

Resource Hub

Planning a BPE: where to start and common techniques

BPN Training Module 2

Delivered by



Funded by



Image: Springfield Meadows – Credit: Ssassy Property

BPE Training Modules – Introduction

- BPN has produced 5 training modules on domestic Building Performance Evaluation (BPE), funded by Ecology Building Society.
- These form part of a BPE Resource Hub hosted by BPN and sponsored by Rockwool.
- The aim is to help you understand what BPE is, what the benefits are, and how to run a successful BPE project.

Module 1	Module 2	Module 3	Module 4	Module 5
BPE: What, why & the benefits it brings	Planning a BPE: where to start & common techniques	Undertaking dwelling BPE	Data interpretation, reporting & taking action	The performance golden thread: BPE & robust QA

Module 1: recap

- Module 1 covered the following areas:

Module 1

BPE: What, why & the benefits it brings

- What is BPE and why is it needed?
- What are the common BPE techniques?
- Are there differences between BPE for different housing projects?
- What are the benefits and outcomes of BPE?

- Module 2 builds upon Module 1 and covers how to plan and to start a BPE

Module 2: Planning a Building Performance Evaluation (BPE)

Module 2

Planning a BPE:
where to start &
common
techniques

- Engaging project participants
- BPE at different project stages
- More detail on common BPE techniques and their purpose
- Timing of BPE

Who needs to be engaged in a BPE?

Occupants

- Vital for BPE success
- Involved early for existing dwellings or self-build projects – need to understand their priorities and use these to inform targets
- Involved later for new build – but need to be considered throughout planning process (e.g. likely priorities, minimising intrusion/disruption)
- In many cases occupant feedback may be the main source of in-use BPE
- You must plan for meeting data protection requirements (e.g. GDPR)
- Equality and diversity should be promoted (e.g. plan for adjustments that may be required)
- Engagement for retrofit may be different from new build (e.g. focusing on comparisons before and after; light touch if a relatively minor retrofit)



Who needs to be engaged in a BPE?

Architects, retrofit coordinators, building performance evaluators

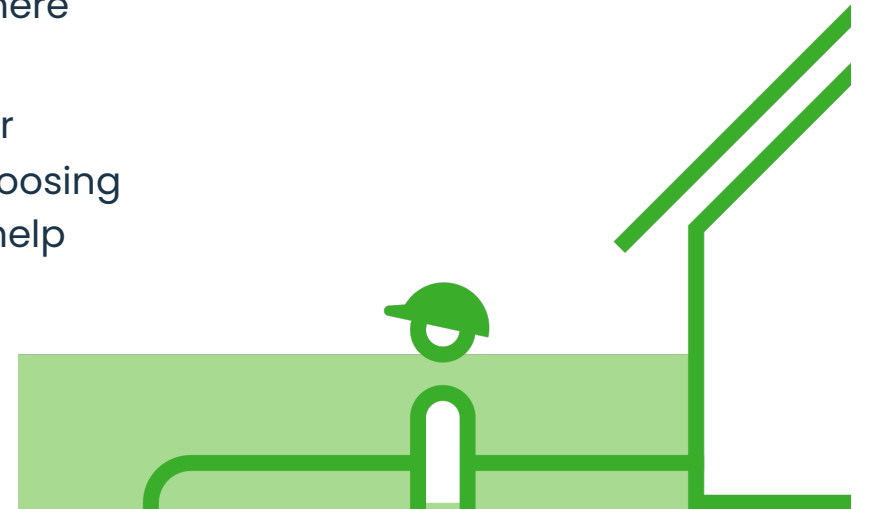
- Various professionals can help plan and implement BPE
- Raise early when employing architects/retrofit coordinators – BPE can be part of their remit and cost
- Specialist building performance testors are needed for particular BPE techniques (e.g. airtightness testing, thermal imaging, whole fabric heat loss testing)
- WoodKnowledge Wales' Building Performance Evaluation Guide gives information on such specialists, the level of expertise required and indicative costs



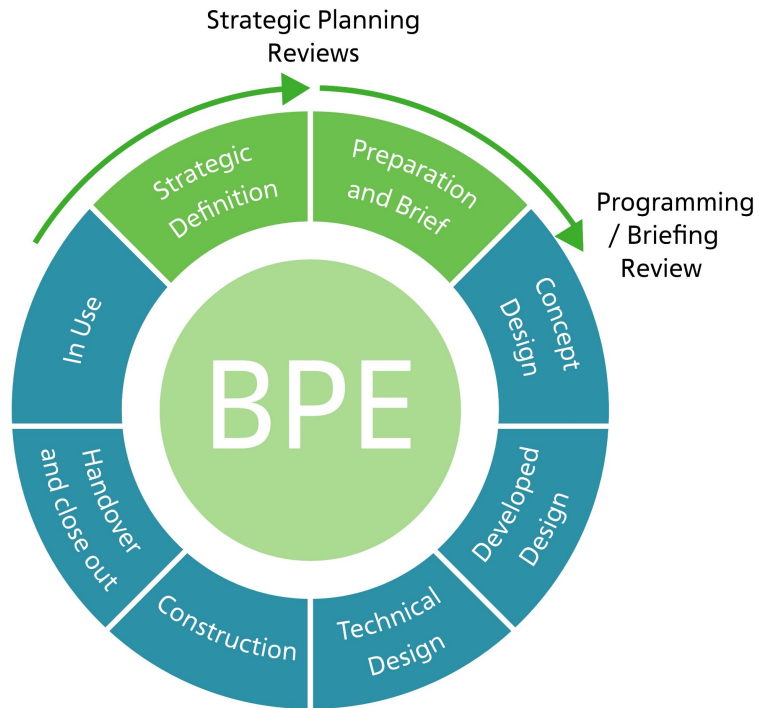
Who needs to be engaged in a BPE?

Contractors

- Contractors will need to be informed about / take part in the BPE
- They need to understand the performance targets and how these are to be achieved on site / may be compromised by particular actions
- Will need to be involved in reviewing results and in remedial action where necessary
- Communication of any performance issues requires context and clear explanation of findings and implications, backed up by evidence - choosing the most appropriate BPE technique and way to present results may help



What happens at different project stages?

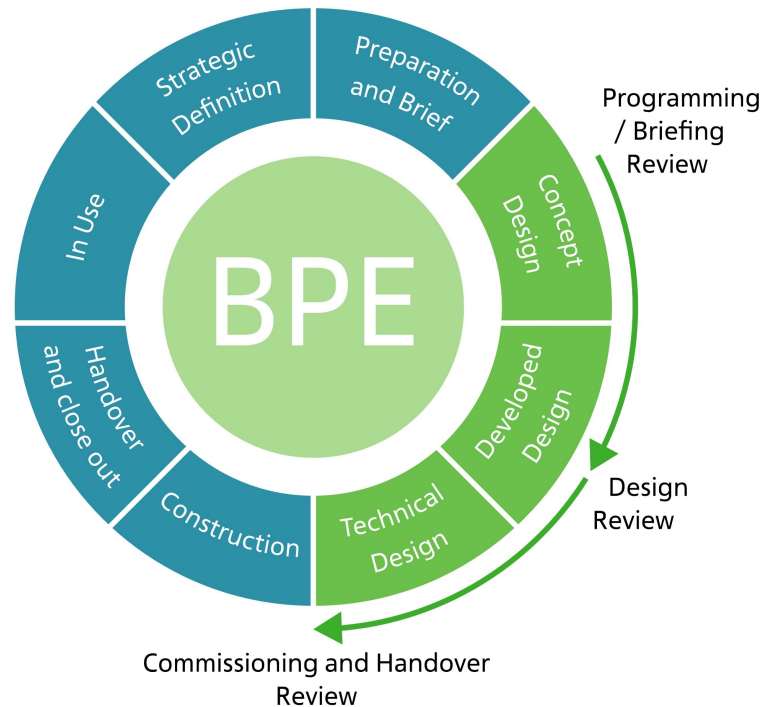


Strategic Definition and Preparation & Briefing (RIBA Stages 0-1)

- Set measurable performance outcomes/targets
- Reflect on lessons learnt from past BPE any parties were involved in, if relevant
- Use these targets and lessons to inform project preparations
- Engage with all relevant parties
- Set expectations around BPE timetable and process

What happens at different project stages?

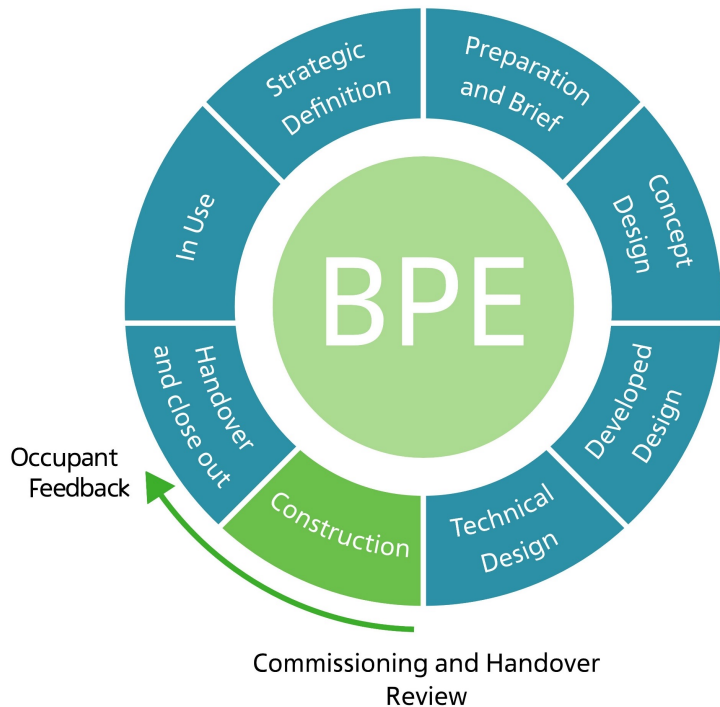
Concept, Developed and Technical Design (RIBA Stages 2-4)



- Use performance outcomes and targets to inform design / retrofit strategies
- Further development of detailed targets
- Choose BPE techniques to test the design and identify decisions that may impact on ability to meet targets, e.g.
 - Site visits
 - Design reviews (e.g. energy, airtightness, ventilation etc.)
 - Early stage overheating analysis
 - Procurement review
- By Stage 4 there should be a detailed plan for how BPE will be delivered in practice, with associated budgets

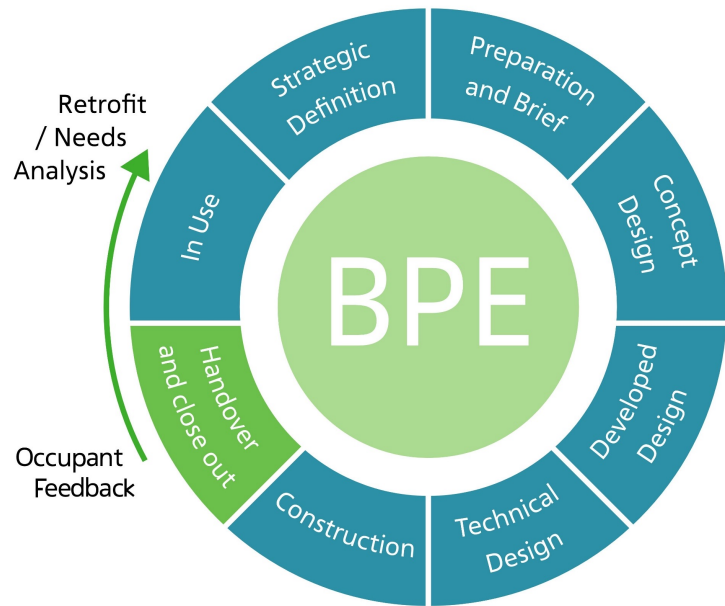
What happens at different project stages?

Manufacturing & Construction (RIBA Stage 5)



- Focus on ensuring design and specification are executed as planned
- Any changes should be checked for impact on performance
- BPE techniques can help identify issues, e.g.
 - Building walk-throughs with additional on-site checks
 - Tests / surveys e.g. air permeability, fabric
 - Commissioning and handover review
- Also need ongoing consideration of Design review, and early consideration of Handover & Induction review
- Review findings with contractors promptly to allow remedial action where needed
- Commission any in-situ monitoring equipment

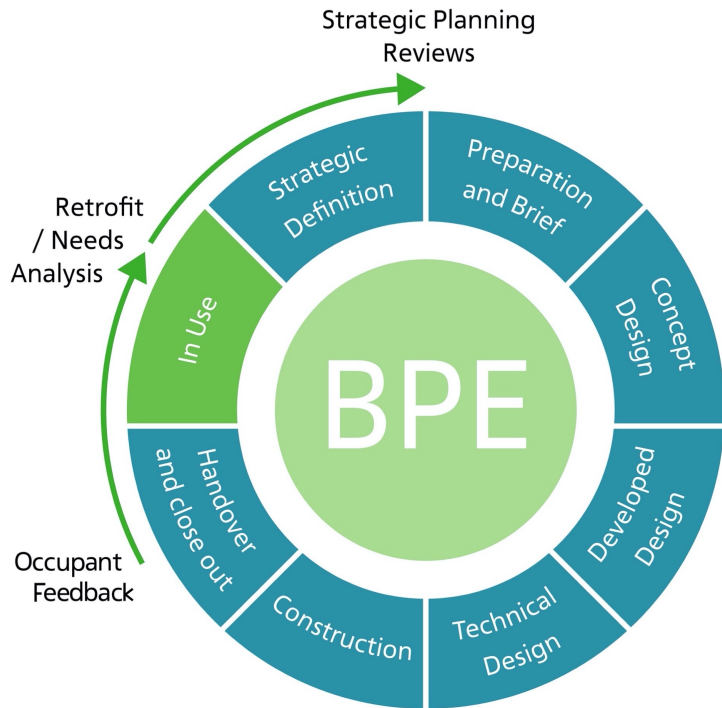
What happens at different project stages?



Handover (RIBA Stage 6)

- Ensure monitoring and evaluation processes are fully explained to occupants and landlords (where relevant)
- Ensure occupants are aware of how to use controls and (where relevant) monitoring equipment
- BPE techniques at this stage include:
 - **Commissioning review** where re-commissioning or seasonal commissioning is required
 - **Handover & induction review**

What happens at different project stages?



In Use (RIBA Stage 7)

- Level of BPE depends on project goals and outcomes of preliminary testing
- Options include: Preliminary Evaluation / Standard BPE / Investigative BPE - see Module 1
- Overall performance of dwelling should be considered with reference to targets and occupant feedback, bringing findings from different BPE techniques together
- Further remedial action can be taken if needed
- BPE techniques include:
 - Occupant feedback
 - Commissioning review (recommissioning/seasonal)
 - Energy use / energy generation / water use monitoring
 - Internal / external condition monitoring (e.g. temperature, relative humidity, CO₂)

What are common BPE techniques?

Common BPE techniques at / relating to design stage include:

- Site visits – e.g. to understand constraints and opportunities
- Design review – e.g. review of key building parameters, performance targets, design strategies and drawings etc. This review can cover various factors e.g. energy, fabric design, airtightness, ventilation, thermal bridging, moisture risks etc.
- Early stage overheating analysis – to review risks and mitigation strategies
- Procurement review – to ensure this matches the project targets



What are common BPE techniques?

Common BPE techniques at or relating to construction stage include:

- Building walk-throughs – for additional on-site checks and QA, resolving queries
- Tests / surveys which may include:
 - Air permeability tests – there are 2 common methods, blower door and Pulse
 - Fabric tests – e.g. thermal imaging to visualise heat loss through building fabric and identify problem areas; measurements of whole house heat loss
 - Acoustic checks
- Commissioning review – to check outcomes are consistent with project targets
- Additionally, ongoing consideration will be needed for:
 - Design review – e.g. using outputs to inform checks above, updating design if changes are made at construction stage
 - Handover & Induction review – planning for this



What are common BPE techniques?

Common BPE techniques at or relating to handover and in-use stages include:

- Commissioning review – e.g. where re-commissioning is required, to check outcomes are consistent with project targets
- Handover & Induction review – e.g. checking the information provided to occupants is sufficient and clear
- Monitoring and review (typically over a 12 month period) of:
 - Energy use & generation
 - Water use
 - Internal conditions (e.g. temperature, humidity, CO2)
 - External conditions (e.g. temperature, humidity, exposure)
- Occupant feedback – to assess comfort, satisfaction, wellbeing, needs, usability
- Bringing findings from all techniques together, to assess overall project performance

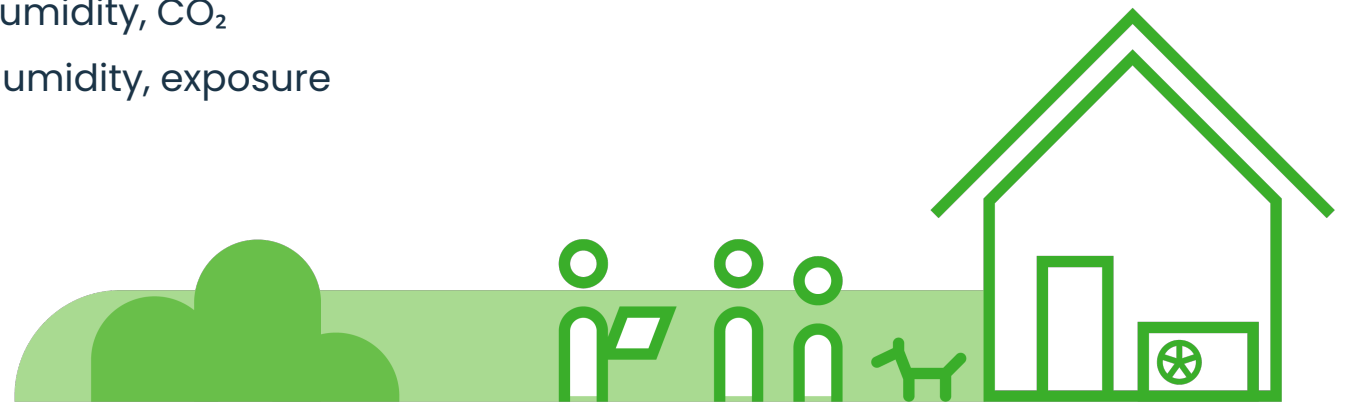


What are common BPE techniques?

Common BPE techniques applied in-use include:

- Occupant feedback:
 - On comfort, satisfaction, wellbeing, needs, usability, etc
 - May be gathered via surveys, questionnaires, interviews
- Monitoring and review:
 - Energy use and generation
 - Water use
 - Internal conditions – e.g. temperature, humidity, CO₂
 - External conditions – e.g. temperature, humidity, exposure

BPE will enable a better understanding of the building, inform recommissioning and help occupants understand services and controls



How to gather and use occupant feedback

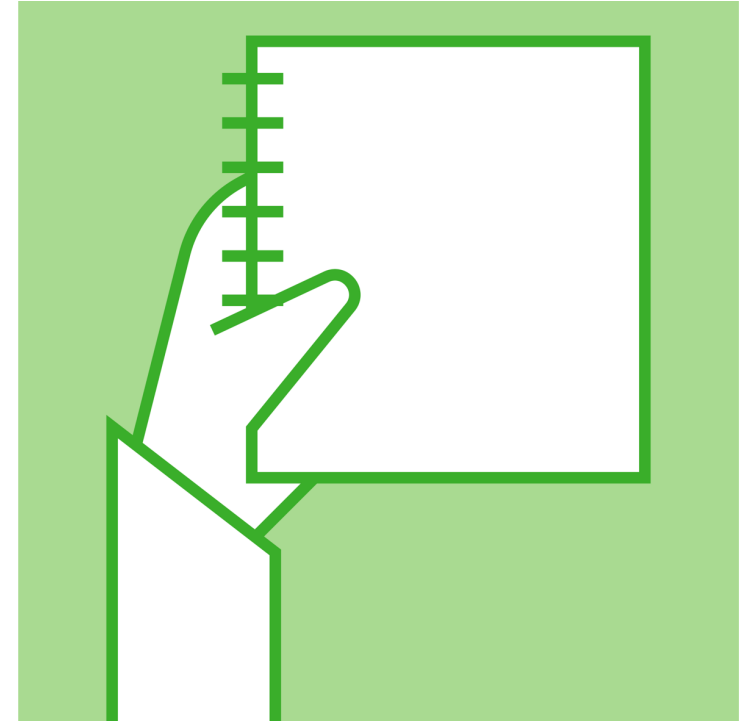
- Gathering occupant feedback requires clear, mostly standardised questions
- These should focus on key points – e.g. covering comfort, controllability, air quality, specific technologies and, where relevant, changes before/after retrofit
- Data collection tools include surveys, questionnaires and interviews – one tool per home should be enough
- Seasonality and length of time in the home need to be considered in deciding when to gather data – two stages of feedback are often needed
- Initial feedback (shortly after move-in / completion of retrofit) can raise useful red flags
- Early feedback should be used to inform remedial action and the direction and level of detail of further BPE, where needed

The image shows a screenshot of a survey form titled "SOAP RETROFIT Domestic Occupant Satisfaction Survey". The form includes a progress bar, a "Required" indicator, and three sections of questions with Likert scales. The first section is "Comfort" with the question "In general, how comfortable do you find the environment within your home?". The second section asks "What is your opinion of the overall Winter conditions in your home?". The third section asks "What is your opinion of the Temperature in the Winter in your home?". Each question has a scale of seven radio buttons with labels: "Very uncomfortable", "Uncomfy", "Somewhat uncomfy", "Neutral", "Somewhat comfy", "Comfy", and "Very comfortable".

Credit: SOAP Retrofit

What have we covered?

- BPE Training Module 1 - recap
- Who needs to be engaged in BPE
- What needs to happen at different project stages
- What BPE techniques might be used at each stage?
- How to gather and use occupant feedback





Find more on all of this at the BPN
Resource Hub:

building-performance.network/

The background features a dark purple color with a large, light purple circle in the center. Overlapping this circle is a smaller, darker purple circle. A white square is positioned at the top center, partially overlapping the top of the light purple circle. The text "Resource Hub" is centered horizontally and vertically within the overlapping area of the two circles.

Resource Hub