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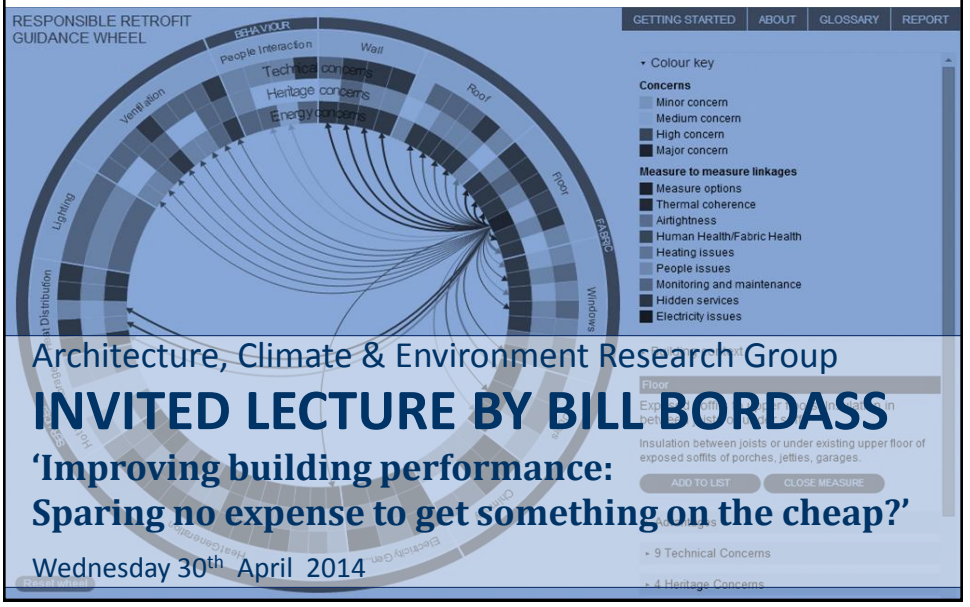

Architecture, Climate & Environment Research Group

INVITED LECTURE BY BILL BORDASS

'Improving building performance: Sparing no expense to get something on the cheap?'

Wednesday 30th April 2014

'IMPROVING BUILDING PERFORMANCE: SPARING NO EXPENSE TO GET SOMETHING ON THE CHEAP?'

Invited Lecture by Dr Bill Bordass OBE

Bill Bordass is a building scientist who worked at RMJM London, where he led its building services and energy groups. In 1984 he set up William Bordass Associates, which studies the technical and environmental performance of new, existing and historic buildings in operation and works closely with human factors specialists. He was on the Probe team which undertook and published 20 post-occupancy evaluations of recently completed buildings. He is research and policy adviser to the Usable Buildings Trust charity, which collects and disseminates information on building performance and its implications. He has contributed to over 200 publications including energy consumption guides, the Soft Landings Framework (2009) and the Special Issue of Building Research & Information on New Professionalism (2013).

www.usablebuildings.co.uk

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3

University of Nottingham
30 April 2014

IMPROVING BUILDING PERFORMANCE:
Sparing no expense to get something on the cheap?

Bill Bordass

the **USABLE BUILDINGS TRUST**

www.usablebuildings.co.uk

4

Summary

1. Where are we now?
2. How did we get here?
3. What was I up to while this was happening?
4. Where do we need to be?
   How might we get there?

5

1

WHERE ARE WE NOW?

6

Building performance in use is in the public interest

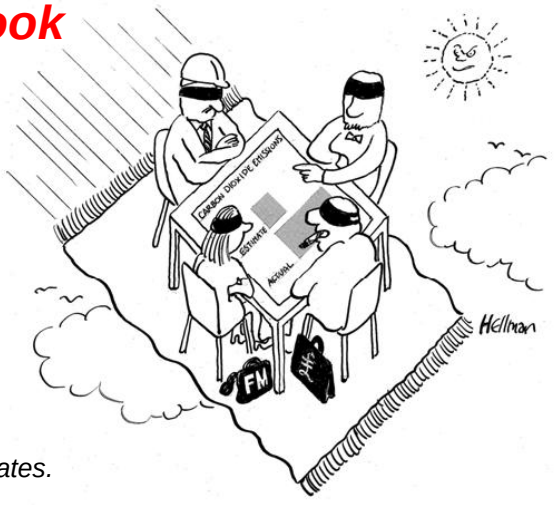
- Buildings last a long time, well beyond the time horizons of their creators, with many players involved in different roles.
- As building users, the whole population has an interest in them working better in every respect.
- **Now we want to improve the performance of the stock,** *especially (not only) in terms of energy and carbon …* ***BUT***
- The feedback loop from performance in use to construction and policymaking is poorly closed, *a disastrous oversight.*

BUT DO WE UNDERSTAND WHAT WE ARE DOING?

7

In the 1990s, there were often big gaps between design claims for low-energy buildings and in-use performance

but nobody took much notice



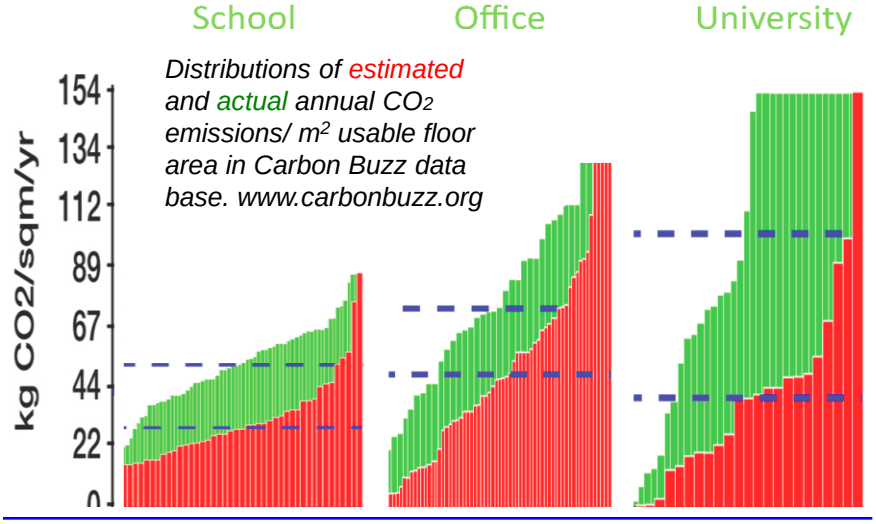
Cover of the 2001 report "Flying Blind", that advocated making in-use performance visible and actionable, starting with energy certificates.

Graph based on an energy survey in 1998 of an office building that won a major sustainability award in 1997.

CREDIT: Hellman cartoon for W Bordass, *Flying Blind,* Association for the Conservation of Energy & OXEAS (2001)

8

The evidence is now overwhelming: *slide from Carbon Buzz*



Distributions of estimated and actual annual CO_2 emissions/ m^2 usable floor area in Carbon Buzz data base. www.carbonbuzz.org

SOURCE: Ian Taylor and Judit Kimpian, *Carbon Buzz Launch slides,* 6 June 2013. www.carbonbuzz.org

9

The gaps occur in housing too:
40 years after the 1973 oil crisis

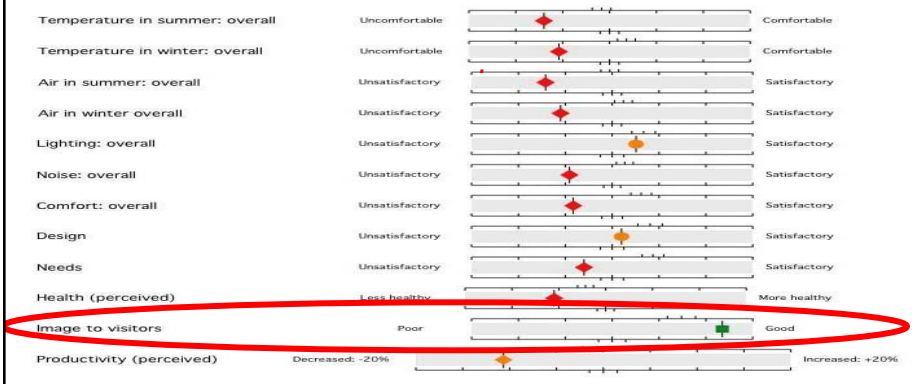
Minister launches Hub-led project to tackle the performance [illegible] Ecobuild 6 March 2013

A new project to examine the energy performance of new homes is unveiled today. The industry-backed project brings together leading housebuilders and industry experts to investigate the actual performance of homes and better understand how this compares to that expected by the original design. Communities and Local Government minister Rt Hon Don Foster MP announced a new £380,000 grant for

10

The gaps are not only for energy:
occupant survey, multi-award-winning school

<< RED: below average *AMBER: Average* *GREEN: Above average >>*

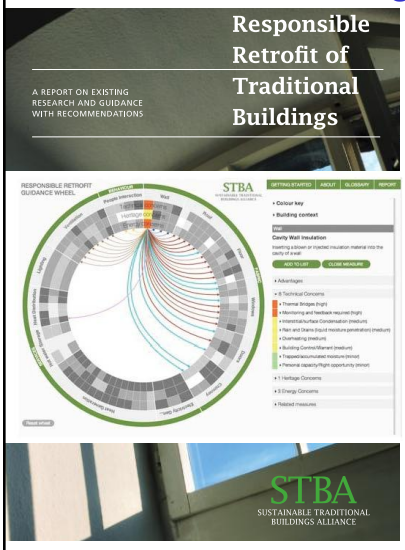


" … the architecture showed next to no sense. It leaked in the rain and was intolerably hot in sunlight. Pretty perhaps, sustainable maybe, but practical it is not." … STUDENT

SOURCE: BUS Method survey of a building services engineering award-winning Academy school in South East England, 2009

11

The gaps are not just for new buildings: *Knowledge base for retrofit*



SOME CONCLUSIONS

Industry and policy lack understanding of traditional building performance.

Lack of connection between research intelligence and guidance procedures.

Significant uncertainty in application of models and software.

Some methods used are inappropriate.

A systemic approach is necessary to avoid unintended consequences.

There are good opportunities, but some will need to be developed using a rather different basis and structure.

SOURCES: Report (Sept 2012) downloadable from www.stbauk.org Guidance Wheel at www.responsible-retrofit.org/wheel

12

Why aren't designers and builders better tuned into outcomes? "Any system without feedback is stupid." … AMORY LOVINS

- Not what clients or government have asked them to do: "hand over and walk away" is systemically embedded in standard procedures and contracts, so follow-through is not part of the standard offering.
- The industry and the associated professions didn't fill the vacuum created while central and local government progressively outsourced its technical expertise, research and performance feedback work.
- The policy emphasis has been on construction, not performance in use, even when feedback information has been revealing problems.
- Government has often preferred to bury any bad news, or go contractual, seeking to blame rather than to learn.
- Rigid divisions between funding of capital and operational costs – getting worse if anything, in spite of all the talk.
- "Post-Occupancy Evaluation" (POE) is a construction industry

13

50 years ago: RIBA Plan of Work (1963) STAGE M: Feedback

- PURPOSE
  To analyse the management, construction and performance of the project.
- TASKS TO BE DONE
  Analysis of job records.
  Inspections of completed building.
  Studies of building in use
- PEOPLE DIRECTLY INVOLVED
  Architect, engineers, QS, contractor, client.
- … but in 1972 the RIBA removed Stage M from its publication Architect's Appointment.

14

Half a century later, it's just come back! *RIBA Plan of Work 2007 and 2013*

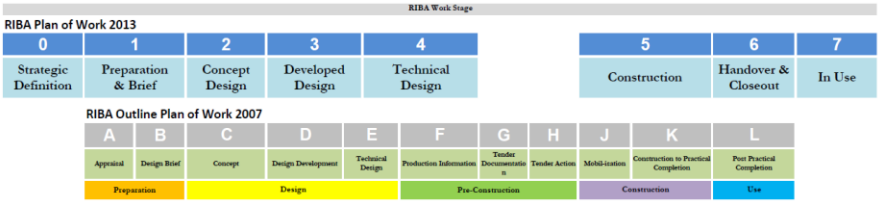


Fig 1. RIBA Plan of Work 2013 compared with RIBA Outline Plan of Work 2007

***For the practitioners here**, do you follow through from design into operation and feed back the insights?*

***For teachers**, how much building evaluation do students do?*

If not, why not? What's getting in the way?

And why does the spreadsheet that accompanies the RIBA Plan of Work 2013 allow sustainability to be switched off ?

SOURCE: RIBA Plan of Work overview (March 2013). See also www.architecture.com/planofwork

15

2

HOW DID WE GET HERE?

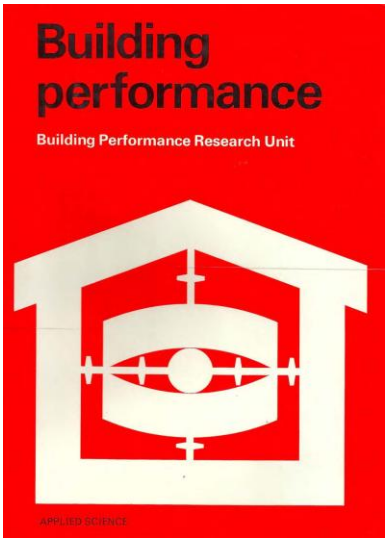
16

Buildings last a long time
so good performance is in the national interest

- With traditional construction, feedback was slow and evolutionary.
- In the 18th and 19th Centuries, with burgeoning industry, powerful clients, and government struggling to keep up, professions emerged to help ensure fairness and protect public interest.
- In the 1920s, and as building was becoming more science-based, the government set up the Building Research Station (*later BRE)* to provide guidance in the national interest. Its initial focus was on basic science and providing advice to government and the construction industry. It later broadened out into other performance issues.
- As the public sector grew, so did the number of building-related staff in design, construction, property, maintenance and management.
- Many Ministries had information services, research and technical units supporting their buildings-related activities. *They were far from perfect, but they were useful sources of guidance and feedback.*

17

In the late 1960s, building performance evaluation started in some universities



Pioneers included the University of California, Berkeley and the Building Performance Research Unit at Strathclyde (BPRU).

However, after BPRU's seminal book in 1972, the subject failed to gather momentum, as it did not fit well with academic criteria, or get sustained industry support (this was the same year RIBA abandoned Stage M).

"*Unfortunately, interdisciplinary subjects have a way of escaping from any discipline whatever."* … ERIC DREXLER

REFERENCE: T Markus et al, *Building Performance,* Applied Science Publishers (1972)

18

In the 1970s and 80s, the tide also turned in government …

- Widespread disruption and disillusionment in the 1970s.
- The ascendancy of ideas about free markets, competition and choice; and a *de facto* inefficient public sector.
- Professionals being seen as an elitist conspiracy against the public, and becoming treated as just another business.
- The Rothschild Report 1972, advocated a customer-contractor relationship for government applied research.
  But where are the intelligent customers now?
- Following the oil crises, good work was done on energy performance through government programmes and private efforts, *but …*
- the energy demonstration programme was technically focused, and tended to look for shining examples *and to bury bad news*.

"Few things are harder to put up with than the annoyance of a good example" … MARK TWAIN

19

Subsequently, the government disconnected many of its feedback loops about building performance

"The social contract has been fractured by outsourcing" … AL GORE
"Missing feedback is a common cause of system malfunction" … DONELLA MEADOWS

Some examples:

- Property Services Agency
- Central Electricity and British Gas Research Laboratories
- Research and technical units in Ministries
- Central and local government design and works departments
- Building Research Establishment
- Energy Efficiency Best Practice programme
- Partners in Innovation research programme
  but from 2010 we have had work by the Technology Strategy Board

Dismemberment of the Department of the Environment 1997-2002

WHERE IS THE INSTITUTIONAL MEMORY?

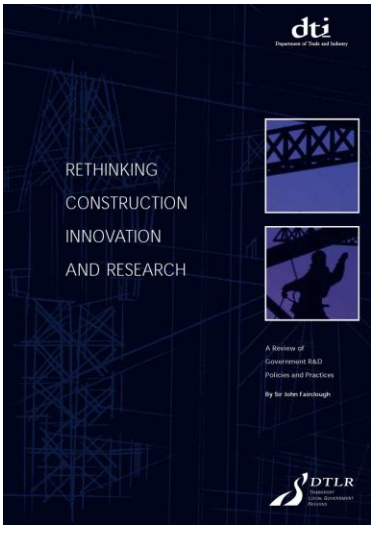
Nobody else (e.g. professional institutions), has helped enough to fill this gap and provide continuity, so policy is based more on hope, predictions, & lobbies, than experience of what works and what really needs attention.

20

Buildings policy since tended to focus on construction, *not performance in use*

RETHINKING CONSTRUCTION

THE REPORT OF THE CONSTRUCTION TASK FORCE



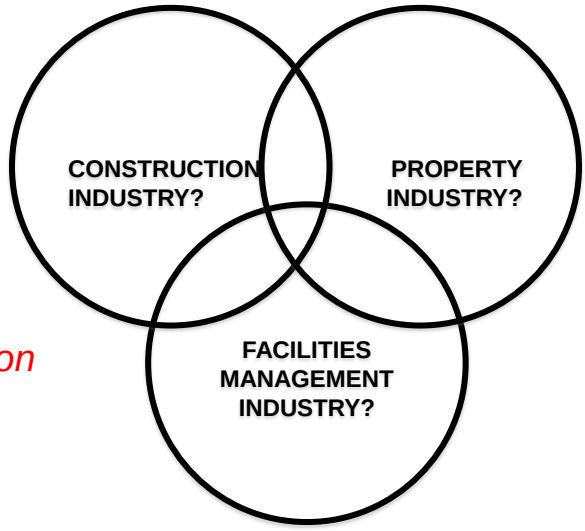
REFERENCES: The Egan Report (DTI, 1998), the Fairclough Report (DTI and DTLR, 2002)

21

Which industry and market is really responsible for building performance?

None of these: it's much more complicated than that.

The lack of traction is not a market failure, but a category error!



22

This is just one of many category errors: *seeking answers in the wrong places*

- The construction industry understands building performance.
  ***No**, it designs, builds & alters buildings. It doesn't follow through.*
- The energy supply industry understands the demand side.
  ***No**, it just supplies the energy and wants to make money.*
- Markets and regulations will solve the problems.
  ***No**, it also needs integration, insight, leadership and judgment.*
- Improvement is about capital investment.
  ***No**, it is more about commitment and management.*
- Innovation in buildings is all about new technology.
  ***No**, it is about bringing people, processes and things together.*
- Better energy efficiency will always decrease overall energy use.
  ***No**, this creates a risk of rebounds (e.g. Jevons Paradox). The social goal should be saving: we can't transform the system by stealth.*
- Statistics, databases and "big data" will tell us all we need to know.
  ***No**, we need the stories and insights, tacit knowledge, not just data.*

23

Onto the bonfire? *Are we too concerned with markets and trading, not long-term public interest?*

"Market fundamentalism has taken root in the machinery of government"

JOHN ASHTON, former UK Climate Spokesman (2013)

AND MUCH EARLIER …

"The English will spare no expense to get something on the cheap."

NIKOLAUS PEVSNER (circa 1960)

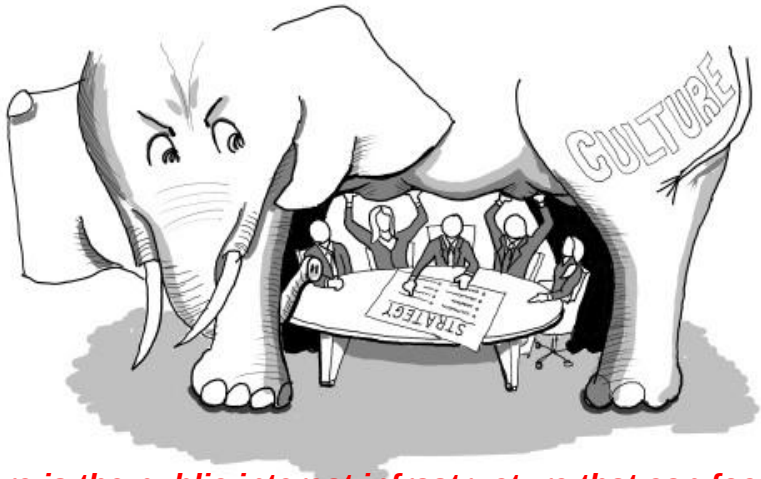
How do we maintain the chain of progress?

Where are the disinterested professionals?

SOURCE: John Ashton, former FCO Climate Spokesman, RSA Lecture (16 May 2013)

24

A societal problem: *The elephant isn't in the room, IT IS THE ROOM!*



Where is the public interest infrastructure that can focus all players on improving building performance in use?

SOURCE: Bruce Flye, 2012, www.bruceflye.com/concept-graphics/illustrations/4092610

25

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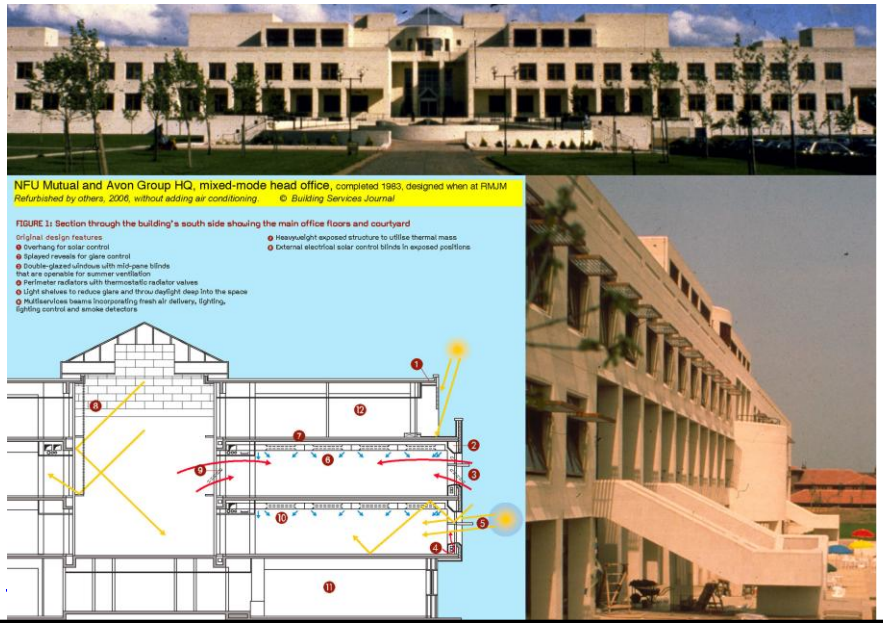
WHAT WAS I UP TO WHILE THIS WAS HAPPENING?

26

1972-84, in a multi-skilled design office



27

1985-88 review of demonstration projects 1988-91 office case studies etc.


December 1989

BEST PRACTICE PROGRAMME

Good Practice Case Study 1

ENERGY EFFICIENCY IN OFFICES

Low cost major refurbishment
Policy Studies Institute
100 Park Village East, London NW1

- New atrium avoids the need for air-conditioning.
- New, smaller double-glazed windows improve thermal performance.
- Good daylight gives low lighting costs.
- Air quality sensors regulate fresh air intake.
- Solar energy collection from atrium exhaust air.

The Project

The Result

Energy Efficiency Office

1998: Energy Efficiency Best Practice programme replaced the Energy Efficiency Demonstration Scheme, *where results had been disappointing.*

Case Study 1 performed well in terms of its energy use, particularly electricity.

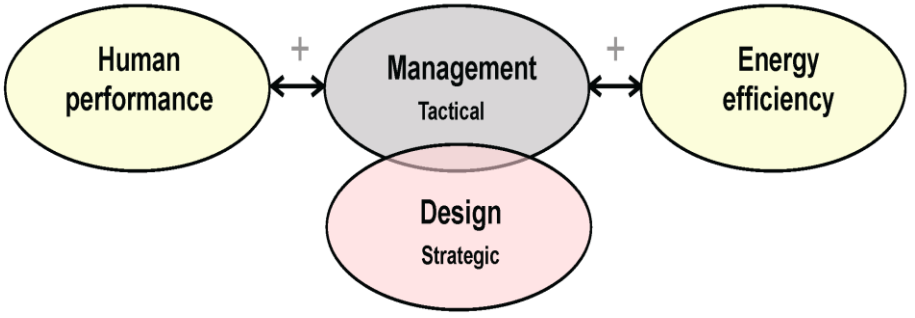
It had also been studied as part of the Building Use Studies (BUS) *Office Environment Survey* of occupant satisfaction in 50 buildings, where it also performed unusually well.

Was there a link? We sought out opportunities to combine occupant and energy surveys.

SOURCE: Energy Efficiency Best Practice Programme, Case Study 1, *Policy Studies Institute* (December 1989)

28

Where good things happened … *associations of low energy with happy occupants*

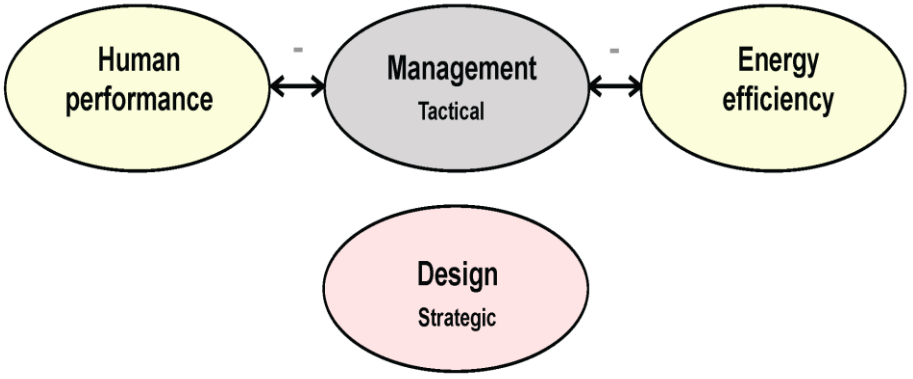


The better-performing buildings tended to be those where there was a better understanding of user requirements during procurement, and better follow-through to good management in use.

One could usually name the individual or individuals responsible for championing the building in use and driving the virtuous circles.

29

… and where they didn't
no positive associations



Without this understanding and commitment - linking design to use and management – performance in use could be disappointing, in terms of energy and/or occupant satisfaction. *So we need to bring out the leaders.*

30

We encouraged people to brief and design for usability and manageability

Physical variables

	A **Fit and forget** *Make invisible*	**B** **Implement and manage** *Make usable*
Context-free	*Make habitual* **Implement and internalise C**	*Make acceptable* **Risk, freedom and robustness D**

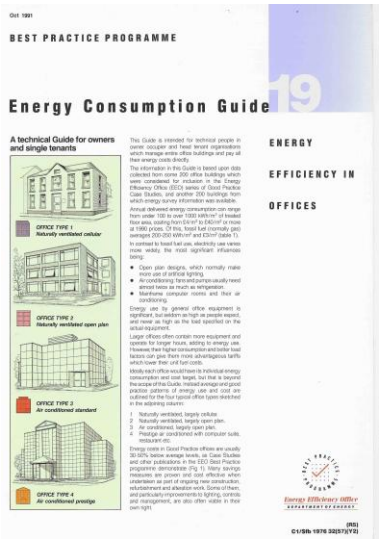
Context-dependent

Behavioural variables

SOURCE: After W Bordass and A Leaman, *Design for manageability,* BR&I, **25** (3) 148-157 (May/Jun 1997)

31

1991 Office Energy Consumption Guide *revised 1998*



Consumption Guide 19 was based on case studies and related information.

This permitted transparency between annual fuel and electricity consumption totals and individual energy end-uses.

The approach allowed development of "tailored benchmarks" for any building.

The Energy Best Practice programme planned to develop a tailored approach to energy benchmarking for all sectors.

The Carbon Trust took over this programme in 2001, *but it was not interested in benchmarking, so missed the opportunity to build infrastructure.*

ACKNOWLEDGEMENT: 1998 revision with John Field and input from BRE

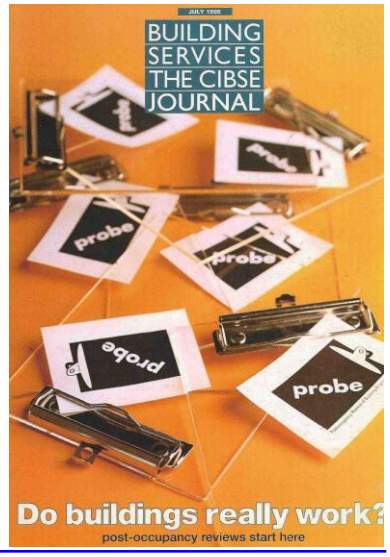
32

Probe: 20 published Building Evaluations *in Building Services Journal* 1995-2002

- Review of design intent and site documentation.
- Technical survey (walk-through and spot checks).
- Energy survey with CIBSE TM22.
- Envelope pressure test *(in Probes 2 and 3).*

- Occupant questionnaire survey.
- Management interviews.
- Designers' response.

- Extensive technical report
- Editing to 6-page article.



UK Government funding: DOE, then DETR, then DTI

TEAM: BSJ, ICE, other ESD, BUS, WBA, TES

FOR FURTHER INFORMATION AND DOWNLOADS: See the Probe section *(in menu top left)* of www.usablebuildings.co.uk

33

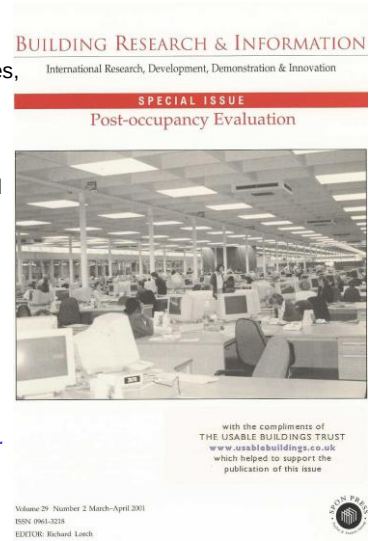
Some general conclusions *from the Probe surveys (1995-2002)*

Good buildings, but recurrent problems:

- **Interfaces** between work packages.
- **Control systems**, management and user interfaces, system and management responsiveness.
- **Handover processes**, with insufficient preparation and little follow-through into occupancy.
- **User dissatisfaction** with environment, noise, and unwanted interruptions.
- **Energy use often much higher** that anticipated, *e.g. with far to much defaulting to ON or wasteful*.
- **Unmanageable complication**, once mostly in deep air conditioned buildings, was migrating into green buildings, with damaging results.

Some of the lessons:

Design intent needs to be clear.
Basic, essential features are often absent.
Keep things as simple as practicable and do them well.
Take account of unintended consequences.
Manage expectations to avoid credibility gaps between expectations and outcomes.



SOURCE: Overview published in a Special Issue of *Building Research & Information*, **29** (2), 179-174 (March-April 2001).

34

Technology - management interactions: *Strategic conclusions from the Probe studies of public and commercial buildings in use, 1999.*

		Technological complexity	
		More	Less
Building management input	More	Type A ***High Performance***	***Will ordinary people be able to look after them?***
		Big danger, especially for public buildings	***Simple, well integrated*** ***Sense and Science*** Type B

Type A *can be fragile*
Seek more Type B
(and possibly Type D)
Avoid Type C -
unmanageable complication.

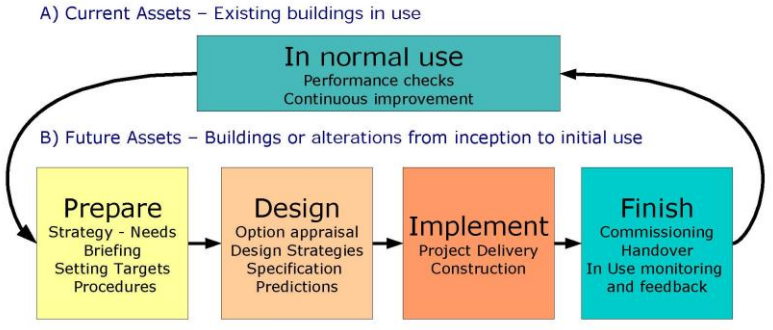
Diagram first appeared in: *Probe 19: Designer Feedback,* Building Services, the CIBSE Journal, page E21 (March 1999).

35

2002: since government was tuning out, *we set up a charity to help represent performance in use*

36

Seeking to close the loop, to make follow-through, feedback and learning routine



You can review performance at all stages in the life cycle

FORESIGHT: Before you do something new *(existing situation and analogues)*

INSIGHT: At any time *(reality checking, managing expectations)*

HINDSIGHT: After you've completed a project *(learning and fine tuning)*

SOURCE of hindsight-foresight-insight classification: D Bartholomew, *Building on Knowledge,* Wiley-Blackwell (2008).

37

Some things the Usable Buildings Trust has been doing

Raising awareness of building performance in use:
•Seeking to make building evaluation and feedback routine.
But we got a surprise when we worked with large clients.
•Drawing attention to the gaps between intentions and outcomes.
•Providing information and bringing people together.

Helping to make energy performance visible:
•Advocating Display Energy Certificates (DECs) based on actual energy use *and helping to demonstrate how they could be implemented.*
•Developing a Landlord's Energy Statement to assist DECs in commercial buildings, *for which DECs sadly are not yet mandated.*

Encouraging client, design & building teams to focus on outcomes:
•Advocating a *New Professionalism* for the building professions.
•Helping to develop *Soft Landings,* to improve the focus of all building procurement processes on performance in use.

38

But we have had limited success: *complication has burgeoned in the same period*

- Technical complication
- Legislative complication
- Contractual complication
- Bureaucratic complication
- Tick-box procedures: feature creep
- Complication for building users and managers

So less money to spend on basics

The complication disease has now spread to housing too!

AND NOTHING JOINS UP PROPERLY!

"Complexity is profitable, [it] makes people believe you understand it."
JON DANIELSSON

Insights on housing provided by Prof F Stevenson, Sheffield University, Z Grant, Eng D, Bristol University and others.

39

… so the generic conclusions from the 1990s work continue to echo in more recent studies

2006-10 LOW CARBON BUILDINGS PROGRAMME

- Basics still not right, e.g. fabric performance.
- Even more complicated systems, *including renewables.*
- Complicated, unusable controls, *now even in simple buildings.*
- Poor commissioning, handover and follow-through.

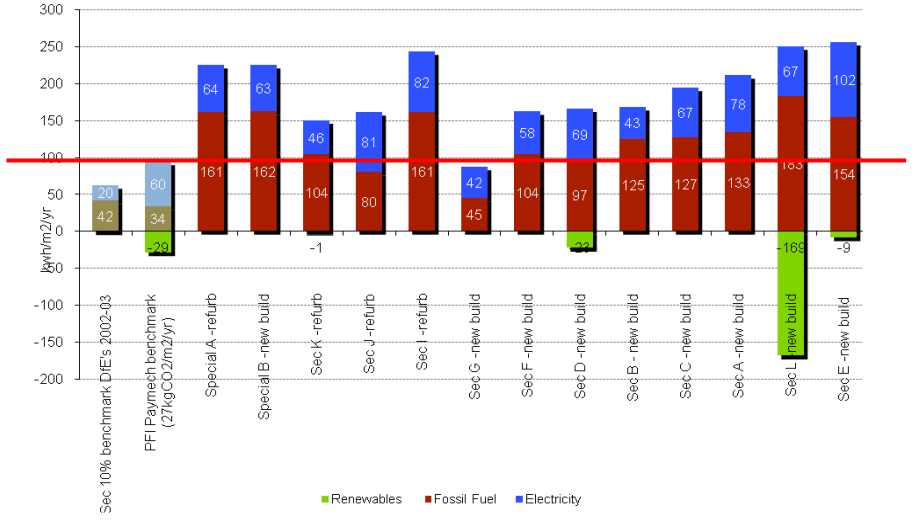
2011-15 TSB BUILDING PERFORMANCE EVALUATION

Similar results seem to be emerging, with the same weak links, plus:

- Unsuitable procurement processes.
- Dysfunctional sub-metering systems. MVHR in housing.
- Systems that weren't really needed *(partly the result of conservative reactions to performance specifications).*
- Poor communication and benchmarking of intended performance.
- But some relative successes too.

40

Energy use in new secondary schools … *more renewable energy, but less efficient?*



SOURCE: Partnerships for Schools, 2011

41

4

WHERE DO WE NEED TO BE? HOW MIGHT WE GET THERE?

42

If you wanted to improve building performance in use, *what would you do …*

A. **Focus on building performance in use?**

OR

B. **Do lots of other things in the hope that building performance will improve …?**

Why are we doing things the long way round? *Why is actual performance the hole in the middle?*

43

Places to intervene in a system after Donella Meadows

- The underlying mindset or paradigm. But is it appropriate?
- How are goals set? And by and for whom? Are contradictions highlighted?
- Are they actually met? And compromises identified?
- What skills and resources are required to meet them?
  Are they realistically available over time? Scope for self-organisation?
- What rules and constraints emerge in the particular context?
  Scope, boundaries, degrees of freedom. And who sets the rules?
- What are the required information flows?
  e.g. what feedback is needed and how can it get leverage in the population?
- What are the positive / 'virtuous' feedback processes?
  Promoting things that make significant improvements to the system.
- What are the negative / 'vicious' feedback processes?
  Avoiding things that lead to chronic, and more seriously, acute, failures.
- What are the stocks (people, energy, goods) and flows in the system?
  Where are the buffers, constraints and bottlenecks?
- Parameters, standards, targets.

HANG ON A MOMENT … WE NEED TO CHANGE THE GAME !

SOURCE: Adapted from Donella Meadows, *Places to intervene in a system,* Whole Earth (Winter 1997).

44

Places to intervene in a system *after Donella Meadows*

1. The underlying mindset or paradigm. *But is it appropriate?*
2. How are goals set? *And by and for whom? Are contradictions highlighted?*
3. Are they actually met? *And compromises identified?*
4. What skills and resources are required to meet them?
   Are they realistically available over time? Scope for self-organisation?
5. What rules and constraints emerge in the particular context?
   Scope, boundaries, degrees of freedom. And who sets the rules?
6. What are the required information flows?
   e.g. what feedback is needed and how can it get leverage in the population?
7. What are the positive / 'virtuous' feedback processes?
   Promoting things that make significant improvements to the system.
8. What are the negative / 'vicious' feedback processes?
   Avoiding things that lead to chronic, and more seriously, acute, failures.
9. What are the stocks (people, energy, goods) and flows in the system?
   Where are the buffers, constraints and bottlenecks?
10. **Parameters, standards, targets.**

So why does so much activity occur at Level 10, and not question the context?

SOURCE: Adapted from Donella Meadows, *Places to intervene in a system,* Whole Earth (Winter 1997).

45

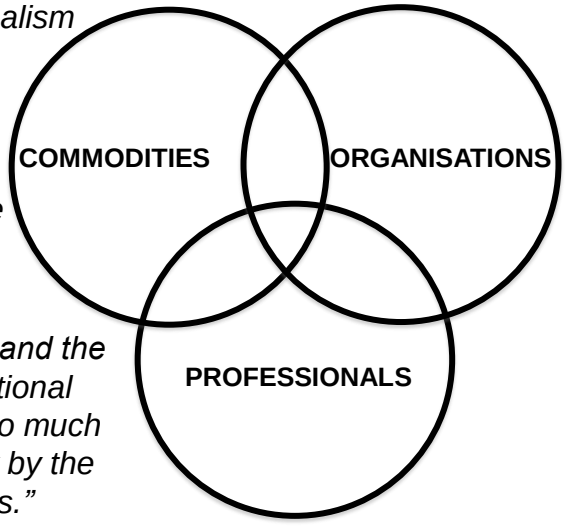
How societies structure expertise

"At present, professionalism seems to hold its own.

It has stayed ahead of commodification … but may ultimately lose out to organisations …

new hiring patterns … and the loose form of organisational professionalism point to much weaker control of work by the professions themselves."

ABBOTT (1988)

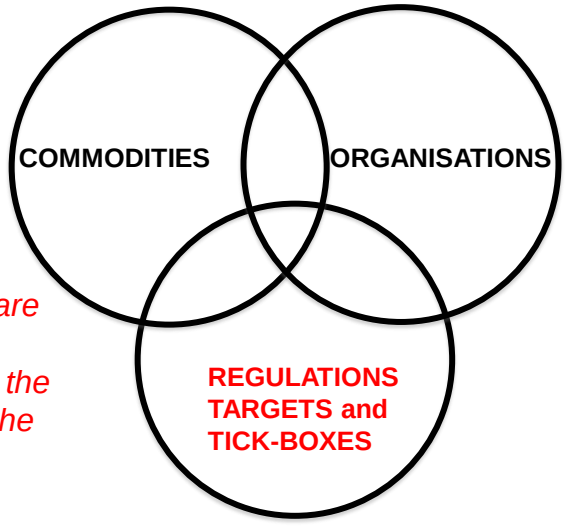


SOURCE: A Abbott, *The system of professions,* University of Chicago Press, 1988, page 325.

46

Where we seem to be now in the UK

But do the regulators understand what they are doing? With so much outsourced, where are the vision, the integration the public interest, and the "intelligent customer"?



47

Sustainability raises complex moral and ethical dilemmas

- Work ‘after us’ and for ‘the other’.
- Intergenerational equity.
- Deferred impacts over long periods.
- Differential geographical and social impacts.
- High levels of uncertainty and unpredictability.

It needs vision, imagination, reflection and commitment: *what professionals are supposed to be for!*

“[it] does not tempt us to be less moral than we might otherwise be; it invites us to be more moral than we could ever have imagined.” … MALCOLM BULL

SOURCES: S Hill, Edge debate, New Professionalism, 20 Feb 2013, M Bull, London Review of Books, 3-6, 24 May 2012

48

Re-asserting the proper role of the building professional

- Many construction-related institutions require their members to understand and practice sustainable development.
- How can they do this unless they understand the consequences of their actions? *The real outcomes.*
- If they don’t, they are working outside their region of competence …
- **in other words, not acting in a fit manner for a professional ! ***
- And are they getting the right institutional and educational support?

SO WHY NOT?

- Change attitudes to the nature of the job and procurement routes.
- Re-define perceptions of the professional’s role, to follow-through properly and to engage with outcomes.

* see Royal Academy of Engineering and Engineering Council, *Statement of Ethical Principles.*

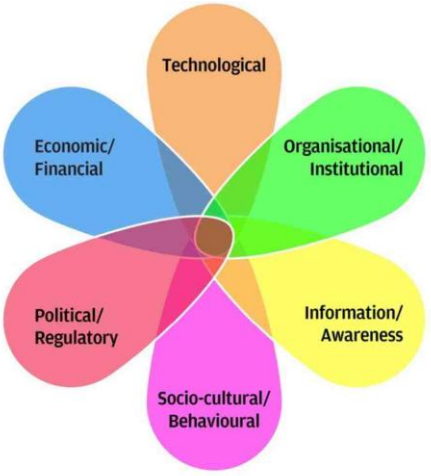
49

Energy Efficiency in the Built Environment *(EEBE - Cambridge)* Barrier Categories

… and that's just for energy!

So many barriers to surmount …

what could we do that could enable people to come together in the middle, quickly?



SOURCE: Cambridge Centre for Sustainable Development, *Barriers to energy efficiency in the built environment* (2012)

50

Climate change: *a* ***super-wicked problem***

K Levin, B Cashore, S Bernstein & G Auld (2012)

CHARACTERISTICS:

- Time is running out.
- Those who seek to provide a solution also cause the problem.
- Central authority is weak or non-existent.
- Policy responses discount the future irrationally.

RESULT: A POLICYMAKING TRAGEDY

THEIR DIAGNOSIS:

- Trigger ***sticky interventions*** that *by progressive incremental trajectories*
- ***entrench support*** over time, while
- ***expanding*** the population they cover.

Or in other words:

PROMOTE VIRTUOUS CIRCLES OF PROGRESSIVE IMPROVEMENT

SOURCE: K Levin et al, *Overcoming the tragedy of super-wicked problems,* Policy Science **45**, 123-152 (2012)

51

UBT's proposed **sticky interventions**:
seeding things with potential to snowball over time

Cultural adaptations, not just
"technical innovations" and "managerial solutions"

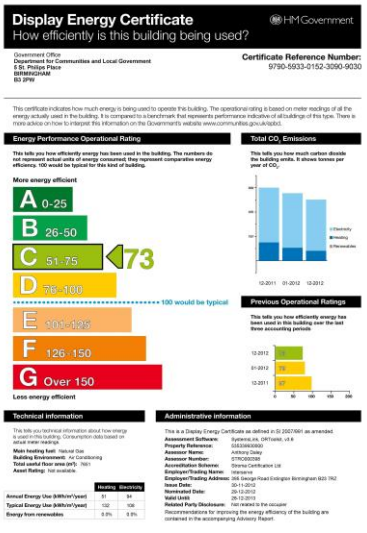
1. MAKE IN-USE PERFORMANCE CLEARLY VISIBLE
In ways that motivate people to strive to improve it.

2. REVIEW PROFESSIONAL ETHICS and PRACTICES
Help building-related professionals work in the public interest and engage properly with outcomes.

3. CONSOLIDATE THE KNOWLEDGE DOMAIN
Develop building performance as an independent knowledge domain, with the authority to inform practice and policymaking.

52

STICKY 1. Make performance visible
Display Energy Certificates were a start

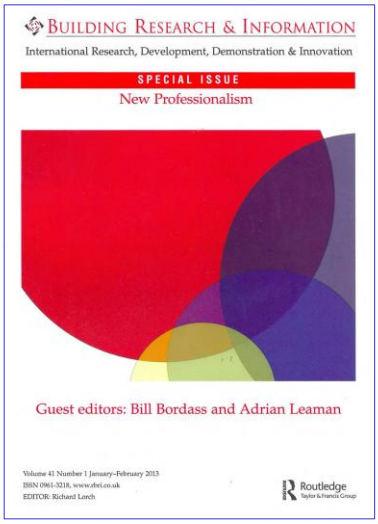


- We already have DECs.
- In some cases *(as here)* they have been motivating improvement by management & focused investment.
- But they are poorly supported, their potential hopelessly under-realised:
  - *Not extended to private sector buildings, in spite of wide support, including CBI.*
  - *No government investment at all in developing the benchmarking.*
  - *Seem to be regarded by officials as a bureaucratic procedure, not THE window on performance, and a means of integrating many related activities.*

We need to build a solid technical infrastructure and contact point for development. Who will do it, as government doesn't see the need?

53

STICKY 2. Review professional ethics and practices, *starting with individuals*



PROVISIONAL LIST DEVELOPED WITH THE EDGE

ETHICS AND BEHAVIOUR:

1. Be a steward of the community, its resources, and the planet. Take a broad view.
2. Do the right thing, beyond your obligation to whoever pays your fee.
3. Develop trusting relationships, with open and honest collaboration.

ENGAGEMENT WITH OUTCOMES:

4. Bridge between design, project implementation, and use. Concentrate on the outcomes.
5. Don't walk away.
   Provide follow-through and aftercare.
6. Evaluate and reflect upon the performance in use of your work. Feed back the findings.
7. Learn from your actions and admit your mistakes. Share your understanding openly.

THE WIDER CONTEXT:

8. Seek to bring together practice, industry, education, research and policymaking.
9. Challenge assumptions and standards. Be honest about what you don't know.
10. Understand contexts and constraints. Create lasting value. Keep options open for the future.

SOURCE: The Editorial of BR&I **41**(1), Jan-Feb 2013 can be downloaded at tandfonline.com/toc/rbri20/41/1#.UbBwiusawVs

54

Getting more sense into procurement *Soft Landings can help*

1. **Inception and Briefing**
   Appropriate processes, better relationships. Assigned responsibilities, including client. Well-informed targets related to outcomes.
2. **Design and construction**
   Including expectations management.
3. **Preparation for handover**
   Better operational readiness.
4. **Initial aftercare**
   Information, troubleshooting, liaison, fine tuning, training.
5. **Longer-term aftercare**
   monitoring, review, independent POE, feedback and feedforward.

Can run alongside any construction process

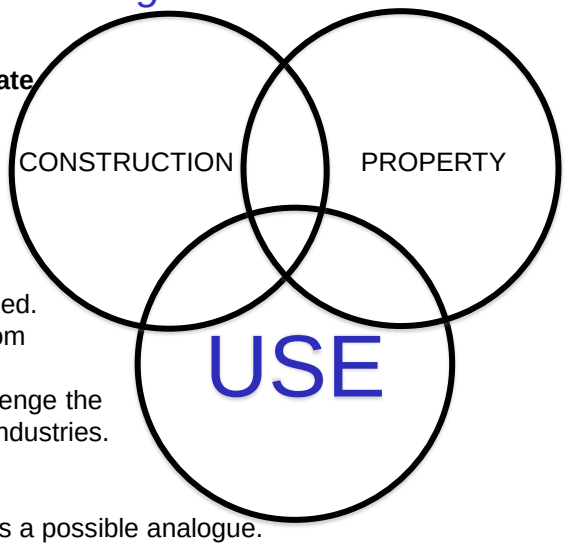
~~***It has proved important*** *to bring out the Champions, leaders who can maintain the focus on outcomes and*~~

SOURCE: downloadable from www.usablebuildings.co.uk and www.softlandings.org.uk

55

STICKY 3. How about an independent *Institute of Building Performance?*

Strengthen representation of BUILDING USE. Help create demand-side leadership.



- Public interest.
- Independent.
- Interdisciplinary from the start. No historic silos.
- Authoritative, evidence based.
- Can bring together work from many different sources.
- Can both support and challenge the construction and property industries.
- Connects research, practice and policymaking.
- Institute for Fiscal Studies is a possible analogue.

56

Big challenges for academe

- Shared vision for all building professionals.
- More attention to the ethical dimensions.
- Building performance in use a core subject for both education and research.
- More multi-disciplinary working.
- Closer working with professional practices.
- Support to Insitutions as learned societies.
- Effective development of the knowledge domain.
- More collaboration and influence on policy.

57

www.usablebuildings.co.uk

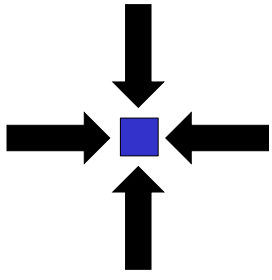
58

A vision for energy performance: *where good performance becomes normal*

Stop micro-managing! Seed virtuous circles instead.
Make real performance in use the objective function:

- Everyone must own their bit of the problem and concentrate their efforts.
- Count everything. Benchmark its elements where practical.
- Develop effective methods of communicating the results clearly, transparent between design, operation and policy.

With collective understanding that performance in use is the goal, systems used in producing, owning, occupying, using, managing, equipping, maintaining and altering buildings can measure their contribution towards it, based on what actually works; and identify what needs attention.



- This could then drive better performance … **BUT**
- **It needs sound technical support & authoritative benchmarking.**

SOURCE: W Bordass & R Cohen, Technical Platform Scoping Study Stage 1 report, Usable Buildings Trust (Dec 2011), unpublished