

# RESEARCH REPORT

Exploring the design of policies to increase efficiency of electricity use within the industrial and commercial sectors

Undertaken by the Carbon Trust & SPA Future Thinking

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The views expressed in this report are those of the authors, not necessarily those of the Department of Energy and Climate Change (and the results will not necessarily reflect Government policy).

# Contents

<b>Executive Summary .....</b>	<b>5</b>
<b>Introduction .....</b>	<b>15</b>
Context .....	15
Objectives of the study.....	16
<b>Methodology .....</b>	<b>17</b>
Overall approach .....	17
Sampling frame.....	18
Recruitment .....	20
Carrying out the research .....	21
Analysis .....	23
<b>Findings .....</b>	<b>24</b>
Barriers.....	24
End-user views on incentive scheme characteristics .....	32
Feedback from ESCOs.....	49
<b>Appendix A .....</b>	<b>54</b>
<b>Appendix B .....</b>	<b>56</b>
<b>Appendix C .....</b>	<b>57</b>
<b>Appendix D .....</b>	<b>65</b>



# Executive Summary

## Context

The efficient use of electricity, and of energy more broadly, is a critical element of the UK's transition to a low carbon economy and the achievement of its 2050 targets. Analysis published by the Government, and by other organisations, has shown that the potential energy and cost savings from efficiency measures are substantial. DECC's Electricity Demand Reduction (EDR) Project is working to ensure that those potential savings are realised.

While the potential savings are large, with a significant proportion of measures offering attractive payback periods and rates of return, many projects are not implemented due to a complex mix of barriers. Existing policy is acting to overcome these barriers and unlock the potential energy savings, but there remains potential to go further, with additional benefits for the energy system, the economy and the UK's environmental goals.

## Objectives

This project was designed to inform the early stages of the policy development process, with a particular objective to build the evidence base on incentive policies, and to explore which types of incentive schemes would most effectively address the barriers to the implementation of energy efficiency measures, within the industrial and commercial sectors.

To inform the design of these policy interventions, DECC commissioned the Carbon Trust and SPA Future Thinking to conduct a qualitative research project to explore the potential role of incentive schemes in increasing the efficiency of energy use.

## Approach

The qualitative research comprised a combination of structured depth interviews and group sessions. Feedback was sought from both the potential “customers” of a policy intervention, “end user” industrial and commercial businesses and their landlords, as well as Energy Service Companies (ESCOs) which might supply end users with propositions, and manufacturers that might sell the associated energy efficiency products to those end users.

The research focused on low and medium energy intensity end users. Highly energy intensive businesses are already subject to a number of policy measures designed to encourage energy efficiency (e.g. the Climate Change Agreements) and energy is already a significant cost so these businesses are more likely to prioritise energy efficiency in the absence of a new incentive scheme. How the research should be used

A qualitative approach was adopted to give us an in-depth understanding of factors influencing choice and behaviour. This approach means that there are few numeric results presented in the findings and that the findings are not statistically ‘representative’ and may not be generalizable either to the population as a whole or to other groups within the population).

### Key findings

#### Barriers

Interviewees identified a complex mix of organisational, financial and informational barriers that hinder the uptake of energy efficiency measures. These barriers were categorised as follows:

- **Low priority** given to energy efficiency by the company;
- **Capital constraints**;
- Short investment **payback** period requirements;
- **Lack of expertise** in energy efficiency;
- Complex internal **decision making** processes that favour simple, compelling propositions;
- Other, including **fear of disruption** of daily business.

The barriers were greatest for the smaller organisations. For them, energy efficiency was simply not a priority compared to staying in business and, for the successful, growing their businesses. Energy was an insignificant cost for those that were least engaged. Capital was severely constrained in general, and even if available was unlikely to be allocated to energy efficiency, given the relative insignificance of energy costs for most organisations. Small organisations also did not know what energy efficiency measures to implement nor if their required 3 year payback period was achievable.

Medium and large businesses and landlords had more capital available. Many of these organisations said they were committed to energy efficiency but that it was not a top priority. Most had received energy efficiency audits and had implemented measures. Whilst organisations had greater capital availability, this capital would still not necessarily be assigned to energy efficiency measures; it had to compete with their core business which was generally more of a priority. Some large businesses had in-house expertise in energy efficiency and did not need external support. Decision making was more of a barrier for large businesses, where complex internal decision making processes favour simple, compelling business cases. This barrier could combine with the low priority placed on energy efficiency (or perceptions about long payback periods) to discourage businesses from trying to win internal funding for energy saving investments.

The research highlighted some of the relationship issues between end users, ESCOs and landlords that raised the additional barriers of:

- Agency issues leading to misaligned incentives to save energy between tenants and landlords;
- Concern that energy service contracts might lead to loss of control over building energy systems;
- Lack of trust in third parties offering energy efficiency services.

Some of the landlords interviewed mentioned an agency issue – they had little incentive to invest in energy efficiency measures given their tenants would be the ones benefiting from lower energy bills, unless landlords incorporated energy provision into their service charges. Some larger organisations and landlords had concerns about loss of control when working with ESCOs, and end users were often mistrustful of third parties in general. The ESCOs interviewed also did not view small and medium sized businesses as their natural customers – they typically target businesses with large energy bills that could be reduced through long term, high capex interventions.



### End user views on incentive scheme characteristics

The research focused on **five** characteristics of an incentive scheme that are of most interest to DECC:

- Finance: how are measures paid for?
- Incentive payment: what form is the benefit to the end user and when is it received?
- Audit: how are energy efficiency opportunities identified?
- Third parties: what is the role of third parties in the scheme?
- M&V: how are energy savings measured and verified?

The interviews and group sessions explored how important each characteristic was to different types of organisation. Finance and the incentive payment characteristic were found to be the two most important characteristics;– interviewees were most interested in these characteristics and they drove interviewees' choices. The research then explored attitudes to different variants of each characteristic, for instance the finance characteristic had a 'no upfront cost' variant and a 'loan' variant. The research found that no single variant had universal appeal to all the interviewees. Different variants addressed different barriers, and had varying appeal to interviewees, as summarised below.

## Finance

The research explored how the incentive scheme might finance energy efficiency measures. Two variants were explored: 'No upfront cost' and 'Loans'.

### No upfront cost

With this variant, a third party company finances the energy efficient equipment; the cost of the equipment is repaid through energy savings. This was a popular variant with broad appeal. It addressed most of the barriers except the low priority of energy efficiency measures. It was preferred by those with **capital constraint** barriers, which included most of the small and many of the medium sized organisations. It also helped address **uncertainty** barriers because the savings were felt to be guaranteed.

Interviewees identified some relationship related issues with this variant. Some users had trust and contractual issues about working with third parties (such as ESCOs). The ESCOs interviewed saw a mismatch between their normal target (large) customers and the small and medium sized companies that liked this variant the most.

If these issues were addressed, the only organisations that this option would not appeal to would be those able to finance investments who are not willing to **share savings** with a third party. This is inherent in this option. This issue could be minimised by assuring organisations that the profit made by third parties is fair, and commensurate with their service and risk. This comes down to trust, both in the business model and the particular third parties offering this service. Increasing trust would also broaden the appeal of this option in general.

### Loans

'Loans' directly addressed **capital constraint** barriers. Preferences were mixed. Some saw loans as an appealing way to finance energy efficiency investments. Those that did not faced other barriers such as lack of internal energy efficiency expertise, or energy efficiency being given low priority and these were not addressed by loans. Some interviewees held broadly negative views on loans in general, for example because they were uncomfortable taking on debt, or because their company policy was not to take loans. All interviewees said that loans would need to be low interest or interest free to be appealing.

### Incentive payment: type and timing

#### Lump sum rebate

With this variant, end users would benefit from a 10-30% rebate against the cost of energy efficient equipment they purchase. This variant was perceived as reducing the **payback period** the most. It did not address any other barriers including priority and capital constraints barriers – organisations would still have to finance 70-90% of the cost of a measure. This variant was preferred by those with fewer **capital constraints** and who valued its **simplicity** and **certainty** – which explains why it was liked by many medium to large organisations, landlords and manufacturers.

A number of interviewees expressed concern that this variant would attract “free-riders” who would have made eligible investments anyway. This is also an issue for the other incentive mechanisms but interviewees perceived it as being a greater issue for this one.

#### Payments based on savings

A series of incentive payments based on verified energy savings was the least popular variant across the finance and incentive payment characteristics, mainly due to its **complexity**. Interviewees were also concerned that the **payback period** would be too long. This variant had possibly the greatest potential to make energy efficiency measures more of a **priority** because if an incentive was large enough the returns might no longer be insignificant. This could in turn redirect **capital** investment towards energy efficiency measures. However, without knowing how large the savings would be, interviewees were not able to determine its impact on these two barriers.

Some interviewees associated this variant with feed-in tariffs and were concerned about the **risk** of Government suddenly reducing tariffs.

Those that liked it, were some of the medium and large companies and landlords, particularly those expecting to be in / owning their properties for longer periods of time. This group thought it would give the **greatest savings**, were comfortable with the **complexity** and could forecast their energy usage so were at ease with the **certainty** of the incentive.

Among those who liked the idea of incentive payments based on energy savings, there was a clear preference for a fixed price per unit payment over a variable price payment. Despite being designed to create greater **certainty** in a world of variable energy prices, interviewees found the variable price variant to be confusing (most initially felt it was *less certain*) and found this **complexity** to be off-putting.

The basic payment based on savings variant involved payments being made over a series of years. An alternative was offered with an upfront payment which would need to be paid back if estimated savings were not achieved. Interviewees were divided about this variant. The preference was driven by **capital constraints** and **certainty**, namely their confidence in the scheme’s ability to estimate and deliver the savings. Medium sized companies varied in their capital constraints – those with less capital available chose the upfront payment variant and vice versa. Large companies had few capital constraints and their choice was mainly driven by their capacity to deal with uncertainty such as being able to estimate future energy usage. Many interviewees found the risk of paying back the incentive unappealing, and thought this made a **complex** option even more complex.

## **Type of audit**

Audits were appealing to most small and medium sized companies because they addressed the **expertise** barrier. Interviewees did not pick up on the possibility that audits would help address misconceptions of long and uncertain **payback**. Most medium and large sized companies had already had audits, and in many cases they had been free. Perhaps because of this, there was a strong preference for audits to be free, but without the 'hard sell' that is implicit in the no upfront cost option

## **Role of third party**

Most interviewees were comfortable with the third party doing both the audit and the installation. Those not comfortable were medium or large companies or landlords that did not trust ESCOs or had the expertise to do these in-house. Companies of all sizes expressed concerns about the trustworthiness or impartiality of third parties, and said they would rather deal with reputable organisations.

## **Measurement & Verification**

Most interviewees preferred to confirm the eligibility of potential projects from a list of pre-approved technologies, rather than through a project by project approach (verified by a third party), because of its greater simplicity and a perceived lack of bureaucracy. Ideally, interviewees wanted a comprehensive list with flexibility e.g. to adopt a measure not on the list.

## Conclusions

No one variant appealed across all interviewees. Appeal was driven by the circumstances of the interviewee, the relative importance of the different barriers to them and the broader appeal of the scheme.

### Impact on barriers to energy efficiency

No variant addressed the barrier that energy efficiency was not a priority for any of the organisations interviewed. It is possible that the series of payments for savings would address the low priority of energy efficiency barrier by being sufficiently attractive to motivate senior management, but without knowing the size of the payment this research could not substantiate this possibility.

The barrier that drove preferences the most was **capital constraints** for energy efficiency measures. This determined choice across the finance and incentive characteristics. The capital constraints barrier broadly aligned with the size of company and explains to the greatest extent why different sized companies liked different variants. The 'No upfront cost', 'Upfront payment based on savings' (followed with a possible clawback) and 'Loans' all addressed the capital barrier. The first two also addressed **required payback period barriers**, and 'No upfront cost' also partially addressed the remaining barriers of complex **decision making** and **lack of expertise** in energy efficiency.

The 'Lump sum rebate' and series of payments (a derivative of 'Payments based on savings') variants addressed the **payback barrier**. Those organisations that were not capital constrained liked these variants the most.

Audits addressed the **expertise barrier**. For small and medium sized companies the expertise barrier was more important so they valued audits more, though they had broad appeal, particularly if they were free or were a free component of a broader scheme.

## Appeal of the incentive scheme

In addition to the degree to which they addressed the barriers faced by interviewees, several other factors influenced the preferences expressed by companies:

- Overall scheme complexity, and the sophistication and capability of the organisation to understand and manage it;
- The certainty of scheme payments, and the capability of the organisation to estimate future savings and cope with variance from these estimates;
- The trust and willingness of the organisation to work with third parties.

For capital constrained organisations, **complexity**, **certainty** and **trust/willingness to work with a third party** drove the choice of variant. The 'No upfront cost' variant had broadest appeal because most organisations valued its simplicity and low level of risk. Organisations that preferred 'Loans' did not want to be dependent on a third party.

Most organisations that were not capital constrained chose the 'Lump sum rebate' variant because of its **simplicity** and **certainty**, including minimal measurement and verification requirements as well as there being no need to work with a **third party**. Most interviewees thought 'Payment based on savings' was too **complex** and **uncertain**. Those that did like it, mostly larger organisations, were able to deal with the **complexity**, had **certainty** because they could forecast their energy usage, and felt it offered the largest savings.

# Introduction

## Context

The efficient use of electricity, and of energy more broadly, is a critical element of the UK's transition to a low carbon economy and the achievement of its 2050 targets. Analysis published by the Government, and by other organisations, has shown that the potential energy and cost savings from efficiency measures are substantial. DECC's Electricity Demand Reduction (EDR) Project is working to ensure that those potential savings are realised.

While the potential savings are large, with a significant proportion of measures offering attractive payback periods and rates of return, many projects are not implemented due to a complex mix of barriers. Existing policy (including the CRC and non-domestic Green Deal) is acting to overcome these barriers and unlock the potential energy savings, but there remains potential to go further, with additional benefits for the energy system, the economy and the UK's environmental goals.

To inform the design of these policy interventions, DECC commissioned the Carbon Trust and SPA Future Thinking to conduct a qualitative research project to explore the potential role of incentive schemes in increasing the efficiency of energy use.

## Objectives of the study

The project was designed to inform the early stages of the policy development process, with a particular objective to build the evidence base on incentive schemes, and to explore which incentive schemes would most effectively address the barriers to the implementation of energy efficiency measures within the industrial and commercial sectors.

The project had the following specific research objectives:

- Verify the most important barriers to take up of energy efficiency measures in the Industrial and Commercial sectors, building on existing research projects;
- Understand the level of interest in a well-designed financial incentive to support energy efficiency;
- Understand the capacity of alternative features of policy design to overcome these barriers, driving uptake of energy efficiency technologies;
- Understand the extent to which scheme complexity puts people off participating in a financial reward scheme;
- Identify how these issues differ for different participants, particularly between owner-occupiers, tenants, and landlords;
- Identify the characteristics that would make the offer more or less attractive to energy service companies (ESCOs);
- Explore how ESCOs would develop their customer offers in response to the introduction of the different types of incentive;
- Understand what sorts of customers would the ESCO anticipate being interested in such a scheme and where they would expect to find the greatest take-up.

A qualitative research approach was used comprising interviews and group sessions. The research methodology is explained in the following section.



# Methodology

This section summarises the methodology followed in this research. A qualitative research approach was used comprising interviews and group sessions. Qualitative research can be an extremely valuable tool in circumstances where, for example, there is a paucity of quantitative data, or where more needs to be understood about a situation before quantitative data is gathered. Given the qualitative approach, there are few numeric results presented in the findings; the findings are not statistically ‘representative’ and may not be generalizable either to the population as a whole or to other groups within the population. Further detail about the methodology is available in Appendix D.

## Overall approach

The project set out to answer the research questions through a combination of structured depth telephone interviews and face-to-face group sessions. Interviews were conducted with different types of organisations from several different audiences in order to explore how answers might differ across these audiences and to probe specific issues. The different audiences involved are laid out in Figure 1 below:

**Figure 1: Research Audiences**

Audience	Rationale for inclusion
<b>End user businesses</b>	End user businesses in the industrial and commercial sectors are responsible for the majority of energy consumption and would be the primary participants in any incentive scheme. Understanding their attitudes and preferences is essential.
<b>Commercial Landlords</b>	As the owners of building assets, landlords are important stakeholders and decision makers in the implementation of many energy efficiency measures.
<b>Energy efficient product manufacturers</b>	Manufacturers of energy efficient products understand demand drivers and barriers in the energy efficiency market and can provide a useful perspective on how effectively incentive schemes could stimulate demand for their products.
<b>Energy Service Companies (ESCOs)</b>	ESCOs help their customers finance and implement energy efficiency projects and could play a key role in developing compelling offers based around new incentive schemes.

## Sampling frame

A variety of different approaches were used to identify sample populations from which to recruit interviewees, depending on the audience in question.

To target the most relevant participants for this research, potential end-user businesses were segmented by company size, number of employees, and by energy intensity, which was defined as the amount of energy used to produce a given output. Each of these dimensions was split into three categories (small, medium and large, for size; and low, medium and high, for energy intensity).

Company samples were purchased from Experian, an information services provider. Companies were selected from this sample against the quotas for depth interviews as shown in Figure 2 below. Sectors categorised as highly energy intensive were excluded from the purchased samples, and different research activities were planned for different size bands, as shown below:

- Small companies; focus groups,
- Medium-sized companies; depth interviews,
- Large companies: a combination of depth interviews and energy manager group events.

For the 'Commercial landlord', 'Energy efficient product manufacturer' and 'ESCO' audiences, a combination of publicly available lists, existing Carbon Trust contacts and purchased samples was used to create sample lists from which to recruit. Appendix D provides further detail on the approach and rationale.

Figure 2: Sampling Quotas and Planned Research Activities

Energy Intensity	H	Not target segments		
	M	SME Focus Groups (2 x 8 attendees)	10 user interviews	Energy Manager Event (1 x 8-10 attendees)
	L		5 user interviews	5 user interviews
		S <50	M 50-500	L >500
		Size (Number of Employees)		

## Recruitment

To recruit interviewees for depth interviews or attendees for the group events, SPA Future Thinking used their dedicated call centre to contact companies from the various sample lists. Potential participants were contacted by telephone, often using switchboards to reach the most appropriate person. A screening questionnaire was used to ensure relevance, and an incentive of £50 was offered for depth interviews (£100 plus travel expenses for group events). Interviewees and attendees who agreed to participate were then sent a letter confirming the appointment time and re-iterating the objectives of the research. Appendix A contains a copy of the letter.

Quotas were successfully reached for all the depth interviews. The number of completed interviews per end user segment is shown in Figure 3 below.

**Figure 3: End User Interviews by Size and Energy Intensity**

Company Size	Energy Intensity	Completed interviews
Small	Low / Medium	8
Medium	Low	5
Medium	Medium	9
Large	Low / Medium	8

The completed 'End user' interviews covered a range of sectors including light manufacturing; waste management; transport services; motor trade; retail; hotels & catering; and professional services. 13 of the 30 companies interviewed were in low energy intensity sectors, and 17 in medium sectors. 14 owned their premises, 12 rented, and 5 had multiple sites with a mix of owned and rented space.

In addition, quotas were reached for the other audiences, with 5 'Commercial landlord' interviews, 6 'Product manufacturer' interviews, and 6 'ESCO' interviews.

Recruitment for the group events was much more challenging, and one of the small company focus group events was cancelled due to the difficulty of recruiting enough participants, despite a high volume of companies invited by phone. As a result, 8 depth interviews with small companies were added to the interview quotas. Similarly, the large company energy manager event was poorly attended and the large company depth interview quota was increased.

## Carrying out the research

Interviews were almost always carried out over the telephone as this was the most practical option. A small number of interviews were carried out face-to-face in London.

For both the depth interviews and the group events, a detailed topic guide was developed to ensure a consistent approach to the research and to gain feedback from interviewees in a systematic way. A copy of the 'End-user' topic guide is included in Appendix C. The topic guides were modified for each audience group, in order to focus on the issues and research objectives considered most important for each audience, and were piloted at the beginning of the research.

To explore interviewees' attitudes towards potential incentive schemes and their characteristics, a set of example policy options were developed as a research tool to accompany the topic guide. These options were designed to provide a framework to explore interviewee views about the characteristics of incentive policies. They were not designed to reflect policies that DECC is considering introducing. The options were provided to interviewees in advance in the form of a one page grid that was sent along with the letter confirming the time of the interview appointment (a copy of the grid is included in Appendix B). These were then discussed during the interview to understand their overall reaction to each policy, their preferred option, and also to probe their preferences about the key characteristics of the policy options.

In most interviews respondents had received the grid before their interview, and had it to hand during the interview, however quite a few had not read it comprehensively beforehand. Of the 14 medium sized companies interviewed, 14 had received the grid but of those only 7 had read it properly beforehand.

There were three main options presented, with different variants for some of the characteristics. The options are described in Figure 4 below, in which the vertical columns correspond to the 'Options' discussed with interviewees, and the horizontal rows correspond to the 'characteristics' of those options.

Throughout the rest of this report, the terms 'options', 'characteristics', and 'variants' are used to differentiate between elements of potential policies. The term 'Option' refers to an example policy or scheme as a whole. 'Characteristic' refers to a feature of a policy, for example the timing of payments, or the role of third-parties. Each policy option might work in a different way for each of the characteristics: these are the 'Variants'. For example for the timing of payments there could be a monthly variant, or an annual variant. In summary, options are made up of characteristics, which have different variants. In the table in Figure 4 below, the 'variants' are the descriptions in the individual cells.

In the Findings section of this report, interviewees' views about, and preferences for, the different variants of the characteristics are explored, organised by characteristic. Finance is addressed first, with separate sub-sections covering the two variants of 'No upfront cost' and 'Loans' (loans are not included in the grid or in Figure 4 as part of an incentive scheme but explored as a possible alternative solution to capital constraint barriers).

**Figure 4: Characteristics of Potential Policy Options (in some cases, respondents were presented with more than one variant of a given characteristic – for example there were 4 variants of the incentive payment presented in Option C)**

Characteristic	Option			
	A	B		C
	No upfront cost	Lump sum rebate		Payment based on savings
Finance	No upfront cost - ESCO finances investment cost	None		None
Incentive payment: type & timing	Reduced bills once ESCO has covered investment cost (2-4 years)	Lump sum rebate of 10-30% equipment cost after installation		Series of payments over 4-6 years
				Upfront payment (based on estimate) with clawback if estimated savings are not achieved
Type of audit	Free audit from ESCO	Paid for audit, by a third party		Fixed price per KWh of energy saved
				or Variable price per KWh of energy saved
Role of third parties	ESCO does audit and installs measure	Does audit and installs measure	Does audit only	N/A (Apart from M&V)
M&V process	ESCO measures savings to calculate payments	Specific technologies are approved as eligible		Savings are verified by accredited third party

## Analysis

All interviews and group events were recorded and transcribed. Transcripts were reviewed in depth and the details and comments were summarised and entered into a spreadsheet

This summary spreadsheet was then analysed, looking for trends and relationships between preferences, comments, and contextual information. For example it was noted that many of the smaller companies stated that capital constraints were a barrier, and also preferred or liked the no upfront cost option.

This analysis was used to draw out themes and conclusions from the research. Emerging findings were discussed and checked with the researchers who conducted the interviews.

The following section presents the findings of this analysis.

# Findings

## Barriers

Interviewees spontaneously identified a wide range of barriers to implementing energy efficiency measures. These were consistent with previous studies on energy efficiency. Figure 5 shows the categories of barriers that were mentioned the most by end users and landlords: low priority, capital constraints, payback, expertise and decision making. The strength of the barriers varied by the size of the business interviewed; smaller organisations typically faced more barriers. In addition there were relationship issues, for example between landlords and tenants. The interviewees' thoughts on these barriers are explored in more detail below.

**Figure 5: Barriers for End Users and Landlords**

Barrier	Users			Landlords
	Small	Medium	Large	
<b>Low priority</b>	Critical barrier	Significant barrier	Not a major barrier	Significant barrier
<b>Capital constraints</b>	Significant barrier	Significant barrier	Not a major barrier	Mixed
<b>Payback</b>	Up to 3 years	Up to 3 years	Up to 3 years	Up to 5 years
<b>Expertise</b>	Significant barrier	Mixed	Mainly not a barrier	Mainly not a barrier
<b>Decision making</b>	Not an issue	Not a major issue	Can be a barrier	Can be a barrier (tenants)
<b>Other</b>	Very low energy bills; uncertain future	Fear of disruption	Fear of disruption	Landlord-tenant issues; listed buildings



### Low priority

Energy efficiency was not a priority for any of the small organisations interviewed, and was an area of focus for just a few of the medium ones interviewed. A few expressed some appetite to take some action. Energy was an insignificant cost for those that were least engaged; however even some of those who felt that energy was a significant cost struggled to find the time to focus on energy efficiency. Any spare money or time would be used to address other concerns – concerns that were felt to be more central to a company’s business – before energy efficiency was considered. The perception that financial savings would be quite small compounded this issue.

*“If it was a bigger investment, for instance I could do with more storage space, well if the right place came up at the right money... I wouldn’t think twice, I would do it but to spend 10 years to save a bit of money on electricity, it just wouldn’t enter your thinking, you just wouldn’t bother.”* (End user, small size/ low intensity, construction supplies wholesale)

For medium sized companies, energy efficiency was also not a priority however it was more actively considered and many companies said they were committed to some level. Greater interest was shown by end users with more intensive energy use or that had environmental policies.

*“We haven’t really implemented any or many [energy saving measures]. We are open to trying to do things. We have a general environmental policy that we recycle and we use as much of our packaging and waste....cardboard, paper, all that kind of stuff we recycle and reuse and send away for shredding or crushing, and haven’t yet really extended it to electrical savings.”* (End user, medium size / medium intensity, automotive parts wholesale)

Large company interviewees, most of whom were heads of sustainability or in similar roles, said that they were committed to energy efficiency. This was true for the lower intensity organisations as well as the medium intensity ones, the former citing broader issues than energy efficiency, such as sustainability and reduction of carbon footprints. For medium intensity organisations energy was a significant proportion of their cost base, and therefore received greater attention. A few said that energy efficiency had become a focus since the introduction of the CRC.

Most of the landlords were interested in implementing energy efficiency measures, but they were not a priority in and of themselves. However, some saw them as integral to maintaining and improving their buildings, and to reducing ‘void costs’ by making properties more attractive to tenants.

## Capital constraints

Capital constraints were a barrier, again more so for the smaller and medium sized organisations. Some users were capital constrained at the organisational level, particularly the smaller ones. Other users had capital available for their core business, but said it was hard to access this for energy efficiency measures. Reasons for the latter varied: organisations would prioritise investment in their core business, organisations had budget constraints, and others highlighted cash flow reasons.

*“We have a given budget and it's hard to make space for things like energy efficiency unless they have a very good return.”* (End user, medium size / medium intensity, business support services). Product manufacturers had varied views on the importance of capital constraints. Two of the five product manufacturers interviewed identified capital constraints as a key barrier, while one said it was a less relevant barrier than generally assumed, though they acknowledged that they mainly deal with larger companies.

*“This is the main barrier for end users, and this was greatly ameliorated by things such as the Carbon Trust loans. End users just tell me that getting the funding to upgrade from their existing systems to a new one is horrendously difficult. Also now there are much more capital constraints and people will not fund anything that is not absolutely mission critical.”* (Product manufacturer, radiant heating)

Some users said that capital constraints would drive them to focus on measures with lower upfront capital requirements.

The picture for landlords was more mixed, with some claiming capital constraints as a barrier and some not. One landlord had a dedicated “major projects” fund for each building, which could be drawn upon for any significant investments that needed to be made, including energy efficiency upgrades. While this money was not ring-fenced only for energy efficiency, it made it easier to finance energy efficiency measures (for example as part of a comprehensive building re-fit).

### Payback

Most users required payback periods of 1-3 years. This was often driven by how long the users were expecting to be operating from their property, particularly the case for small companies who either faced uncertain futures or hoped to outgrow their property.

*“This is certainly an issue preventing companies from investing, because they are renting their premises and don't see the point of investing in something that has a 5 year payback period, when they might have moved away already.” (ESCO)*

A small numbers of users were confident that they would be in their property for longer periods and so were comfortable with paybacks of up to 5-6 years, but no longer than this. Small companies generally did not use payback periods to assess the merits of individual investments, but to determine whether it was sensible to invest, based on whether they would be in the same premises for long enough to benefit from the savings realised. Landlords required payback periods of around 5 years, again driven by the length of tenancies.

*“If we are looking at justifying capital expenditure on things [that we hold long term], we would try to make sure that it's not going to get a look in if it's more than 10 years payback. If you are looking at something within asset management, because we trade those properties quite frequently, then it's going to have to be 5 years before it begins to get looked at.” (Commercial landlord)*

Some medium and large companies required investments to pay back within a defined period of two to three years. All potential investments, including energy efficiency, would have to meet these hurdle rates in order to get funded, and most interviewees made statements suggesting that they felt that energy efficiency measures would struggle to achieve these internal requirements. However, several larger companies understood that many energy efficiency measures can achieve these levels of payback.

*“I haven't actually come across an energy efficiency project that doesn't exceed our internal rate of return so there shouldn't be a problem in internally funding it.” (End user, large size / medium intensity, waste management)*

One of the product manufacturers made the point that if end users are not involved in the purchase decision, then even short payback periods may not make energy efficient equipment attractive. This is the case with new buildings where property developers may only be interested in installing the cheapest equipment, because unlike the future occupiers, they are not incentivised by energy savings.

*“Our product has a payback period of 2/3 years but still companies such as builders prefer to buy the cheapest option on the market and don't care at all about energy savings. We try to get to speak to end users if possible because they generally know that if they plan to stay in a place for 5 years or 10 years it's worth investing in energy efficient devices.” (Product manufacturer, heating)*

## Expertise

A number of end users commented that lack of expertise was a critical barrier. Levels of expertise generally increased with the size of the organisations interviewed. In general small organisations said they had very little expertise and the interviewers noted a general lack of understanding of the topic.

*“It's hard to know how you can save energy beyond the normal stuff like energy saving bulbs.”* (End user, medium size / medium intensity, manufacturing)

Interestingly several small users felt that their business was so simple that they would not need external help in identifying energy saving opportunities, either because they knew what the opportunities were or because they had already done the obvious things, so these organisations did not perceive lack of expertise to be a barrier, even though they admitted that they did not have any real expertise.

*“I suppose the short answer [to the question do you see opportunities to save energy] is not really, because the inverters that we've got in the offices as far as we know are about the most efficient way of doing the job.”* (End user, small size / low intensity, wholesale)

*“For us, absolutely obvious [what to do to save energy]. Double-glaze the building, change the light bulbs. That would probably halve our energy consumption or carbon consumption.”* (End user, small size / low intensity, professional services)

Most medium sized organisations also thought expertise was a key barrier, with the exception of a few that had dedicated resources.

The energy efficient product manufacturers viewed expertise as a key barrier for many organisations.

*“We see this as a strong barrier in the field of energy efficiency as companies usually only have good expertise in their core area and are not able to identify opportunities, they lack resources and capability.”* (Product manufacturer, energy efficient equipment)

Most of the landlords interviewed said they had ample internal expertise and did not see this as a barrier.

### Decision making

Larger organisations typically have more complex decision making processes, requiring more than one manager to sign off on a decision. Simplicity and any design that minimised the number or difficulty of sign offs was valued. Medium and large organisations and landlords also required a business case to be developed for energy efficiency investments. Simple, compelling investments were easier to get approval for from internal boards and committees. In a few occasions, interviewees mentioned the value of an audit as part of developing a robust business case.

*“For anything which is going to be truly game changing for the business in the UK, we’re going to have to get this through a Board and the Board accepts one piece of A4 paper per idea which makes it more complicated and I don’t think that’s terribly unusual.” (End user, large size / medium intensity, car manufacturer / retailer)*

### Fear of disruption

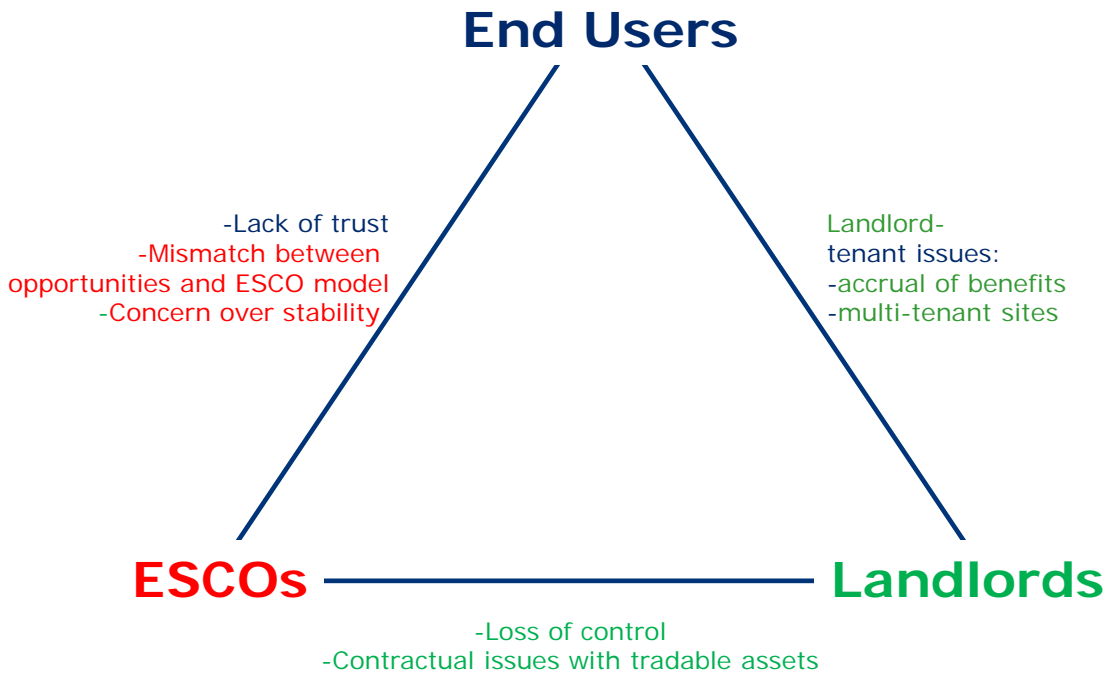
Several of the product manufacturers interviewed noted that end user customers said it was very important that installation of energy efficiency measures did not disrupt their day-to-day business. This concern was echoed by a few end user companies, but they tended to spontaneously mention other barriers such as capital constraints or low priority, rather than concerns about disruption. This disparity may be because once end users are in discussion with energy efficient product manufacturers, they have already overcome initial barriers such as the low priority placed on energy efficiency or capital constraints, and in their discussions with manufacturers, minimisation of disruption is an important aspect of the transaction that is to some degree within the control of the manufacturer / installer. For end users who see little benefit in taking action and are not actively considering it, fear of disruption may be a secondary or somewhat academic concern.

*“I suppose it’s just how it works in practice, how it might or if it might affect our regular day at work. Would that have any effect on anybody’s work here in the office?” (End user, small size / low intensity, financial services)*

## Relationship issues

Figure 6 illustrates some of the relationship issues between the three main actors that form additional barriers to those outlined above.

**Figure 6: Illustration of relationship issues between end users, landlords and ESCOs**



### End users & Landlords

Some of the landlords interviewed identified an agency issue – they had little incentive to invest in energy efficiency measures given their tenants would be the ones benefiting from lower energy bills, unless landlords incorporated energy provision into their service charges.

A small number of users had to get permission from their landlord to implement some energy efficiency measures, or were otherwise constrained by their landlord. A few raised the issue that they had little incentive to take action because the benefits would be shared by all other tenants via the service charge.

*“We only get billed a portion so there’s absolutely no reason for us to change to the most energy intensive light bulbs to anything or even think about double-glazing the building... Because what would happen is we’d invest and unless everybody in the whole building invested, we’d share our savings with everybody else.”* (End user, small size / low intensity, professional services)

*“Yes, well basically the building is like a cave inside, a big building, so installing anything is quite complicated and involves lots of permission from the landlord and the superior landlord and it’s very complicated”* (End user, small size / low intensity, bicycle retail and repair)

Landlords also raised an additional barrier associated with sites occupied by multiple tenants - getting all tenants to agree to measures was a challenge.

## End users & ESCOs

Many of the users mentioned that they would require third parties such as ESCOs to be reputable and potentially backed / vetted by Government. Some preferred to deal with those with whom they had existing relationships such as their energy suppliers, rather than a new third party such as an ESCO.

ESCOs raised a critical issue, which is that there is a fundamental mismatch between the types of energy efficiency opportunities identified by the users and those that they normally focus on. For instance, most users required paybacks of 1-3 years. The “traditional” ESCOs interviewed said that customers can and should finance these themselves. Most of the ESCOs interviewed focused on measures with longer paybacks of up to 15-25 years. In these cases the ESCO faces additional risks relating to whether the end user will still be in business at the end of that period.

*“There are 2 types of risk an ESCO has to work with. One is the technology risk in other words will their technology work, and the other is...will the company be in the business if I invest in that particular companies infrastructure, and if I stack the whole thing in a 7 year contract will the company be there to honour those obligations.”* (ESCO trainer)

## ESCOs & Landlords

Some of the landlords interviewed had concerns about working with ESCOs. One raised the issue that it makes trading property assets more complicated. This was particularly relevant to them because they trade properties quite frequently.

*“...Suddenly you have got an extra complication if you want to trade the asset on, so if you are looking at a company like ours which is trading assets quite frequently, then having a third party [ESCO] involved in it is very unattractive.”* (Commercial landlord)

Several ESCOs highlighted the same issue from their and the tenants perspective, with tenants wanting to enter into an agreement with the ESCO but landlords not wanting to sign off.

*“The tenant wants to do it, he wants to be green, he wants to reduce operational expenditure. The landlord is not interested especially if the contract is going to run on after the tenant departs, the landlord does not want to know. But even when the tenant is still there and the contract only runs during that time, again the landlord has to sign off. There are huge problems with that [that] we’ve come across.”* (ESCO)

In general, landlords were negative about forming potential relationships with ESCOs - some of the individual reasons mentioned include a preference for maintain more control over their properties and the fact that, under some landlord-tenant agreements it would be the tenants benefiting from the ESCO agreement.

## End-user views on incentive scheme characteristics

One of the objectives of the research project was to explore the importance of, and end user preferences for, the key characteristics of potential policy options, and to understand the degree to which these overcome barriers to energy efficiency. The example options described in Figure 4 above and discussed in the interviews were developed precisely to test these characteristics. The characteristics of most interest to DECC were:

- Finance: how are measures paid for?
- Incentive payment: what form is the benefit to the end user and when is it received?
- Audit: how are energy efficiency opportunities identified?
- Third parties: what is the role of third parties in the scheme?
- M&V: how are energy savings measured and verified?

These characteristics are discussed in turn below. An assessment is made of the overall importance of the characteristic to interviewees, and of the appeal of the different variants of the characteristic. The extent to which the variant in question would address the barriers perceived by interviewees is also assessed. Different variants of the characteristics also determined the degree to which end users find the scheme appealing (or off-putting); where interviewees commented on this we have summarised their comments under 'Perception of the scheme'.



### Finance

Finance, and the incentive payment characteristic, were the two most important characteristics – interviewees were most interested in these characteristics and they drove interviewees' choices. The finance characteristic had two variants:

- 'No upfront cost with repayments from energy savings'; and
- 'Loans' (not included in the grid, see Figure 4, as part of an incentive scheme but discussed with interviewees as a possible alternative).

These are explored in more detail below.

#### **No upfront cost with repayments from energy savings**

With this variant, a third party company finances and installs energy efficient equipment. The cost of the equipment is repaid through energy savings, leading to lower energy bills after 2-4 years. In order to minimise its risk, the third party would conduct an audit to identify the energy saving opportunities (free to customers).

#### Appeal

This was a popular variant with broad appeal. It was more popular the smaller the organisation, with it being the most popular variant for small organisations and one of the most popular for medium-sized organisations. Most organisations cited the fact that this variant required no upfront investment from their business as the reason they liked it, as opposed to the free audit or the lower energy bills they would ultimately benefit from. The analysis below illustrates how this variant impacted on more barriers than any other single variant.

*"The idea that the [third party] company would pay for the initial outlay, and the repayments are made through energy savings, and that guarantees us is very [attractive]." (End user, medium size / medium intensity, airport)*

#### Impact on barriers to energy efficiency

Interviewees felt that this variant would address **capital constraints**, **payback barriers** and **lack of expertise**. The impact on each barrier is explored in turn below:

##### Capital constraints:

The most common reason interviewees gave for liking this variant was that it addressed their **capital constraints** barriers, both the organisation not having sufficient capital at all, and the organisation not allocating available capital to energy efficiency measures.

*"If you take it at face value and it does what it says on the tin and we haven't got sharp practices or any of that nonsense which we've all got to look out for, I would have thought this is a very good way of getting things done a lot quicker than waiting till you can afford to do something and then make your savings." (End user, small size / medium intensity, hospitality & catering)*

Conversely organisations that were able to self-finance or preferred to take out loans did not value this variant. The link between this variant and capital constraints probably explains the correlation with company size.

### Payback barrier:

Several interviewees, both medium and large companies, did not like this variant, because they were able and wanted to make an investment themselves, financed either from their own capital or from a loan. They believed that the risk/return would be attractive and did not want to share the savings with a third party.

*“So, if we’ve got the capital to invest and we get a return on that and we see energy savings, then I think we would be more inclined to spend that money ourselves, rather than give the benefit to a third party company.”* (End user, large size / medium intensity, construction)

*“If somebody else pays for it, obviously they’re going to look for a return, obviously they’re looking at getting their money back over a time, and money in the bank doesn’t do anything whereas investing does.”* (End user, medium size / medium intensity, café and retail)

The few interviewees that commented on the timing of the reduction to energy bills had mixed feelings regarding its impact on certainty. Some thought that there was certainty in the reduction, others that 2-4 years in the future was too uncertain.

*“I would say the first one [is the preferred option] where you’ve got offered the free audit and you don’t really have any upfront costs because that’s the easiest to sell to our Head Office. There’s no extra costs, we’re just going to do this for free and then in the long term we’ll be making savings but they won’t have to make an upfront investment.”* (End user, Small size / low intensity, offices / business support services)

### Lack of expertise:

This variant partly addresses this barrier because a third party with expertise and knowledge of the risk and return of the measures is appraising the investment decision and taking the risk. A small number of interviewees highlighted this benefit explicitly. Furthermore interviewees with low expertise tended to like this variant more, and those with greater expertise tended to like it less.

### Low priority:

Interviewees did not say that this variant would increase the priority of energy efficiency. The variant lowers energy bills after 2-4 years. For most organisations lower energy bills were not a priority and this variant does not provide an additional incentive.

### Perception of the scheme

Scheme variants determine end-users’ perception of the scheme and the degree to which they find it appealing or off-putting to deal with. Interviewees commented on the following aspects of the ‘No upfront cost’ variant.

### Uncertainty:

Lack of certainty that energy efficiency investments would save as much energy as estimated was noted as a concern by some companies. Interviewees felt that a strength of this variant over loans was that it was very low risk, because the energy and financial savings were effectively guaranteed by the ESCO.

*“The great thing about it is it feels risk free and you haven’t got to put money upfront. To a participant, those are very attractive aren’t they? You’re not taking a risk and you’re not putting your hand in your pocket at the start.”* (End user, small size / low intensity, bicycle retail and repair)

### Trust:

Dealing with a third party is integral to the ‘No upfront cost’ variant (because they finance and install the measures), yet many interviewees were wary of working with third parties, expressing concern that third party suppliers would either not be capable of giving them useful advice, or would give them advice motivated by their own commercial interests. This was especially true for smaller companies. To overcome these trust issues they suggested that third parties be backed or vetted by Government. This could be through an accreditation scheme.

*“They could come here and give me lot of \*\*\*\*\*, you know and then charge me... to get somebody not knowing what they’re doing and they say ‘change this socket’ or ‘change this light bulb’, you know, I don’t need that”* (End user, small size / low intensity, café)

*“Is there anything to ensure that a company finds the most efficient answer rather than a high cost solution that they can say ‘Okay, you’re going to have to be paying this back for 4 years’ rather than maybe there’s another answer that they could be paying it back for 2 years because it’s in that company’s interests to sell the more expensive product to your solution.”* (End user, small size / low intensity, bicycle retail and repair)

As discussed in the ESCO section below, several of the ESCOs noted general trust and acceptance issues with the ESCO / energy performance contracting model in the UK.

*“There is some scepticism in the private sector towards this model because of the “liberal” practices of some of the early ESCOs who tried to cement customers in for a long period of time with a relatively high cost base, and there was dissatisfaction over that.”* (Product manufacturer, energy efficient equipment)

### A willing third party:

The third parties interviewed in this research, all ESCOs, were uncertain if it was economically viable to offer this option to small and potentially even medium-sized companies. The transaction costs were too high and the risk/return trades did not match – they normally target multiple, high capital expenditure items with typically longer payback periods. (We explain why in greater detail in the ESCO section.)

Box 1 below contains a case study of one of the interviewees, 'Business X', who found the 'No upfront cost' variant to be appealing. Business X is a medium-sized organisation where impending capital outlays created cashflow barriers which in turn drove their choice of this variant.

### Box 1: Case Study of Business X

Business X is a medium-sized wholesaler of parts and accessories for a major car brand, with warehousing space, workshops and sales offices. They rent the space from a landlord and are billed by them for the energy they use. Their biggest energy spend item is on lighting in the warehouse.

They have not really implemented any energy saving measures but are open to doing things and have a general environmental policy to encourage recycling etc but have not extended that to energy efficiency yet.

The main reason for not implementing any energy efficiency measures has been the initial outlay. They have looked at new lighting but it was quite expensive and the payback period was not good enough. They consider 5 years to be reasonable and are on a ten year lease, so would not go beyond that.

The most appealing option for Business X is Option A (where a third party identifies and finances energy efficiency measures at no upfront cost to the end user) for cashflow reasons because they expect a lot of capital outlay over the next few months. So if they wanted to do something at the moment, it would need to be that option.

They felt that option B, the 'Lump sum rebate', would be appealing at 30% if combined with a low interest loan. For Option C, 'Payment based on energy savings', they would need their landlord to get involved to prove the savings they had made and that extra complication made it less appealing.

### Loans

Loans were the other form of finance that was discussed with interviewees. They were not an explicit variant of any of the options tested, but were either spontaneously brought up or suggested by the interviewers to further explore views on finance.

#### Appeal

Opinions on loans were mixed, with an equal number of likes and dislikes. Interest in loans was mainly driven by whether or not the user could fund the investment internally. Most users that did not like loans held strongly negative views along the lines of “we don’t take out loans”. It was not clear if this was a formal company policy or an informal norm. A small number of users said the attractiveness of loans depended on the specific energy efficiency measure and the certainty with which it would payback within the loan timeframe.

*“Well we usually buy capital equipment, that’s our policy and we don’t take out loans. The 20% discount would be more appropriate for our business than the loan term.”* (End user, large size / medium intensity, wood panel manufacture)

*“Whenever I’ve spoken to my finance colleagues, I think their view is well we can really fund these things for ourselves and particularly if they’ve got ECAs, we can fund them ourselves and invariably the type of investments required, they’re actually small scale in the great scheme of things.”* (End user, large size / medium intensity, waste management)

#### Conditions

Interviewees all said that loans would either need to be low interest or interest free. A few interviews said that loan repayments would need to be covered by the savings, or that they would still need certainty over the payback of the project. The issue of how a loan would be secured was also raised.

*“If they’re on a par with commercial loans but you effectively know it’s being paid back through your energy savings then I would have thought that would be a reasonable incentive in itself.”* (End user, large size / low intensity, professional services)

*“If we had a loan but were uncertain about payback over the period and that that actually was a cost effective thing to do then we still wouldn’t do it because we’d have to have certainty.”* (End user, large size / medium intensity, waste management)

#### Impact on barriers to energy efficiency

##### Capital constraints

Interviewees cited loans as being an alternative solution to the ‘No upfront cost’ variant to addressing **capital constraints**. Like this variant, the degree to which they were appealing to interviewees principally corresponded to the capital constraints of the organisation. Some of the larger users explicitly said they did not want loans because they had sufficient capital.

This variant did not address any other barriers.

## Incentive payment

The incentive payment characteristic included the timing of the incentive: upfront, after installation, or a series of payments over time; and the type of incentive: a rebate or a payment based on energy saved.

The incentive payment and finance characteristics, analysed above, were the two most important characteristics.

## Lump sum rebate

With this variant, the end user pays for an audit from a third party company, and then the third party installs the energy efficient equipment. The end user pays for the new equipment but after installation receives a rebate worth 10-30% of the cost of the equipment.

### Appeal

The 'Lump sum rebate' was liked by many medium and large users as well as landlords and product manufacturers – with as many “likes” amongst these users as the 'No upfront cost' variant. It was far less popular amongst small and some medium-sized users, some of whom felt that they would still struggle to justify the investment.

### Impact on barriers to energy efficiency

A small number of interviewees felt that it would reduce the **payback period** the most. However this might have partly been because they had less detail on the size of incentive payments (on a per unit saved basis) of the 'payments based on savings' variant, and were thus uncertain about the impact of that variant on payback periods (explained below for that variant).

Most interviewees thought that it would not address any other barriers including priority and capital constraints barriers – organisations would still have to finance 70-90% of the cost of a measure.

*“The thing is it’s always going to be that initially getting the £20k. Where does that £20k come from? For the company to be able to take that from the monies they’re making... do they have £20k to put up as a lump sum first?”* (End user, medium size / medium intensity, soft furnishings manufacture)

### Perception of the scheme

Most users that liked this variant did so because of its **simplicity** and ease of administration, which they thought was crucial to any proposition. Some also liked the **certainty** it provided, because the incentive payment was paid based on proof of installation rather than verified savings.

*“[Lump sum is the most attractive] because it’s the instant one, isn’t it... No hassle, yes. At the end of the day you’ve got a business to run and you don’t want any more hassle, calling any other people up. Just get the deal done straight away.”* (End user, small size / low intensity, food wholesale)

### Conditions

Most users said that the rebate would need to be at least 30%. A few users thought that a 30% deposit would either not be enough or that the organisation would have already decided to implement the measure and would simply pocket the incentive, i.e. it would not stimulate additional action. Indeed, some of those who liked this option the best conceded when probed that it would be unlikely to actually change their behaviour. Additionality is also an issue for the variant of incentive payments based on energy savings, though no interviewer expressed the concern in relation to that option.

Box 2 below contains a case study of an end user who found the 'Lump sum rebate' (Option B) to be most appealing, because they did not want to share any savings with a third party and had some concerns about payments based on energy savings.

### **Box 2: Case Study of Business Y**

Business Y is a retail and catering business employing around 100 people over two sites. Their energy spend is around £75,000 per year.

The company takes environmental and ethical issues seriously, and benefitted from a Carbon Trust free site survey in 2007 that led to a 40% reduction in energy consumption, even though the business was growing at the time. They still feel that in terms of barriers to action, the main one is about getting good advice and being confident in the results.

If Business Y was looking at energy efficiency at the moment, they would be most interested in Option B, the 'Lump sum rebate' of 10-30% of the cost of energy efficient equipment. They have benefitted from energy efficiency action in the past and would prefer to finance any new investments themselves, rather than give a return to a third party (as in Option A, the third party 'No upfront cost' offer). They felt that as the business is in the position where it can afford to invest, they would get the most benefit from doing that way. Option C, 'Payments based on energy savings', also sounded attractive but there was concern about whether terms would be altered by the Government.



## Payment based on energy savings – series of payments

With this variant the end user pays for and implements energy efficiency projects, and receives an incentive payment based on the amount of energy saved. The payments are made as a series of payments over the following 4-6 years.

### Appeal

'Payments based on energy savings', both a series of payments or the clawback variant analysed below, were the least popular incentive variants, particularly amongst small and medium size organisations. It was liked by some large users and by product manufacturers. This was mainly driven by the ability of different sized companies to deal with complexity. (This ability is analysed in further detail in the "Perception of the scheme" section below.)

### Impact on barriers to energy efficiency

Some interviewees were concerned that the **payback period** would be too long. Most of these interviewees mixed up payback period and the length of time over which the series of payments would apply. Most interviewees needed payback within 3 years and thought that the 4-6 years over which the payments would be spread would mean they could by definition not achieve their required paybacks. In reality, payback within 3 years would be possible as long as the incentive (on a per unit of energy saved basis) was high enough.

Those that liked it, medium and large companies and landlords, particularly those expecting to be in / owning their properties for longer periods of time, thought it would give the **greatest savings**. However, it was difficult for them to choose between this and the other options without knowing the size of the payment. This contrasted with the 'Lump sum rebate' where a range of 10-30% was given.

Interviewees had mixed views on payback. Without knowing the size of the payments, interviewees could not assess the extent to which their organisations would **prioritise** energy efficiency measures as a result of such an incentive being available, and would therefore make more **capital** available to invest in these measures. This variant does not address lack of expertise barriers.



### Perception of the scheme

Most disliked this variant because of its **complexity**, particularly small and medium sized companies. Reasons included not having the capacity or expertise to understand and manage the scheme. Those that liked it, mostly large companies, were more sophisticated in their understanding of energy efficiency and the variants presented to them and were therefore comfortable with this complexity

Interviewees were divided on the **certainty** offered by this variant. Some thought it gave uncertain payments and would be difficult to manage cashflow. Other, more sophisticated organisations that could predict their energy consumption liked its certainty. Many organisations thought it sounded similar to feed-in tariffs and were worried about policy risk, i.e. that the Government would reduce the payments.

*“It [payment based on savings] sounds really good in principle, I suppose these schemes seem to sort of possibly come and go from the Government and you never quite know if it’s going to be quickly pulled from underneath your feet.”* (End user, medium size / medium intensity, retail & catering)

A few users thought it incentivised “the right thing” (i.e. saving energy) and would motivate individuals to use their buildings and equipment efficiently. This is not the case for the ‘Lump sum rebate’ variant, and only partially the case for the ‘No upfront cost’ variant, since it would reward savings generated by new equipment (financed by the third party) rather than behaviour change or more efficient use of existing equipment.

*“I edge more towards option five [payment base on savings], purely for the fact where we’re getting an incentive for reducing our energy usage.”* (End user, medium size / medium intensity, building and decorating)

### Conditions

A few interviewees were concerned that it would be difficult to measure savings, especially if an organisation was growing (but becoming more efficient) and wanted to be sure that relative efficiency improvements would be rewarded.

Box 3 contains a case study of a large organisation who found Option C most appealing because they found an incentive payment based on energy savings attractive.

### Box 3: Case Study of Business Z

Business Z is the UK division of a large car manufacturer, with warehousing and office facilities at a number of sites. They are in the CRC and consider themselves to be very active on energy efficiency.

While they felt that none of the options would dramatically change their approach, they found Option C ('Payments based on verified energy savings') to be best suited to their business because they are already taking action, and are able to finance investments themselves. They have a dedicated and experienced team and feel they can identify opportunities themselves, though they are open to working with consultants in specific cases.

The variable price variant of Option C was less appealing because of the additional complexity and because they feel that they understand energy price risk and manage it already.

The 'Lump sum rebate' Option B (10-30% rebate against the cost of energy efficiency equipment) was felt "unlikely to be a game changer", and with Option A ('No upfront cost' offer provided by third party) they were worried about loss of control.

### Payment based on energy savings - upfront with clawback

Like the variant above, the end user receives an incentive payment based on the amount of energy saved. However with this variant, the payment is made upfront based on estimated savings. Then if savings actually achieved are less than the initial estimate, the difference would be “clawed” back.

#### Appeal

Very few small companies were interested in the ‘Payment based on savings’ option at all because of its complexity and uncertainty (as explained above) so they did not have a view on the alternative variants such as upfront with clawback. Among the medium and large interviewees, views were equally divided on which they preferred between a series of payments or an upfront payment, based on an estimate of future energy savings, and a clawback if verified savings were less than the estimate.

#### Impact on barriers to energy efficiency

A few interviewees commented that they would prefer the upfront payment variant because it would help address **capital constraint** barriers. This preference was driven by their ability to finance the measure / cashflow themselves and therefore how important **capital** constraints were to them. Therefore this variant is likely to address barriers to a greater extent than the series of payments though without knowing the size of the upfront payment interviewees were not able to assess the extent to which it would increase prioritisation of energy efficiency.

*“Clawback would be attractive, because you get the cash upfront - good for cashflow and can forecast the reconciliation.” (Commercial landlord)*

#### Perception of the scheme

Some interviewees thought that the clawback variant was **too complex** – adding additional complexity to a concept, incentive payments based on energy savings, that was already relatively complex. Some interviewees thought that the clawback created too much **uncertainty**. Others thought the clawback was perfectly reasonable and not a significant deterrent to them. Interviewees’ perceptions of uncertainty were based on their confidence in their ability to estimate the savings. Overall, many found that the negative aspects of possibly having to pay back money if target savings were not achieved outweighed the cashflow benefit, hence the number who would prefer to wait for the series of payments over 4-6 years.

*“Absolutely prefer series of payments, no way we would want to give money back.” (End user, medium size / medium intensity, courier)*

Therefore, whilst this variant might address barriers to a greater extent than the series of payments, the perception of the variant was on balance more negative.

## Fixed vs variable price per unit of energy saved

For the two variants above, the payment could either be a fixed amount per unit of energy saved, or a variable amount to provide certainty if energy prices change. So if energy prices fell, the incentive payment would increase and vice versa.

### Appeal

Not many users commented on the difference between fixed and variable prices. A few made the point that in their experience, energy prices were only going up, and thus a variable price designed primarily to offset the reduced financial benefit (because financial savings per unit of energy saved would be lower) would be less valuable.

### Impact on barriers to energy efficiency

Interviewees valued **certainty**, however they did not realise that the variable price would increase the certainty of returns from energy efficiency, as the total benefit, the sum of the incentive payments and the financial cost saving, would be constant, even if energy prices fell.

### Perception of the scheme

Interestingly those that commented on **certainty** initially thought that the fixed price variant was more certain than the variable one. This misperception is most likely because the concept is both hard to explain and to understand. Indeed, most interviewees thought that the variable price variant was too **complex**. This was the main reason they did not like this variant.

*“Well I think [the fixed price] option is more attractive than [the variable price] option. I think [the variable] option is complicated... I can sign off activity up to a certain amount of money but for anything which is going to be truly game changing for the business in the UK, we’re going to have to get this through a Board and the Board accepts one piece of A4 paper per idea.”* (End user, large size / medium intensity, car manufacturer / retailer)

*Yes, and it’s [variable price variant] going to cause a nightmare. Myself personally, I’d say it would cause a nightmare, there’s too much negativity, I think, in option five [variable price], whereas option four [fixed] is just a very straightforward, you’ll receive x amount per unit that you save”* (End user, medium size / medium intensity, construction and decoration)

### Type of audit

Audits in general were of interest to the interviewees; they commented on audits to the same degree as the incentive payment characteristic. Audits were mentioned around a quarter of the time as one of the key reasons the interviewees liked the 'No upfront cost' variant.

Interviewees were given three variants to choose from:

1. Free, by an ESCO
2. Paid for, by another third party
3. Self-audit

### Appeal

Most small and medium users liked audits, as did landlords, because they addressed expertise and decision making barriers. This is analysed in more detail below.

### Impact on barriers to energy efficiency

The interviewees that liked audits valued the **expertise** of a third party in identifying energy efficiency opportunities; they did not have the same level of expertise in-house. These were generally small and medium-sized users.

*“There is absolutely [appetite for energy efficiency]. It’s more a question of bandwidth for us in terms of time we’ve got to devote to it... there’s a lot going on and we’re under-resourced in general but we want to do the research, if there was any way we could get any assistance or any expertise to help us that would be of great interest.”* (End user, small size / low intensity, fashion retail)

Large users were split between liking (free) audits (as part of Option A) and doing self-audits, partially because they had most of the expertise in-house. A small number of interviewees said that an audit would help make the business case to management, helping to address **decision-making barriers**. Some of the users cited examples where they had gone on to implement energy efficiency measures as a result of an audit.

## Perception of the scheme

Interviewees liked the audit because it was **free**. It is hard to distinguish whether this is the main reason they found it appealing or if they truly valued the extent to which it addressed their lack of expertise barrier above. Most medium-sized and large organisations had previously had energy efficiency audits, and in many cases these had been provided free of charge. Some of these audits had been funded by Government, and some provided by product manufacturers (e.g. lighting) to encourage customers to purchase and install their products. Receiving free audits in the past may have made them reluctant to pay in the future. However several interviewees did say that having had positive experiences of audits in the past, they would consider paying in the future.

*“Very positive on the audit, we could be willing to pay for one if it didn't cost too much, but free is better. (End user, small size / low intensity, business support services / offices)*

Some large users preferred to do self-audits was because they disliked working with third parties, because they feel that they have sufficient in-house expertise, or because they were concerned they would not get high quality advice.

*“I've had many [consultancies] knock at my door and very few I've been persuaded to let them go and have a look because I think we just take the view that we've got this in-house person who's an energy manager with 20 years' experience in industrial processes and he was the technical manager at our most energy intensive site and implemented some very effective energy efficient measures.” (End user, large size / medium intensity, waste management)*

Some also raised concerns that the audit would tie them into a contract with the auditor to install identified measures, or that the company doing the audit would put pressure on them to use their services.

*“I would be happy to have one [an audit] undertaken with the proviso that that's what it is and if they have recommendations, we would look at the recommendations but there would be no hard sell or guarantee that we take them up on those recommendations.” (End user, medium size / low intensity, hotels)*

## Conditions

Most interviewees required that the auditor be independent or accredited in some way. This was consistent with widely felt concerns about the trustworthiness or impartiality of third parties, which might mean they did not get the best possible advice.

*“I don't want to pay for an audit but I'm fine with a third party audit if they are certified and knowledgeable.” (End user, small size / low intensity, bakery)*

### Role of third party

#### Importance

The role of the third party was the third-most commented on characteristic. Interviewees were given three variants:

1. Third party does both the audit and the installation;
2. Third party only does the audit; and
3. Third party verifies the savings.

#### Appeal

Most interviewees liked the first variant with the third party doing both the audit and the installation. This was intrinsic to the 'No upfront cost' option (Option A) and it is hard to distinguish between a strong preference for this variant versus an overall preference for Option A, driven by the strong appeal of the no upfront cost variant (especially to those with capital constraints). Nevertheless, only a few interviewees disliked this variant. These were medium or large companies and landlords that did not like working with / did not trust ESCOs and a few large companies that could do both the audit and the installation in-house.

The second variant, where the third party only does the audit and is not involved in installation or financing, was only presented as a variant within the lump sum option (Option B in the examples provided). A small number of interviewees preferred this variant because they preferred to do the actual installation themselves.

Few interviewees commented on the role of third parties in verifying savings. Some observed that they were well used to being audited on other processes and were very comfortable with the idea of a third party conducting audits.

#### Conditions

Most interviewees felt it was important that the third party be reputable. This generally meant being backed / vetted by Government or accredited in some way. Organisations had different preferences for who they wanted the third party to be. Some wanted to work with their energy suppliers, with whom they have a trusted relationship; others wanted the third party to be independent from their energy supplier. Small companies did not like working with consultants; large companies were more comfortable working with consultants. Some interviewees preferred to deal with Government; others found Government "laborious".

*"Government is very laborious, too many barriers and while I appreciate there are rules and regulations, standards, whatever, it can become overly onerous in trying to get a relatively minor thing done."* (End user, medium size / low intensity, hotels)

*"Government backed schemes are reassuring and suggest certainty."* (End user, large size / low intensity, private landlord)

#### Impact on barriers to energy efficiency

The involvement of a third party in and of itself does not address any barriers to energy efficiency; it is the service which they provide that addresses barriers. These services are discussed elsewhere in this section under the relevant characteristic heading (e.g. audits). End users have particular preferences about the type of third party they want to deal with, hence the conditions discussed above.

## Measurement & Verification (M&V) requirements

Interviewees were given two variants that governed which technologies / energy efficiency equipment would be permitted under the scheme, each with different measurement and verification (M&V) requirements. These two variants were:

1. A list of pre-approved technologies that companies could choose from;
2. A project by project approach that would be verified by a third party.

## Appeal

The list of approved technologies was the most popular variant for most interviewees.

*“Probably just go for the first one [standard list] and know that it’s sort of approved rather than getting halfway down the line and finding out it’s not the right thing for the job... and then come to the end of the grant or whatever it is and find out you’re not going to get it anyway.”* (End user, medium size / medium intensity, retail & catering)

## Perceptions of the scheme

### Flexibility

No matter their preference for a list or a project by project approach, the interviewees valued flexibility. The list needed to be comprehensive and be flexible enough to, for example, keep an option for non-standard measures. They did not like the prospect of their chosen measure not being on the list.

*“I can see for somebody who was just starting out on this road, a standard set of contracts and a list of things that are supported would be very useful... For ourselves I think probably the flexible one where we could go and propose something. That might be better but we are a long way down the road of doing this ourselves.”* (End user, large size / medium intensity, chipboard manufacturing)

### Bureaucracy

Interviewees did not like bureaucracy. They thought that measurement of savings could be complicated and time / labour intensive. Some were worried about Government bureaucracy in particular and referenced the CRC in this context.

*“But what isn’t attractive is the potential for the bureaucratic process to take a lot of time to prove each individual investment decision resulted in some outcome. We’re already participants in the CRC and that’s quite a major bureaucratic exercise where we’re entrusted with providing figures. So actually thinking of someone coming to audit all the various investment decisions isn’t necessarily an attractive thing.”* (End user, large size / medium intensity, construction)

Some were unsure what verification would involve e.g. whether a single site visit or repeated site visits would be necessary, and to what extent simply looking at energy usage figures available online / offline would give an auditor the information they needed while having minimal contact with the user.



## Feedback from ESCOs

Six companies from the energy services sector were interviewed to explore ESCO attitudes towards the policy options and to understand how they might adapt their customer offers based on the potential policies. Three of the companies were 'pure' ESCOs offering the standard energy performance contracting model, one was a contract services company about to enter the ESCO market, one was an M&V specialist and one was a former ESCO founder now offering training and mentoring services to new ESCOs. All six had well informed and interesting perspectives on the ESCO market and the potential advantages and disadvantages of the options under consideration.

### View on the characteristics of possible schemes

The ESCOs felt that all three options presented had some appeal and they could see how at a high level they would help with their offers to customers. In most cases they wanted more detail to understand how the scheme would work and how they could develop their offers in response.

### Incentive payment

The '**No upfront cost**' variant was felt to be already happening through the current offers ESCOs have in the market, and interviewees were not sure there was a need for government intervention in that particular model. Other barriers than the economics of individual projects were felt to be the main issue (for example trust in the ESCO model as a whole).

*"Well the first thing that strikes me is that it's not new. That's happening right now... You're talking about an energy performance contract and I'm not sure why there has to be a Government payment on top of that, that's something that has been out in the marketplace." (ESCO)*

The '**Lump sum rebate**' variant was felt to be possibly too simple and would not incentivise actual energy savings (because payment is linked to proof of installation). It was also not clear to ESCOs what the risk was for them to bear (because the incentive is not dependent on achieving a certain level of savings), and ESCOs see risk-bearing as a core part of their offer and justification of their margin. As with some of the end user interviewees, one ESCO questioned whether a 10-30% discount would really be effective, on the basis that if a company can't invest £50k, they may not be able to invest 70-90% of that sum either. One ESCO saw potential for a discount scheme to help make smaller customers attractive to ESCOs.

*"The downside of that simplicity I suppose is that it won't encourage best practice... because there's no need to necessarily provide proof that that technology has actually generated savings." (ESCO trainer)*

*“But what’s the difference between £50k and £35K? ... If they’re not able to invest any money then they can’t invest £35K. I don’t necessarily think that by giving them a discount it’s going to incentivise them to do that. For those where if they’ve got funding, they’ve got funding. The whole idea here is incentivising those businesses that maybe haven’t got the available credit to do so and if they haven’t got £50K, they probably haven’t got £35K so I don’t think you’re necessarily targeting, you’re not necessarily targeting those businesses I think that probably need it more than anyone else. I think that’s less favourable, that’s my view.” (ESCO)*

*“Minimum energy spend is half a million pounds per year, then we can do business with you. With the rebate programme involved suddenly you can start dropping that down to perhaps £100K or £200K so you can get involved in a lot of SMEs.” (ESCO)*

**Payments based on savings** was consistently the most attractive variant for the ESCOs, mainly because it aligns well with the energy performance contracting model with which they are most familiar, in that it rewards energy savings. It was felt that this would encourage ESCOs to maintain equipment in order to maximise savings over time, whereas a ‘Lump sum rebate’ variant especially would not do that, because it is not contingent on savings. The variable price variant was felt by one ESCO to be less valuable in a world where most customers would expect energy prices to go up not down. The possibility of receiving the payments upfront, with clawback if projected savings were not realised, was potentially attractive because ESCOs are confident that the solutions they design will deliver the savings projected.

*“It [payments based on savings] places an emphasis on the maintenance of the equipment which is achieving the energy savings. It extends the role for an ESCO company to come in there. For some it might work better, because it’s not just a matter of putting in the equipment in and walking away, you have to continue making the same auditing to get the payment. So it would work better from all angles, I think.” (ESCO)*

*“[with payments based on savings] there’s potential for greater payments over the term of the ESCO I suppose... you own the assets over that 15-25 year period of what the ESCO would be but it certainly would keep you on top of ensuring that you’ve got the best solution and it’s well maintained” (ESCO)*

## **Role of third parties / ESCOs**

For any incentive scheme in which ESCOs play a major role, it is important that end users are comfortable working with ESCOs. The issue of a lack of trust in third party consultants was revealed in a number of the end user interviews (especially at the SME end of the size spectrum), and this was also noted by several of the ESCOs, who identified trust in the energy performance contracting model as one of the major barriers holding back the ESCO market. There is a concern among end users that a ‘No upfront cost’ offer is ‘too good to be true’ and that ESCOs are making profits at their clients’ expense.

*“The biggest barrier for ESCOs is selling and getting the concept accepted” (ESCO trainer)*

### M&V

M&V was an area of interest for most of the ESCOs interviewed, with a general consensus that M&V costs should be minimised as far as possible to avoid erosion of margins, and to make smaller projects viable. In general it was felt that M&V complexity should vary with overall project complexity.

Where possible standardisation could help minimise the costs, but too rigid an approach could miss good project opportunities. The M&V regime developed should be consistent with global good practice standards currently in use.

The Government, or scheme administrator, has a role to play in ensuring M&V is seen to be transparent, and verification specialists could be contracted by the scheme administrator rather than the ESCOs to address customer concerns about conflicted interests.

### How they would develop their offers

One of the main objectives of the ESCO interviews was to explore how ESCOs would develop their offers to customers based on possible incentive schemes. The ESCOs interviewed were not especially forthcoming on this question, either because they did not see the options as being that relevant to them, or because they needed more detail before they would be able to articulate how they would refine existing offers or create new offers.

*[Could you see a role for ESCOs such as yourself in identifying options and administering the scheme for customers?] “Possibly, I can’t see it as a model working for us. We are very much involved in the design, build and ownership of plant.” (ESCO)*

They did have some thoughts on the general role for government subsidy in helping grow the nascent ESCO market in the UK. As noted above, one ESCO saw potential for government subsidy in making smaller customers (precisely, customers with smaller energy bills) more attractive to ESCOs by improving the economics of the proposition to those customers. Another saw potential for government to reduce one of the main risks borne by ESCOs, that of customers going out of business during the life of an energy services contract, by providing some sort of guarantee.

*“Yes and I think this then goes into the detail doesn’t it? There’s high level, great, sounds good but as with many things, I think the challenge will be in the detail and how you deliver such a scheme. I’m thinking yes, it’s a great idea, that would really incentivise people giving them some money to do so but the other side of it is ‘okay fine but let’s have a look at the detail; let’s see how it really works’... I can see all sorts of challenges around how the Government goes about allocating but in theory that will work but I think it goes back to the detail again doesn’t it.” (ESCO)*

## Broader issues with the ESCO market

The ESCO interviews covered a number of wider issues in the ESCO market that would need to be addressed by or at least taken into account of in the design of a new incentive scheme. Several ESCOs stated that the market for energy performance contracting has not really taken off yet in the UK, especially compared to the market in the USA.

### Target project size and payback period

There was concern that there may be a mismatch between the customers and projects currently being targeted by ESCOs and the customers and projects that a new incentive scheme would be aimed at. Much of the success of the UK ESCO market has been in 10 year plus payback projects in the public sector (for example a new boiler system in a hospital), and several of the ESCOs interviewed identified these longer payback projects as their target market. In addition ESCOs typically target larger organisations with substantial energy bills (and correspondingly large savings potential). As a potential incentive scheme would likely be aimed at a much broader set of projects and organisations (including smaller businesses and shorter payback period projects) ESCOs may only be a delivery channel for a subset of participants and projects. One ESCO did consider the possibility that a subsidy scheme could make smaller customers (i.e. those with an annual energy bill of £100-200k rather than £500k) viable for their services.

*“If it’s a 2 or 3 year payback, most of the companies would do that themselves and fund that from their own investments. From our perspective, ESCO are supplying replacement boiler houses, energy centres with CHP or biomass, all that sort of thing” (ESCO)*

There was not consensus on these issues however, with one ESCO stating that his organisation targeted shorter payback period projects on the basis that their customers did not want to share savings with an ESCO over a 10 year period but would rather the ESCO was paid back quickly so they benefit from the savings to the maximum degree. Also where the ESCO has had to borrow to finance the project, longer projects could increase the financing charges which would be passed on to the customer.

*“Payback period, how long is too long? ...with realistic expectations, if it doesn’t pay back within 3 years, I’m not interested. Some people say well I’ll do a CHP for you, a biomass but it’s going to take 15 years to pay back, clients don’t want to know...” (ESCO)*

*“A lot of, most of the private clients we deal with 5 years is stretching it for them. Public sector not so much. They like the whole 10-15 year thing. I just think they’re getting ripped off but what do I care. If you want to go and get into a project that takes 15 years, I have to wonder, it makes no rational sense to me. If you can get the ESCO to take all the money upfront and be done in 4 years, you then enjoy 11 years of savings, 100% savings to yourself, why would you not go down that route?” (ESCO)*

Whatever the payback period, ESCOs consistently agreed that larger customers were more attractive, because they generally have more opportunity to make substantial energy savings, and because the transaction costs make small customers uneconomic. Where money needs to be borrowed to finance a project, it is easier to finance a single large project than many projects of smaller value.

*“I would typically think you would need it to start at £500,000 for an ESCO to get involved, to make it worthwhile to all parties.” (ESCO)*

*“If [the banks are] going to lend you something, they want to lend you £1m shall we say rather than £10,000.” (ESCO)*

*“The challenge will be economies of scale. I think as an ESCO, if you’ve got the opportunity of I don’t know, of making £5M worth of savings and that £5M of savings could come from 1 client as opposed to 150 different SMEs then that’s quite [challenging] so what can we do to incentivise ESCOs to actually have 150 SMEs on the books instead of 1 big heavy industry or manufacturing client and I think that that’s the challenge and that’s where I think not only do you need to incentivise the end user but you need to incentivise the ESCO to say okay well yes, I’m not going to go after the big boys; I’m going to actually get 150 medium enterprises because all of a sudden you’re now trying to sell your services to 150 clients as opposed to 1 client. I hadn’t thought that through enough because I think that’s the challenge.” (ESCO)*

# Appendix A

## Letter sent to confirmed interviewees

<Name>

<Address Line 1>

<Address Line 2>

<County>

<Post Code>

<Date>

Dear <Name>

Thank you for agreeing to help us in the research we are carrying out for the Department of Energy and Climate Change in association with The Carbon Trust.

As agreed our researcher (<Name>) will call you on <Date> at <Time>.

The research is intended to help DECC understand what might encourage organisations to take energy-saving measures. DECC wishes to understand what kind of scheme would be most effective in encouraging businesses to buy energy efficient technologies.

The attached grid shows some options that could help and encourage companies to identify opportunities for energy efficiency and to buy energy-efficient equipment.

All of the options assume organisations taking up the offer will **achieve energy savings** if they buy energy-efficient equipment/technology and the energy savings will be the same across all of the options for any given technology.

The attached grid summarises differences between the options in terms of:

- How organisations might identify opportunities to save energy
- How they might be assisted in paying for energy efficient technologies
- What benefits (apart from energy savings) each options might offer them
- When they receive the benefit
- The degree of certainty regarding the scale of financial incentives
- How the energy savings will be measured and verified

It would be helpful if you could look at the grid before the researcher calls.

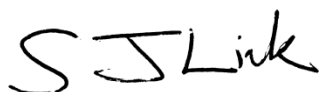
We are interested in which option or features initially strike you as most attractive (i.e. likely to encourage you to buy energy-saving equipment/technology) and why.

During the interview we will ask you about your views of the different options along each ROW (e.g. different options for identifying energy efficiency opportunities etc)

We are an independent market research agency working for DECC and the Carbon Trust. The interview will be conducted under the Market Research Society Code of Conduct and your anonymity will be protected. No-one will attempt to sell you anything as a result of your participation in this research.

We look forward to talking with you. The interview should take around half-an-hour.

Yours sincerely,

A handwritten signature in black ink that reads "S J Link". The letters are cursive and connected.

Stephen Link

Director



# Appendix B

Example policy options grid provided to interviewees in advance (attached to letter in Appendix A). This is the version provided to end user companies. Subtly different grids were provided to different audiences.

	Option 1	Option 2	Option 3	Option 4	Option 5
	<b>No upfront cost offer made by 3rd party</b>	<b>Investment opportunity presented by 3rd party</b>	<b>Upfront payment for improving energy efficiency</b>	<b>Series of fixed payments for improving energy efficiency</b>	<b>Series of payments linked to energy prices for improving energy efficiency</b>
<b>How are my energy efficiency opportunities identified?</b>	You receive a free energy audit from a third party company	You receive an energy audit from a third party company. The cost will depend on the complexity / size of your property	You receive an energy audit from a third party company. The cost will depend on the complexity / size of your property	You identify energy efficiency opportunities in your business yourself	You identify energy efficiency opportunities in your business yourself
<b>How are the installed technologies / measures paid for?</b>	Based on the findings from the audit, the third party company installs appropriate energy-saving technologies into your property at no upfront cost to you. They regain the cost of installation plus a profit through the energy savings that result	Based on the findings from the audit, the third party company installs appropriate energy-saving technologies into your property. You pay for them upfront	You install energy saving technologies and pay for them upfront	You install energy saving technologies and pay for them upfront	You install energy saving technologies and pay for them upfront
<b>What is the benefit to me?</b>	Reduced delay before you benefit from lower bills due to a subsidy payment received by the installer.	A lump sum payment of 10%- 30% of the cost of the technology / measure.	A lump sum payment of 10%- 30% of the cost of the technology / measure.	An incentive payment based on the energy savings you make, in addition to any financial savings.	An incentive payment based on the energy savings you make, in addition to any financial savings.
<b>When do I get the benefit?</b>	Once the cost of installing the measures has been paid off after 2-4 years, you receive the full benefit from lower energy bills.	Once you prove that you have installed the measure	Once you prove that you have installed the measure	You receive a series of payments spread over the next 4 years	You receive a series of payments spread over the next 6 years
<b>How certain is the benefit?</b>	The financial savings benefit can vary with energy prices.	Very certain – you will know the % subsidy amount before committing.	Very certain – you will know the % subsidy amount before committing.	You will receive a fixed £ per unit of energy.	The per unit payment varies according to energy prices.  When energy prices are high, and the energy-saving measures you have installed provide larger £ savings, the payment is lower (and vice versa).
<b>How are the energy savings measured and verified?</b>	The third party measures the energy savings made in order to calculate the re-payment	Specific technologies and products are approved as eligible to receive the subsidy	Specific technologies and products are approved as eligible to receive the subsidy	Energy savings are measured by you and verified by a third party accredited by the scheme	Energy savings are measured by you and verified by a third party accredited by the scheme



## Appendix C

Example depth interview topic guide. This is the guide developed for end users. Slightly different guides were used with other audiences to ensure the relevant issues were addressed.



# Exploring Policy Design to Increase Energy Efficiency

## Discussion Guide 8

Version: Users  
Prepared for: Carbon Trust/DECC  
Ref: jn1409/SL  
Date: 30 August 2012

## Introduction (5mins)

Research nature: On behalf of DECC, we are researching:

- Why people aren't implementing energy efficiency/carbon/cost saving measures and how they might be encouraged to do so
- Reactions to potential policies that DECC is considering
- What policy characteristics are preferred and most likely to stimulate activity
- How successfully or otherwise these policies may be in overcoming barriers to implementation
- The interview will last approx. 30 mins.

Reassure on confidentiality: "I work for SPA FT (an independent and impartial market research consultancy). All information you share with me is treated in the strictest of confidence, we do not directly attribute comments back to any individual or individual company and you will not be re-contacted again as a result of taking part in this survey."

### **GAIN PERMISSION TO RECORD**

- Name
- Job role/title and length of time with company/in this position
- Nature of business
- Business location/size (one vs. multi-site)
- Does the business own the premises or is there a landlord? Is the company billed directly for energy usage by their supplier? Would the business have to seek approval from the landlord before purchasing new (energy efficient equipment? (if so, explore later how this might affect interest in the options presented)
- We're interested in energy quite broadly including heating, air conditioning and office equipment. Does the business own equipment such as industrial motors or pumps which use high levels of energy?
- If so, have you considered/investigating replacing such equipment? With what result? Would these be expensive to replace?

## Environmental Initiatives & Planning (5mins)

- What is company policy / stance re. environmental issues
  - How are current initiatives managed / planned / co-ordinated (centrally / dedicated person vs. more ad hoc / down to individuals)
  - Who makes / is involved the decision
- How does the business currently manage energy usage?
  - Who looks after energy management in you organisation?
  - Do you use in-house energy managers, employ energy service providers or use their landlord's building managers?
- What, if any, initiatives or carbon saving measures have been implemented to date
  - When initiated
  - How successful have they proved
  - How is success measured
- How are energy saving / efficiency projects funded? Is there a specific budget allocated to energy saving / efficiency?
- 

## Identification of Barriers (5mins)

- What is the current appetite for implementing (further) energy efficiency measures within your business
- What are the main reasons why the company isn't implementing any (further) implementation of energy efficiency measures. **PROMPT WITH EACH OF THE BELOW IF NOT ALREADY MENTIONED.(IF THIS SECTION IS TAKING TOO LONG ONLY THOSE AREAS MENTIONED SPONTANEOUSLY BY RESPONDENTS WILL BE PROMPTED). SUB BULLETS USED TO CLARIFY WHAT WE MEAN.**
  - Lack of funds
    - Would there simply not be the money available even if this was considered a priority?
  - Lack of information / expertise
    - Do they feel they know how to reduce their energy consumption/increase their efficiency? Have they had energy efficiency audits? Who might they go to for advice?
  - Low priority
    - Other possible investments rated higher priority
    - Finance available only for top priorities. Why? What would make energy efficiency a higher priority? What level of savings might be needed?
  - Confusing supplier landscape
    - Do they feel they know where to go to for help?
  - Lack of resources / time

- Are people able to investigate options? Would working with experts/ESCOs solve this problem?
  - Uncertainty of ROI/Payback period too long
    - Do they feel they could calculate return on investment?
    - If not to what extent does this act as a barrier to investment
    - What kind of payback period would they be looking for?
  - **IF HAVE LANDLORD** Landlord [or subsequent tenants] gaining benefit
    - Is this a disincentive?
- Which of these are the most important barriers?
- Does the importance of these barriers vary across different fuels or different potential project

## REACTIONS TO EXAMPLE POLICIES (15mins)

**Setup:** Before this interview we sent you a table that presents a framework for the different types of policy that DECC could introduce in the future. This research sets out to explore your reactions to these to ensure policy is designed with businesses, like yours, in mind.

[See Appendix B for the options grid provided in advance.]

- Faced with a choice of the different policies under this framework, which do you think is the most attractive or motivating for your business?
- Why is this policy the most attractive?
  - What features or benefits of that particular policy do you find the most attractive and why?
  - How, if at all does this help you overcome the barriers we have talked about previously?

I would now like to talk through in detail each of the specific areas that the policy framework covers beyond what you have already talked about.

## Identifying Your Energy Efficiency Opportunities

- Do you have a preference for any of these options / which would be more likely to stimulate the business into action?
- Why?

- What is the rationale for rejecting the other options? (We will establish if any elements would be rejected outright so any option featuring those elements would be disregarded)
- Why is option x less appealing (if not rejected outright)

### IF NOT MENTIONED PREVIOUSLY

- Have you had an energy efficiency audit in the last 2-3 years?
  - If so, was it helpful?
  - Did it stimulate action within the business? Why / why not?
- Do you feel that you are sufficiently able to identify energy efficiency opportunities yourself?
  - What is the basis for this?
  - Would you find it valuable to have a third party help you to identify energy efficiency opportunities?

### ASK ALL

- Does the offer of an audit fulfil a need that the business currently has?
- Under the types of policy offered here would you have a preference for what type of organisation conducted the audit? E.g. an independent organisation, equipment or energy supplier?
  - Why do you have this preference?
- *It **might** be necessary to establish that **technology that you are buying** is eligible for support from the scheme. Would you prefer:*
  - *To choose from a “menu” of standard contracts, with basically the same terms for all qualifying businesses – even if this restricted the type of project you could implement*
  - *Or project by project approval by a central regulator, where you could apply for funding for any project that could be proven to save energy*

### Paying for energy efficient technologies or measures

- Do you have a preference for any of these options / which would be more likely to stimulate the business into action?
  - Why? How does this relate to the barriers?
- What is the rationale for rejecting the other options?
- Why are other options not as appealing if not rejected outright?

**IF UNABLE TO GIVE RESPONSE** Who would be the person within the organisation who would best be able to answer, what kind of factors would be taken into account when making this decision.

## Loans

**EXPLANATION:** Another route might be to finance energy efficiency measure through loans. Would you be interested in a loan that is specifically intended to fund energy efficiency improvements? Why/Why not?

- To what extent would the offer of a loan overcome the barriers to investment mentioned earlier?
- Would this depend on whether the loan was offered at market interest rates, or lower interest rates? Would this need to be at an extremely competitive rate to be of any interest? If respondent feels they are able to answer – what kind of interest rate would make the loan attractive, 5% (more or less)?
- (If they claim a loan at standard interest rates would stimulate action establish why action not previously taken)
- Would it depend on length of loan? What payback period/length of loan would make this attractive? What if the loan was 2/4/7 years?
- Would a loan by itself be enough to stimulate action within your organisation? If not, why not? What about a loan with an audit?

## What is the benefit to me

- Do you have a preference for any of these options / which would be more likely to stimulate the business into action?
  - Why? How does this relate to barriers?
- What is the rationale for rejecting the other options?
- Why are other options less appealing (if not rejected outright)
- What do they think of the suggested 10-30% payment? If insufficient, what level might be motivating?

## When do I get the benefit

- Do you have a preference for any of these options / which would be more likely to stimulate the business into action?
  - Why?
- If they would consider a series of payments would they prefer to receive these monthly or annually?
- What is the rationale for rejecting the other options?
- Why are other options less appealing (if not rejected outright)

### IF NOT ALREADY MENTIONED

- How important is the timing of the benefit to your business?
- Would you (still) favour payments before energy savings had been demonstrated if you risked having to pay back money if the energy savings were less than expected
- Over what sort of period would you normally expect a similar investment to pay for itself?
  - Would 4-5 years be acceptable?
  - What about 10 years?
    - What levels of financial saving would make this scheme attractive (e.g. 5% saving on energy matched by equivalent saving)

### How certain is the benefit

- Do you have a preference for any of these options / which would be more likely to stimulate the business into action?
  - Why?
- What is the rationale for rejecting the other options?
- Why are other options less appealing (if not rejected outright)

### IF NOT ALREADY MENTIONED

- How important is the certainty of the benefit to your business?
  - Why?
  - **IF VERY IMPORTANT** Why is it important given the potential uncertainty over how much energy you could save?
- Would you expect confirmation that the project would definitely receive incentive payments before or after the project was implemented?
- For the variable schemes, how important is it to have a fixed price per megawatt hour? Why?

*Another option would involve levels of payment determined by other means for example, you might receive a tradable certificate for every MWh of energy savings you make but the value of that certificate could vary depending on the supply and demand for certificates.*

- Is this more or less appealing than the options offered? Why?
- **IF NOT APPEALING** Would this option become appealing if there was a guaranteed floor price so you had a guaranteed minimum level of savings?

### Measuring the energy saved

- It **might** be necessary to establish that **technology that you are buying** is eligible for support from the scheme. Would you prefer:
  - To choose from a “menu” of standard contracts, with basically the same terms for all qualifying businesses – even if this restricted the type of project you could implement
  - Or project by project approval by a central regulator, where you could apply for funding for any project that could be proven to save energy
- Do you have a preference for any of these options / which would be more likely to stimulate the business into action?
  - Why?
- What is the rationale for rejecting the other options?
- Why are other options less appealing (if not rejected outright)
- **IF OPTIONS 4 OR 5 PREFERRED “THIRD PARTY MEASUREMENT”**
- Would you prefer an upfront payment based on estimated savings?
- The schemes would be set up to reduce energy usage. Would you accept penalties if the energy savings achieved were later measured and found to be less than expected?)

## Delivery Channel

- If you were to implement energy efficiency measures under one of these schemes, what type organisation would you prefer to deal with? **PROMPT IF NECESSARY**
  - Directly with government?
  - Through a third party?
    - What type or third party would this be? E.g. existing energy supplier? Landlord? Equipment supplier
  - What is driving your preference? E.g. expertise, perceptions of cost, resources (or lack of them), complexity of the scheme

## Overview

- So would a scheme based on rewarding reduced energy usage be appealing? Why/Why not?
- How would the scheme need to be structured for you to take advantage of the scheme?
- Are there any other features or benefits of the scheme that (would) need to be articulated that might affect your interest?
- Would the scheme need to cover all energy or could a scheme focussed just on electricity be attractive

**END**



# Appendix D

## Additional detail on research methodology

This Appendix provides further detail on the methodology used, including the overall approach, the sampling quotas used, the recruitment process, how the research fieldwork was carried out and how it was analysed.

### Overall approach

The project set out to answer the research questions through a combination of structured telephone depth interviews and in-person group sessions. Interviews were conducted with different types of organisations from several different audiences in order to explore how answers might differ across these audiences and to probe specific issues. The different audiences involved are laid out in Figure A1 below:

**Figure A1: Research Audiences**

Audience	Rationale for inclusion
<b>End user businesses</b>	End user businesses in the industrial and commercial sectors are responsible for the majority of energy consumption and would be the primary participants in any incentive scheme. Understanding their attitudes and preferences is essential.
<b>Landlords</b>	As the owners of building assets, landlords are important stakeholders and decision makers in the implementation of many energy efficiency measures.
<b>Energy efficient product manufacturers</b>	Manufacturers of energy efficient products understand demand drivers and barriers in the energy efficiency market and can provide a useful perspective on how effectively incentive schemes could stimulate demand for their products.
<b>Energy Service Companies (ESCOs)</b>	ESCOs help their customers finance and implement energy efficiency projects and could play a key role in developing compelling offers based around new incentive schemes.

## Sampling frame

A variety of different approaches were used to identify sample populations from which to recruit interviewees, depending on the audience in question.

### End users

To target the most relevant populations for this research the universe of end user businesses was segmented by company size, defined by number of employees, and by energy intensity, defined broadly as the amount of energy used by a business to produce a given output. Each of these dimensions was split into three bands to make a nine cell matrix (see Figure A2 below). For company size the small, medium and large bands were respectively: less than 50 employees; 50-500 employees; and more than 500 employees. The energy intensity bands (low, medium and high) were not defined using values but an assessment and categorisation of the energy intensity of the sector in question (based on SIC sector codes and descriptions). Each sector was classified as low, medium or high.

Because they are already subject to a number of policy measures designed to encourage energy efficiency (e.g. the Climate Change Agreements (CCAs)), and because energy is a significant cost (as a % of revenue), businesses in sectors with high energy intensity (e.g. steel manufacture) were excluded from the sample, on the basis that they are already highly incentivised to take action on energy efficiency. For example, 53 of the 54 sectors eligible for CCAs had their Agreements renewed during the most recent period<sup>1</sup>. CCAs are only available to sectors that “meet challenging targets for improving their energy efficiency or reducing their carbon emissions”<sup>2</sup>. The incentive schemes under consideration are designed to influence energy users who are not currently taking significant action on energy efficiency.

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<sup>1</sup> See “Climate Change Agreements: Results of the Fifth Target Period”; report for DECC by AEA, 2011

<sup>2</sup> From DECC website <http://www.decc.gov.uk/en/content/cms/emissions/ccas/ccas.aspx>

While the incentives are potentially relevant for businesses of all sizes, a different research approach was planned for different sized businesses:

- For small businesses, it was initially felt that focus group sessions might work better than depth interviews. This was because participation in a group encourages a thoughtful and considered approach, especially among individuals who are not expert in energy efficiency issues, and because group events can lead to participants building on each other's ideas, resulting in more productive discussion than one-to-one interviews.
- For medium and large organisations depth interviews were planned. Medium and large sized companies can be quite complex, and we felt it was important to understand a little about each organisation and the context in which decisions were made. In larger companies we expected the interviewees to have significantly more specialist knowledge about energy efficiency and to be more engaged in the subject, and depth interviews offered the best opportunity to discuss the key issues in detail.
- For large companies (more than 500 employees) an additional group session was planned with energy managers from those companies to discuss topical issues. We expected a group event with well-informed participants to lead to a very productive discussion with in-depth exploration of the key issues.

Figure A2 below shows the sampling quotas and the research approach planned for each organisation type.

**Figure A2: Sampling Quotas and Planned Research Activities**

Energy Intensity	H	Not target segments		
	M	SME Focus Groups (2 x 8 attendees)	10 user interviews	Energy Manager Event (1 x 8-10 attendees)
	L		5 user interviews	5 user interviews
		S <50	M 50-500	L >500
		Size (Number of Employees)		

As shown in Figure A2 above, 20 depth interviews were targeted with medium and large sized companies of low and medium energy intensity, complemented by focus groups with small companies and a group event with energy managers from large companies.

To identify companies within the segments, company samples were purchased from Experian for the low and medium energy intensive sectors. When companies were contacted, the energy intensity classification (and size information) was checked and companies were either re-assigned to other segments or excluded if the original SIC code or size information was incorrect.

### Other audiences

For other audiences, simpler approaches were used as follows.

For the small number of landlords and ESCOs targeted (5 interviews in each category), publicly available lists and sources were used along with existing contacts of the Carbon Trust and SPA Future Thinking. This approach was used because it seemed the most pragmatic solution given overall project time-constraints and because obtaining contact details for commercial landlords in the public domain is challenging. The landlords in the Carbon Trust's contact databases may be more engaged in energy efficiency issues than the general population, but this was not felt to introduce bias into the final sample, not least because during the actual end user recruitment, several contacts among the purchased samples for end users turned out to be landlords and these were recruited into the landlord quota.

For energy efficient product manufacturers, the publicly available Energy Technology List database was used to identify sample lists from which to recruit the 5 manufacturer interviews targeted. These covered a wide range of different technologies.

For large company energy managers, the Carbon Trust's database of energy manager contacts was used, because given the overall time constraints and the added difficulty of identifying companies that actually have energy managers, it was felt to be most pragmatic and cost-effective to use this resource. This was not felt to bias the research because within the energy manager universe, having contacted the Carbon Trust does not necessarily indicate that that individual is more engaged than those that have not (whereas among small companies, it certainly would indicate above average engagement in the issues), in addition we believe most large company energy managers in the UK have contacted the Carbon Trust at some point and are therefore in the database. For example 75% of the FTSE100 have been Carbon Trust customers.

### Recruitment

To recruit interviewees for depth interviews or attendees for the group events, SPA Future Thinking used their dedicated call centre to contact companies from the various sample lists, in general using the head office switchboard to reach relevant individuals as outlined below:

- For end user companies, the caller asked to speak to the individual who would best be able to discuss how their organisation would respond to possible energy efficiency incentive schemes. In small companies this tended to be the proprietor / partner / director. This was also true in medium-sized companies but in several cases the interviewees held roles such as energy or procurement manager, or positions in finance. In large companies we typically spoke to energy / sustainability managers, and sometimes procurement managers.
- For commercial landlords, in some cases we had named contacts (e.g. from Carbon Trust lists). In other cases we asked to speak to the person best able to discuss "how the organisation might respond to the Government incentivising commercial landlords to make energy savings at their properties".

- For ESCOs and product manufacturers we asked to speak to the person best able to comment on Government “efforts to encourage companies to make energy savings”. At these organisations we typically spoke to a Sales Director or Business Development Director.

To ensure we spoke to the most relevant organisations, we used a series of screening questions to confirm the relevance of companies (and to check size and energy intensity information), and only recruited companies who met the criteria, including confirmation that they would consider taking advantage of a financial incentive to reduce their energy use.

Potential interviewees were offered an incentive of £50, and potential attendees at group events were offered £100 plus travel expenses. Once companies had confirmed that they were happy to participate in either interviews or a focus group, they were sent a letter that confirmed the time of the appointment and the purpose of the research, and re-emphasised points made during the initial call about anonymity, data protection and any follow-up. A copy of the letter is included in Appendix A.

Hitting the sample quotas for the depth interviews proved to be reasonably straightforward, with target numbers achieved for all segments (see Figure A3 for final end user numbers by size and intensity band), however, recruitment for the group events proved to be challenging.

For the small company group events, we purchased lists of small London-based companies with 5-20 employees from Experian, screening out those with SIC codes which suggested they might be highly energy intensive (using the categorisation developed for general recruitment and outlined above). Participants were telephoned using a screening questionnaire to confirm eligibility. This questionnaire confirmed that the individual had responsibility (sole or joint) for decisions about buying (energy efficient) equipment. Participants also had to confirm that they were potentially interested in initiatives that would reward them for purchasing energy-efficient equipment.

Most calls were made during the normal working day from 9am to 5pm but we also experimented with making weekday evening calls from 5 to 9pm and calling from 10am to 4pm on Saturdays. When calling numbers drawn from the sample, priority was given to those addresses within W1 or W2 postcodes before we branched out to other parts of London. The venue was in Central London and we wanted to keep participant journey times short to encourage participation. When respondents indicated interest we followed up with emails confirming the date/time/venue and encouraging them to attend. On the Friday and Monday before the Tuesday group, we followed up with additional phone calls to confirm attendance.

Over 1,500 companies in the Greater London area were contacted by telephone, with only 8 agreeing to take part in an event (of whom, 6 attended on the day). As a result of difficulties in recruiting the first group, and the fact that some said they were happy to take part in research but were unable to attend an evening focus group, the second event was cancelled and an equivalent number of small company depth interviews was planned.

The large company energy manager event was also difficult to recruit for. The contact sample was drawn from Carbon Trust listings of large companies with energy managers, supplemented with samples of large London-based companies drawn from Experian. Again, we prioritised central London-based companies, but did contact those in other parts of the South East as well. In total, 425 large companies in the Greater London area were contacted by telephone. There was a lot of interest but we struggled to find people able and willing to

attend the session. 6 agreed to participate. Again, we sent follow-up emails and made follow-up calls, but had several late withdrawals, and on the day only 2 turned up. As with small companies, the number of depth interviews was increased.

As a result 47 depth interviews were completed in total, with 30 company end user interviews and 17 interviews across the landlord (5), product manufacturer (6) and ESCO (6) categories. The breakdown of end user interviews by size and energy intensity is shown in Figure A3:

**Figure A3: End User Interviews by Size and Energy Intensity**

Company Size	Energy Intensity	Completed interviews
Small	Low / Medium	8
Medium	Low	5
Medium	Medium	9
Large	Low / Medium	8

## Carrying out the research

Interviews were almost always carried out over the telephone as this was the most practical option, especially in the many cases where the interview was rescheduled at quite short notice by the interviewee. A small number of interviews were carried out face-to-face in London.

For both the depth interviews and the group events, a detailed topic guide was developed to ensure a consistent approach to the research and to gain feedback from interviewees in a systematic way. A copy of the end user topic guide is included in the Appendix C. The topic guides were modified for each audience group, in order to make them as relevant as possible and to focus on the issues and research objectives considered most important for each audience.

The guide was piloted with an end user and a commercial landlord and as a result of feedback minor changes in emphasis were made with less time spent on barriers.

To explore interviewees’ attitudes towards potential incentive schemes and their characteristics, a set of example policy options were developed as a research tool to accompany the topic guide. These options were designed to provide a framework to explore interviewee views about the characteristics of incentive policies. They were not designed to reflect policies that DECC is considering introducing. The options were provided to interviewees in advance in the form of a one page ‘grid’ that was sent along with the letter confirming the time of the interview appointment, a copy of the grid is included in Appendix B, and then discussed during the interview to understand their overall reaction to each policy, their preferred option, and also to probe their preferences about the key characteristics of the policy options.



There were three main options presented, with subtly different alternative options for two of the options (so 5 options in total were presented to the end user audience). The options are described in Figure A4 below.

**Figure A4: Policy Options Presented (as a Research Tool)**

Option	Description	Alternative Option
A - No upfront cost	End user receives a free audit from a third party company, who then finances and installs energy efficient equipment. The cost of the equipment is repaid through energy savings, leading to lower energy bills after 2-4 years.	N/A
B - Lump sum rebate	End user pays for an audit from a third party company, and then the third party installs energy efficient equipment. The end user pays for the new equipment but after installation receives a rebate worth 10-30% of the cost.	End user installs the equipment themselves.
C – Payment based on savings	End user pays for and implements energy efficiency projects, and receives an incentive payment in the form of a fixed amount per unit of energy saved. The payments are made over the following 4-6 years.	The amount of the incentive payment per unit of energy varies, to provide certainty if energy prices change. So if energy prices fell, the incentive payment would increase.

Because the research was designed to explore what determines the appeal and effectiveness of particular policy options, the example options were presented as a combination of key characteristics, which varied from option to option.



The characteristics were as follows:

- How are energy efficiency opportunities identified?
- How are the measures paid for?
- What form does the benefit to the end user take?
- When is the benefit received?
- How certain is the benefit?
- How are energy savings measured and verified?

The example policy options featured these characteristics in different combinations, as shown in Figure A5 below.

**Figure A5: Characteristics and Variants explored in each option**

Characteristic	Options			
	A	B		C
	No upfront cost	Lump sum rebate		Payment based on savings
Finance	No upfront cost - ESCO finances investment cost	None		None
Incentive payment: type & timing	Reduced bills once ESCO has covered investment cost (2-4 years)	Lump sum rebate of 10-30% equipment cost after installation		Series of payments over 4-6 years
				Upfront payment (based on estimate) with clawback if estimated savings are not achieved
Type of audit	Free audit from ESCO	Paid for audit, by a third party		Fixed price per KWh of energy saved
				or
Role of third parties	ESCO does audit and installs measure	Does audit and installs measure		Variable price per KWh of energy saved
M&V process	ESCO measures savings to calculate payments	Specific technologies are approved as eligible		Self-audit
				N/A (Apart from M&V)
M&V process	ESCO measures savings to calculate payments	Specific technologies are approved as eligible		Savings are verified by accredited third party

During the interviews, each of these aspects was explored, in order to probe underlying preferences about the characteristics that make up policies, and to assess the importance of those characteristics to interviewees, as well as their effectiveness in overcoming the barriers to energy efficiency.

The researchers felt the grid was effective, and helped people to consider the various options and possible scheme characteristics. They found no evidence that seeing the grid in advance of the interview affected interviewee responses to introductory questions about barriers to energy efficiency.

Interviewees used the grid to choose between the five vertical options but also to pick up on specific scheme characteristics they liked or found off-putting. One of the benefits of having the grid and seeing the options expressed vertically is that interviewees could consider characteristics of a scheme that were interdependent, for example a series of incentive payments based on savings would require some form of external M&V.

In most interviews respondents had received and looked at the grid before their interview and had it to hand during the interview. There were interviews where:

- the interviewee had looked at the guide before the interview but could not remember much about it;
- the interviewee said they had not received the guide;
- the interviewee had received but not looked at the guide.

In these circumstances, the interviewer described three basic options (A, B and C as per Figure A4 above) and explored reactions to the options as a whole. Where the respondent expressed interest in any of these options, the researcher probed views on different characteristics that were consistent with these options. For example, if they were interested in receiving incentive payments to reflect energy savings achieved the researcher explored their views on the timescales over which they might expect to receive payments.

The interview was manageable without advance review of the grid, and for less sophisticated respondents it helped the researcher ensure the interviewee understood what they were being told. However, interviews where the grid had not been reviewed in advance were more focussed on options rather than characteristics (because it was understandably harder for interviewees to think about characteristics in isolation); also respondents were not able to pick up on elements in the grid unless the interviewer raised these issues.

It was clear that some elements of the grid were not easily understood. In most cases interviewees were confused by the variable payment alternative of Option C (payments based on savings) and the researcher had to explain how it worked, and why it would offer greater certainty in a world of variable energy prices (most interviewees initially understood it to be less certain).

The grid was also shown to focus group participants. They were shown the grid in the group rather than before, to avoid a situation where some participants had studied it and thought about it in advance of the group while others had only glanced at it.

The telephone depth interviews typically lasted around 30-35 minutes and began with contextual questions about the interviewee's role, the company's operations, its property ownership status (i.e. owner or tenant), and its attitude to, and previous action on, energy efficiency. This was followed by a small number of questions exploring the barriers to energy efficiency that the interviewee felt were important for their organisation, and then the bulk of the discussion time was spent on the options and characteristics, and the interviewees' preferences and comments about them.

In larger companies, the person we spoke to was typically a decision-influencer rather than the ultimate decision-maker but we would have had great difficulty in securing interviews with the final decision-makers (who might be a board director or indeed a committee). The interviewee was able to talk about the decision-making processes within their organisation and explain what might make a scheme more or less attractive to their management. In smaller companies we generally spoke to the main decision-maker. With product manufacturers and ESCOs we felt that we were talking to the most appropriate person, who had a broad overview of / responsibility for their organisation's approach to developing business, and in most cases a good understanding of wider market trends and issues.

## How the research should be used

As this is qualitative research, we cannot assume that it is representative of the wider population, but it gives us a more in-depth understanding of inter-relationships between different factors (e.g. interventions and barriers) which could only superficially be achieved using a quantitative survey.

In addition a number of factors should be taken into account when using the findings of the research:

**Small sample size:** The 47 interviewees conducted in total were spread across 4 different audiences (end users, landlords, product manufacturers and ESCOs), and the largest group, end users (30 interviews), was itself spread across 3 size bands and 2 energy intensity bands. As a result the sample size for any distinct grouping was relatively small (e.g. small companies (8) or medium size / medium intensity (5)). This presented challenges in identifying themes or correlations.

**Complex options to consider:** The set of options presented was complex, containing many variants (the grid presented to end users had 5 columns (1 per option) and 6 rows (1 per characteristic)). There were thus a lot of variants for interviewees to assimilate and comment on. In a 30-35 minute interview that also included opening remarks, context, and brief discussion of barriers, it was difficult for preferences about all variants to be probed in depth.

**Lack of detail about options:** while researchers were able to present most of the key details about the lump sum option (B), for the payment based on savings option (C), one of the most important details – the size of the incentive payment in £/unit – was not available. This made it hard for interviewees to compare their attractiveness. This led to some confused comments regarding which option they felt was better at reducing payback periods (when in fact they did not have the information to judge).

**Varying level of knowledge / engagement:** Some interviewees, despite having confirmed a general interest in energy efficiency incentives during screening, had very little awareness of their energy efficiency options, little familiarity with the subject, and overall little interest in any of the options presented. Some were just able to choose a preferred option, but it was hard to probe the underlying reasons, and difficult to get them to comment on the characteristics of other options.

**Interviewees hadn't always received or reviewed the grid:** while in cases where interviewees had not received or reviewed the grid in advance, the interviewer was able to explain options and conduct a productive interview, it meant that the interview was more focussed on options than characteristics, because it was understandably hard for interviewees to isolate the characteristics and variants from the overall options as presented. This also presented challenges for analysis at the characteristic level.

### Analysis

All interviews and group events were recorded and transcribed. Transcripts were reviewed in depth and the details and comments were summarised and entered into a spreadsheet. For each interview, the spreadsheet recorded:

- **Contextual details** such as company size, energy intensity, sector, property ownership, type of building, energy consuming equipment used, and interviewee role;
- Information about the organisation's **attitude to energy efficiency**, and previous actions taken;
- The main **barriers to improving energy efficiency** perceived by the interviewee;
- Preferences, and **what was liked or not liked about each of the options** and its key characteristics, and why;
- **Additional comments** on aspects such as audits, loans, and interaction with third parties.

This summary spreadsheet was then analysed, looking for trends and relationships between preferences, comments, and contextual information. For example it was noted that many of the smaller companies stated capital constraints as a barrier, and also preferred or liked the no upfront cost option.

This analysis was used to draw out themes and conclusions from the research. Emerging findings were discussed and checked with the researchers who conducted the interviews.