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The Business Case for BPE

Proposal for market development activities

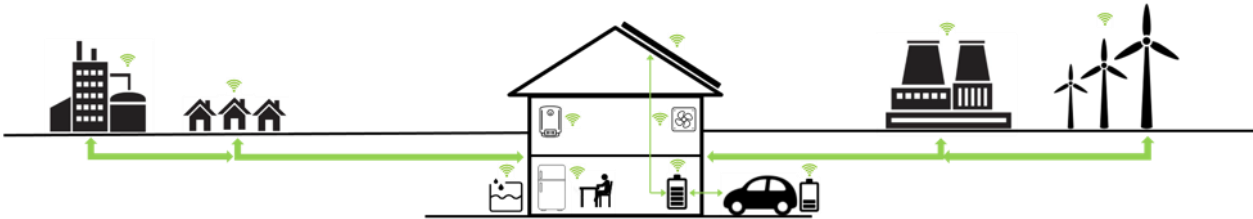
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Introduction

The built environment is seeing a period of unprecedented demand for innovation and change. This is being driven by a combination of the mainstream acceptance that we must transition to a Net Zero Carbon economy as quickly as possible, and the exponential growth of smart technologies, particularly the 'Internet of Things' (IoT).



Known by some as the 'Fourth Industrial Revolution'¹, the arrival of intelligent objects, appliances and machine learning at commercially viable scale is fundamentally changing the way we understand and interact with buildings. This is being combined with the need for buildings to become an active part of the wider energy system, whilst ensuring they actually deliver the designed levels of energy performance, comfort and occupant needs.

There is a growing realization that Building Performance Evaluation (BPE) can and will play a central role in helping turn this vision of a Net Zero Carbon future into a healthy and productive reality. Experts in this area are beginning to collaborate more closely with innovators from across the financial, construction, IT, Electric Vehicle (EV) and energy supply chain to understand what this future might look like, and strategically position themselves to take advantage as new business models appear.

It is already apparent that it is no longer enough to think this will be a world of simply predicting energy and water demand. We are rapidly approaching a future where multiple players will need to know **how** the built environment is performing, **why** this is the case, plus **what** and **when** the wider energy system and occupant needs impacts will be.

The need for a BPE business case study

The Building Performance Network (BPN) is committed to promoting the increased use of BPE techniques across the UK. In the context of these growing trends, we aim to conduct a scoping study to clearly demonstrate the business case for BPE in this future. Working with a team of partners the project will provide much needed independent evidence to explain:

- What and why are so many innovations taking place in this sector?
- Who will see most value in the greater use of new BPE techniques and technologies?
- Which sectors are best placed to take best advantage of new business models?
- What strategic support is required to help make this future a mainstream reality?

¹ The First Industrial Revolution refers to the industrial use of steam power; the second refers to electromagnetic rotary devices forming the basis for practical electricity use; the third refers to widespread use of the world wide web.

Stage 1 – BPE: The value & the benefits

Desk study of BPE related policy and regulatory trends

An introductory study to coherently explain the environmental, technological, financial and political factors that are changing the way in which the built environment is expected to perform and how BPE will need to play a vital role in achieving this. This work will be based upon the expert knowledge brought by both BPN's membership and additional supporting project partners.

Case studies – Social housing, care homes, community and educational buildings

It is always powerful to present examples of projects where innovative ideas and products are being trialled in the real world. Our current intention is to focus on sectors where there is already a clear appreciation of the value BPE can bring for clients, owners and occupiers. These include **new build and retrofit projects** in the following sectors:

- **Social housing**
- **Care homes / supported living**
- **Community and health centres**
- **Schools and higher learning centres**

Whilst each exemplar project is likely to have a range of different original objectives, we envisage a core set of BPE themes will be present to allow a structured comparison to be presented. These themes are likely to include:

BPE case study themes				
Design & Delivery	Level of consultation with future occupants	Incorporation of previous BPE in briefing, design, construction & maintenance processes	Use of new data capture technologies during construction	
Space heating demand	Fabric design strategy	Thermal junction & air tightness modelling & detailing	Communication of design intent and practical site training	Comparison of design intent with as-built performance data
Energy	Total demand	Total generation (In particular renewable energy systems)	Peak demand	Electric vehicle interactions
Overheating	Peak temperatures	Length and time of extreme periods	Effectiveness of designed management strategies	Occupant adaptation techniques
Indoor Air Quality	Relative humidity	CO2 profiles	VOC profiles	
Water	Total demand	Peak demand		
Occupant	Understanding of operating systems	Understanding of maintenance requirements	Perceptions of comfort	

Stage 2 – BPE: Future market demands & opportunities

This stage of the project will use a combination of desktop research, targeted online interviews and a web-based questionnaire to map-out the fundamental types of data and analysis that will be seen as valuable in the future.

What and why are innovations taking place in this sector?

Forward thinking individuals and organizations are already beginning to see buildings from two interrelated, but distinctly different, perspectives: as a product and as a service. The areas of most significance, and therefore value, are likely to be different depending on which perspective you take.



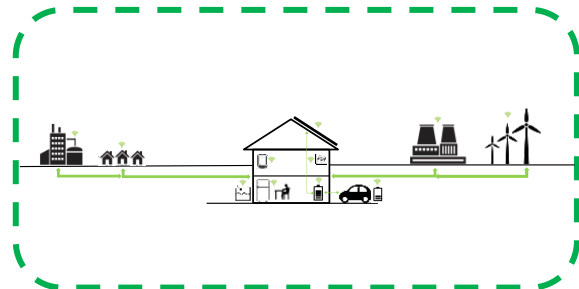
Building as a *Product*

Typically, people & organizations that see their relationship with the building as finite (i.e. ends once works are complete).

Primary value streams are likely to focus on:

- De-risking innovation
- Differentiating through quality
- Demonstrating regulatory compliance

Product / system suppliers, new-build developers, retrofit contractors, building control bodies & project financiers



Building as a *Service*

Typically, people & organizations that see their relationship with the building as longer term (i.e. over a lifespan of 50 years or more).

Primary value streams are likely to focus on:

- Providing occupant comfort, health & functionality
- Providing functionality & practical maintenance regimes
- Managing future energy & water demands
- Predicting future energy generation

Building owners, occupiers, building services suppliers, facilities managers, energy providers, network operators, healthcare providers & policy makers

Mapping the future value streams

We can already begin to envisage what type of themes might appear during this research. The following examples help to illustrate this based upon the previously postulated split in perspectives between buildings as a finite **product** a more longer-term relationship **service**

Building as a 'Product' - Potential value streams			
Who	What	Why	When
Product / system suppliers	Confirmation products are installed within guidance Performance of products in-situ	Risk of later litigation Critical info for innovation	At end of most projects During works if higher risks
Contractors / Developers	Installed as specified Interactions with other components and systems	Risk of later litigation Valuable for future bids	As soon as possible after each work package is finished
Building Control /Warranty Provider	Visual record of process Technical data points as per Approved Documents	Responsible for approving work and any future risk consequences	As soon as possible once project is complete
Building owner / financier	Visual record of process Additional quality focused checkpoints	Assurance 'product' is as specified Ability to challenge future issues	As soon as possible after each work package is finished

Building as a 'Service' - Potential value streams			
Who	What	Why	When
Building owner / occupier	Energy & water demand Internal conditions	Gauge level of performance being delivered Trigger operational improvements Predict future issues	Health & comfort issues – Daily Cost critical issues – Monthly
Facilities Manager	As above plus Unusual services patterns	Optimise controls Predict and plan maintenance	As above
Energy Provider	Energy demand patterns Weekly / monthly peaks	Optimise purchasing / export Balance wider system	Electric – every 15 mins Water - Weekly
Energy Network Operator	Energy demand patterns Seasonal changes	Balance wider system Shift peak demand (batteries)	Every 5 mins

With the results of this research, it will be possible to better understand if these two proposed perspectives are actually correct, and if the suggested primary value streams do match with the aims of the organization types as expected.

Understanding the future market demand and expectations

This stage will aim to take the critical step of asking how ready the BPE sector currently is to meet the now more clearly defined demands and expectations of these future markets. Whilst the exact findings from stages 1 & 2 will reveal specifics it is likely that the following questions will sit at the centre of such considerations:

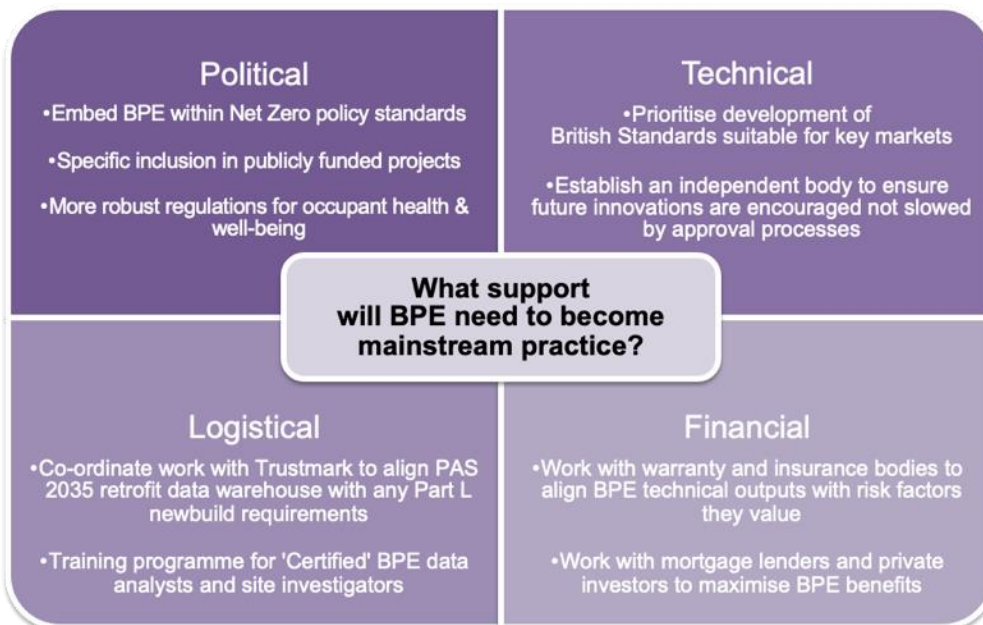
- Are the expectations of the BPE sector technically possible?
- Will it be possible to deliver these at the scale envisaged?
- Is an attractive price point potentially achievable?
- Are there any suitable existing industry agreed standards?
- What are the causes of any resistance to change?

Sector briefing packs and summary report

Informed by the findings from the previous work, we will produce sector specific information packs to help both raise awareness of the value BPE can bring and help those seeking to enter the market tailor their approach to the future. The packs will explain: what these future clients / users in each sector will want, when they want this, and most importantly, why do they feel they will value this information or service?

Stage 3 – BPE Strategy for market development

As with all innovation journeys there are likely to be challenges and barriers along the route to mainstream adoption. This final stage of activity will therefore identify what these issues are and propose actions that can be taken to support greater progress. Whilst far from exhaustive, the following diagram presents some of the issues the BPN has identified during recent discussions with our members and supporters



A strategic route map will be produced highlighting key stages for target sectors as defined in Stage 2. This, in combination with the Sector specific information packs will be form the basis of the BPN Campaigns programme for 2022 – 23.

Proposed project timeline

		Q2 - 2021			Q3 - 2021			Q4 - 2021			Q1 - 2022			Q2 - 2022		
		<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">Key</div> <div style="display: flex; gap: 5px;"> <div style="width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black;"></div> 1 <div style="width: 15px; height: 15px; background-color: #FFD700; border: 1px solid black;"></div> 2 <div style="width: 15px; height: 15px; background-color: #FF8C00; border: 1px solid black;"></div> 3 </div> </div>														
Prelims - Project creation and partners																
1	Agree funding partners	1	1	1												
2	Agree exact project scope and prioritizations		1	1												
3	Create steering group and working groups			1												
Stage 1 - BPE: The value & benefits																
1	Desk study of policy and regulatory trends (Building, Energy Supply & Health sectors)			1	1	1										
2	6 x Case studies - Social housing - new & retrofit			1	1	1	1	1	1	1	1					
3	6 x Case studies - Public care homes, health centres, schools etc			1	1	1	1	1	1	1	1					
4	Output 01 - Up to 12 x PDF co-branded case studies on BPN website									3	3	3				
Stage 2 - BPE: Future market demands & opportunities																
1	Mapping 'Building as a Product'				1	1	1									
2	Mapping 'Building as a Service'				1	1	1									
3	Future trends - Technical & standards					1	1	1	1	1						
4	Future trends - Commercial & delivery					1	1	1	1	1						
5	Consultation - What does BPE data mean to you today, in 2025 & 2030?										1					
6	Output 2 - BPE Sector briefing packs & summary report													3	3	
Stage 3 - BPE: Strategy for market development																
1	Identify key Political, Technical, Financial & Logistical barriers										1	1	1			
2	Consult on BPN proposals for solution with project partners & supporters													3		
3	Output 3 - 'Route map for BPE market growth' with supporting sector campaigns strategy															

Deliverables

This programme of activity will deliver a combination of outputs designed to increase understanding of the BPE related innovations taking place across the built environment sector and stimulate debate across other sectors and UK policy makers about how BPE can play a key role in our journey to a Net Zero society.

- **Output 01** - Up to 12 x BPE Market Leader case studies, co-branded with supporters and sponsors, launched as PDFs on the BPN website and promoted via the wider Sustainable Development Foundation networks
- **Output 02** – Industry wide consultation, ‘What does BPE data mean to you today, in 2025 & 2030?’, presented as sector specific briefing packs for use by all project supporters
- **Output 03** – Launch of a ‘Route map for BPE market growth’ supported by targeted sector campaigns forming the basis of BPN campaign activities in 2022 & 2023

How to get involved and support this project

The BPN places great importance on the independent evidence-based nature of all its activities. Our core team and administration are funded by the kind support of our membership. We are hugely thankful for the additional support provided by our Pioneer Members who also take a more direct role supporting research and campaigns.

In addition, we actively seek to fund major research projects via a number of sponsors from as wide a cross-section of the target audience as possible. We are very keen to hear from people and organisations who can represent the views of the following sectors:

- Policy makers
- Research organisations
- Higher Education
- Project financiers
- Warranty providers
- Building owners
- Energy providers
- New-build developers
- Retrofit contractors
- Construction product suppliers
- Building services suppliers
- MMC system suppliers
- Building control bodies
- Facilities managers
- Energy network operators

If you think your organisation or company would benefit from the outputs of this project, then please send us an email via info@building-performance.network. We are happy to discuss a variety of ways to get involved ranging from offering your time to be part of our working groups to direct financial support of part or all of the proposed activities.



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