasonal commissioning are realised.
- **Thank you**



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For more information

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Visit the website

- [GOV.UK/esfa](https://www.gov.uk/esfa)