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SPONGE

Insights from the Usable Buildings Trust

211 Old Street London

17 May 2011

***Professionalism revisited
after 30 years of free markets***

**Bill Bordass, Adrian Leaman
Fionn Stevenson and Mark Way**

www.usablebuildings.co.uk

Structure of the talk

- 1. Context**
 - 2. Where are we now?**
 - 3. Moving forward**
 - 4. Where next?**
-

1

CONTEXT



Decade by decade (± 5 years): *Historical context*

1960s	Expansion	<i>“the white heat of technology” RIBA Plan of Work, Stage M.</i>
1970s	Retrenchment	<i>Limits to Growth. Oil crises. Three day week. IMF.</i>
1980s	Uncertainty	<i>Thatcher, Reagan and markets. Big bang. Bruntland report.</i>
1990s	Realignment	<i>Rise of FM, MBA. BREEAM launch Latham, Egan and Fairclough.</i>
2000s	Binge and bust	<i>Outsourcing. PFI. Mortgaging the future. Zero carbon mythology.</i>
2010s	Hangover shock and disorientation	<i>Commitments exceed resources. Debt implosion. Lock-in.</i>
2020s	Shipwreck on or survival?	<i>Vicious or virtuous circles? The death of short-termism?</i>

Decade by decade (± 5 years): *Energy and services*

1960s	Expansion	<i>District heating. Quality issues. Autarkic house.</i>
1970s	Retrenchment	<i>Oil crisis. Energy conservation. But North Sea gas and oil too.</i>
1980s	Uncertainty	<i>Ayatollah. 25,000 therm limit. Shortage, then abundance.</i>
1990s	Realignment	<i>Fuel privatisation. Rio. Focus on competition, not security.</i>
2000s	Binge and bust	<i>More services. More regulation complication, tick boxes ...</i>
2010s	Hangover, shock and disorientation	<i>Cheaper or better, market capture Will the tail wag the dog?</i>
2020s	Shipwreck on or survival?	<i>Simpler or more complicated? Demand or supply dominated?</i>

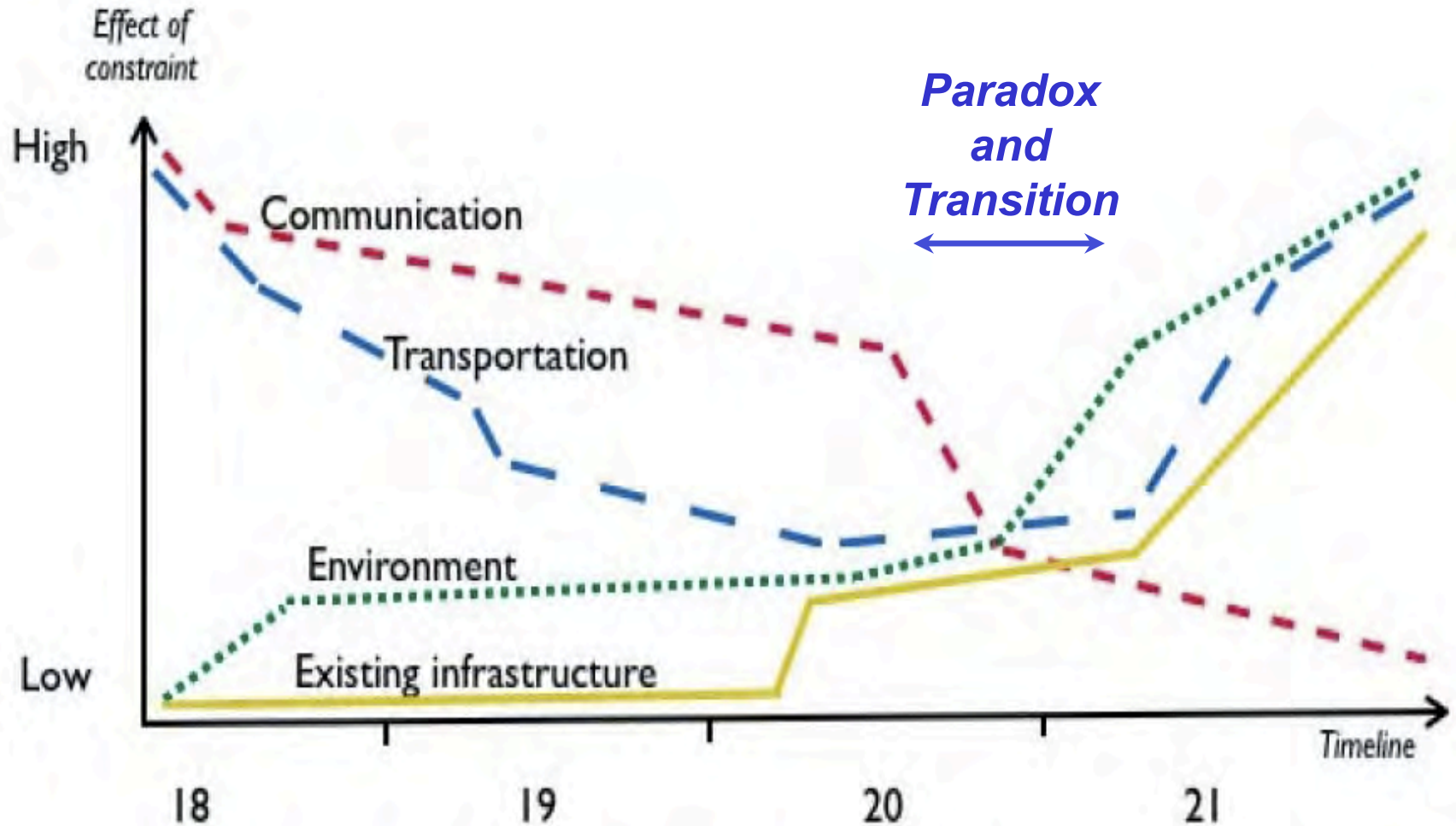
Decade by decade (± 5 years): *Occupiers and management*

1960s	Expansion	<i>Architectural theory. POE. Environmental psychology.</i>
1970s	Retrenchment	<i>Behaviourism. A Coleman, O Newman, Space Syntax.</i>
1980s	Uncertainty	<i>Management theory, SBS, Space Planning, BUS.</i>
1990s	Realignment	<i>Age of Paradox. Optimism for FM, outsourcing CSR. Probe.</i>
2000s	Binge and bust	<i>Workplace productivity. Open planning. KPIs. UBT.</i>
2010s	Hangover, shock and disorientation	<i>POE and users penny drops ... but not well understood.</i>
2020s	Shipwreck on or survival?	<i>Users as victims ... or Usable buildings!</i>

Vision 2000: *our crystal ball in the 90s:* **Paradox, Transition and Consequences**

- Undertaken for a UK utility in 1993-94.
- Examined social, economic and technical trends affecting building electricity use in 20 years' time.
- Suggested that we were in an ***Age of Paradox***, where the economy and our buildings were not taking proper account of the world in which they would find themselves.
- Predicted a ***Period of Transition***, which arrived more slowly than expected, but we now seem to be in; towards
- an ***Age of Consequences***, in which decisions would be much more strongly influenced by downstream effects.
- Convergence between business efficiency and sustainability, as are both are ultimately about waste avoidance.

Paradox and transition: *adapting to changing constraints over time*



Buildings and services for the future: *things we had expected to see by 2010*

- Simple, robust, adaptable buildings to suit many purposes, with good passive design and mixed mode services.
- Complex, more highly serviced buildings would also be required, but should be kept to a necessary minimum. Scope for major improvements in their efficiency.
- Better design for usability, manageability and responsiveness; and seek to minimise downside risks.
- FMs much better informed and more involved in design.
- More understanding of performance in use by designers, builders and government, to focus efforts better.
- Major opportunities for improving controls.
- Large reductions in energy demands and other resource and environmental impacts. Effective waste avoidance.

Buildings and services for the future: *and the horrors we hadn't anticipated*

- Outsourcing of technical skills by government.
 - Collapse of research by fuel industries.
 - Denial of non-domestic funds to Energy Saving Trust by the gas regulator, applying Chicago School principles.
 - Privatisation of the Building Research Establishment.
 - Dismembering of the Department of the Environment.
 - Egan report *Rethinking Construction* and Fairclough *Rethinking Construction Innovation and Research* taking little account of the importance of building performance.
 - Ending of *Partners in Innovation* research funding.
 - Little interest in the technical infrastructure by the Carbon Trust, which replaced the EST vacuum in non-domestic.
-

2

**WHERE ARE
WE NOW?**

For most designers and builders, *performance in use is another country ...*

“in theory, theory and practice are the same, in practice they aren't”
SANTA FE INSTITUTE for research into complex systems

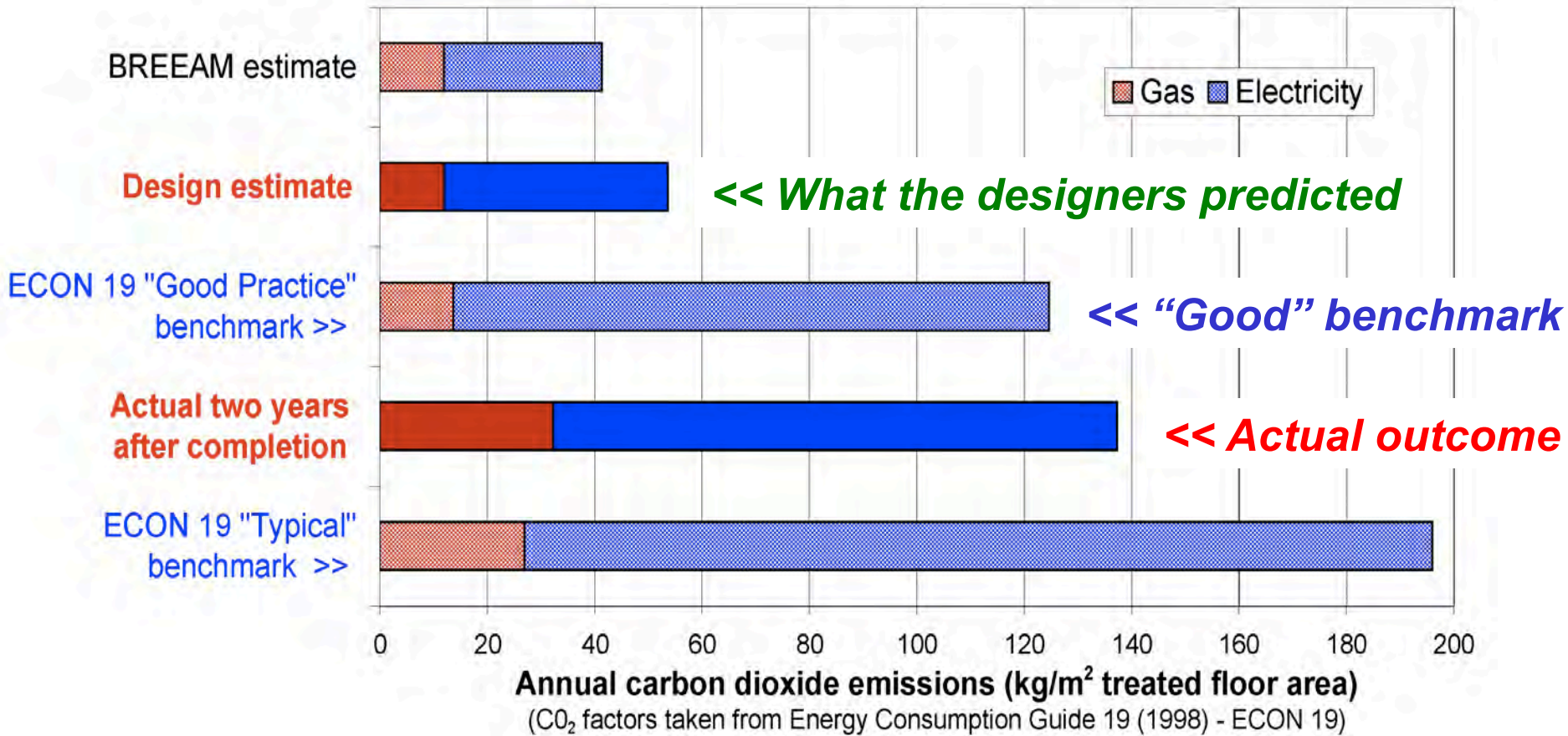
*“designers seldom get feedback,
and only notice problems when asked to investigate a failure”*
ALASTAIR BLYTH CRISP Commission 00/02, UK

*“unlike medicine, the professions in construction
have not developed a tradition of practice-based user research ...
Plentiful data about design performance are out there, in the field ...
Our shame is that we don't make anything like enough use of it”*
FRANK DUFFY Building Research & Information, 2008

*“I've seen many low-carbon designs,
but hardly any low-carbon buildings”*
ANDY SHEPPARD Arup, 2009

The Credibility Gap: *We couldn't deliver low-energy and carbon performance reliably in the 1990s. We're still finding it difficult.*

Data from the winner of a Green Building of the Year Award



SOURCE: see discussion in S Curwell et al, *Green Building Challenge in the UK*, Building Research+Information **27**(4/5) 286 (1999).

We've been trying to close the feedback loop at www.usablebuildings.co.uk

**Usable
BUILDINGS**

... for
feedback
and
strategy

... from the Usable Buildings Trust

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Usable Buildings is a free resource for practitioners, managers, building owners, developers, students and anyone else who wants to make buildings more suitable for the people who use them, less damaging to the natural environment and a better long-term investment. Usable Buildings is run by the Usable Buildings Trust.

The Usable Buildings Trust (UBT) is an independent charity, registered in the United Kingdom. UBT promotes better buildings through the more effective use of feedback on how they actually work. It spreads the results through its website, user groups, collaborative working and input to postgraduate courses. UBT is also a home for approaches which are not quite ready for widespread application and an incubator for their development. [Aims Background](#)

Donations: We welcome donations. Please use the Donations and Gift Aid form on the Sponsorship section of our [Brochure](#). Thank you.

Who we are and what we do: [Trustees' Report](#) summarises activities and plans. [What Do We Do?](#)

Website: Our website is text-based and designed primarily to deliver pdf files. [Website set-up](#).

Latest posted: [The Building Services Brief of the Future | 89 Culford Road | Surpassing Expectations | Human Factors: the bottom line | Soft Landings | The Great Escape |](#)

Basics: [POE and Feedback: Getting Started | Probe 9 | A Guide to Feedback and Post-Occupancy Evaluation |](#)

[Full Latest /st Live \(real-time\) monitoring \[Please send in more examples!\]](#)

Latest one liners: "Who are you going to believe? Me, or your own eyes?" [Groucho Marx](#) | "If the choice is between cooking alive and wasting money unnecessarily I would rather waste some money, because long before we cook we are going to kill each other if we don't deal with climate change." [George Soros](#) | "The paradox of public transport is the better it does its job the less 'efficient' it may be." [Tony Judt](#) | "I got rid of the Ferrari: it was bad for my hamstrings." [Ryan Giggs](#) [More](#)

Hosting: We host the [Feedback Portfolio: Techniques](#) and the [Probe](#) archive.

Support: We support [Soft Landings](#).

Searching: Most of the material available here is in pdf files, about two-thirds of which are password protected. If you wish to search within files that are not password protected use the Google search syntax: "filetype:pdf site:www.usablebuildings.co.uk search term" . Example: for articles on health type in the Google search area: "filetype:pdf site:www.usablebuildings.co.uk health" [Show example](#)

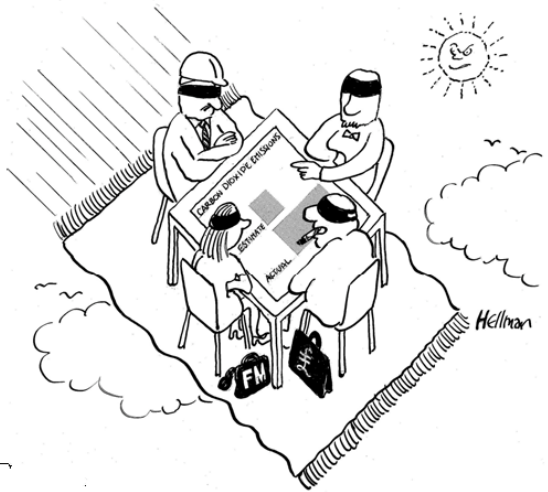
Thursday, March 18

Established in the late 1990s when the research and policy emphasis on Rethinking Construction largely ignored building performance in use. UK Registered charity from 2002.

We did a lot of work on DEC's based on actual energy use

FLYING BLIND

Everything you wanted to know about energy in commercial buildings but were afraid to ask



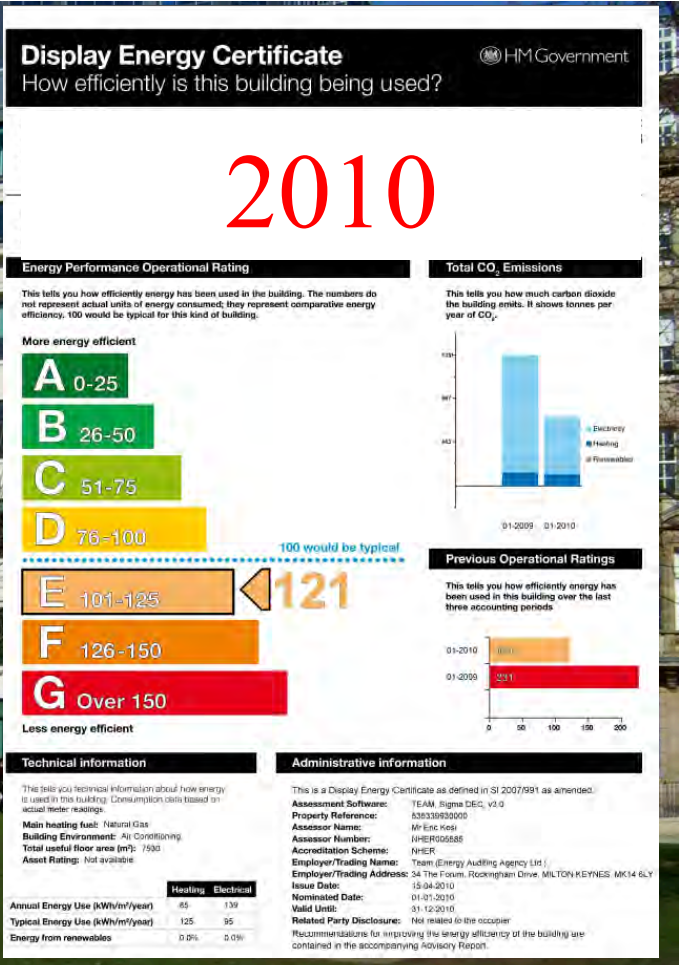
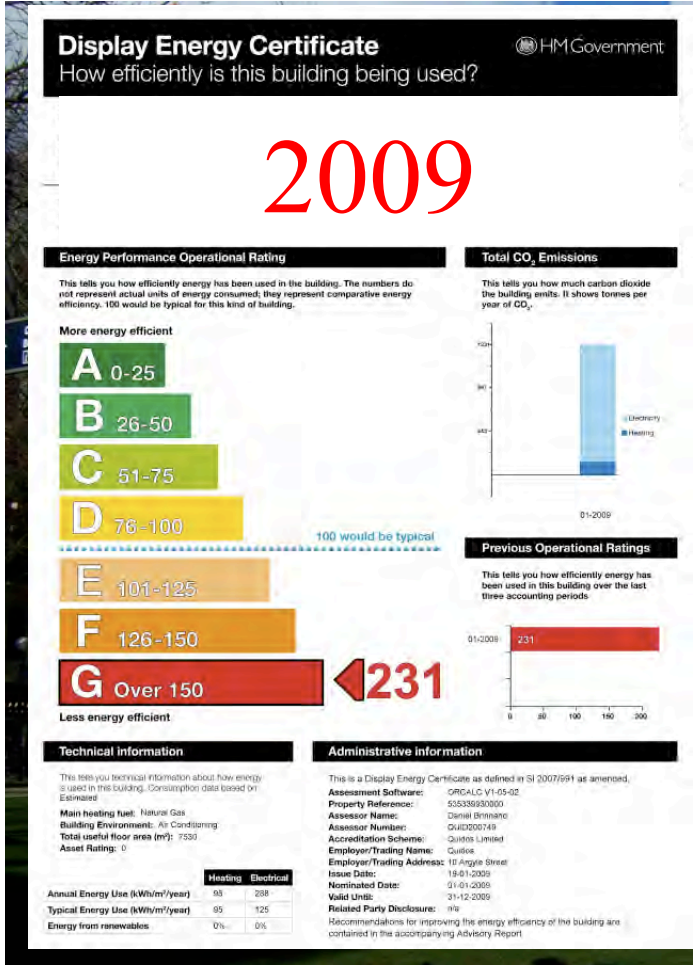
October 2001

Energy Certificate

Building Energy Performance >		As built:	In use:
Certificate type	FULL	Asset Rating	Operational Rating
Building Type	Office		
Whole or part of building	Whole building		
Very energy efficient			
A			
B		B	
C			
D			D
E			
F			
G			
Not energy efficient			
Asset rating method:	UK National Standard 2004	Calculated	Actual
Operational rating method:	UK Office Tailored Benchmarks 2002	48	83
Units used:	kg CO ₂ per sq m of net area per annum >		
Occupancy level	Square metres net lettable area per person	14	12
Equipment heat gain level	Watts per square metre net	12	12
Weekly occupancy hours	Hours per week	55	58
Heating performance ratings		A B C D E F G	A B C D E F G
HVAC performance ratings (cooling, fans and pumps)		A B C D E F G	A B C D E F G
Lighting performance ratings		A B C D E F G	A B C D E F G
Management rating (for in-use performance only)		A B C D E F G	A B C D E F G
Internal Environmental Quality		Not assessed	Not assessed
Risk level		Not assessed	Not assessed
Further information can be found in the Energy Log Book			
GB 2004		 <small>Directive 2002/91/EC</small>	

Certifying organisation: Street P.O. Box City Contact Tel email	Building name Organisation Street City Contact Tel email
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DECs can mobilise management *without spending vast amounts of money*



We did a lot of work on DECs
... and last week's reward!

Government department blocks DEC proposal

BUILDING
13 MAY 2011

Business department takes stand against mandatory energy certificates for private sector

By David Matthews

Proposals to make energy efficiency certificates mandatory for all private sector buildings have been blocked by the Department for Business, Innovation and Skills, despite support from other departments, Building understands.

Two sources close to the government said that the communities and energy departments had backed the plan to roll out display energy certificates (DECs) for the private sector.

But they confirmed that the business department had blocked the proposal because it believed there was little evidence that DECs would be effective, that they would cost too much and would add to the regulatory burden on businesses.

It is understood that the communities department, backed by the energy department, wanted the commitment to DECs included in the Energy Bill, which had its second reading in the Commons on Tuesday, but this was blocked by the business department at cabinet level.

On Tuesday, the UK Green Building Council and British Property Federation, backed by the heads of Hammerson, British Land and Land Securities, called on the government to include the measures in the bill.

They say that if all private buildings have DECs this would create a "league table" of green landlords, which should push up standards.

The government has already said it will roll out DECs to private buildings by October 2012 in its Carbon Plan, released in March this year, but the UK Green

Building Council (UK-GBC) fears that if the Energy Bill is not used to introduce DECs they will not be adopted in time.

Paul King, chief executive of the UK-GBC, said: "If there is opposition from the business department, it's extremely disappointing given the extent of business support for rolling out DECs. There seems to be tension within government between the desire to cut carbon and the desire to cut regulation. But these aren't mutually exclusive."

The business department was unavailable for comment.

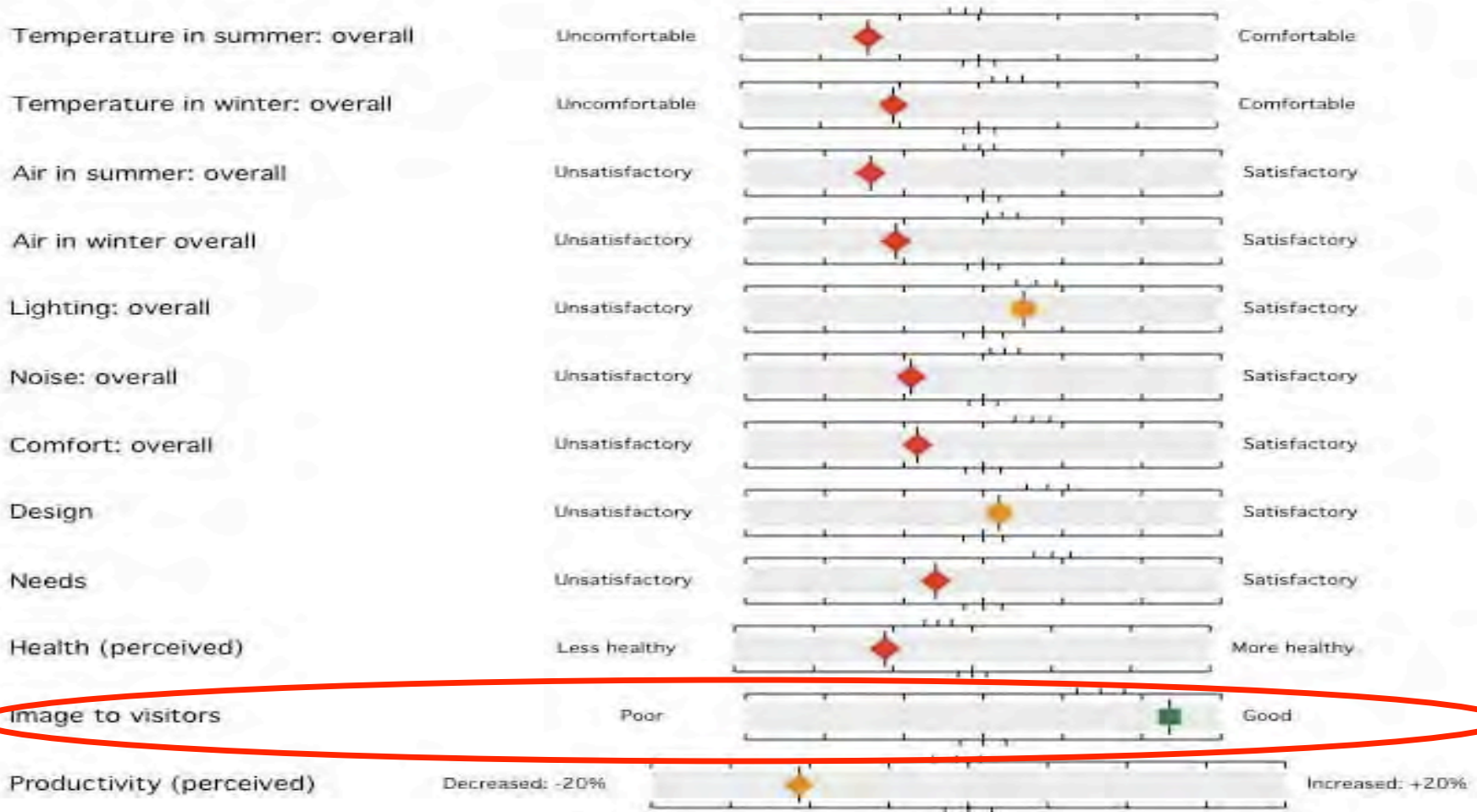
New buildings: *What do we normally find?*

- Too often they perform much less well than anticipated, *especially for energy and carbon, often for occupants, and with high running costs.*
- Unmanageable complication is the enemy of good performance.
So why are we being forced to make buildings more complicated in the name of sustainability, when we don't get simple things right?
- Buildings are seldom tuned-up properly and controls are poor.
So if we have more to do, what chance do we have?
- Design intent is seldom communicated well to users.
Designers and builders tend to go away at handover.
- Good environmental performance and occupant satisfaction can go hand in hand, *but only where committed people have made it do so.*
- Modern procurement systems make it difficult to pay attention to critical detail. *Not a good idea when promoting innovation.*
- Are we ***sparing no expense to get something on the cheap?*** *

**KEEP IT SIMPLE, DO IT WELL,
FOLLOW IT THROUGH, TUNE IT UP**

Credibility gaps: Occupant satisfaction

Occupant survey, award-winning educational building, 2009



What impresses the judges may not impress the users!



Why are these lights on
in a new university building?



Why are these lights on
in a new university building?

Cutting Carbon in Commercial Property through:

- Green leases
- Sustainability measurement and benchmarking
- Valuation of sustainable buildings
- Owner occupier partnerships
- Sustainable retrofitting
- Guidance for property agents

... and how about turning off the perimeter lights on a sunny day?



Design intent to reality: perspectives

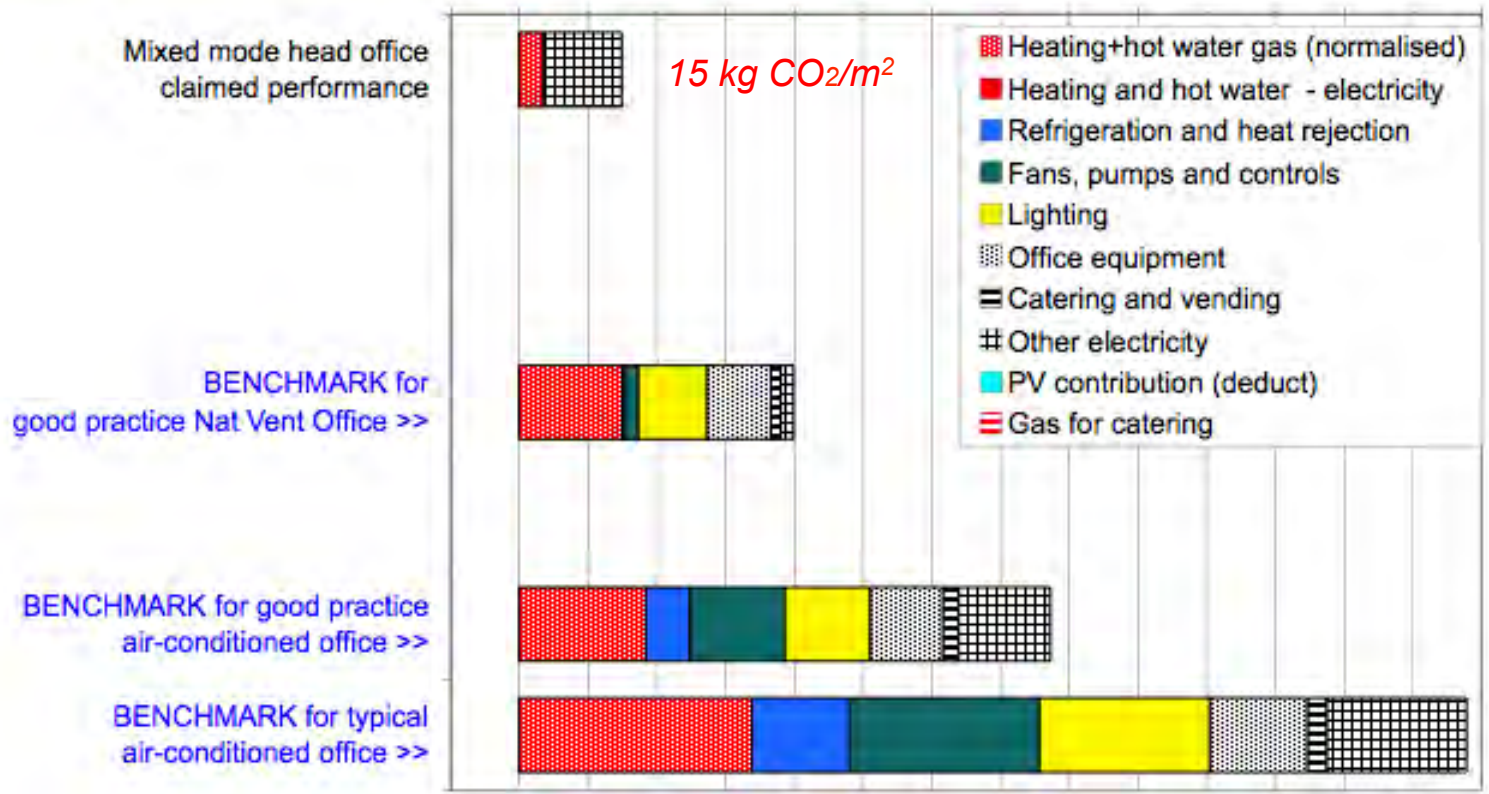
1: the design claim, as published

Annual CO₂ emissions of energy use in a low-energy office building

kgCO₂/m² Treated Internal Floor Area at UK ECON 19 CO₂ factors of 0.19 for gas and 0.46 for electricity

<< Onsite renewable supply << >> Building energy demand >> expressed as CO₂

-10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

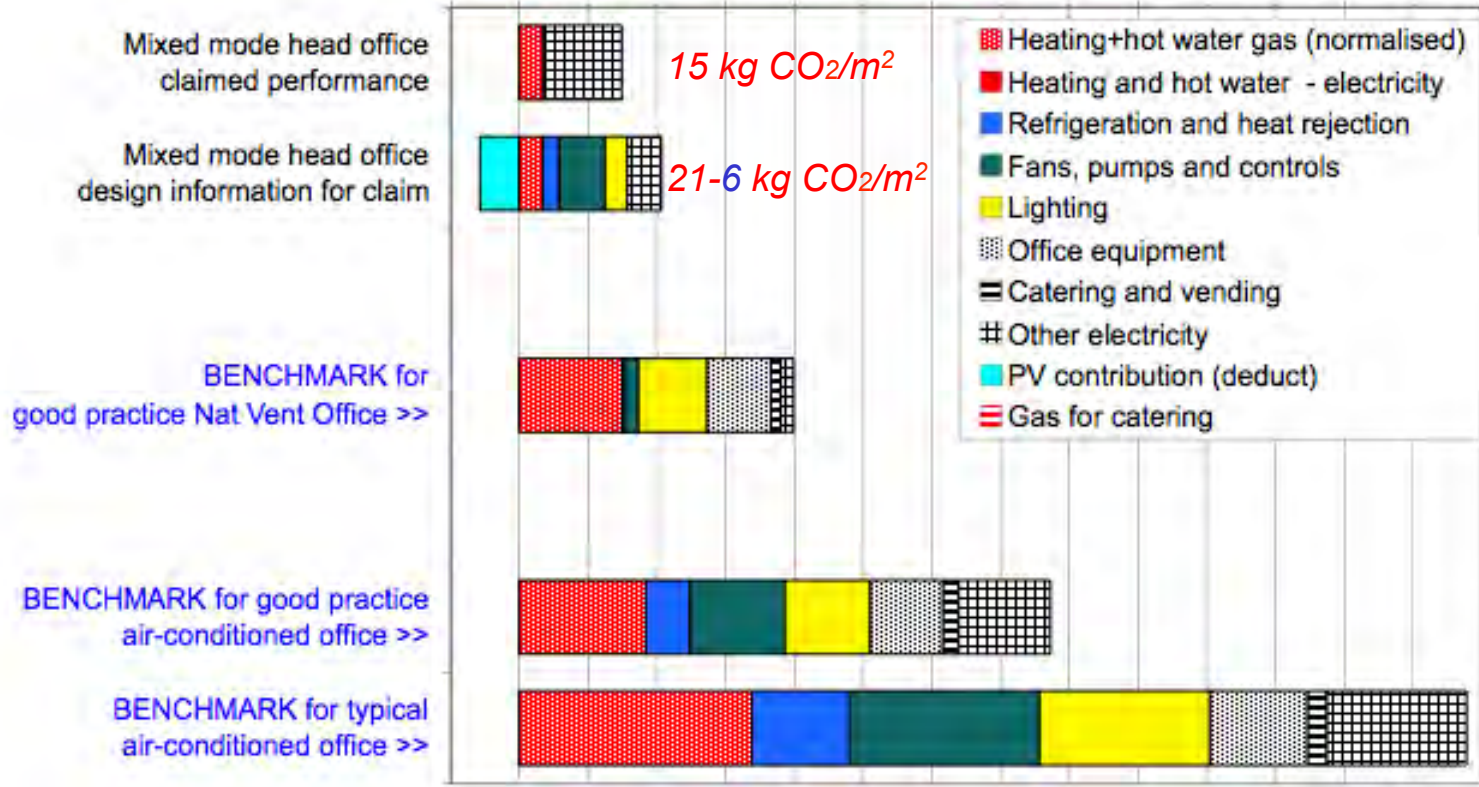


Design intent to reality: how the gap widens 2: the basis for the design claim

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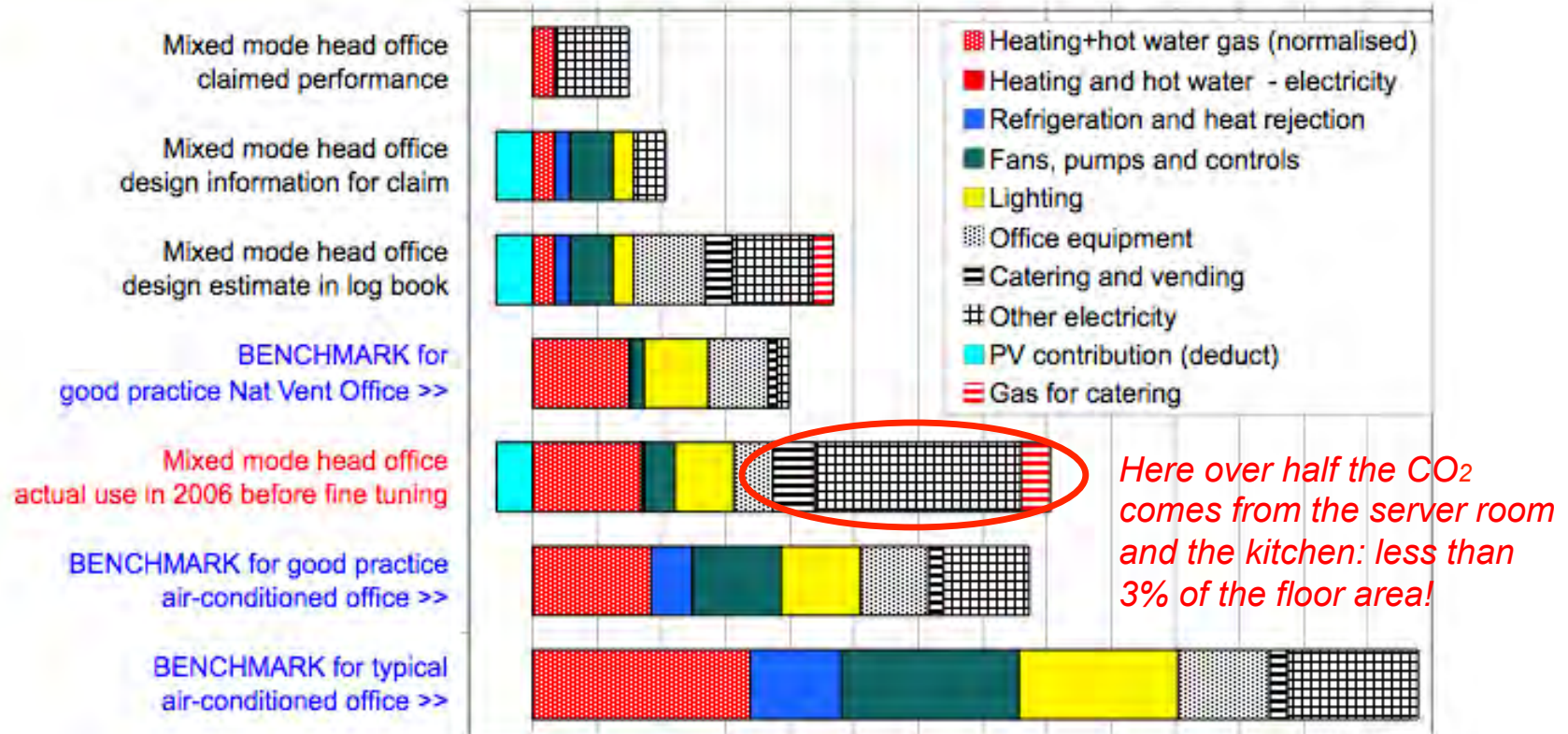


Components of energy performance: 5: designers need to influence “unregulated” loads!

Annual CO₂ emissions of energy use in a low-energy office building

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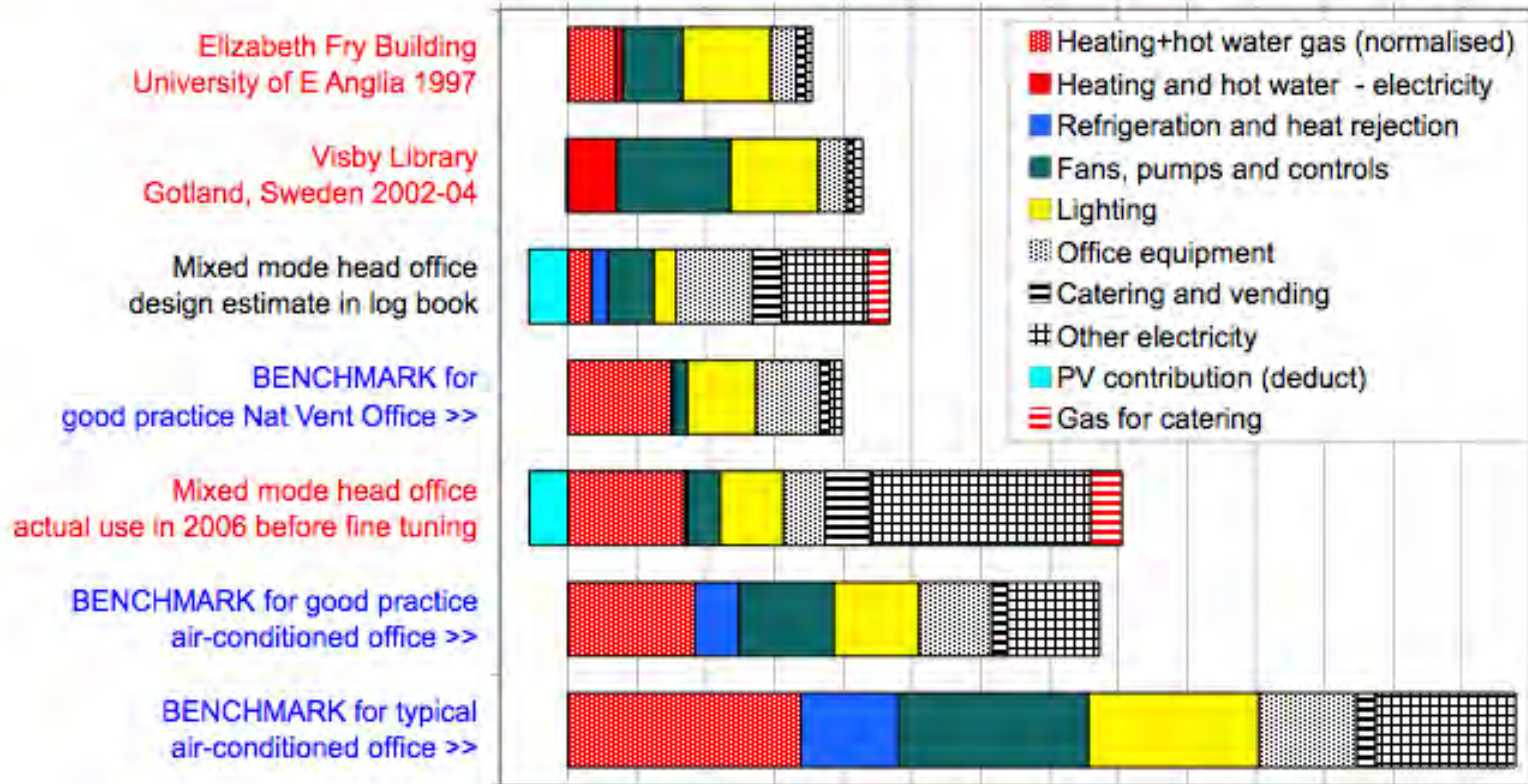


We must learn from the fine structure: 6: how it relates to two other low-energy buildings

Annual CO₂ emissions of energy use in a low-energy office building

kgCO₂/m² Treated Internal Floor Area at UK ECON 19 CO₂ factors of 0.19 for gas and 0.46 for electricity

<< Onsite renewable supply << >> Building energy demand >> expressed as CO₂
-10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140



So why are we being encouraged to spend money on green bling when we aren't getting the fundamentals right?



Getting the leverage on emissions: *First people, then energy, then carbon*

- Engage people - *if not, there may well be unintended consequences.*
- Reduce demand - *prevention is better than cure!*
- Increase efficiency - *of the services that meet the demand.*
- Avoid waste, a priority for both new **and existing buildings.**
- Decarbonise supplies - *but low-carbon energy is a scarce resource not to be squandered: be sure to get the demand down first.*
- Get results by doing things simply, cheaply ... **and well!**

BIG SAVINGS ARE POSSIBLE USING THE MULTIPLIER EFFECT

e.g:

- *Halve the demand* **X**
- *Double the efficiency* **X**
- *Halve the carbon in the supplies ... AND*

You are down to one-eighth of the carbon.

Controls, manageability and usability need to receive much more attention

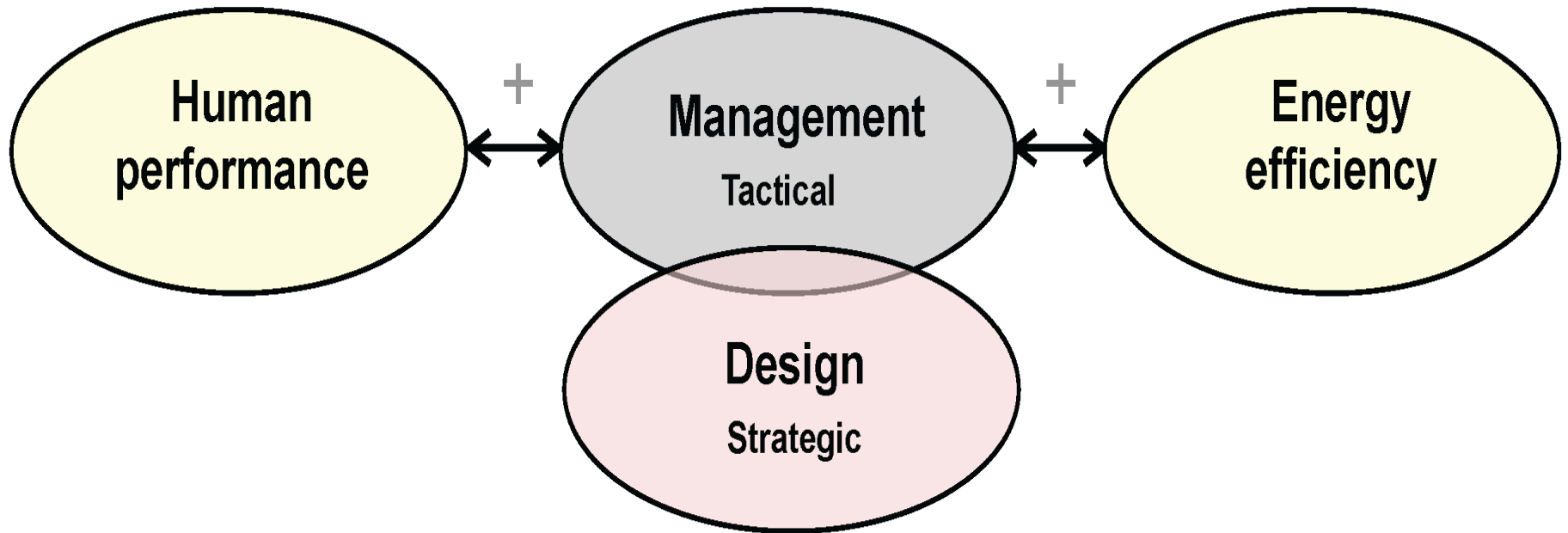


“An intelligent building is one that doesn’t make its occupants feel stupid” ... ADRIAN LEAMAN

“We sell dreams and install nightmares” ...BMS SUPPLIER

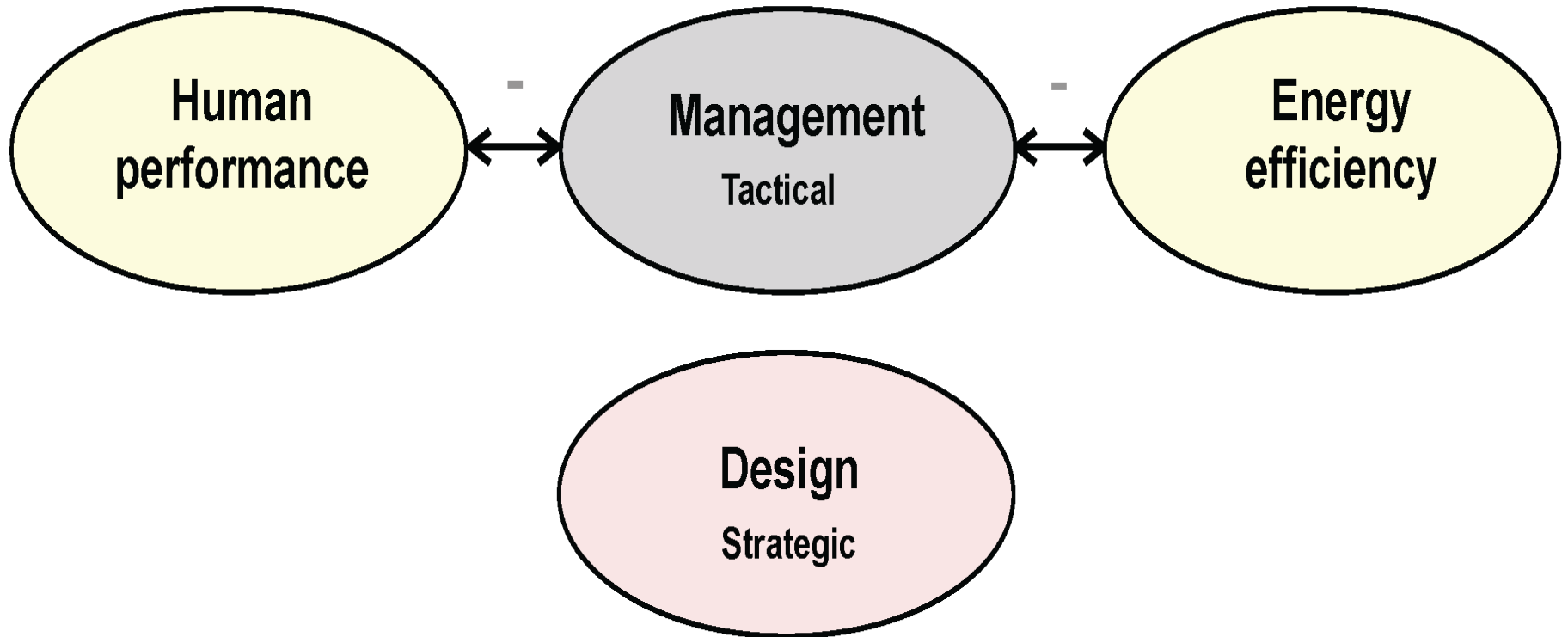
Design for manageability

... where good things happen



Design for manageability

... and where they don't



and in housing ...

Sigma findings 2009 by Oxford Brookes

- Demonstration house to CSH Code 5
- Occupancy evaluated over a year.
- Extensive feedback from occupants, including comfort, ergonomics, space.
- Energy use higher than anticipated.
- Complicated and confusing user technologies and renewables. *Domestic buildings have caught the nondomestic disease!*



Occupants can be thwarted

some results from Elmswell housing study

Two-thirds of residents ...
were not able to program their thermostats.

MVHR was present ... **but** 95% of people opened
the windows when they wanted some air.

Design air change was 0.5 to 1 air changes/hour ... **but**
a single open window can increase the rate to 17 ac/h!

3

MOVING FORWARD



The context today: the party's over *need to make better use of what we've got*

- Decline of No Sea oil and gas. *UK is an energy importer for the first time in 300 years. Peak oil. Fukushima.*
- Need to slash fossil fuel use and emissions anyway.
- Chronic shortage of money. International power shifts.
- Pressures to cut costs, *but we need to do things better.*
- Additional costs of infrastructure and climate adaptation.
- Fewer opportunities for new revenue, *or to service debt.*
- Most of the buildings we will have in 2050 are already here. *We need to make them perform much better.*
- Many buildings procured over recent years will give cause for regret as the context changes.

You can't tell if you have a good building
... unless you find out how it is working

Elizabeth Fry building has the last laugh

The story of the Elizabeth Fry building (AJ 23.4.98) contains a number of ironies. My favourite is that it didn't even make the shortlist of the Green Building of the Year Award in 1996.

DR ROBERT LOWE

Leeds Metropolitan University

When natural ventilation was all the rage, a novel form of mechanical ventilation was quietly slipping into Britain: the Swedish Termodeck system. One of the first buildings to use Termodeck and other Swedish detailing was an academic facility at the University of East Anglia. How has it fared?

BY THE PROBE TEAM

PROBE

14: Elizabeth Fry Building



14 ELIZABETH FRY BUILDING

LETTER TO ARCHITECTS' JOURNAL

The good performers don't necessarily impress the judges

It's the process, not just the product

Factors for success at the Elizabeth Fry Building, UEA

- A good client.
- A good brief.
- A good team *(worked together before on the site).*
- Specialist support *(e.g. on insulation and airtightness).*
- A good, robust design, efficiently serviced *(mostly).*
- Enough time and money *(but to a normal budget).*
- An appropriate specification *(and not too clever).*
- An interested contractor *(with a traditional contract).*
- Well-built *(attention to detail, but still room for improvement).*
- Well controlled *(but only eventually, after monitoring and refit).*
- Post-handover support *(triggered by independent monitoring).*
- Management vigilance *(easier now, but must be sustained).*

But only its technical features were mentioned when a Royal Commission used it an exemplar

Is High Performance the Answer?: strategic conclusions from the Probe POEs

		Technological complexity	
		More	Less
Building management input	More	<i>Type A</i>	<i>Type D</i>
	Less	<i>Type C</i>	<i>Type B</i>

Technology - management interactions: strategic conclusions from the Probe POEs

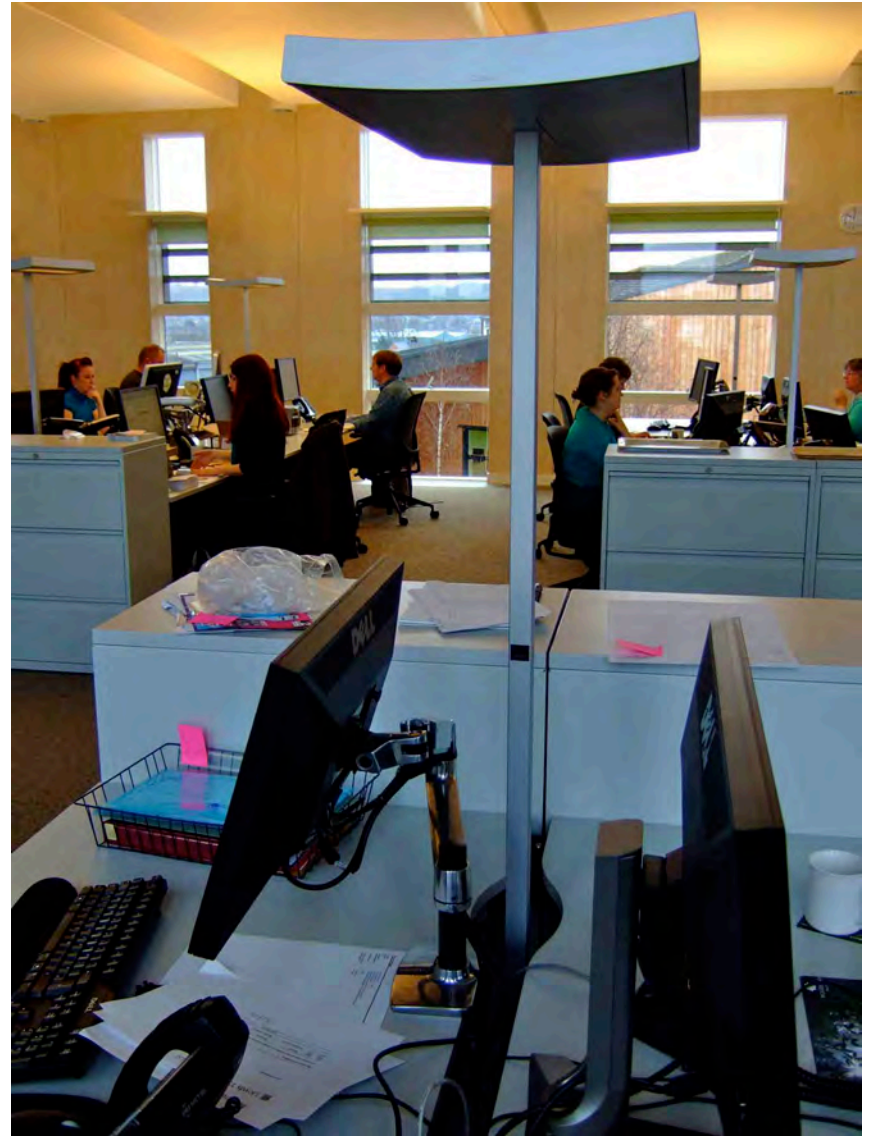
		Technological complexity	
		More	Less
Building management input	More	Type A High Performance	Type D Rare, not replicable?
		Risky with performance penalties Type C	Simple Smart Sense + Science Type B

Secure Type A
Seek more Type B
(and possibly Type D)
Avoid Type C.

From National Trust, Heelis, Swindon...



... to the Woodland Trust, Grantham, 2010



Feilden Clegg Bradley and Max Fordham embedded POE learning from Heelis into this building, soon to be reviewed.

Soft Landings: *supporting a new professionalism that engages routinely with outcomes on any project*

Soft Landings can run alongside any procurement system, and:

- Link actual building performance and FM to design.
- Ease transition to occupation.
- Reduce post-handover problems and assist fine-tuning.
- Facilitate feedback.
- Capture learning, and improve professional competences.

Soft Landings can help to:

- Relate client and design targets to achieved outcomes.
- Manage expectations and review performance at intervals throughout a project, and on into use.
- Allocate responsibilities, *including client responsibilities*.
- Improve relationships between designers, builders, clients and users.

The golden thread ... MARK WAY



Soft Landings: the Five main stages

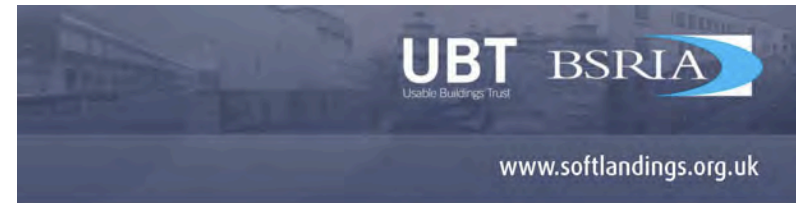
From the Framework published in July 2009

1. **Inception and Briefing**
*Appropriate processes.
Assigned responsibilities.
Well-informed targets.*
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.*

Downloadable free

from www.usablebuildings.co.uk
and www.softlandings.org.uk

BSRIA is hosting an industry group



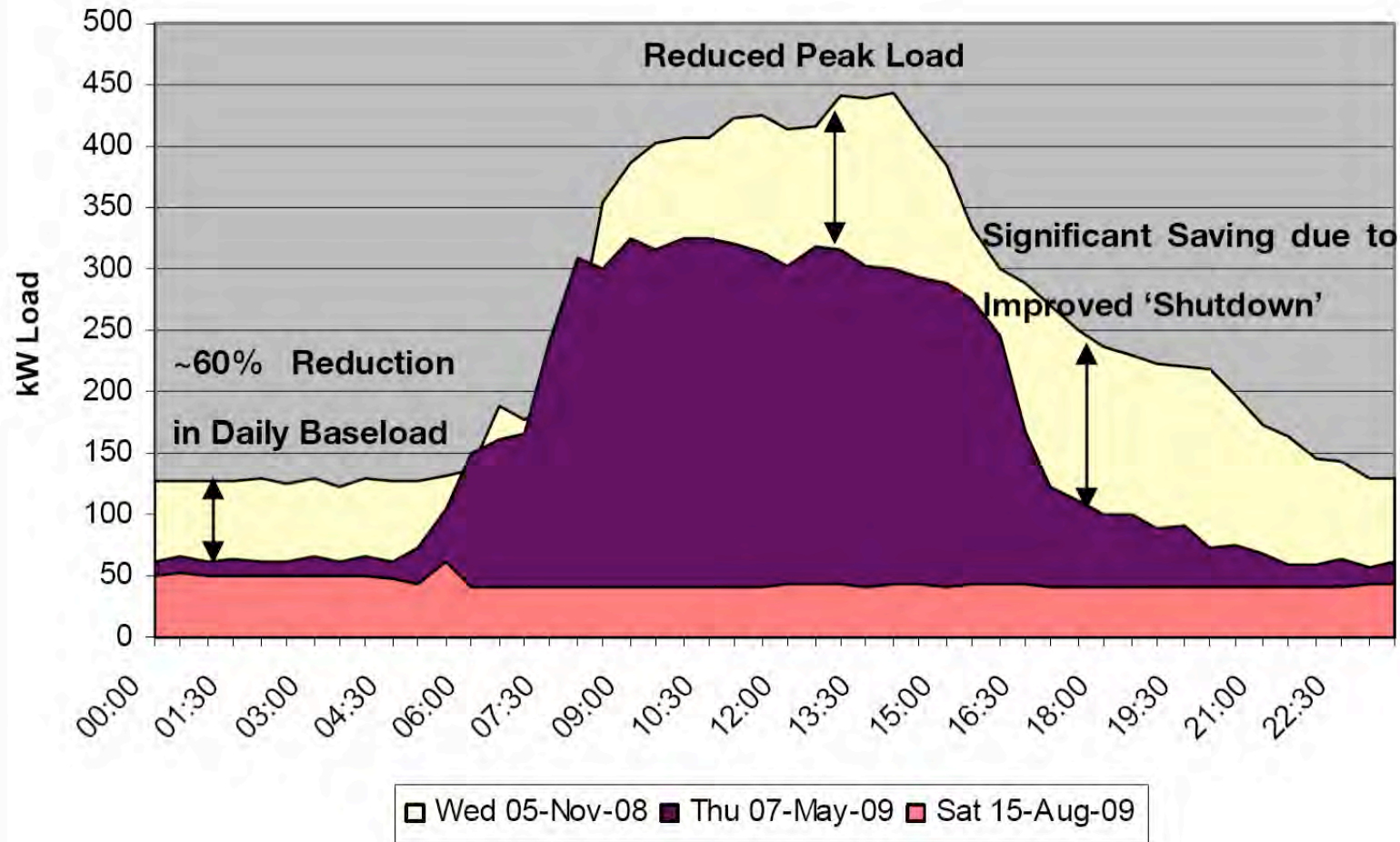
the **SOFT LANDINGS FRAMEWORK**

for better briefing, design, handover and building performance in-use



Follow-through can pay for itself

Intervention in a recently-completed school



Saving over £ 40,000 p.a. in electricity bills: avoid default to ON

Soft Landings: *Everybody can win*

- Better communication, proper expectations management, *fewer nasty surprises*.
- More effective building readiness. *Less rework*.
- Natural route for feedback and Post-occupancy evaluation, *to improve the product and its performance in use*.
- Teams can develop reputations for customer service and performance delivery, *building relationships, retaining customers, commercial advantage*.
- Vital if we are to progress towards more sustainable, low-energy, low-carbon, well-liked buildings and refurbishments, *closing the credibility gaps*.

SO WHAT IS STOPPING US?

- **ATTITUDES:** *Everybody needs to be committed, starting with the client - perhaps the biggest obstacle. The “golden thread” needs to be put in place.*
 - **PROCESSES:** *There is a learning curve to pay for (probably best from marketing budgets), and the feedback has to be managed.*
 - **TECHNIQUES:** *Independent POE surveys cost money (but not much).*
 - **CAPACITY:** *We need facilitators, investigators, troubleshooters and fixers.*
 - **MONEY:** *Particularly allocation for tune-up etc. after practical completion.*
 - **IMAGINATION:** *Often constrained by burgeoning bureaucracy!*
-

4

WHERE NEXT?

Where next?

- There's a lot to do, and less money and things to do it with, *though there might be more manpower, and scope for more care.*
- Existing buildings and infrastructure will be strong constraints, *we will need to make better use of we've got where we can.*
- Massive potential for engineering, *but we need to clear our minds and get closer to the decision-makers, and to ordinary users.*

SOLUTIONS WILL INCLUDE THE SIMPLE AND THE ADVANCED:

- Loosely coupled systems.
- Robust buildings, with options available.
- Demand destruction.

IT WON'T JUST BE "GREENED" BUSINESS AS USUAL

- There will be cultural and behavioural changes.
 - There will be some surprising and disruptive innovations.
 - 19th and 20th Century solutions (e.g. District Heating and CHP) will have a role but may well be less of panacea than policymakers think.
-

THE FUTURE: New professionals *follow design intent through into reality*

- They understand what is needed *strategic briefing*
- Are clear what they want, and communicate it plainly *strategic design*
- Are ambitious, but realistic *question all assumptions, understand users*
- Follow things right through *e.g. using **Soft Landings** procedures*
- Review what they do *manage expectations, undertake reality checks*
- Make others aware of what they are after *specify: what, why and how*
- Check that things will work *technical feasibility, usability and manageability*
- Get things done well, with attention to detail *communicate, train, inspect*
- Finish them off *commission, operational readiness, handover, dialogue*
- Help the users to understand and take ownership *provide aftercare support*
- Review performance in use *including **post-occupancy evaluation***
- Work with occupiers to make things better *monitoring, review and fine tuning*
- Anticipate and spot unintended consequences *revenge effects*
- Learn from it all *and share their experiences*

TRY TO MAKE THINGS SIMPLER AND DO THEM BETTER ...
only making them complicated where this is essential.

Why do we need a new professionalism?

What has changed?

- The urgent need to reduce the environmental impact of existing and new buildings: *we must now find ways to do this quickly and reliably.*
 - Shortages of financial and material resources: *we can no longer afford to “invest” in the wrong things, but we can do things more carefully.*
 - Rapid technological, social and economic change: *we need to keep ahead of the game.*
 - **Increasing (often unnecessary) complication** of requirements, process and product: *we need to find what works well and do it better.*
 - **Outsourcing of technical and operational skills**, research and feedback by government: *we need to replace this lost practical expertise.*
 - **Excessive reliance on economics**, contracts and markets: *we need to go beyond the specification and the profit motive.*
 - **Virtualisation of education and practice**: *professionals need to confront the consequences of their actions, learn from them and share results.*
 - **30 years of professionalism being regarded as anti-competitive or elitist**: *but how else can those we trust also have the wider interests at heart?*
 - **Destruction of professional judgment by PR**, *reinforcing received wisdom.*
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What is stopping good feedback happening? *Pretence and Control?*

- The contract culture: *you can never get more than you ask for.*
 - The outsourcing culture: *provision without understanding and commitment.*
 - The bureaucratic culture: *tick the box, ossify the process, gravy train for accreditation.*
 - The MBA culture: *power without technical understanding. Targets, KPIs, scorecards ...*

 - Free-market everything: *buildings are not consumer products, but public resources.*
 - Corporate takeover, *stifling local initiatives and small players.*
 - Market capture *and sterilising variety.*

 - The design culture: *not informed by use and regarding users as wilful.*
 - The innovation culture: *novelty without getting the fundamentals right.*
 - “Green bling”: *appearance before substance. Playing to the gallery.*

 - PR: *remorseless spin without substance. No recognition of the downsides.*
 - Newspeak: *where the mediocre becomes “excellent”.*
 - Hope before experience: *e.g. “Zero Carbon”. Also corrupts the science*
 - Wreck the context: *don’t capture the stories, just set up databases and dashboards.*
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And what can we do about it - tomorrow? *Over to you ...*



Take one zero off your budget and creativity begins.

Take two zeros off and you have sustainability ...

JAIME LERNER, former Mayor of Curitiba, Brazil

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