Green Construction Board

Valuation and Demand Working Group
Mapping the Real Estate Lifecycle
for Effective Policy Interventions
1 Introduction

The real estate market is characterised by multiple interactions between many parties across a lifecycle of several decades, and in some cases centuries. The profound social, economic and environmental significance of buildings, together with their lengthy and complex lifecycles, mean that achieving the relatively rapid changes required to meet the UK’s climate change and other commitments will require carefully crafted and targeted interventions.

With these challenges in mind, the Valuation and Demand Working Group of the Green Construction Board (GCB) commissioned three related studies* to consider the role of property policy in helping to achieve the UK’s sustainability goals.

This project, undertaken by Sweett Group, SIAM and Kingston University, reviews the real estate life cycle and examines the stakeholders, direct and indirect, involved in decision-making through a building’s physical life. Drawing on existing literature and interviews with a cross section of industry professionals, it identifies the influences and motivations of key players throughout the lifecycle. The study highlights opportunities to achieve carbon savings by strengthening existing interventions or targeting opportunities that are not being fully exploited.

Key findings are shown schematically in Figure 1. Selection of each activity displays relevant information on the lifecycle stage and the opportunities to further develop its contribution to energy and carbon savings.

* These reports are available at www.greenconstructionboard.org/index.php/working-groups/valuation-and-demand.
Figure 1: Frequency and impact of events in the real estate life cycle

Comment
It is likely that all, or almost all, properties, in whatever sector, will be subject to minor refurbishment or component replacement over time. Often this will link with change of occupier/ownership. However, this is not always the case. Time is typically very limited for refurbishment with the aim of minimum disruption to operational activities or the duration of a void period, in many instances those involved will not be energy efficiency specialists and may be briefed to target lowest capital cost rather than the most efficient solution. Incentives (such as enhanced capital allowances) and ‘choice editing’ (i.e. limiting the number of available options to those that are more efficient or have lower impacts) can help encourage energy and carbon efficient decisions and can help to deliver incremental or in some cases significant improvements in building performance.

Key participants here are occupiers, asset managers and property managers, the primary motivations will be to manage cost and maintain space availability. In some situations (e.g. owner occupiers or those on longer leases) consideration is given to the efficiency considerations, particularly where the current and/or target occupiers have corporate reporting or other drivers. Initiatives to raise awareness of the opportunities for efficiency through refurbishment activities (e.g. the Energy Saving Opportunity Scheme) can help to encourage more consideration of operational performance in decisions.
Most depictions of the real estate life cycle are biased towards design and construction and do not provide a representative view of the key opportunities for energy and carbon reduction. Some representations acknowledge the impact of economic and management decision-making, but still place emphasis on physical events.

In reality, the real estate lifecycle comprises economic triggers and resulting design / physical responses. There are many more economic and management events in the lifecycle than design / physical activities; furthermore they tend to occur more frequently. Indeed, some events occur almost constantly e.g. payment of rents, taxes, rates and utilities, whereas others, such as lease renewals, are less frequent or, in the case of owner-occupied properties, do not occur at all.

Figure 1 provides an alternative way to illustrate the lifecycle in terms of events which are routine or frequent and those which are rare (horizontal axis). It also shows the impact of each event on energy and carbon (vertical axis) and the proportion of UK real estate affected (size of box). Each quadrant is described in more detail below.

Quadrant 1: (top left) Higher impact; higher frequency:
Key events include both design/physical and economic/management activities, but are concentrated on the latter.
The occupier’s management of the building and the associated payment of energy costs are linked to, and have an impact on, energy consumption and carbon emissions, but at present this impact is not financially or socially significant for many occupiers. Significant potential savings can be achieved through effective building management (domestic and non-domestic) and many studies have shown that management is a key influence over building performance.
Building management and payment of utility bills are routine and can be considered frequent, affecting all stock, though to differing degrees.
Planned maintenance provides opportunities to upgrade asset performance and ensure effective operations of current assets. Undertaking works ‘in use’ e.g. during a period of continued leasing is often a significantly more expensive and complex undertaking. However, it may be required where current services are not fit for purpose.
Activities in this quadrant are generally lightly regulated*, even where the level of spend and potential impact is high. In some limited cases, they are subject to mandatory reporting regulation (CRC), but these affect few buildings, even within the commercial sector, and none in the domestic sector.
Increasing the proportion of buildings subject to energy management and good quality planned maintenance would deliver quick wins due to the frequency and potential impact of these activities. At present drivers are relatively weak, despite energy costs being important for some occupiers.

Quadrant 2: (top right) Higher impact; lower frequency:
This quadrant contains activities related primarily to development and other significant physical events such as major refurbishments. Policy has primarily focused on these events through the operation of planning consents and Building Regulations.
Events in this quadrant deliver long-term upgrade of the building stock; however, their infrequency means that progress is slow. Further, these benefits are only fully realised if the building is operated and maintained to a high standard (see Quadrant 1).

1 e.g. for a prestige office this might involve a sophisticated management system, whilst for a home it could be little more than considering the set point of the heating system.

* with respect to energy and carbon efficiency.
Consultees felt that Building Regulations and planning are generally effective and respected mechanisms, with Building Regulations being the most appropriate intervention for designing in energy efficiency. The influence of planning consents has reduced recently due to the increased number of ‘deemed’ consents under the General Permitted Development orders. This is particularly the case for the domestic sector. Concerns were also raised about the training and experience of committee members and even planning officers in relation to technical energy and construction matters.

Although policies affecting this quadrant have been successful in driving improvements in energy efficient and low carbon design, they are ineffective in predicting or controlling subsequent energy use and enforcement is considered to be insufficiently rigorous. The research showed support for tightening of standards, with stronger enforcement and penalty regimes. There was concern that loosening of planning controls could have unintended consequences for energy and carbon efficiency.

The research found that many schemes initially aspire to high performance, but that design characteristics are compromised during the development process to reduce cost. Energy efficiency will not be compromised if it translates into market value, or where compliance is an essential enabler of wider business activities. Evidence suggests that a link to value is weak except in some sub-markets and that current compliance regimes to not typical require aspirational standards to be demonstrated in practice.

These events already have a major impact on buildings and are essential to the success of any developer. Given their rarity and significance, every effort should be made to lock in high performance and ensure that these benefits are achieved in practice.

**Quadrant 3: (Bottom Left) Lower impact; higher frequency:**

This quadrant primarily includes management/economic events such as payment of business rates/council tax and debt repayments. Also included, but occurring less frequently, are rent reviews and lease renewals. Regular maintenance, re-fit and ‘churn’ activities, which help improve building management and make incremental performance improvements are also included in this quadrant.

Some property sales may also fall into this sector (if not Quadrant 4). Several of these events affect all properties (e.g. payment of business rates or council tax), while others are limited to leased buildings or those for which there are borrowings. Regulations, such as Minimum Energy Efficiency Standards, will increase the significance of lease events for rented buildings helping to drive physical interventions; however these measures do not address in use performance or the large proportion of buildings that are owner-occupied.

Events in this quadrant are not currently strongly linked to energy use or carbon, but might have significant potential as mechanisms for performance-based incentives or choice editing. These might include incentives to provide variable rates of council tax, business rates or insurance premium tax. Experience from other sectors (e.g. vehicles) suggests that even relatively small performance-based incentives can help drive behaviour change.

While there is a potential opportunity for lenders to drive change by placing requirements on borrowers, the research revealed little evidence of this in practice as energy/carbon performance is not currently seen as a material risk to the lender’s security. This links back to a perception of a weak relationship between energy/carbon and market values. Some small movement was identified in the domestic mortgage market, where household expenditure is becoming more thoroughly considered in loan affordability assessments.
Ultimately, behaviour change will only be affected when the impact of energy consumption and the associated carbon emissions is such that landlords and occupiers are motivated to take action to reduce their costs, secure associated incentives or, most powerfully, maintain the ability to transact or secure income and debt from a property.

Events in this quadrant have the potential to leverage change. Minimum Energy Efficiency Standards are significant as they will target lease events but they will only impact potential performance for rented buildings. Further measures to incentivise actual performance outcomes could be applied to target a far wider range of occupiers.

Quadrant 4 (Bottom Right) Lower impact; lower frequency:

In this quadrant events are concentrated in the economic/management cycle. They include capital transactions (if not in Quadrant 3), together with longer commercial lease transactions (primarily those of 10 years and above on full repairing and insuring terms) and financial restructures. Owners are required to provide an EPC on sale, but currently this has little impact beyond those described previously for Minimum Energy Efficiency Standards (where the building will be subsequently let).

There is some potential to target this quadrant, although the limited and unpredictable frequency of events means that some properties will remain unaffected for long periods2. One option might be to link incentives to sales events (e.g. a link between stamp duty rate and EPC rating), although this would, again, link only to theoretical rather than actual operational performance. There is some evidence that home owners are more likely to make improvements to their homes in the first 12 months after purchase, so an incentive linked to the sales process (with some retrospective action) could prove effective.

In general, these events have less potential to trigger energy or carbon saving. However, effective interventions could be linked to residential sales, where sales typically bring a change of occupier and an increased willingness to undertake improvements.

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2 This is not necessarily a bad thing, e.g. linking an incentives / penalty to sales is one means of achieving a ‘soft start’ policy introduction as only a proportion of properties will be affected in any given year.
investors and high net worth individuals may all react differently to interventions to enhance energy efficiency.

- **Owner-occupiers dominate both in numbers of holdings and in energy terms.** Overall, approximately 65% of the residential market is owner-occupied, with the figures being just over 50% for commercial. The size of the residential market far exceeds that of the commercial so the largest single stakeholder group comprises domestic owner-occupiers. Whilst the majority have mortgages, approximately one-third do not; Energy efficiency improvements are not a priority for many unless incentives are significant, easy to access and likely to be sustained. Non-domestic owner-occupiers are similarly diverse, ranging from the Government and other public sector bodies to SMEs and individuals. Many occupy inefficient older buildings. Large owner-occupier organisations may pro-actively manage energy, particularly where this is part of company reporting. However, many SMEs do not.

- **Tenants lease buildings either for business or home occupation.** Large occupiers have corporate responsibility policies, and strong awareness of environmental concerns. However, to many tenants, energy is simply an expense that is typically only a small proportion of total occupancy costs. This could explain weak take up of opportunities to invest in energy efficiency schemes by tenants. Further, many lack the financial ability to carry out improvements or tenure over the time horizon to recoup costs.

**Advisors/Influencers**

*Clients are ultimately responsible for decisions, but are normally influenced by advisors and more widely by professional standards (established by professional bodies), financiers and, in some cases, shareholders. SMEs and residential owner-occupiers seldom have property advice on an on-going basis.*

*Architects and engineers are engaged only for infrequent big interventions; building surveyors and facilities managers have increasing relevance within the in use phase but are not typically in a position to instigate activity.*

*Planners and building control officers have power and influence; but need to oversee very broad portfolios and may not always have the necessary detailed knowledge.*

**Valuers and financiers play a critical role during most activities,** from planning/design to annual reporting and acquiring and re-structuring debt. Although valuers are increasingly taking sustainability issues into consideration, there is little evidence that energy matters are reflected in lending criteria. Where energy and carbon is considered this is typically for compliance purposes, for example a green building certification (e.g. a BREEAM rating) is often now required for planning approval and an EPC rating for transaction purposes. However, neither directly translates to actual energy performance.

For some, knowledge about the factors influencing a building’s energy use is still relatively low. Further, the relatively siloed nature of construction and property professionals means that whilst they are expert in their own discipline they may not have the necessary breadth of experience or opportunity to initiate the level of collaboration required to bring about change. Further education and cross-over of knowledge could assist better decision-making.
4 Motivations

Compliance with statutory interventions is an imperative for most participants. Whilst its importance will inevitably vary within both residential and non-domestic markets, an overwhelming message from those consulted was that meeting regulatory requirements is the chief motivation for all stakeholders. The research also revealed an appetite for stronger enforcement and stricter penalties for non-compliance.

Ability to transact and thereby realise value from property is key, and anything that influences this will have the close attention of the market. Any intervention that links energy or other sustainability-related consideration to the right to develop, sell or let a property will rapidly receive close attention and is likely to have an early influence on value and valuations, perhaps disproportionately so.

Enhanced returns are an important motivator for many. For deliberative investors, energy efficiency is normally seen as a cost, which requires justification in terms of eventual rental/capital value or risk reduction. The research indicated little belief in differential market pricing, especially in buoyant markets where ‘anything will let’, although an energy efficient building certification and other ratings (e.g. BREEAM) are now seen as part of the expected specification for prime properties.

Few funders consider energy and carbon matters in determining lending applications. However, some borrowers may be asked for evidence of their improvement strategy for target assets falling short of an EPC of E. Further, lifestyle and affordability questions to residential borrowers could extend to energy costs.

Corporate responsibility has made energy and carbon issues reputational matters. The reputational benefits of a ‘beyond compliance’ culture are important to some property owners and investors. However, they are small in number compared with the total market.

In the residential sector motivations are complex, but energy efficiency does not feature highly. Some home owners are both energy conscious and prepared to invest in efficiency measures. However, for many, energy is simply taken as a cost which they absorb or their inability to raise finance and or unwillingness to take on new debt for this purpose discourages action. Residential tenants are unlikely to make improvements and often do not pressurise landlords to improve efficiency and are unlikely to be in a position to require improvements in a market with restricted supply. Social landlords will invest in energy improvements, but there is little evidence of this in the private rented sector.

5 Opportunities

Four broad categories of intervention exist for improving energy efficiency and carbon performance in buildings.

- **Gateways** where specific performance standards must be achieved (e.g. building regulations or planning)
- **Market stimulation** by providing clear information on performance
- **Incentives** linked to performance
- **Choice editing** whereby minimum performance standards are adopted for key technologies so that the minimum is always achieved (e.g. for example minimum standards of efficiency for a boiler or chiller).

The previous sections of this report show that action is required in both of the following areas to achieve energy and carbon reductions; firstly, the creation of buildings with the potential to be efficient, and secondly efficient use of these buildings by occupiers (including fit out, maintenance and management).

To create buildings with the potential to be efficient it is essential to maximise the impact of significant events in the lifecycle (e.g. development, sales and letting). These interventions will be most influential if they
are linked to the ability to undertake transactions and thereby to the principal’s ability to gain value from their undertakings.

At present, there is relatively little focus on the frequent events occurring during the operational stage of a building’s life. There is evidence to suggest that this is a major omission and that the quality of operational management is a key, if not the most important, factor influencing a building’s energy use.

Encouraging occupiers to use their buildings efficiently requires incentives/penalties and choice editing that reflect their ongoing management and maintenance activities together with periodic small works. While energy prices are a stimulus for some, further incentives are required for many to raise the profile and amplify the impact of energy efficiencies.

Incentives linked to real performance (and underpinned by quality and accessible operational energy use data and benchmarks) would encourage occupiers to get the best out of their buildings and would encourage tenants to demand higher standards from their landlords. This would in turn create a stronger case for developers and asset managers to consider a ‘beyond compliance’ approach, and should encourage developers to prioritise ‘real’ performance rather than the theoretical assumptions of a compliance model.

There is evidence from the NABERS system used in Australia that the availability of reliable and benchmarked energy performance data can be a powerful stimulus to both landlord and occupier behaviour and form a cornerstone in the establishment of a strong market for energy efficient buildings.

Much of the current focus on energy efficient behaviour targets developers, landlords and their professional teams. These participants are only involved at certain lifecycle stages and are subsequently absent for most of the ongoing decision-making during the building’s life. Crucially these parties typically have little knowledge of the actual energy use of their buildings, post completion.

Conversely, those who are engaged in advisory roles during the lengthy in use period (valuers, financiers, agents, lawyers) may have insufficient knowledge to advise clients adequately on energy/carbon matters. Additional education and professional training is required for all disciplines, not just engineers and architects, to avoid missing opportunities to improve energy and carbon performance.

Opportunities to make changes to existing leased buildings are infrequent and brief. The cost and disruption of moving means that tenants tend to stay in their buildings through multiple leases or lease extensions. Short leases have not necessarily resulted in short periods of occupation. As a result, a landlord’s possession of a building is less frequent than might be indicated by average lease lengths. Vacant space is expensive for landlords in terms of lost income and continued outgoings (including void rates). A landlord will typically do the minimum required to get a building back to a lettable condition quickly and therefore any measures extending the vacancy period will be resisted (even if there is no associated capital cost) unless they demonstrate a clear impact on value or lettability or are required for compliance purposes.

Many (most for the domestic sector) buildings are owner occupied. Measures targeted solely at landlords will not impact on the decisions or behaviours of this group. Further, property is not the core business activity of many landlords who may not respond as expected to economic drivers, particularly where they are complex.

Conversely, occupiers are involved with their buildings on a daily basis and have the opportunity to materially improve their building’s operational performance. However, they do not routinely do so because performance is generally not assessed or made relevant to their wider business or personal goals. Interventions that target occupiers and make their energy use more significant (e.g. by using performance based incentives) could stimulate both greater energy efficient behaviour and demand for more energy efficient buildings.
6 Recommendations

1. The opportunities afforded by rare or infrequent events with a large or very large impact on energy/carbon performance should be maximised. Whilst standards for new construction and refurbishment have continued to tighten, there is evidence that actual performance does not meet the intended design standard sometimes by a factor of three or more. There are many reasons for this covering design, construction, commissioning and operational activities. It is important that these relatively rare opportunities to make a major intervention in the building stock are optimised in practice as well as in theory.

2. New interventions should explicitly address actual energy use through measures focused on occupier performance. A range of high profile and constant/frequent lifecycle events (e.g. payment of rates or taxes) could be used to heighten the significance of operational performance, but only if robust in use performance data is available. Incentives and increased transparency of (real) performance for occupiers would increase focus on fit out standards, management and behaviour. They would also increase demand for accommodation that is capable of achieving higher performance, thereby catalysing landlord and developer actions to enhance their assets’ performance.

3. Reduce complexity by prioritising a few, significant and long term mechanisms to measure and drive behaviour. Harmonising existing regimes to create consistent and compatible reporting requirements would help to reduce complexity relating to energy and carbon in buildings and businesses. It would also help to establish greater market transparency and necessary benchmarks around which performance incentives can be developed.

4. Where measures are introduced, they should be rigorously enforced with sufficient penalties to ensure compliance. Transactions, be they development permissions, sales or letting events are key points in the cycle where minimum standards can be enforced.

5. Choice editing should ensure that, by default, efficient technologies are used for periodic activities (e.g. repairs, churn and minor refurbishment). A focus on in use incentives (see point 2) will also help drive energy efficient decision-making during these events.

6. Energy and carbon topics should be fully incorporated within professional development programmes. All professional bodies associated with the built environment should ensure that their initial education and ongoing training schemes explicitly include information needed by their professional members to make informed decisions and provide clear-sighted advice.

These recommendations may involve additional regulation and costs, e.g. in establishing a mechanism for measuring, benchmarking and incentivising in use performance and in closing the performance gap. However, these costs need to be considered in the context of:

- Annual investments in new buildings of ~£5Bn and a further ~£3.7Bn spent on repair and maintenance. Even a small improvement in the scale of actual energy efficiency delivered by this investment would justify significant actions.

- Potential cost effective energy savings of 84 billion kWh are available in domestic and non-domestic buildings by 2020, equivalent to the output of more than 9 power stations. Securing these savings requires both investment in the physical condition of buildings and a desire to operate the building efficiently combined with better knowledge of how to achieve this.
• Potential growth in the UK market for energy services and related employment and the establishment of the UK amongst international market leaders in this important area. This sector is estimated to be worth in excess of £17bn to the UK economy and has the potential to be a driver of considerable continued economic growth.

Finally, the research found within all stakeholder groups consulted, a strong majority of participants supported and indeed indicated they would welcome well designed, clear and rigorously enforced regulation to help get the most from the above opportunities.
The research involved a literature review and over 40 semi-structured interviews with a diverse range of industry professionals with expertise spanning the whole real estate life cycle for both domestic and non-domestic sectors (see Appendix B); other informal consultations also took place. No individual householders or SME tenants were interviewed but consultees included representatives and consultants working with these groups. Interviews were conducted between June and October 2013. Further team meetings and a stakeholder workshop enabled discussion and development of ideas.

Using the findings of the interviews and literature review a diagrammatic representation of real estate life cycle activities was developed. This identified that activities could be designated as either design/physical or economic/management. Often economic issues trigger management decisions which may, or may not, have physical consequences. Once identified, these events were tabulated according to:

- The frequency with which they normally take place (e.g. redevelopment is a ‘rare’ event; paying rates and utilities is ‘constant’, whilst for investment properties, rent reviews and lease renewals are ‘periodic’)
- The estimated proportion of properties affected, both domestic and non-domestic, (for example, all properties are subject to repair, but not all have leases and few have planned preventative maintenance programmes)
- The current main policy interventions associated with the activity (for example: EPCs on sale/letting; planning and Building Regulations for (re)development)
- Whether the impact of current interventions is considered to be high or low and the potential for future interventions

The resultant analysis enabled the activities to be placed into quadrants according to their impact and frequency.

Data to support the study was been gathered from a number of sources (see References), but in many cases there are no firm statistics to inform the sizing and placing of events in a specific position. For example, although it is known that the average lease length for commercial properties is now less than 5 years, many leases are renewed, often on several occasions. Similarly, although the normal lease used domestically is the Shorthold Tenancy which is granted for 6 or 12 months, the incidence of longer-term renting has grown significantly. Further, in the social housing sector, tenants may occupy the same property for very many years. Therefore, lease length is not a good indication of occupation period. Similar difficulties exist with transactions, even where average data are available, it can be misleading. For example, a headline figure of 34% of residential property being let, disguises significant variability; for example in London over 50% of residential property is rented.

In terms of capital transactions, estimates vary. Whilst holding periods for prime commercial stock in strong markets may be as low as five years, the Land Registry, which requires all property transacted since 1970 to be registered, records that over 30% of land is still unregistered. It was therefore concluded that for the whole market capital transactions must be considered as infrequent.

Building lifespan is also problematic. Whilst a tendency to make assumptions based on a 60 year cycle may have firm foundations, life length is a product of a complex inter-play of physical, economic and social factors. Where permitted building densities increase and technologies change rapidly, building lives will be shorter, for example, central London offices. Domestic properties tend to have a longer life length with approximately 37% of stock pre-dating World War II and almost 60% being in excess of 50 years. It is estimated that the renewal rate is approximately 1%.

For these reasons, we have used referenced data sources, combined with interviewee opinions and expert views to arrive at what is hoped to be a fair, if schematic, representation of the real estate life cycle.
Appendix B: Acknowledgements

References

This research was undertaken by Adam Mactavish of Sweett Group, Charles Woollam of SIAM and Sarah Sayce, Judith Farren Bradley and Fiona Quinn of Kingston University. The project was overseen by Louise Ellison Head of Sustainability at Hammerson and Chair of Green Construction Board Valuation and Demand Working Group.

The project team would like to thank all of the professionals that gave their time to inform the study. The organisations represented are listed below.

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