



 #bcoevents
@BCO_UK

BCO ESG WORKSHOP: Design for Performance



Debbie Hobbs

Head of Sustainability
LGIM Real Assets



AGENDA

16.00 Introduction from Debbie Hobbs, Head of Sustainability, LGIM Real Assets

16.05 Presentation from:

- Robert Cohen, Technical Director at Verco
- Sarah Ratcliffe, Programme Director at Better Buildings Partnership

16.30 Panel discussion & workshop, joined by:

- Simon Wyatt, Partner at Cundall

17.30 Event close

The Investment world is changing



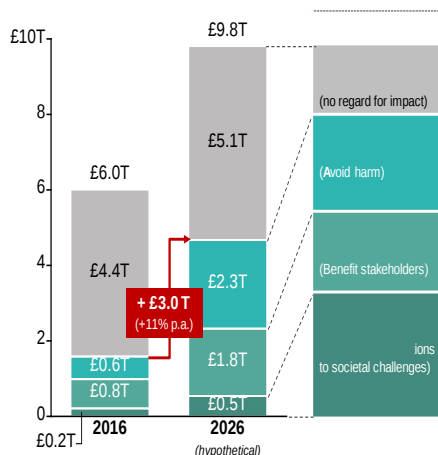
Letter from the chair

What if... we could bring together the very best of Government, private markets and civil society to find new solutions to our most difficult social and environmental problems?

What if... we could unlock billions of pounds of additional investment to tackle these challenges – investment that could reduce inequality between the regions, mitigate pressures on the NHS, or help us meet our carbon reduction targets?

What if... by doing so, we could boost economic growth and establish the UK as a global thought leader?

Total UK invested capital stock, GBP Trillion



Our customers want more than just returns – they want IMPACT



Along with UNPRI the SD Goals are becoming much more important

Millennials want transparency of impacts



Nine out of ten millennials believe the success of a business should be measured by more than just financial performance

60% of Millennials want to join companies that have a societal purpose

Questions to be answered today

1

The principle of Design for Performance (DfP) – do those attending agree that focusing on performance outcomes will deliver better buildings?

2

Technical – What actually needs to happen to make DfP work and what will the challenges be?

3

Market – what would be the market response and will there be any challenges?

4

The BCO Guide – should the BCO guide incorporate DfP and if so, how?



Design for performance:

How new commercial office buildings can achieve energy efficiency promises

Presenter's name: **Robert Cohen and Sarah Ratcliffe**
Presented to: **BCO ESG Workshop**
Date: **14 March 2018**



- Are UK offices energy efficient? Are we using the right metric?
- How is a performance based approach possible for new buildings
- Is it possible to adopt that solution in the UK?
- Making Design for Performance happen
- Workshop debate

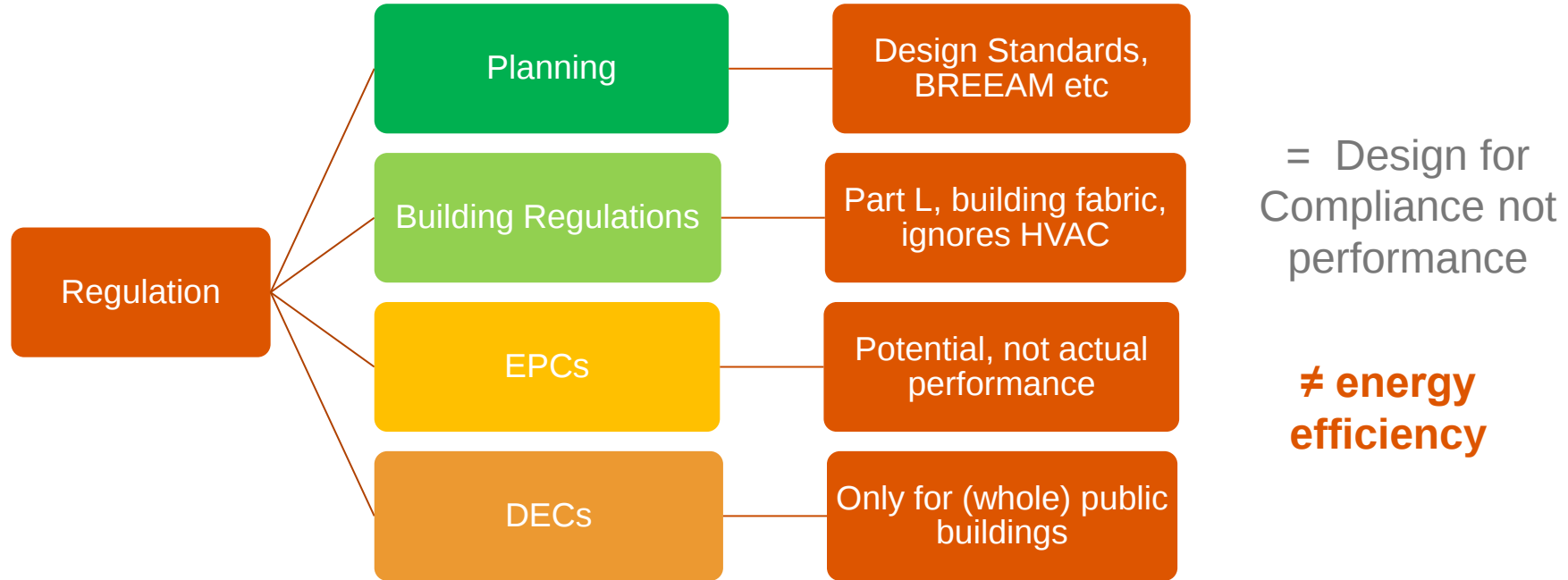


Are large UK office buildings energy efficient?

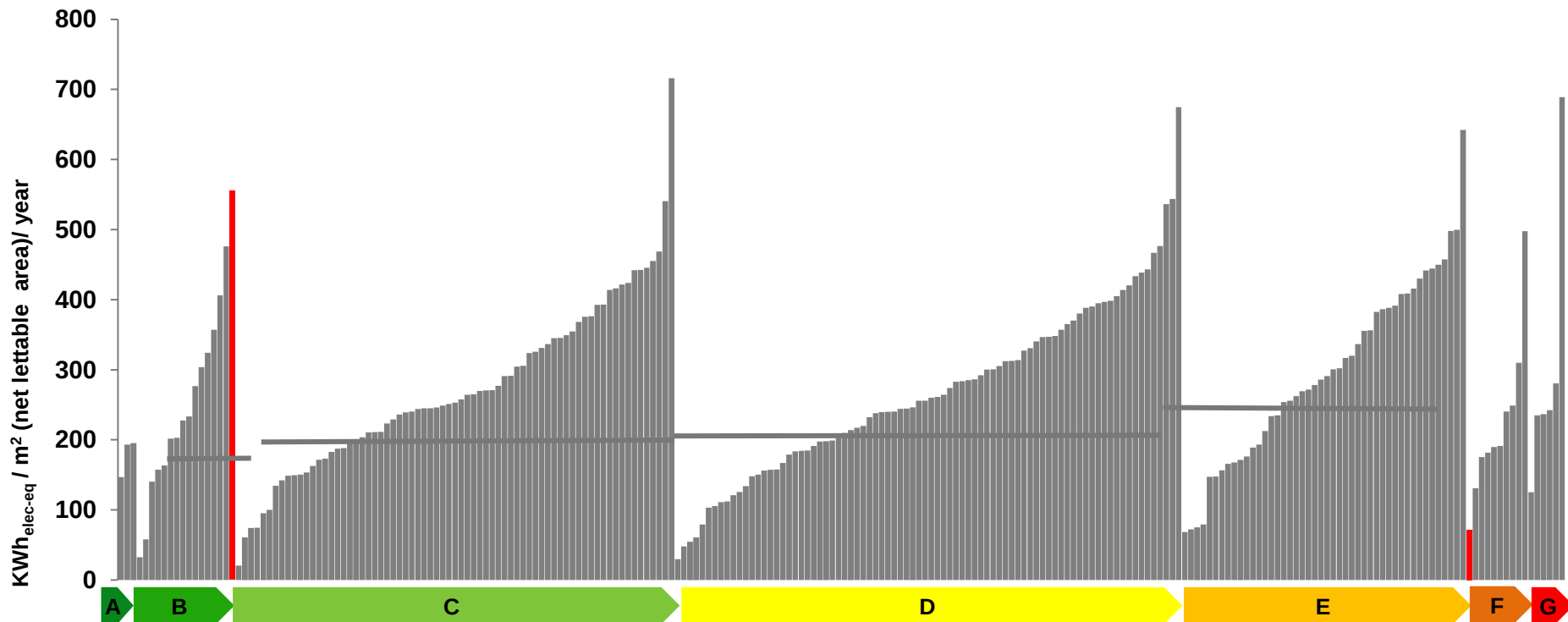
Do we have the right metrics to answer that question?



The UK approach to energy efficiency in buildings



Are EPCs a good indicator of building energy efficiency?



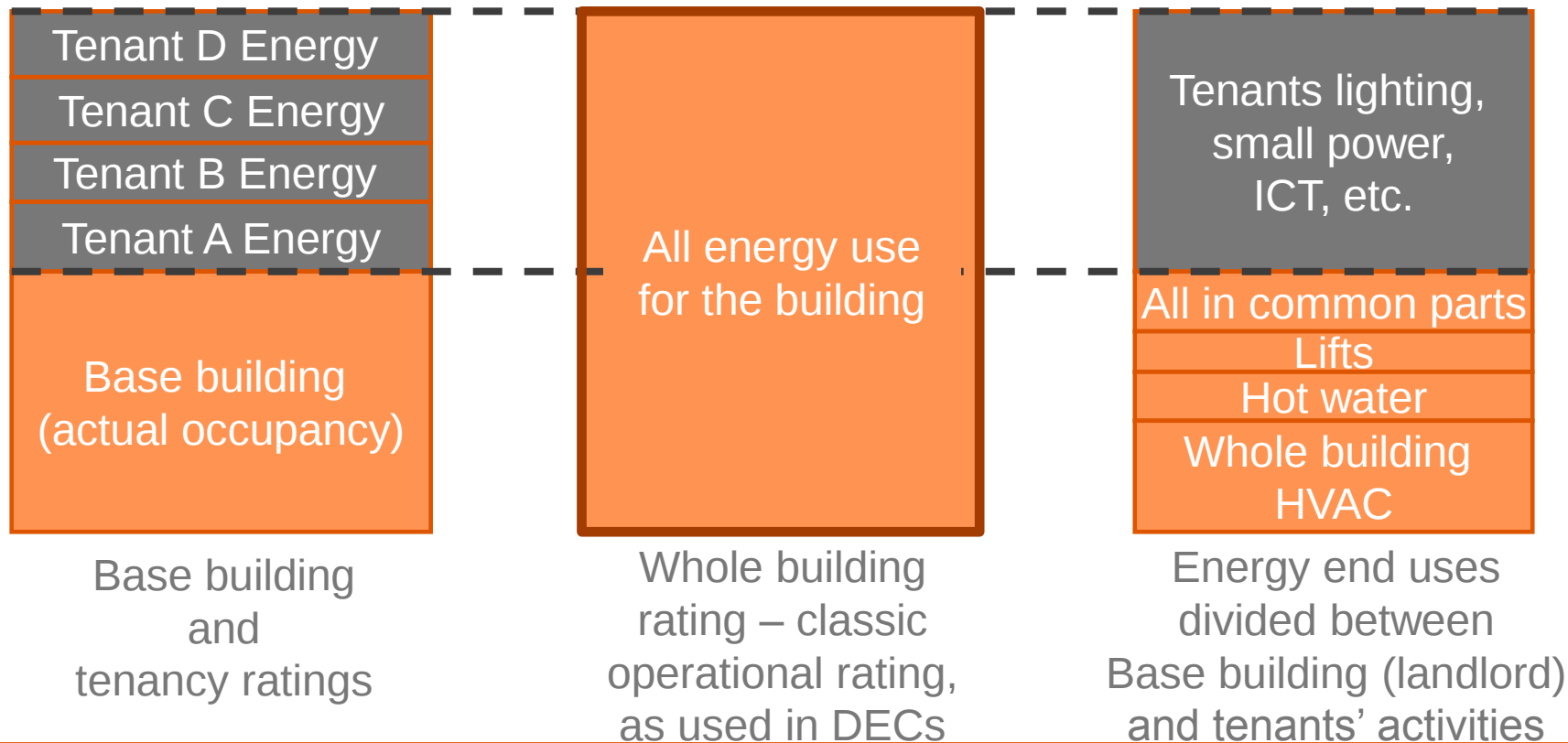
Source: Real Estate Environmental Benchmark Update, BBP, 2016



Let's instead define a measurable metric for a building's energy efficiency



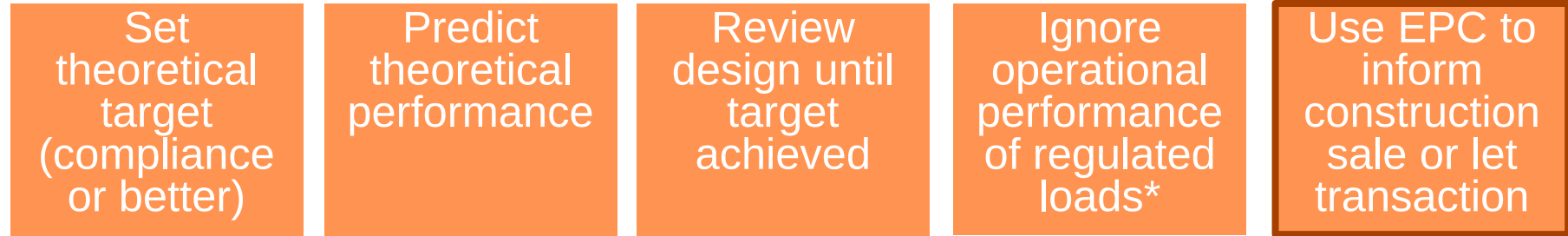
giving each party the data they need to manage the environmental impacts they are able to control directly



If the aim is market transparency, which approach is better?



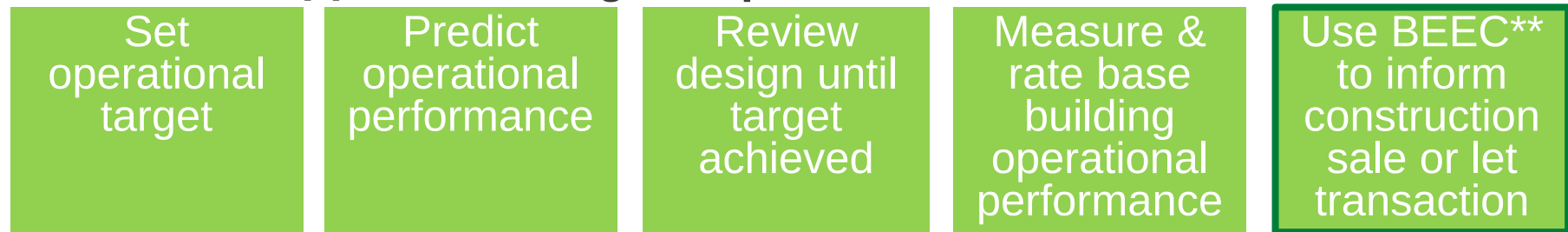
UK approach: design for compliance



*A DEC (whole building operational rating) is produced for public buildings

Building in operation

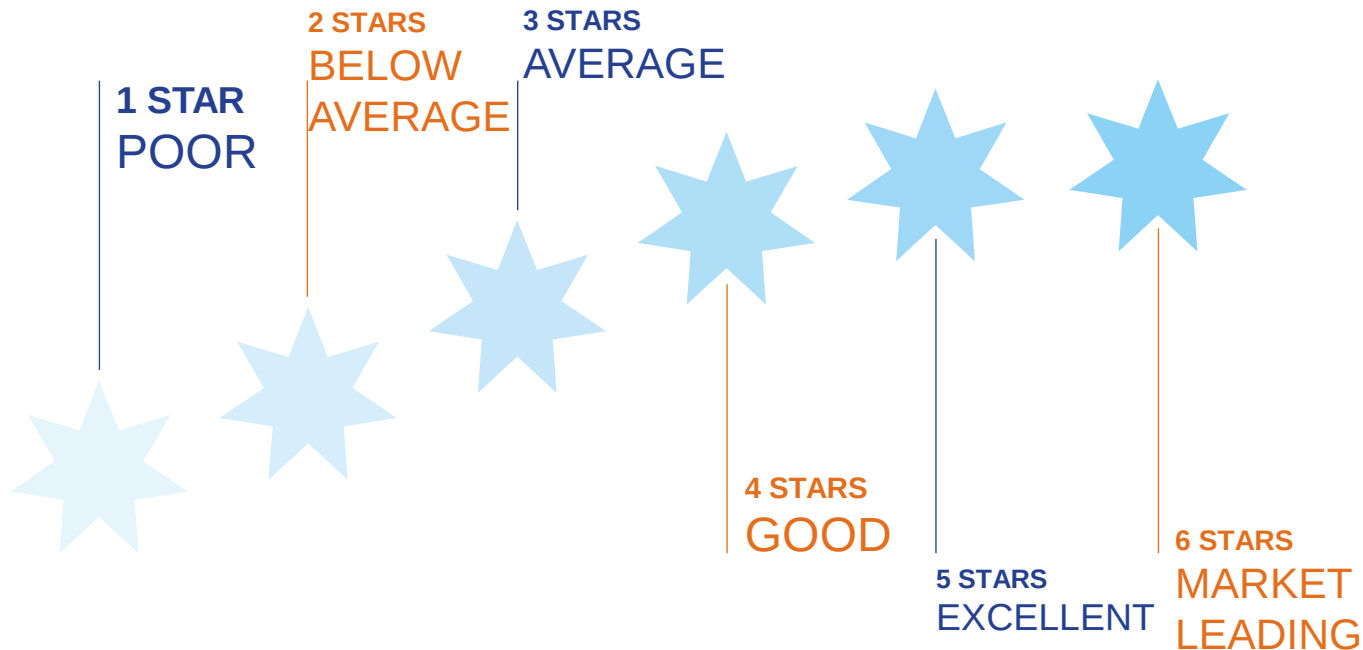
Australian approach: design for performance



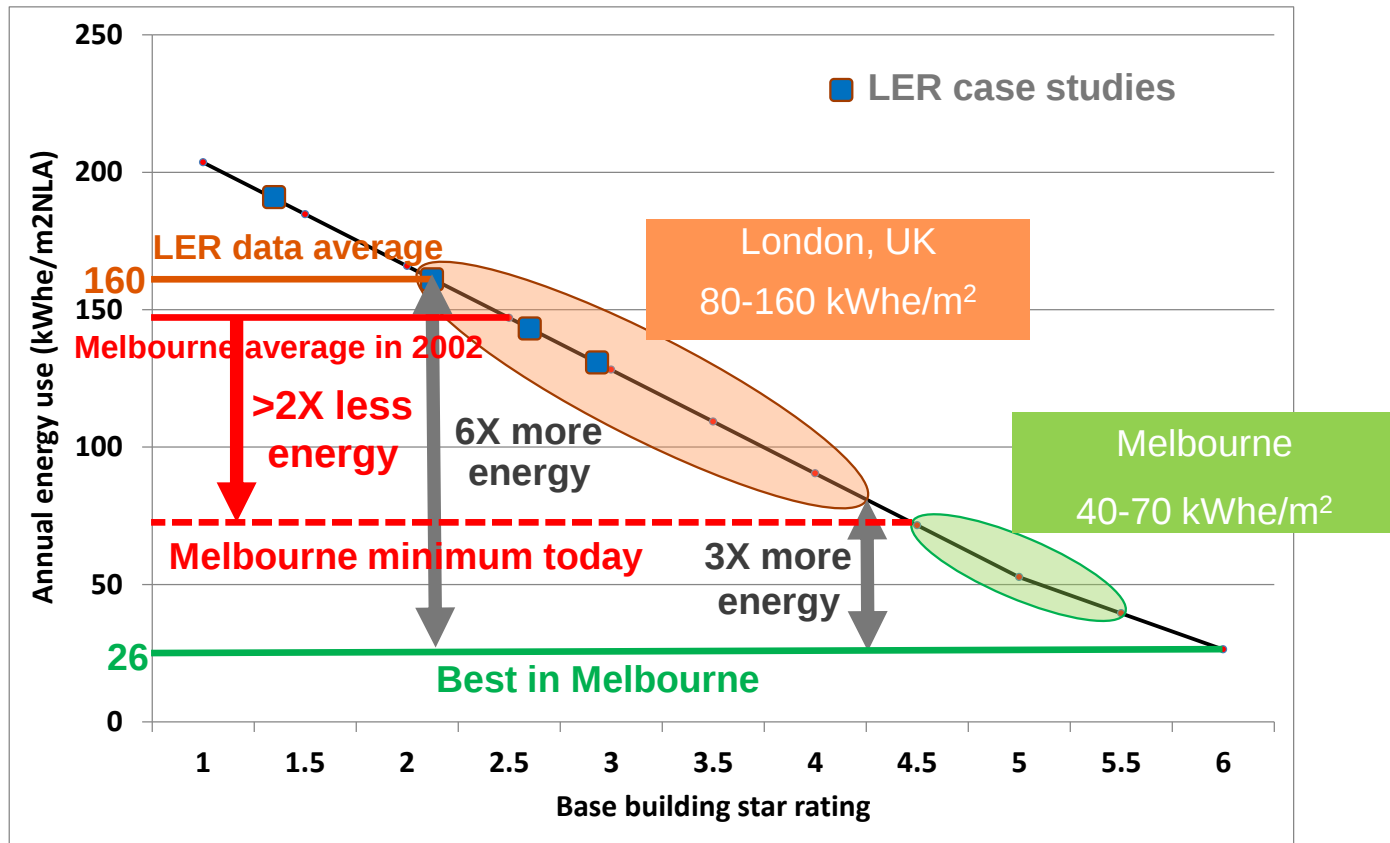
**A Building Energy Efficiency Certificate (BEEC) comprises a NABERS base building operational rating and Tenancy Lighting Assessment



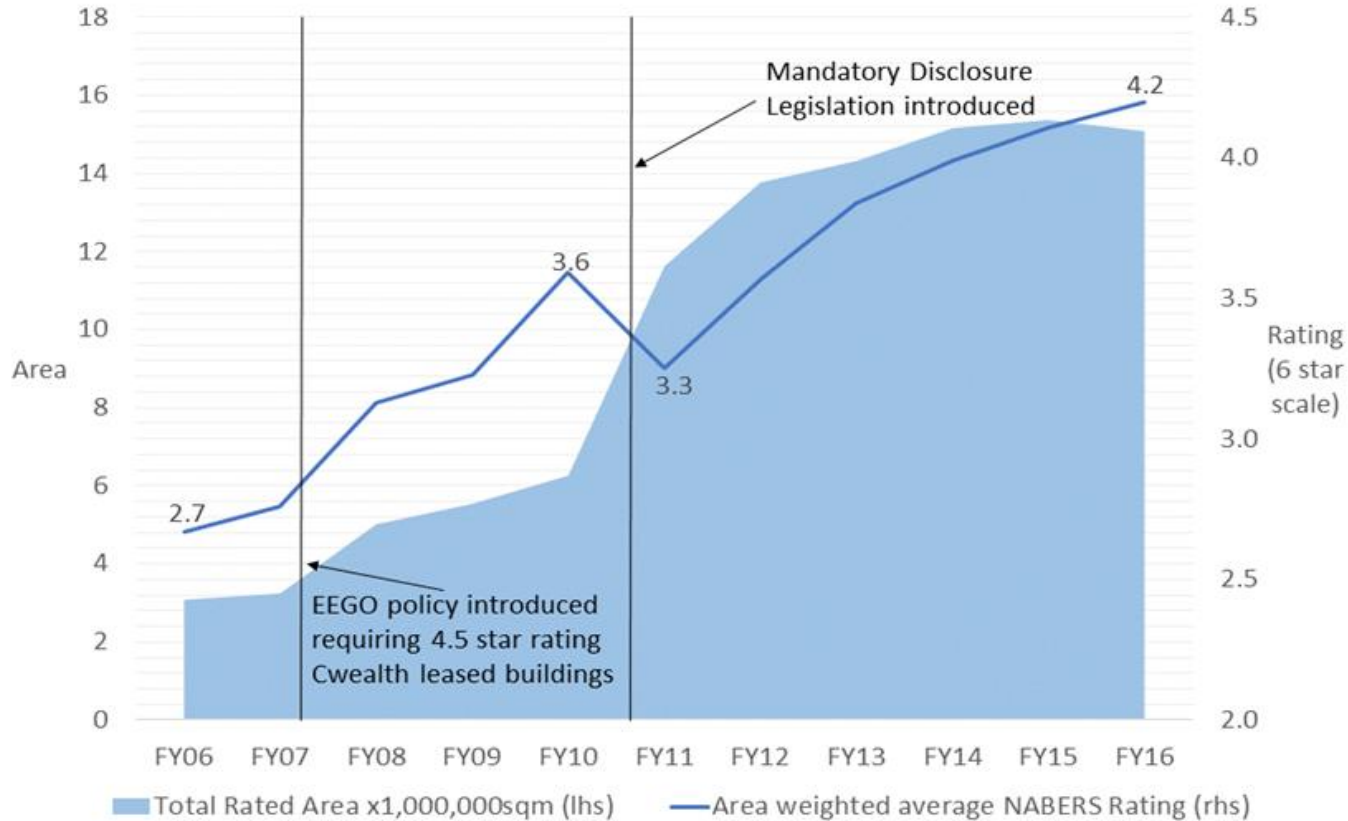
Consumer-friendly NABERS stars scale on trajectory to net zero energy



London base building energy intensity 3 to 6 times higher than Melbourne



Existing buildings efficiency also transformed by performance outcome focus



Is it plausible new UK commercial buildings are not energy efficient?



- Energy efficiency performance is invisible – not measured, not even measurable, let alone rated or disclosed.
- The market does care but must resort to EPC or BREEAM - **no decent metric**.
- Design focuses on technology that improves EPC, not measureable improvements in actual performance.
- Regulation of inputs (Part L) ratcheted up for last 30 years with little evidence it is having intended outcomes in air-conditioned offices.
- Most large new office buildings are air-conditioned, but air-conditioning system and its controls are a blind spot in Part L, treated by model as black box.
- Was this because perceived need for a/c is marginal in UK's climate, so expected energy penalty will be modest? ECON 19 exposed this myth in 1990

“The UK’s energy policy for commercial office buildings is broken”

London Energy Transformation Initiative, May ‘17



So what is going wrong, specifically?

- Control systems are not being designed and specified in sufficient detail
- Controls do not enable (HVAC, lighting) service level to be tailored to demand
- Ditto, design intent rarely sets out to limit services to unoccupied parts of a building (voids and when out of hours use requested by some tenants, etc.)
- BMS controls are often not working effectively for energy efficiency
 - set to avoid complaints rather than also achieve efficient operation
- Metering systems are mandated in new buildings but are ignored or do not work
- Building managers / FM teams:
 - Lack skills needed to operate a building efficiently
 - Do not have building performance requirements written in to their contracts
 - Are not incentivised to improve performance.



How is a performance based approach possible for new buildings

Learning from experience in other markets

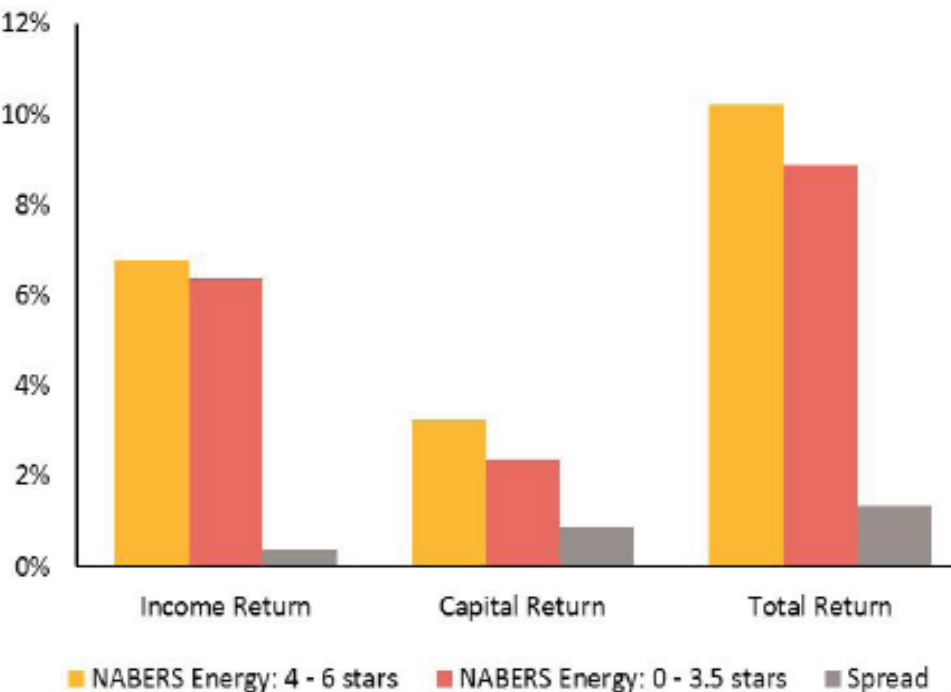




- Established to empower developers to design, construct and manage buildings to achieve an agreed *Base Building* rating measured in-use
- Effect on market has been transformational - typical new office Base Buildings use half the energy they did in 2002 and the best one-fifth
- Scheme is essentially market driven but infrastructure developed by government
- Mandatory performance disclosure law (on sale or let) informs market
- Office development in Australia has a design-for-performance culture and innovation across the whole supply chain is flourishing
- Better rating commands rent premium - Base building energy rating used by leaseholders as proxy for building quality: better designed, better constructed, better commissioned, better operated and maintained
- For developers and investors, office buildings with better energy ratings have higher asset values, reduced vacancy rates and increased yields

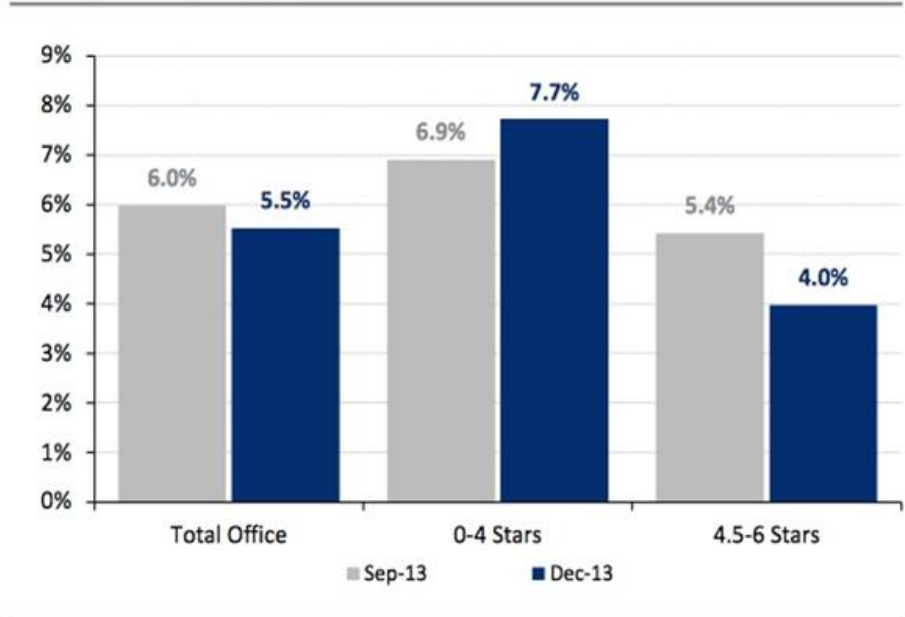


Investors see better energy ratings produce lower voids and higher returns



Source: The Property Council/IPD Green Property Index, MSCI, March 2015

Figure 16. Market Vacancy Rate comparisons
Percentage, Period End



Source: NABERS, IPD



What Energy Commitment Agreements entail

DESIGN AND CONSTRUCTION

1. **Set a target** base building energy performance level
2. Include performance target and process in **contractual documentation**
3. **Advanced computer simulation** to check target achievable & set budgets for each meter
4. **Independent design review** of design package and the simulation work

OPERATION

1. **Monthly monitoring reports** comparing performance vs targets and tracking rating
2. **Intensive fine-tuning** during first year, including 4 detailed BMS reviews
3. Provide data to allow the operational performance to be verified after 12 months of full occupation - third party **validation** of **rating**.
4. **Disclosure** to affected parties (tenants, investors) of the achievement or otherwise of target



Is it possible to replicate this approach in the UK?

An introduction to the industry backed 'Design for Performance' project



The UK Design for Performance (DfP) initiative funders and supporters



Australian expert support from Energy Action, designers of the NABERS Energy system



Timeline



2012 - 2013	Landlord Energy Rating (LER): Developed for BBP – a NABERS style system aimed at <u>existing</u> multi-let commercial offices
2015 - 2016	Commitment Agreement Feasibility study: Deep dive review and comparison of the situations in the UK and in Australia.
May 2016 – March 2018	Design for Performance Pilot projects: Apply and test DfP at various points in procurement and operational journey.
May/June 2018	Publication of Design for Performance outputs including: • Pilot projects findings • A UK Commitment Agreement Protocol • Stakeholder specific briefings: • Investors • Owners • Designers • Government • Industry Bodies



Progress with pilots testing the key DfP processes

	DESIGN AND CONSTRUCTION		EARLY OPERATION		
	IDR	Adv Sim	BMS tune up	M&V	Get Rating
245 Hammersmith Road	X	X			
1 Angel Court		X			
10 Burlington Street			X	X	X
York House plant upgrade		X			
5 Endeavour Square, IQL	X	X	X	X	X
Office refurb, Wimbledon	X	X	X	X	X

IDR = Independent Design Review

M&V = Monitoring and verification

X = key Commitment Agreement process included in pilot

X = activity will extend beyond March 2018

Activity underway	Activity ~ completed
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Pilot study key findings

- Client leadership and target setting critical
- Performance outcome needs to matter to the market
- Advanced simulation should drive design and operation
- Intensive fine tuning of controls remains essential
- Building managers must be contracted to target comfort AND efficiency
- Ensure oversight of tenant fit-outs
- Need central point visibility of HVAC operation throughout building
- Avoid divided responsibilities for HVAC control and maintenance

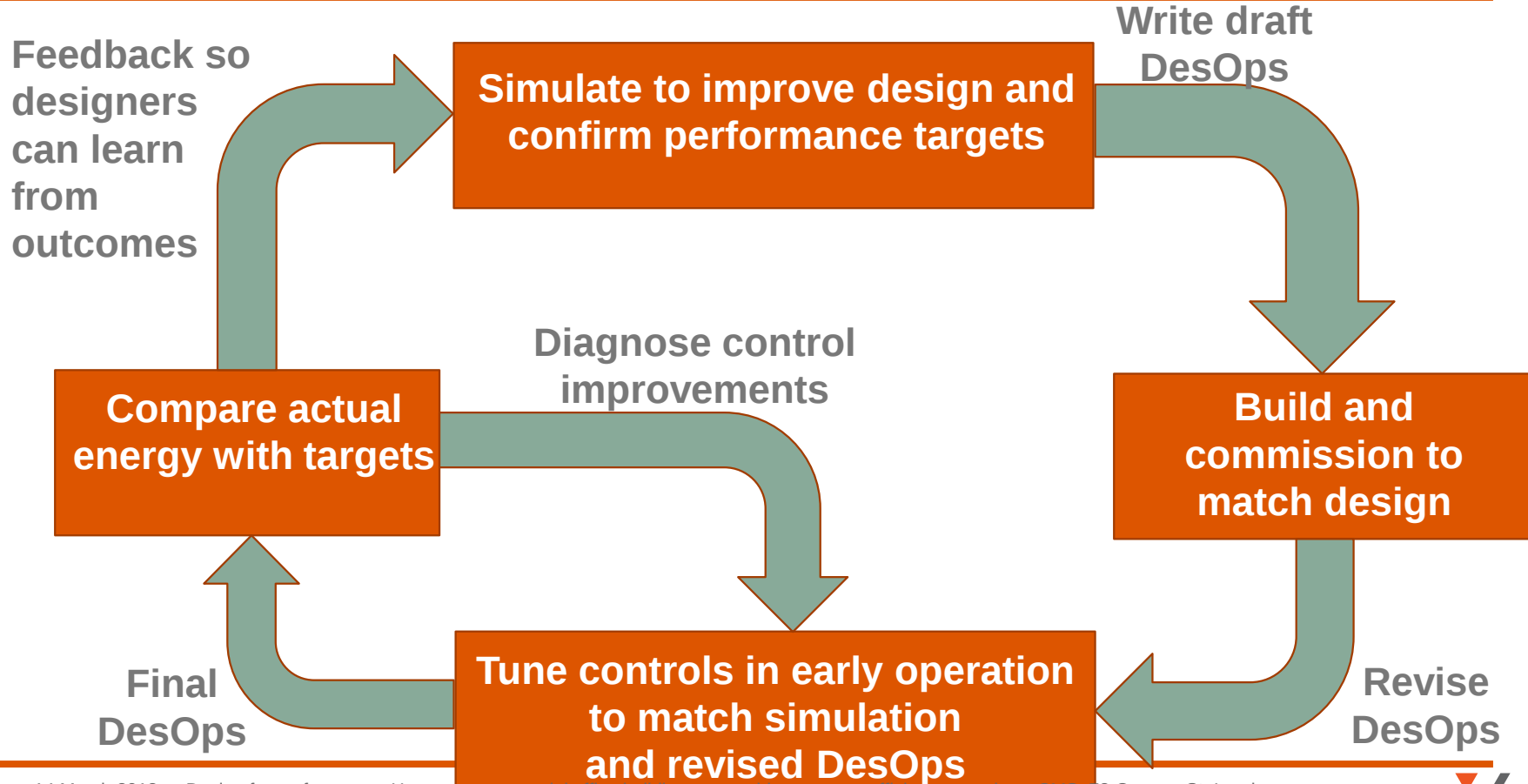
Pilot study key findings – how are UK and Australian contexts different



- Commercial buildings in Australia do not have better fabric, shading, etc.
- Procurement differences
 - Design & Build presents same challenges in UK as they have in Australia
 - Landlords in Australia manage and maintain all elements of HVAC in building
- Multiple areas where skills level in Australia now exceeds UK's:
 - Advanced simulation of HVAC systems and controls
 - Design and implementation of HVAC controls
 - Managing agent and FM team ability to tune and operate HVAC efficiently
- Mandatory performance disclosure on sale or let:
 - Portfolio NABERS rating now a managing agent KPI in Australia
 - UK base building rating will use scale based on energy intensity not carbon



Place simulation at centre of design and operation





How to make 'Design for Performance' happen



Design for Performance Transition Phase

- Building the market – DfP Pioneers
- Developing the infrastructure
 - Project agreement
 - MEP brief
 - Scheme administrator
 - Governance structure
 - UK IDR panel
 - Development of advanced simulation capacity
- Business plan to ensure long-term viability
- Fully-fledged Scheme in place by Summer 2019

Supportive context: market transformation drivers towards DfP



- **BREEAM New Construction** Verification stage to be launched by BRE summer 2018



Supportive context: market transformation drivers towards DfP



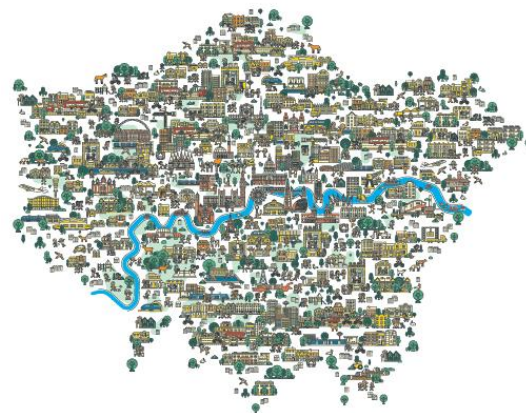
- **BREEAM New Construction** Verification stage to be launched by BRE spring 2018
- **GLA's London Plan** may mandate performance reporting for all major new development

MAYOR OF LONDON

THE LONDON PLAN

THE SPATIAL DEVELOPMENT
STRATEGY FOR GREATER LONDON
DRAFT FOR PUBLIC CONSULTATION

DECEMBER 2017



Supportive context: market transformation drivers towards DfP



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Soft Landings guides



Free to download Soft Landings guides including Framework and Core Principles

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Building energy metering



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- **UKGBC "Advancing Net Zero"** synergies



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Advancing Net Zero Carbon

Inspired by the WorldGBC campaign, we are planning two significant pieces of work in summer 2018 surrounding net zero, which would represent the foundations for a major new programme in the UK.



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- **UKGBC “Advancing Net Zero”** synergies
- **Aldersgate Group** advocates **Commitment Agreements** and **performance based labelling**

ALDERSGATE GROUP: ENVIRONMENTAL REGULATION



Policy design: The processes that support the delivery of regulation could be improved, possibly through better target setting and compliance monitoring. This situation is exacerbated because the tools (i.e. the energy modelling software) use metrics that poorly predict operational performance, so are difficult for occupiers to use. Together these factors mean **there is a danger of designing for regulation rather than actual performance.**

Because compliance with the London Plan is primarily assessed at design stage there is a reduced incentive for ensuring actual performance is improved in terms of outcomes that matter to end users.

Furthermore, because the GLA has few powers in later stages of planning & construction it can be challenging to monitor the progression of buildings effectively.

However, the Better Buildings Partnership has identified potential solutions to this through setting performance-based outcomes targets which would be enforced through Commitment Agreement Protocols. These would commit a developer and their main contractor to achieving a specific base building energy performance rating verified by measurement. Approaches such as these should be considered in future.



	Grade A offices > 2,000 m ²	Grade B offices > 2,000 m ²
Project Agreements	Mandatory	Recommended
Minimum performance target	LER 4 stars	LER 3 stars
Base building performance measurement and disclosure (new build)	Mandatory	Mandatory
Base building performance measurement and disclosure (existing offices)	Mandatory from 2022	Mandatory from 2025

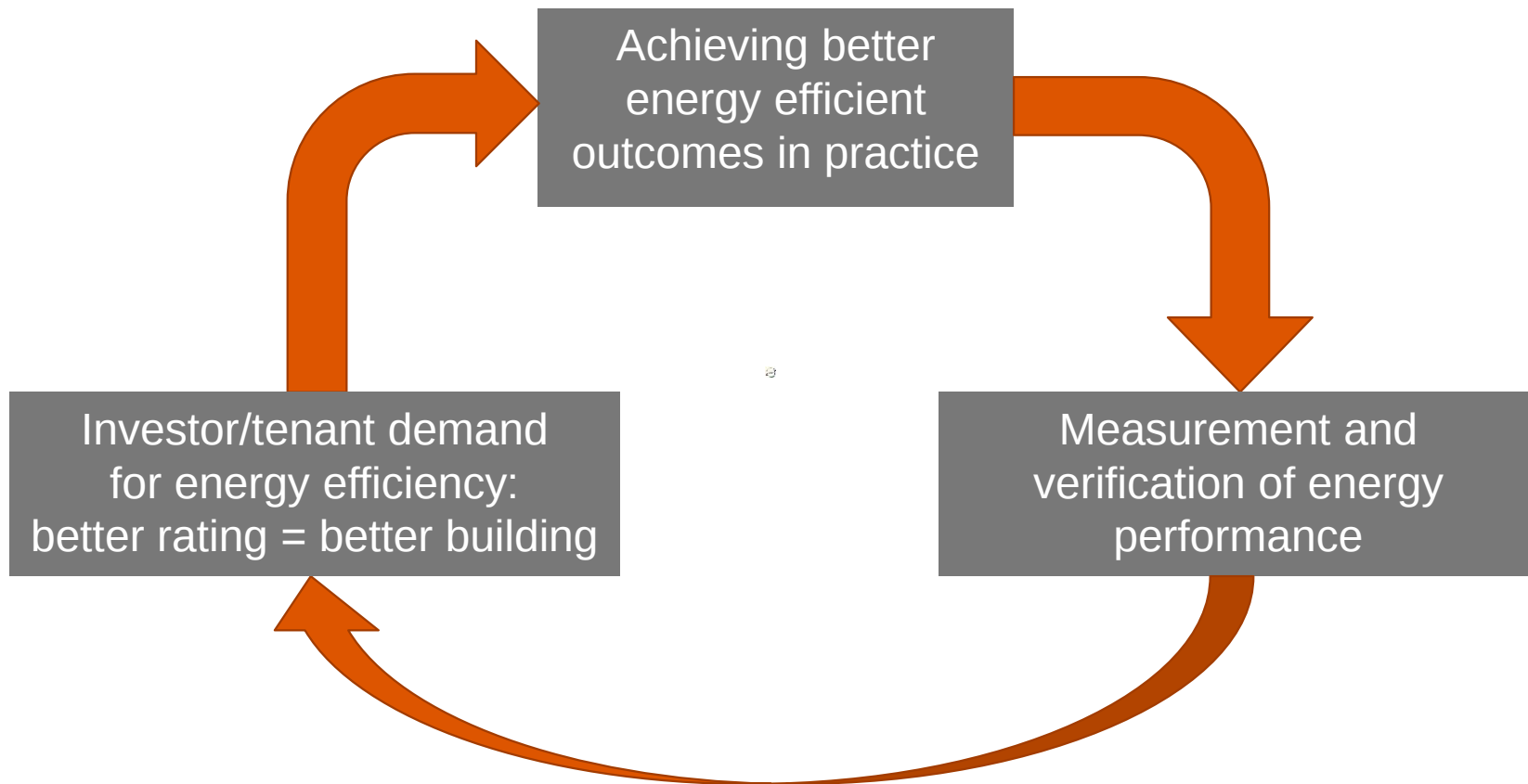
Benefits of Design for Performance for property owners



- Reduced capital expenditure through sizing plant to demand
- Reduced operating expenditure by reducing base building energy costs
- Reduced defects in the development process
- Attract & retain tenants who value a better quality work environment for employees
- Attract & retain investors who value sustainability
- A credible, independently verified means for benchmarking and monitoring actual improvements in performance and quality
- Market recognition & competitive advantage for building owners and tenants.



A virtuous circle for market transformation needs pump priming





Questions to be answered today

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With thanks to our event host:

