

Carbon Penalties & Incentives

A review of policy effectiveness for carbon reduction and energy efficiency in the commercial buildings sector



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Executive Summary

- 1 This study uses a combination of primary survey, literature review and expert stakeholder dialogue to assess the effectiveness of a range of current and pending policy instruments deemed to have a direct or indirect effect on energy and carbon performance in the UK commercial buildings sector. In addition to consideration of the instruments on an individual basis, the assessment of the functionality and effectiveness of the policy framework as a whole is a notable innovation of the study.

Key Findings

- 2 It has been demonstrated that, in the eyes of many actors with interests in the commercial buildings sector, there are **significant limitations within the existing framework of energy and carbon policy instruments**. However, there are a number of **positive attributes too that can be developed further to improve the effectiveness of the policy framework as a whole**.
- 3 Our research has shown that the current policy framework has the following notable features:
 - Instruments are not distributed evenly across the commercial buildings' lifecycle, with the Occupation/Use phase subject to the greatest number of obligations, incentives and penalties. By contrast, there are relatively few instruments which focus specifically on the transactional or financing stages of the lifecycle. This arguably **suppresses the potential impact of the policy framework on market demand for energy and carbon efficient buildings**, especially amongst investors and lenders. Early signs suggest that the pending implementation of Minimum Energy Performance Standards has the potential to materially alter this dynamic because of its likely focus on lease transactions as a compliance trigger.
 - The **framework of instruments is almost entirely focused on operational energy and carbon, and almost completely disregards embodied carbon** which, as the operational efficiency of buildings improves, accounts for an ever greater proportion of the total carbon impact of commercial buildings. Whilst there are instruments beyond the scope of this study which might have an effect on the embodied carbon of construction materials and property services, our finding implies that greater policy focus should be devoted to driving down the energy and carbon intensity of the commercial building sector supply chain.
 - The **effectiveness of individual instruments is deemed by market actors to vary considerably**. Interestingly, some of those instruments that are considered to be particularly effective are not specifically intended to deliver energy or carbon reduction outcomes, but may have a vicarious effect in that regard. The Landfill Tax is perhaps the most salient example.
 - Market participants generally view the policy framework as **complex** whilst around half consider it to be of moderate or greater administrative burden.
 - There appears to be a **clear link between policy familiarity and the level of perceived benefit** to the business of market actors. It is widely recognised that lack of awareness continues to be a considerable impediment to low carbon transition and energy efficiency within the sector. This poses a key question about the role of Government and industry groups in communicating with the market on policy expectations and requirements, and promoting the increasingly evidential business case for energy efficient property (see, for example, "The Business Case for Green Building" by the World Green Building Council). This finding also suggests that the industry could fail to appreciate, build upon, or implement an otherwise good policy, simply because it is not widely known.
 - There is a clear trend of **weakening effectiveness of obligations as they move from policy design to implementation**. Particular concerns are noted around inadequate enforcement, incompatibility with the workings of the market, and inadequate integration of penalties and/or incentives to drive compliance. A similar trend is apparent with those instruments that act as direct incentives, albeit less pronounced. Conversely, **penalties are considered to be implemented more effectively**.

- 4 Perhaps above all, the effects of the policy landscape and the individual instruments within it are found to be **highly nuanced, depending on a wide range of building lifecycle, property market and other factors**. In that sense, it seems unlikely that a simple framework of instruments could ever apply effectively to each and every circumstance within the commercial buildings sector. This implies that a degree of policy complexity is, to an extent, inevitable.
- 5 Generally speaking, those **instruments which have a broad impact by amplifying the price of energy consumed are found to be ineffective** in driving energy and/or carbon efficient behaviours and decisions, mainly due to their lack of visibility and the inelasticity of energy demand within the sector. Notable examples of this include the Climate Change Levy and the CRC Energy Efficiency Scheme. Given there are several policies of this type, many of which overlap in scope, there would seem to be an **opportunity for effective rationalisation without detriment to policy objectives**, thereby reducing elements of market friction.
- 6 **Policies which are process-driven without imposing an obligation for action are also found to be comparatively ineffective**, such as Air Conditioning Assessments required under the EU Energy Performance of Buildings Directive. Methods of mandating or strengthening the incentive for action arising from such policies are therefore considered to be important.
- 7 Conversely, **Building Codes, positive financial incentives and choice editing instruments are found to be generally more effective**, as long as they demonstrate adherence to certain pre-conditions of policy effectiveness (see Section 2 of the Main Report). The **effectiveness of such policies can be amplified considerably when bundled into packages**. In particular, bundling policies with an effect throughout the building lifecycle, such as Building Regulations and the forthcoming Energy Savings Opportunity Scheme, could have a significant role to play in bridging the performance gap which commonly exists between the design and post-construction phases.
- 8 It is not possible to be precise about the actual energy and carbon reduction effect of existing policy instruments because there are **major limitations in the current approach to quantifying and monitoring policy impacts**.

Headline Recommendations

- 9 A wide-ranging suite of recommendations are made which should, as far as is practicable, be taken together as a package of interventions. These seek to **simplify complexity, reduce unnecessary instruments through rationalisation, strengthen incentive and penalty effects, and improve the arrangements for impact measurement and monitoring**.
- 10 Specifically, recommendations (more detail on which can be found in the Main Report) are provided with respect to:
 - Addressing the perception of complexity by increasing market participants' familiarity with individual instruments and the framework of policies as a whole, highlighting the role of government, professional institutes and industry bodies in raising awareness and engaging on policy matters on an industry-wide and sub-sector-specific basis.
 - Addressing complexity by removing inadequate or inappropriate metrics through a transparent and ongoing process of review.
 - Organising instruments into related 'bundles' which address key aspects relating to energy and carbon performance of buildings. Specifically, all policies should contain a bundle of measures which ensure the assessment of energy and carbon performance, labelling of that performance against appropriate benchmarks, establishment of minimum performance standards and provision of sanctions for failing to meet that standard.

- Providing clear signposting of policy trajectory to the owners and users of commercial buildings, including on a policy-specific basis. The evidence contained in tools such as the Green Construction Board Low Carbon Routemap provides a compelling case for these trajectories to be established on an 'upwards only' basis.
- Prioritising policy requirements by identifying which aspects of buildings' performance throughout the lifecycle need to be addressed, and by introducing greater balance into the policy framework between embodied and operational energy and carbon.
- Identifying instruments with limited effectiveness which would not form part of an effective policy bundle that could be reduced in scope or removed. This should run in parallel with focusing on those instrument types which are found to be generally effective such as dynamic and properly enforced standards for new and existing buildings, positive financial incentives for performance ahead of compliance, and continued use of choice-editing policy types to remove inefficient and outmoded products from the marketplace.
- Focusing effective instruments on aspects of the property lifecycle where their cost-effectiveness will be maximised by improving the rigour and transparency of Regulatory Impact Assessments and by improving the flow of bottom-up, sector-specific data to inform the policy-making and implementation process.
- Ensuring a robust and consistently enforced regime for all policies.
- Reducing the amount of change made to instruments for political purposes by transparently prioritising policy effectiveness and market efficiencies, and through greater independent scrutiny.
- Establishing a clear monitoring and scrutiny role for a representative group of policy-makers and commercial building actors, ideally by mandating such a function to an existing body, in order to:
 - Provide an assessment of market opinion of the effectiveness of existing policies (which could be used against official data relating to tco2e of carbon reduction);
 - Provide government with an informed understanding of market conditions within which policy would be made;
 - Advise on the need for new or modified policies in given areas;
 - Advise on how best to co-ordinate or 'bundle' policies; and
 - Identify where policy overlap might enable policies to be reduced in scope or scrapped.

1 Introduction

Establishing the background and rationale for the project

An array of policy instruments exists which, directly or indirectly, relates to the energy and carbon performance of commercial buildings in the UK. Some policies have been created with the specific primary goal of reducing energy use in and/or carbon emissions from commercial buildings, whilst in other cases the energy and carbon effect of instruments are vicarious of other policy objectives, such as waste reduction.

The Committee on Climate Change (CCC) recently concluded that, overall, non-domestic building policies do not apply consistently across the sector and it is not clear that they provide sufficient incentives for driving the uptake of energy saving or carbon reduction measures. Notably, the CCC recommends that

“Government should conduct a comprehensive assessment of non-residential low-carbon policies to ensure they work effectively.”

The Green Property Alliance¹ (GPA), a subsidiary of the Property Industry Alliance established to promote cross industry communication on the subject of sustainability, convened a number of commissioning partners, including the Green Construction Board, to review the effectiveness of carbon penalties and incentives pertaining to the UK commercial buildings sector.

Study Objectives

The motive for the study is, above all, to bring objective primary and secondary evidence to the attention of policy-makers and market participants to help inform the continued advancement of the policy framework in order that the most effective carbon reduction solutions can be brought forward. Specifically, the study has sought to analyse the range of current and emerging legislative and fiscal levers and penalties which apply to commercial property energy and carbon performance, comparing their objectives and examining such questions as:

- What they seek to achieve and the extent to which they have been successful in meeting their objectives;
- Whether any of the fiscal incentives or legislative measures lead to unintended or undesirable consequences or behaviours;
- Whether or not penalties and incentives positively change behaviour, and/or whether they are arguably rewarding sub-optimal behaviour;
- Whether there are other measures conceivable which are not currently being employed, but which could make a measurable difference to the performance of non-domestic buildings (e.g. behavioural or other non-legislative measures); and
- To what extent there is overlap in the range of energy and carbon policies.

Guiding principles

In pursuit of its objectives, a number of important guiding principles have underpinned the study:

- It has been carried out independently and impartially based on objectively assessed evidence from published sources and transparently commissioned market surveys;

¹ See <http://www.greenpropertyalliance.net>

- It seeks to build upon and complement what has been and is being done elsewhere, including a suite of relevant studies that have been commissioned in parallel by the Green Construction Board Valuation and Demand Working Group;
- It is neutral of all political parties and individual commercial interests;
- It does not make detailed recommendations on the design or implementation of individual policy instruments, but seeks to:
 - ✓ make observations on the types of policies which have been successful in encouraging emissions reductions in commercial property;
 - ✓ make positive recommendations for improvements to existing policies based on empirical observation;
 - ✓ make observations as to particular factors which are hampering the success of particular policies; and
- It has been informed by structured dialogue with a range of stakeholders (seeking where possible to ensure balanced representation of differing sector interests), including through workshops, meetings and an extensive market survey.

Scope and exclusions

The study is concerned with the effectiveness of policies relevant to energy and carbon performance across the whole lifecycle of *commercial* buildings.

It therefore excludes consideration of policies aimed specifically at public buildings or dwellings unless they are relevant to the consideration of policy effectiveness for commercial property.

The study is limited to policies that are operational within England & Wales.

Other principal exclusions include instruments specific to:

- energy-intensive (industrial) processes which may be performed within buildings; and
- Travel to and from commercial buildings.

To confirm the specific instruments deemed to be within scope, an exhaustive list was compiled, capturing those which fall into one or more of the following non-mutually exclusive typologies:

- Instruments which require prescribed standards for new or existing buildings, or energy-consuming products installed within buildings, associated with which there are defined penalties (financial or otherwise) for non-compliance [referred to hereinafter as “**Obligations**”]; and/or
- Instruments which provide financial, reputational or other forms of incentive for standards of energy efficiency or carbon performance to be met, either with respect to whole buildings or the energy-consuming products installed within them [referred to hereinafter as “**Incentives**”]; and/or
- Instruments which impose reputational disbenefits, or direct or indirect costs beyond the baseline cost of energy, in relation to energy consumption and/or carbon emissions, based on either actual consumption/emissions metrics or hypothetical product or asset efficiency ratings [referred to hereinafter as “**Penalties**”].

Table 1 (overleaf) lists all of the Obligations, Incentives and Penalties that were scoped into the study by the Steering Group, and organises them in relation to their respective primary functions:

- Instruments which amplify the **price / value** effect of the energy consumed and/or carbon emitted in the construction, operation or demolition of **buildings**.
- Instruments which require or promote minimum **standards** of energy performance for new, refurbished or existing **buildings**.

- Instruments which apply a **reputational** effect to **organisations** with commercial property interests relating to their energy and/or carbon performance.
- Instruments which require or promote minimum standards of energy and/or carbon performance in the systems and **technologies** installed in buildings.
- Instruments with a **different principal policy function** but through which consequential effects on energy and/or carbon performance in the lifecycle of buildings may arise.

Some of the instruments identified fall into multiple categories, depending on their dynamic effect at different stages of the property lifecycle.

As part of the scoping process, it was also agreed with the project Steering Group that further groups of instrument were to be excluded from the study, namely those relating to national or sub-national planning policy, as well as voluntary standards (e.g. BREEAM) which may or may not also be imposed through local planning policy. Whilst both planning policy and voluntary standards can undoubtedly have an effect on energy and/or carbon performance, it was considered impractical to assess the effectiveness of these instruments within the scope and time of this review. Given that a review of housing standards has recently been launched by the Department of Communities and Local Government, and which may establish new principles for the use of voluntary standards within the planning process which could have implications for non-domestic development too, there would be considerable merit in commissioning a separate but linked assessment of planning-based energy and carbon policy effectiveness for commercial property.

Report Structure

The main body of this report is focused on the observations and conclusions arising from an extensive literature review (studies and commentaries relating to policy effectiveness as well instrument-specific sources), a survey of stakeholders with a variety of interests in the commercial building sector, and more focused engagement with an array of policy, commercial property and business experts.

Much of the evidence arising from these research techniques, as well as a detailed explanation of methodology, is contained in supporting appendices.

Table 1 Instruments within scope

Principal Instrument Function	Policy Instruments Scoped In	Instrument Type
Amplify the price / value effect of the energy consumed and/or carbon emitted in the construction, operation or demolition of buildings	<ul style="list-style-type: none"> • Feed in Tariff • Renewable Heat Incentive • CRC Energy Efficiency Scheme • Climate Change Levy • Climate Change Agreements • Hydrocarbon Oil Duty • Carbon Price Floor • EU Emissions Trading Scheme 	<ul style="list-style-type: none"> • Incentive • Incentive • Obligation Penalty • Penalty • Penalty • Penalty • Penalty • Penalty
Require or promote minimum standards of energy performance for new, refurbished or existing buildings	<ul style="list-style-type: none"> • Building Regulations • Minimum Energy Performance Standards • Energy Saving Opportunities Scheme • Smart Metering • Green Deal • Allowable Solutions 	<ul style="list-style-type: none"> • Obligation • Obligation • Obligation • Obligation • Incentive • Obligation Penalty Incentive
Apply a reputational effect to organisations with commercial property interests relating to their energy and/or carbon performance	<ul style="list-style-type: none"> • Mandatory GHG Reporting • Display Energy Certificates • Energy Performance Certificates 	<ul style="list-style-type: none"> • Obligation • <i>Voluntary</i> • Obligation
Require or promote minimum standards of energy and/or carbon performance in the systems and technologies installed in buildings	<ul style="list-style-type: none"> • Enhanced Capital Allowances • Ecodesign Directive • EC F-Gas Regulation • HCFC Phase-out • EPBD: Air Conditional Assessments 	<ul style="list-style-type: none"> • Incentive • Incentive • Obligation • Obligation • Obligation
A different principal policy function but through which consequential effects on energy and/or carbon performance in the lifecycle of buildings may arise	<ul style="list-style-type: none"> • Landfill Tax • Aggregates Levy • Community Infrastructure Levy • Flat Conversion Allowance 	<ul style="list-style-type: none"> • Penalty • Penalty • Penalty • Incentive

2 Assessment of the policy framework

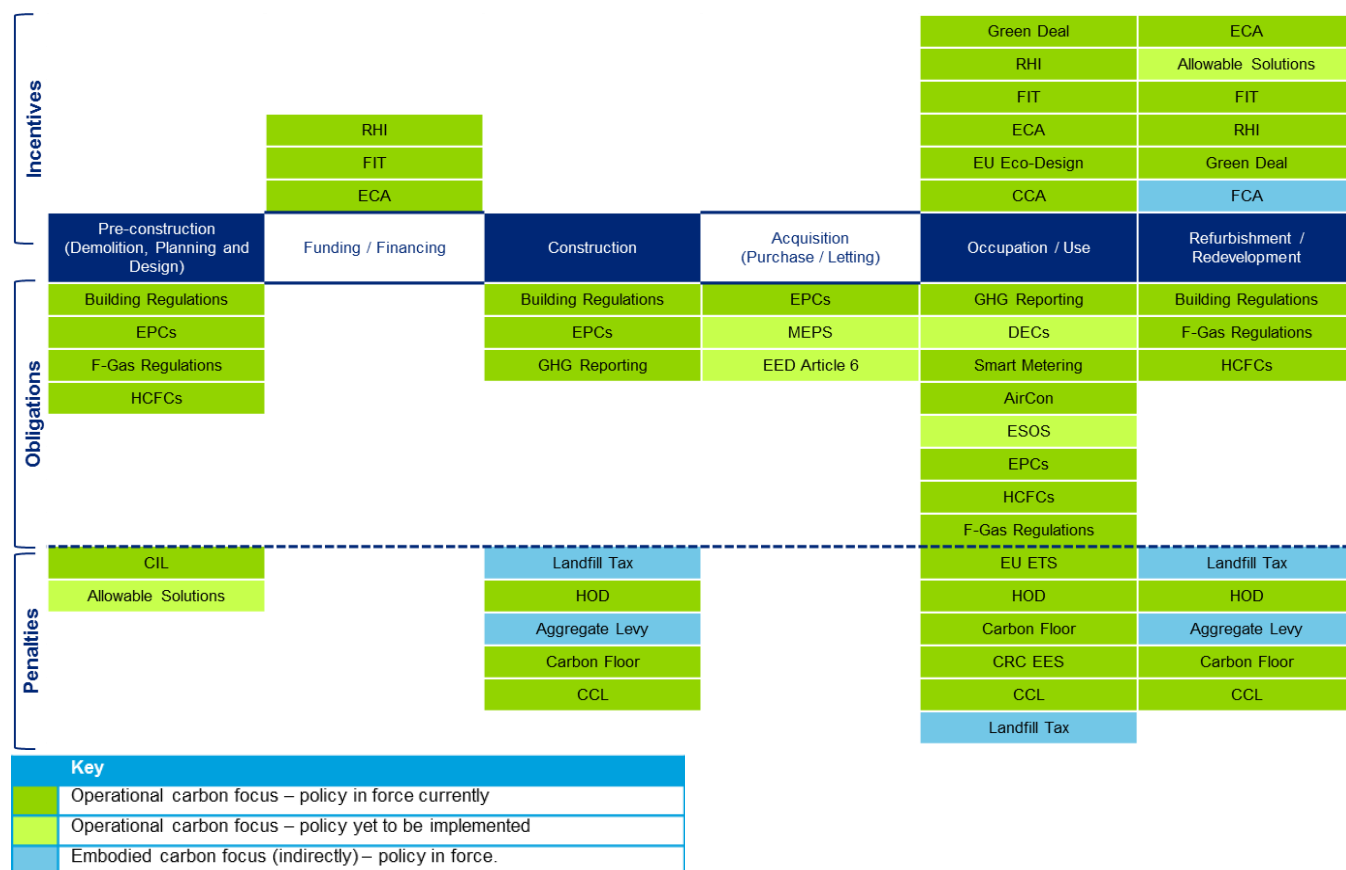
How does the policy framework relate to the building lifecycle?

Figure 1, overleaf, shows the framework of policy instruments mapped against the commercial building lifecycle. Whilst it should be noted that planning-related policies are excluded from the scope of this study, and these would have an effect in the pre-construction stages of the lifecycle, a number of key observations can be drawn:

- Numerically, the distribution of instruments across lifecycle stages varies. The greatest number of instruments effect the Occupation/Use stage, although that is not to imply that commercial building occupiers are disproportionately impacted compared to landlords; the responsibility for compliance with these instruments will often fall to the landlord, depending on the requirements of the instrument and the terms of occupation.
- The number of instruments pertinent to each stage is not a direct proxy for carbon impact or administrative burden because some instruments have a greater effect than others.
- Different organisations will be exposed to different combinations of obligations, depending on any qualification criteria which may apply (as is the case with the Carbon Reduction Commitment Energy Efficiency Scheme, Mandatory Greenhouse Gas Emissions Reporting and the proposed Energy Saving Opportunities Scheme). Penalties and incentives are typically not based on organisation-based participation criteria, save for some exceptions.
- The construction (and the refurbishment and redevelopment) phase is subject to several instruments. Those which are penalties seek generally to reduce the impact of the construction process itself, and in some cases these are reputed to have had notable success in meeting their policy objectives. The case of landfill tax is perhaps the most pertinent example, especially when taken in the context of the high-profile construction-sector campaign to Half Waste to Landfill by 2012. However, there is recognition within the latest UK Construction Strategy of the need for a plan to reduce capital (embodied) carbon in the construction process, signalling the fact that this continues to be an area of largely untapped opportunity.
- Indeed, the vast majority of instruments relate to operational energy use and/or carbon emissions. The fact that the Committee on Climate Change, charged with monitoring progress against the Carbon Budgets set via the Climate Change Act 2008, has noted that emissions from the sector have been static in recent years suggests that these policies are not having very much effect.
- Those few instruments which are relevant to embodied energy and carbon are essentially coincidental of other (non-energy or carbon) policy objectives. By extension, it can be seen that no policy instrument is specifically focused on delivering embodied or total lifecycle energy and/or carbon savings.
- Although instruments exist at each stage of the lifecycle, there is little in the way of direct linear relationships between individual policies. This effectively means that each policy acts at a particular point in time and generally in isolation of others. One exception to this would be the link between EPCs and Feed in Tariffs, where the underlying energy rating of a building determines the level of incentive available for micro-generation. Arguably, strengthening policy relationships across lifecycle stages, particularly from Pre-Construction, Construction and into Occupation/Use, would help to reduce the well documented gap between design and operational performance.
- There are relatively few instruments which focus specifically on the transactional or financing stages of the lifecycle, which arguably suppresses the potential impact of the policy framework on the market demand for energy and carbon efficient buildings amongst the investment and lending communities.
- A number of instruments have an effect at multiple stages in the building lifecycle. This is particularly the case for penalties and obligations which apply at the construction, refurbishment and demolition stages, such as Landfill Tax, Aggregates Levy and Hydrocarbon Oil Duty. Similarly, Enhanced Capital Allowances are relevant in the context of capital investments at any stage.

- There are relatively few instruments which apply directly to property decisions related to funding or transactions. Historically, there has only been a requirement for EPCs to be in place in the context of construction, lettings and sales, but the proposed introduction of Minimum Energy Performance Standards marks a significant policy intervention in the transaction of commercial property. Whilst the instrument itself is directed specifically at lettings, it is also expected to have significant and growing implications for sales.
- Some instruments, such as the proposed Allowable Solutions, could be deemed to have different effects at different stages of the lifecycle; acting as a direct cost on development but potentially providing a source of funding or incentive for retrofit activity.

Figure 1 Distribution of policy instruments across the property lifecycle



Abbreviations

- AirCon – Air Conditioning Assessments required under the Energy Performance of Buildings Directive
- Building Regulations – specifically, Part L of the Building Regulations focusing on the Conservation of Fuel & Power
- CCA – Climate Change Agreements
- CCL – Climate Change Levy
- CIL – Community Infrastructure Levy
- CRC EES – CRC Energy Efficiency Directive
- DEC – Display Energy Certificates (required of public bodies occupying commercial buildings).
- ECA – Enhanced Capital Allowances
- EED Article 6 – Purchasing by Public Bodies required under the Energy Efficiency Directive
- EPCs – Energy Performance Certificates (required for all non-dwellings, save for some exemptions, at the point of construction, sale or letting).
- ESOS – Energy Saving Opportunities Scheme
- EU Eco-Design – Eco-Design Directive
- FCA – Flat Conversion Allowances
- FIT – Feed in Tariff
- GHG Reporting – Mandatory Greenhouse Gas Emissions Reporting
- HCFCs – HCFC Phase-Out
- HOD – Hydrocarbon Oil Duty
- MEPS – Minimum Energy Performance Standards, pursuant to the Energy Act 2011

What are the pre-conditions of policy effectiveness?

In order for policies to be effective, including in terms of the traction which they achieve within the commercial buildings sector, there are several broad characteristics which are considered to be pre-requisites, as set out below.

Clear signposting

1. Confidence that progressive policy direction will be maintained, giving clear lead-in times (with accurate information on details such as tax/tariff rates): Transparent short, medium- and long-term energy efficiency/carbon reduction objectives and targets with simplicity at their heart.
2. Comprehensive consultations are efficiently run within prescribed timescales.

Encouraging

3. A framework that offers adequate scale of opportunity and confidence that its duration will match or exceed the expected period required for capital invested to be repaid
4. Policies that make use of markets to minimise the costs of achieving energy efficiency objectives.
5. Where appropriate, the provision of incentives that recognise the risks associated with energy efficiency investments, or other measures to reduce those risks.

Policy connectivity

6. Policies that cover energy efficiency within all areas within the buildings sector which reflect the cost effective potential in each of those areas, and are capable of being bundled into policy packages.
7. Minimum overlap between policies (especially where overlaps may confuse incentives for investments), including effective co-ordination of policies across Government Departments.
8. Alignment of energy efficiency with wider policies (i.e. including climate change, energy supply, construction, etc.).
9. Where appropriate, complementary Government-led demand creation policies, including consumer communication and information campaigns.

Enforcement

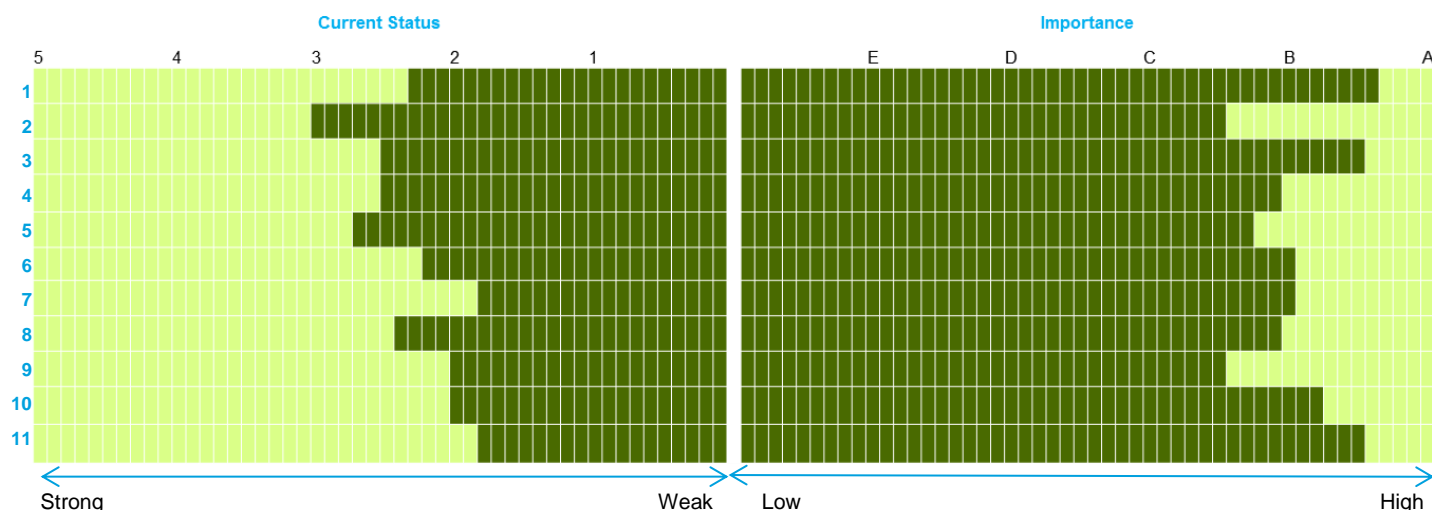
10. Comprehensive, enforceable review mechanisms and timelines to ensure delivery of intended outcomes.
11. Institutions that have the mandate and adequate resources to deliver/oversee effective implementation.

These pre-conditions were derived from a review of published sources² (and are complementary to those defined in concurrent work for the GCB on domestic policies, which is yet to be published. They were then rated, using the scale below, by a group of expert stakeholders (see Appendix A) according to their importance and the extent to which the current policy framework is perceived to be addressing them.

Current status (on balance, across the framework of penalties and incentives)	Importance
1 = completely absent	A = critical
2 = weak	B = high importance
3 = moderate	C = moderate importance
4 = strong	D = low importance
5 = addressed completely	E = zero importance

² See, for example, Aldersgate Group (2012), Environmental Audit Committee (2012) and Institutional Investors Group on Climate Change (2011)

Figure 2 Current status and importance of pre-conditions of policy effectiveness



Several notable observations emerge from the results:

- In general, the current framework and approach to policy making scores relatively poorly. In that sense, there is considered to be a need for an improved policy framework, including in relation to the process through which policies are designed and implemented.
- With respect to the current framework, the pre-conditions which were deemed to be most weakly applied were effective coordination between policies and sufficient resourcing and governance to oversee effective implementation.
- Conversely, effective consultation processes were seen as a relative strength of the current approach to policy-making, albeit that on average this was only deemed to be moderate.
- Pre-conditions relating to enforcement were seen as being most weakly evident in the current framework. This mirrors, to an extent, the disconnect between the effectiveness of policy design and implementation identified in the review of individual instruments (see pp. 15-17).
- In terms of importance, the need for overall confidence in the direction of policies was generally seen as being either critical or of high importance. This was closely followed by the relative importance of having policies which deliver a clear and reliable return on investment alongside the need for effective enforcement arrangements.

How does this correspond with the wider view of the market?

Details of the approach to and findings of an extensive market survey are provided at Appendix F. A major part of the survey sought to elicit views on the efficacy of the current framework of policies, when considered in the round.

Notable findings include:

- There is a perception of a 'crowded', complex and /or confusing array of policies which affect the procurement and operation of commercial buildings, although the data do not tell us whether market participants feel that this complexity is avoidable or a necessary function of a complex and fragmented sector. It might in fact be argued that regulating energy, carbon and commercial buildings is bound to be a complex process, although this does not necessarily mean that the instruments themselves need to be complicated.
- Revealingly, there was a relatively strong bias towards the view that the existing framework of policies is burdensome.
- Survey responses indicated that where there are high levels of familiarity with individual instruments, market participants are likely to perceive them as providing some benefit to their organisations. Indeed, there appears to be a reasonably strong correlation between familiarity and perceptions of benefit. It could therefore

be presumed that if familiarity with instruments is increased then any negative associations with the complexity of them might be diminished.

- Most respondents consider their behaviour to be positively affected by the policies. The results indicate that behaviour has been most affected during the acquisition and operational stages of the property lifecycle, followed by the construction and the planning and design stages (the latter of which may be significantly influenced by planning policies that are beyond the scope of this study). The positive association with acquisition activities is perhaps counter-intuitive given the historic lack of policy emphasis at this stage of the lifecycle, although it is realistic to expect the recent addition of the prospect of Minimum Energy Performance Standards to the policy framework to have had a significant impact on the survey results.
- The property lifecycle stage in which the policies are deemed to have the greatest negative effect on behaviour is the operation stage. This is the stage of the lifecycle to which the highest number of instruments relates and is also the stage for which there is the greatest number of instruments yet to be implemented. It might be that the relatively high number of negative responses may be a reflection of the uncertain impact of prospective obligations.

3 Effectiveness of individual instruments

What do previous studies say?

In his article, *Carbon targets, carbon taxes and the search for Archimedes' lever*³, David Roberts points out that policy levers (such as carbon taxes or regulatory standards) require strong fulcrums (political will, strong institutions, effective enforcement etc.) to be effective. In that sense, he points out that an assessment of policy effectiveness is not simply to ask “does this policy reduce carbon?” but requires a deeper analysis to establish whether or not policies “create constituencies for further political action”. By placing considerable emphasis on the sentiment of the property market, and by considering a comprehensive range of policy effectiveness criteria with respect to their design and implementation, the study is specifically seeking to address this critical supplementary question.

There are several published documents which assess the strengths and limitations of some (but not all) of the instruments within the scope of this study. It is useful to summarise the key findings of those to establish some context, which might be taken as illustrative of the received wisdom on policy effectiveness to date, before turning to the findings of the primary research from this study.

The Committee on Climate Change has recently published its fifth report to Parliament on progress against the UK's carbon reduction budgets⁴. Overall, it finds that **non-domestic buildings policies do not necessarily apply consistently across the sector, and it is not clear that they provide sufficient incentives for driving the uptake of energy and carbon reduction measures.**

Specifically, the Committee concludes:

- On **Green Deal**: concerns remain about potentially low levels of delivery and the Government should consider further incentives [note: this section of the Climate Change Committee report is specific to the domestic sector, but, based on current market sentiment and Deloitte analysis of Pay As You Save mechanisms in other parts of the world, the principle applies to the non-domestic sector too].
- On the **CRC Energy Efficiency Scheme**: simplification of the scheme beyond the Committee's original recommendations has further eroded the incentives to improve energy efficiency it set out to provide. It is now essentially a modest carbon tax which is unlikely to provide major additional energy efficiency incentives.
- On forthcoming **Minimum Energy Performance Standards**: non-residential Green Deal has been launched but uncertainty remains over minimum energy performance standards for the private rented sector, which will provide a crucial incentive for commercial landlords to engage in the Green Deal.
- On the **Renewable Heat Incentive**: revisions needed to drive uptake (noting that recently published proposals to increase tariffs for the non-residential scheme could provide the necessary incentives to deliver the required uptake).

On renewable heat generally: the low carbon price for heat and high capital costs mean that further funding / investment support will be required from 2015. Separate analysis, published by Government and undertaken by McKinsey⁵, shows that, despite the apparent increase in the breadth of the policy framework over time, there remains a significant gulf in the abatement potential of energy efficiency measures in the commercial buildings sector and that captured by the existing policy framework. Most notably in relation to electricity efficiency, electrical demand in the commercial sector is projected to increase as a result of the electrification of heat. The study, *Capturing the full electricity efficiency potential of the UK*, highlights three principal categories of intervention in which the carbon and economic impact would be greatest: building efficiency improvements, lighting controls, HVAC and controls. Significantly, it is only in relation to HVAC and controls that the majority (>50%) of abatement potential is considered to be captured by policy, and much of this is owing to the existence of a number of product specific policies (rather than

³ Roberts, D (2013)

⁴ Committee on Climate Change (2013)

⁵ McKinsey & Co (2012)

building-level policies). The abatement potential of building efficiency improvements and lighting controls are considered to be largely un-captured (<25%).

Perversely, these latter two categories are considered to have by far the greatest abatement potential (42% and 27% of the total abatement potential for the sector respectively, compared to 10% for lighting controls). **In total, of the 40TWh of abatement potential to 2030 identified through electrical efficiency measures, only 14% is considered to be captured for the services (commercial) sector.**

Admittedly, the scope of policies considered within the analysis is not as extensive as the range of instruments within the scope of this study. However, some clear conclusions are pertinent to this study, especially the finding that **policies which have a broad impact on the price of electricity to the end user (such as CRC, CCL and EU ETS) have very limited impact on demand once the overlap with other policies is removed.** It can be seen in the review of the primary market survey undertaken for this study (refer to Appendix F), that this conclusion is broadly mirrored by the feedback of survey respondents.

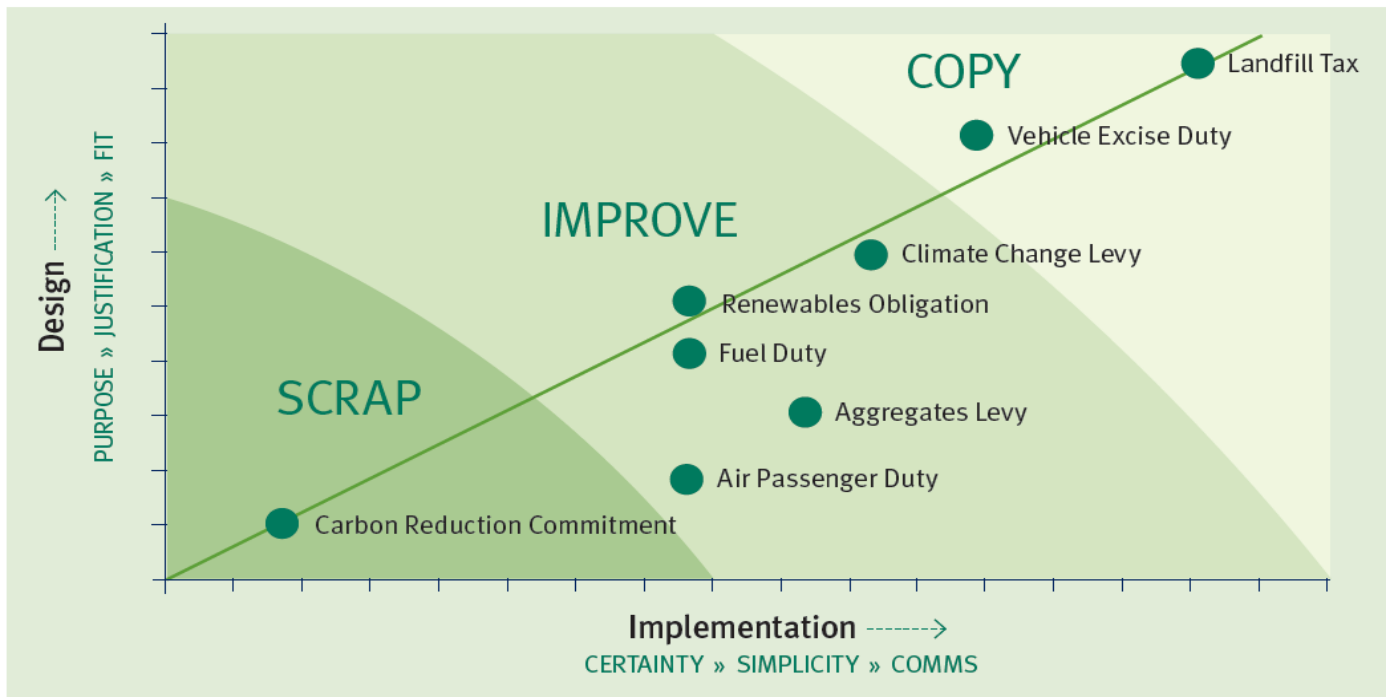
It is interesting to note, however, that DECC analysis to underpin the UK Energy Efficiency Strategy estimates that existing policies will serve to deliver 30 TWh of abated energy consumption, for both electricity and heat, across the commercial and public sectors by 2030. Although the scope of the analysis is wider than that undertaken by McKinsey, this seems to provide a divergent view of the impact of existing policies over the same timeframe.

In a survey of businesses undertaken for the CBI by Deloitte in 2012, and which built upon a previous survey in 2009, some clear conclusions were drawn about the perceived effectiveness and efficacy of a range of environmental taxes, including the Landfill Tax, Aggregates Levy and CRC Energy Efficiency Scheme which fall within the scope of this study. Specifically, the following key points were noted in relation to each:

- The **Landfill Tax** is considered to be a notable success story, with certainty about future rates allowing businesses to plan and invest with confidence.
- There is considered to be a lack of clarity on the purpose of **Aggregates Levy** and the **Climate Change Levy**, although they are considered to be simple to manage. The CCL is also noted as being part of a confusing and duplicative framework of broad impact instruments, especially when mapped against EU ETS (to which Climate Change Agreements and the CRC Energy Efficiency Scheme might also be added).
- A very negative view of the **CRC Energy Efficiency Scheme** exists amongst businesses and it is not considered to effectively deliver energy efficiency savings, although it could be argued that it has had an important impact in data collection and raising boardroom attention of energy consumption and emissions.

Overall, the CBI survey suggests the following framework of approaches for with respect to the environmental taxes reviewed as set out in Figure 3 below.

Figure 3 Conclusions of the CBI survey of environmental taxes



Source: Confederation of Business Industries (2012)

The UK Energy Efficiency Strategy, published by Government, also highlights the issue of misaligned financial incentives for the commercial buildings sector, particularly with respect to the EU ETS, CRC, CCL and CCAs. The CRC Energy Efficiency Scheme, for example, could be deemed to be misaligned in its intent to amplify the price of energy to the purchaser but not necessarily the end user. However, as the CBI report suggests, it could be argued that these instruments are not so much misaligned (in the sense that they are all seeking to deliver the same amplifying effect on the price of energy consumed), but rather that they combine to form an unnecessarily complicated arrangement of duplicating effects.

Our discussions with expert stakeholders suggest that the complex and changing policy landscape is a challenge because it creates confusion and uncertainty. Some of the previous iterations to CRC, CCAs, Solar Feed-in Tariffs and the guidance around RHI are cited as particular examples. This combination of issues is reinforced almost invariably in the range of published sources reviewed, as detailed in Appendix B.

These analyses are complemented by a wider range of UK studies and policy critiques which further identify a number of characteristics of policy success and failure. Some of these are specific to instruments targeted at commercial buildings (or the built environment generally), whilst others are elicited from broader business surveys and academic studies which were relevant to a broad spectrum of economic sectors.

In combination, these sources served to highlight the following key issues which are sometimes deemed to be characteristic of certain policy limitations:

- **Strategy:** Absence of clear environmental tax and fiscal strategy, and confusion over purpose of individual instruments (e.g. is the aim to achieve environmental outcomes or deliver revenues?).
- **Definitions:** Moving goal-posts by adjusting definitions to support political ends (e.g. environmental taxes) and lack of clarity on key regulatory definitions (e.g. zero carbon standards).
- **Metrics:** Inconsistent and unreliable use of metrics and rating frameworks to underpin instruments. Compliance tools, especially hypothetical modelling tools, can encourage mediocrity and fail to deliver real performance outcomes.
- **Alignment:** Lack of complementarity between individual instruments, and between taxes and regulations. Unnecessary duplication in places.

- **Market:** Lack of government appreciation of how instruments interface with market dynamics (both within sector and between sectors), including in relation to investment timescales and Landlord-Tenant interface.
- **Complexity:** Implementation can be complex and administratively burdensome (i.e. disproportionate time, skill and cost associated with compliance).
- **Certainty:** lacking in certainty, either in relation to tariff levels and pricing beyond the short-term, or in terms of regulatory detail of proposed instruments.
- **Enforcement:** Significant deficiencies in enforcement of regulatory requirements (e.g. Part L, Energy Performance of Buildings Directive requirements for EPCs as part of property transactions process) and lack of related transparency.
- **Visibility:** Certain instruments lack visibility (e.g. Climate Change Levy, Enhanced Capital Allowances), which suppresses their potential to influence behaviour. [It should be noted that this criteria has been excluded from the assessment of individual instruments described overleaf, on the grounds that it is difficult to discern this from the published sources].
- **Implementation:** High-profile examples of uncertainty and poorly handled implementation (e.g. changes to Feed in Tariffs with insufficient consultation and lack of certainty in lead-up to zero carbon regulations).
- **Incentives:** Lack of incentives to support specific instruments suppresses uptake (e.g. Green Deal), or undermines effectiveness (e.g. CRC Energy Efficiency Scheme) especially in relation to energy efficiency investments. Equally, generous incentives can lead to very rapid uptake which can cause budgetary challenges for the Exchequer, as was evidenced during the first phase of the Feed in Tariff.

How effective are the existing policies considered to be by the market?

These characteristics were used to form the basis of an analysis of the individual policy instruments within the scope of the project. The issue of costs (to the market and to the regulator) was also added to the assessment framework.


A range of published sources, including Government responses to consultations, press articles and academic/industry reports, specific to each individual instrument were reviewed and the balance and tone of comments noted in relation to each of the assessment criteria. A detailed explanation of the methodology, together with a comprehensive record of the findings in relation to each instrument, is contained in Appendix E.


Table 2 Matrix of RAG ratings for individual policy instruments

	Strategy	Definition	Certainty	Metrics	Alignment	Market	Complexity	Penalties & Incentives	Enforcement	Cost	DESIGN	IMPL.
* Part L, Building Regulations	●	●	●	●	●	●	●	●	●	●	●	●
CRC Energy Efficiency Scheme	●	●	●	●	●	●	●	●	●	●	●	●
Green Deal	●	●	●	●	●	●	●	●	●	●	●	●
Energy Performance Certificates	●	●	●	●	●	●	●	●	●	●	●	●
Display Energy Certificates	●	●	●	●	●	●	●	●	●	●	●	●
Feed in Tariff	●	●	●	●	●	●	●	●	●	●	●	●
Mandatory Greenhouse Gas Reporting	●	●	●	●	●	●	●	●	●	●	●	●
Renewable Heat Incentive	●	●	●	●	●	●	●	●	●	●	●	●
EU Emissions Trading Scheme	●	●	●	●	●	●	●	●	●	●	●	●
EcoDesign Directive	●	●	●	●	●	●	●	●	●	●	●	●
Energy Saving Opportunities Scheme	●	●	●	●	●	●	●	●	●	●	●	●
Community Infrastructure Levy	●	●	●	●	●	●	●	●	●	●	●	●
Minimum Energy Performance Standards	●	●	●	●	●	●	●	●	●	●	●	●
EPBD Air Conditioning Assessments	●	●	●	●	●	●	●	●	●	●	●	●
Allowable Solutions	●	●	●	●	●	●	●	●	●	●	●	●
EED 5: Purchasing by Public Bodies	●	●	●	●	●	●	●	●	●	●	●	●
EC F-Gas Regulation	●	●	●	●	●	●	●	●	●	●	●	●
HCFC Phase-Out	●	●	●	●	●	●	●	●	●	●	●	●
Smart Metering	●	●	●	●	●	●	●	●	●	●	●	●
Aggregates Levy	●	●	●	●	●	●	●	●	●	●	●	●
Landfill Tax	●	●	●	●	●	●	●	●	●	●	●	●
Hydrocarbon Oil Duty	●	●	●	●	●	●	●	●	●	●	●	●
Climate Change Levy	●	●	●	●	●	●	●	●	●	●	●	●
Carbon Floor Price	●	●	●	●	●	●	●	●	●	●	●	●
Climate Change Agreements	●	●	●	●	●	●	●	●	●	●	●	●
Enhanced Capital Allowances	●	●	●	●	●	●	●	●	●	●	●	●
Flat Conversion Allowances	●	●	●	●	●	●	●	●	●	●	●	●

KEY

●	Limited criticism and generally supportive comments given.
●	Some criticism voiced and/or occasional support (often qualified; a "mixed bag" of opinions)
●	Considerable levels of criticism and/or limited support shown.
●	Insufficient commentary was found to support a rating.

 Hatched ratings apply only to the over-arching categories of policy 'design' and 'implementation'. They have been applied where there is limited industry commentary in relation to the individual criteria contained within that category (generally indicated by a number of unrated criteria, as above) so that the rating applied is deemed to be tentative.

 For instruments that are yet to be implemented, no overall RAG rating is given for the implementation category.

Notes on Table 6

It is important to note that every effort has been made to ensure that the outputs published within this section are strictly impartial and represent the opinions and views of the market rather than the opinion of Deloitte.

The fully documented review is included in Appendix E.

* Part L, Building Regulations incorporates the zero carbon pathway.

Figure 4 RAG rating of policies' effectiveness in relation to design criteria

Incentives					Green Deal	ECA
					RHI	Allowable Solutions
					FIT	FIT
					ECA	RHI
Obligations					EU Eco-Design	Green Deal
					CCA	FCA
	Pre-construction (Demolition, Planning and Design)	Funding / Financing	Construction	Acquisition (Purchase / Letting)	Occupation / Use	Refurbishment / Redevelopment
	Building Regulations		Building Regulations	EPCs	GHG Reporting	Building Regulations
Penalties	EPCs		EPCs	MEPS	DECs	F-Gas Regulations
	F-Gas Regulations		GHG Reporting	EED Article 6	Smart Metering	HCFCs
	HCFCs				AirCon	
					ESOS	
					EPCs	
					HCFCs	
					F-Gas Regulations	
	CIL		Landfill Tax		EU ETS	Landfill Tax
	Allowable Solutions		HOD		HOD	HOD
			Aggregate Levy		Carbon Floor	Aggregate Levy
			Carbon Floor		CRC EES	Carbon Floor
			CCL		CCL	CCL
					Landfill Tax	

Figure 5 RAG rating of policies' effectiveness in relation to implementation criteria

Incentives					Green Deal	ECA
					RHI	Allowable Solutions
					FIT	FIT
					ECA	RHI
Obligations					EU Eco-Design	Green Deal
					CCA	FCA
	Pre-construction (Demolition, Planning and Design)	Funding / Financing	Construction	Acquisition (Purchase / Letting)	Occupation / Use	Refurbishment / Redevelopment
	Building Regulations		Building Regulations	EPCs	GHG Reporting	Building Regulations
Penalties	EPCs		EPCs	MEPS	DECs	F-Gas Regulations
	F-Gas Regulations		GHG Reporting	EED Article 6	Smart Metering	HCFCs
	HCFCs				AirCon	
					ESOS	
					EPCs	
					HCFCs	
					F-Gas Regulations	
	CIL		Landfill Tax		EU ETS	Landfill Tax
	Allowable Solutions		HOD		HOD	HOD
			Aggregate Levy		Carbon Floor	Aggregate Levy
			Carbon Floor		CRC EES	Carbon Floor
			CCL		CCL	CCL
					Landfill Tax	

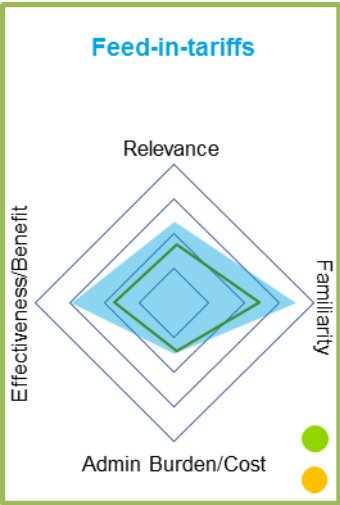
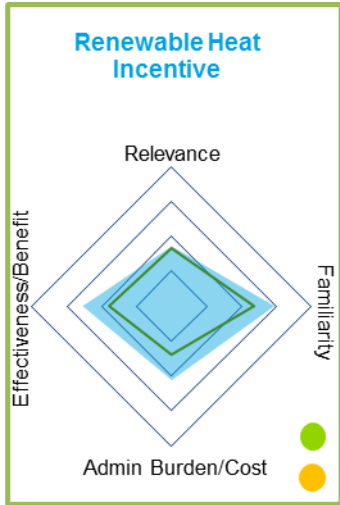
Figures 4 and 5 illustrate the design and implementation RAG ratings for the framework of instruments in relation to the commercial building lifecycle. A number of key observations can be drawn:

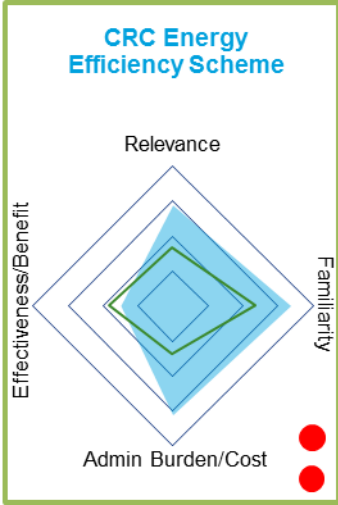
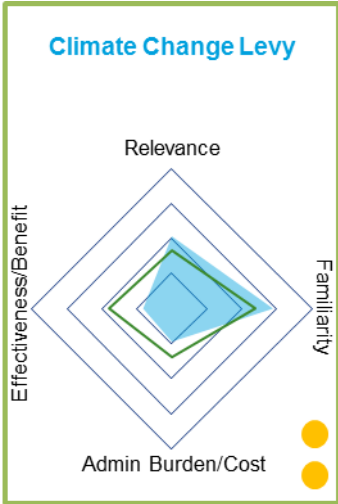
- Generally, policies are perceived to be less effective in implementation, compared to their effectiveness in design. This is particularly pronounced in relation to incentives, but also appears to be the case for obligations too (although a number of the obligations within scope are yet to be implemented, so the trend is less pronounced when compared with the incentives).
- Conversely, the implementation of penalties appears to be better perceived as being more effective. However, this is partly as a result of the fact that two of the instruments which receive generally supportive comments for their implementation where perceptions of their design are weaker (Aggregates Levy and Hydrocarbon Oil Duty), are repeated at multiple stages of the property lifecycle.
- Across the framework of penalties and incentives, the criteria which appear most susceptible to negative sentiment are certainty, [interaction with the] market, complexity and enforcement. This to some extent mirrors the rating of the pre-conditions of policy effectiveness in Section 2.
- There are some interesting anomalies in this regard too. For example, the effectiveness pre-condition relating to policy coordination is perceived by those who attended the stakeholder workshop as being one of the weakest features of the current policy framework, whereas the sources reviewed in relation to the individual policy instruments yielded generally positive or mixed comments on the alignment of those instruments. This might be a function of the fact that many of the comments noted in the instrument-specific review would have been made prior to their implementation, when issues of alignment were not as apparent as they may have become post-implementation.
- The instrument which appears to receive the greatest level of positive sentiment is the Landfill Tax (albeit this instrument is not targeted specifically at the energy or carbon performance of property). The Aggregates Levy is also reasonably popular, but again is not targeted at energy or carbon outcomes. The apparent confidence of the market with these instruments appears to mirror the findings of the CBI Survey outlined above (see pp. 13-14) and gives credence to some of the key positive attributes of the instrument in determining its effectiveness.

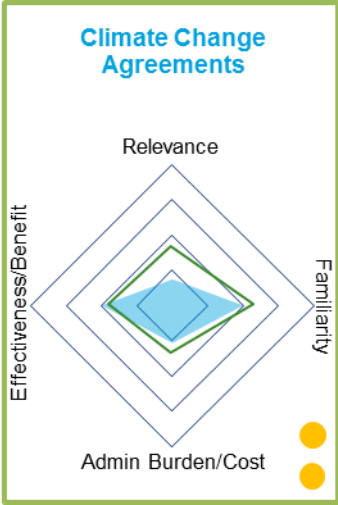
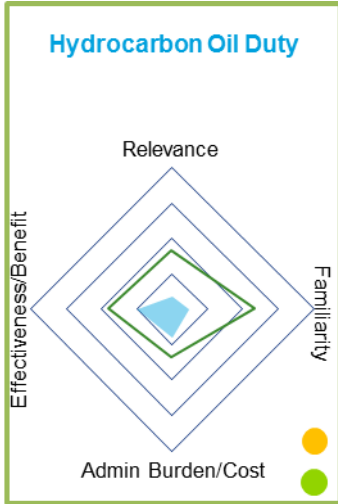
From an implementation perspective, instrument complexity and the effectiveness of incentives and penalties for non-compliance / non-compliance are frequently cited as key concerns, whilst there are few instruments which draw positive sentiment in relation to enforcement. When coupled with the results of the market survey described earlier in this section, these issues are clearly significant barriers to the perceived effectiveness of current policy within the market.

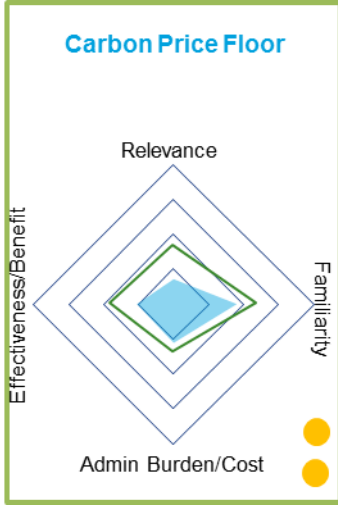
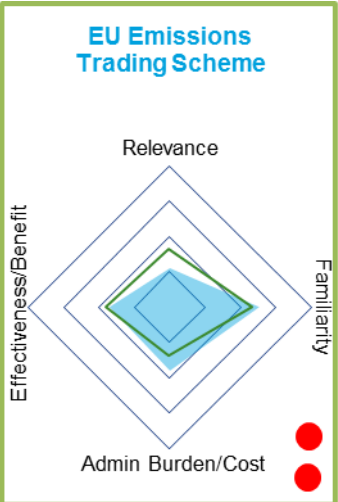
As part of the market survey described in Appendix F, respondents were asked to provide their views on the perceived relevance, familiarity, benefit/effectiveness and administrative burden/cost for each of the policy instruments within the scope of this study. Table 3 below provides a commentary on the notable observations in relation to each instrument, with the profile of the survey feedback illustrated through a suite of spider diagrams. By way of comparison with the review of published sources, the 'Design' and 'Implementation' RAG ratings are also shown in relation to each. This shows some interesting trends, but also some notable anomalies.

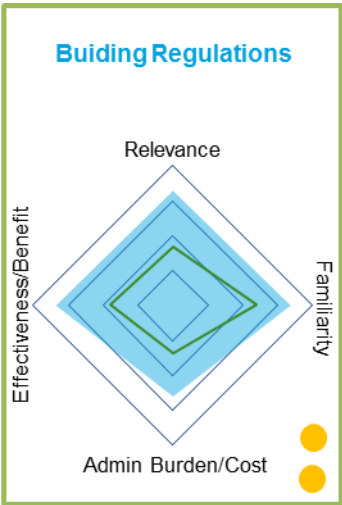

Table 3 Instrument commentary [Note: green line on spider diagrams denotes average survey response for all instruments; blue shading denotes survey response for the individual instrument].

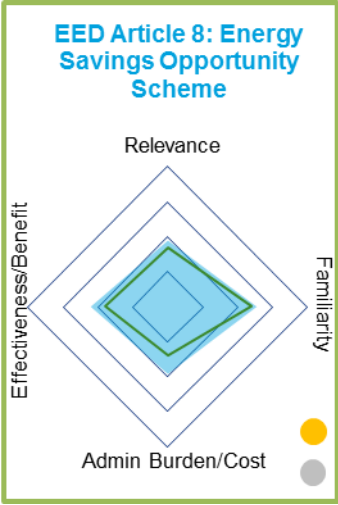
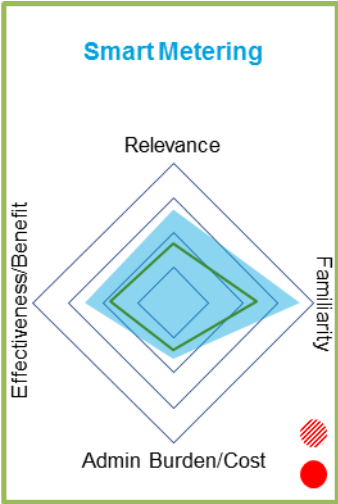
Instrument	Responses	Survey response profile	Deloitte Commentary
Instruments which amplify the price / value effect of the energy consumed and/or carbon emitted in the construction, operation or demolition of buildings			
Feed in Tariff	71		<p>Respondents had very high levels of awareness of FiTs and their effectiveness is also considered to be high.</p> <p>A very good cost-effectiveness ratio is evident with FiTs compared to other instruments, being, as they are, a positive financial incentive. One of the key reasons that FiTs might be perceived as being so effective is that they deliver secure, long-term revenue streams which substantially exceed the capital cost of initial installation for qualifying technologies. This is consistent with a number of key attributes of effective policy. Clearly, there was some significant noise concerning the cut to the tariff levels introduced reasonably quickly after the scheme came into effect. Although much of the industry now accepts that the level of the cut was justified in the context of public funding availability and the falling capital cost of the technology (especially with regard to PV), the abrupt nature of the change was disruptive and had an impact on the traction of the instrument within the market. This damaging impact was more a function of the approach to policy-making, rather than the design of instrument itself.</p> <p>Whilst take-up rates for Feed in Tariffs are available, these are in the aggregate and are not distinguished between residential property, commercial property and land-based schemes. It is therefore not possible to quantify the impact on the commercial property sector specifically.</p>
Renewable Heat Incentive	62		<p>Respondents considered themselves to be highly familiar with RHI and that it was highly effective. However, the relevance to the organisations of respondents of the instrument was not deemed to be very high.</p> <p>Initial take-up of the RHI was lower than expected by Government, but the scheme was subsequently reviewed and a number of amendments made to the qualification process and, notably, to the tariff levels. Based on press commentary at the time at which the revisions were introduced, the response of the market was generally very strong.</p> <p>The Non-Domestic RHI Scheme supports renewable heat installations in business, industry and the public sector as well as district heating schemes for domestic properties. It is therefore not possible to be precise about the specific impact on commercial property. Whilst there was 595 MW of installed capacity accredited under the Scheme to the end of December 2013, only 1.3% of installations by SIC Code relate to real estate activities.</p>

Instrument	Responses	Survey response profile	Deloitte Commentary
CRC Energy Efficiency Scheme	88	 <p>Very high levels of familiarity and reasonably high levels of relevance and admin burden/cost but low levels of effectiveness. Clearly respondents' views are that this instrument is an expensive and burdensome means of not achieving very much in the way of energy efficiency outcomes.</p>	<p>The CRC EES has been subject to significant changes in design on an annual basis since its introduction which makes it a comparatively unstable instrument. It is clear from the review of published sources and the feedback from survey respondents that there are a number of features of the CRC EES which suppress its popularity and perceived effectiveness as a carbon reduction tool, particularly now that reputational incentives, by virtue of the dropped league tables, have been removed and that levies are retained by Government (although it is acknowledged that publication of participants' carbon emissions data may have an effect in this regard). It has therefore become similar in effect to instruments such as the CCL, but with the added requirement of detailed energy consumption reporting. However, the data collection and reporting requirements could be considered transformational in that the scheme has required qualifying organisations to introduce detailed energy data management regimes where these were commonly not in place previously, raising the internal profile of energy as a business resource and risk.</p>
Climate Change Levy	65	 <p>Familiarity is high – possibly because it is shown on each energy bill and there is some perception that it is a relevant instrument. Effectiveness is considered to be negligible, perhaps because of its small financial value which is reflected in the view that the administrative burden and costs posed are also considered to be very low.</p>	<p>CCL has a broad policy impact by amplifying the cost of energy at the point of use. The inelasticity of energy demand within the commercial sector is a noted feature of the market, and this is likely to be a significant contributory factor to its relative ineffectiveness as a stimulant of behaviour change. However, it should be acknowledged that for energy intensive industries not covered by this study, the CCL has been reported to have had a motivating effect where those industries have belonged to CCAs.</p>

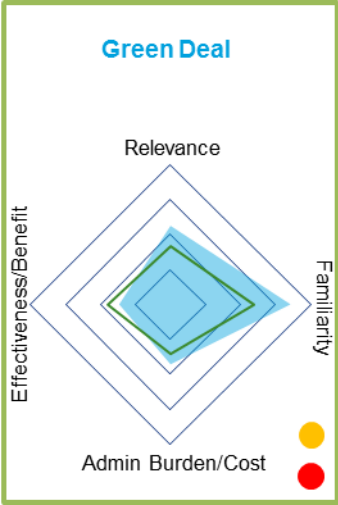
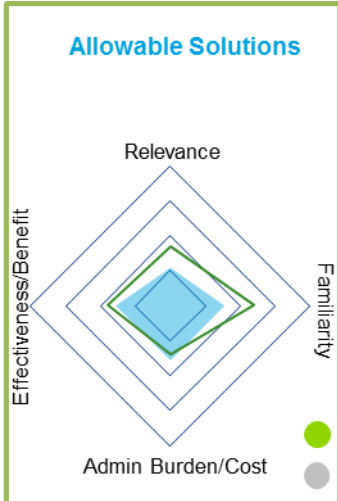
Instrument	Responses	Survey response profile	Deloitte Commentary
Climate Change Agreements	53	 <p>Familiarity and effectiveness are considered to be reasonably high but relevance hardly registers and burden/cost is very low.</p>	Despite CCAs not being a directly 'real estate'-related incentive, the high familiarity and effectiveness scores could be related to their similarity to CCL. These results could also be due to a function of perception around the positive use of an incentive for achieving particular carbon intensity outcomes, even though the direct relevance of the instrument to most commercial property actors and businesses is negligible.
Hydrocarbon Oil Duty	43	 <p>87.8% of those who responded were unfamiliar, and the profile of feedback with respect to effectiveness, relevance and cost reflects that.</p>	This instrument is essentially 'off-radar', and as such is not likely to have any real impact on energy use and carbon impact within the sector. This lack of familiarity is not considered to be a major issue for policy effectiveness given that it has principal relevance to transport fuels.

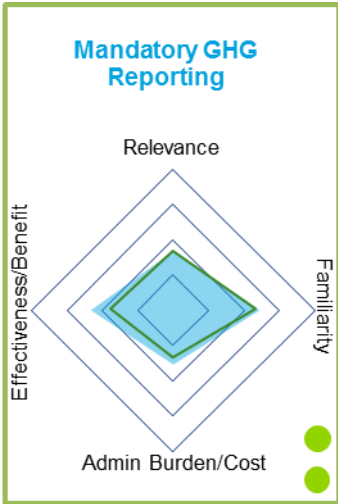
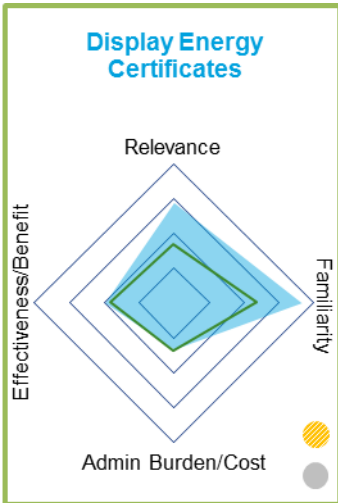
Instrument	Responses	Survey response profile	Deloitte Commentary
Carbon Price Floor	55	 <p>The profile is broadly unremarkable, with 54% of those who responded claiming to be unfamiliar with it.</p>	<p>Whilst familiarity with this instrument is relatively low, this shouldn't mask the fact that, in many ways, the Carbon Price Floor exhibits a number of effective policy characteristics. By providing a clear and escalating trajectory of carbon pricing over time, and notwithstanding the inelasticity effect of underlying price drivers, it provides for confident business planning. In that respect, it has some of the hallmarks of the Landfill Tax, which is widely regarded as a model form of environmental taxation. The fact that familiarity is low is an important point though, and raises questions about the need for greater knowledge and education in the market; based on the link between familiarity and benefit perception noted earlier in this report, it is reasonable to assume that the Carbon Price Floor could become an ever more important and acknowledged feature of the policy framework. Critically, the Carbon Price Floor targets energy generation (albeit that this will filter down to end user energy costs), and some have argued that it could pave the way for the removal of broad levies on energy consumption such as CCL. This would seem sensible given the relative lack of perceived effectiveness of those instruments at the moment, assuming that the Carbon Price Floor escalates in line with the levels of carbon reduction necessary, and that European-wide mechanisms are strengthened to avoid carbon leakage from the UK economy to other parts of the European Union.</p>
EU Emissions Trading Scheme	50	 <p>35.4% of those who responded were unfamiliar and it was generally perceived to be of little relevance.</p>	<p>It is, in some respects, surprising that levels of stated familiarity are as high as they are. This might be due to the considerable press coverage of emissions trading schemes in Europe and beyond, giving it familiarity in name, but not necessarily in relation to policy detail. This instrument currently has limited direct impact on real estate, but will be of relevance to a number of businesses that are occupiers of commercial property. The rationale for its inclusion in the study is because of the potential for the scope of the ETS to be extended to non-intensive energy using organisations in the future. As a trading scheme, the ETS has some similarities to the first iteration of the CRC Energy Efficiency Scheme (then known as the Carbon Reduction Commitment) and the reasonable level of perceived benefit of the ETS might be attributed (despite the heavily reported issues concerning over-allocation of carbon permits to the market) to the visibility that a trading mechanism inherently brings with it.</p>

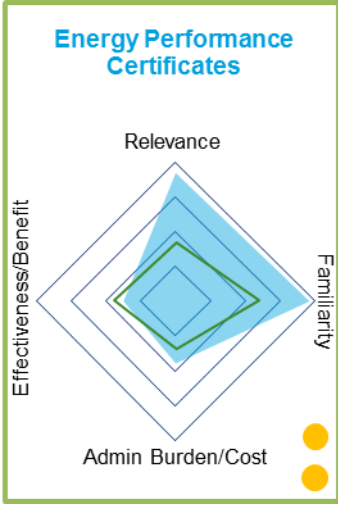
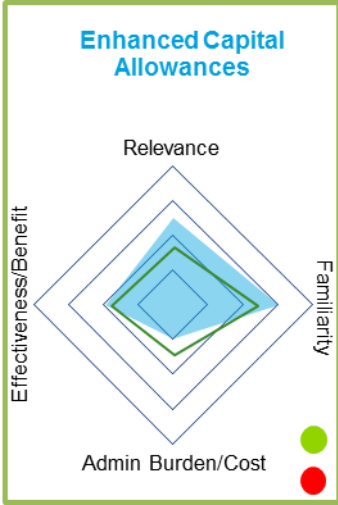
Instrument	Responses	Survey response profile	Deloitte Commentary
Instruments which require or promote minimum standards of energy performance for new, refurbished or existing buildings			
Building Regulations	100	 <p>Respondents had, unsurprisingly given their mandatory nature, a high level of familiarity (84%) with the Building Regulations and perceived them to be beneficial. As might be expected, their relevance is high.</p>	<p>Interestingly, the administrative burden & costs associated with Building Regulations are considered to be low, even though considerable attention has been given to the impact of rising Part L standards on capital build costs in recent years (although much of this debate has been centred on the residential sector). This might be explained by recent analysis by the Zero Carbon Hub which shows that the cost of achieving higher standards in new buildings has reduced significantly since the zero carbon escalator was first announced.</p> <p>Their longevity as an instrument is also likely to be a factor. Uncertainty in the context of the zero carbon pathway continues to be an issue for the non-domestic market, with the final definition of a zero-carbon non-domestic building seemingly some way off. Recently, the timeliness of confirmation of the programmed 2013 uplift (now to take effect from 2014) has been a matter of concern to some in the industry.</p>
Minimum Energy Performance Standards	71	 <p>As is discussed above, respondents recognised in MEPS high levels of familiarity and effectiveness and low levels of administrative burden and costs. Given the poor performance of EPC assessors in the past, low-cost solutions to MEPS, e.g. undertaking new assessments which remove assets from risk-prone EPC ratings, are possible. It will be important to see what the regulations say when they are published.</p>	<p>Even though MEPS are yet to be implemented and the regulatory detail is still to be confirmed, it is clear that the instrument has captured considerable attention due to the perceived impact on a number of property fundamentals, perhaps above all the potential for diminution of value for those assets which fall below the minimum performance thresholds. It is probably fair to surmise that MEPS has been one of the most keenly debated instruments since the Energy Act 2011 achieved Royal Assent, which is perhaps an indicator of its potential for transformational impact on the market. Whilst implementation of the regulations is yet to happen, it seems clear that an instrument which is targeted specifically at a transactional element of the commercial property lifecycle can have considerable impact, as noted in a concurrent GCB study on mapping the impacts of minimum energy efficiency standards for commercial real estate, which is yet to be published.</p>

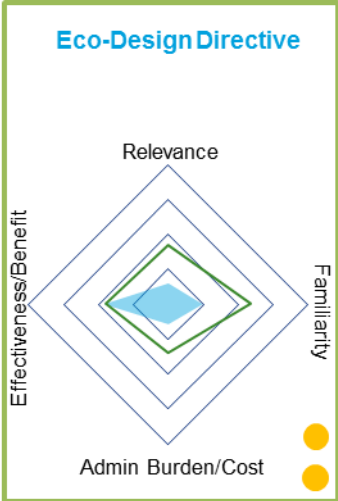
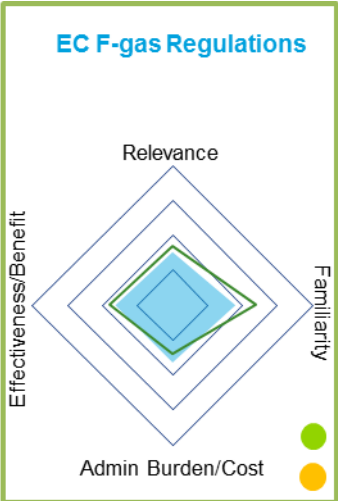
Instrument	Responses	Survey response profile	Deloitte Commentary
Energy Saving Opportunities Scheme	54	 <p>The profile of responses for this instrument is broadly in line with the average for all instruments. In that sense, nothing much stands out.</p>	<p>The consultation on the ESOS policy proposals has very recently closed, and the Government response to the consultation is awaited. The growing body of evidence on the wider business benefits of low carbon and energy efficient buildings suggests that organisations which are obligated to undertake audits of their energy performance (such as under the ESOS proposals) would benefit from using the obligation as a trigger for a more comprehensive assessment of their occupational assets and business requirements. In that respect, and given the strong correlation found in this study between levels of policy familiarity and the perceived benefits of those policies, Government could consider encouraging organisations to broaden the scope of their energy audits to include for example occupier satisfaction surveys and wider internal environmental quality reviews. This could form part of a strong communication campaign delivered by Government and Real Estate Industry bodies, including through the anticipated ESOS Good Practice Guidance, to promote not only improved energy efficiency but also optimised productivity.</p>
Smart Metering	74	 <p>Very high levels of familiarity and strong perception of relevance with low admin/cost burden and reasonably good effectiveness – suggests good cost-effectiveness score. This is not consistent with the balance of views identified from published sources in Appendix E.</p>	<p>The NAO argues that “the benefits of proceeding with this major technological and logistical undertaking are still uncertain. There is limited evidence of how much and for how long British consumers’ behaviour might change, and costs could escalate”⁶. However, the true benefit of smart metering is not necessarily derived from behaviour change (although that may form part of a valid policy argument), but from putting in place the infrastructure to allow the energy market to become responsive to demand dynamics, i.e. the amount and source of energy being demanded, which is becoming a more pertinent requirement as decentralised energy generation increases.</p>

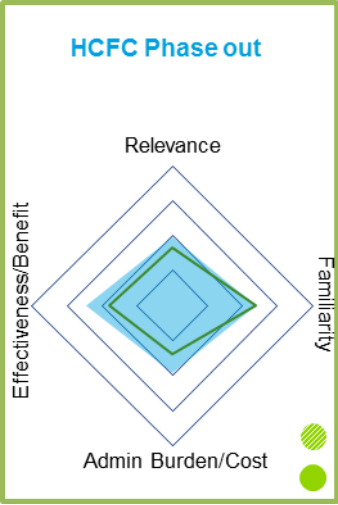

⁶ National Audit Office (2013) “Preparations for the roll-out of smart meters” <https://www.nao.org.uk/report/preparations-for-the-roll-out-of-smart-meters/>

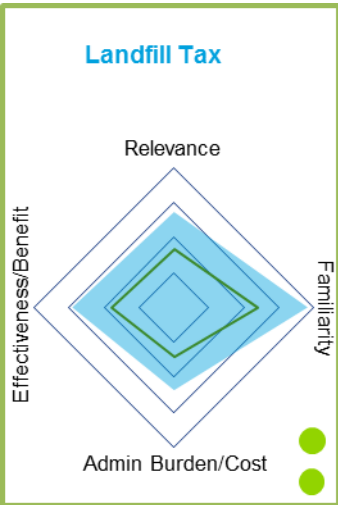
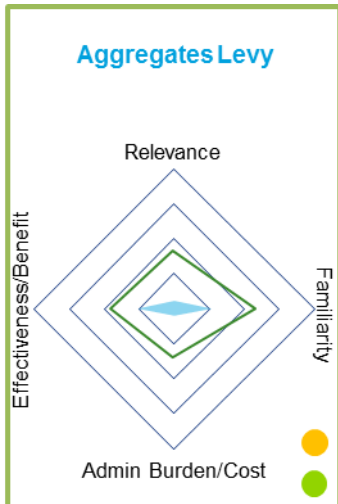
Instrument	Responses	Survey response profile	Deloitte Commentary
Green Deal	69	 <p>Very high levels of familiarity but also low levels of perceived effectiveness.</p>	<p>As the current Government's flagship green policy, it is unsurprising that Green Deal has such high levels of familiarity, even though the majority of the policy emphasis and media attention to date has been skewed towards the residential sector. There has been considerable focus on Green Deal as a mechanism for enabling energy efficiency retrofits and it is directly linked with MEPS. However, concerns have been raised over the high cost of capital currently available in the market (which in many commercial contexts will be prohibitive and makes certain measures unviable in the context of the Golden Rule), liabilities for outstanding repayments in void properties, the need for consents in complex leasing and licensing contexts, and an overly simplistic financial model in the context of heterogeneity of commercial buildings sector. Very low levels of initial take-up in the residential market will almost certainly have an effect on market perceptions within the commercial sector too. Expectations of an effective impact in the prime markets are therefore low, although there could be some potential for the Green Deal in secondary and tertiary contexts, subject to the effective implementation of MEPS as part of a policy bundle.</p>
Allowable Solutions	58	 <p>60.7% of those who responded were unfamiliar</p>	<p>To date, Allowable Solutions has been discussed primarily in the context of the residential sector which makes low levels of familiarity here reasonably predictable. There is essentially no definition of Allowable Solutions for the non-domestic sector, as things stand, with the most recent Government consultation on Allowable Solutions specific to homes (with the exception of the possibility of using Allowable Solutions derived from house building to fund efficiency improvements to non-domestic buildings). However, a policy which essential provides a flexible and cost-effective approach to delivering carbon outcomes on development projects is likely to be well received by the industry, assuming it conforms to the pre-conditions of effective policy.</p>

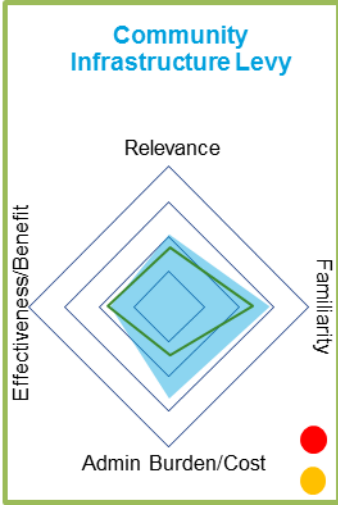
Instrument	Responses	Survey response profile	Deloitte Commentary
Instruments which apply a reputational effect to organisations with commercial property interests relating to their energy and/or carbon performance			
Mandatory GHG Reporting	54	 <p>The effectiveness of this instrument being considered to be quite high and the administrative burden and cost quite low suggests that this form of mandatory reporting could present good levels of cost-effectiveness.</p>	<p>It will be interesting to see the extent to which these perceived levels of cost-effectiveness transpire after a sufficient number of organisations have been subject to the reporting regime. In addition, it would also be interesting to test whether the cost-effectiveness profile would be expected to move out if the qualification criteria are extended in future to capture non-quoted companies. Further, the relationship between GHG reporting and ESOS should be monitored in order to see whether their interaction will be complementary or otherwise.</p>
Display Energy Certificates	92	 <p>Limited effectiveness, unsurprisingly given their limitation in use to large public sector buildings, but respondents had very high levels of familiarity with this instrument and perceived it to be highly relevant.</p>	<p>This suggests that there is some demand for an effective operational rating, albeit that limitations of the current Display Energy Certificate methodology mean that certain modifications would need to be made in order for the tool to be an effective and balanced policy instrument. It should also be noted, however, that relatively high levels of familiarity could be misleading given the limited presence of DEC's within the market.</p>

Instrument	Responses	Survey response profile	Deloitte Commentary
Energy Performance Certificates	107	 <p>EPCs were considered by respondents to be relevant but ineffective, whilst cheap and having a low administrative burden.</p>	<p>This profile suggests that their design is considered to be better than their implementation. Some of the issues relating to their inadequacies, such as poor performance of energy assessors and negligible enforcement are likely to be to blame for this. However, their ineffectiveness might also be due in part to the cheapness which the market has hitherto attached to them. More fundamentally, EPCs have hitherto not required any action as a result of their existence. MEPS may change that and there are already strong signals that this is beginning to change. It will be interesting to see whether this drives a market shift toward higher quality EPCs. Certainly, perceptions of low cost and ineffectiveness could suggest that there is scope to increase their effectiveness, even if that comes at some expense.</p>
Instruments which require or promote minimum standards if energy and/or carbon performance in the systems and technologies installed in buildings			
Enhanced Capital Allowances	61	 <p>23% of those who responded were unfamiliar and despite moderately high relevance and very low admin burden or cost, their effectiveness is deemed to be low.</p>	<p>ECAs suffer from low uptake because of a number of factors such as relating to a limited number of eligible technologies, complex application procedures and limited understanding of the financial benefits ECAs may bring to a project. It may be possible and useful to explore ways in which the ECA regime could be modified to promote greater access to the opportunities it provides.</p>

Instrument	Responses	Survey response profile	Deloitte Commentary
Eco-Design Directive	46	 <p>75% of those who responded were unfamiliar but those who are suggest that it has reasonably good levels of effectiveness.</p>	High levels of unfamiliarity are likely to be due to the supply chain focus of the Directive; essentially, if qualifying products do not meet the criteria set by the Directive, they cannot be sold in the EU. This imposes little disruption on the property market as a customer for those products, and ensures minimum standards of efficiency through a regime of choice-editing. The Directive is intended specifically to be used together with other policy tools, in particular the Energy Labelling Directive, and the European Commission notes that the effects of mandatory requirements under these two Directives can be significantly reinforced if combined with other voluntary schemes and financial incentives. The benefits of the 'bundling' of policies is considered further below.
EC F-Gas Regulation	49	 <p>54.2% of those who responded were unfamiliar. Lacks the level of familiarity and effectiveness which the HCFC Phase Out has (see below), possibly because the association with HCFCs and ozone depletion is a long-standing issue of public prominence, or perhaps a sampling issue in the survey responses because it is a relatively technical issue dealt with primarily by building surveyors.</p>	Instruments which are focused on one specific technical aspect of building energy performance can be significant in their effect, even where familiarity across the wider cohort of market actors is low.

Instrument	Responses	Survey response profile	Deloitte Commentary
HCFC Phase-out	51	 <p>Considered to be quite highly effective. Long-term anti CFC campaign may have a part to play in consideration of its effectiveness although familiarity is average.</p>	As the key milestone date of 1 January 2015 approaches, following which it will be illegal to top up air conditioning / cooling systems with HCFC R22 refrigerant, the visibility of the instrument might be expected to increase markedly, as it stands to enforce the capital replacement of plant which cannot accept non-HCFC refrigerant. It will be interesting to see how sentiment within the market evolves up to and immediately following this date, especially amongst asset and facilities managers. It certainly appears to be the case that many asset managers are preparing for implementation from 2015, but the effectiveness of the policy will be significantly determined by enforcement.
EPBD: Air Conditional Assessments	53	 <p>30% of those who responded were unfamiliar with this instrument despite this being a mandatory requirement in many buildings. Respondents perceived these assessments to present a very low administrative burden and/or cost but also to present very low effectiveness levels.</p>	The relatively low levels of familiarity are likely to be due to the instruments relevance predominantly for those responsible for asset and facilities management given its specific role in the operational phase of the building lifecycle. The perceived low levels of effectiveness may be due to the fact that it is predominantly seen as just a compliance test rather than being valued as a tool to improve energy efficiency. That having been said, by combining the regulatory requirement with other policy instruments linked to energy management, its effectiveness could be amplified.

Instrument	Responses	Survey response profile	Deloitte Commentary
Instruments with a different principal policy function but through which consequential effects on energy and/or carbon performance in the lifecycle buildings may arise			
Landfill Tax	65	 <p>Only 4.6% of those who responded were unfamiliar with the LFT for reasons discussed above. It is widely considered to be an effective instrument, albeit with not insignificant cost associated with the levy.</p>	The qualities of the LFT, such as its certainty, simplicity and justification could be emulated to good effect in other instruments.
Aggregates Levy	62	 <p>72.7% of those who responded were unfamiliar but this is likely to be due to the limited number of contractors (the organisation type to which this instrument is most directly relevant) in the survey responses. The profile of responses was otherwise unremarkable.</p>	Aggregates Levy has many of the hallmarks of the Landfill Tax, although with less emphasis on price escalation over time. However, levels of familiarity and relevance are deemed to be too low for it to have a material effect on decisions taken by commercial property actors. Whilst its impact in the sector might therefore be limited, this is not to imply that the instrument is ineffective.

Instrument	Responses	Survey response profile	Deloitte Commentary
Community Infrastructure Levy	63	 <p>Respondents have a high level of familiarity with this instrument and perceive it to be burdensome and/or costly. Some CIL costs can be very expensive for developers and there is, as yet, little to suggest that CIL will be effective in improving the energy efficiency of buildings</p>	<p>In theory, CIL provides LAs with the opportunity to levy funding from development activity to support overtly low carbon infrastructure investment, including packages of building retrofit. However, this is generally not happening in practice with CIL investment typically targeted at community infrastructure, transport etc. In the context of Allowable Solutions, it is suggested that CIL remains focused on these traditional areas of infrastructure funding (albeit in the context of sustainable development principles required by NPPF etc) to avoid duplicative levies being applied for the same outcome. The question of whether or not the combined impact of CIL and Allowable Solutions may be an impediment to development viability is a separate matter for consideration, beyond the scope of this study.</p>

Which types of policy appear to be most effective?

There are several noteworthy studies that have sought to determine the most effective *types* of policy instrument for driving behaviour change and carbon-conscious decision-making. To identify potential innovations which may overcome the identified policy limitations, it is therefore important to consider the blend of characteristics of effective policy with those policy types which are considered to be most impactful in delivering the energy and carbon reduction outcomes. Essentially, if the most impactful policy types can be sustained and/or brought forward in a way which is consistent with the pre-conditions and characteristics of effective policy, then it can be expected that – all other things being equal – accelerated and deeper energy and carbon reduction outcomes will be realised.

To that end, the following are considered to be particularly pertinent findings and recommendations from credible published sources:

- Some point to interesting evidence around the motivations for certain types of behaviours with respect to energy and carbon performance within businesses. Some evidence⁷ seems to point to the mixed effects of monetary (nonmonetary) incentives depending on the nature of the tasks involved. The general lessons that can be drawn from this body of research are that monetary (nonmonetary) incentives tend to be less (more) effective when tasks are perceived as pro-social behaviour (economically instrumental) motives. Whilst the connection between these motives of individuals with the behaviour of commercial organisations in response to external (financial) policy drivers is untested, it nevertheless provides an interesting point of consideration for the assessment of policy effectiveness. Indeed, as DECC⁸ points out in its analysis to support the *UK Energy Efficiency Strategy*, it is important to complement traditional economic thinking about business decision making by taking into account the broader social and cultural context in which decisions take place.
- Regulations and building codes/standards are widely found to be the most cost effective way of changing behaviours of real estate market participants. A number of academic analyses point to this and the notion is also endorsed by key market participants such as the Institutional Investment Group on Climate Change and the World Business Council for Sustainable Development⁹. However, it must also be noted that various reports commissioned by the Green Buildings Performance Network affirm the need for Building Codes to be dynamic and ambitious, with a clear trajectory of escalating standards over time supported by a broader policy package¹⁰.
- This complements a number of studies which cite the importance of policy packages/bundles. In particular, an extensive international study, *Building Energy Efficiency Best Practice Policies and Policy Packages*¹¹, finds that a “combination of standards (setting a floor on efficiency or energy use), a label (serving as a measuring stick), and financial incentives (to improve building performance beyond existing standards) is an extremely powerful means of increasing energy efficiency”. It notes that policy bundles can be devised in many different configurations.

These findings appear to complement those of the market survey, from which a key insight is that generally effective policy types appear to be (subject to the individual instruments being designed and implemented in accordance with the characteristics of effective policy):

- Those which impose an element of choice editing by prohibiting the use of particular types of product, whether that be:
 - ✓ a specific technology or material, such as through HCFC phase-out;
 - ✓ banning the sale of products which do not meet prescribed energy performance criteria, such as through the EU Eco-Directive; or
 - ✓ impeding the liquidity of buildings which do not comply with pre-determined energy performance standards, such as through MEPS,
- Building codes, such as Building Regulations; and
- Positive financial incentives, such as Feed in Tariffs.

⁷ Eccles et al (2012)

⁸ Department of Energy & Climate Change (2012)

⁹ See, for example, Global Buildings Performance Network (2013), Institutional Investors Group on Climate Change (2011) & World Business Council for Sustainable Development (2009)

¹⁰ See, for example, Urge-Vorsatz (2012), Shui Bin & Li Jun (2012), McDonald, N. & Laustsen, J. (2013) & Global Buildings Performance Network (2013)

¹¹ Levine et al (2012)

On the other hand, generally ineffective policy types appear to be those which are considered as having a broad impact on underlying energy costs at the point of use, such as CCL (which reinforces the findings of research by McKinsey and published by DECC¹²), and those which require some form of assessment without mandating action (whereby the process of undertaking the assessment becomes merely a box-ticking exercise), such as EPBD Air Conditioning Assessments.

However, it is also interesting to note that there are some considerable discrepancies between the RAG ratings attributed to policy instruments based on the review of published sources with the profiles of cost and effectiveness yielded through the market survey. There are likely to be two key reasons for this, which will be apply to greater and lesser extents on an individual instrument basis:

- The published sources reviewed were largely contemporaneous with the timing of instruments being brought forward. In some cases, considerable time will now have passed, and the experiences reflected in the market survey will be influenced more heavily by post-implementation circumstances (except, clearly, in the case of instruments yet to be implemented).
- Many of the published sources reviewed were authored by those with a specific interest in the particular instrument on which they were commenting. The market survey is likely to be yielding a broader perspective from the market, which will more likely include a balance of expectations and perspectives.

Is there evidence of any unintended consequences?

This review has found no evidence of direct contradictions between policy instruments in which compliance with one would lead to non-compliance with another. There may be differences in the way in which energy or carbon is measured, and the operational boundaries to which those measurements apply, but this is not, in and of itself, an impediment to the effectiveness of individual policies. It might be argued, however that it is a contributory factor in the complexity of the overall policy framework that is perceived by the market.

On an individual policy level though, there are several ways in which existing energy and carbon policy instruments could be deemed to be driving to perverse outcomes. Examples include (but this is not an exhaustive list):

- The use of performance-related metrics to underpin financial penalties or incentives can lead to unintended consequences from a business behaviour perspective. An example of this might be the CRC Energy Efficiency Scheme which in its initial period of operation used a combination of early action metrics and year-on-year performance improvement metrics to determine a reputational effect by virtue of placement within a performance league table. A financial bonus or penalty was then applied to the recycling of revenues accrued from the purchase of carbon allowances based on participants' league table position. This had the effect in a number of instances of organisations delaying their action on energy efficiency and carbon reduction in order to await the time at which the reputational and financial rewards of improving performance would be greatest.
- It has been argued on several occasions that the energy modelling conventions which underpin Building Regulations, Energy Performance Certificate ratings, and related policies such as Feed in Tariffs and Minimum Energy Performance Standards are encouraging sub-optimal building design from an energy perspective (& sub-optimal building operation as the conventions are based on theoretical performance) and also allowing regulatory risk to be avoided and/or removed by hypothetical tinkering with the model without delivering any savings in kilowatt hours or carbon.
- The first phase of the Renewable Heat Incentive was found to be providing an incentive to overproduce heat. This was identified by DECC as being most acute in the small and medium biomass boiler installations "*because of the way RHI tariffs are designed to compensate users for both the extra capex and opex involved in installing a renewable heating system, tariffs will often be higher than the short run marginal cost of generating an extra unit of heat (i.e. the fuel or electricity cost). This can lead to an incentive to over-produce heat in order to maximise revenue from RHI payments. This excess heat would not be useful and would not be displacing heat produced*

¹² McKinsey & Co (2012)

from conventional sources"¹³. To address this, a tiered tariff was introduced for small and medium biomass installations as these are the installations where the incentive to over-produce is clearest. The tiered tariff is split into a tier 1 tariff which is available for the eligible heat generated in the first 1,314 hours of operation each year (this tier aims to mainly cover the capital cost repayment) and a tier 2 payment that covers the fuel costs of the installation (which in 2014 would be set at around 2.3p/kWh).

¹³ DECC (2013) "TECHNICAL ANNEX TO SUPPORT THE CONSULTATION ON THE NON-DOMESTIC RHI EARLY TARIFF REVIEW"
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/208546/RHI_tariff_review_consultation_Technical_annex_MAY_2013_-_FINAL_DRAFT_corrected_v1_P.pdf

4 Measuring the carbon impact of policies

So far, this Report has highlighted a number of issues with respect to the market traction of energy and carbon policies in the commercial buildings sector, and in relation to the consistency of individual instruments against a range of widely accepted characteristics of policy effectiveness. This raises some serious questions about the deliverability of energy and carbon reduction objectives, which are discussed further in Section 5.

However, it is clearly also important to review the estimated, and where possible, actual, effect of the policy framework on energy use and carbon emissions. This is not a straight-forward exercise though, because there is no consistent methodology for assessing policy impact. Indeed, the Treasury Green Book¹⁴ explains that, in relation to greenhouse gas emissions:

Impacts of policies and measures on greenhouse gas emissions

- Current methodologies for assessment of the effects of policies and measures on greenhouse gas emissions are policy specific with no standard guidance available. There are some models available that can be used to assess the effects of particular types of proposals on emissions.
- The impact of a new policy, project or programme on emissions should be expressed in terms of carbon savings, or in terms of additional emissions, measured in million tonnes of carbon-dioxide equivalent (MtCO₂).
- In cases where quantification of the climate change effect is impractical, an assessment of whether the policy is likely to increase or decrease emissions, combined with a qualitative assessment of the significance of this change, should be included in the appraisal.
- Once the emissions impact of a proposal has been quantified, current research informs the calculation of illustrative values for the social damage cost of carbon. This can then be used to estimate the monetary value of the impacts.

The estimated carbon impact of some of the policy instruments within the scope of this study is initially determined by Government as part of the Regulatory Impact Assessment. Table 4 summarises and explains these estimates.

Table 4 Summary of Regulatory Impact Assessment estimates of carbon impacts

Instrument	Year of Assessment	Estimated CO ₂ savings	Assumptions used by the Government
Part L, Building Regulations 2006	2006	0.524 mtCO ₂ per year from non-domestic buildings.	CO ₂ saving comparing to BAU based on 2002 building regulations. Calculation based on NDEEM stock model; assuming annual build rate around 14,398,000m ² per year.
Part L, Building Regulations 2010	2010	0.1mtCO ₂ per year rising to 0.9 mtCO ₂ by 2020. Cumulatively, a total of 60 mtCO ₂ over a notional 60 year lifetime of non-domestic buildings.	The valuation of savings in the Consultation RIA was based on the guidance on greenhouse gas policy evaluation and appraisal in government departments published by DECC in December 2008 (the IAG guidance). This guidance provided a common platform for evaluations and appraisals of greenhouse gas policies and proposals across Government. DECC has continued to use the 2008 guidance as the basis for this implementation stage RIA but has incorporated revised values for energy and CO ₂ emissions published during 2009.
Part L, Building Regulations 2013	2013	1.88mtCO ₂ cumulative saving from non-domestic buildings over 10 year lifetime.	The 1.88mtCO ₂ is combined from 1.67mtCO ₂ for new buildings and 0.21mtCO ₂ for refurbishment of existing buildings. To assess the potential uncertainty in the RIA, sensitivity tests have been carried out by changing the assumption in build rate, energy prices and carbon values using the DECC IAG Group ranges and build rate.
CRC Energy Efficiency Scheme	2009	1.5mtCO ₂ per year from non-domestic buildings by 2015.	In total, this target group covers emissions corresponding to about 53.2 million tonnes of carbon dioxide (MtCO ₂) per year, and analysis suggests that currently available energy efficiency measures could cost-effectively save 1.5MtCO ₂ (0.5MtC) per year by 2015, rising to 3.6MtCO ₂ (1.0MtC) per year by 2020. Government wants to cut emissions from the target group by incentivising investment in energy efficient technologies and systems, and by encouraging the business and the public sector to improve their energy management and reduce waste.

¹⁴ HM Treasury (2014)

Instrument	Year of Assessment	Estimated CO2 savings	Assumptions used by the Government
Green Deal	2012	1.2 – 2.3 mtCO2 per year from non-domestic buildings.	The analysis of the 10% and 20% voluntary uptake scenarios is based on updated versions of the non-domestic marginal abatement cost curves which have been produced by the Committee on Climate Change. The updated model applies a BAU uptake of energy efficiency measures over the period 2010-2020. It is unclear whether the figures in the RIA are annual or cumulative over the lifetime of the policy. However, in paragraph 312 of the RIA, table D7 reports a potential cumulative carbon saving of between 21MtCO2 and 32MtCO2, which suggests that the carbon saving figures quoted in paragraph 35 of the RIA are per annum.
EPCs	2007	1.32 mtCO2 saving by 2020 from non-domestic buildings.	The benefits from provision of an EPC in this sector arise from three issues: the split incentive between landlord tenant which acts as a barrier to investment in energy efficiency, the pressure to maintain value in the property market and the importance of Corporate Social Responsibility (CSR).
Feed-in-Tariff	2009	10mtCO2 saving by 2020. No breakdown between domestic and non-domestic sectors.	<ul style="list-style-type: none"> • Future costs and benefits have been discounted using the Green Book social rate of time preference (3.5%). • Impacts are presented in 2008 prices and have been discounted to 2008. • Impacts are presented as additional to the baseline. • Resource costs are net of the value of carbon abated.
Renewable Heat Incentive	2011	44mtco2 saving by 2020. No breakdown between domestic and non-domestic sectors.	<p>Firms may incur costs when investigating renewable heat technology options. These costs, such as the time required researching what a suitable renewable technology may be, have been included in the non-financial barriers of the tariff setting and uptake modelling.</p> <p>The estimated admin burden of the RHI will vary according to the population (the number of businesses that sign up to receive the incentive). The population used in these estimates is taken from the final proposal presented in this RIA, and is expected to increase every year until 2020 as the level of renewable heat deployed increases.</p> <p>It should be noted that the admin burdens presented in this RIA are significantly higher than those presented in the February 2010 consultation RIA. This is due to the decision that all non-domestic installations will be metered (instead of the mixed deeming and metering approach proposed in the February consultation).</p>
Climate Change Levy (CCL)	1999	2mtC equivalent to 7.3mtco2 annual savings by 2010.	An independent evaluation by Cambridge Econometrics has examined the effect of the levy since its announcement in Budget 1999 and introduction in April 2001.
Climate Change Levy (CCL)	2005	Total CO2 emissions are reduced by 68.2mtCO2 (18.6mtC) by 2010, with the annual reduction rising from 3.1mtC (11.4mtCO2) in 2001 to 3.7mtC (13.6mtCO2) by 2010.	The results are discussed in budget 2005 and are based on the Cambridge Economics study: Modelling the initial effects of the CCL.
Climate Change Agreement (CCA)		Total 15.8mtCO2 (4.3mtC) savings by 2010	The results from the modelling study by Cambridge Economics showed that overall 221PJ less energy had been consumed in the CCA sectors compared to the Base Years, which amounts to an absolute saving of 4.3 mtC (in the UK Climate Change Programme, it was envisaged that the CCAs would only save 2.5mtC by 2010)

The aggregated annual and cumulative impact estimates of these instruments in relation to commercial property are shown to 2020 in Figures 6 and 7 respectively (overleaf). These show a significant escalation in estimated impact from 2011/12 with the advent of a number of different instruments which, at the time of the RIAs, were deemed to have an escalating impact over time.

There are several key points of note:

- The estimated impacts do not cover all of the policy instruments within the scope of this study (and for which no such RIA estimates exist);
- Some instruments, such as the CRC Energy Efficiency Scheme, the Feed in Tariff and the Renewable Heat Incentive have been amended substantially since first being brought into effect; and
- Some of the RIA estimates are sensitive to changing build rates within the sector, whilst all will be sensitive to constantly changing macro-economic conditions which affect business behaviour and debt markets.

Figure 6 Annualised RIA impact estimates of policy instruments to 2020.

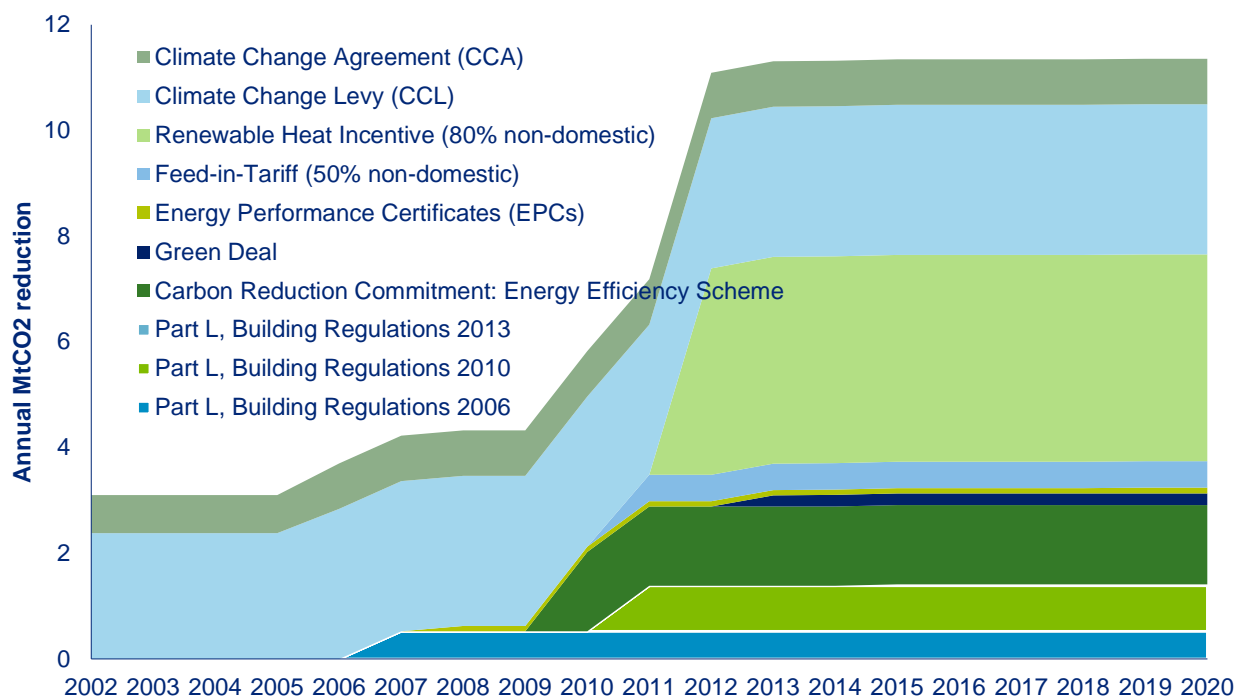
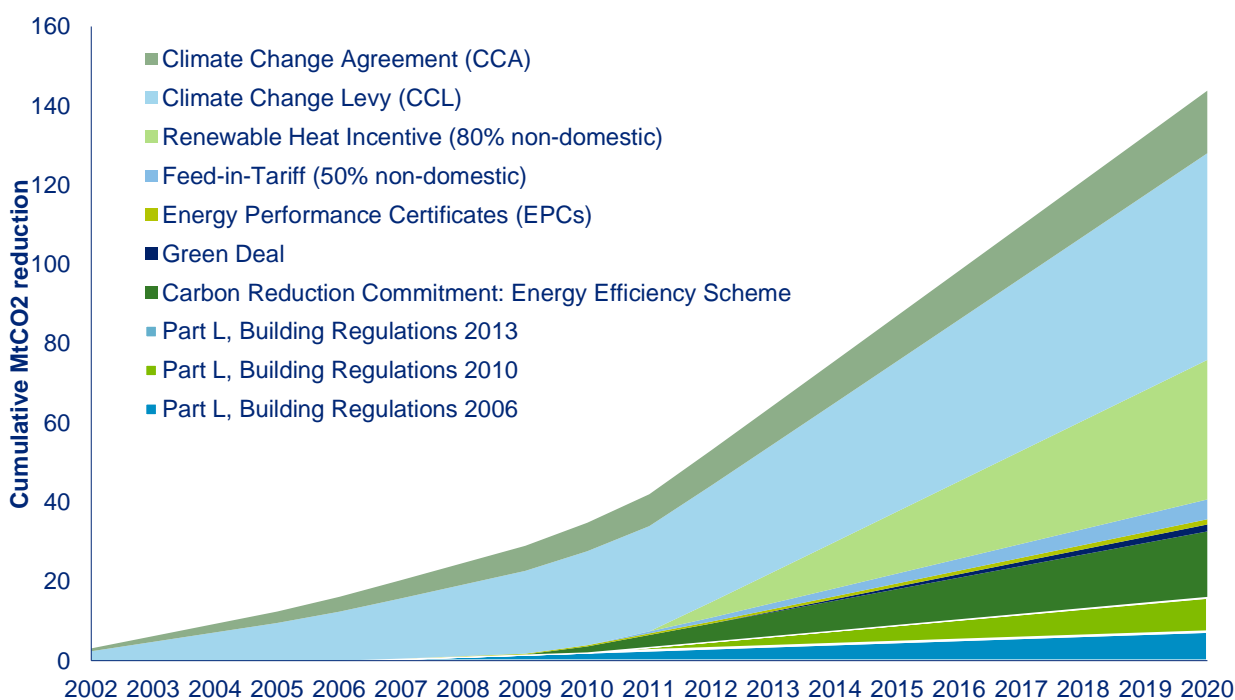


Figure 7 Cumulative RIA impact estimates of policy instruments to 2020



How government estimates, measures and monitors policy impacts

It is understood that DECC has been putting together an *Updated Energy & Emissions Projections*¹⁵. In its Annex G, it includes a detailed year-on-year projection of CO2 savings by each policy.

Each year DECC sends out an updated request to the relevant policy analysts and figures are then provided by analysts in each policy team and are based on (but often not identical to) their latest Regulatory Impact Assessment analysis.

However, the *Updated Energy & Emissions Projections* (UEP) report focuses largely on the overall UK carbon budget in total and only has very little information about the details and assumptions of the CO2 models for each of the

¹⁵ <https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2013>

policies. However, the report does provide the following explanation of the basis for incorporating policies into the UEP model:

"These emissions projections include all "climate change" policies that the government is committed to. The evaluation of these policies is undertaken according to DECC-HMT policy appraisal guidelines consistent with the most recent projection baseline, and taking account of existing policies.

Where possible, policies are modelled and incorporated into the DECC Energy and Emissions Model. Other policies enter the model as exogenous demand reduction or in one case as off-model adjustments. Newly announced policies are included where funding has been agreed and where decisions on policy design are sufficiently advanced to allow robust estimates of policy impacts to be made. Policy overlaps and double counted savings are excluded."

Source: DECC (2013)

Why are these savings different from the initial RIA?

As explained in the UEP report, the figures reported in Annex G reflect an updated model outcome based on the updated policies, new data and new research findings. In addition, the treatment of policy overlaps used in the UEP projections differs to that used for initial policy appraisal purposes. In the UEP projections, a number of criteria are used to determine the ordering in which savings are attributed. These include the extent to which the policy is binding (e.g. regulations), when it was announced and how cost-effective the measure is expected to be. This is different to the approach followed for appraisal purposes where the marginal impact of each new policy is assessed after taking account of any policies that have already been announced. This means that many of the latest UEP figures are not consistent with the original RIA.

However, the general assumption is that the latest UEP figures are more accurate and closer to the actual carbon emission savings realised by the policies.

Since the UEP is a constantly updated model which is deemed by government to reflect actual progress against the total UK carbon budget target, it theoretically illustrates the combined effectiveness of those policies which are specifically designed to tackle climate change. However, it is not possible within the scope of this study to draw quantified conclusions on policy effectiveness from the UEP model data, due to various externality factors, such as climatic variations and operational behaviour that will also impact on carbon emissions, and in the absence of a detailed understanding of the UEP methodologies. Nevertheless, if the UEP model can be analysed in further detail, with greater transparency provided by government on the current modelling approach in relation to each policy, then it may become a robust measure of policy effectiveness, and, therefore, a key policy monitoring tool for industry and governmental stakeholders.

Why is CCL not included in the ongoing CO2 saving projection?

The 2005 Budget referred to an annual reduction of 3.1MtC from the Climate Change Levy based on a study by Cambridge Economics¹⁶. However, the policy is not reported in the Annex G summary table. DECC's explanation is that the Climate Change Levy is included as a price effect, however DECC has not estimated a counterfactual (i.e. has not done a model run without the CCL). The effect of the CCL has also been diluted in the industrial sector by Good Quality Combined Heat & Power exemptions and the rebates available for companies which are in CCAs. The award of rebates, the use of CHP, and the scope of CCAs, have all increased since 2005.

Similarly, DECC's published estimates of the effect of the CRC Energy Efficiency Scheme exclude the price effect of having to buy CRC emissions allowances, but this is not to imply that DECC has not allowed for a price effect in its reference projection.

What is the limitation of the current approach?

It has been noted that DECC has undertaken detailed modelling work and collected a vast amount of data to come to a CO2 saving projection in the Annex G schedules. However, there are few observations from the research:

- It appears that although a general methodology statement describes how the figures are projected, none of the original reference models and data sources are publicly available.

¹⁶ Cambridge Econometrics (2005)

- The main purpose of DECC's UEP model is to report on compliance with the UK carbon budget. Such an objective requires a modelling process to take into account the actual operation of the buildings, which requires modelling work to reflect both the physical aspects of the building stock as well as the operational aspects (including behaviour of occupants, management efficiency etc.). It is therefore difficult to determine conclusive policy impacts in isolation without an understanding of the actual modelling methodologies.
- A number of policies, such as CRC and CCL, which have a price effect are excluded in the Annex G data, which means that the CO2 savings analysis method across all policies may not be consistent and, therefore, difficult to compare absolute CO2 saving on a policy-by-policy basis.
- The projection table reported in 2013 is materially different from the 2012 version. For example, the projected total saving by 2027 in the commercial and public service sector has been reduced by more than 30% in the 2013 version. However, without further investigation into the detailed modelling assumptions, particularly to account for issues such as the 'rebound effect' of improved thermal performance of buildings on the propensity to run heating and cooling systems, it is not possible to conclude whether any such change is a direct indication of policy effectiveness.

The difference of the total CO2 saving budget projection figures between 2012 and 2013 are summarised in the table below:

Table 5 12-month change in Total Carbon Budget Projection

Total Carbon budget projection, baseline policies included (2008-2027)	2013	Difference	2012
Residential	398.71	-177.33	576.0
Commercial and Public Services	174.11	-83.55	257.7
Industry	83.37	-10.24	93.6
Transport	191.52	+30.54	161.0
Agriculture & Waste	34.00	0.00	34.0
Electricity Supply	0.00	-289.63	289.6
Total (MtCO2)	881.72	-530.21	1411.93

However, it does appear that the latest version has been structured in a systematic way, which includes a clear baseline case as well as year-on-year projections. Such improvement in the model seems to indicate that DECC has now established a consistent method of estimating and projecting the CO2 impact from each of the policies.

What has not been done?

While significant effort has been made to estimate the CO2 savings from each policy, there is little evidence to suggest that the actual policy impact is measured and monitored. Although it is appreciated that the nature of many policies may be difficult, if not impossible, to measure, future policy design should consider a data collection mechanism to provide the best possible method to evaluate the KPIs of each policy.

Taking Building Regulations as an example, while a huge amount of data has been centrally registered with Landmark, it appears that there is no existing tool to consolidate the bottom up data to provide an overview of the UK building performance. A combination of lack of regulation, established toolkits & method and adequate enforcement has also created what is now a well-recognised performance gap.

Future policy-making should be, as far as is possible, responsive to the measured impacts of implemented policies. Establishing a framework of KPIs on a policy-by-policy basis and a mechanism for capturing the impact data would appear to be an important action in the interests of both policy-makers and market participants.

A note on metrics

Efforts by the commercial buildings sector to establish a consistent approach to measuring, reporting and benchmarking energy and carbon performance have been prevalent in recent years. Organisations including the GPA, EPRA & INREV have been foremost amongst these.

It is widely accepted by market commentators, academics and representative bodies that transparency in relation to energy consumption and carbon emissions in the property industry is impeded by a general lack of non-financial performance data, and a lack of consistency in the way in which non-financial performance is measured.

Some also argue that efforts to promote greater non-financial performance disclosure have, perhaps ironically, served only to compound the inconsistency issue, with a number of separate commercial interests vying for a USP in the growing market of reporting and benchmarking products and initiatives (such as GRESB, ISA, ULI Greenprint, IPD EcoPAS).

Meanwhile, the framework of regulatory and carbon instruments in England and Wales has continued to evolve, with a number of different instruments having been introduced in recent years. As the policy mapping in Section 3 of this report shows, different instruments relate to different stages of the carbon and property lifecycles (and in some cases individual instruments have an effect at multiple lifecycle stages). Some relate, for example, to the regulated energy and carbon standards required of new buildings, whilst others are levied against the consumption of energy within occupied buildings. In that sense, it is entirely appropriate for metrics to be selected which suit the particular purpose of the policy instrument that they are intended to underpin. Certainly, there are no known examples of any individual or organisation calling for a single metric to be applied across all policy instruments.

Efficacy of policy metrics

In principle, it is appropriate that different metrics and rating systems underpin different policy instruments. That having been said, the efficacy of those metrics will be dependent, in specific circumstances, on three key considerations:

- Whether or not metrics are relevant and appropriate to the intended purpose of the individual policy instruments which they underpin;
- Whether or not metrics are sufficiently rigorous in both their design and application to support fair and effective policy instruments (be they regulatory or fiscal); and
- The extent to which there is sufficient *alignment* between the metrics used for different policy instruments to ensure that policies can work in packaged combination, where the transformative impact is dependent on the collective framework of policies being greater than the sum of its individual parts.

Issues identified

The review of instruments set out in Section 4 suggests that metrics are, by and large, of limited contention. It is only in respect of the EU ETS and the Feed in Tariff that the published sources reviewed reveal considerable levels of criticism, or limited support. Furthermore, the criticisms of the metrics used for the Feed in Tariff related principally to the tariff level set following the review in 2012 (which itself was subject to a successful legal challenge) and the linking of tariff level eligibility to the EPC rating of the building. The criticisms identified of the ETS were specific to a perceived weakening of the non-compliance penalties rather than the underlying measures of performance per se.

The lack of criticism with respect to policy metrics found during the instrument review is perhaps surprising, particularly when the results of the market survey are considered. Here, a number of strong, discretionary views were offered, particularly in relation to the role of EPCs and their lack of relevance and rigour, the point being that securing industry buy-in to the underlying metrics is critical to the traction of the policies themselves.

Indeed, the review of sources undertaken as part of this study revealed inconsistent and unreliable use of metrics and rating frameworks as a key concern. In particular, compliance tools, especially hypothetical modelling tools associated with EPCs and Building Regulations, are deemed by some to encourage mediocrity and fail to deliver real performance outcomes. This criticism is further reflected in the strength and persistence of industry campaigns to mandate the roll-out of Display Energy Certificates to commercial premises, based on the perceived merits of operational energy ratings by many in the market (notwithstanding the acknowledgement that the rating methodology has significant limitations which would need to be addressed prior to the roll-out of a mandatory operational rating).

5 Recommendations

Given the key messages emerging from the research, it is possible to draw out themes which may serve as recommendations that, if taken up, would likely result in better achievement of policy objectives as well as enabling market efficiency. These themes and recommendations can be taken independently, but are deemed to have the greatest potential when adopted as a package of interventions. They are as follows:

Simplifying complexity

- Addressing the perception of complexity by increasing market participants' familiarity with the framework of instruments and individual instruments
 - Depending on their constitution, all professional institutes and industry bodies to require and/or encourage members to improve their knowledge of energy and carbon efficiency measures and policies.
 - Where appropriate, sub-sector-specific engagement programmes, from inception and post-implementation monitoring, with relevant stakeholders should be undertaken and the results of these disseminated. There may be particular benefits in focusing such activities on secondary market actors around specific instruments such as the Green Deal, or those above the SME threshold that is likely to be applied to ESOS qualification. Specific engagement incentives ought to be considered where there are persistent barriers.
- Addressing complexity caused by inadequate or inappropriate metrics
 - Through the Delphi Group proposed (see below) to maintain a regular and on-going focus on the effectiveness of policy design and implementation, all energy efficiency and carbon reduction tools and metrics should be reviewed in terms of their fitness for purpose. EEDO, which is already charged with building the evidence base relating to the effectiveness of existing policies and to assist in generating impact assessments for future policy changes, should have a central role in this process, perhaps including through the provision of secretariat support to such a group.
 - All data relating to this review to be made publicly available.
- Ordering instruments into 'bundles' which address key aspects relating to energy and carbon performance of buildings
 - All policies should contain a bundle of measures which ensure the assessment of energy and carbon performance, labelling of that performance against appropriate benchmarks, establishment of minimum performance standards and provision of sanctions for failing to meet that standard. This will help to enable coherence for market actors who find the existing framework of instruments to be complex.
- Providing clear signposting of policy trajectory
 - Each policy should have a clear trajectory associated with it which sets out how it will be reviewed and updated. It should be for government to decide what those trajectories should be, based on appropriate levels of consultation with the market, although the Low Carbon Routemap¹⁷ work undertaken by the Green Construction Board provides a compelling basis for arguing that such updates will present "upwards only" improvements of energy efficiency and carbon reduction.

Reducing unnecessary instruments through rationalisation

- Prioritising policy requirements and identifying which aspects of buildings' performance throughout the lifecycle need to be addressed
 - Building on the work of the GCB 'Low Carbon Routemap' and other relevant studies, government should identify appropriate intervention points within building lifecycles and alter its policy priorities accordingly
 - Given the clear deficit of policy attention on embodied carbon identified with the lifecycle mapping of instruments in this study, interventions need to be established which address the embodied carbon impacts at relevant stages of the property lifecycle. This is particularly pertinent to construction activities (but for which decisions taken during the pre-construction stage will have a potentially significant bearing)

¹⁷ Green Construction Board (2013)

for which the need for a national plan is recognised in *Construction 2025*¹⁸, the industrial strategy for the construction sector published by Government in 2013. Particular instruments of relevance to this would be product labelling, linked to choice editing policies and carbon intensity escalators which restrict the availability of carbon intensive products where suitable alternatives exist.

- Identifying instruments with limited effectiveness which would not form part of an effective policy bundle that could be reduced in scope or removed, in lieu of focusing on obtaining maximum impact from the following:
 - Dynamic standards for new buildings (Building Regulations) and existing stock (Minimum Energy Performance Standards) on a clear, time-bound trajectory, with penalties levied consistently for non-compliance. Again, the evidence of the GCB Low Carbon Routemap¹⁹ would suggest a presumption in favour of escalating standards over time. MEPS need not be solely linked to transactional triggers but could, for example, be required to be met due to the passage of certain time periods or upon works being undertaken to the building.
 - Positive financial incentives which promote new and existing building standards ahead of the standards trajectory, linked to clear and robust (asset + operational) labelling systems.
 - Continued emphasis and effective enforcement of choice-editing policies which prohibit the use of energy/carbon intensive technologies or ozone depleting substances, including banning inefficient, outdated technologies at point of replacement.
 - Promoting maximum value from energy audit requirements, including mandating or incentivising appropriately the implementation of 'low-hanging fruit'. As part of this, the potential merits of energy conservation programmes with wider business productivity and resilience outcomes could be promoted, with tools and guidance established to enable business occupiers to integrate energy audits with wider staff engagement programmes on workplace satisfaction.
 - Notwithstanding European Union requirements for an end user tax, the advent of the carbon floor price for energy generation provides an opportunity to review the efficacy of demand side instruments such as the CCL, especially considering the number of instruments which have similarly broad effects on the cost of energy use subject to a) the floor price escalator continuing to move at the pace required to incentivise low carbon investment and b) appropriate mechanisms being established at the European level to avoid the risk of carbon leakage from the UK.

Strengthening instruments which incentivise and penalise

- Focusing effective instruments on aspects of the property lifecycle where their cost-effectiveness will be maximised
 - Undertaking much more rigorous Regulatory Impact Assessments prior to policy implementation which accounts for the cost-effectiveness of the measures more accurately and the extent to which market disruption would occur (building on evidence from post-implementation reviews). Assumption precedents established in historic RIAs which have since been demonstrated to be inaccurate should be challenged and updated.
 - Better bottom-up, sector-specific data collection on which to base decisions & policy is needed. Specifically, property owners and occupiers should significantly improve their collection of energy and carbon data, and a mechanism is needed through which this can be assimilated at the industry level and provided to policy-makers. The use of operational energy use and landlord energy ratings platforms would be necessary for this, such as those administered by CarbonBuzz and the Better Buildings Partnership, for example. The recently incepted Operational Energy Use project, funded by the Green Construction Board, is a welcome early step in the process of improving industry-wide data collection.
- Ensuring a robust and consistent enforcement regime for all policies
 - There should be a root and branch review of the failings of enforcement regimes with a view to ensuring that rigorous and appropriately funded approaches to enforcement follows

¹⁸ Department for Business, Innovation & Skills (2013)

¹⁹ Green Construction Board (2013)

- Reducing the amount of change to instruments for political purposes – think about policy effectiveness and market efficiencies first
 - All carbon and energy-related policies should be subject to far greater scrutiny which is independent of politics. The roles of the Committee on Climate Change or the Green Construction Board could be re-examined for this purpose, for example.

Government and industry collaboration on monitoring policy effectiveness

There is clearly a degree of complexity associated with the framework of penalties and incentives and, arguably, a crowded landscape of instruments. It is also clear that 'the commercial buildings industry' is supportive of the identified need to significantly improve the carbon performance of the UK's current and future building stock. There are, however, positive and negative market perceptions about the effectiveness of policy in this area and there appear to be a number of lessons learnt by practitioners which policy makers would probably appreciate knowing more about.

Appropriate support from market participants to policy makers needs to focus on examining how markets can efficiently allow for policy objectives to be achieved effectively and how regulations can avoid disturbing the efficiency of markets unduly. It stands to reason that the less 'friction' policy experiences with the workings of the market, the more likely the policy is to be effective.

There have been a number of initiatives in this regard recently, for example the Green Deal and MEPS working groups which have advised DECC, but these have been constituted on a piecemeal basis.

It is strongly recommended that government (ensuring cross-departmental representation that is reflective of the diverse policy-making and implementation responsibilities in this area) works with relevant stakeholders to determine the effectiveness of proposed and existing individual policy instruments on a regular, ongoing basis. Stakeholders should include those who can represent the opinions of:

- Investors
- Developers
- Landlords
- Lenders or debt finance providers
- Lawyers
- Engineers (particularly of building services)
- Building Control
- Asset, Property, Building & Facilities managers (representing building owners' and occupiers' views)
- Real estate consultants (for matters of value & market functioning to inform cost benefit analysis)

It should be recognised that this recommendation is not intended to lead to the establishment of another group, but to ensure that the following principal functions are clearly mandated to an existing organisation (or an existing partnership of organisations):

- Provide an assessment of market opinion of the effectiveness of existing policies (which could be used against official data relating to tco2e of carbon reduction)
- Provide government with an informed understanding of market conditions within which policy would be made
- Advise on the need for new or modified policies in given areas
- Advise on how best to co-ordinate or 'bundle' policies
- Identify where policy overlap might enable policies to be reduced in scope or scrapped.

This research has also demonstrated a linkage between familiarity with penalties and incentives and a perception of them being beneficial. When market participants perceive benefits can be derived from instruments it is far more likely that they will engage with them. It is suggested that policy makers and those responsible for its implementation would benefit from learning more about how best to publicise policy-related information to market participants and that this should also be an objective of the stakeholder group.

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- **Chair:** Bill Hughes (Legal & General Property) - Green Property Alliance & Green Construction Board
- Jeremy Blackburn – Royal Institution of Chartered Surveyors
- Nick Cullen (Hoare Lea) – British Council for Offices
- Helen Drury – British Council for Shopping Centres
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Name	Representing	Name	Representing
Sarah Meagher	DECC	Charlotte Jacques	Schroders
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Justin Snoxall	British Land	Rich Griffiths	UK Green Building Council
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Alex Hill	Aviva Investors		

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