



Department
of Energy &
Climate Change

CRC Energy Efficiency Scheme Evaluation

Appendix 2: Stage 2 report on qualitative research

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Executive summary

Introduction

CAG Consultants, in partnership with Carbon Trust, Databuild and the Imperial College Business School, were commissioned by DECC to undertake research on the non-domestic energy efficiency landscape for medium to large scale organisations across the UK. The research examined a number of areas including: how energy use is managed by organisations, what steps they may have taken or considered to improve energy efficiency in recent years and which factors influenced their decision making processes. One specific use of this research has been to evaluate phase 1 of the CRC Energy Efficiency Scheme, but the research may be used to inform other areas of policy in future.

The scoping stage of this study was completed in June 2014, comprising a literature review, initial qualitative research and development of a theory of change. Stage 2 of the evaluation, running from July to December 2014, comprised three separate workstreams: a quantitative survey, further qualitative research and econometric research. Stage 3 of the evaluation, involving further desk review and final synthesis of findings from earlier stages, was completed between January and March 2015.

CAG Consultants led the qualitative workstream within this research. This report presents the findings of the qualitative workstream, and forms an appendix to the overall synthesis report on the CRC evaluation. There are two further appendices presenting the findings of quantitative research undertaken by Databuild and econometric research undertaken by Imperial College Business School.

The evaluation of the CRC was commissioned to establish the impact of the CRC and specifically to address the following objectives:

A: Assess the extent that the CRC has delivered reductions in emissions by the take-up of energy efficiency measures.

B: Identify the barriers and drivers to energy efficiency and assess the extent to which the CRC has overcome barriers and emphasised drivers.

C: Assess whether the CRC has delivered abatement in a cost-effective manner.

D: Identify how the CRC has been delivered and whether it has been administered effectively.

This report details the findings of the qualitative research undertaken in stages 1 and 2 of the evaluation in relation to these objectives. The aims of qualitative research in stage 2 of the evaluation were:

- to explore the drivers and causality underlying corporate strategy, corporate action and operational action on energy efficiency, within both CRC and non-CRC organisations; and
- to deepen our understanding of CRC participant experiences of different aspects and phases of the CRC.

This research was designed to test the theory of change for the evaluation by exploring assumptions on causal links and on the relative importance of different drivers, within and outside the CRC. Implications for the theory of change are presented in the synthesis report.

Methodology for qualitative research

The evidence presented here draws on the qualitative research undertaken during the scoping stage of the evaluation as well as more extensive qualitative research undertaken during stage 2. The scoping research mainly comprised interviews with CRC participants, while the main phase of research included interviews with comparison groups, specifically 'information declarers' (organisations falling below the threshold for the CRC scheme) and organisations which qualified for CRC but were granted exemptions owing to their participation in Climate Change Agreements (CCAs) or the EU Emissions Trading System (EU ETS).

Across the two stages, the qualitative research workstream involved a total of 69 in-depth telephone interviews with CRC and non-CRC organisations, in addition to 5 scoping interviews with DECC, the Environment Agency and industry bodies. Forty-four of the 69 interviews were with energy managers or their equivalent, who had operational responsibility for energy management in their organisation. The aim of these interviews was to explore the organisation's behaviour on energy efficiency, the drivers for this behaviour (including CRC and other government schemes) and – for CRC participants – to explore the organisation's experience of the CRC.

The remaining 25 interviews were with senior managers, at or near board level in these organisations. These interviews were shorter and aimed to explore the level of priority attached to energy efficiency at board level and the strategic drivers for this priority, and to assess the influence of government schemes including the CRC.

In both the energy manager and senior manager interviews, care was taken to establish the overall context and drivers for energy efficiency within an organisation, before asking about the influence of the CRC. This broad research on non-domestic energy efficiency generated findings on energy efficiency behaviour, drivers and barriers, and the influence of other government schemes, as well as on the CRC.

To check the validity of drawing comparisons between the CRC and comparison groups, the report presents findings on the energy characteristics of the different sample groups. Generally, CRC and information declarers were found to be broadly equivalent in terms

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of energy intensity, with CCA/EU ETS organisations being more energy intensive, as would be expected given the targeting of these respective schemes.

Caveats about the methodology were that:

- owing to sampling issues, there was a relatively high proportion of manufacturing firms in the information declarer sample;
- there was some overlap between the information declarer, CCA/EU ETS and CRC groups, owing to involvement in CRC phase 2 and other issues; and
- the comparison groups, both information declarers and CCA/EU ETS organisations, may have been influenced by the CRC to some degree.

Findings and analysis

The findings of quantitative research in relation to the four evaluation objectives are summarised below.

A: Assess the extent that the CRC has delivered reductions in emissions by the take-up of energy efficiency measures

The qualitative evidence suggests that, for some CRC organisations, the requirement to comply with CRC contributed to a significant increase in the priority attached to energy use within the organisation. But, as discussed under objective B, the increase in energy prices over the CRC period was cited by most respondents as a stronger driver for increased priority. However the sign-off process for CRC allowances was reported to have an impact on Board-level awareness of energy in some organisations. A few high energy users reported that the CRC focused their attention on the less energy intensive or smaller sites within their portfolio, which would not previously have been given priority. Increased priority for energy was demonstrated in a number of ways as detailed below.

Qualitative evidence suggests that CRC participants tended to report having an energy manager or similar post with clear responsibility for energy use, more than non-CRC organisations in the qualitative sample. Some CRC participants reported that the CRC stimulated the collection of more complete and accurate energy use data than their organisation would have collected without the CRC. There is evidence that CRC participants tended to report including energy in their business planning process, and undertaking forecasting of energy use, more than non-CRC organisations interviewed.

The qualitative research found a few examples of organisations making a major effort to reduce their energy use, and particularly their electricity use, in order to avoid qualifying for phase 2 of the CRC. But in general, both CRC and non-CRC organisations reported introducing a similar range of energy efficiency measures. CRC organisations tended to report the introduction of behaviour change measures, more than the non-CRC organisations in the qualitative sample. They also reported more investment in insulation and refurbishment than the non-CRC organisations interviewed, but this may be attributable to the higher proportion of non-manufacturing organisations in the CRC

sample. The synthesis report examines this evidence in conjunction with quantitative survey findings.

CRC organisations were more likely than non-CRC organisations to have introduced Automatic Meter Reading systems (AMRs) and to have adopted energy or carbon management standards, such as the Carbon Trust Standard (CTS). The qualitative research suggests that this was driven by the Early Action Metrics (EAMs) which were publicised before the start of the CRC, which is consistent with many organisations reporting that they did not continue to subscribe to CTS after the EAMs were dropped.

There were also some indications, from qualitative evidence on energy trends and the factors underlying these, that the CRC scheme and the CCA/EU ETS schemes may have contributed to some reduction in emissions. Many of the CRC and CCA/EU ETS organisations reported declining trends in energy use over the period of the CRC, with a few organisations reporting a general decline since around 2008 with the exception of an increase in 2012/13. Some of these organisations reported different patterns, including static energy use or general variability, with a few reporting an increasing trend in energy use from 2010. While a few of the information declarer energy managers reported declining energy use, most reported a mixture of increases and decreases in annual energy use since around 2008.

Overall, the qualitative evidence suggests that the CRC has had some impact on energy efficiency action which may have led to emissions reductions. But, by the nature of qualitative research, it was not able to provide systematic evidence of whether CRC organisations had taken action on a greater scale or earlier than they would have in the absence of the scheme. The synthesis report analyses the qualitative findings in combination with the quantitative survey results and econometric research to provide a fuller assessment of the impact of the CRC on energy efficiency action and emissions.

B: Identify the barriers and drivers to energy efficiency and assess the extent to which the CRC has overcome barriers and delivered drivers

Increasing energy costs were cited by most respondents as the main driver for action on energy efficiency in recent years. However, a number of organisations reported that their action on energy efficiency was driven not just by energy cost increases but by other factors relating to their relationship with the public sector or general public, through public listing, competition or other mechanisms. These factors included Corporate Social Responsibility, investor expectations, tender and contracting requirements and customer expectations. Other significant drivers included estate rationalisation (particularly for the public sector), replacement of old equipment with more energy efficient models, the contribution of committed individuals and concern about future government policy direction on energy efficiency.

Considering the influence of government schemes other than CRC, CCAs appeared to have had some influence on energy efficiency action, although it was difficult to distinguish the effect of this driver from the effect of rising energy prices given the energy intensity of CCA activities. EU ETS appeared to be having less effect currently, owing to surplus allowances and a low carbon price. Mandatory carbon reporting has clearly influenced public reporting of carbon and other greenhouse gases by quoted companies, but assessing the long-term impact of this is not within the scope of this

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study. And views were mixed on the impact and potential impact of the CCL and ESOS respectively: while the ESOS scheme was not yet active, many organisations were preparing their approach to ESOS compliance.

Looking at the influence of the CRC scheme, about half of CRC participants reported that the CRC had not increased their action on energy efficiency. But about half of CRC participants reported that the CRC had increased the priority attached to energy or had led to earlier or faster action on energy efficiency within their organisations, particularly in relation to improved energy monitoring and reporting. A few CRC participants reported significant action on energy efficiency with the aim of reducing consumption below the qualifying threshold for phase 2, but no information declarers reported that they had taken action to keep below the threshold. The research found no evidence of the CRC influencing switching fuels from electricity to gas.

Considering the relative impact of different drivers in the CRC:

- the financial driver in the CRC appears to have contributed to the changes in the take-up of energy efficiency measures and practices, but this impact was reported to have come more from the high-level sign-off of CRC allowances than from the inclusion of CRC costs in business cases. Many respondents felt that this driver would have been stronger if revenue recycling had been implemented as originally planned;
- the awareness raising driver appears to have been influential and to have contributed to take-up of energy efficiency measures and practices in some organisations. The mechanisms most frequently cited for this were improvements in energy data and energy management, high-level sign-off of CRC allowances and – to a lesser extent – appointment of energy managers or other support for implementation; and
- the perceived impact of the reputational driver has been more mixed. There is evidence that compliance has been a strong reputational driver for many participants. While there is some evidence that the Performance League Table (PLT) acted as a reputational driver during the preparatory phase and the first year of the CRC, there is little evidence that the PLT or Annual Report Publication (ARP) have acted as motivators since then.

The qualitative research found that organisations with the following characteristics tended to report early action on energy efficiency, before the CRC:

- high energy costs relative to total costs;
- sensitivity to reputational drivers (e.g. public sector bodies; publicly-quoted organisations; organisations which tendered for public sector contracts and organisations with a high public profile);
- sensitivity to environmental factors (e.g. waste and water industries); and

- larger-scale organisations.

The most commonly cited barriers that affected energy efficiency investments, even in CRC organisations, were conflicts with business priorities and capital cost barriers. While some mechanisms were available for overcoming capital cost barriers, such as energy performance contracts, it was reported that these could be complex to administer in accounting terms. Other barriers, which were important to specific types of organisation, involved motivations for energy efficiency investment being split between landlords and tenants, between franchisee and franchisor, and between customer and client in service agreements.

There was little direct evidence that uncertainty acted as a direct barrier to energy efficiency. But some respondents would like more clarity and certainty on future government policy. There was some indirect evidence that this would enable them to plan ahead more effectively, including possibly taking more action on energy efficiency. Many respondents wanted to see a simpler and clearer policy landscape for energy and carbon, rather than a perceived plethora of schemes.

Overall, the qualitative research suggests that the early stages of the CRC appear to have had most impact (i.e. pre-scheme preparation and the first year or so of the scheme). This appears to have been linked to the incentive effect of proposed revenue recycling, together with the impact of ensuring compliance at the start of the scheme.

C: Deliver abatement in a manner which is cost-effective

This section discusses the cost-effectiveness of energy efficiency measures influenced by the CRC. Cost-effectiveness of CRC delivery is discussed under objective D.

The limited evidence gathered by the qualitative research on the cost-effectiveness of measures suggests that the energy efficiency actions undertaken by both CRC and non-CRC organisations were cost-effective since most generate a payback within 5-7 years or less. The synthesis report considers this finding in the light of evidence from the quantitative survey and desk review.

In addition to the direct benefits of energy cost reductions, CCL and CRC cost reductions, which generate value for money, there was some evidence that take-up of energy efficiency measures had generated some wider benefits for organisations. In particular, energy efficient lighting was reported to provide better quality light, with extended lifespans and reduced maintenance costs, while some energy efficiency measures made a contribution, albeit less measurable, to the public profile of particular organisations. There was some evidence that corporate actions on energy management, stimulated by the CRC, had benefited organisations in terms of improved housekeeping of energy data, better management of resources, better information to inform energy purchasing and better management systems. There was limited evidence of non-energy benefits from raised board-level awareness, through assisting with preparation for potential future carbon tax policies in the UK or overseas.

There was some suggestion that the CRC has had some negative unanticipated effects in terms of competitiveness and diversion of effort from energy efficiency for some organisations, and possibly to have generated some 'gaming' (i.e. avoidance activity) in

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terms of changes in building ownership, but it is not clear what the scale of these effects are. The synthesis report considers these findings in relation to other sources of evidence.

The scheme was also reported by some to have stimulated the growth of energy consultancies, which could be regarded as either negative or positive.

D: Identify how the CRC has been delivered and whether it has been administered effectively

The qualitative evidence suggests that the CRC imposed a significant administrative burden on participants, particularly in its early years. For most participants, this burden has been reduced by simplification of the scheme, as explained below. But some participants with complex structures or particular business models (e.g. franchises, leases) still found administration burdensome. Some participants used external consultants to reduce this burden and to reduce the risk of non-compliance.

Considering CRC communications, many participants felt that CRC guidance documents were long and complex, but that they had improved in recent years and that the complexity reflected the complexity of the scheme itself. Similarly, many participants found the Help Desk frustrating at the start of the scheme, but most found that it had improved. There were fewer comments on other forms of communication, although there was some evidence that the volume of emails and the robustness of the registry had also improved since the start of phase 1. There was some suggestion that workshops were a useful way of sharing information on upcoming changes.

The aspects of phase 1 which were reported to be most burdensome were the use of digital certificates (initially), the complexity of buying and surrendering allowances, the inadequacy of energy supplier statements, the difficulties posed by complex corporate structures or landlord/tenant relationships and the lack of consistency with reporting for other government schemes. Audit and enforcement requirements were not reported to have been particularly burdensome.

The changes introduced at the end of phase 1 were generally welcomed by CRC participants and stakeholders. Phase 1 simplifications benefited most but not all participants, although they did contribute to a sense of continual change in the CRC scheme.

Although this evaluation was not explicitly considering phase 2, some early findings emerged in relation to phase 2. The phase 2 qualification threshold in 2013 created winners and losers, particularly amongst organisations with CCA or EU ETS exemptions, who could find themselves with higher or lower CRC burdens depending on the details of their energy use. But the CCA and EU ETS clarifications were generally welcomed.

From the evidence available to date, the administration of phase 2 appeared to be relatively smooth, particularly for those organisations already familiar with phase 1. The increase in the cost of allowances from £12 to £16.40 per tonne was significant for some but not others, while a few organisations found the option of forecasting the number of allowances needed problematic, particularly if they had a decentralised structure for energy purchasing. Attitudes to forward purchasing were mixed: some organisations had gone ahead to make purchases while others felt that the 80p per tonne price differential between 'forward purchasing' and 'buy to comply' was insufficient to motivate

forward purchase. Some organisations expressed irritation that emissions factors for the year ahead were not available from DEFRA at the time that they needed to define the next year's requirement for allowances.

This evidence will need to be triangulated with evidence from other sources, including the econometric research, quantitative survey and desk research.

Suggestions for future of the CRC

Overall there was a general view that there had been too many successive changes to the scheme, including changes between the design and implementation phase. Bearing in mind the potential negative impacts of further changes, the broader suggestions from participants for the future of the CRC were as follows.

- a minority of respondents wanted to see the CRC abolished;
- most respondents viewed the CRC as a tax. They were willing to pay it but felt strongly that it would be much more cost-effectively delivered if it was added to participants' electricity bills, in the way that CCL is;
- some respondents would like to see CRC combined with other energy or carbon schemes. For example they would welcome a combined report for CRC, CCA and EU ETS. And they would like to see a link between CRC and ESOS, such as being able to use a proportion of CRC allowances to fund energy audits or to fund energy saving measures recommended by the energy audits;
- more generally, many respondents feel that the CRC would have more impact if it combined 'carrots' (i.e. incentives of some form) with 'sticks' (having to report and buy CRC allowances). The final point was widely made by respondents across the CRC, CCA/EU ETS and information declarer groups. They reported that incentives were generally more positively received than taxes, and felt that some form of incentive would do more to promote energy efficiency than the current scheme. Several respondents suggested that some of the cost of CRC could be used to fund energy efficiency initiatives

There is likely to be an element of 'lobbying' in the suggestions above. For example, while most respondents would prefer to see the CRC administered in a similar way to the CCL, a few felt that it would have less impact in this form because of the lower visibility this would give to CRC payments at board level.

The synthesis report triangulates these qualitative research findings and suggestions with evidence from other sources, including the econometric research, desk research and the quantitative survey.

1. Introduction

CAG Consultants, in partnership with Carbon Trust, Databuild and the Imperial College Business School, were commissioned by DECC to undertake research on the non-domestic energy efficiency landscape for medium to large-scale organisations across the UK. The research examined a number of areas including how energy use is managed by organisations, what steps they may have taken or considered to improve energy efficiency in recent years and which factors influenced their decision making processes. One specific use of this research has been to evaluate phase 1 of the CRC Energy Efficiency Scheme (CRC), but the research may also be used to inform other areas of policy in future.

The scoping stage of this study was completed in June 2014. It comprised a literature review, initial qualitative research and development of a theory of change. Stage 2 of the evaluation, which ran from July to December 2014, comprised three separate workstreams: a quantitative survey, further qualitative research and econometric research. Stage 3 of the evaluation, which involved further desk review and final synthesis of findings from earlier stages, was completed between January and March 2015.

CAG Consultants led the qualitative workstream within this research. This report presents the findings of the qualitative workstream and forms an appendix to the overall synthesis report on the CRC evaluation. There are two further appendices presenting the findings of quantitative research undertaken by Databuild and econometric research undertaken by Imperial College Business School.

The CRC was designed to drive energy efficiency and reduce carbon emissions in large non-intensive energy users, both public and private sector, across the UK. Collectively, these are estimated to be responsible for around 10% of the UK's greenhouse gas emissions. Qualification for the CRC was based on electricity usage. Organisations were subject to the scheme if during 2008 they had at least one settled-half-hourly meter and consumed over 6,000 megawatt-hours (MWh) of qualifying electricity through half-hourly meters. Qualifying organisations have to comply with the scheme or face financial and other penalties.

To assess the impact of the CRC on energy use and carbon emissions, it was important to explore what would have happened in the absence of the CRC. This evaluation used a counterfactual group, known as 'information declarers'. These were organisations with half-hourly electricity meters which were obliged to report their electricity consumption in 2008 but which fell below the 6,000 MWh threshold in that year and were therefore not included in the CRC.

As the information declarers would generally be smaller organisations than the CRC participants, a second comparison group was also used. These were organisations

which were fully exempt¹ from paying for phase 1 CRC allowances because their carbon emissions were adequately covered by other government carbon schemes, namely Climate Change Agreements (CCAs) and the EU Emissions Trading System (EU ETS). Many of these organisations were more energy intensive than CRC participants and some were also larger organisations.

The evaluation of the CRC was commissioned to establish the impact of the CRC and specifically to address the following objectives:

A: assess the extent that the CRC has delivered reductions in emissions by the take-up of energy efficiency measures;

B: identify the barriers and drivers to energy efficiency and assess the extent to which the CRC has overcome barriers and emphasised drivers;

C: assess whether the CRC has delivered abatement in a cost-effective manner; and

D: identify how the CRC has been delivered and whether it has been administered effectively.

This report details the findings of the qualitative research undertaken in stages 1 and 2 of the evaluation in relation to these objectives. The aims of qualitative research in stage 2 of the evaluation were:

- to explore the drivers and causality underlying corporate strategy, corporate action and operational action on energy efficiency, within both CRC and non-CRC organisations; and
- to deepen our understanding of CRC participant experiences of different aspects and phases of the CRC.

This research was designed to test the theory of change for the evaluation by exploring assumptions on causal links and on the relative importance of different drivers, within and outside the CRC. It was also designed to deepen understanding of the customer journey for CRC participants.

As part of the discussion of drivers, respondents were asked about the influence of CRC in the context of other government schemes such as Climate Change Agreements (CCAs), the EU Emissions Trading System and the recently introduced Energy Savings

¹ During phase 1, complex rules prevented organisations from having to buy CRC allowances for emissions already covered by the EU ETS or CCA schemes, but all organisations with electricity consumption exceeding 6,000 MWh in 2008 had to register for the CRC and report on emissions, even if they were not liable for any CRC allowances. Simpler rules apply to phase 2 of the CRC: organisations only need to register if their emissions (excluding those covered by EU ETS and CCA schemes) exceed 6,000 MWh, and they only need to report on these emissions.

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Opportunity Scheme (ESOS). While the latter was not in force at the time of the research, many organisations were already planning how to meet ESOS requirements.

The remainder of this report is split into the following key sections:

- section 2 presents an overview of the methodology;
- section 3 presents findings and analysis from qualitative research on Objective A;
- section 4 presents findings and analysis from qualitative research on Objective B;
- section 5 presents findings and analysis from qualitative research on Objective C;
- section 6 presents findings and analysis from qualitative research on Objective D;
- section 7 highlights key issues for the final synthesis;
- annex 1 is the topic guide for qualitative interviews with energy managers;
- annex 2 is the topic guide for qualitative interviews with senior managers; and
- annex 3 lists the qualitative interviews undertaken, by sector.

2. Methodology for qualitative research

Overview of qualitative research methodology

The qualitative research workstream involved a total of 69 in-depth telephone interviews with CRC and non-CRC organisations, in addition to 5 scoping interviews with DECC, the Environment Agency and industry bodies. Forty-four of the 69 interviews were with energy managers or their equivalent, who had operational responsibility for energy management in their organisation. In a few cases, these were consultants retained by the organisation to provide support on CRC and other energy matters. The aim of these interviews was to explore the organisation's behaviour on energy efficiency, the drivers for this behaviour (including CRC and other government schemes) and – for CRC participants – to explore the organisation's experience of the CRC. Most of these interviews were undertaken during stage 2 of the research using the topic guide presented in Annex 1, while 13 of the energy manager interviews were undertaken during the scoping stage using a broadly similar topic guide. Both the stage 1 and stage 2 interviews with energy managers lasted between 30 and 60 minutes. Interviews with CRC organisations tended to be at the upper end of this range because of the need to cover the participant's experience of the scheme.

The remaining 25 interviews were with senior managers, at or near board level in these organisations. These interviews were shorter and more focused, lasting 15-30 minutes, as experience during the scoping stage showed that it was not realistic to obtain longer interviews with this respondent group. The aim of these interviews was to explore the level of priority attached to energy efficiency at board level and the strategic drivers for this priority, and to assess the influence of government schemes including the CRC. The topic guide for these interviews is presented in annex 2.

In both the energy manager and senior manager interviews, care was taken to establish the overall context and drivers for energy efficiency within an organisation, before asking about the influence of the CRC. The stage 1 qualitative research was framed as 'CRC research' for CRC participants but as broader 'non-domestic energy efficiency research' for non-CRC participants. However, the stage 2 qualitative research was framed as broad research on non-domestic energy efficiency for both CRC and non-CRC groups, including the influence of government carbon schemes. This ensured that a consistent approach could be taken for interviews with CRC and non-CRC organisations, using the same overall topic guide. This broad research on non-domestic energy efficiency generated findings on energy efficiency behaviour, drivers and barriers, and the influence of other government schemes, as well as the CRC.

Numbers of qualitative interviews

The qualitative interviews were conducted with a range of organisations with medium to large energy use, including CRC participants, other information declarers and those with CCA/EU ETS exemptions from the CRC, to explore differences in behaviour and drivers between these groups. Further details of sampling within these groups are given in the next section.

In the main phase of qualitative research, 30 of the 51 interviews were undertaken with organisations qualifying for CRC phase 1: 20 at energy manager level and 10 at senior manager level. 11 interviews were with information declarers, roughly half at energy manager level and half at senior manager level. And the remaining 10 interviews were with organisations which had full exemptions from paying CRC allowances during phase 1, owing to CCA and EU ETS exemptions, again roughly half at energy manager and half at senior manager level. In practice the boundaries between the groups were slightly blurred, as discussed under the heading ‘limitations of the qualitative research methodology’ below.

The findings from the main phase of the qualitative research have been combined with findings from the scoping stage. This involved a further 23 interviews, of which 5 were with government or industry stakeholders, 15 were with CRC organisations (at both energy manager and senior manager level) and 3 were with information declarers.

A full summary of the numbers of qualitative interviews undertaken with different groups is shown in table 2.1.

Stakeholder	Interviewee	Interviews completed during stage 1	Interviews completed during stage 2	Total number of interviews
CRC participants	Energy manager	10	20	30
	Senior manager	5 (same companies as above)	10 (different companies from above)	15
Information declarers for phase 1 of CRC	Energy manager	3	6	9
	Senior manager	0	5	5
Organisations with CCA/EU ETS exemptions for phase 1 of CRC	Energy manager	0	5	5
	Senior manager	0	5	5
EA		1	0	1
DECC		1	0	1
Sector/trade bodies		3	0	3
TOTAL		23	51	74

Table 2.1: Summary of qualitative interviews across stages 1 and 2

Sampling for qualitative interviews

During the scoping stage, CRC participants were identified through existing DECC contacts, and information declarers were identified from DECC's list of information declarers. At this stage, the project team had no access to any unpublished data about the scale or energy intensity of these organisations. The scoping sample aimed to cover a range of sectors and types of organisation, both public and private.

During stage 2 of the evaluation, the qualitative sample was drawn from named contacts in the Environment Agency databases that were also used to provide the sample for the quantitative research. Further detail on these databases is presented in the quantitative research report.

The majority of the qualitative interviews were with organisations drawn from the same sample frame as the quantitative research but withheld from the quantitative survey. Six interviews were follow-on interviews with organisations already interviewed as part of the quantitative research, where the survey had identified appropriate senior manager contacts or where there was opportunity to follow up specific issues. A couple of organisations were purposively chosen for inclusion in the qualitative sample because of interesting behaviour being reported by key stakeholders during the scoping stage of the research (e.g. reported action to avoid qualifying for phase 2 of the CRC).

The original aim had been to select a range of stage 2 interviewees so that the qualitative sample across both stages met the following criteria:

- high/medium/low energy intensity relative to the CRC sample (based on electricity and turnover data for 2008, in the absence of more accurate data on energy intensity);
- a range of public and private sector bodies, to reflect the characteristics of CRC participants, as per the quantitative sample;
- a mix of large- and small-scale private organisations within the CRC, on the basis of carbon emissions, as per the quantitative sample;
- inclusion of both information-declarers and organisations with CCA/EU ETS exemptions, within the comparison group; and
- coverage of a range of sectors, to reflect the broad characteristics of CRC and larger information-declarers, taking into account the sectors already covered during stage 1.

Some but not all of these aims were achieved in practice. The recruitment of interviewees was initially based on these criteria, and this was successful for the CRC sample. The CRC sample was recruited directly by CAG Consultants using an approach that involved calling a shortlist of targeted organisations, chosen to provide a broad balance of sectors, sizes and (where known) energy intensities. This was a slow process because each target organisation was contacted up to 8 times before being substituted with another organisation.

2. Methodology for qualitative research

As a result of the slow pace of recruitment using this method, the project management team identified a risk that research with the comparison groups would not be completed within the required timeframe. In consultation with DECC, a decision was taken to recruit the remaining information declarer and CCA/EU ETS interviews with assistance from the Carbon Trust, using a less targeted approach. To achieve the required number of interviews within the research period, a long list of organisations in the two comparison groups was contacted in parallel by the Carbon Trust. Interviews with CAG researchers were arranged with those responding first to this process. This introduced more risk of response bias, and also less control over the sector balance in the comparison group samples.

The outcome of this process was that the private-sector comparison group samples were to some degree dominated by manufacturing organisations. It is possible that this may have partly been due to response bias, since there may have been a more positive response from more energy-intensive organisations which had already worked with Carbon Trust in the past. While the eventual sample is probably representative of the CCA/EU ETS group, which consists mainly of manufacturing organisations, it is arguably less representative of the information declarer group.

A list of the qualitative interviews undertaken in stages 1 and 2 is presented in annex 3, together with a rough characterisation by sector. An outline of the energy intensity of the CRC and non-CRC groups, based on qualitative research findings, is given below. A fuller sectoral breakdown of the comparison groups is presented in the synthesis report.

Characteristics of CRC and comparison group samples

To check the validity of drawing comparisons between the CRC and comparison groups, this section outlines the information on energy intensity which emerged from the qualitative research. The synthesis report provides further energy intensity statistics on the different sample groups. Generally, CRC and information declarers were found to be broadly equivalent in terms of energy intensity, with CCA/EU ETS organisations being more energy intensive.

During the qualitative interviews, many respondents were able to provide estimates of the share of energy costs as a proportion of total costs for their organisation. Where information was provided, energy costs represented more than 10% of turnover for most CCA/EU ETS organisations, for some CRC organisations and for a few information declarer organisations. These could be characterised as having medium energy intensity.

For some CCA/EU ETS manufacturing organisations, energy represented more than 30% of their costs. These could be characterised as having high energy intensity.

CRC and information declarer organisations more often cited energy costs in the range 0.5% to 5%, representing low energy intensity. Some organisations with energy costs around 1% of turnover still described energy costs as being significant. In the retail sector, for example, two respondents mentioned that energy costs were significant because they were high in relation to the organisation's profit (e.g. 50% of profit), even if they were not particularly high in relation to turnover (e.g. 3% of turnover).

Approach to interviewing and analysis

All of the stage 2 qualitative interviews, and most of the scoping stage interviews, were undertaken by telephone. The added value of face-to-face interviews with CRC participants during the scoping stage did not justify the additional time and cost involved.

The interviewers were experienced senior researchers within CAG, who were briefed and shadowed by an experienced stage 1 interviewer before undertaking interviews independently. Databuild provided quality assurance of initial interviews to ensure that interviewers were following good practice for social research.

The interviews were recorded and transcribed. DECC were provided with copies of anonymised transcripts, but a few transcripts were withheld because they could not be fully anonymised.

Coding and analysis of the transcripts was undertaken using qualitative data analysis software. This enabled the stage 2 transcripts to be analysed alongside stage 1 transcripts.

Limitations of the qualitative research methodology

Some caveats must be borne in mind when analysing the findings from this research.

Sectoral spread: There was little control over the sector spread for comparison group interviews because of the way these interviews were recruited. The manufacturing sector dominated both the information declarer and CCA/EU ETS groups, which was probably fair for CCA/EU ETS but may have over-represented manufacturers within the information declarer group.

Blurring of boundaries: The boundaries between groups were less clear than might be expected. For example, some CRC organisations interviewed had partial exemptions from CRC owing to CCA or EU ETS participation. A few information declarers had qualified for phase 2 of the CRC, so had some experience of the phase 2 customer journey. Similarly, a few CCA/EU ETS organisations had also become liable for CRC payments in phase 2. Conversely, a few CRC organisations which qualified for phase 1 were no longer part of the scheme in phase 2, or were now fully exempt on the grounds of the new rules for CCA/EU ETS exemption. This is discussed further in the synthesis report.

CRC influence on comparison groups: Both groups - information declarers and EU ETS/CCA exempt organisations - may have been influenced to some degree by the initial announcements about the upcoming CRC and, in the case of EU ETS/CCA organisations, the need to register within the CRC system. The topic guide enabled the interviewers to probe for such influence with comparison group organisations.

Evaluation objectives

The detailed evaluation questions covered by the topic guides, as set out in annexes 1 and 2, were agreed at the end of the scoping stage. These evaluation questions were as follows:

Evaluation objectives and questions
Evaluation aim A: Assess the extent that the CRC has delivered reductions in emissions by the take-up of energy efficiency measures
A1: Are there increases in the take-up of energy efficiency measures that can be attributed to the scheme? (DECC has provided a menu of potential measures)
A2: Are there improvements in energy management practices and capacity that can be attributed to the scheme? (menu includes: staff capacity and training; data reporting; accurate forecasting of energy consumption; business planning; business cases; financing; staff awareness)
A3: Are there increases in board-level awareness of energy efficiency that can be attributed to the scheme? (menu includes: allocation of resourcing; targets; strategic priority)
A4: Are CRC participants behaving in different ways to non-CRC participants in any other respects (as a result of the policy, and not for other reasons)?
A5: What is the timescale for the changes in A1-A3: permanent/temporary; short/long-term?
A6: What are the incremental emissions reductions achieved as a direct/indirect result of the scheme?
Evaluation aim B: Identify the barriers and drivers to energy efficiency and assess the extent to which the CRC has overcome barriers and emphasised drivers
B1: What broader factors have been driving changes in A1-A3, over the period of the CRC, in both CRC and non-CRC organisations (including the recession, restructuring, market influences, energy prices, other policies such as CCL, EU ETS, CCA and mandatory reporting)?
B2: How far are changes in A1-A3 attributable to the financial cost of CRC payments, as opposed to these other factors?
B3: How far are the changes in A1-A3 attributable to the awareness-raising drivers in the CRC (e.g. board-level sign-off; corporate reporting), as opposed to other factors?
B4: How far are the changes in A1-A3 attributable to the reputational drivers in the CRC (e.g. publication of the Performance League Table, its successor the ARP and enforcement), as opposed to other factors?
B5: Which phases of the scheme had most impact on the actions (A1-A3): Pre-scheme preparation, phase 1 or phase 2?
B6: What factors have influenced the effectiveness of different drivers (CRC/other), across different types of participant (e.g. price signal, presentation of data, energy-intensity of participant; scale of participant)?
B7: Are there additional barriers to actions A1-A3 that need to be overcome, and how far do these apply to different types of participant? (e.g. finance, ownership structure, lack of viable energy efficient technologies, other...)
B8: Have policy uncertainty and changes in government policy, within or beyond the CRC, been a barrier to action on energy efficiency (A1-A3)?
Evaluation aim C: Assess whether the CRC has delivered abatement in a cost-effective manner
C1: Have the energy efficiency actions taken by participants been cost-effective (with particular reference to the menu of actions in A1)?
C2: What wider benefits have actions A1-A3 generated for participants? (in relation to energy bills, reduced CRC costs, carbon emissions, improved services for customers etc.)

C3: Have there been any unanticipated effects of the CRC, other than the intended impacts covered by objectives A and B?
Evaluation aim D: Has the CRC been administered effectively?
D1: Is the scheme delivered efficiently and consistently (e.g. by promoting simple procedures)?
D2: Has communication with participants been clear, convenient and timely (e.g. guidance, help desk, other communications with stakeholders)?
D3: What were the most burdensome aspects of the scheme in phase 1 (including registration, reporting, audit enforcement and other elements of the CRC), and how have these changed with phase 1 simplification and phase 2?
D4: Has simplification of the scheme sufficiently minimised overlap with other schemes (primarily EU ETS and CCA) and reduced the administrative burden on participants?
D5: What has been the impact of successive changes to the scheme, and what lessons can be drawn for the management of future changes?

The next four sections of the report present detailed findings and analysis from the research, in relation to these evaluation objectives and evaluation questions.

3. Findings and analysis on evaluation objective A

Objective A: Assess the extent to which the CRC has delivered reductions in emissions by the take-up of energy efficiency measures

Summary

The qualitative evidence suggests that, for some CRC organisations, the requirement to comply with CRC contributed to a significant increase in the priority attached to energy use within the organisation. But, as discussed under objective B, the increase in energy prices over the CRC period was cited by most respondents as a stronger driver for increased priority. However the sign-off process for CRC allowances was reported to have had an impact on board-level awareness of energy in some organisations. A few high energy users reported that the CRC focused their attention on the less energy intensive or smaller sites within their portfolio, which would not previously have been given priority. Increased priority for energy was demonstrated in a number of ways as detailed below.

Qualitative evidence suggests that CRC participants tended to report having an energy manager or similar post with clear responsibility for energy use, more than non-CRC organisations in the qualitative sample. Some CRC participants reported that the CRC stimulated the collection of more complete and accurate energy use data than their organisation would have collected without the CRC. There is evidence that CRC participants tended to report including energy in their business planning process, and undertaking forecasting of energy use, more than non-CRC organisations interviewed.

The qualitative research found a few examples of organisations making a major effort to reduce their energy use, and particularly their electricity use, in order to avoid qualifying for phase 2 of the CRC. However, in general, both CRC and non-CRC organisations reported introducing a similar range of energy efficiency measures. CRC organisations tended to report the introduction of behaviour change measures more than non-CRC organisations in the sample. They also reported more investment in insulation and refurbishment than the non-CRC organisations interviewed, but this may be attributable to the higher proportion of non-manufacturing organisations in the CRC sample. The synthesis report examines this evidence in conjunction with quantitative survey findings.

CRC organisations were more likely than non-CRC organisations to have introduced Automatic Meter Reading systems (AMRs) and to have adopted energy or carbon management standards, such as the Carbon Trust Standard (CTS). The qualitative research suggests that this was driven by the Early Action Metrics (EAMs) which were publicised before the start of the CRC, which is consistent with many organisations reporting that they did not continue to subscribe to CTS after the EAMs were dropped.

There were also some indications from qualitative evidence on energy trends, and the factors underlying these, that the CRC scheme, and the CCA/EU ETS schemes, may have contributed to some reduction in emissions. Many of the CRC and CCA/EU ETS organisations reported declining trends in energy use over the period of the CRC, with a few organisations reporting a general decline since around 2008 with the exception of an increase in 2012/13. Some of these organisations reported different patterns, including static energy use or general variability, with a few reporting an increasing trend in energy use from 2010. While a few of the information declarer energy managers reported declining energy use, most reported a mixture of increases and decreases in energy use since around 2008.

Overall, the qualitative evidence suggests that the CRC has had some impact on energy efficiency action which may have led to emissions reductions. But, by the nature of qualitative research, it was not able to provide systematic evidence of whether CRC organisations had taken action on a greater scale, or earlier than they would have, in the absence of the scheme. The synthesis report analyses the qualitative findings in combination with the quantitative survey results and econometric research to provide a fuller assessment of the impact of the CRC on energy efficiency action and emissions.

Detailed findings on objective A

Under objective A, we examine evidence on the trends in actions on energy efficiency and then the trends in emissions themselves, and the factors driving these trends. The next section, on objective B, reviews the evidence as to how far the CRC is driving these trends.

The findings from energy managers and senior managers were similar on objective A. Both reported recent trends in take-up of energy efficiency measures and management practices. Energy managers tended to emphasise that the CRC helped to improve energy data reporting. While senior managers provided a more first-hand perspective of changes in board-level priority, their perspectives on changes in board-level priority were similar.

A1: Are there increases in the take-up of energy efficiency measures that can be attributed to the scheme?

The evidence for each measure is presented in turn.

Behaviour change

Most of the CRC participants reported undertaking staff awareness and behaviour change initiatives, some of which were part of broader sustainability initiatives. Similar initiatives were reported by some information declarers and CCA/EU ETS organisations. Some respondents described these as being 'zero cost' initiatives, but saw them as important in generating changes in the attitude of staff towards energy:

3. Findings and analysis on evaluation objective A

If you don't get buy-in from the people that actually operate these plants you can spout off as much as you like but it won't make a lot of difference unless they're in touch with it really. (CRC energy manager 5, cement)

Overall, slightly more CRC participants than comparison group members tended to report undertaking behaviour change work.

Energy efficient lighting

The majority of both CRC and information declarer respondents reported installing Light Emitting Diode (LED) lighting or other forms of energy efficient lighting. The introduction of LED lighting was often seen as a 'no brainer' compared to incandescent lights, generating significant electricity savings.

At the moment [it's] just a lot more LED, that's the biggest thing at the moment. (CRC energy manager 6, supermarket)

The business case for LED compared to fluorescent lights was reported to be less clear cut, and some respondents reported that they only replaced fluorescents with LEDs if undertaking more general refurbishments.

Some organisations with CCA/EU ETS exemptions also mentioned the installation of LED lighting but, for some, lighting was less of a priority compared to process energy investments. Also, some manufacturing companies reported that energy efficient fluorescent lights (using T5 or T8 tubes) were more suitable for their circumstances than LEDs (e.g. because of process heat in factories).

To sum up, both CRC and comparison groups reported the introduction of LED lighting, although fewer organisations with CCA/EU ETS exemptions tended to report this.

Other energy efficient equipment

Many CRC and non-CRC respondents reported other operational actions, involving both generic and specialist equipment. The types of measures depended more on the sector than on whether an organisation was in the CRC. For example, some manufacturing firms, which were more strongly represented in the information declarer and CCA/EU ETS interview samples (as shown in annex 3), had installed generic manufacturing measures such as variable speed drives, inverters and energy efficient compressors. Some other organisations had installed energy efficient boilers, while a few mentioned measures involving heating and ventilation systems, heat exchangers, data centres and the replacement of chillers or other old equipment with more energy efficient models.

Some respondents, both within and outside the CRC, reported significant energy savings through investment in specialist equipment related to their sector. These were often the most significant measures that the organisation had undertaken, in terms of their impact on energy consumption. For example, one local authority in the CRC made

major savings² by replacing chillers. The energy manager reported that the chillers were replaced simply because they were at the end of their useful life, but the resulting savings took the local authority below the threshold for phase 2 of the CRC.

While equipment was normally replaced at the end of its life, there were a few examples of early replacement being motivated by energy savings, particularly for manufacturing firms, irrespective of their CRC status.

In the last year we've probably replaced the linings of three furnaces just directly for energy efficiency, again that was about a £7,000-£8,000 project per furnace but you're saving 20% on the heat loss, so when you're running the furnace for 24 hours you can then put that cost benefit together to see whether it's worth doing or not. (Information Declarer (ID) energy manager 4, manufacturing)

In summary, the differences in the level of investment in energy efficient equipment appeared to vary more with industry/organisational type than with CRC status.

Building fabric

Some CRC respondents, particularly those with extensive premises or property, reported investment in insulation. Fewer information declarers and CCA/EU ETS organisations mentioned this, possibly because the interviewees in these groups included a higher proportion of manufacturing firms than the CRC interviewees. Some CRC respondents mentioned that insulation was the first step in improving energy efficiency.

The first projects that we did were insulation ones at group campus. Group campus has expanded in size but are using a lot less gas now than it did. Our Property Services/Estates guy has been really proactive in the use of the Salix fund, so he's done the passive stuff first – insulation, then he's looked at heating controls, lighting controls. (CRC energy manager 15, education)

Some CRC organisations had also made, or were anticipating making, significant energy savings through the refurbishment of old buildings, which generally included the replacement of old equipment. These investments were not necessarily motivated by energy savings, but generated savings because new equipment and premises generally met higher energy efficiency standards than old.

We also carry out a modernisation programme as well to numerous stores, and that basically is where we effectively close the store for a period and strip the store back to just a shell and core state then refit it out with new equipment, so that's refrigeration, heating, lighting and its re-launched then effectively like a new

² Savings from replacing the chillers were estimated to be 2,000 MWh per year.

3. Findings and analysis on evaluation objective A

store. That would have a big impact on energy because the equipment that's come back in again and the stores that would be picked for that modernisation would be coming from the oldest stores. (CRC energy manager 30 – retail)

Metering and controls

Many organisations from both CRC and non-CRC groups mentioned the use of energy monitoring, metering or controls to manage energy use (e.g. using sub-meters, energy dashboards or Building Management Systems).

We also have internal controls and monitors where we can dial into individual stores and monitor, if we're seeing a spike in a stores consumption we can dial into the store and see what happened there last month, we can spot there's an issue there... lights were left on for a 3 week period, or something happened. All our controls, all our lighting systems are all on building management systems, so we'd be monitoring that to look at issues. (CRC energy manager 30, retail)

Some CRC participants reported that they had installed metering, such as Automatic Meter Readers (AMRs) and gas data loggers, in anticipation of the CRC – motivated by the Early Action Metrics. This is discussed further under objective B.

In summary, there was evidence of increased take-up of automatic metering systems in preparation for the CRC, but little evidence of increased take-up of control systems in the CRC group.

Fuel switching

A few respondents with CCA/EU ETS exemptions mentioned that they had switched to using gas as the heat source for particular industrial processes, rather than electricity or oil. This was reported to be cost-driven and generally required major investment in new, specialist equipment. Fuel switching was only mentioned by manufacturing companies and was not mentioned by CRC or information declarers, except for one information declarer who had a CCA.

Renewable energy

Many organisations reported that they were pursuing renewable energy opportunities, with no particular difference in take-up between CRC and non-CRC organisations. Solar photovoltaics (PV) was the most commonly mentioned technology, while a few organisations had installed or were developing renewable energy from wind, biogas, Combined Heat and Power, heat pumps and biomass. The Feed-in-Tariff (FITs) and Renewable Heat Incentive (RHI) were both mentioned as drivers of this activity.

In summary, renewable energy activity did not appear to be influenced by an organisation's CRC status.

A2: Are there improvements in energy management practices and capacity that can be attributed to the scheme?

Most CRC and non-CRC respondents reported that their organisations had increased their corporate activity on energy efficiency in recent years. Some CRC participants reported that the scheme had been a catalyst for them to improve their monitoring and reporting of energy use, and for bringing in staff or consultancy resources on energy management at the start of the scheme. The evidence relating to different aspects of energy management practice is discussed in turn below.

Staffing

Many of the CRC respondents, and some information declarers and CCA/EU ETS exempt organisations, had staff with clearly defined responsibilities for energy management, both at corporate and site level. However these staff were not always called 'energy managers', or occupied with energy management full time, and might be described as 'facilities manager', 'property manager', 'sustainability manager' or 'carbon manager'. Irrespective of this, having staff with clear energy management responsibilities was cited as being a driver for action on energy.

I think the step-change was when they decided to employ an energy manager and then the drive ever since then. (CRC energy manager 22, retail)

Some organisations reported that they had limited staff time to deal with energy and carbon schemes, but these comments came more from non-CRC than CRC organisations. In particular, a few CCA/EU ETS manufacturing organisations described themselves as having small management teams, in spite of their significant energy use.

In summary, CRC organisations were a bit more likely than the comparison groups to have internal staff with clearly defined responsibilities for energy management. The use of external consultants is discussed separately under heading D1 below.

Reporting

Most CRC and non-CRC firms reported undertaking some form of internal energy reporting. Some CRC organisations commented that the CRC had provided an impetus for improving the data, and rationalising their electricity and gas meters, which had generated benefits for energy management.

I would say it's helped us get housekeeping in order in terms of electricity and gas meters and things like that. So it's really helped make sure we've got our own house in order. (CRC energy manager 15, education)

Others commented that CRC reporting requirements enabled them to put together a more complete dataset for their organisation than would otherwise be achievable.

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But I have to say that if it wasn't for something like the CRC it would be very, very difficult to get your hands on this type of data. I think it is a long process but it does certainly have its benefits. (CRC energy manager 11, local authority)

I've been trying to run this European office reduction initiative but because I don't have any CRC sticks behind me, I don't get the information I necessarily want in the format that I've asked for it. (CRC energy manager 1, holding company)

Some organisations which had CCAs said that they reported on carbon emissions for CCA purposes only. Most public sector organisations reported that they are required to submit carbon footprint data to government, which then become publicly available. But few private sector organisations reported that they made their carbon or energy reports public. The driver for this tended to be mandatory carbon reporting for publicly-quoted companies, irrespective of whether they were subject to the CRC.

In summary, the CRC appears to have encouraged some private-only owned organisations to improve energy reporting. It has had less impact on those public sector organisations and publicly-quoted companies which already reported for other purposes. But there have been house-keeping benefits for some of these organisations as well, in terms of identifying which meters belong to them.

Business planning

Many of the CRC participants reported that they took account of energy in their business planning process, in terms of the future cost of energy and future energy investments. Some of the higher profile companies were already doing this before the CRC.

We obviously have significant internal plans every year on how we are going to reduce our carbon footprint and our energy consumption, that all feeds into our European carbon footprinting as well. But energy control and energy management has been part of the norm for [Company] for quite a time now, so from a corporate level I can't say there have been many changes for a long time. (CRC energy manager 19, food)

Some of the information declarers and CCA/EU ETS exempt organisations reported similar business planning processes, in the latter case linked to CCA targets. But a few respondents – primarily information declarers – said that they did not have an action plan for energy but identified energy investment opportunities on an ad hoc basis.

The CRC therefore appears to have encouraged the inclusion of energy issues in business planning for some organisations.

Targets

Most organisations, both CRC and non-CRC, reported that they had corporate targets for energy or carbon reduction. In the case of organisations with CCAs, these were

generally the CCA targets. As discussed under heading B1 below, the driver for these targets was often energy cost reduction rather than environmental performance.

For some public sector and larger, high-profile organisations, these targets were part of a broader carbon management plan.

We have a carbon management plan that the council adopted five years ago now, and we have a commitment to reduce the carbon emissions from the operations by 35%, that's from our 2008/09 baseline and that was the first time we'd made a concerted effort to reduce energy. (CRC energy manager 11, local authority)

A few CRC organisations and information declarers said that they focused on specific energy efficiency opportunities rather than targets.

It's more activity driven, if the guys had said 'go find 20% cost savings or energy reduction in the next year, go off and that's your targets', for me it's not the right way to look at it because there might be 50% cost savings out there, or 30%. (ID energy manager 4, manufacturing)

Overall, CRC and non-CRC organisations did not appear to differ in their use of targets.

Relative measures

Many of the CCA/EU ETS exempt organisations, and several of the CRC and information declarer organisations, mentioned that they focused on indicators of energy efficiency rather than absolute carbon or energy reduction, to allow for fluctuations in business activity.

And we've been extremely successful over the last 14 years, when we started in 2000 our SDC was about mid-30,000's, about 35,000 kWh's per tonne. We're down to roughly about 16,000 kWh per tonne. (CCA/EU ETS senior manager 4, manufacturing)

The measures used for these indicators varied by sector, including energy use by employee, by customer and by floor area, and energy use per tonne of throughput.

We set targets for each individual restaurant to reduce their consumption each year, we have to normalise that for the amount of people they're serving and so we don't want to penalise a restaurant that's increasing its sales by 10% by telling them they shouldn't use more energy. (CRC energy manager 19, food)

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In summary, many organisations with CCAs had adopted relative carbon or energy targets, but the CRC scheme does not appear to have significantly influenced this practice.

Standards

Many CRC organisations, and some information declarers and CCA/EU ETS organisations, reported that they had at some point been accredited to energy or carbon management standards. Some CRC organisations had initially signed up to the Carbon Trust Standard, when it was one of the CRC Early Action Metrics, but most had let this lapse since the Early Action Metrics were dropped.

I'd rather buy £10,000 for the LED light fittings than pay £10,000 for the Carbon Trust standard. (CRC energy manager 15, education)

Some other CRC organisations, and also information declarers and CCA/EU ETS organisations, were accredited to the environmental management standard ISO 14001. Views on the usefulness of ISO 14001 were mixed. A few organisations commented that it was too bureaucratic but others felt that it drove improvements.

The commercial benefits of the EMS are fairly intangible: it possibly helps on the commercial front. But it also drives business improvements. (ID senior manager 4, manufacturing)

A few organisations had integrated energy management with health & safety and quality management, seeing them all as part of their 'compliance' process.

We'd seen the advantages across the business on environmental and health & safety side, including quality and starting to incorporate the whole business structure in that integrated system, particularly as we're growing as a business made a lot of sense. (CRC senior manager 18, waste)

Several organisations mentioned that they were considering the energy management standard ISO 50001 as a way of dealing with the requirements of the Energy Savings Opportunity Scheme (ESOS).

In summary, CRC appears to have initially encouraged the adoption of the Carbon Trust Standard by many organisations in preparation for the CRC, but many allowed this accreditation to lapse when the EAMs were dropped or became less important (i.e. when revenue recycling was dropped).

Energy audits

Many CCA/EU ETS organisations, some CRC organisations and a few information declarers mentioned that they had undertaken internal or external energy audits. Some

of the CCA/EU ETS organisations had undertaken several energy audits, as might be expected given their higher energy intensity.

Some external energy audits had initially been free, provided by the Carbon Trust, but more recently they have been paid for (except in Wales where they were still free). Organisations mentioned that they had used energy consultants to undertake later audits, sometimes the same consultant who was advising them on their CCA. Some felt that the audits had been useful and had led to action on energy efficiency, while others felt that the consultants did not provide any significant new ideas.

A few organisations mentioned that the energy audits felt like a 'selling exercise' on the part of the energy consultant, presumably because taking up their recommendations would involve more consultancy work.

From this evidence, the CRC scheme does not appear to have significantly influenced the take-up of energy audits.

Forecasting

Some CRC organisations, and a few information declarers and CCA/EU ETS organisations, mentioned that they routinely forecast energy use. The main driver for this appeared to be budget management and energy purchasing, but some reported that their forecasts were used to purchase allowances in advance for CRC phase 2.

I forecast the consumption, but what has previously been the case is we've always bought our energy in October. (CRC energy manager 3, local authority)

The CRC appears to have had some, albeit modest, influence on the forecasting of energy use.

Resilience

Senior managers from both CRC and non-CRC organisations were asked whether their organisation was concerned about risks associated with energy or carbon. Some replied that they did consider these risks. Others were primarily concerned about risks in terms of future price increases or future carbon taxes. A few were concerned that energy prices in the UK were particularly at risk, with environmental taxes and electricity market reform.

Energy risk is more of an issue in the UK than in France, Spain or the US. In the UK we are seeing increases in energy prices. For example, in the UK we have achieved a 30% reduction relative to output but our energy prices are still going up. (CRC senior manager 13, manufacturing)

Some organisations, primarily from the CCA/EU ETS and CRC groups, mentioned that they were concerned about energy security. A few were taking action on this. For

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example, one of the CCA organisations timed its production operations to fit low cost electricity tariffs and was investigating renewables and Electricity Demand Reduction to improve security of supply. In summary, organisations participating in a government scheme – whether CCA, EU ETS or CRC – appeared to be slightly more likely to be concerned about energy security.

Integration into mainstream business

Organisations varied in the extent to which energy management was integrated into the culture of their organisation. This varied according to the level of priority attached to energy reduction, as explained in relation to objective A3 below.

A few CRC participants reported that they were trying to integrate energy management more closely into normal business on the ground, while retaining a central team which took an overview of energy and/or carbon management.

So certainly the stuff around accountability we're trying to make sure that we've got names of people now who are accountable, rather than it just being well the Utilities Team look after energy. We need to move away from that and have a lot more accountability now. (CRC energy manager 9, property)

However, a few organisations, both within and outside the CRC, reported that their organisation did not see energy management as core to its normal business.

We worked that out for 12 months, we give them that there and it's fed into the dashboards, so they're really top dollar with that, we really are very good, but the Area Managers were sort of like 'Is energy me, should that be me?' There's still this culture of 'Well I don't do energy'. (CRC energy manager 22, retail)

In summary, the CRC did not appear to have a significant influence on whether energy management was integrated with or separate from mainstream business for the organisation.

A3: Are there increases in board-level awareness of energy efficiency that can be attributed to the scheme?

This section examines whether changes in board-level awareness of energy efficiency within participating organisations could be attributed to the CRC scheme.

Level of priority attached to energy

Most of the respondents, both CRC and non-CRC, felt that energy was a high strategic priority for their business, and that its importance had grown in recent years (e.g. since 2005). The main driving force was felt to be rising energy costs, rather than the CRC.

Energy consumption ... is a very significant issue and it's our second spend behind HR, and it was an issue irrespective of the CRC or not. (CRC senior manager 2, holding company/leisure)

A few CRC organisations reported that energy was not a priority for them. This was generally explained by energy costs not being a significant proportion of their turnover or profit. No CCA/EU ETS or information declarer organisations interviewed reported this, but this may reflect the higher proportion of manufacturing organisations with higher energy intensity in this sample group.

Level of board awareness

Some organisations reported that energy efficiency had been a strategic priority for their board for some time. This tended to be reported by higher profile organisations, particularly those which were publicly listed or influenced by public opinion in some way (e.g. more consumer-facing organisations), irrespective of whether they were in the CRC.

So it gave a very, very strong focus from our Directors to really focus on this area to understand what our operation and embodied carbon emissions are, and to reduce them.... So our focus is very, very strong on the energy efficiency of this business because of the energy initiatives being in place since 2006, but also from that cost perspective. (CRC energy manager 8, water)

Similarly, intensive energy users, including organisations with CCA/EU ETS exemptions, tended to have good board-level awareness of energy. This was often described as an interest in reducing energy costs, rather than necessarily improving energy efficiency.

Top management is interested owing to the savings that can be made in energy costs. For example, last winter was mild and oil prices were lower, which combined to reduce energy costs. (CCA/EU ETS senior manager 5, manufacturing)

Overall, there was no clear evidence from the qualitative research that board-level awareness of energy costs was higher in CRC than in non-CRC organisations, because energy price increases were a strong driver irrespective of CRC status. However the sign-off process for CRC allowances was reported to have had an impact on board-level awareness of energy in some organisations, as explained below.

High-level sign-off of CRC submissions

Several CRC participants reported that CRC had a direct impact on the board-level profile of energy, and that high-level responsibility for signing off CRC payments contributed to this.

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It's a very small thing in CRC but making sure that you have a senior person responsible I think has probably had quite a big impact in a lot of organisations, because it has to be on the Director's desk. It's given that strategic importance if you see what I mean, otherwise it will just happen in a back office somewhere. (CRC energy manager 15, education)

Similarly, several energy managers saw the CRC as helping them to raise the profile of energy in their organisation, partly because of the high visibility of CRC costs at board level.

But the CRC helped me in a way of engaging the board to say here's cost of about [nearly £100,000], here's a big pot of money which is coming out. At the time when it was first metered we didn't think we would recover from that from our tenants so it was becoming an organisational cost, and it did help to focus the board a bit to say what can we do. (CRC energy manager 16, property)

Some organisations, particularly those with business models for which CRC was complex, such as those involving landlord/tenant or franchiser/franchisee relationships, reported that board-level interest could be generated by problematic issues.

It [the CRC] is very much a hot topic for us, something that gets discussed at every single board meeting, because it's such a thorny issue I think for us to deal with because of the landlord/tenant issues. (CRC energy manager 9, property)

So, overall, high-level sign of CRC allowances was reported to contribute to a higher profile of energy concerns amongst CRC senior management in some organisations.

Change in board-level influence of CRC over time

Several CRC participants commented that board-level awareness of the CRC had been high at the start of the scheme but had since declined. They attributed this partly to removal of the Performance League Table and associated revenue recycling, and partly to the fact that CRC was now a standard cost that was routinely included in budgets.

I think the other thing is that in a funny sort of way I think CRC board-level attention to it is slightly waning compared to the very first few years, it's become less focussed because of the lack of the league table and perhaps because it's a not so new scheme now as well. We used to find it was much more difficult to get the sign-off for our return, and now that process has become a lot easier... It's not quite the same boardroom driver that it set itself out to be originally. (CRC senior manager 16, energy)

But a few CRC participants commented that the increase in CRC carbon price from £12/tonne to £16.40 per tonne was raising board awareness and prompting action, to raise income or reduce costs.

The relevant board member is directly involved in discussions about CRC costs and compliance, and the level of awareness and action has been impacted by the move to increase costs from £12 to £16. They are now, for example, looking at renewables installations on their estate. (CRC senior manager 8, defence)

But most respondents, when prompted, did not feel that the increase in the cost of CRC allowances had made a significant difference to board-level awareness. Overall, there was evidence that board-level awareness of the CRC was higher towards the start of the scheme.

Focus on pass-through elements in bills

A few respondents mentioned that their boards were concerned about CRC as part of a broader set of environmental charges associated with energy use which they saw as being imposed by government. These respondents commented that other pass-through costs (e.g. those associated with Electricity Market Reform) were likely to outweigh the cost of CRC as a proportion of energy bills.

If you actually look at the levy inside the bill that's passed through, you'll probably find the renewable obligation that's changing because of the electricity market reform, you've actually got greater increases than CRC. (CRC energy manager 16, property)

For comparison, DECC's report on Prices and Bills (2014) estimates that businesses which are medium-sized users of energy currently face energy (gas plus electricity) costs that are on average around 28% higher as a result of policies, including the CRC. But, according to DECC's analysis, wholesale prices remain the biggest driver of price increases.³

Step change

The interviewees were asked whether there had been a step-change in the priority attached to energy management and, if so, when this was and what caused it. A few companies, particularly those who were 'public-facing' (e.g. publicly quoted, serving the public sector or with a high public profile), reported that energy had been a priority before the introduction of the CRC.

³ Prices and Bills report, DECC, 2014.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/384404/Prices_Bills_report_2014.pdf.

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Well we were doing it before the CRC came in, so this is something we were given targets by [Company] back in 2005, so it's something that's been in place for a significant period of time. (CRC energy manager 6, supermarket)

The introduction of mandatory carbon reporting for publicly listed companies in 2012 was reported to have created a step change for some publicly quoted companies, irrespective of their CRC status.

But then there was another driver which I go back to again, the mandatory carbon reporting – because it became a requirement it actually helped us really, it meant we got support to try and put in place initiatives to better capture all the data, and because it was a requirement that went in the annual report. (ID energy manager 3, house building)

Several other respondents reported that their organisations began to focus more on energy before the start of the CRC because of increasing energy prices. Several attributed this to a spike in oil prices in 2008, but a few put this earlier:

We started around 2008, I think we experienced a spike towards the latter end of 2008. We seemed to have a fairly good energy contract, mostly electric contract at that time. I noticed from then we had a bigger up-step in our price of energy from that point on. That's when it raised its profile as being a major cost element going forward from that point on. (CCA/EU ETS senior manager 2, manufacturing)

However, CRC requirements were cited by several participants as having contributed to a step-change, both in the cost of energy and the regulatory requirements. Preparation for meeting CRC requirements may also have started in, or even before, 2008 since that was the year for which organisations were required to declare their electricity consumption to the Environment Agency.

I guess for all companies in the UK it's got to be the introduction to the CRC really, because that basically placed the tax on carbon for companies that had never been involved in anything like that before. (CRC energy manager 31, finance (energy consultant))

A few organisations commented that the CRC had created a new focus on their smaller sites, which had not previously been seen as a priority for energy efficiency.

But the smaller sites wouldn't have even considered it before, so it's quite a new thing for offices and small industrial sites to take that into consideration. (CRC energy manager 1, holding company)

A few organisations, both within and outside the CRC, commented that the appointment of an energy manager had in itself created a step-change in activity on energy efficiency. It is difficult to assess the extent to which appointment of an energy manager was itself attributable to the CRC in these cases.

I started in the company in 2010 – the first quarter of 2010 so I guess momentum in this area started then. (ID energy manager 2, manufacturer)

Another cause of a step-change, mentioned by a few organisations, was the change in technical options, particularly for lighting.

About 2010/11, when we started to do a number of energy efficiency projects. What I would say is the massive growth in the use of LED technology, and its fitness for purpose in task lighting situations has really opened the eyes of our electrical engineers to what is possible. (CRC energy manager 15, education)

For some organisations, it was the combination of a number of factors (such as increased regulation, rising energy prices, Corporate Social Responsibility and carbon reporting) that created a step-change in the priority they attached to energy management.

[The driver was] Energy cost I think, we've obviously got the Carbon Reduction Commitment which is another tax, and then you've Carbon Change [sic] Levy and various taxes on energy, plus increasing costs in recent years. (CRC senior manager 12, manufacturing)

To sum up, several organisations attributed a step-change in board-level awareness of energy issues to the introduction of the CRC, but other factors such as rising energy costs were more commonly cited.

A4: Are CRC participants behaving in different ways to non-CRC participants in any other respects (as a result of the policy, and not for other reasons)?

An obvious difference in behaviour is that CRC participants have had to comply with the scheme, in terms of meeting regulatory requirements, submitting annual reports, maintaining an evidence base and buying & surrendering allowances. This imposed a time as well as a cost burden on CRC participants. Evidence presented under objective D below suggests that some types of organisations found CRC compliance particularly complex or onerous, including: property companies who were complying with CRC on behalf of tenants; franchise companies who were complying on behalf of franchisees; companies which operated services or sites on behalf of clients; and national or

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international organisations operating large numbers of sites across the UK (who may not previously have reported aggregate energy use at UK-level).

Other differences in behaviour are described in the summary at the beginning of this section on objective A. The summary provides an overview of the differences in behaviour between CRC and non-CRC organisations on sub-objectives A1 to A3 which are attributable to the CRC.

A5: What is the timescale for the changes in A1-A3: permanent/temporary; short/long-term?

There seems to be little direct evidence of actions being consciously implemented to be short or long-term, or permanent as opposed to temporary. However, the evidence discussed above suggests that CRC participants have done more behaviour change work than non-CRC participants interviewed in the qualitative research. Behaviour change work is potentially reversible but could have long-term impacts if maintained. In a few cases, phase 1 CRC participants had made particular efforts to avoid qualifying for phase 2, and these efforts may well be temporary unless the participants expect there to be an eventual phase 3.

Other aspects of CRC organisations' corporate behaviour, such as higher staffing for energy management and improved data systems for energy monitoring, are theoretically reversible but are more likely to have a medium-term impact. CRC participants also reported doing more insulation works and refurbishment work than non-CRC participants, which will tend to have longer-term impacts on energy efficiency.

The qualitative research found that both CRC and non-CRC organisations reported having made investments in energy efficient equipment, such as low-energy lighting, building management systems, heating and ventilation systems, variable speed drives and specialist process equipment. The synthesis report examines these findings in combination with quantitative survey results on the take-up of different energy efficiency measures.

A6: What are the incremental emissions reductions achieved as a direct/indirect result of the scheme?

The qualitative research gathered anecdotal information on changes in emissions, and reasons for these changes. These will be analysed together with findings from the econometric workstream and quantitative survey, to assess whether the CRC scheme had a direct or indirect impact on carbon emissions and related energy efficiency.

During the qualitative interviews, energy managers were asked for high-level information on trends in energy use. Several participants pointed out the CRC publications do not give an accurate picture of trends in energy use or carbon emissions, because of definition changes between successive reports.

But from a CRC point of view there's obviously been changes in the scope of CRC due to the simplification so figures are not really comparable year to year. (CRC energy manager 5, cement)

Many of the CRC and CCA/EU ETS organisations reported declining trends in energy use over the period of the CRC, with a few organisations reporting a general decline since around 2008 with the exception of an increase in 2012/13. Some of these organisations reported different patterns, including static energy use or general variability, with a few reporting an increasing trend in energy use from 2010. While a few of the information declarer energy managers reported declining energy use, most reported a mixture of increases and decreases in annual energy use since around 2008.

Changes in business activity or occupancy rates were cited most frequently as the factors driving these trends in energy use. This was cited by a wide range of organisations, irrespective of their CRC status. While a few organisations had seen steady growth or steady decline since 2008/09, more had seen a decline in activity around 2008/09 and then a recent recovery, which they perceived as driving energy use.

I think the biggest factor there for the reduction in absolute carbon emissions was the fact that we ran into the recession and our headcount dropped dramatically, the number of units we were building dropped dramatically so in effect we were using a lot less energy. (ID energy manager 3, house building).

The second most commonly cited factor was the adoption of energy efficiency measures or practices. This tended to be reported as a factor by more CRC and CCA/EU ETS organisations than by the information declarer organisations interviewed. This could indicate that these schemes had encouraged take-up of these measures to some degree or could indicate that larger organisations had tended to take up measures more than smaller ones.

One of the other things that we're doing is we've obviously invested over those years in improvements on our equipment. (CCA/EU ETS energy manager 3, manufacturing)

The third most commonly cited factor was variation in gas use according to weather, with several organisations mentioning that the cold winter in 2012/13 pushed up their gas consumption significantly. This was particularly mentioned by information declarer organisations.

We've had an energy management system in and our gas can vary by 30% based on outside temperature, so with the same energy management system 2011 to 2012 we used 1.5 million KWh of gas [GWh], but then we had that harsh winter '12/'13 when we were still getting snow in April and we used 2.8 million KWh of gas. [GWh] (ID/CCA – energy manager 11, manufacturing)

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A wide range of other factors were cited by one or more respondents, including increased on-site generation from renewable sources, the installation of new facilities or equipment which meet higher standards but use more energy, changes in business scope, increased outsourcing and changes in the ownership of sites or facilities, including acquisitions and disposals.

We've seen a very big increase actually in our gas consumption over that period, that's because of bringing new technology on board actually for treating clinical waste but from a relatively low base with a 400% increase. (CRC senior manager 18, waste)

Some organisations, particularly CRC and CCA/EU ETS participants, explicitly mentioned that their energy intensity had declined in recent years (i.e. their relative energy efficiency had increased). Some manufacturing organisations, including CRC and non-CRC organisations, emphasised that energy efficiency was linked to business activity since higher throughput levels enabled them to run their plants more energy efficiently.

We use the same electricity whether we make 150 tonnes or we make 250 tonnes. (CCA/EU ETS energy manager 3, manufacturing)

A further subtlety mentioned by a few organisations was that assets retained during the recession tended to be newer or more energy efficient than those disposed of, so that the recession had the effect of increasing the long-term energy efficiency of the remaining asset base.

Overall, there were some indications that the CRC scheme, and the CCA/EU ETS schemes, have contributed to some reduction in emissions. The synthesis report combines these findings with those from the quantitative survey and econometric analysis, to make a more complete assessment of this.

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Objective B: Identify the barriers and drivers to energy efficiency and assess the extent to which the CRC has overcome barriers and emphasised drivers

Summary

Increasing energy costs were cited by most respondents as the main driver for action on energy efficiency in recent years. However, a number of organisations reported that their action on energy efficiency was driven not just by energy cost increases but by other factors relating to their relationship with the public sector or wider public, through public listing, competition or other mechanisms. These factors included Corporate Social Responsibility, investor expectations, tender and contracting requirements and customer expectations. Other significant drivers included estate rationalisation (particularly for the public sector), replacement of old equipment with more energy efficient models, the contribution of committed individuals and concern about future government policy direction on energy efficiency.

Considering the influence of government schemes other than CRC, CCAs appeared to have had some influence on energy efficiency action, although it was difficult to distinguish the effect of this driver from the effect of rising energy prices given the energy intensity of CCA activities. EU ETS appeared to be having less effect currently, owing to surplus allowances and a low carbon price. Mandatory carbon reporting had clearly influenced public reporting of carbon and other greenhouse gases by quoted companies, but assessing the long-term impact of this is not within the scope of this study. Views were mixed on the impact and potential impact of the CCL and ESOS respectively: while the ESOS scheme was not yet active, many organisations were preparing their approach to ESOS compliance.

Looking at the influence of the CRC scheme, about half of CRC participants reported that the CRC had not increased their action on energy efficiency. About half of CRC participants reported that the CRC had increased the priority attached to energy or had led to earlier or faster action on energy efficiency within their organisations, particularly in relation to improved energy monitoring and reporting. A few CRC participants reported significant action on energy efficiency with the aim of reducing consumption below the qualifying threshold for phase 2, but no information declarers reported that they had taken action to keep below the threshold. The research found no evidence of the CRC influencing switching of fuels from electricity to gas.

Considering the relative impact of different drivers in the CRC:

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- the financial driver in the CRC appears to have contributed to the changes in A1-A3, but this impact was reported to have come more from the high-level sign-off of CRC allowances than from the inclusion of CRC costs in business cases. Many respondents felt that this driver would have been stronger if revenue recycling had been implemented as originally planned;
- the awareness raising driver appears to have been influential and to have contributed to behaviours A1-A3 in some organisations. The mechanisms most frequently cited for this were improvements in energy data and energy management, high-level sign-off of CRC allowances and – to a lesser extent – appointment of energy managers or other support for implementation; and
- the perceived impact of the reputational driver has been more mixed. There is evidence that compliance has been a strong reputational driver for many participants. While there is some evidence that the Performance League Table (PLT) acted as a reputational driver during the preparatory phase and the first year of the CRC, there is little evidence that the PLT or Annual Report Publication (ARP) have acted as motivators since then.

The qualitative research found that organisations with the following characteristics tended to report early action on energy efficiency, before the CRC:

- high energy costs relative to total costs;
- sensitivity to reputational drivers (e.g. public sector bodies; publicly-quoted organisations; organisations which tendered for public sector contracts and organisations with a high public profile);
- sensitivity to environmental factors (e.g. waste and water industries); and
- larger-scale organisations.

The most commonly cited barriers that affect energy efficiency investments, even in CRC organisations, were conflicts with business priorities and capital cost barriers. While some mechanisms are available for overcoming capital cost barriers, such as energy performance contracts, it was reported that these could be complex to administer in accounting terms. Other barriers, which were important to specific types of organisation, involved motivations for energy efficiency investment being split between landlords and tenants, between franchisee and franchisor, or between customer and client in service agreements.

There was little direct evidence that uncertainty acted as a direct barrier to energy efficiency but some respondents would like more clarity and certainty on future government policy. There was some indirect evidence that this would enable them to plan ahead more effectively, including possibly taking more action on energy efficiency.

Many respondents wanted to see a simpler and clearer policy landscape for energy and carbon, to replace the perceived plethora of schemes.

Overall, the qualitative research suggests that the early stages of the CRC appear to have had most impact (i.e. pre-scheme preparation and the first year or so of the scheme). This appears to have been linked to the incentive effect of proposed revenue recycling, together with the impact of ensuring compliance at the start of the scheme.

Detailed findings on objective B

In this section, we examine the drivers for energy efficiency action, the significance of CRC influence and the aspects of the CRC that have been most effective in overcoming previously identified barriers. We then look at remaining barriers not addressed by the CRC.

There was broad consistency between energy manager and senior manager views on objective B. In organisations which had undertaken early action on energy efficiency, before the CRC, senior managers tended to express more strongly than energy managers that the CRC had little influence on them. But in other organisations, some senior managers reported that the CRC did have influence (e.g. on business cases; on raising organisational priority). Energy managers tended to report more often that the CRC enabled them to collect good quality energy data and that it helped them to engage the board in energy efficiency matters.

B1: What broader factors have been driving changes in A1-A3, over the period of the CRC, in both CRC and non-CRC organisations' drivers for energy efficiency?

Energy costs

Energy costs were cited by most respondents as the major driver for action on energy efficiency, both in terms of increased management awareness of energy costs and in terms of improved payback periods. This view was put forward by CRC, CCA/EU ETS and information declarer organisations alike.

There's a very, very strong driver from wholesale energy prices making any reductions in energy usage far more attractive than they were previously in terms of paybacks, etc. (CRC energy manager 8, water company)

Cost reduction is THE focus of action on energy. Carbon is not an issue at all. (CCA/EU ETS senior manager 1, agriculture)

It's obviously important because the costs are going up, as you know it suddenly becomes more important because it does cost a hell of a lot more; you're making 5% more income just to cope with the increase in the utility usage, so it suddenly

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becomes more and more important, it's affecting these costs and salaries. It's really important that you dedicate time to it. (ID senior manager 1, leisure)

Increasing energy prices were reported to be the biggest driver of action on energy efficiency, irrespective of CRC status.

Carbon reduction

Most respondents, across the CRC and comparison groups, felt that energy costs were a significantly stronger driver than carbon reduction. CCA/EU ETS organisations were particularly likely to feel that costs were the main driver.

If you use less energy you're producing less carbon, so the cost is the main driver rather than the carbon. (CCA/EU ETS senior manager 2, manufacturing)

Several organisations, across all groups, explained that energy and carbon reduction went hand in hand for them. There were some exceptions, such as waste companies which used landfill gas to reduce their carbon footprint.

Several public sector respondents, particularly those in the CRC scheme, reported that carbon was a real driver. A small number of private companies also cited carbon as a real driver. These tended to be large, high-profile companies or companies working in environmental sectors (e.g. waste and water).

Respondents also mentioned a number of other drivers for the behaviour outlined in A1-A3. Several of these other drivers relate to organisations which have a particular interest in how they are viewed by the public, which are referred to here as 'public-facing' organisations.

Drivers for public-facing organisations

Some CRC organisations reported that they were already prioritising energy efficiency before the advent of the CRC. As explained under objective A3, the drivers for this varied but generally related to the organisation's public profile in some way. Some were public sector bodies, which had to report to government on their energy and carbon performance. Of the private-sector organisations which were already prioritising energy efficiency, some were concerned about Corporate Social Responsibility generally, a few were driven by the requirements of being publicly listed (e.g. mandatory carbon reporting), a few by investor or customer expectations and a few by tender and contract requirements. These different public-facing drivers are explored further below.

Public-facing driver: Corporate Social Responsibility

Corporate Social Responsibility (CSR) tended to be regarded as important by public-facing organisations, such as public sector organisations and their suppliers, as well as organisations with a high public profile. There were also a few organisations whose overall ethos involved environmental commitment, either because of their origins (e.g. public sector) or because their business required environmental awareness (e.g. water).

Those with strong concerns about CSR tended to prioritise energy issues, irrespective of their CRC status.

I think there's a genuine belief amongst members that we want to do the right thing by the planet, we want to do our little bit. (CRC senior manager 6, local authority)

For some private sector organisations, the sense of 'doing the right thing' for CSR purposes was combined with the fact that energy efficiency actions made 'good business sense'.

We do it for two reasons, we're doing it because it's seen as the right thing to do and we want to be following that trend. It's seen as a good way to invest in the business as well, so if something [has] reasonable payback then it makes sense to do it. (ID energy manager 2, manufacturing)

Public-facing driver: tendering and contractual processes

A few organisations mentioned that energy management and environmental improvement were driven by the requirements of competitive tenders. Most of these organisations were competing for public sector tenders (e.g. for provision of leisure services or building materials). While demonstrating environmental improvement tends to be a tender requirement, there was a sense that money was often still the bottom line.

Yes there is the more and more we get we have to demonstrate our energy performance and environmental impact on tender documents, so that's a prerequisite of any tender now. The whole thing has raised its profile, but the environmental tender still doesn't carry a huge amount of weight, it's something that's considered. (CRC senior manager 1, cement)

Public-facing driver: customer expectations

A few other organisations mentioned that their behaviour was also influenced by private-sector client specifications. In the example below, the retailer was developing and running showrooms on behalf of environmentally-aware manufacturers, and had to meet their specifications in relation to energy efficiency.

Also in terms of some of the manufacturers who drive, they tell us what to do a lot of the time in terms of telling us how to build sites. So we're not given a free rein in terms of how we build something, they tell us what to do and are very green. (CRC energy manager 29, retail)

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Customer expectations were also mentioned as a driver by a few property companies, who were competing for tenants, and by a few universities, who saw themselves as competing for students.

Public-facing driver: investors

Several organisations, both CRC and non-CRC, mentioned that their energy and/or carbon performance was driven mainly by investor expectations and, for UK-listed organisations, by mandatory carbon reporting.

In terms of our performance and in terms of carbon emissions that is something that is looked at the most senior levels of the company, particularly because we have investors and this is something that we have to put into the public domain. (CRC energy manager 2, hotels)

Mandatory carbon reporting had provoked a step-change in behaviour in some publicly-listed organisations. A few explicitly mentioned using the Carbon Disclosure Project (CDP) to meet the mandatory reporting requirement.

I think the other one I'd flag up which is an awareness was CDP. So when my parent company signed up to CDP all of a sudden we had to start to calculate these things. (CRC senior manager 4, supermarket)

To sum up, a number of 'public-facing' organisations reported that their action on energy efficiency was driven not just by energy cost increases but by other factors relating to their relationship with the public sector or wider public, through public listing, competition or other mechanisms.

Other drivers

In addition to these drivers cited by 'public-facing' organisations, the qualitative research identified a number of other drivers for behaviours A1-A3 which applied to other organisations as well.

Other drivers: estates strategy

A few CRC organisations and information declarers, all from the public sector, cited their estates strategy or accommodation strategy as driving action on energy efficiency. Energy efficiency investments and refurbishment were targeted at those buildings which were being retained, while disposal provided a means of reducing energy usage and running costs. One CRC participant explained that this had been a key element of their strategy to get below the electricity consumption threshold for CRC phase 2.

So [the] accommodation strategy gets us down in size, reduce some of those buildings, take them out of commission, reduce the energy costs of running; but

the driver from CRC was that it set a benchmark, get below 6 [GWh] and you're not paying carbon tax and you've have the benefit of the energy reduction as well. So that was a real target for us. (CRC senior manager 6, local authority)

The context of on-going public sector cuts, and associated rationalisation of assets, may be the reason for an estates strategy being cited as a driver by public sector rather than private sector respondents.

Other drivers: replacement of equipment

Some improvements in the energy efficiency of equipment were motivated by the need to replace equipment that had reached the end of its working life, rather than by energy efficiency per se. Technological improvements meant that some types of replacement equipment were more energy efficient than older models.

Yeah it was just because the old equipment was beyond its reliable life. It wasn't done from an energy perspective. (CRC energy manager 3, local authority)

Other drivers: committed individuals

In a few cases, irrespective of CRC status, interviewees reported that it was the drive and commitment of particular individuals that made a difference, whether these were energy managers, property managers or facilities managers.

But he [Property Services guy] is quite unique in that he's very proactive, willing to go out and find projects for us to then put through the Salix funding stream, whereas if he was a different kind of person it might be a different story really. He's got the will and the interest; he sees it as an important issue for him. (CRC energy manager 15, education)

A few organisations also mentioned that the commitment of a particular senior manager arose from personal conviction.

One of the large Banking Groups [clients] came to us which was a particularly motivated individual within that organisation, he's one of these chaps who saw it as a debt he owed to his children to make sure that we don't use the resources over and above. (CRC energy manager 17, property)

Finally, a few respondents felt that the likely future direction of policy on energy and carbon was a driver for prioritising these issues within their organisation.

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Other drivers: future policy

A few CRC and non-CRC respondents felt that there was a general policy trend, in the UK and Europe, towards more carbon reporting and policies like the CRC. So, in taking action on the carbon/energy agenda, organisations were following a trend as well as taking actions that made good business sense.

I think there's probably a feeling that policy is going to tighten in this area. That's more just a gut feeling I suspect rather than a specific policy is going to come and bite us. But yeah, I think probably it's seen as we're preparing the business for the way the world's going. (ID energy manager 2, manufacturing)

To sum up, while energy costs were cited by most respondents as the main driver for action on energy efficiency, some 'public-facing' organisations also cited drivers that related to their public reputation. Other drivers that were mentioned by some organisations included estate rationalisation, replacement of equipment, the contribution of committed individuals and concern about future policy directions.

The next two sub-sections examine the influence of other government carbon policies on energy efficiency action, first non-CRC schemes and then the CRC.

Influence of other government carbon policies

The interviews asked about the influence of CRC in the context of other government carbon policies. This section presents the qualitative evidence that was collected on the influence of Climate Change Agreements (CCA), the Climate Change Levy (CCL), the EU Emissions Trading System (EU ETS), the emerging Energy Saving Opportunity Scheme (ESOS) and other non-CRC schemes.

Climate Change Levy (CCL)

The Climate Change Levy is a tax which is levied on fossil fuel energy supplied to non-domestic customers, unless they have exemptions (e.g. through a Climate Change Agreement – see below). For electricity, the tax from April 2014 was 0.541 pence per kilowatt hour, while for gas it was 0.188 per kilowatt hour.

The CCL is paid by a larger pool of organisations than the CRC and is simple for organisations to comply with, since it is included in energy bills. Many CRC respondents commented that they would like the CRC to be levied in the same way as the CCL, to reduce their administrative costs and ensure that the costs were automatically included in business cases for energy efficiency measures.

As climate change levy goes up my business cases get better, and my ability to get capex [capital expenditure] improves and because it's on the bill it's easy. (CRC energy manager 19, food)

But some respondents also commented that CCL is less visible than the CRC, and appears to have little influence on energy efficiency action in their organisations.

CCL adds about 5% to energy bills so nobody notices, it's all on the bill. It's just part of what you pay. (CRC energy manager 31, finance (energy consultant))

To sum up, CCL is regarded by many as being much simpler to comply with than the CRC, although it was suggested by some that it may have less influence on energy efficiency action.

Climate Change Agreements (CCAs)

Climate Change Agreements are voluntary agreements which provide eligible energy intensive industrial sites with exemptions on the Climate Change Levy (CCL) of between 65% and 90% (gas and electricity respectively),⁴ in exchange for meeting stretching energy efficiency or carbon reduction targets.

There is significant overlap between organisations participating in the CRC and those with Climate Change Agreements. During phase 1 of the CRC, organisations with more than 25% of their emissions covered by CCAs or EU ETS (see below) were exempt from paying CRC allowances, although they still had to register for CRC and report emissions under the scheme. Those below the 25% threshold had to purchase CRC allowances for emissions from activities not covered by the CCA site(s). The rules for phase 2 of the CRC are different, since energy covered by CCAs or EU ETS sites is simply excluded from the CRC. Any energy not covered by these sites still counts towards CRC qualification and the requirement to register and pay for CRC allowances.

For the purposes of this research, organisations with full exemptions from CRC allowances were treated as 'CCA/EU ETS exempt'. But organisations which were paying any CRC allowances were classified as 'CRC', even if they were part of a CCA for some sites. While all information declarers were below the CRC threshold for phase 1, a few had CCAs because they worked in energy-intensive sectors.

Several respondents explained that they set up CCAs in order to obtain exemption from CCL and/or CRC payments.

CCA obviously without them there we'd be paying more through the CCL, so the real benefit for us from that one is over its lifetime. I guess it's saved us quite a lot of tax payments for the climate change levy. (CCA/EU ETS energy manager 1, chemicals)

⁴ There are two forms of agreements: approximately 50 sector-level agreements and 8,000 underlying agreements with organisations. Under the old CCA scheme (pre-2013) if the site (or the sector as a whole, for sector-level agreements) failed to meet its agreed target, then the owner(s) had to purchase carbon allowances to make up for the shortfall. In the new CCA scheme, businesses have to pay a buy-out fee instead (based on £12 per tonne of CO₂ by which they fail their target). In accordance with eligibility criteria, qualifying energy used on a CCA site is exempt from CRC.

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Even if an organisation missed its CCA target and had to buy carbon allowances (or pay a buy-out fee), this could still be cheaper than paying CCL on all its energy use.

Yes, our cold stores are on climate change agreements, we're in that agreement because it saves us money. [...] For instance I know that some of our sites aren't going to meet their targets, so I've said that you're going to have to pay probably £100,000 to remain in the climate change agreement. [But...] I'm thinking well if you take into account the reduction in electricity and not having to take part in CRC it's probably worth a million pounds. (CCA/EU ETS energy manager 4, logistics)

Some CCA respondents felt that the CCA had helped to drive energy efficiency within their organisation, but others felt that cost drivers were pushing these initiatives anyway, given the energy intensity of the CCA sectors. However, several respondents reported that their CCA had helped to justify proposed actions to their senior management.

I wouldn't say it's necessarily driven us to do a lot that we wouldn't have done. It's always nice to have it there as another thing to add onto any justification for any projects, because as soon as you add in the fact that 'Oh if we do this it will help us maintain our climate change agreement, and help us hit our target, which helps us to save £150,000 a year in climate change levy fees'. (CCA/EU ETS energy manager 1, chemicals)

But in some cases, CCA targets were perceived to have stimulated more corporate action on energy management.

We have CCA targets. This was really behind setting up the environmental committee and putting the action plan together. (CRC senior manager 12, manufacturing)

A few stakeholders mentioned that CCA targets were very relaxed at first, but that they had become tighter in the second round of CCAs.

In the last round of climate change agreements a lot of people had quite cushy base years, and because a lot of the umbrella agreements dealt with carbon across the sector; so if one plant failed but another plant did really well and it balanced out, then nobody had to buy any carbon. Whereas now, the targets are a lot tighter and the DECC and the various trade collaborations have put a lot more effort into getting the targets right for the different businesses. (CRC energy manager 31, finance (energy consultant))

Generally, respondents tended to be more positive about CCAs than about the CRC, as they see them as a means of reducing taxation and CRC payments. Some respondents mentioned that they used consultants to administer their CCA, as administration was not straightforward.

EU Emissions Trading System (EU ETS)

A few CRC firms had exemptions from CRC for sites which were covered by the EU ETS, but the overlap with CRC was significantly less than was the case with CCAs. EU ETS is targeted at energy intensive sites, but does include some non-industrial sites. For example, one health trust and a property company reported that some of their sites were covered by the EU ETS (comprising a hospital and some office blocks respectively).

EU ETS I think was originally put in place to catch big users, mines, factories, oil rigs, but it did capture some of the large office buildings which is a bit of a shame because it's based on thermal energy rather than our electricity consumption.
(CRC energy manager 17, property)

A few respondents described the initial introduction of the EU ETS as a significant influence on their organisation.

Well from a professional point of view certainly over this last 6/7 years when the EU-ETS scheme came under our legislative umbrella for us to be participant in it, that helped raise the focus in that it was going to be another financial impact [...] and obviously would have to be built into any sort of future business case, budgeting etc. (CRC energy manager 12, health)

However, most organisations have been allocated more EU ETS allowances than they needed, particularly because the recession meant that carbon emissions fell in 2008/9, so few EU ETS organisations have had to purchase significant amounts of allowances. This has contributed to the price of EU ETS allowances falling from its initial rate of €20/tonne to around €5/tonne.

We had a bank of allowances anyway because we've outperformed what we've had in allocation, we've never had to buy allowances and have had quite a few in the bank. It was a case of we knew in 4 or 5 years if we didn't do anything we'd have to buy, but it wasn't a huge amount anyway so it wasn't driving us there.
(CCA/EU ETS energy manager 2, chemicals)

As with CCAs, EU ETS was described as helping to justify energy efficiency investments or fuel switching, with the main driver still being energy costs.

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It was factored in when we went to the board with the gas conversion that this will minimise the purchase of allowances. But no, it didn't drive it, the main driver was economic and that was the difference between oil price, gas price, and the fact that you could use less gas to get the same amount of heat. (CCA/EU ETS energy manager 2, chemicals)

But a few organisations mentioned that they were concerned about future rises in the cost of EU ETS allowances, as organisations use up their backlog of allowances in the coming years.

A lot of our clients are actually large industrials, and they're all very concerned at the moment because a lot of them are going to run out of their free allowances and have to start buying allowances on the EU-ETS. Some are already having to buy allowances on the EU-ETS, but the allowance price is currently low, but some of the really big emitters will dwindle their account balances by around 2017 – 2019. [...] in some sectors we're talking about a kind of median EUA⁵ price of around €20. (CRC energy manager 31, finance (energy consultant))

Although EU ETS organisations tend to be energy intensive, some of them have small management teams and find EU ETS onerous to administer.

It's very bureaucratic. We're a small company, I'm the Operations Manager, the guys who operate the plant report to me. [...] I'm having to do this, we don't have an Energy Manager or anything like that, you're getting 105 page document that's guidance and you think 'I haven't even got time to read it, never mind absorb it and figure out what I'm meant to do'. (CCA/EU ETS energy manager 2, chemicals)

The amount of effort required did not always feel proportional to the carbon streams being measured.

Overall, the administration of EU ETS was found to be fairly onerous by participants. Although many had not had to buy EU ETS allowances for some time, some used EU ETS as an added justification for undertaking energy efficiency actions.

Energy Saving Opportunity Scheme (ESOS)

ESOS regulations became law in July 2014 to meet the requirements of Article 8 of the EU Energy Efficiency Directive. Many participants volunteered their views on the scheme, as the qualitative fieldwork was being undertaken in the period leading up to the launch of ESOS. As with the CRC, some organisations reported that it would not influence their behaviour because they were already taking action.

⁵ European Emissions Allowance price (EUA price)

I don't think it's going to be any help to us at all because we already do energy audits, we already know exactly what's in our restaurants and therefore again it's just not been aimed quite right. (CRC energy manager 19, food)

However, these respondents tended to feel that ESOS would be useful in stimulating action and awareness by medium-sized companies who were above the ESOS thresholds but had previously done less to tackle energy efficiency.

But I think it [ESOS] really does help concentrate the minds for organisations who aren't yet thinking about it, and brings energy management and energy reduction much more up the board room agenda of medium sized organisations, and SME's who perhaps are still not seeing it as an opportunity energy reduction. (CRC senior manager 16, energy)

A common complaint about ESOS was the perception that it required organisations to pay lead assessors, who would normally be independent consultants, to undertake audits and related services. Several respondents described ESOS as a form of taxation, in the sense of being a scheme which increased their running costs. A few said that they would prefer money to be raised through a tax on fuel bills, along the lines of CCL, rather than being required to meet ESOS auditing requirements.

Then you have ESOS which is just another monitoring tool, another cost for us. Just saying 'We use energy, here you go here's some more money', it would be much easier than instead of having all these particular consultants that you have to bring in line, and people we have to bring in just to enter data and take people away from their day job, and extra costs to businesses; why doesn't the government just put another fee on the energy that we're using? (CRC energy manager 29, retail)

But some stakeholders felt that ESOS would generate real action on energy efficiency, as many firms were looking at the energy audits as a real exercise rather than just a compliance exercise.

Yeah, everyone's kind of getting their heads around and all the response that we've seen is very good, and actually a lot of businesses as opposed to just playing the game and ticking the compliance box, and just getting on with it; a lot of them are trying to get something useful out of it and do the right thing, so that's really positive to see actually. (CRC energy manager 31, finance (energy consultant))

However, some stakeholders felt that there were just too many different schemes in the non-domestic policy arena. A few asked whether ESOS could possibly be tied in to

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CRC in some way, to reduce the time required to meet the requirements of separate programmes.

I'm a bit concerned the government have gone a bit mad with all these programmes [...] It could maybe be tied in with the CRC because there's too many programmes. It's a lot of work and I don't think they realise how much resource and time is needed for all this. (CRC energy manager 32, professional)

In the run up to the launch of ESOS in December 2014, a few respondents also voiced uncertainties about the details of the scheme. They found it difficult to prepare for the scheme when the proposals were perceived to be continually changing.

ESOS is changing every week. They [DECC] go into an open consultation. We don't want to waste time and effort preparing stuff that's not needed. Originally, ESOS included vehicle movements, but now they are not including vehicles [that are] not owned by the company. (CRC senior manager 13, manufacturer)

Overall, ESOS was high in respondent's minds at the time of the research. Views on the scheme were mixed, ranging from those who saw it as an additional cost burden which would have little beneficial impact on their organisation, to those who saw it as raising awareness within organisations which had done little on energy efficiency.

Mandatory carbon reporting

In October 2013, the UK government made carbon reporting mandatory for quoted companies, including those listed on the London Stock Exchange. Several respondents, including one information declarer, mentioned that they had recently started reporting and publishing carbon emissions because of this requirement. This is discussed further under objective A2.

To sum up, CCAs appeared to have some influence on energy efficiency action, although it is difficult to distinguish the effect of the driver from the effect of rising energy prices. EU ETS appeared to be having less effect currently, owing to surplus allowances and a low carbon price, but might have more effect in future if the market for allowances tightens. Mandatory carbon reporting clearly influenced public reporting of carbon and other greenhouse gases by quoted companies, but assessing the long-term impact of this is not within the scope of this study. Views were mixed on the impact and potential impact of the CCL and ESOS respectively.

Significance of the CRC as a driver compared to other factors

About half of the CRC participants interviewed felt that the CRC did not change their level of activity on energy efficiency. Some just reported that it had not had much impact, while others explained that energy efficiency was already on their agenda because of the other drivers outlined above. The latter group tended to be organisations

which were sensitive to public opinion (e.g. public bodies and organisations serving the general public or public bodies) or sensitive to environmental issues (e.g. water).

I wouldn't have said that [the CRC] made any significant difference in terms of the way we dealt with energy, because we were already monitoring it anyway. (CRC energy manager 4, health)

If the CRC didn't exist I can say with 100% certainty that a strategy that's been employed and the reductions in energy and operational carbon would have occurred anyway. (CRC energy manager 8, water)

However, about half of the CRC participants interviewed did feel that the CRC had increased the priority attached to energy or had led to earlier or faster action on energy efficiency within their organisations. This group included some large organisations and some public sector organisations, as well as smaller private-sector organisations.

I think it is fair to say the carbon reduction commitment is one of the drivers that ensures that carbon and energy remains higher up the agenda in our organisation, because obviously we have a statutory duty to comply with that scheme. (CRC energy manager 11, local authority)

It definitely drives businesses to think, whenever you're getting hit with the carbon tax its bringing it back to the fore what can we do to try and minimise energy, whether it be small LED projects or bigger modernisations it all comes back to what we can do to reduce that bill at the end of the month/year. (CRC energy manager 30, retail)

It did accelerate the deployment of AMR early on, which was a bonus because obviously I've always said meters are actually key to everything. So that was a positive. (CRC stakeholder 4)

For a few of the organisations interviewed, including both public and private sector examples, CRC had a major impact on energy use because the organisation took action to get electricity use below the qualifying threshold for phase 2.

CRC is an extra cost in the business – so there has been real focus in getting beneath the threshold. The cost of carbon is rising and will continue to do so (e.g. £16/tonne), so from an economic viewpoint we need to keep these costs down. (CRC senior manager 13, manufacturing)

There was no evidence of organisations switching fuels from electricity to gas in order to avoid qualifying for CRC. Fuel switching was only reported by organisations with CCAs who undertook fuel switching for major industrial processes.

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Most but not all of the information declarer interviewees were aware of the CRC. None of the information declarers in the qualitative research mentioned targeted activity to keep below the CRC threshold for phases 1 or 2.

Some CRC participants mentioned that the CRC encouraged them to improve the quality of their energy monitoring and reporting, and had encouraged some organisations to bring in energy management expertise. There is substantial evidence that the Early Action Metrics resulted in a temporary increase in the uptake of the Carbon Trust Standard, as well as increased uptake of AMRs.

I'd been trying to get them in prior to that in order to be able to monitor energy consumption, and it was always met with 'Oh what's the benefit? How do you know it's going to work?' The fact that the Early Action Metrics were there gave me ammunition to say 'we're doing it'. (CRC senior manager 2, holding company/leisure)

While many CRC organisations reported that they dropped the Carbon Trust Standard when it no longer helped their position in the CRC league table, some reported that installing AMRs – particularly for gas – brought on-going benefits in terms of energy management.

By putting on the AMR particularly on gas we have significantly reduced our gas consumption across our estate because measuring it means you can manage it better. (CRC senior manager 16, energy)

To sum up, about half of CRC participants reported that the CRC had not increased their action on energy efficiency. However, about half of CRC participants reported that the CRC had increased the priority attached to energy or had led to earlier or faster action on energy efficiency within their organisations, particularly in relation to improved energy monitoring and reporting. A few CRC participants reported significant action on energy efficiency with the aim of reducing consumption below the qualifying threshold for phase 2, but no information declarers reported that they had taken action to keep below the threshold. There was no evidence of the CRC influencing switching fuels from electricity to gas.

The following sub-sections explore the influence of the three different drivers in the CRC's design: the financial driver, the awareness driver and the reputational driver. These drivers were developed in response to a report⁶ by the Carbon Trust in 2005 to overcome three barriers to action on energy efficiency by large non-intensive energy users: lack of cost drivers, lack of awareness/information, and lack of motivation.

B2: How far are changes in A1-A3 attributable to the financial cost of CRC payments, as opposed to these other factors?

This research generated mixed evidence about the impact of the marginal cost of buying CRC allowances. Respondents in the qualitative research reported that the cost of phase 1 was 6-8% of energy costs, while the cost of phase 2 was around 11%. Over

⁶ Inducing Innovation for a low carbon future: drivers, barriers, and policies, Carbon Trust, 2005.

the scheme as a whole, the cost of CRC allowances was reported by DECC to be nearly £700,000 per year.

Overall impact of CRC cost

For some CRC organisations which were prioritising energy efficiency before the CRC, the scheme was seen as a tax that did not significantly influence their behaviour.

So from my perspective the only way in which it has worked is that it's increased our energy costs effectively by 8% or so, and now its 11% or something. (CRC energy manager 19, food)

Conversely, there were some organisations that were not particularly active on energy efficiency for which the financial cost was still not reported to be a driver since the cost of CRC allowances was again effectively regarded as a tax.

It's a sort of failing of CRC really because the cheque just gets written off. We could save a load of money here, if we reduced our consumption we'd pay less CRC. (CRC energy manager 22, retail)

The perception of the CRC as a tax is discussed further under objective D.

Interviews with CRC participants suggest that the cost of allowances was made more visible because of high-level sign-off within organisations of CRC allowances, as discussed under objective A3.

The CRC all of a sudden basically added about 6% to energy bills for businesses, but I think more importantly than that at the end of the year was a big cheque that somebody had to sign. (CRC energy manager 31, finance (energy consultant))

At a corporate level, the financial cost may have contributed to the awareness-raising aspect of the CRC, helping to drive strategic priority and set targets for energy efficiency.

I don't think [a business unit] in particular would really have had it on their agenda quite so much as they have [if] it wasn't for the financial burden... the increased costs that are involved have made them push more towards setting targeted time limits on putting measures in place, or reducing the consumption in line with the allowances going up next year, for example. (CRC energy manager 10, holding company/leisure)

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The increase in the cost of CRC allowances from £12 per tonne in phase 1 to £16.40 per tonne in phase 2 was seen by some to have increased the financial driver, although others felt that it was not significant.

It's a good stick, especially now that the carbon price is going up, obviously I'm not going to be very popular for saying that! But it does help. (CRC energy manager 1, holding company)

But many respondents emphasised that the CRC was one of several drivers, rather than the main driver. The overall importance of other drivers, such as energy cost, depended on the energy intensity of the organisation and other factors, as discussed under objectives A1-A3.

In summary, while there was substantial evidence that the overall cost of the CRC contributed to increasing awareness of energy use and energy efficiency at board-level, there was slightly less evidence that the cost of CRC allowances influenced the business case for particular energy efficiency measures, as discussed below

Influence on business cases

A few CRC respondents reported that CRC costs slightly improved paybacks and – at the margin - helped to get energy efficiency projects approved.

The introduction of CRC helped to improve some of the project paybacks, but it's just a programme we were delivering anyway. [...] Obviously we reflected the introduction of it in our rates forecast, or our cost forecast; that helped some projects to get through. (CRC energy manager 6, supermarket)

However, savings in CRC allowances were not generally seen as significant in the business case for individual energy efficiency investments. The influence was positive but marginal.

Basically the CRC saving on [the gas saved by a particular gadget] is negligible on how much it's going to cost. So there is already a good payback on the term of investment, and the CRC reduction is seen as a small bonus. (CRC energy manager 1, holding company)

Several CRC respondents reported that CRC savings were not included in the business case for energy efficiency investments. The reasons given ranged from CRC savings being insignificant compared to other factors and uncertainties in the business case, to uncertainty about the long-term future of the CRC scheme or to the structure of their business meaning that CRC costs were not allocated down to business unit level.

...it's assumed now that those [energy] price increases are here to stay; whereas the CRC although it has a future, it's uncertain, so we don't tend to factor it in if I'm honest. (CRC energy manager 3, local authority)

Most CRC organisations reported that the CRC had not actually tipped any specific investments into viability, as its impact on the business case was too marginal. This may have been, in part, because the respondents were mainly reporting on the adoption of mature technologies which have become 'no brainers', where CRC savings were relatively insignificant.

If anything was that marginal we probably wouldn't do it. (CRC senior manager 1, cement)

Potential influence of revenue recycling

Many CRC respondents were strongly critical of the government's decision not to implement revenue recycling, which would have provided stronger financial incentives for energy efficiency action. They felt that the CRC was more positively received and provided a stronger driver for action when revenue recycling was expected to form part of its design. This would have redistributed resources from organisations towards the bottom of the CRC's annual 'Performance League Table' (PLT) to those near the top of the PLT. While this would have provided a stronger financial driver for good performance, it could also have strengthened the reputational driver of the PLT.

Many CRC respondents commented that revenue recycling would have provided a real incentive for businesses to improve their performance and compete with each other. Many reported that the prospect of reducing CRC payments or getting some money back was a strong motivator.

In the concept of revenue recycling was something to get your teeth into and was a way for us to arguably drive some competition in the hotels. (CRC energy manager 2, hotels)

Because before you could actually really make CRC a business case, if you do drive these reductions you will get a smaller CRC bill. (CRC energy manager 1, holding company)

It is likely that the prospect of revenue recycling encouraged the adoption of the 'Early Action Metrics', as evidenced under headings A1 and A2, in the preparatory phase of the CRC scheme.

The original design raised expectations, resulting in disappointment amongst many CRC participants when revenue recycling was not implemented. For some, this resulted in a reported loss of trust in government policy which some respondents linked to their

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disappointment at successive reductions in Feed-in-Tariffs. A few organisations explicitly reported that they cut back their action on energy efficiency as a result.

When we did our 5 year forecast, for instance from 2010 onwards, obviously we were anticipating lots of building changes to drive down consumption because of the potential rewards from CRC. Most of these got shelved in the light of changes to the scheme when they took away the incentive frameworks. (CRC energy manager 9, property).

It is not entirely clear whether respondents would have liked the results of revenue recycling in practice. The attraction of revenue recycling may have been more symbolic (having a 'carrot' as well as a 'stick' in the policy) rather than rational (in terms of saving significant sums of money for particular organisations). One senior manager admitted that revenue recycling would not have been straightforward:

It did influence the organisation [but] they didn't understand the level of effort that would have been required to actually put us where we needed to be. Therefore I think we would have been very disappointed... (CRC senior manager 2, holding company/leisure)

To sum up, the financial driver in the CRC appears to have contributed to the changes in A1-A3, but this impact appears to have come more from the high-level sign-off of CRC allowances than from the inclusion of CRC costs in business cases. This driver would have been stronger if revenue recycling had been implemented as originally planned, and it is likely that the prospect of revenue recycling acted as a financial driver for the Early Action Metrics in the scheme's preparatory phase.

B3: How far are the changes in A1-A3 attributable to the awareness-raising drivers in the CRC (e.g. board-level sign-off; corporate reporting), as opposed to other factors?

Many CRC respondents reported that the CRC had helped to raise awareness of energy use and energy efficiency in their organisation.

Yes, it's helped in making the high level more aware. So the focus has been to consider energy consumption where they might not have before. (CRC energy manager 1, holding company)

As explained in objectives A2 and A3, the mechanisms most frequently cited for this were improvements in energy data and energy management, and high-level sign-off of CRC allowances.

But the CRC helped me in a way of engaging the board to say here's cost of about [nearly £100,000], here's a big pot of money which is coming out. (CRC energy manager 16, property)

A few CRC participants mentioned that awareness was raised by making board members personally responsible for compliance.

I think the threat of putting the key person in jail for a period of time did the job. If you want to influence a company into taking notice, the fact that you're going to put the most senior person behind bars for not conforming, yes definitely it focused people's attention. (CRC stakeholder 4)

But, as explained above under B1, the awareness-raising driver was less important to some CRC participants who were already engaged with energy issues, particularly those which were sensitive to public opinion (e.g. those serving the public or those in the public sector).

The idea of CRC was to make the board aware by giving them one big bill, well that didn't work for us at all they were already aware. (CRC energy manager 19, food)

Many respondents pointed out that the CRC had encouraged improvements in measuring energy use, and some pointed out that this was the first step towards managing energy.

CRC has taught them one thing, you can't measure it [then] you can't manage it. (CRC energy manager 1, holding company)

Many CRC participants felt that CRC had helped them to improve their data, even if this was a time-consuming exercise. One stakeholder suggested that the phase 1 registration process was particularly useful in identifying whether the meters that were being billed by energy suppliers were still owned by the organisation. Others commented that the improvement in data quality had benefits for the organisation, even if they did not directly lead to action on energy efficiency.

...the CRC has helped me immensely in cleaning up the estate and metering etc., but it's had no impact on energy conservation whatsoever. (CRC energy manager 22, retail)

Some CRC participants felt that CRC reporting had increased awareness of total energy use and energy costs at board level. For example, one international company had not

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previously collated energy use for its different UK operations, and found that this was a useful exercise. Another explained that having UK-level reporting had helped their organisation to reduce electricity purchase costs.

It's been shown that actually having a management at a high level like CRC can improve your reduction. It can make sure that you're aligning your corporate accounts, you're getting a better buy for your electricity and so other countries are starting to do that as well. (CRC energy manager 1, holding company)

A few CRC organisations mentioned that an energy manager or similar post was created to ensure that CRC requirements were met, and that this helped to kick start energy management and bring more focus on to energy bills.

So to be honest until my job was created they didn't necessarily know what their trends or why their energy use was what it was, or where it was being used or anything like that. To be honest our energy bills were coming in and they were being paid by direct debit and the money was going out, and that was pretty much all there was to it. [...] Certainly if CRC had never happened I don't know at what point they would have ever thought to get their energy house in order. (CRC energy manager 4, local authority)

The CRC was regarded positively by some energy and senior managers, as a tool for raising awareness or energy management within their organisations.

So for me it was perfect walking into a job where we were doing very little, or we had useless data and processes, it was an ideal perfect scheme to kick off through the company to get that attention. (CRC senior manager 16, energy)

To sum up, the CRC awareness raising drivers appear to have been influential and to have contributed to behaviours A1-A3 in some organisations. The mechanisms most frequently cited for this were improvements in energy data and energy management, and high-level sign-off of CRC allowances.

B4: How far are the changes in A1-A3 attributable to the reputational drivers in the CRC (e.g. publication of the Performance League Table, its successor the ARP and enforcement), as opposed to other factors?

The reputational drivers in the CRC have comprised three main elements:

- the Performance League Table - PLT (which covered the first two years of the scheme, 2010/11 and 2011/12);

- the Annual Report Publication – ARP (which replaced the PLT in 2012/13 and 2013/14); and
- enforcement activities for non-compliance with CRC regulations.

Early designs for the scheme included provision for revenue recycling, so that CRC allowance payments made by organisations towards the bottom of the PLT would have been paid to those towards the top of the PLT. Proposals for revenue recycling were dropped as part of DECC's contribution to restoring public finances in 2010, so that CRC allowances are now paid directly to the Treasury.

Does reputation matter?

As explained under objective B1, reputation tended to be a more significant issue for organisations which were 'public facing' (e.g. public bodies; publicly quoted companies; high-profile household names; and private sector organisations serving public sector or high-profile clients). The latter were more likely than non-public-facing organisations (e.g. private organisations, and those selling 'Business to Business' (B2B)) to be taking action already on energy efficiency or carbon for other reasons, prior to the CRC, but they would also be expected to be more sensitive to reputational drivers within the CRC.

In contrast, while non-public-facing organisations might have been less susceptible to non-CRC drivers, they were also likely to be less susceptible to reputational drivers within the CRC.

For us going into generally industrial markets, not that many of our [Trade] customers in [Country] are going to be, to be honest, that concerned about our energy efficiency, they'd be more concerned about what's the cost of the material to them. (CCA/EU ETS energy manager 1, chemicals)

With these differences in sensitivity in mind, the next few sections discuss the evidence about the strength of different reputational drivers in the CRC.

Compliance and enforcement as reputational issues

Many of the organisations involved in the qualitative research reported that complying with legislation was important to them. CRC compliance carried weight with many participants because it was a regulatory requirement. This is consistent with the high levels of compliance observed by the Environment Agency (generally in the range 97-99%). Those organisations which were most concerned about their reputation were particularly concerned not to generate media headlines through non-compliance with the scheme.

No not really, its reputational drivers, it's more a question of a certain paper(s) having the headline that [Company] doesn't comply with legislation rather than having to pay a certain amount for it. At the end of the day we want to do what's

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right and obviously we want to comply with all legislation. (CRC energy manager 19, food)

Several participants mentioned that the enforcement fines and penalties, as well as the threat of criminal charges, were significant enough to raise attention.

Yes, as was the intention of the scheme it's highlighted the role of energy let's say from a compliance perspective. It probably had a limited effect in terms of the additional cost but the drivers around compliance were very strong, obviously with the associated fines and penalties involved. It raised the profile of energy certainly on that basis. (CRC energy manager 21, local authority (energy consultant))

But a few participants mentioned that they were unaware of enforcement actions being taken against participants.

Yes, the threat of being fined is important. But I haven't seen any information on organisations which have failed to comply with CRC. (CRC energy manager 14, energy consultant)

A small number of CRC participants said that they were not concerned about enforcement notices, some of which related to minor compliance issues. In the example below, the participant was surprised that there was no penalty for missing submission of allowances, and reported that the organisation was not troubled by the enforcement notice.

We are subject to an enforcement notice this week because [...] all he has to do is say 'we want this many units', and he forgot. So [...] you can buy and settle in November, but there's no penalty. So we're not bothered [...] about the enforcement notice, no. (CRC energy manager 22, retail)

But generally, in spite of a few counter-examples, compliance with CRC and avoidance of enforcement penalties appear to have been a strong driver for CRC participants.

Influence of the Performance League Table (PLT)

For the first two years of the CRC, the PLT was published on an annual basis. The rationale was that the PLT would still have a reputational impact, even if it was no longer linked to revenue recycling (see heading B2). This report ranked CRC participants using a weighted average of three metrics:

- an 'Early Action Metric' (reflecting take-up of AMRs and the Carbon Trust Standard or its equivalent);

- an 'Absolute Metric' (the percentage change in emissions compared to the previous year); and
- a 'Growth Metric' (the percentage change in CRC emissions per unit of turnover since the previous year).

In 2010/11, the Absolute Metric and Growth Metric were not available, since this was the first year of the scheme, so the ranking in the PLT was based solely on the Early Action Metric. In 2011/12, all three metrics were available for some organisations, but the impact of the Growth Metric was limited by the fact that fewer than half of organisations chose to submit turnover figures, either because they were concerned about submitting sensitive information or because they felt that this would disadvantage their position in the PLT.

Some CRC organisations reported that the Performance League Table was a motivator during the first year of the CRC. Many organisations took action on the Early Action Metrics, before or during this first year. Some organisations reported that their organisations were concerned about their position in the PLT first time round.

[Our Company] was 151st – in the top 10%. Before that nobody was looking at it. (CRC energy manager 7, service company)

But these organisations tended to lose interest in the PLT when press interest in the first table did not materialise.

We did not get a single enquiry from any media organisation that challenged us as to where we were in the league table. That spoke volumes to me. (CRC energy manager 8, water company)

Several respondents also commented that the league table was not useful because it compared organisations in very diverse sectors. They would have preferred to see sector-specific league tables which they felt would have been more meaningful. The implication was that they would have been strongly motivated to improve their position relative to their competitors.

I was hoping that maybe there was something that you could have industry groups or something, smaller groups that you could more compare between. (CRC senior manager 5, holding company)

Some other respondents reported that there were anomalous results in the first league table. Without trust in the meaning of the league table and its metrics, there was little motivation for organisations to improve their ranking.

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It's one size fits all isn't it, and when you compare it to the totally different sectors, it's how meaningful is that? And how are you going to use it, and what cost do you put into it to be able to climb up that? (CRC senior manager 1, cement)

Nevertheless, when the PLT was abolished, some CRC organisations felt that an opportunity to influence board directors had been lost.

But I do think when it came to the board that was something that did bring people around the PR and the CR/CSR side, all of a sudden its why aren't we on top? [...] We don't like the league table because we want to be at the top and it costs us money to get there. But at the same time it is a good motivator for industry, private industries especially. (CRC senior manager 16, energy)

Influence of the Annual Report Publication (ARP)

Most CRC respondents did not feel that the Annual Report Publication (ARP), which replaced the PLT from 2012/13 onwards, had a significant influence on their organisations. The metrics were no longer used but total carbon emissions was presented for each organisation, together with some information on their low carbon activity (e.g. renewables) and voluntary management information.

The consensus was that the ARP did not have significant influence within CRC organisations. Although not explicitly stated by respondents, this may have been because it was not presented in a 'league table' format, so that meaningful comparisons cannot easily be drawn between participants. Respondents commented that it was still difficult to draw comparisons across different sectors, that the ARP was not widely publicised and that many organisations did not submit responses on management information.

The ARP is absolutely not a driver. Initially in year 1 it [the PLT] had an impact but it was just on the EA website – and you even had to look for it there. It's not really in the public domain. Organisations have worked out that you can just say 'undisclosed' to the management questions – you don't have to answer all the questions. (CRC energy manager 14, energy consultant)

To sum up, there is evidence that compliance and enforcement have been strong reputational drivers. There is some evidence that the PLT acted as a reputational driver during the preparatory phase and the first year of the CRC, but little evidence that the PLT or ARP have acted as motivators since then.

B5: Which phases of the scheme had most impact on the actions (A1-A3): Pre-scheme preparation, phase 1 or phase 2?

The evidence outlined in B1-B4 suggests that pre-scheme preparation for the CRC may have been particularly important. In particular, the influence of proposed revenue recycling and the Early Action Metrics appear to have been significant.

Evidence presented under objectives A (see above) and D (see below) suggests that registration for phase 1 was a considerable undertaking for some organisations. For example, large organisations – particularly those with many different sites – had to do considerable work to collate energy use across all their gas and electricity meters and 29 different fuel types. The threat of enforcement action for non-compliance provided an impetus to many organisations to provide accurate information. The evidence presented in A2 suggests that the improved energy data gathered through this process did facilitate better energy management by some CRC participants. So the compliance requirements of the beginning of phase 1 were also a significant part of CRC influence.

Several participants suggested that the latter part of CRC had less impact at board level than it had around the start of phase 1. This was largely because CRC payments were a standard part of participants' budgets, and because many board members had got used to the scheme and simply treated it as a carbon tax. This did not mean that energy efficiency was neglected, since higher energy prices continued to drive this for most organisations, but that the CRC was less of a driver than it was previously.

Any efficiency we get there will obviously have an effect on driving down our energy usage, that in turn will reduce our carbon and that will reduce what we pay the CRC. But CRC has no direct pressure as far as I can see on the approach, it's a cost that is part of the overall energy cost now. (CRC energy manager 26, leisure)

Given the timing of this research, it was too early to assess the impact of phase 2 of the CRC. But a few CRC participants commented that the increase in CRC allowance costs from £12 per tonne to £16.40 per tonne in phase 2 had pushed up board-level awareness again. For example, one organisation commented that they were pushing to reduce their energy use so that their overall CRC bill would remain unaltered when the price went up. But most CRC participants felt that this increase had not made a significant difference to board-level awareness.

To sum up, qualitative research suggests that the early stages of the CRC appear to have had most impact (i.e. pre-scheme preparation and the first year or so of the scheme). This appears to have been linked to the incentive effect of proposed revenue recycling, together with the impact of compliance requirements at the start of phase 1.

B6: What factors have influenced the effectiveness of different drivers (CRC/other), across different types of participant (e.g. price signal, presentation of data, energy-intensity of participant; scale of participant)?

This section summarises the evidence presented in B1-B4, on the effectiveness of different drivers across different types of participant.

Four characteristics have particularly emerged from the qualitative evidence as potentially influencing organisational behaviour:

- energy intensity;

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- sensitivity to reputational factors (including public/private sector);
- sensitivity to environmental factors; and possibly
- organisational scale

Energy intensity

Relatively energy intensive organisations, including some manufacturing companies, dominated the CCA/EU ETS group but were also present in both the information declarer and CRC samples. An outline of the characteristics of the different groups was given in chapter 2, based on rough information provided by interviewees. There was overlap between these groups. For example, a couple of the information declarers interviewed had CCAs.

For the more energy intensive organisations, energy costs tended to be a strong driver. Many had undertaken energy audits and had invested in process equipment with lower energy intensity. There was mixed evidence as to whether these organisations had developed targets and action plans in response to the CCA, EU ETS or CRC, or whether energy costs were enough of a driver in themselves to generate action. It might be expected that CRC influence on this group would be low relative to the energy cost driver.

In contrast, the CRC appears to have had more influence on organisations or activities with lower energy intensities, such as office-based and property-based activities. In some cases, the CRC encouraged multi-stream businesses to address energy efficiency in their less-energy intensive business streams.

I guess from our organisation they [government policies] all affect us, but really from a real estate perspective and on message from this call it's really CRC which has an effect, because the EU-ETS is very much across our generation business, and the CCA's have around our co-generation business. (CRC senior manager 16, energy)

Sensitivity to reputational factors

The discussion under objectives A and B has highlighted that the more 'public-facing' organisations appeared to be more sensitive to reputational factors. 'Public-facing' organisations included public sector organisations, publicly-listed corporations, organisations which sell directly to the public (e.g. supermarkets) and organisations whose clients were in these earlier groups. The latter group tended to be influenced through the procurement policies and tendering processes of the earlier groups. The 'public-facing' organisations tended to be more sensitive to non-CRC drivers and were more likely to have prioritised energy efficiency issues and energy or carbon measurement prior to the introduction of the CRC. But their 'public-facing' nature also meant that they were potentially more sensitive to reputational drivers within the CRC.

In contrast, private equity companies, particularly those selling their products or services to other businesses, appeared to be less sensitive to reputational factors and to be less likely to have prioritised energy issues prior to the CRC, unless their business was energy-intensive.

Sensitivity to environmental factors

Organisations in some sectors, particularly waste and water, appeared to have higher awareness of environmental issues because they regarded them as real issues for their business. This appeared to be not only because of the 'public-facing' nature of the organisation, but also because these organisations were potentially affected by environmental risks, including climate change. For example, one waste company explained that their involvement with landfill and landfill restoration meant that their business was directly concerned with environmental protection and improvement. Similarly, a water company explained that climate change impacts were regarded as a direct threat to their business, so that climate change mitigation was a real concern for the company. One supermarket also reported that climate change impacts were perceived as a real risk to their business.

Organisational scale

Larger organisations appeared more likely to have already taken action on energy efficiency before the CRC, partly because they were more likely to be publicly-quoted and high-profile, and partly because they were more likely to employ a dedicated energy manager. Some respondents from smaller organisations, including some energy intensive organisations amongst the information declarer and CCA/EU ETS groups, reported that their management teams were small and had less time and less expertise for non-core business issues than larger organisations. This may imply that smaller companies are more in need of incentives to improve energy efficiency, but that they also face more constraints in taking action.

To summarise, the qualitative research found that organisations with the following characteristics tended to report early action on energy efficiency, before the CRC:

- high energy costs relative to total costs;
- sensitivity to reputational drivers (e.g. public sector bodies; publicly-quoted organisations; organisations which tendered for public sector contracts and organisations with a high public profile);
- sensitivity to environmental factors (e.g. waste and water industries); and
- larger organisations.

B7: Are there additional barriers to actions A1-A3 that need to be overcome, and how far do these apply to different types of participant?

This section presents evidence on the remaining barriers to energy efficiency actions (A1-A3), which are still experienced by CRC participants and the comparison groups. The first group of barriers are common barriers most frequently mentioned by respondents.

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Common barriers: conflicting corporate priorities

The most commonly cited type of barrier was tension between energy goals and other corporate objectives. Some organisations highlighted tensions between their business objectives and reducing their absolute energy use. These would not necessarily imply that there were tensions between business objectives and energy efficiency, measured relative to economic activity. Examples included: rising energy consumption for property companies when occupancy rates rose; rising fuel costs for a logistics company when business grew; and rising energy costs for a university when student numbers increased. A few participants explicitly commented that their business objectives took precedence over absolute carbon or energy targets.

Because the organisation is going to want to develop and grow, it's not just going to want to stand still, as I guess like businesses, they're not going to want to put things on hold just for the sake of the carbon targets really, being honest! (CRC energy manager 15, education)

But some CRC and non-CRC organisations also cited tensions between their business objectives and energy efficiency per se. For example, a few organisations mentioned that health and safety requirements constrained potential energy efficiency gains (e.g. through the specification of minimum working temperatures), and two universities mentioned that they were investing in energy-intensive research equipment. One of the health trusts explained that patient experience was the main driver for their energy use, although they could try to deliver this patient experience more efficiently.

Because we're a hospital it's kind of whatever it is; it sounds awful but if it's cold the heating's on, if it's dark the lighting's on, and patient experience is probably the driver for a lot of what goes on. What we try and do in the background is obviously improve how we deliver the heating, cooling, lighting and everything else with it. (CRC energy manager 4, health)

Several organisations mentioned that tighter regulations were tending to push up energy intensity in their sector. One particular example was the waste industry, where more energy is required to achieve recycling rates and to provide safe disposal of clinical waste (e.g. through incineration).

There's a similar push to take all those wastes away from landfill and into recycling and manage them better, which requires the adoption of new technologies with the consequent energy consumption that goes with it. (CRC senior manager 18, waste)

Another example was the water industry, where higher waste water quality standards have meant higher energy use.

The drivers for that were the forecast increase in energy demand that we had on our business. When that came through from the regulatory requirements we have, there was a strong driver within the water sector as a whole in terms of waste water intent, and waste water treatment. (CRC energy manager 8, water)

A few other organisations mentioned that higher standards were being expected by customers or required by industry bodies. For example, a retailer reported that higher levels of lighting were required in some showrooms, while a leisure company reported that customers now expected cooler temperatures in gym facilities, which increased the energy used for air conditioning.

To sum up, some business objectives were reported to limit the efficiencies that CRC participants were willing and able to make.

Capital cost barrier

The most frequently cited barrier, other than conflicting corporate priorities, was the capital cost of energy efficiency investments. This was reported as a barrier even by some of the largest and best known organisations. The capital cost was still felt to be a barrier by a significant number of CRC participants and CCA/EU ETS organisations, but this barrier was mentioned less by information declarers.

The key issue was that energy efficiency investments requiring capital expenditure had to compete with other potential investments. While a 7-year payback was regarded as adequate by some organisations, others reported that projects with paybacks of this length simply could not compete with other uses of corporate capital.

It's about 7 years [[payback] for a voltage optimiser, and 7-10 years for solar. These are competing with other capital investments with a payback of 1-2 years. (CRC senior manager 12, manufacturing)

Economic uncertainty could also be a barrier to long-term investments. A few respondents reported that their organisations limited capital so tightly that they would not even spend money on measures with a short payback.

A contractor will say 'We can change your lighting, the payback is 1½ years', which is fine. [...] It won't go because it's £50,000. (CCA/EU ETS energy manager 4, logistics)

Several public sector organisations reported that public sector cuts had made it more difficult to get political approval for expenditure on energy saving measures, even if they saved money in the long run.

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I think it's a much harder sale now because there's just not enough money to pay staff let alone to do things where you have to win politicians around first. (CRC energy manager 3, local authority)

Overcoming the capital cost barrier

Some respondents reported that overcoming the upfront capital cost barrier was vital to encouraging take-up of energy efficiency measures.

The trick with any of the energy efficiency measures is to come up with a way of funding implementation. (CRC stakeholder 4)

Some respondents, from the CRC and non-CRC groups, mentioned mechanisms that they had used to overcome the capital cost barrier. A few had used energy performance contracts or leasing arrangements, either for energy efficiency management or for solar PV investments.

Again a lot of that [energy efficient lighting] was externally financed where they could say 'Okay then there's an agreement that you rent the fittings' or whatever. I think it's paid for in the savings, so there's no capital up front. (CCA/EU ETS energy manager 4, logistics)

Energy service companies (ESCOs) were mentioned by one respondent, who felt that they required a long timeframe more suited to the public than private sector. A few respondents mentioned that accounting rules surrounding energy performance contracts or service agreements were problematic.

Very simple but the accountant standards just want to look at everything as a lease and that is a barrier. If we didn't have that barrier we'd be the most [energy] efficient business in the UK. (CRC senior manager 1, cement)

One respondent, based in Northern Ireland, emphasised that interest free loans, obtained via the Carbon Trust, had enabled the early replacement of old, inefficient equipment. They reported that, without these loans, the equipment would not have been replaced early.

Other reported barriers, applicable to organisations in general, are discussed below. Barriers which are specific to certain business structures are discussed at the end of this section.

General barriers: Low hanging fruit has gone

A few organisations reported that they had already undertaken the most cost-effective energy efficiency measures and that remaining measures would be less cost-effective and/or require a large scale capital investment. This was mentioned more by

organisations with CCAs than by CRC and information declarer organisations. It is difficult to tell whether the organisations with CCAs had been incentivised by CCA targets, or whether the energy intensive nature of their business had been the main driver for measures to be taken.

For instance, if you go into a company who's never considered energy use today they'll have a lot of low hanging fruit, so being set a target through CRC or CLA [aka CCA] is easily achievable. Because we've been doing it for 10 years it's getting harder, well there are no big savings to make. (ID/CCA energy manager 11, manufacturer)

General barriers: Lack of priority

A few CRC respondents felt there was a lack of priority for spending on energy efficiency. In some cases this was linked to lack of awareness of energy efficiency issues, as in this example where an organisation had bought new equipment without considering its energy usage.

I've got a client whose just been over to Sweden bought a load of machines, stuck them in the factory and he's got absolutely no idea how much energy they're going to use. Can't believe it! He knows it makes the widget and that's great, that's what he wants. (CRC stakeholder 4)

In other cases, this seemed to be linked to energy costs being insignificant compared to other costs and revenues affecting the organisation.

When you're talking to them the first thing they'll say is 'Do you know how much I earn an hour? Do you realise how much money I bring into this organisation?' And you're probably talking about 'could we switch off say one in three lights, there's 50 lights and you don't need them all'. (CRC stakeholder 4)

General barriers: Short timescales

Several CRC and non-CRC participants reported that the potential for energy efficiency investments was limited by short timescales for certain buildings, either because these buildings were coming to the end of a lease, or because there was uncertainty as to whether particular buildings were going to be retained in the organisation's portfolio (see 'the Estate Driver strategy' above). This could lead to 'disposal blight' where a particular building was not refurbished because of ongoing uncertainty as to whether it would be retained in the long run.

We wouldn't go putting PV cells on roofs that we knew weren't going to be there for the payback period. (CRC energy manager 4, health)

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General barriers: Specialist skills

A small number of respondents reported that energy consultants did not have sufficiently specialist skills to be able to make a significant contribution to their organisation, beyond recommending obvious technologies such as LED lighting.

So we put those specialist contractors in place because your normal contractor can't cope with it, doesn't understand it, there's a skill shortage. A lot of the energy management people are still in boxes 'Put LED lights in and you'll be fine' sort of thing, but the trying to change the operation and fix the faults is the more difficult part. (CRC energy manager 22, retail)

The next section examines barriers specific to certain business structures, which involve motivations for energy efficiency improvements being split between different actors.

Specific barriers: Landlord/tenant issues

Several CRC respondents leased rather than owned their buildings, while a few owned buildings which were used by other organisations, whose energy consumption they did not control. Property ownership issues were identified as barriers to energy efficiency investments.

From the tenant's or lessee's perspective, there was little incentive for them to improve energy efficiency in a building which they would hold for a relatively short time.

That's my moan over leased buildings. There's no incentive for us [as tenants] to do anything on a building if we're only there for a short time. (CCA/EU ETS energy manager 4, logistics)

From the landlord's perspective, they had limited influence over their tenants' energy consumption and did not benefit directly from energy efficiency investments that reduced their tenants' energy bills, although these investments could potentially increase the value of their properties over the longer term.

A few respondents mentioned leasing of buildings as an increasing trend, as organisations preferred not to have buildings on their balance sheets. The implication is that the landlord/tenant issues are likely to become more important in future.

So other companies must be the same they don't want it as an asset, they'll just lease it, they don't want it on the balance sheet, just lease it. So I can only see the number of lease buildings going up and up, and everybody saying we're not going to do anything. (CCA/EU ETS energy manager 4, logistics)

Specific barriers: Franchise models

Organisations operating franchises also reported that they faced split incentives in terms of energy efficiency investments. Only a few franchise organisations were interviewed, but these organisations reported that their franchisees were not charged for the full cost of their energy consumption (e.g. CRC costs were not recharged to them) because of the administrative complexity of doing this. This is contrary to the ‘polluter pays’ principle of efficient environmental taxation.

We don't have any real way of recharging our franchisees unless we go back and change all of our franchise agreements, we pay on behalf of our franchisees which actually means that the person that's using the energy isn't actually paying for CRC, which goes against the principles of CRC but that's where it says 'Polluter pays'. (CRC energy manager 19, food)

Specific barriers: Service agreements

Split incentives, unclear boundaries and short time horizons were also reported by organisations which operate services on sites or facilities that belong to the client, or are leased on their behalf. Some service agreements created a situation where there was little motivation for either side to invest in energy efficiency measures.

By the time you've actually got anywhere in terms of negotiating and putting plans together, you've only got five or so years left. It's not our business model to invest in plant machinery or buildings because we don't get our money back. They're not our facilities and it's not our plant. (CRC senior manager 2, holding company/leisure)

In some cases, it was not clear which organisation is responsible for emissions: for example a facility might be owned (or, presumably, leased) by one organisation but operated on their behalf by a service company. While there may have been clarity in terms of responsibility for CRC payments, the split responsibilities still hampered energy efficiency investments.

If we're on a site operating a [Supermarket] distribution centre [where] we don't buy the electricity or gas, we may record the usage so that's getting reported back to [our head office]. That square footage is getting back to [our head office] but it's not our building, as far as I can see that's the [Supermarket], we just operate it. If they're taking that in thinking that's part of our company's carbon, well it's not, well I think it's not. (CCA/EU ETS energy manager 4, logistics)

To sum up, the most commonly cited barriers that affected energy efficiency investments, even in CRC organisations, were conflicts with business priorities, and capital cost barriers. While some mechanisms were available for overcoming capital

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cost barriers, such as energy performance contracts, it was reported that these can be complex to administer in accounting terms. Other important barriers, which were important to specific types of organisation, involved motivations for energy efficiency investment being split between landlords and tenants, between franchisee and franchisor, and between customer and client in service agreements.

B8: Have policy uncertainty and changes in government policy, within or beyond the CRC, been a barrier to action on energy efficiency (A1-A3)?

Some respondents reported that they had lost trust in government policy through their experience of successive changes to previous policies. They referred both to the various changes to the CRC before its launch, and to the policy of degeneration of Feed-in-Tariff incentives. As explained in B1, a few respondents complained that it was difficult to prepare for new schemes such as ESOS when the details of the scheme kept changing.

One respondent cited the landfill tax escalator as an example of a policy where the trajectory of future tax increases was clearly flagged in advance. This certainty allowed their business to change business practices significantly, and make appropriate investments, to enable them to operate efficiently when landfill taxes became high.

A better example I think is landfill escalator tax, so when John Gummer brought that in it was whatever it was, £8 a tonne, and now it's rising towards £80 a tonne. The key bit about the landfill escalator tax is; here's its introduction and here's the trajectory of the costs. So it's possible to go to the Finance Director and say give us a million quid, we'll build a recycling route forward and that will therefore avoid a cost of £2 million. And they go yeah get that, tick the box. (CRC senior manager 4, supermarket)

Only one respondent mentioned policy uncertainty as a reason for not including CRC costs in the organisation's business cases, compared to the likelihood of energy prices staying high. Conversely, another respondent appeared confident that there would be a phase 3 of CRC, explaining that their organisation would probably qualify for phase 3 if the threshold remained unchanged.

Some respondents commented that they felt that new policies were continually emerging from government, on a piecemeal basis, giving them a sense that the government did not have an overall strategy or plan. Some organisations felt that the schemes were irrelevant to them because they were already active in managing energy.

For me, it's just that you know there will be a new scheme in 3-4 years' time. It [government policy] is just a form of taxation. The government is forcing companies to do many things, but many companies are doing these things anyway. (CRC senior manager 13, manufacturing)

A significant number of respondents would like to see a simpler policy regime with fewer separate schemes.

It does seem strange when they've got these things in place they keep rolling different bits and pieces out all the time, which I think makes it more complicated than it should be. I think it could be simplified much- much more to be honest. (CCA/EU ETS energy manager 3, manufacturing)

But one respondent, who works on carbon compliance for many different companies, felt that regulation was beginning to reach critical mass in terms of influencing companies and their investors.

I think it is but largely because regulation is increasing and has certainly increased markedly over the last few years, and so I think they're more conscious of getting caught out because they wouldn't want to be non-compliant because that would be bad especially from an investor point of view. And from an investor point of view it is becoming more important to them to make ethical investments I guess. (CRC energy manager 31, finance (energy consultant))

There is little direct evidence that uncertainty is acting as a direct barrier to energy efficiency. But some respondents would like more clarity and certainty on future government policy. There is some indirect evidence that this would enable them to plan ahead more effectively, including possibly taking more action on energy efficiency. . Many respondents would like to see a simpler and clearer policy landscape for energy and carbon, rather than a perceived plethora of schemes.

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Objective C: Assess whether the CRC has delivered abatement in a cost-effective manner

Summary

In this section we discuss the cost-effectiveness of energy efficiency measures influenced by the CRC. Cost-effectiveness of CRC delivery is discussed under objective D.

The limited evidence gathered by the qualitative research on the cost-effectiveness of measures suggests that the energy efficiency actions undertaken by both CRC and non-CRC organisations were cost-effective since most generate a payback within 5-7 years or less. The synthesis report considers this finding in the light of evidence from the quantitative survey and desk review.

In addition to the direct benefits of energy cost reductions, CCL and CRC cost reductions, which generate value for money, there was some evidence that take-up of energy efficiency measures had generated some wider benefits for organisations. In particular, energy efficient lighting was reported to provide better quality light, extended lifespans and reduced maintenance costs, while some energy efficiency measures made a contribution, albeit less measurable, to the public profile of particular organisations. There was some evidence that corporate actions on energy management, stimulated by the CRC, had benefited organisations in terms of improved housekeeping of energy data, better management of resources, better information to inform energy purchasing and better management systems. There was limited evidence of non-energy benefits from raised board-level awareness, through assisting with preparation for potential future carbon tax policies in the UK or overseas.

There was some suggestion that the CRC has had some negative unanticipated effects in terms of competitiveness and diversion of effort from energy efficiency for some organisations, and possibly to have generated some 'gaming' (i.e. avoidance activity) in terms of building ownership, but it is not clear what the scale of these effects are. The synthesis report considers these findings in relation to other sources of evidence.

The scheme was also reported by some to have stimulated the growth of energy consultancies, which could be regarded as either negative or positive.

Detailed findings on objective C

This research addressed this evaluation objective in qualitative terms, focusing on respondents subjective views on the cost-effectiveness of energy efficiency actions influenced by the CRC. The cost-effectiveness of CRC administration is addressed separately under objective D.

Energy manager and senior manager views on objective C were broadly consistent. Views about the impact of CRC on competitiveness tended to be put forward more by senior managers than energy managers.

C1: Have the energy efficiency actions taken by participants been cost-effective (with particular reference to the menu of actions in A1)?

This section examines the reported cost-effectiveness of energy efficiency actions undertaken by participants, of the type detailed under objective A1. While payback is not the only measure of cost-effectiveness, particularly for larger and longer-term investments which may generate an attractive rate of return but have a relatively long payback period, it is the focus of this section as it was the measure most often mentioned by respondents. In the text that follows, the most cost-effective and quickest payback measures are considered first, followed by less cost-effective measures with longer payback periods.

Immediate payback measures

Most of the CRC participants and many of the CCA/EU ETS and information declarer organisations had undertaken behaviour change actions to reduce energy use, which could be undertaken without any significant up-front cost. These actions were clearly cost-effective, although they may in some circumstances have been reversible if the new behaviours were not maintained.

Yeah, things like low hanging fruit. Things like turn the lights off when you go home at night, weekends turning off all the equipment, the things we can do without any cost or any investment but gives us a small return. (CRC energy manager 32, professional)

Shorter payback measures: 1 to 3 years

Measures reported to have short paybacks included LED lighting (where this was replacing incandescent lighting), and some building management systems and timer controls.

If you've got incandescent then the payback period comparing that to an LED it's a no-brainer, you're saving kilowatts [sic]. (CRC energy manager 26, leisure)

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Other types of investments were reported to have short paybacks in some circumstances. For example, a CCA firm reported that they obtained a 1-2 year payback for a major investment to switch from oil to gas for one of their industrial processes.

Most organisations reported having started their energy efficiency action with the short payback measures, but in some reported that they had already completed these before the introduction of the CRC. Others were still focusing on short payback measures.

... [we undertook] a project of a variety of energy saving measures and technologies, so trying to kick off some low hanging fruit really that could be done quickly and make a significant difference. (ID energy manager 1, local authority)

A few organisations, reported that they looked for very short payback periods. Those organisations attaching lower priority to energy issues tended to require a faster payback for energy efficiency investments, as they were often competing with other potential capital investments which would generate a 1-2 year payback.

My criteria for payback is strategically a 12 months payback, I considered other retailers and they're 4 years/6 years and that sort of thing. I'm still on 12 months and if it doesn't give a 12 month payback we don't do it, and even then we're not doing all of them. (CRC energy manager 22, retail)

Longer payback measures: Over 3 years

Replacement of boilers, HVAC and insulation were reported as generally requiring a payback in excess of 3 years.

Then we go into the medium 1 to 3 year maybe putting timers on systems, and then the bigger things looking at boilers, air conditioning systems, ventilation systems, windows, cladding, and roofing. So [we're] looking at that. (CRC energy manager 32, professional)

Some organisations had installed voltage optimisers, which they reported as typically generating a 7 year payback. Some had also installed low carbon rather than energy efficiency measures, such as solar PV panels, which were reported to generate a payback of 7 years or more, often making use of subsidies from the Feed-in-Tariff.

Some lighting projects could fall into this longer payback category, if fluorescent lighting was already in place. Some respondents reported that replacement of fluorescent lighting with LEDs was not always appropriate, depending on the lighting application, and that investment in LEDs was sometimes delayed until lamps needed replacing or an office needed refurbishment.

When you start looking at fluorescent lighting and stuff like that especially if you as we have, have always gone for the high efficiency lamps, PL's and stuff like that throughout then the savings are getting smaller. (CRC energy manager 26, leisure)

Organisations varied greatly in their willingness to make energy efficiency investments generating a payback period above 3 years. For example, one CRC manufacturer reported that his organisation looked for 3-year paybacks and refused projects with a payback of 5 years.

Back in 2007 [...] I put in an absolute rake of stuff [for approval] and it was all 5 year paybacks and then we got thrown them back [...] and now it's probably 3 years simple payback generally. (CRC senior manager 1, cement)

Paybacks sometimes varied by the scale of the investment, with longer paybacks being accepted for larger investments.

Depending on the size of investment if we're spending £10,000 for instance we'd be looking at something around maybe 2 years. If we were spending £100,000 we'd obviously expect there to be a longer payback on that sort of equipment. £100,000 could be anything up to 10 years. (CCA/EU ETS energy manager 3, manufacturing)

There was some indication that more energy intensive firms tended to be more willing to tolerate longer payback periods, irrespective of their CRC status. The statement below is from an information declarer who has a CCA, and is therefore, by implication, involved in some relatively energy-intensive activity and is subject to CCA targets.

But if we just did it on just a 2 or 3 year payback I don't think we'd do any of the efficiencies that we've done; one or two but the majority are longer term paybacks. (ID/CCA energy manager 11, manufacturing)

A few respondents reported that CSR and ethical considerations could facilitate approval of longer payback investments.

For somebody to do it as a payback you'd want payback within 5 years or so, but you may find that stuff that's taking much longer to payback would get authorised if we thought it was morally the right thing to do. (CRC senior manager 15, manufacturing)

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There was some indication that public sector bodies and their contractors were willing to consider longer paybacks than private sector. In one case, a leisure contractor had a lease on a leisure centre for over 20 years, and so could consider energy efficiency investments with very long paybacks. But in other cases, public sector organisations were limited by the maximum payback of 5 years set by Salix finance.

It's just a timescale that we've basically set, and it's sort of aligned certainly where we've used Salix in the past theirs is 5 years as well. In the NHS we use Salix to fund some of the initiatives and they basically have a 5 year payback that they insist on. (ID energy manager 6, health)

To sum up, the limited evidence gathered by the qualitative research on the cost-effectiveness of measures suggests that the energy efficiency actions undertaken by both CRC and non-CRC organisations are cost-effective since most generate a payback within 5-7 years or less. The synthesis report cross-checks against this finding the evidence from the qualitative survey and desk review.

C2: What wider benefits have actions A1-A3 generated for participants?

The direct benefits generated for participants by actions A1-A3, as evidenced above, include:

- reductions in energy bills; and
- reductions in CRC and CCL payments.

There is evidence, as presented under objectives A and B, that participants could potentially generate other types of benefit through actions A1-A3. The benefits of different types of action are discussed below.

Benefits of installing energy efficiency measures (A1)

As explained under objective A, some energy efficiency actions formed part of wider investments to replace equipment or refurbish property. In these senses, the energy efficiency benefits were generally seen as a side-benefit of the wider refurbishment or replacement activity, rather than the other way round.

A few respondents reported that energy efficient lighting could provide better quality lighting, extend the lifespan of lamps and hence reduce lighting maintenance costs.

The lifecycle of LED lighting can be for up to 15 years of a replacement, whereas originally with tungsten and high energy light fittings, sodium light fittings etc. the lifecycle can be anything from up to 3 to 5 years. So you've lower staffing costs actually going out and replacing, you've got a better lighting facility for example,

so it supports the system of estates operational costs. (CRC energy manager 12, health)

With the exception of lighting, few non-energy benefits were reported for energy efficiency measures.

There is no direct evidence of energy efficiency measures contributing to an organisation's reputation, but a few participants reported that CSR benefits could strengthen the case for making an energy efficiency investment.

Sometimes it's not just the payback; as I said to you we are a selling company and we need to take into account also the benefits that we are going to get in selling the image of the company. (CRC energy manager 25, retail)

One respondent commented that low carbon or energy efficiency measures which were externally visible, such as solar PV panels, were deemed to generate more reputational benefit than invisible measures such as a building management system.

Benefits of taking action at corporate level (A2)

More non-energy benefits were reported for improved corporate action on energy efficiency. As set out under objective A2, some CRC participants reported that better measurement and reporting of energy data, as required by the CRC, contributed to better management of their resources. For example, identifying an organisation's electricity and gas meters for phase 1 registration was sometimes a useful housekeeping exercise, enabling an organisation to identify meters that they no longer used or owned but were still being billed for.

A few organisations reported that CRC prompted them to compile energy use information across all their UK business, which gave them better information for reviewing supply contracts and obtaining the best price for their energy.

A few organisations also reported that the adoption of environmental management systems, such as ISO14001, had driven business improvements beyond energy savings. The Early Action Metrics stimulated many CRC participants to adopt the Carbon Trust Standard, at least on a temporary basis, which may have facilitated such improvements.

Some public-facing organisations may also have benefited commercially from being able to demonstrate that they were undertaking corporate action on energy efficiency. The evidence on reputational drivers under objective B3 suggests that some participants saw corporate action on energy as contributing to other commercial requirements such as improving their competitive position, meeting the conditions of public tendering processes or meeting carbon disclosure requirements. There is, however, no direct evidence on how meeting CRC requirements helped the organisations to meet these other commercial requirements, other than being able to demonstrate compliance with legislation. There was some indirect comment, from a stakeholder, that compiling

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energy data for the CRC might be a stepping stone towards mandatory carbon reporting, helping an organisation to prepare for that broader process.

Benefits of raising board-level awareness (A3)

There is limited evidence of non-energy benefits from raising board-level awareness of carbon and energy issues, for example through CRC sign-off. A few senior managers commented that they saw the CRC as an indication of future policy direction, so perceived compliance with CRC as being part of their preparation for future carbon taxes in the UK or EU.

To sum up, in addition to the benefits of energy cost reductions, CCL and CRC cost reductions, there was some evidence that take-up of energy efficiency measures had generated wider benefits. In particular, energy efficient lighting was reported to provide better quality light, with extended lifespans and reduced maintenance costs, while some energy efficiency measures made a less measurable contribution to the public profile of the organisation concerned. There was some evidence that corporate actions on energy management, stimulated by the CRC, had benefited organisations in terms of improved housekeeping of energy data, better management of resources and better information to inform energy purchasing and better management systems. There was limited evidence of non-energy benefits from raised board-level awareness.

C3: Have there been any unanticipated effects of the CRC, other than the intended impacts covered by objectives A and B?

The qualitative research identified four possible unanticipated effects of the CRC that were reported by CRC participants or stakeholders. These were reported to be:

- growth in consultancies offering support on CRC compliance;
- diversion of resources away from energy efficiency activities to meet CRC requirements;
- effects on competitiveness; and
- changes in ownership of buildings or assets, to reduce CRC exposure.

These effects are explained further below.

Growth in consultancies offering support on CRC compliance

A significant number of the organisations interviewed used external consultants to manage their CRC compliance. A similar pattern was observed with CCA organisations, where use of CCA consultancies was fairly common. A few respondents commented, in a negative way, that the CRC had effectively become a 'job creation scheme' for consultancies and for the organisations that administered the scheme.

All of the consultants and all of the other people who are involved in it... it's been a job creation scheme and I don't say that lightly its absolutely true; there are people out there doing things that didn't need to be done, weren't being done and those things being done haven't changed the price of fish, other than introduced a delay and a frustration. (CRC senior manager 2, holding company/leisure)

On a more positive note, several organisations reported that external consultancies had helped them to undertake energy audits and identify opportunities for energy reduction. These were often the same consultancies that were supporting them for other purposes (e.g. energy purchasing, CRC or CCA compliance). So the use of consultancies offering CRC compliance services may have had benefits as well as costs for energy efficiency.

Diversion of resources away from energy efficiency activities

Several CRC respondents commented that the CRC took away money and resources that could be spent reducing energy use. This implied that the organisation allocated a limited budget of staff time or funding for this activity, and that CRC compliance competed with the delivery of action on energy efficiency.

There's a limit to the amount of money available within a company that they will spend on energy, or energy related issues. If you take it away as a tax it's no longer there to put in whatever, whether that's better insulation, whether it's more efficient pumps, motors and things like that. (CRC stakeholder 3)

Some of these respondents saw the cost of CRC allowances as directly reducing their budget for action on energy efficiency.

The first thing I would say is that the amount of money that we've had to spend on the strategic initiatives and improvements have been significantly reduced because of the amount of carbon tax that we pay to the government for the last few years. Had that £½+ million been available then that could have been invested in the infrastructure. (CRC senior manager 9, manufacturing)

Others commented that getting to grips with the CRC initially diverted staff time away from making energy efficiency action. This was most likely to be the case for organisations with complex structures, which made CRC compliance particularly problematic. A few organisations commented that the time spent trying to get to grips with the CRC effectively stopped their other actions on energy efficiency.

Effectively what the CRC did was delay us two years in carrying out energy efficiency measures, because we had to stop what we were doing and try and understand the CRC and how we could best deal with all the things that it was requiring of us to do, and it stopped dead energy efficiency programming that had been going on. (CRC senior manager 2, holding company/leisure)

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The cost of employing external consultants, to reduce the risk of non-compliance, was cited as an additional burden by some of these respondents.

Everything is so complicated to understand, the CRC audit reviews and checks is so time consuming and that's time I'd rather be spending trying to reduce energy but I can't. I pay a consultant to help and the money that I have goes towards verifying that I'm doing the right things. (CRC energy manager 32, professional)

To sum up, several CRC participants reported that the CRC was diverting staff time and resources away from energy efficiency action in their organisations. The comments suggested that the perceived diversion of effort and resources was greatest at the beginning of phase 1.

Effects on competitiveness

A few organisations voiced concern about the effects of CRC on their competitiveness. There were two types of organisation saying this. Firstly, a small number were smaller companies which were competing with non-CRC organisations, and which felt they could not pass on CRC costs to their customers without losing custom. For example, one medium-sized property company reported that it was in this situation.

Secondly, there were a few larger organisations, primarily those in CCAs and EU ETS, which were competing internationally and felt that energy costs in the UK were higher than in other countries, particularly for electricity. They appeared to be referring to the general burden of pass-through costs on electricity, not just the CRC from which these firms were at least partially exempt.

I sometimes worry it disadvantages the UK. I sometimes think our cost of electricity is more than our sister plants in [country], so I think there's a disadvantage on some of these costs. Without a doubt it prompts us to take actions but I do suspect it also disadvantages us. (CCA/EU ETS senior manager 3, manufacturing)

Several CRC organisations explicitly mentioned that they were able to pass CRC costs on to customers, to reduce the impact on their competitiveness. These tended to be property or service companies which were charging clients for use of certain premises. But many CRC organisations said that they did not pass CRC costs on to customers, or that there was no direct relationship between their pricing policy and their CRC costs.

Changes in ownership

A few stakeholders, including one information declarer and a CRC consultant, reported that they had heard of organisations changing the ownership of buildings or assets to reduce their CRC exposure. This could be done, for instance, by selling a building to

another organisation which was not subject to the CRC and then leasing it back. As a tenant, rather than landlord, the first organisation would not then be liable for CRC on the emissions from meters in that building. It is not clear how widespread these 'avoidance' tactics have been.

To sum up, there was some suggestion that the CRC has had some negative unanticipated effects in terms of competitiveness and diversion of effort from energy efficiency for some organisations, and possibly to have generated some 'gaming' in terms of building ownership, but it is not clear what the scale of these effects are. The synthesis report considers these findings alongside other sources of evidence.

The scheme was also reported by some to have stimulated the growth of energy consultancies, which could be regarded as either negative or positive.

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Objective D: Identify how the CRC has been delivered and whether it has been administered effectively

Summary

The qualitative evidence suggests that the CRC imposed a significant administrative burden on participants, particularly in its early years. For most participants, this burden has been reduced by simplification of the scheme, as explained below. But some participants with complex structures or particular business models (e.g. franchises, leases) still found the administration burdensome. Some participants used external consultants to reduce this burden and to reduce the risk of non-compliance.

Many participants felt that CRC guidance documents were long and complex, but that they had improved in recent years and that the complexity reflected the complexity of the scheme itself. Similarly, many participants found the Help Desk frustrating at the start of the scheme, but most found that it had improved. There were fewer comments on other forms of communication, although there was some evidence that the volume of emails and the robustness of the registry had also improved since the start of phase 1. There was some suggestion that workshops were a useful way of sharing information on upcoming changes.

The aspects of phase 1 which were reported to be most burdensome were the use of digital certificates (initially), the complexity of buying and surrendering allowances, the inadequacy of energy supplier statements, the difficulties posed by complex corporate structures or landlord/tenant relationships and the lack of consistency with reporting for other government schemes. Audit and enforcement requirements were not reported to have been particularly burdensome.

The changes introduced at the end of phase 1 and in phase 2 were generally welcomed by CRC participants and stakeholders. Phase 1 simplifications benefited most but not all participants, although they did contribute to a sense of continual change in the CRC.

Although this evaluation was not explicitly considering phase 2, some early findings emerged in relation to phase 2. The phase 2 qualification threshold in 2013 created winners and losers, particularly amongst organisations with CCA or EU ETS exemptions, who could find themselves with higher or lower CRC burdens depending on the details of their energy use. But the CCA and EU ETS clarifications were generally welcomed.

From the evidence available to date, the administration of phase 2 appeared to be relatively smooth, particularly for those organisations already familiar with phase 1. The increase in the cost of allowances from £12 to £16.40 per tonne was significant for some but not others, while a few organisations found the option of forecasting the number of allowances needed problematic, particularly if they had a decentralised structure for energy purchasing. Attitudes to forward purchasing were mixed: some organisations had gone ahead to make purchases while others felt that the 80p per tonne price differential between ‘forward purchasing’ and ‘buy to comply’ was insufficient to motivate forward purchase. Some organisations expressed irritation that emissions factors for the year ahead were not available from DEFRA at the time that they needed to define the next year’s requirement for allowances.

Overall there was a general view that there had been too many successive changes to the scheme, including changes between the design and implementation phase.

This evidence will need to be triangulated with evidence from other sources, including the econometric research, quantitative survey and desk research.

Detailed findings on objective D

This section reviews evidence on how the scheme was delivered, and considers participants’ views on different aspects of administration and delivery.

The evidence presented here is drawn largely from energy manager interviews, because senior manager interviews did not cover CRC administration in any detail. However, some senior managers volunteered views about the effectiveness of CRC as a whole, which relate more to the design of the scheme rather than how it was administered.

D1 Is the scheme delivered efficiently and consistently (e.g. by promoting simple procedures)?

Administrative burden of the CRC

Many CRC participants commented on complexity of the CRC, particularly before the recent simplification of the scheme.

The downside of it, I think, is it’s overly complex and it’s fairly bureaucratic, and many an hour was [spent] trying to resolve whether an item should be in or should be out. (CRC energy manager 21, local authority (energy consultant))

Those respondents who felt that the CRC had little impact on their organisation tended to be very critical of the CRC, and the administrative burden created by phase 1 of the scheme.

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I honestly think the CRC was just a complete and utter waste of time and money. It didn't make us do anything we weren't already doing, and it just created a whole raft of completely unnecessary bureaucracy. (CRC senior manager 18, waste)

A few respondents suggested that the administrative complexity of the CRC, particularly during its early years, had provided the justification for recruiting an energy manager who went on to lead broader energy initiatives within their organisation.

During the majority of the year it was probably half a person and then at peak times it was three people. I think most organisations recognise it as one full-time equivalent and I'd go along with that to be honest. (CRC energy manager 21, local authority (energy consultant))

Organisations with many different sites, and those with complex company structures and property ownership arrangements, tended to find the administration particularly burdensome. Several organisations reported that an individual spent at least 3 months working on their CRC submission each year.

For the next effectively three months, the majority of my time will be spent doing [the] CRC submission. It takes a lot of time and a lot of manpower to get all the information together and put it in a workable format. (CRC energy manager 10, holding company/leisure).

A few organisations felt that the CRC still required a full-time equivalent person, even after simplification. This was particularly reported by organisations which paid CRC for parts of the organisation that they did not control (e.g. franchises).

Administrative burden is absolutely huge particularly for a business of our kind [franchise structure], and I normally have to bear the brunt of that. [...] Every year we do reporting, its new people – different people that don't understand it, that question it, that don't want to be part of it. The communication piece is a huge challenge, so when we come to trying to gather data it is a humongous task and involves months and months of work. (CRC energy manager 2, hotels)

Some other CRC participants reported that compliance was relatively straightforward. Of these, a few organisations already had energy reporting set up to comply with other schemes such as the EU ETS, Carbon Disclosure Project or their own management systems. Others had simple corporate structures, owned their own buildings or covered a relatively small number of sites. Several CRC participants commented that administration had become easier as they got used to the scheme.

Phase 1 was OK once you got used to it... When the scheme started, once you're doing something for a year or two, you get to understand it. (CRC energy manager 7, service company)

To sum up, the administrative burden of the scheme was significant in its early phases. While most organisations reported that the burden had reduced over time, some organisations with complex structure still found the scheme burdensome, even post simplification.

Use of external consultants

Many CRC participants chose to employ external consultants to assist them with CRC compliance. This reduced the administrative burden on in-house staff but clearly had a financial cost.

So basically they do all the data crunching and they come up with the evidence pack and the annual report, and basically all I have to do is make sure our Treasury surrenders the allowances by a certain date, and get the MD in the UK to sign off the certificate of audit for the evidence pack, and that from an administration point of view is all it is. For me anyway. (CRC energy manager 20, manufacturing)

Several CRC participants mentioned that they used an external consultancy primarily to reduce their risk of non-compliance, rather than to reduce the administrative burden.

You often feel that you have to go to a consultant to get everything right – to manage and reduce the risk [of non-compliance]. (CRC senior manager 13, manufacturing)

In a few cases, CRC compliance had been brought in-house again since the scheme has been simplified and had become easier to administer.

I think in the case of changes that have happened to CRC that has been a challenge, that's why we took the decision first of all to outsource. But it has become a little easier as our interest and expertise has increased, that's why we brought it in-house. (CRC energy manager 15, health)

A few organisations commented that there were benefits from delivering the scheme in-house, in terms of reducing costs or influencing decision-making.

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A lot of people did just hire large consultancies to do it but fortunately our council just decided we'd do it ourselves. That's been good because it's helped me build relationships with the people who are the decision makers and who hold the purse-strings. So it's been very helpful for that. (CRC energy manager 3, local authority)

CRC viewed as a tax

The views of many CRC participants were influenced by the early changes to the CRC, such as the removal of revenue recycling, as discussed above under heading B4. Most CRC respondents felt that the CRC, without revenue recycling, had effectively been reduced to a carbon tax.

CRC, I'd say, doesn't influence at all because basically it's just become a tax, so it's just a cost of doing business, and I think anything it had has totally been lost. (CRC energy manager 26, leisure)

These respondents felt that the administrative burden on their organisations had been much greater than, say, the Climate Change Levy, which is paid as part of business energy bills. In this sense, these participants felt that the CRC would be more cost-effective if administered as a tax on energy bills.

If they had turned it into a tax ... if was just linked to your consumption on the bill, it would have had the same impact, but actually instead of wasting all our time and effort and money on people to do bureaucratic things, we could have focused those people on actually implementing programmes. (CRC senior manager 2, holding company/leisure)

Some respondents commented that a tax would still have keyed into the cost driver and stimulated energy efficiency.

My view is that it probably would have received the same amount of focus because [...] if you made energy more expensive we would recognise it and we would have to use less of it. (CRC senior manager 2, holding company/leisure)

However, a few participants commented that the CRC would have less impact on senior-level awareness of energy costs if reporting requirements were dropped, and if it did not appear in corporate accounts as a separate, identifiable cost.

5 years ago, if CRC had just been a levy, it would not have focused people's minds. (CRC energy manager 7, service company)

To sum up, the qualitative evidence suggests that the CRC imposed a significant administrative burden on participants, particularly in its early years. For most participants, this burden has been reduced by simplification of the scheme (see objective D4 for more details on this). But some participants with complex structures or particular business models (e.g. franchises, leases) still find administration burdensome. A significant proportion of participants use external consultants to reduce this burden and to reduce the risk of non-compliance. Most CRC participants felt that the CRC could be more efficiently administered as a tax on electricity bills, similar to the CCL, although a few commented that it might have had less impact in this form.

D2: Has communication with participants been clear, convenient and timely (e.g. guidance, help desk, other communications with stakeholders)?

The evidence presented here covers participants' view of CRC guidance, the help desk and other communication mechanisms.

Guidance

Many CRC participants felt that CRC guidance was problematic in the early stages of the scheme but had since improved. The guidance was criticised for being long and complex, and for being changed frequently. A few participants commented that the guidance was sometimes inaccurate, particularly when changes were introduced, and that there was sometimes a lack of clarity on points of detail.

AMR metering was a good example, at the start it was very unclear as to whether it was the extent of the metering that you had in place at a given date, or whether it was the date that you would install the AMR metering. (CRC energy manager 9, property)

Several participants commented that it was better to have one, albeit long, guidance document than the multiple versions of guidance previously provided. But others reported that the guidance was still long and complex, including the guidance for phase 2.

I wouldn't say it was confusing but there was an awful lot of guidance for what is something that is now or could and should be quite simple. I don't know exactly how many pages the final version of the Stage 1 [phase 1] guidance ran to but it was a lot, and the same applies with Stage 2 [phase 2] guidance there's a lot of it. (CRC energy manager 18, water)

A few participants suggested that this complexity arose from the complex nature of the scheme, not the guidance itself.

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If we do have any queries it can be frustrating trying to get those resolved, and I think one of the complexities of it is that there's so many varied organisations within the same scheme it isn't really a 'one choice fits all'. (CRC energy manager 6, supermarket)

In summary, many participants felt that CRC guidance documents were long and complex, but that they had improved in recent years. A few participants felt that the complexity of the guidance reflected the complexity of the scheme itself. This links to earlier comments under heading D1 that the scheme could be more simply administered as a tax on electricity.

Help desk

Participants' views on the CRC help desk followed a similar pattern of initial problems followed by improvement. There had been initial teething problems such as CRC help desk staff not being able to answer queries or provide advice beyond what was already stated in guidance.

Certainly during the initial stages, and I'm sure this is the case with any large project, the people administering CRC didn't understand the scheme. You would send a query off to the CRC helpline and they would just reply with a cut and pasted bit of the guidance you'd referred to them. So at the start it was exceptionally frustrating. (CRC energy manager 9, property)

A few participants also mentioned problems with delays, which could be particularly problematic if they were close to submission dates. But again, the help desk had improved over the years.

Sometimes the helpdesk was frustrating with the delays getting back, and the problem is obviously you only find you have a problem right at the end when you're trying to get the answer back and there's potentially a three day wait. This year was much better than last year, last year was better than the previous year, so it improved. (CRC energy manager 4, health)

A few participants commented that there was some inconsistency between the answers provided by, and the level of knowledge of, different members of the help desk staff. This could cause problems in consistent handling and tracking of a query, and in the quality of the response.

It depends who you talk to at CRC help. I have a direct number for CRC Operations and tend to go straight to them. When I have a specific question I write an email, and all they do is quote the guidance. Even when I say that I have read the guidance. Sometimes the person on the help desk knows less than I do. (CRC energy manager 14, energy consultant)

But CRC participants' experience of the CRC helpdesk generally improved over time. Some participants used the tactic of calling CRC operations staff direct, once they had their number. In the later stages of phase 1, some CRC participants praised the help desk for being quick to respond and going out of their way to find answers to complex queries.

I thought the Environment Agency did a fairly good job in what was a fairly complex scheme. I think that's probably one of the positives to it, and they were pretty good at coming back to query resolution. (CRC energy manager 21, local authority (energy consultant))

To sum up, many participants found the Help Desk frustrating at the start of the scheme, but most found that it had improved.

Other communications

A few participants indicated that the volume of CRC email communications had initially been too high, so that they did not necessarily read everything. They felt that the volume was now more manageable, and this contributed to a better relationship between participants and the EA.

The level of comms that we get is now much more appropriate, so the notices that they send out to us are now relevant, the language is better, the structure of the documentation they send out is much better. So I think as a participant now certainly the interaction with them is much better. (CRC energy manager 9, property)

A few participants mentioned that they found sector support groups or regional workshops useful in getting to grips with changes in CRC requirements, and that these were a more effective means of communication than long emails.

it would be good to have regular gatherings regionally – anybody got any issues, anybody got any thoughts, rather than just a huge email here's the latest set of changes. We don't necessarily always have time to read because some of the initial ones were 200 pages long⁷, it's not always clear. (CRC energy manager 4, health)

There was relatively little comment about the web portal and registry. A few participants mentioned initial problems (e.g. crashing frequently; being unable to save part-way

⁷ The reported length of 200 pages has not been verified.

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through a submission) but these problems appeared to have been resolved. A few respondents said that the computer interface worked well. There was little negative comment about recent use of the web portal and registry.

In terms of administering through the registry it's been fairly straightforward. (CRC energy manager 5, cement)

From the limited evidence available on phase 2, use of the registry for phase 2 appeared to have been unproblematic for most organisations, and an improvement on registration for phase 1.

The mechanics of things like the online registry sometimes that doesn't work as well as it could, but again it was a brand new thing at the start I'm sure some initial teething problems. When I used the registry to register for phase 2 I found it a lot better. (CRC energy manager 9, property).

In summary, many participants felt that CRC guidance documents were long and complex, but that they had improved in recent years and that the complexity reflected the complexity of the scheme itself. Similarly, many participants found the Help Desk frustrating at the start of the scheme, but most found that it had improved. There was less comment on other forms of communication, although there was some evidence that the volume of emails and the robustness of the registry had also improved since the start of phase 1. There was some suggestion that workshops were a useful way of sharing information on upcoming changes.

D3: What were the most burdensome aspects of the scheme in phase 1 (including registration, reporting, audit enforcement and other elements of the CRC), and how have these changed with phase 1 simplification and phase 2?

CRC participants were asked to identify the most burdensome aspects of phase 1 of the CRC. The issues that were most frequently raised are summarised below, in approximate chronological order. The effects of phase 1 simplification and phase 2 are discussed under heading D4.

Initial use of digital certificates

The initial stages of phase 1 used a high level of computer security, involving digital certificates, because it was anticipated that the PLT would be used for revenue recycling. Digital certificates were very problematic at the start of the scheme. These were replaced with single-use PIN numbers which appear to have been more straightforward for participants to use.

At the start, the first year with the whole element of the digital certificate and having to log in, that scheme was very cumbersome [...] there were a lot of problems in trying to get us set up with the digital certificate. That element has been removed and we've been allowed to basically report and pay for the 2nd

and 3rd year, so it's been a lot easier and cleaner in that regard. (CRC energy manager 30, retail)

A few CRC participants were also involved in EU ETS and commented that the CRC's security requirements were significantly simpler than those of EU ETS.

Well because I've been through the hoop of the EU-ETS hardship, and it really was hard work, the CRC scheme element process I recollect it to be a lot simpler than the EU scheme, because on the EU scheme we had to get independent solicitors involved in saying who I am. (CRC energy manager 12, health)

To sum up, use of digital certificates was problematic at the start of the CRC, but the new systems of single-use PIN numbers has been much more straightforward for users.

Purchasing and surrendering CRC allowances

Several participants commented that the process of purchasing and surrendering allowances was unnecessarily complex and protracted, particularly given that the CRC had been simpler than initially envisaged. They described a relatively long-winded process for paying CRC allowances.

We get the CRC allowance statement to say we've submitted what allowances we actually need, then we get a notification back plus a memorandum account. That then goes to our accountants, that then goes to an external financial services body who then cross-reference and check, and the District Treasurer has to sign it all off, hard copy and all the rest of it, and then it goes through into an external payment body that we use for them to arrange for the payment to be made within the 19 day deadline. (CRC energy manager 12, health)

These participants would prefer a simpler system which involved the EA invoicing their organisation for the relevant number of allowances⁸.

The only issue that we have with paying these days is the fact that they won't send us an invoice, so every year we have to go through the loops with our finance people because the process is we raise a purchase order, you send us an invoice, we pay it. It doesn't work that way for CRC, that's about the only irritant now. (CRC senior manager 16, energy)

⁸ DECC have advised that invoicing for CRC allowances is not technically possible because there is no contractual arrangement between the EA and the participant.

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The original rationale for distinguishing between purchase and surrender of CRC allowances was to encourage participants to better manage expected energy use by offering a cheaper price for better energy management. It was too early to gather evidence on the option to forward purchase allowances during phase 2.

To sum up, several CRC participants felt that the system for ordering, purchasing and surrendering allowances was unnecessarily complex. It is not clear whether forward purchasing of allowances will become significant during phase 2.

Inadequacy of energy supplier statements

DECC has worked with Ofgem to improve supplier invoices. But some CRC participants commented that statements from energy suppliers were still often late or inadequate, and that this impacted on their ability to meet CRC submission deadlines.

Working with external energy companies is not the easiest, sometimes they're quite obstructive which then makes it difficult because that is what you're relying all your information on. If they can't provide it in a timely manner you then find it difficult to hit the submission dates. (CRC energy manager 10, holding company/leisure)

These participants were also concerned about the lack of accuracy in energy supplier statements, which were sometimes estimated if they needed to give consumption up to a particular cut-off point.

It's incredibly difficult because the suppliers make errors that impact the accuracy of your data, estimated readings just for billing for want of a better word. (CRC energy manager 16, property)

Some participants and stakeholders suggested that the system for requiring statements from energy suppliers could be further streamlined, and that this would ease the administrative burden of the CRC.

We believed right from the start that it should have been simplified so much so that you can now demand from your supplier a written summary of what your energy use has been for the last 12 months. [...] We believe that should have been like in effect your VAT statement where you received it, you check it, agree with it, sign it off and sent your cheque along with it, and that should have been the end of the admin side of CRC. (CRC stakeholder 3)

To sum up, some participants felt that chasing and checking supplier invoices added to the burden of administering the CRC, and the system for requiring supplier statements could be further improved.

Lack of consistency with other government schemes

Some participants found it frustrating and time-consuming that CRC definitions were not compatible with other government guidance (e.g. DEFRA's guidance on carbon footprinting) and other government energy and carbon schemes (e.g. ESOS, CCA, EU ETS). They noted that the reporting requirements of these schemes were similar but that there were differences in the emissions factors, the emissions covered (e.g. carbon vs. all greenhouse gases), the activities covered and the time periods (e.g. financial year reporting for the CRC compared to calendar year reporting for EU ETS). Ironically, the financial year reporting period had originally been introduced by DECC as a result of consultation with EU ETS participants, who wanted to avoid the reporting deadlines coinciding.

CRC is an additional burden upon us because it measures it in a slightly different way using different emission factors, it has a slightly different guidance than the DEFRA guidance and it means that we've had to invest a lot of time and effort. (CRC energy manager 8, water)

Some participants felt that they should only have to report once, for all the schemes (e.g. CRC, ESOS, CCA and EU ETS). They felt that this would reduce their administrative burden, reduce the need for consultants and mean that there was only one set of definitions to be used.

What I think the business would prefer is to have one reporting scheme for everything and one set of factors for everything, so we don't have a plethora of schemes with different factors you can't compare. Having one scheme to do everything would simplify our administration considerably. (CRC energy manager 5, cement)

Participants tended to express particular irritation about new ESOS requirements that were being introduced at the time of the research, which differed slightly in scope from CRC requirements.

To sum up, some participants were frustrated by the requirement to report carbon and energy use to government in several different formats, and felt that there should be more consistency between the different schemes.

Complex corporate structures

Some participants reported major problems for certain business models, including franchises, service companies, Private Finance Initiatives (PFIs) and complex holding company structures. Problems arising from landlord-tenant relationships are discussed under the next sub-heading.

6. Findings and analysis on evaluation objective D

Particular problems arose when it was unclear which organisation should bear CRC costs, as this could lead to protracted arguments and even legal action. CRC costs were particularly resented when the organisation paying CRC did not have control over some or all of the energy users for whom they were paying CRC, which some felt contravened the environmental taxation principle of 'polluter pays'. The lack of control also made it more difficult to collect energy data for CRC submissions.

We do operate a chunk of hotels but the vast majority are franchised, and it is no exaggeration the franchise obviously caused an unbelievable amount of pain. [...] What we do is we buy the allowances and then we invoice the hotels for their proportion which is a perfectly reasonable thing to do, but some of the owner groups decline to make that payment. We are in legal dispute with many of our hotels and owner groups because of the CRC. (CRC energy manager 2, hotels)

The qualitative research suggested that CRC compliance had been particularly burdensome for these business models, because of the complexities of collating data and determining who should bear CRC costs.

Landlord-tenant relationships

Property organisations reported particular problems with the CRC, despite clear guidance that landlords were responsible for paying CRC on behalf of their tenants. Most of the property companies interviewed were critical of the CRC and felt that it was not appropriate for their type of business.

It really is a piece of legislation that's ideally drafted for a company that's in manufacturing or something like that, that is completely responsible for its energy consumption as production lines, and those sorts of things. (CRC energy manager 16, property)

While those interviewed were aware that they could recharge CRC costs to tenants, under guidance from the Royal Institute of Chartered Surveyors (RICS), this was not always straightforward and a few chose not to do this so that they remained competitive with non-CRC landlords.

The idea that we can influence energy consumption in our customer's demise is just a complete fallacy frankly. [...] And I know about the RICS Code of Practice guidance says now that we can pass those costs onto our customers if we choose to, we've chosen not to because we don't feel it's appropriate. We feel it would put us at a disadvantage compared to other property firms who aren't in the CRC scheme. (CRC energy manager 9, property)

In summary, property companies reported particularly negative views on the CRC because of the complexities of recharging CRC costs to tenants.

Audit and enforcement

During phase 1, CRC participants were liable for enforcement penalties of up to £40 per tonne of carbon for non-compliance. In practice, compliance rates were very high (e.g. 99%). Attitudes to enforcement are also discussed under objective B on drivers.

CRC respondents were required to undertake internal audits, and responses suggest that this requirement is generally being met. Some energy managers suggested that they welcomed such checks, since it meant that they were not the only person in the organisation who was ensuring that the organisation was CRC compliant.

The EA also commissioned 418 external audits over phase 1 of the CRC, representing about 20% of CRC participants. Of the respondents mentioning audits, more than half had been subject to external audits. While some participants mentioned that maintaining their evidence pack or compliance pack was burdensome, the audits themselves were time-consuming but not particularly problematic.

We then had an Environment Agency audit on the data and they found it to be 100% accurate and no issues whatsoever, but again all these items are very, very time consuming in the background because even though you are 100% confident in the data that we have, because we are looking at so many sites in the level that those audits go to, to understand where the energy is within those sites and do the checks that they need to do is still a time-consuming process. (CRC energy manager 8, water)

A few participants commented that they knew the CRC better than the external auditor, so they felt the audit did not have 'teeth'.

I've got to say that was a bit disappointing because we felt the auditor knew less than we did. We thought we'd be given a good hard going over and at that point you know you're clean, you've done all the right things, but it seemed to be a light touch audit. (CRC energy manager 17, property)

A couple of participants also commented that the external auditors did not understand their particular business, which hampered the audit. But in general, audits did not seem to have been overly burdensome.

A significant number of CRC respondents mentioned that they had not yet been externally audited. The EA commented that some participants positively wanted to be audited, to provide reassurance that they were fully compliant with the CRC. This was consistent with some comments from participants.

We did get audited and we've done very well. The auditor was of the opinion that our systems were robust and we had interpreted things correctly, so they were quite happy with that. (CRC energy manager 5, cement)

6. Findings and analysis on evaluation objective D

In summary, the aspects of phase 1 which were reported to be most burdensome were the use of digital certificates (initially), the complexity of buying and surrendering allowances, the inadequacy of energy supplier statements, the difficulties posed by complex corporate structures or landlord/tenant relationships and the lack of consistency with reporting for other government schemes. Audit and enforcement requirements were not reported to have been particularly burdensome.

Evidence on the impact of phase 1 simplification and phase 2 are presented under the next sub-heading.

D4: Has simplification of the scheme sufficiently minimised overlap with other schemes (primarily EU ETS and CCA) and reduced the administrative burden on participants?

There have been two major rounds of changes to the CRC. A number of simplifications were introduced to the final year of phase 1, in April 2013, after considerable consultation with CRC participants. These simplifications included the change from the PLT to the ARP, the removal of the cap-and-trade mechanism, the removal of schools in England from the CRC and reduction from 29 to two fuels (gas and electricity). This reduced the scope of emissions covered by the scheme. A further change was that participants were no longer required to submit a footprint report, which had been required to establish an organisation's full emissions. Linked to this, there was no longer a 'de minimis' rule requiring payment of CRC on 90% of emissions, but instead CRC had to be paid on 100% of electricity consumption, including non-half-hourly meters.

Some further changes were introduced to phase 2 of the scheme, starting in April 2014. Those organisations whose qualifying consumption exceeded 6,000 MWh in 2013 were required to register for phase 2. There were important changes to the interactions between CRC, EU ETS and CCA liabilities between phases 1 and 2, as explained below.

During phase 1, organisations with at least one settled half hourly meter (sHHM) who used above the 6,000 MWh threshold in total via any half-hourly meter (or dynamic supplies) had to register and report for CRC, although any emissions already covered by the EU ETS or CCAs were exempt from paying CRC allowances. Furthermore, if an organisation had a site with more than 25% of its carbon emissions covered by a CCA then the organisation or subsidiary site was exempt from CRC on all its emissions, including non-CCA emissions. A further exemption was given for groups with CCAs whose residual electricity consumption, after deduction of emissions covered by CCAs, was now less than 1,000 MWh per year.

In phase 2, organisations had to register and report for CRC if they had a settled half hourly meter (sHHM) and if, after omitting consumption covered by EU ETS and CCAs, their electricity consumption from sHHMs was greater than 6,000 MWh. But all non-CCA and non-EU ETS energy supplies are potentially liable for CRC payments, if this threshold is reached. A number of other changes were included in phase 2 such as an increase in the cost of allowances from £12 per tonne to £16.40 per tonne, the option of buying allowances in advance at £15.60 per tonne (forward purchase, as opposed to 'buy to comply'). Phase 2 also allowed participants to divide their organisation up into

'participant equivalent' units for CRC reporting, rather than having to report on EA-defined 'significant group undertakings' as in phase 1.

Respondents' views on different aspects of the simplifications and phase 2 changes are presented below.

Impact of phase 1 simplification

The qualitative research found that phase 1 simplification had reduced the administrative burden for most, but not all, CRC respondents. Some organisations commented that the reduction from 29 to two fuels was a help, reducing both the cost of administration and the cost of their CRC allowances. A few commented also that dropping the footprint report would also reduce their administrative costs, since most of the data required could now be obtained from energy supplier invoices.

Well it's simpler now because it's purely electricity and natural gas. The supplier invoice route, the obligation on suppliers to provide data has been useful, obviously we have data but then you get suppliers statements which sort of summarises everything. (CRC energy manager 5, cement)

But a few organisations reported that dropping the 'de minimis' rule, and reporting on 100% rather than 90% of all electricity consumption, brought in many of their small sites, increased their CRC costs and meant that their compliance systems had to be changed.

But the simplified version made very little difference to us because the majority of our CRC costs are related to electricity anyway. What it actually did, it brought in all of our sites rather than have some of them excluded which were the very, very small sites. Again we had to change the governance process, I had to explain to the board why the CRC with its simplified version was going to cost us an extra £500,000 per year because it was now going to include all of our electricity demand rather than 90% of it. (CRC energy manager 8, water)

Some respondents felt that the simplifications contributed to a sense that the CRC was continually changing and there had not been a 'steady state' during phase 1. This is discussed further under heading D5. But in general, participants welcomed the simplifications introduced for the last year of phase 1.

Qualification for phase 2

Phase 2 of the CRC commenced during the research period, so this research only covers the start-up of this phase. The new qualification period, and the changes to CCA and EU ETS rules, meant that some organisations entered the scheme while others dropped below the qualifying threshold.

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A few of the phase 1 CRC participants had dropped out of the scheme for phase 2. This was either because their electricity consumption had fallen below the qualifying threshold, or because the changes in EU ETS/CCA rules meant that their residual consumption was not large enough to qualify.

Because electricity and supplying the EU ETS sites was no longer included in the reporting. We could drop it out, so effectively then we dropped below the threshold. (CRC energy manager 4, health)

A few industrial organisations reported that they had recently been granted further exemption from CRC because of an exclusion applying specifically to the mineralogical and metallurgical sectors, granting exemption from a range of climate change levies.

Because we're in the sort of mineralogical sector we've got the recent announcement in the budget to now consider in terms of exemptions from climate change levies. That means a lot of our sites will no longer have to report under CRC, so we need to change our systems so we're only accounting for the sites that still have to report under CRC. (CRC energy manager 5, cement)

Conversely, a few EU ETS/CCA organisations were reported to have started paying CRC allowances in phase 2, because of the removal of the 25% rule.

Yes, so all the company was exempt [in phase 1], but that wasn't the case for phase 2. Obviously the government cottoned onto it and said 'Okay then you can exempt your cold stores, your Climate Change Agreement sites, but the rest of it has to be in'. (CCA/EU ETS energy manager 4, logistics)

And at least one information declarer had entered phase 2 because their electricity consumption had reached the qualifying threshold in 2013. There were some suggestions that some potential participants, if close to the CRC threshold, may have changed the ownership and control of particular assets or buildings to keep below the threshold in the qualifying year.

What you could say is [another part of the organisation] you can now own headquarters, which maybe has got three data centres, well straight away you could cut your half-hourly electricity in half, and this is a tactic that's been employed by [related organisations]. (ID energy manager 9, other public)

There were a few comments about the change in phase 2 from organisations reporting on 'significant group undertakings' to having the choice of reporting on 'participant equivalents'. All of these comments on this were positive, because the organisations concerned were able to reduce the number of units for which they reported.

Registration for phase 2

Respondents who had already been involved in phase 1 reported that registering for phase 2 was straightforward, as they were already familiar with the systems from phase 1. A few respondents resented having to re-enter their details, when the Environment Agency already had these.

Phase 2 has been easier because everyone has already gone through the learning curve and the pain of phase 1 I think. There's a lot less sleepless nights over phase 2 because of familiarity of what's going to be expected. (CRC energy manager 17, property)

A few new entrants to phase 2 did not find the registration process so straightforward, as they felt the Environment Agency was not prepared for such participants.

The registration stage wasn't particularly easy, but I think that was probably more based on our circumstances going from an information declarer for phase 1, to a participant for phase 2. I don't think they were particularly geared up for people to make that transition. (ID/CRC phase 2, energy manager 7 – leisure)

However, generally, the registration process for phase 2 was unproblematic and much smoother than for phase 1.

Overlap with CCA and EU ETS

The simplification of rules regarding the overlap between CCA and EU ETS were generally felt to provide useful clarity, although there were winners and losers in terms of the impact on CRC bills, as explained above.

So for example in CRC [phase 1] it was very clear what we need to do for our offices, but as a complex organisation it wasn't quite a clear how we were best to treat the cross over between us and EU-ETS sites and things. And obviously phase 2 has really helped clarify that. (CRC senior manager 16, energy)

But some other elements of inconsistency between CRC and EU ETS had not been changed, such as EU ETS reporting on a calendar year basis while CRC reports on a financial year basis.

Increased cost of allowances

A few phase 1 participants reported that the increase in the cost of allowances in phase 2 was making their organisation consider further action on energy efficiency or changes to energy management.

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We tend to have factored that cost in to the profit plan, but obviously it's now going up to £16 per tonne from £12 so that should then perk a few ears and eyes up. I think 2015 we're going to resurrect some of the energy initiatives that we parked. (CRC energy manager 20, manufacturing)

But some other participants reported that the increase in the cost of allowances made little difference to their action on energy efficiency or their board's level of awareness.

A few participants commented that they expected the cost of allowances to increase further in future.

I think it was last year or the year before everybody guessed that it was going to go up from £12 a tonne to £30 a tonne in a 10 year period, so that's what we were budgeting. (CRC energy manager 33, research)

Forecasting option

Phase 2 participants have the option of 'buying to comply' or purchasing allowances in advance at a slightly lower price, which involves forecasting the number of CRC allowances they would require. While many CRC organisations already made their own forecasts for fuel purchasing purposes, a few organisations reported that that forecasting increased their administrative workload because their fuel purchasing was decentralised.

Interestingly, the simplification proposals going forward with a forecast on two allowance sale periods probably... well definitely has increased our administrative burden, we're coordinating a forecast approach for a hundred hotels that we don't operate. (CRC energy manager 2, hotels)

Forward purchase or 'Buy to comply'

A few new entrants to phase 2 of the scheme reported that they had purchased allowances in advance, as their board members wanted to minimise the cost of allowances. Some other participants such as universities and a few 'cash-rich' companies were reported to have bought ahead. But some existing participants, moving from phase 1 to phase 2, reported that that the differential between the 'buy to comply' price and 'forward purchase' price was not large enough to incentivise forward purchase.

The price difference between £15.60 and £16.40 is not big enough to generate much interest in buying ahead. [...] The difference is between buying in April and the following September – 15 months. If you left the money in the bank, you would get some interest, so 80p is not enough of an incentive. (CRC energy manager 14, energy consultant)

Several CRC participants reported that it was difficult to forecast their requirements for CRC allowances when emissions factors for the following year were not published far enough in advance. They felt that DEFRA should announce emissions factors earlier in the year.

It's a bit of a pain not knowing the emissions factors before you're asked to pre-pay so if the emissions factor is reduced you could have bought yourself too many allowances, but then within the phase they can be used the year after I suppose. So I think that needs to be the other way around, announcing the emissions factors before the initial one. (CRC energy manager 19, food)

Overall, while there were some criticisms, as outlined above, the changes introduced at the end of phase 1 and in phase 2 were generally welcomed by CRC participants and stakeholders.

They [EA/DECC] have learnt lessons from scheme 1 [phase 1], and I think phase 2 is more streamlined for that, so to be honest I do think it's probably easier, or should be easier going forward. (CRC stakeholder 4)

To sum up, phase 1 simplifications benefited most but not all participants, although they did contribute to a sense of continual change in the CRC. The application of the phase 2 qualification threshold in 2013 created winners and losers, particularly amongst organisations with CCA or EU ETS exemptions, who could find themselves with higher or lower CRC burdens depending on the details of their situation. The administration of phase 2 appeared to be relatively smooth, particularly for those organisations already familiar with phase 1. But the increased cost of allowances was significant for some, while others found forecasting for forward purchases problematic, particularly if they had a decentralised structure for energy purchasing.

Attitudes to forward purchasing were mixed. Some organisations had gone ahead to make purchases while others felt that the price differential between 'forward purchasing' and 'buy to comply' was insufficient to motivate forward purchase. Some organisations expressed irritation that emissions factors for the year ahead were not available from DEFRA at the time that they needed to define next year's requirement for allowances.

D5: What has been the impact of successive changes to the scheme, and what lessons can be drawn for the management of future changes?

Many of the CRC participants commented that compliance had been complicated by successive changes to the scheme, from the early changes to remove revenue recycling to the more recent changes to replace the PLT with the ARP, and to reduce the number of fuels from 29 to two. Each set of changes meant that senior staff in CRC organisations had to spend time familiarising themselves with the new guidance and revising their systems to ensure compliance with the changed rules.

6. Findings and analysis on evaluation objective D

So every time we simplify it, every time it changes, it means lots of work goes on in the background to make sure that people within the business understand all those new rules, and just as importantly understand what the budgetary impact of CRC is as it changes. (CRC energy manager 8, water company)

There was a sense that, between the design phase and the introduction of phase 2, there had been no 'steady state' for people to get used to.

There's the classic admin burn of the whole scheme because of the amount of changes in the guidance, and you just get used to what you're supposed to do reporting and it's changed again. (CRC energy manager 1, holding company)

A few participants felt that successive changes had undermined the overall credibility of the scheme.

It got to the point where there was this new big scheme and we got everybody's attention, it got into boardrooms and so on, and then you'd be constantly be issuing reports to say 'actually now we won't get our money back' and 'now this has changed' and 'now this has changed'. In the end the message gets a bit lost because by that point they know it's a tax that they pay and beyond that the interest level kind of drops off a little bit. (CRC energy manager 3, local authority)

A few organisations linked their experience with CRC to their organisation's experience with changes in other government energy policies, such as the reductions in the level of the Feed-In-Tariff.

From previous experience, obviously all the changes and things like the feed-in tariff and things like that had a massive impact. A clear policy from government that is not constantly changing is very important, and it had a huge impact on my previous organisation, all the changes. (CRC energy manager 15, education)

A small number of organisations reported that they thought the CRC might be scrapped, and had therefore limited their response to it.

In some regard we had hoped that it might be scrapped, and therefore we've done what we had to do just to comply. (CRC energy manager 18, water)

Overall there was a general view that there had been too many successive changes to the scheme, including changes between the design and implementation phase.

7. Suggestions for future of CRC

Respondents made various suggestions for changes to the CRC, as follows:

- a minority of respondents wanted to see the CRC abolished;
- most respondents viewed the CRC as a tax. They were willing to pay it but felt that it would be much more cost-effectively delivered if it were added to participants' electricity bills, in the way that CCL is;
- some respondents would like to see CRC combined with other energy or carbon schemes. For example they would welcome a combined report for CRC, CCA and EU ETS. And they would like to see a link between CRC and ESOS, such as being able to use a proportion of CRC allowances to fund energy audits or to fund energy saving measures recommended by the energy audits; and
- more generally, many respondents feel that the CRC would have more impact if it combined 'carrots' (i.e. incentives of some form) with 'sticks' (having to report and buy CRC allowances).

The final point was widely made by respondents across the CRC, CCA/EU ETS and information declarer groups. They reported that incentives were generally more positively received than taxes, and felt that some form of incentive would do more to promote energy efficiency than the current scheme. Several respondents suggested that some of the cost of CRC could be used to fund energy efficiency initiatives.

For example, CRC is a tax, a carbon tax, so typically an organisation will buy £100k of allowances which goes to government and is not necessarily spent on energy reduction. It would be better for funding to go to force spending £100k on energy saving initiatives. At the moment CRC is just a process. Even if only 50% went to government and 50% had to be spend on energy saving initiatives – that would be better. (CRC energy manager 14, energy consultant)

There is likely to be an element of 'lobbying' in the suggestions above. For example, while most respondents would prefer to see the CRC administered in a similar way to the CCL, a few felt that it would have less impact in this form because of the lower visibility this would give to CRC payments at board level.

The findings presented under heading D4 suggest that some CRC participants would be reluctant to see further changes to the CRC. Also, as explained under heading B8, a

7. Suggestions for future of CRC

few respondents commented that advance notice of change is helpful, as this allows organisations to plan their response to future changes and can help them to minimise the effect on their competitiveness.

The synthesis report triangulates these qualitative research findings and suggestions with evidence from other sources, including the econometric research, desk research and the quantitative survey.

Annex 1: Stage 2 topic guide for energy managers

The questions below are for energy or facilities managers in CRC organisations. There is a shorter version (below) for board level interviewees. The estimated interview length for CRC participants is 50-60 minutes. Questions in italics would be omitted from the topic guide for non-CRC organisations.

Theme	Questions/script	Estimated timing
Pre-interview briefing	Interviewee is sent briefing note setting out the background to the research, listing the main topics and explaining how information from the interview will be used.	-
Introduction	<p>Good morning/afternoon. My name is X and I am calling from an organisation called CAG Consultants on behalf of the Department of Energy and Climate Change (DECC). Thanks for making time to have a chat with me today.</p> <p>[For organisations already surveyed by Databuild: This is a follow-on to the shorter interview that you have already undertaken with Databuild's survey team, allowing us to explore issues in more depth.]</p> <p>I hope that you have seen and had an opportunity to read the briefing note that we sent to you. As explained in the briefing note, we are currently carrying out some work for DECC, speaking to medium and large-scale organisations across the UK about how they manage their energy use. We're particularly interested to discuss the steps you have taken in recent years to improve your energy efficiency and the factors influencing your decision making, including government schemes.</p> <p>The results will be used by DECC to inform future energy efficiency policy, so this is an opportunity for your organisation to feed into DECC's decision making.</p>	3 minutes

Annex 1: Stage 2 topic guide for energy managers

Theme	Questions/script	Estimated timing
	<p>We will keep any information that you share with us confidential and store it securely, in accordance with the Data Protection Act. Neither you nor your organisation will be identifiable in our report to DECC, unless otherwise agreed with you.</p> <p>Before we go any further, can I just check whether you are happy for me to record this interview? The recording will not be shared outside the research team but an anonymised transcript of the interview will be shared with DECC. Are you happy with this? (If yes, proceed to record; if no, abort recording and take notes instead).</p> <p>Can I just confirm your job title, and how long have you been in post?</p> <p>And, just for background, could you clarify whether you are an employee of the organisation or an external consultant?</p> <p>In our discussion, it would be helpful if you give me the organisation's or senior management's viewpoint rather than your personal viewpoint – or at least indicate where your viewpoint diverges from the organisation's viewpoint.</p> <p>And please don't worry about saying 'I don't know' to any of the questions.</p> <p>As you will have seen from the briefing note, I would like to cover six broad topics. The first topic is...</p>	
<p>Topic 1 – main question</p>	<p>How significant is energy use as a strategic issue for your organisation? And how important is carbon as a strategic issue?</p> <p><i>We would like to understand how far your organisation is motivated to reduce energy use and therefore carbon emissions, and what drives its strategic approach to these issues.</i></p> <p><i>Note to interviewer: please review published information for the organisation before the interview.</i></p>	<p>5 minutes</p>
<p>Follow-up questions</p>	<p>(after initial response...)</p> <ul style="list-style-type: none"> • Probe the reasons behind the strategic importance attached to energy use (and if applicable separately for carbon emissions) (e.g. cost, reputation, other - over short, medium and long-term). • How does the organisation demonstrate this importance? (e.g. targets, resource?) • Has this strategic importance changed over time? In what way? • Are there any conflicts between energy reduction and other corporate priorities? (e.g. customer service; acquisitions, new market opportunities...other priorities) 	

Theme	Questions/script	Estimated timing
<p>Topic 2 – main question</p>	<p>What are the recent trends in overall energy use for your organisation, and what factors are driving these trends?</p> <p><i>We would like to understand overall trends in energy use by your organisation in recent years (e.g. 2007 – 2010 and since 2010) and the reasons for any obvious changes over this period. We are interested to know whether you have this information, as energy manager/facilities manager, or whether it is held elsewhere in your organisation.</i></p> <p>Note to interviewer: please review any published figures for the organisation beforehand.</p>	<p>5 minutes including follow-up questions</p>
<p>Follow-up questions (as far as possible, ensure that these questions are answered during the discussion)</p> <p>[omit questions in square brackets if already answered – e.g. in quant survey, where applicable]</p>	<ul style="list-style-type: none"> • [Does your organisation collate information on energy use? why/ why not? how is this captured?] • [What are the overall trends in energy use for your organisation from 2007 to 2010 (if known)? Probe separately for electricity and gas] • [And what are the trends in energy use since April 2010? Probe separately for electricity and gas] • Has there been a change in energy use over these two periods? If so, please can you explain why? (after initial responses, probe – any restructuring, market changes, corporate policy; also probe the degree of certainty and extent of contribution of these factors) 	
<p>Topic 3 – main question</p>	<p>What strategic action is your organisation taking at a corporate level to manage or reduce energy use and/or carbon emissions, and how has this changed in recent years? (e.g. energy reporting, accreditation, planning – we will come onto more specific operational measures in the next topic).</p> <p><i>We would like to understand how your organisation manages energy use at a corporate level, and how this has changed in recent years (e.g. 2007 – 2010 and since 2010).</i></p>	<p>12 minutes including follow-up questions</p>
<p>Follow-up questions (as far as possible, ensure that these questions are answered during the discussion)</p>	<ul style="list-style-type: none"> • Does your organisation report carbon emissions in its annual reporting, for example via your organisation’s annual report or website? (Probe (after initial response): any carbon emissions targets? Disclosure of progress against targets?) what are the reasons for reporting/ not reporting? • Has your organisation applied for accreditation through any energy or carbon reporting and reduction standard, or similar schemes? (probe – if so, which?) when? And why? • How is energy use managed within your organisation? (probe (after initial response): one senior level person with overall responsibility? who has operational responsibility for different businesses/sites? How are these coordinated?) 	

Annex 1: Stage 2 topic guide for energy managers

Theme	Questions/script	Estimated timing
	<ul style="list-style-type: none"> • How did organisational/reporting arrangements for energy (or carbon if applicable) change between 2007-2010? (probe: main drivers for changes) • And what about since 2010? (probe: main drivers for changes; record CRC if mentioned) • How did senior-level awareness of energy use change between 2007-2010? (probe: main drivers for changes; is energy an issue just because of cost, or is energy use an issue in itself?) • And what about since 2010? (probe: main drivers for changes; record CRC if mentioned)? • Does your organisation have energy reduction plans in place? (probe: how do these fit with business planning; probe: do you forecast your energy as part of this) • How has the energy planning process changed since 2007? (probe: main drivers; record CRC if mentioned) 	
<p>Topic 4 – main question</p>	<p>What actions has your organisation taken at an operational level to improve energy efficiency, and what factors have driven these actions?</p> <p><i>We would like to understand what types of practical action your organisation has taken to reduce energy use or improve energy efficiency of its operations in recent years (since 2010), and the factors that have influenced this.</i></p>	<p>10 minutes (including follow-up questions)</p>
<p>Follow-up questions (as far as possible, ensure that these questions are answered during the discussion)</p> <p>NOTE: questions marked [...] may be omitted if already answered earlier in the discussion.</p>	<ul style="list-style-type: none"> • Has your organisation taken any measures to improve energy efficiency between 2010 -2014? (probe – anything else? Soft measures such as staff behaviour change? Hard measures such as lighting? What is the balance between permanent measures (e.g. technologies) and more reversible measures (e.g. behaviour)? Any fuel switching (e.g. electricity to gas or vice versa?)) • [Has your organisation’s level of activity on energy efficiency changed over the past four years?] • Why has your organisation taken the actions you have, over the past four years? (probe (after initial response): what helped to develop a business case for these measures? how easy or difficult has it been to implement changes? what have been the challenges/ benefits? What payback period does your organisation require?) • Is your organisation planning to take any further actions to improve energy efficiency? What are these? (probe (after initial response): what about... behaviour change, lighting, HVAC, refurbishment, other investments, anything else?) • [What do you see as the main drivers for energy use/efficiency, going forward? (probe – anything else?)] • What are the reasons for not taking further action on energy use/efficiency measures, beyond those your organisation is already pursuing? (probe (after initial response): organisational changes, other competing priorities, finance, anything else?) 	

Theme	Questions/script	Estimated timing
<p>Topic 5 – main question</p>	<p>FOR CRC PARTICIPANTS (AND CCA/EU ETS EXEMPT ORGANISATIONS): To what extent has your organisation’s strategy on energy been influenced by government schemes such as the CRC, CCA, CCL and EU ETS, and what has been your experience of these schemes?</p> <p><i>We would like to understand your organisation’s experiences with these government schemes, and whether they have influenced decision-making in your organisations.</i></p> <p><i>Note to interviewer: please listen for other potential influences on energy (e.g. GHG reporting, building regs; Feed-in-tariffs)</i></p>	<p>20 minutes for CRC participants; 10-15 mins for control groups (including follow-up questions)</p>
<p>Follow-up questions (as far as possible, ensure that these questions are answered during the discussion)</p>	<p>FOR ALL INTERVIEWEES:</p> <ul style="list-style-type: none"> • What has been the relative influence of CRC, CCA, CCL and EU ETS on the organisation’s decision-making about energy? (probe – why? When were these influences felt?) • What has been the relative administrative workload of these schemes for your organisation? (probe – why? In what way? Is there overlap?) • To what extent, if any, has the CRC influenced changes in action on energy efficiency in your organisation? (after initial response, probe the relative influence of different aspects of the CRC and why/why not influential: <ul style="list-style-type: none"> ○ preparation for CRC? (e.g. early action metrics) ○ financial cost of CRC? ○ information compiled for CRC? (probe - what has been the effect of the regular process of CRC reporting? Has it stimulated ongoing energy efficiency action?) ○ reputational aspects of CRC? (e.g. ARP) <p>FOR ALL CRC REGISTRANTS (INCLUDING CCA/EU ETS EXEMPT ORGANISATIONS):</p> <ul style="list-style-type: none"> • To what extent, if any, has CRC influenced your organisation’s take-up of energy efficiency measures, positively or negatively? (probe: level of take-up? earlier action? different types of measures?; how important is CRC compared to other influences?) • Are there any types of action which were not viable before the CRC, and where the CRC has tipped the balance towards viability? (probe – are CRC costs included in the business case? If not, why not?; how much are changes in viability attributable to CRC or other factors) • To what extent, if any, have changes to the CRC affected your organisation’s response to the scheme? (prompt if needed, e.g. removal of CRC revenue recycling; abolition of the Performance League Table; restriction to electricity and gas; and for local authorities - exclusion of ‘dynamic’ unmetered supplies) • To what extent have senior management been engaged with CRC issues? (probe after initial response: 	

Annex 1: Stage 2 topic guide for energy managers

Theme	Questions/script	Estimated timing
	<p><i>What difference, if any, does regular high-level reporting, sign-off and payment of CRC make to the board's engagement with energy efficiency? How has board-level engagement with CRC changed over time? Has the increase from £12 to £16/tonne raised board awareness?)</i></p> <p>FOR ALL CRC PARTICIPANTS (EXCLUDING CCA/EU ETS EXEMPT ORGANISATIONS)</p> <ul style="list-style-type: none"> • <i>How did you find the administration of Phase 1 of the scheme from registration onwards?? (probe for positives and negatives: probe - initial registration and start-up process; communications, help desk, reporting, adequacy of guidance; ease of taking meter readings, reporting on multiple sites (if applicable), buying/surrendering allowances),</i> • <i>Are you eligible for Phase 2? If not, why not? (probe for any temporary changes to avoid Phase 2 registration) If yes, how does your experience of Phase 2 administration differ from Phase 1? How are you finding Phase 2 of the scheme, so far (probe for experience of simplification, communications, adequacy of guidance, readiness for trading?)</i> • <i>Has your organisation ever been subject to audit or enforcement for CRC compliance? (probe - if so, what was your experience of this?)</i> • <i>How far do potential enforcement penalties drive your response to the CRC? [even if not subject to any enforcement]</i> • <i>Have you brought in external resources to support compliance with the CRC? If so, what resources and why? (probe – use of external consultants and their responsibilities; level of capacity for CRC compliance within the organisation itself)</i> • <i>Has the cost of CRC allowances influenced the prices which you charge your customers? (probe – why or why not?)</i> • <i>Can you think of any ways in which the Scheme could be further simplified or the administrative burden lessened?</i> 	
Topic 6 – main question	<p>Summing up, what do you feel works well and less well about these government schemes and wider non-domestic energy efficiency policy (i.e. policy affecting industry, business and other organisations)?</p> <p><i>We would like to understand your overall views on energy efficiency policy.</i></p>	5 minutes (including follow-up questions)
Follow-up questions (as far as possible, ensure that these questions are answered during the discussion)	<ul style="list-style-type: none"> • Summing up, what aspects of the CRC, CCA and EU ETS have worked well overall, in your view? (probe (after initial response): have they encouraged reductions in energy use? influenced take-up of energy efficiency measures in your organisation? Raised awareness for senior management? (Probe – if so, how? When did this happen?) • And, similarly, what aspects of these schemes have worked less well overall? Why do you think this is? (probe – have policy uncertainty or policy changes affected how well these schemes have worked? have policy uncertainty or policy changes affected your approach to energy efficiency?) • Would you be happy to be re-contacted if needed later in this research? 	
	Many thanks for your time.	

Annex 2: Stage 2 topic guide for senior managers

The questions below are for board level interviewees in CRC organisations. A longer version has been prepared for facilities managers/energy managers. The estimated interview length for this board level interview is 15-20 minutes. *Questions in italics should be omitted from non-CRC interviews.*

Theme	Questions/script	Estimated timing
Pre-interview briefing	Interviewee is sent briefing note setting out the background to the research, listing the main topics and explaining how information from the interview will be used.	-
Introduction	<p>Good morning/afternoon. My name is X and I am calling from an organisation called CAG Consultants on behalf of the Department of Energy and Climate Change (DECC). Thanks for making time to speak to me today. [Where relevant – this is a follow-on from an interview with an energy manager, to ensure we capture board-level views.]</p> <p>I hope that you have seen and had an opportunity to read the briefing note that we sent to you. As explained in the briefing note, we are currently carrying out some work for DECC, speaking to medium and large-scale organisations across the UK about how they manage their energy use. We're particularly interested to discuss steps taken or considered in recent years to improve your energy efficiency and the factors influencing your decision making, including government carbon schemes.</p> <p>The results will be used by DECC to inform future decisions regarding future energy efficiency policy, so this is an opportunity for your organisation to feed into DECC's decision making.</p> <p>We will keep any information that you share with us confidential and store it securely, in accordance with the Data Protection Act. Neither you nor your organisation will be identifiable in our report to DECC, unless otherwise agreed with you.</p> <p>Before we go any further, can I just check whether you are happy for me to record this interview. The recording will not be shared outside the research team but an anonymised transcript of the interview will be shared with DECC. Are you happy with this? (If yes, proceed to record; if no, abort recording and take notes instead).</p>	1 minute

Annex 2: Stage 2 topic guide for senior managers

Theme	Questions/script	Estimated timing
	As you will have seen from the briefing note, I would like to cover four broad topics. The first of these is...	
Topic 1 – main question	<p>How significant is energy use as a strategic issue for your organisation? And how important is carbon as a strategic issue?</p> <p><i>We would like to understand whether your organisation is motivated to reduce energy use and / or carbon emissions, and what drives its strategic approach to these issues.</i></p> <p>Note to interviewer: please review published information for the organisation before the interview.</p>	2 minutes
Follow-up questions	<p>(after initial response...)</p> <ul style="list-style-type: none"> • Probe the reasons behind the strategic importance attached to energy use (probe if needed - cost, reputation, other - over short, medium and long-term). • What about the reasons behind the strategic importance attached to carbon emissions? • Do you see any conflicts between energy or carbon reduction and other corporate priorities? • How concerned are you about increasing the resilience of your organisation to future risks associated with energy and carbon? 	
Topic 2 – main question	<p>What strategic action is your organisation taking at a corporate level to manage or reduce energy use, and how has this changed in recent years?</p> <p><i>We would like to understand how your organisation manages energy use at a corporate level, and how this has changed in recent years (e.g. 2007 – 2010 and since 2010).</i></p>	5 minutes including follow-up questions
Follow-up questions	<p>(after initial response..)</p> <ul style="list-style-type: none"> • What was the Board’s level of awareness of energy before 2010? Did this change in the period 2007-2010? (probe: Why? What were the main drivers for changes) • And what about since 2010? (probe: Why? What were the main drivers for changes; record CRC if mentioned) • If there is increased Board-level awareness, is this being translated into increased high-level activity to reduce energy use? (probe - have they put in place an energy management strategy, or an energy reduction plan, set targets, appointed staff, provided finance etc.) • Does your long term business plan consider the implications of energy efficiency and future energy costs? • If there is concern/awareness at Board level but they are not doing anything about it, why has there been little or no change? 	

Theme	Questions/script	Estimated timing
Topic 3 – main question	<p>To what extent has your organisation’s strategy on energy been influenced by government schemes such as the CRC, CCA, CCL and EU ETS?</p> <p><i>We would like to understand whether and how these schemes have influenced decision-making in your organisation, particularly since 2010.</i></p>	4 minutes (including follow-up questions)
Follow-up questions	<p><i>(after initial response...)</i></p> <ul style="list-style-type: none"> • Do you know which government schemes and policies on energy use apply to your organisation? (probe (after initial responses) – CRC? CCA? EU ETS? Climate Change Levy) • How have these schemes influenced your overall energy strategy, if at all? (probe for CRC vs other schemes) • To what extent, if any, has the CRC influenced changes in action on energy use/efficiency in your organisation? (prompt for drivers – preparation for CRC, financial cost of CRC; information compiled for CRC; reputational aspects of CRC) • <i>To what extent has your board engaged with CRC issues? (probe after initial response: What difference, if any, does regular high-level reporting, sign-off and payment of CRC make to the board’s engagement with energy efficiency? How has board-level engagement with CRC changed over time? Has the increase from £12 to £16/tonne raised board awareness?)</i> 	
Topic 4- main question	<p>In summary, what do you feel works well and less well about these government schemes and wider non-domestic energy efficiency policy (i.e. policy affecting industry, business and other organisations)?</p> <p><i>We would like to understand your overall views on energy efficiency policy.</i></p>	3 minutes (including follow-up questions)
Follow-up	<ul style="list-style-type: none"> • Probe for what works well • Then what works less well (probe – have policy uncertainty or policy changes affected how well these schemes have worked? have policy uncertainty or policy changes affected your approach to energy efficiency?) • Probe for understanding/awareness of CRC, and which aspects of CRC that work ‘well’/‘less well’ 	
	Many thanks for your time.	

Annex 3: List of qualitative interviews with CRC and non-CRC participants

The table below lists the 74 qualitative interviews, with an indication of the sector for each organisation, as classified informally by interviewers. Some reference numbers are missed out because of reclassification or rebooking of interviews. In particular, senior manager interviews were reclassified as energy manager interviews if the interviewee was not at or close to board level.

Interview reference	Indication of sector
CRC stakeholders – scoping stage	
CRC stakeholder 1	CRC policy and delivery
CRC stakeholder 2	CRC policy and delivery
CRC stakeholder 3	industry stakeholder
CRC stakeholder 4	industry stakeholder
CRC stakeholder 5	industry stakeholder
CRC energy managers – scoping (10)	
CRC – EM 1	major holding company
CRC – EM 2	hotels
CRC – EM 3	local authority
CRC – EM 4	health
CRC – EM 5	cement
CRC – EM 6	supermarket
CRC – EM 7	service company
CRC – EM 8	water
CRC – EM 9	property
CRC – EM 10	smaller holding company/leisure
CRC energy managers – stage 2 (20)	
CRC - EM 11	local authority (energy consultant)
CRC - EM 12	health
CRC - EM 13	other public body
CRC - EM 14	energy consultant
CRC - EM 15	education
CRC - EM 16	property
CRC - EM 17	property
CRC - EM 18	water
CRC - EM 19	food services
CRC - EM 20	manufacturing
CRC - EM 21	local authority (energy consultant)

Interview reference	Indication of sector
CRC - EM 22	retail
CRC - EM 25	retail
CRC - EM 26	leisure
CRC - EM 27	transport
CRC - EM 29	retail
CRC - EM 30	retail
CRC - EM 31	finance (energy consultant)
CRC – EM 32	professional services
CRC – EM 33	research
CRC senior managers – scoping (5)	
CRC – SM 1	cement
CRC – SM 2	smaller holding company/leisure
CRC – SM 3	water
CRC – SM 4	supermarket
CRC – SM 5	major holding company
CRC senior managers – stage 2 (11)	
CRC - SM 6	local authority
CRC - SM 7	education
CRC - SM 8	defence
CRC - SM 9	manufacturing
CRC - SM 10	other public body
CRC - SM 12	manufacturing
CRC - SM 13	manufacturing
CRC - SM 15	manufacturing
CRC – SM 16	energy
CRC – SM 17	public transport
CRC – SM 18	waste
Information declarers – energy managers – scoping (3)	
ID – EM 1	local authority
ID – EM 2	manufacturer
ID – EM 3	house building
Information declarers – energy managers – stage 2 (5)	
ID - EM 4	manufacturing
ID - EM 6	health
ID - EM 7 (also in CRC phase 2)	leisure
ID - EM 9	other public body
ID – EM 11 (also in CCA)	manufacturing
Information declarers – senior managers – stage 2 only (5)	
ID – SM 1	leisure
ID - SM 4	manufacturing
ID – SM 5	manufacturing
ID – SM 6	manufacturing
ID – SM 7	manufacturing
Organisations with CRC exemptions owing to CCA/EU ETS schemes –	

Annex 2: Stage 2 topic guide for senior managers

Interview reference	Indication of sector
energy managers – stage 2 only (5)	
CCA/EU ETS – EM 1	chemicals
CCA/EU ETS – EM 2	chemicals
CCA/EU ETS – EM 3	manufacturing
CCA/EU ETS – EM 4	logistics
CCA/EU ETS – EM 5	manufacturing
Organisations with CRC exemptions owing to CCA/EU ETS schemes – senior managers – stage 2 only (5)	
CCA/EU ETS – SM 1	agriculture
CCA/EU ETS – SM 2	manufacturing
CCA/EU ETS – SM 3	manufacturing
CCA/EU ETS – SM 4	manufacturing
CCA/EU ETS – SM 5	manufacturing

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