



Building Performance Network

Presentation: Ecobuild
8th March 2018

Our Activities

Agenda



A Building Performance Network for the UK

George Martin, Chief Executive, Building Performance Network

Measuring Building Performance: New Frontiers

Professor Will Swan, University of Salford

Improved measured performance in use and assuring performance - learning from 'energiesprong retrofit' in the UK

David Adams, Melius Homes

Learning Lessons from the good and the bad

Paul Valentine, British Board of Agrément

Q & A

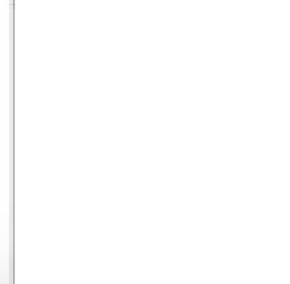
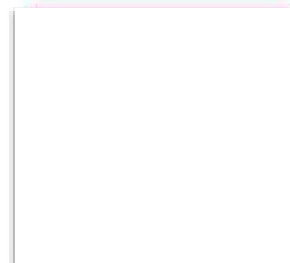
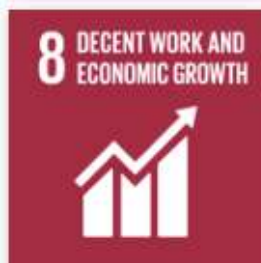
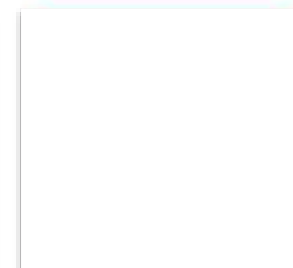


SUSTAINABLE DEVELOPMENT GOALS

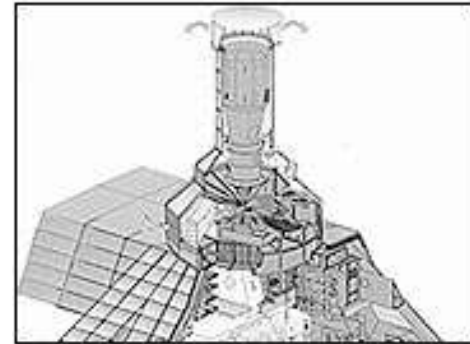




SUSTAINABLE DEVELOPMENT GOALS



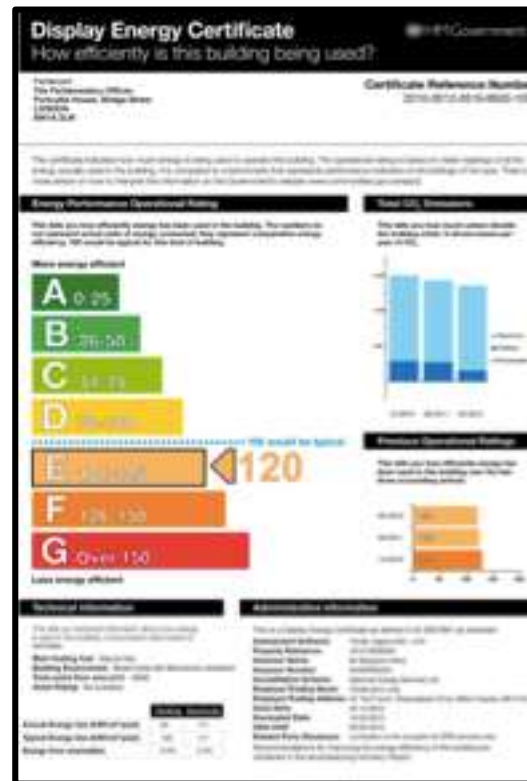
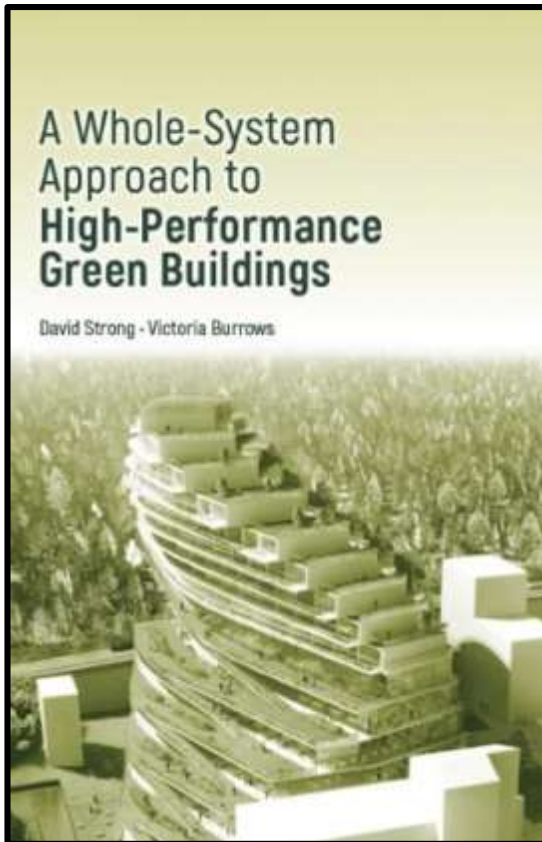
Portcullis House



Quote: “It is highly energy efficient. It uses only about one third as much fuel as a conventionally air conditioned building. Heat is recycled from exhaust air, and cooling is provided by groundwater from boreholes.”

But what’s the reality in practice?

Portcullis House



Performance Measurement



1. Energy
2. Carbon
3. Thermal comfort
4. Indoor air quality
5. Health of occupants
6. Wellbeing of occupants
7. Lighting
8. Acoustics
9. Water
10. Resilience and Adaptation



Professor Dame Sally Davies
Chief Medical Officer for England

In her annual report, published on the 2nd March 2018 she recommends that DEFRA need to explore whether the public should be encouraged to have devices to measure indoor air quality.

Indoor Air Quality



“In Western cities, the biggest source of air pollution is something else entirely: household items like your deodorant and shampoo”.

New Scientist 24th February 2018



Royal College
of Physicians

RCPCH

Specialist Centre for
Paediatrics and Child Health
Leading the way in Children's Health

Every breath
we take:
the lifelong
impact of
air pollution

What if...



“According to 2012 figures, indoor air pollution may have caused or contributed to 99,000 deaths in Europe”

Each year in the UK, around 29,000 deaths are attributed to outdoor air pollution. Indoor air pollution is also a significant source of pollutants.

Indoor air pollution plays a role in many of the health challenges of our time and has been linked to cancer, asthma, stroke and heart disease, diabetes, obesity, and changes linked to dementia.

Neither the concentration limits set by government, nor the World Health Organization's air quality guidelines, define levels of exposure that are entirely safe for the whole population.

Evolution of BPE



.....just one example of the many strands.....

BUS and PROBE post occupancy studies



Elizabeth Fry Building Occupied January 1995

1980's Development of the occupant survey by Dr Sherwood Burge and Dr Alan Hedge to study sick building syndrome. This became the Office Environment Survey (OES).

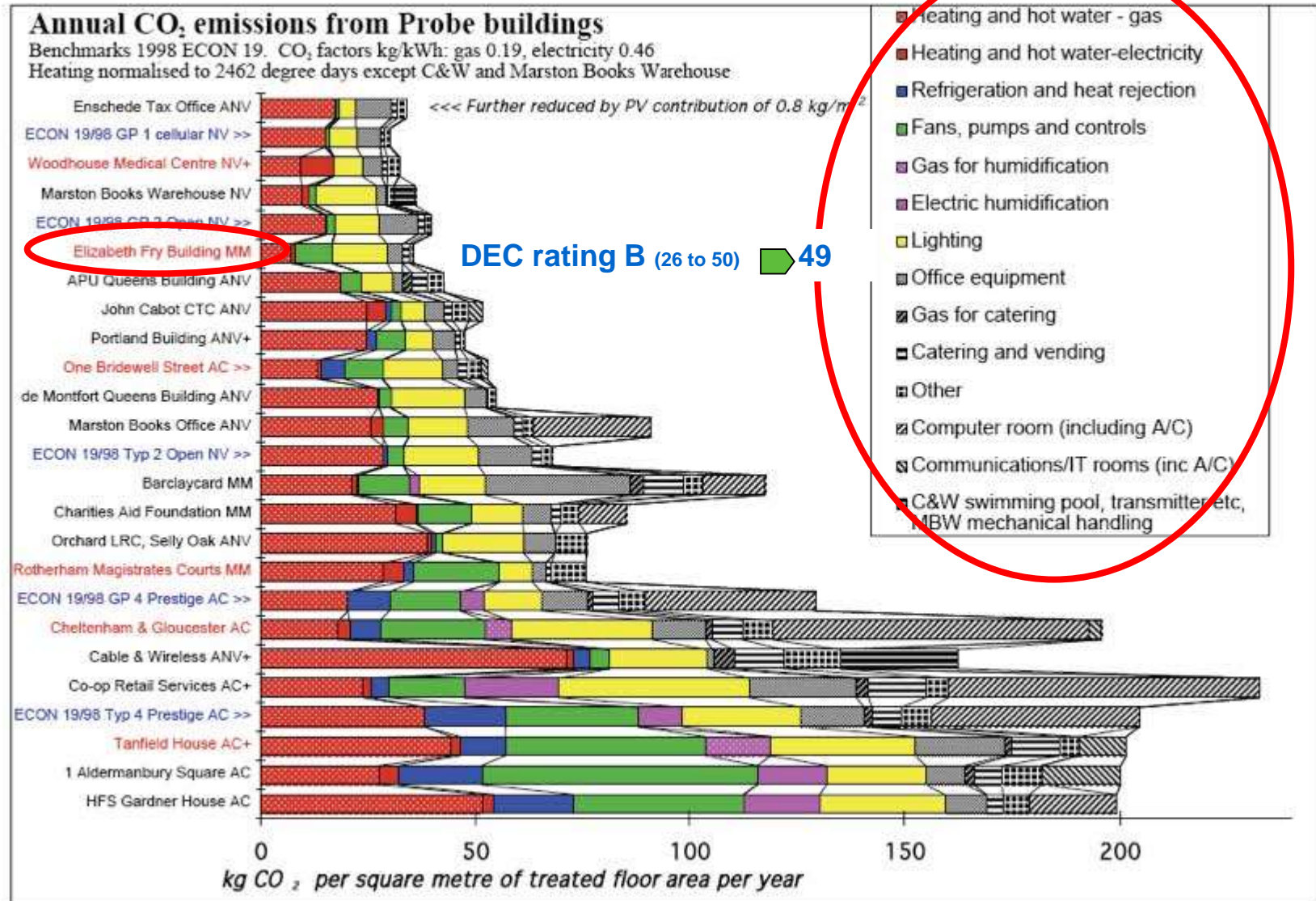
1995: The development of PROBE was a team effort devised originally by Paul Ruyssevelt and Roddi Bunn. The research was undertaken by Bill Bordass and Adrian Leaman along with John Field, Robert Cohen and Mark Standeven. PROBE used the OES survey and simplified it to become Building Use Studies (BUS) for undertaking post occupation surveys.

PROBE research 1995 -2002 was jointly funded by the UK Government and The Builder Group, publishers of Building Services Journal now the CIBSE journal.

The PROBE Team



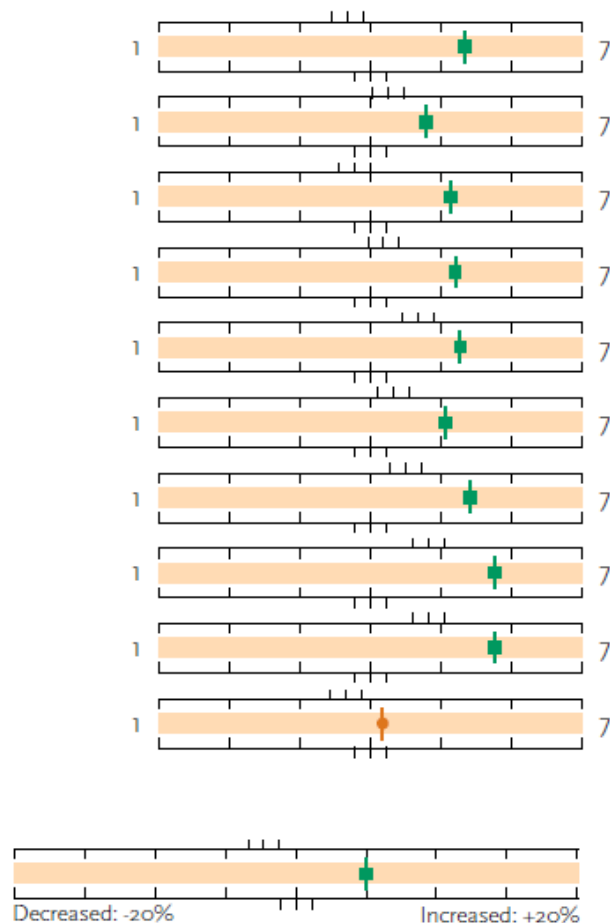
Report CO₂ emissions like this ...



Source: Probe team www.usablebuilding.co.uk

BUILDING PERFORMANCE 1 UNIVERSITY CASE STUDY

1998 occupant survey



Temperature in summer overall
1 = uncomfortable 7 = comfortable

Temperature in winter overall
1 = uncomfortable 7 = comfortable

Air quality in summer overall
1 = unsatisfactory 7 = satisfactory

Air quality in winter overall
1 = unsatisfactory 7 = satisfactory

Lighting overall
1 = unsatisfactory 7 = satisfactory

Noise overall
1 = unsatisfactory 7 = satisfactory

Comfort overall
1 = unsatisfactory 7 = satisfactory

Design
1 = unsatisfactory 7 = satisfactory

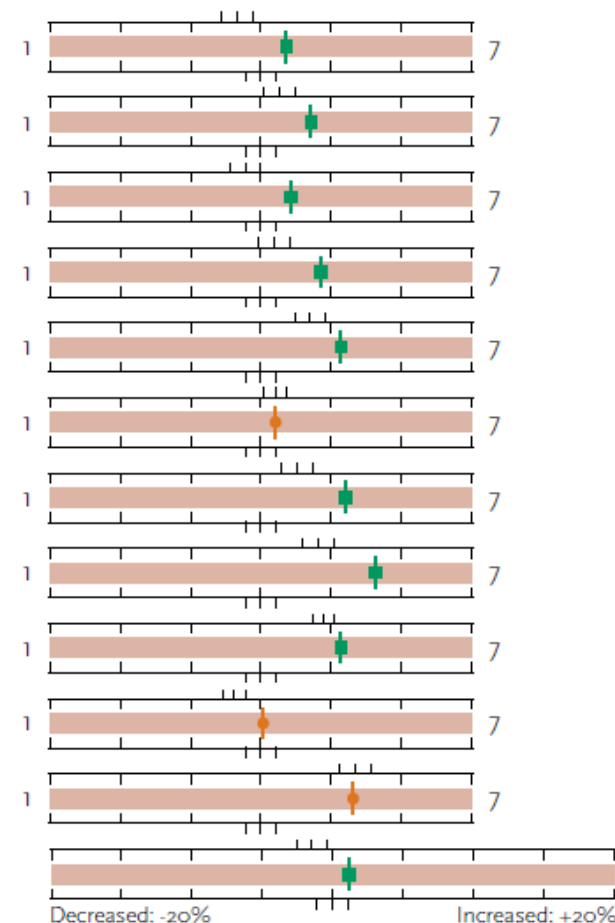
Does the building meet your needs?
1 = very poorly 7 = very well

Health
1 = less healthy 7 = more healthy

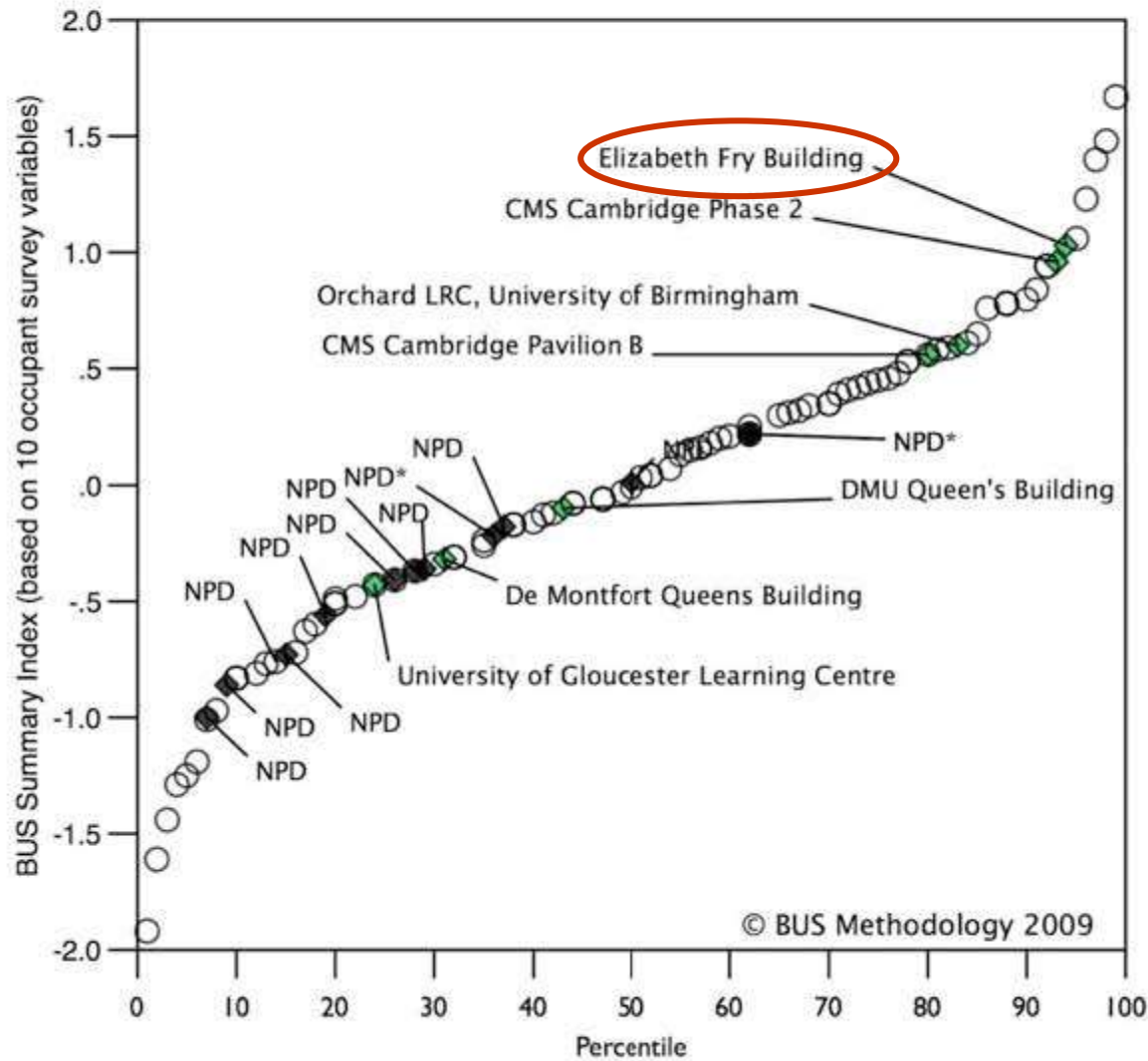
Image to visitors
1 = poor 7 = good

Perceived productivity

2011 occupant survey



Performance of Higher Education Buildings



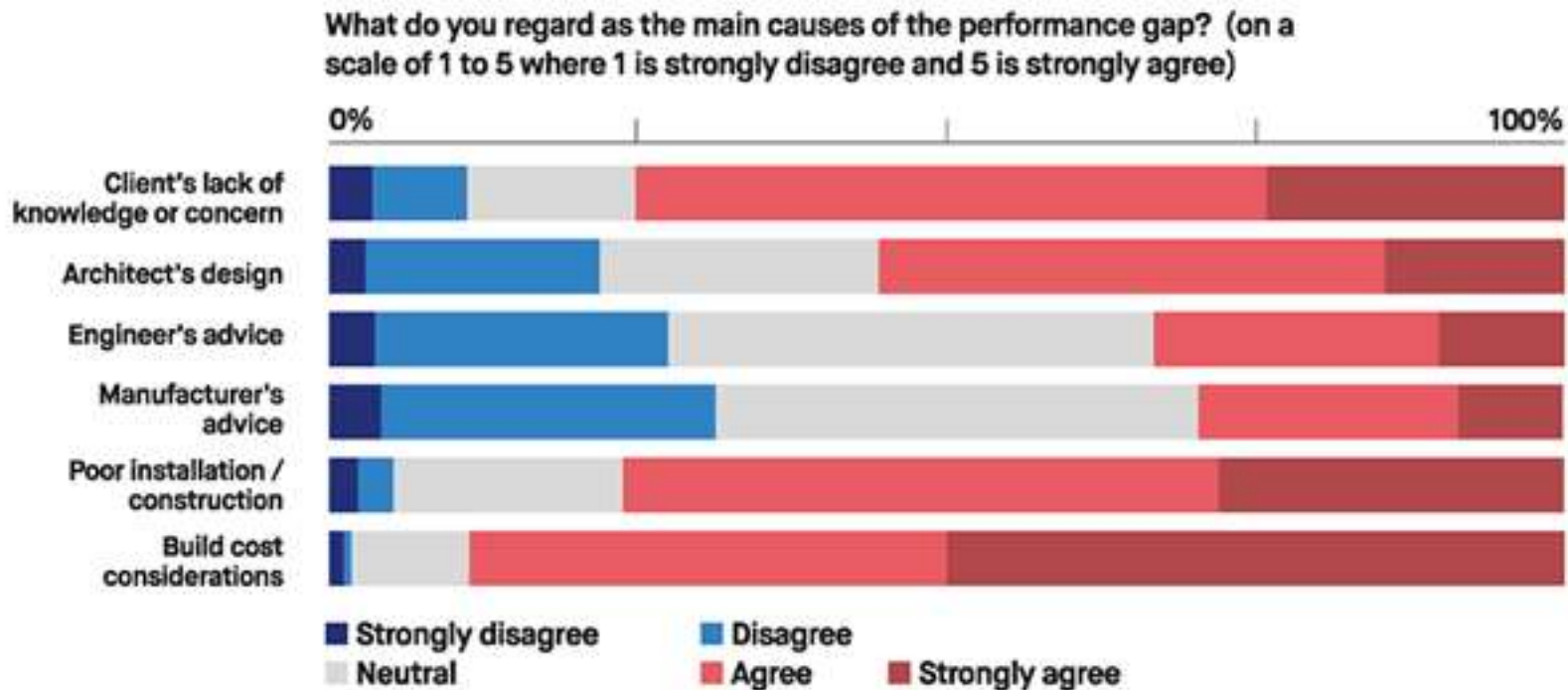
Key

- Named: HE buildings with information in the public domain
- Green: Buildings with elements of 'green design intent'
- NPD: Not public domain
- NPD* Charity
- Other data points: Other buildings in UK data set



Performance Gap Causes

Performance gap causes



Construction Manager February 2018

The survey was carried out in conjunction with Recticel



Why have a BPN?

1. Most of the industry do not know about Building Performance and its evaluation. This leads to poor decisions about policy, regulations and funding.

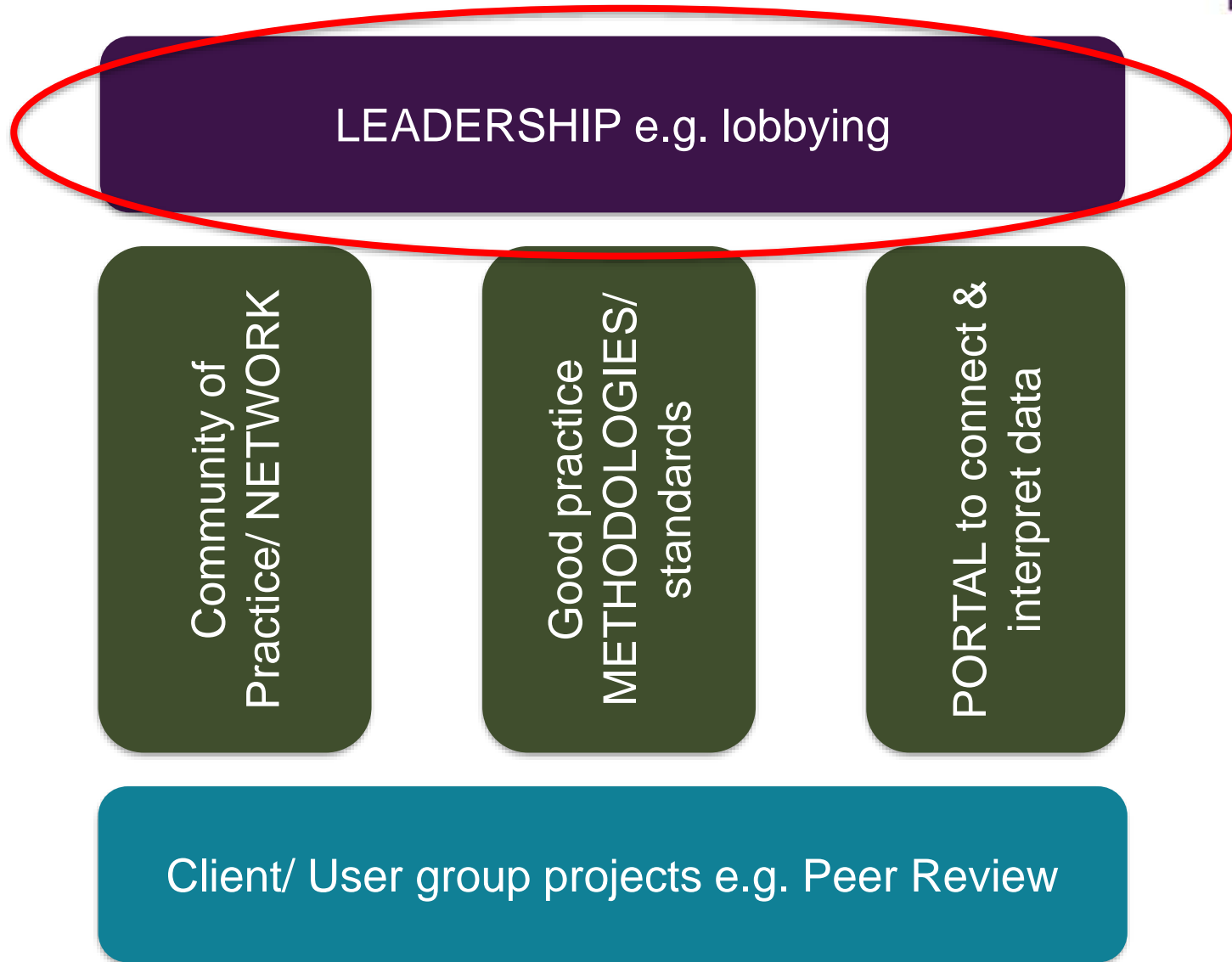
2. BPE standards are not harmonised and there is no consistency of implementation across the sector. This leads to confusion and mismanagement.

3. There is no leadership on BPE in the UK; we need a body with independence and credibility to provide this.

BPN Objectives

1. Create one collective, independent voice by bringing together people with an interest in building performance
2. Promote and develop building performance evaluation to ensure that data is consistent and supports decision-making
3. Provide leadership to influence policy, procurement and practice towards performance-based outcomes.

BPN Workstreams



Leadership



1. Building regulations

Push for change of approach to as built performance

2. Near & zero energy buildings

Push for evidence of measured real energy performance

3. New build homes – ventilation and overheating

Seek measurement of IAQ, overheating/ thermal comfort, and noise post completion. Use this to influence policy and help resolve overheating and ventilation problems

4. Home refurbishment projects

Seek measurement of energy use, ventilation rates & moisture management post completion. Use to influence policy & the adoption of a whole house approach rather than single measures.

5. Handover & operation of building systems

Gather evidence about the handover of buildings & their on-going performance in practice (Soft Landings)

Leadership continued



6. Health & well-being

Collect measured data on the basics of health & well-being effects e.g. indoor air quality/ pollutant levels, thermal comfort, daylighting & acoustics.

7. Health & well-being 2

Collect measured data on less tangible aspects of health & well-being e.g. colour, ergonomics etc

8. Smart buildings

Investigate collection of big data from smart buildings and how this can be used to inform management of the building.

9. Smart meter rollout

Is this working? Can people get access to the data? Are they collecting the right data to draw any conclusions?

10. Product/ system performance and BIM

Examine the performance of a number of trial projects to identify the performance of specific products/ systems in real-life situations and compare that to performance claims in test circumstances.

BPN Workstreams

LEADERSHIP e.g. lobbying

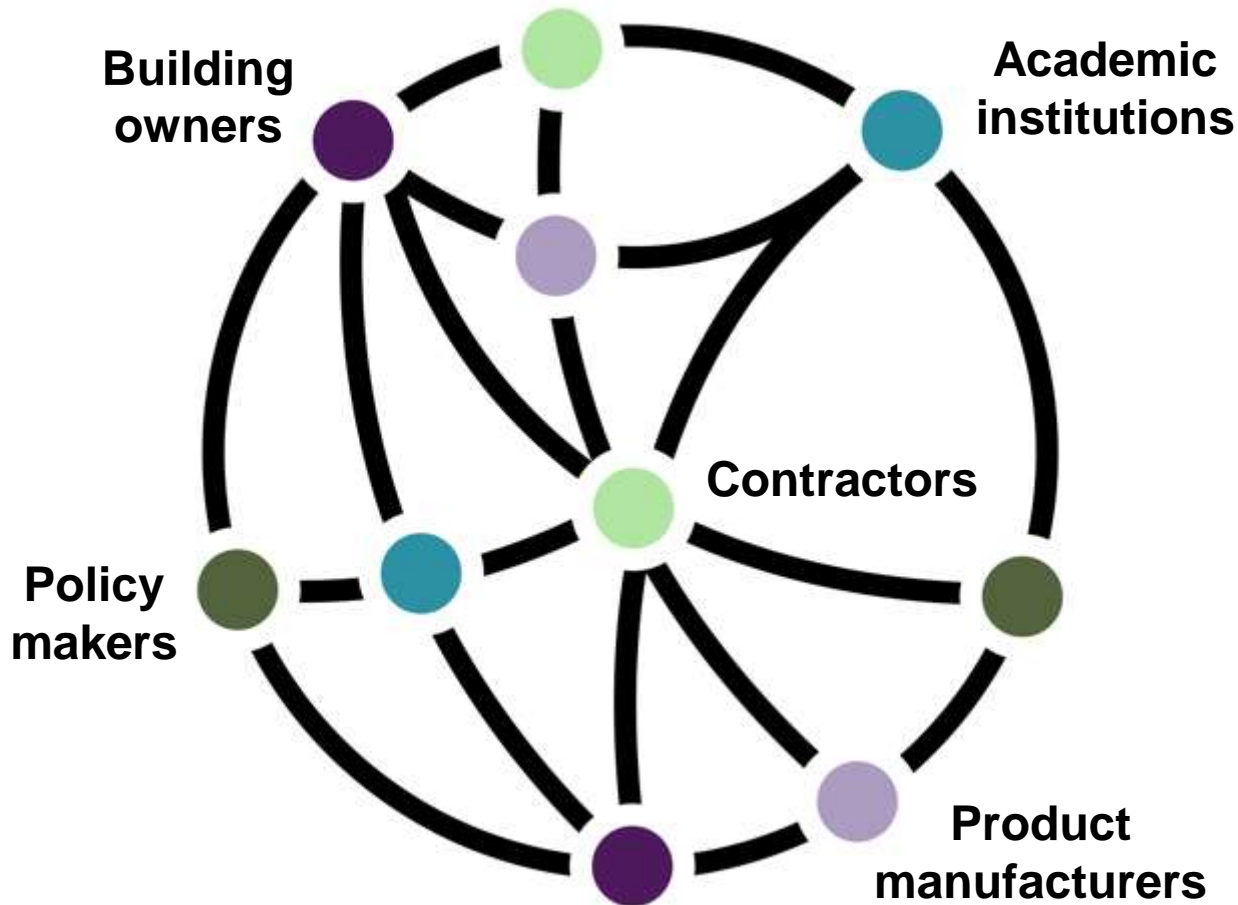
Community of
Practice/ NETWORK

Good practice
METHODOLOGIES/
standards

PORTAL to connect &
interpret data

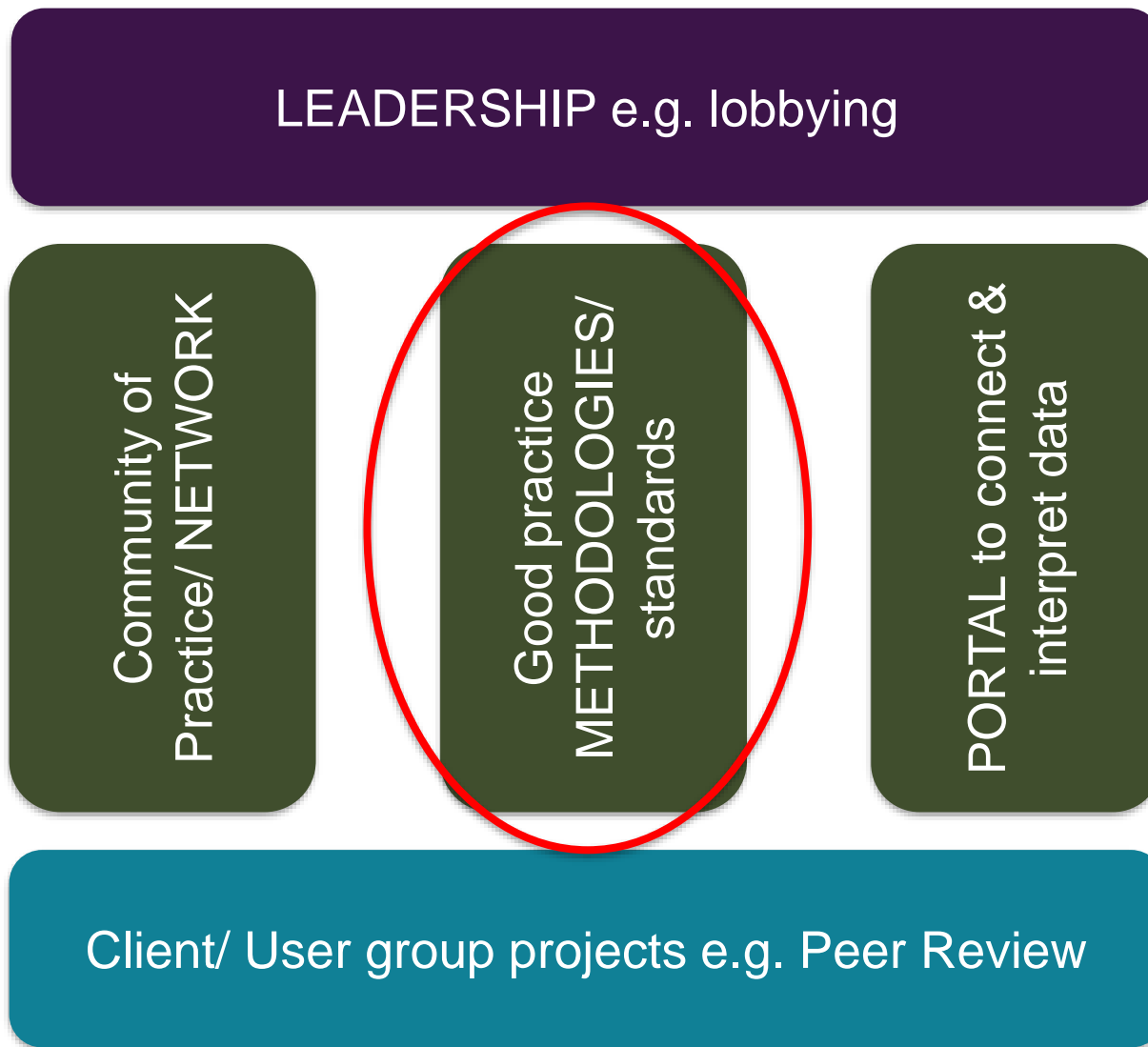
Client/ User group projects e.g. Peer Review

The BPN Network



The Building Performance Network seeks to link academic institutions, contractors, product manufacturers, building owners and policy makers together.

BPN Workstreams



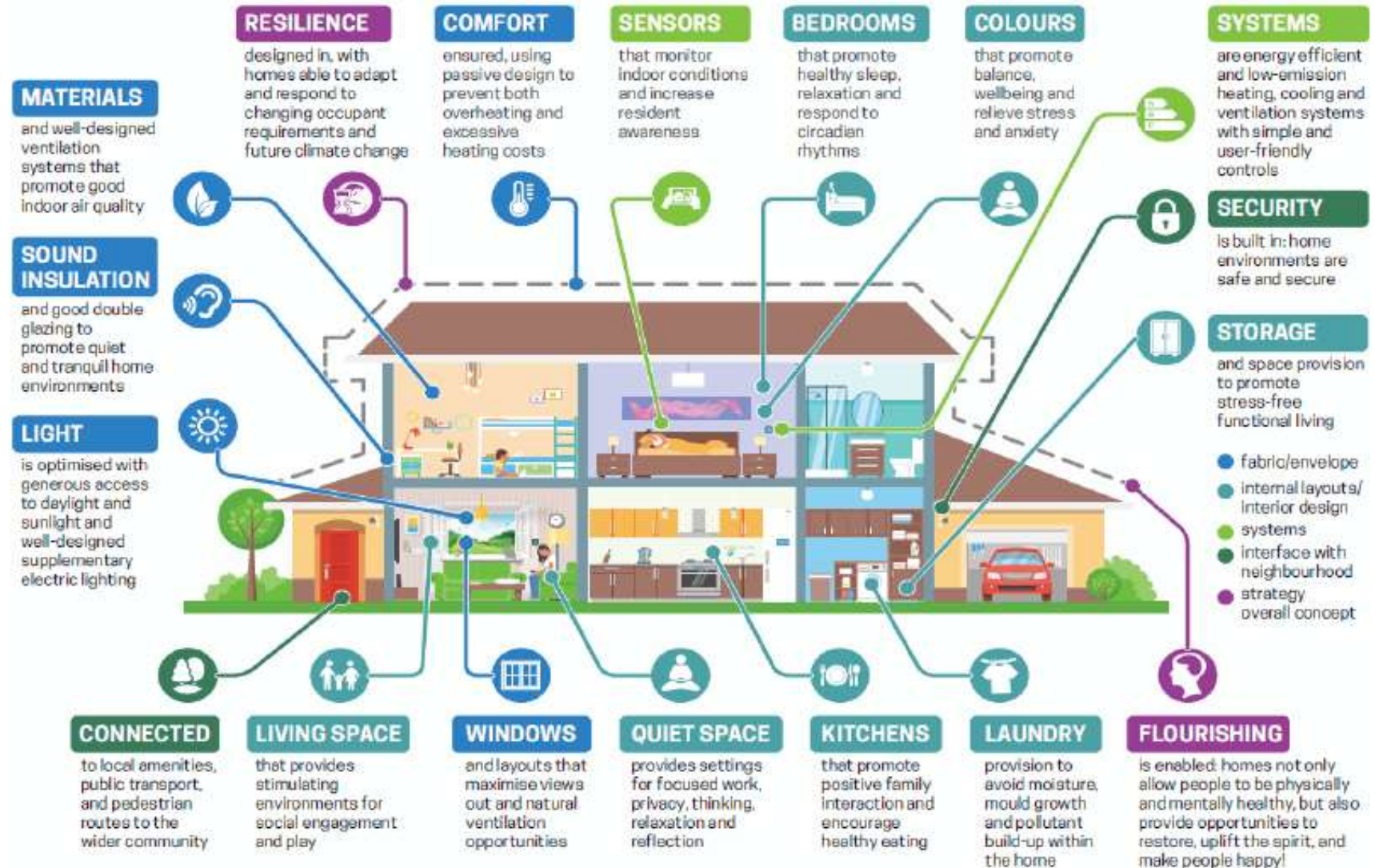
Research Projects



1. State of the Nation Review: Building Performance - Domestic
2. State of the Nation Review: Building Performance – Non Domestic
3. Measuring Building Performance: Methods, Tools and Facilities
4. Big Data - Smart Buildings
5. Faster Measurement Methodologies
6. Measuring Health & Wellbeing

What Makes a Healthy Home?

Figure 1: What makes a Healthy Home?



BPN Workstreams

LEADERSHIP e.g. lobbying

Community of
Practice/ NETWORK

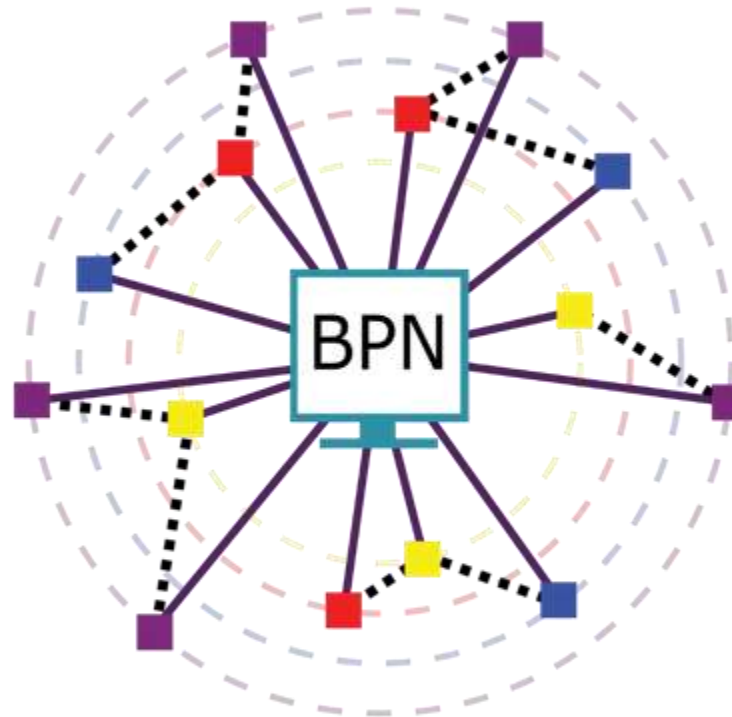
Good practice
METHODOLOGIES/
standards

PORTAL to connect &
interpret data

Client/ User group projects e.g. Peer Review

The BPN Portal

- Link to BPN Portal
- Online platform
- Residential
- Education
- Commercial
- Industrial



The BPN proposes a portal to link and provide a window into the quality of existing datasets to allow greater comparison and create a larger data resource.

BPN Workstreams

LEADERSHIP e.g. lobbying

Community of
Practice/ NETWORK

Good practice
METHODOLOGIES/
standards

PORTAL to connect &
interpret data

Client/ User group projects e.g. Peer Review

Working with user groups

PRE-PROJECT

- Advise on methodologies
- Highlight what can be learnt from different approaches
- Learning from other client group studies

POST-PROJECT

- Peer review
- An authoritative & collective view on the quality of the work
- Stamp of approval (if appropriate!)

This would be based on a BESPOKE Research Partner agreement.

Marketing and promotion



Benefits of working with BPN



1. BPN aims and is supported by many to be THE one collective, independent voice on BPE for the whole industry

2. Endorsement of individual performance gap closure initiatives by the BPN will have more credibility as an independent, trusted body

3. Peer review Involving the BPN in your BPE projects will ensure that best practice has been adopted and the measurement will provide the performance information you actually need.

4. The organisation would retain the IP from the data; learning about methodologies could be shared if agreed - for strategy deployment

5. Learning from BPN and other client/ user groups would help an organisation to be at the forefront of work developing BPE standards for new areas such as health and well-being

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