Department of Energy & Climate Change

Evaluation of the Carbon Emissions Reduction Target and Community Energy Saving Programme

Research undertaken for DECC by Ipsos MORI, CAG Consultants, UCL and Energy Saving Trust

Unique Reference Number 14D/330

Any enquiries regarding this publication should be sent to us at deccecoteam@decc.gsi.gov.uk

This document is available from our website at www.gov.uk/decc

Evaluation of the Carbon Emissions Reduction Target and Community Energy Saving Programme

Contents

1. Introduction

This report sets out the findings from an independent evaluation of the Carbon Emissions Reduction Target (CERT) and the Community Energy Savings Programme (CESP). The research was commissioned by the Department of Energy and Climate Change (DECC) and undertaken by a consortium of Ipsos MORI, CAG Consultants, University College London and Energy Saving Trust.

1.1 Research Purpose

The aim of the evaluation was to determine whether CERT and CESP met their objectives, outlined in this report, and provide evidence to inform future energy efficiency policy design and implementation. This report sets out the key findings and conclusions of the evaluation which broadly fell into three research streams:

- Process research stream,
- Householder experience research stream; and
- Energy company cost analysis research stream.

The purpose of the process stream, led by CAG Consultants, was to evaluate the processes involved in CERT and CESP, i.e. the mechanics of the programmes – the 'how' part – that enable outputs to be achieved.

The key objectives of the householder experience research stream, undertaken by Ipsos MORI, were to understand householders' experiences of the two programmes, to identify the drivers and barriers to participation, and to understand the impact of CERT and CESP measures on thermal comfort, affordability of energy and on householders' attitudes and behaviours in relation to energy efficiency.

The purpose of the cost analysis stream, led by Ipsos MORI, was to establish estimates of the total resource costs incurred as a consequence of the two obligations, how these changed over time and, where possible, what implications the costs associated with the programmes have for future energy efficiency policy design.

At the time of writing, Ofgem enforcement investigations into six of the CERT and CESP Obligated Parties are currently ongoing. Therefore the evidence and viewpoints put forward by Obligated Parties in this report should be considered in this context.

1.2 Evidence

This report is based on a range of evidence gathered through the evaluation, completed between May and December 2013. The research conducted included:

- **Stakeholder research:** 61 in-depth qualitative interviews with a range of stakeholders to explore the dynamics of the CERT and CESP schemes in more detail, the lessons learned from the schemes and the underlying drivers of the costs of delivery. This included stakeholders across DECC, Ofgem, the Scottish Government, the Welsh Assembly Government, the obligated parties, trade and sector associations, the supply chain, local authorities, housing associations and community organisations.

- **CERT and CESP Case Studies:** Seven case study areas were selected to provide an illustration of a range of different local areas as well as lessons on delivery. The full rationale behind the case study area selection is included in the appendices. The case studies explored in detail the delivery of CERT and CESP schemes at a local level. Interviews were carried out with those involved in delivering and administering the schemes, as well as beneficiaries of the schemes. All references to case study areas have been anonymised using letters, to protect the anonymity of stakeholders in each area. The case study research involved two main strands, as follows:

    - **Process case study research:** 37 in-depth qualitative interviews were carried out with delivery stakeholders (including obligated parties, local authorities, housing associations, community groups and the supply chain). These were supplemented with a desk review of evidence on delivery of CERT and CESP in those case study areas.

    - **Householder case study research:** in-home interviews were conducted with local residents in five of the case study areas[1]. This included customers of the schemes, as well as those who did not receive measures. Quantitative surveys were conducted across each area, supplemented by follow-up qualitative depth interviews with survey respondents to explore experiences in more detail. For each case study area the quantitative interviews were conducted within a selected Lower Layer Super Output Areas (LSOA[2]) - on the basis that CESP schemes were selected on these geographical boundaries - where CERT or CESP activity took place. For CESP areas where an insufficient number of properties existed to achieve the target number of 100 interviews, two or more neighbouring LSOAs were combined to provide a larger area within which to interview. The number of interviews completed can be seen in Table 1.1 (a more detailed breakdown, along with fieldwork timings and the demographic profile of the case study areas and sample, are included in the appendices):

Table 1.1: Breakdown of interviews between case study areas

Case study area		A		C		D	E	G	
		CERT	CESP	CERT	CESP	CESP	CERT	CERT	CESP
Interviews (n.)	Quantitative	100	100	100	100	100	100	100	100
	Qualitative	4	4	5	4	6	5	5	5

- **CERT customer survey:** A survey of CERT customers nationally was undertaken between 28th June and 4th July 2013 through Ipsos MORI's weekly Capibus omnibus survey. This survey was designed to establish take up rates of CERT measures, satisfaction with installations, and costs incurred by householders. Further details about the Omnibus methodology are included in the appendices.

- **Cost requests**: Monitoring information on the cost of CERT and CESP to obligated parties are not held centrally either by Ofgem (the administrator of the schemes) or by

[1] Further details about why two case study areas were not included in the customer phase of the evaluation are included in Appendix A3.

[2] An LSOA is a geographical boundary consisting of aggregated Output Areas. They include between 400 and 1,200 households.http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/census/super-output-areas--soas-/index.html. The eligible areas for CESP are defined as those LSOAs with the lowest income decile under the IMD in England and the lowest 15% of LSOAs in Wales and Data Zones Scotland.

DECC. In order to obtain quantitative evidence, obligated parties were approached by the evaluation team for detailed information on the administration and delivery costs associated with the two schemes. All obligated parties provided some of the information requested, though the level of detail varied, as did their engagement with the exercise. This information was provided on the condition that figures would be presented only in aggregate form. Further detail on the information requested is included in the appendices.

- **Cost surveys with housing associations, local authorities and installers:** An on-line survey of housing associations and local authorities was undertaken to establish the resource costs incurred by these parties in the delivery of CERT and CESP. The survey was also used to explore issues relating to scheme development costs. Responses were received from housing associations and local authorities to 13 CESP schemes and 11 CERT schemes (mainly covering activity in 2012 and primarily covering Wales and Scotland). Two installers responded to the survey request, one relating to CERT and one to CESP (mainly covering activity in 2012).

- **Desk review:** a desk review of relevant literature was undertaken, including a review of material providing evidence in relation to the costs of delivering CERT and CESP.

This evidence is supplemented with qualitative evidence from the interim evaluations of both CERT and CESP undertaken by Ipsos MORI, CAG Consultants and BRE:

- A review of the qualitative interviews and desk research undertaken in 13 case study areas in the interim evaluation of CESP (covering schemes in the period 2009 to March 2011)

- A review of the qualitative interviews and desk research undertaken in four case study areas in the interim evaluation of CERT (covering activity up to March 2011).

1.3 Limitations of the evidence

This report should be read with the limitations of the evidence detailed in Table 1.2 in mind.

Table 1.2: Limitations of evaluation's evidence

Cost analysis	
Level of detail	While each of the obligated parties provided some cost information relating to their delivery of CERT and CESP, not all suppliers provided cost information in the same level of detail. Findings have only been presented where at least two obligated parties have provided relevant information (to avoid disclosure), and this inhibits our ability to address a number of the research questions, and in particular those involving a breakdown of costs across the eligible energy efficiency measures.
Verification of accuracy of obligated party cost data	All cost calculations are based on cost data submitted by the obligated parties. It is beyond the scope of this report to look into the methodology and/or accuracy underpinning the submissions on cost made by each obligated party.
Quantitative	The cost analysis has focused on obtaining reliable quantitative evidence as far as possible. However, in a number of areas, it has not been possible to collect

precision	systematic evidence on costs, particularly in relation to the costs incurred by wider stakeholder groups (householders, housing associations and local authorities) in the delivery of the schemes. For example, low response rates were received to the cost surveys with housing associations, local authorities and installers. This meant there was not a sufficient sample collected to provide a robust analysis of the costs to organisations other than the obligated parties. Where possible, qualitative evidence has been used to provide an illustration of costs, but it should be noted that these are indicative examples only.
Gross costs	The costs presented in the cost analysis sections are estimated in gross terms. Based on evidence collected through the stakeholder interviews (further discussed in later sections), it is likely that a share of the energy efficiency measures would have been installed by householders or RSLs in the absence of CERT and CESP. In these cases, the costs incurred by obligated parties may not represent wholly additional resource costs (though they will represent a complex system of transfer payments from the obligated parties to relevant households, and to the extent that any costs were recovered through energy bills, from bill payers to the obligated parties).
Stakeholder research	
Narrow focus in terms of measure types	The research with stakeholders focused on the insulation and heating elements of the programmes, rather than the lighting, appliances and others elements also included in CERT. This meant that the supply chain stakeholders interviewed were selected for their knowledge and experience of domestic energy efficiency retrofit under the programmes, rather than the wider aspects.
Householder survey	
No baseline	This evaluation was designed retrospectively and was not built in from the outset of the programmes. This means that there is no baseline against which to compare current attitudes towards, and levels of uptake of, energy efficiency measures (see interim CESP evaluation report for a fuller explanation of the issues encountered with conducting a baseline survey). All surveys were conducted after the installations of CERT or CESP measures. This poses a challenge attributing particular attitudes, behaviours and levels of uptake to CERT and CESP measures with a high degree of certainty. Some conclusions have been drawn about the impacts through retrospective interviews with stakeholders and comparing the attitudes and reported behaviour of a sample of customers with non-customers. However, these are not sufficient to robustly indicate what would have happened in the absence of the programmes, and are vulnerable to hindsight having changed respondents' perceptions of what would have happened anyway.
Recall of participants	Caution should be exercised when considering respondents' views about the initial stages of the programme due to the potential lapse in time between when they were approached to take part and the interview.
Case study sub-group sample sizes	Due to the penetration of CERT and CESP measures in the case study areas, caution should be exercised when considering results for CESP non-customers and CERT customers. This is because of the small sample sizes on which these results are based.
Identifying a	Establishing a completely accurate measure of whether someone has installed a

'CERT customer' and Super Priority Group and Priority Group eligibility	CERT measure (as opposed to an energy efficiency measure which benefitted from alternative funding) is not possible from a self-reported survey alone (further details of the reasons why this is the case are provided in the appendices). When comparing figures between the final Ofgem CERT report and the national survey, the latter tended to under-estimate the number of insulation measures installed by around a factor of 2 (between 1.8 for professional loft insulation and solid wall insulation and 2.6 for cavity wall insulation). While imperfect, this measure still provides a broad indicator of households receiving CERT-funded measures. There are similar challenges around testing a household's eligibility for Priority or Super Priority status - we are reliant on respondent knowledge of the detail of the benefits they receive. However, this would have been a similar problem for the obligated parties and this term is therefore used throughout this report.

1.4 Note on comparisons with other energy efficiency obligation schemes

It should be noted that some of the costs and benefits reported within the evaluation are not directly comparable with those that have been estimated or reported in previous obligations, such as the Energy Efficiency Commitment, nor their successor, the Energy Company Obligation.

By way of example, the carbon saving targets set under CERT and CESP are different from those under ECO. This is because of an updated evidence base on energy efficiency measures, which is mainly due to reductions in:

a. the assumed theoretical lifetime energy savings associated with each individual measure (that is, energy savings under laboratory test conditions): and
b. the reduction in estimated energy savings once the measures are installed (for example, by applying 'in use factors' to the savings – to take into account underperformance once measures are installed in the home - as opposed to under laboratory conditions). The scores for loft insulation were also adjusted to take into account that some parts of some lofts are untreatable as they are inaccessible.

The eligible measures under ECO were also more restricted than those under CERT and CESP, with ECO also focussing on hard to treat cavity and solid wall insulation. The carbon targets under ECO were therefore lower to reflect the fact that these harder to treat measures may require larger subsidies from obligated suppliers.

The evaluation of EEC can be found on the internet[3]. Data on the Energy Combination Obligation are published by the Department of Energy and Climate Change, and can be found on the Government website[4].

[3] For example, the evaluation of EEC 2 can be found here: http://s3.amazonaws.com/zanran_storage/www.defra.gov.uk/ContentPages/4234041.pdf

[4] https://www.gov.uk/government/collections/green-deal-and-energy-company-obligation-eco-statistics

1.5 Summary version of the report

A separate executive summary version of the report has been produced, which is being published alongside this full report. This version of the report should be read for the full detail behind the evaluation, and for an appreciation of the detailed findings.

1.6 Glossary of terminology used in the report

A number of terms are used in this report, some of which are derived specifically for the purposes of this report, which the reader may not be familiar with. A full glossary of terms used is included below.

Adjusted CO_2 savings: Lifetime savings of carbon dioxide including uplifts. *Also see: Unadjusted CO_2 savings.*

Bonus: Incentives that were used to encourage delivery of certain measures or the way in which the measures were delivered (such as increasing the density of measures delivered in local areas or within individual homes). Incentives were in the form of increases to the carbon saving attributed to the measures delivered. *Also see: Uplift.*

Carbon / CO_2 savings: Lifetime savings of carbon dioxide attributable to the measures installed through the programmes

CERT - Carbon Emissions Reduction Target: Legislative driver for improving the energy efficiency of existing households in Great Britain and contributed to the UK's legally binding emissions reduction commitments. Ran April 2008 to December 2012. *Please refer to Chapter 2 for further details.*

CERT customer: An individual/household who installed an energy efficiency measure under CERT. *Please refer to the appendices for the exact definition used in the customer survey element of this evaluation.*

CERT non-customer: An individual/household who had not installed an energy efficiency measure under CERT. This may mean the individual/household had installed measures that could not be assigned to CERT; that the individual/household had installed measures at another point in time (either before or after CERT); or that the individual/household has not installed any measures. *Please refer to the appendices for the exact definition used in the customer survey element of this evaluation.*

CESP - Community Energy Saving Programme: Policy to improve domestic energy efficiency in Great Britain's most deprived areas, which ran between October 2009 and December 2012. *Please refer to Chapter 2 for further details.*

CESP customer: An individual/household who installed an energy efficiency measure under CESP. *Please refer to the appendices for the exact definition used in the customer survey element of this evaluation.*

CESP non-customer: An individual/household who had not installed an energy efficiency measure under CESP. This may mean the individual/household had installed measures that could not be assigned to CESP; that the individual/household had installed measures at another point in time (either before or after CESP); or that the individual/household has not installed any measures. *Please refer to the appendices for the exact definition used in the customer survey element of this evaluation.*

CFL - Compact Fluorescent Lamps: A type of low energy lighting.

CWI - Cavity Wall Insulation: Energy efficiency measure that fills cavity walls (the gap between external walls) in a property with insulation. Most properties built after 1920 have cavity walls.

ECO – Energy Company Obligation: The energy efficiency programme that was introduced into Great Britain in 2013, which replaces CERT and CESP.

EEC - Energy Efficiency Commitment: The obligation that preceded CERT. The first scheme (EEC1) ran from 2002 to 2005 and the second (EEC2) ran from 2005 to 2008.

EWI - External Wall Insulation: Energy efficiency measure where insulation is fitted to external solid walls of a property, with the insulation then covered with either render or cladding to protect it. Most properties built before 1920 have solid walls.

IWI - Internal Wall Insulation: Energy efficiency measure where insulation is fitted to the internal solid walls of a property. Most properties built before 1920 have solid walls.

IO - Insulation Obligation: An obligation introduced under amendments to CERT in 2009 and 2010 that required a proportion of the carbon emissions reduction target to be delivered via insulation measures**.** *Please refer to Chapter 2 for further details.*

Mt of CO_2: - Million tonnes of carbon dioxide

NPG - Non Priority Group: Measure used by DECC to determine those who are not classed as vulnerable households under the Priority Group measure. *Also see: PG – Priority Group.*

PG - Priority Group: Measure used by DECC to determine vulnerable households under CERT. It refers to households where particular benefits are claimed and/or a household member is 70 years old or above. *Please refer to the appendices for the exact DECC definition and the definition used in the customer survey element of this evaluation.*

PRS: Private Rented Sector

SPG - Super Priority Group: Measure used by DECC to determine vulnerable households under CERT; this group was a subset of the Priority Group used in CERT. It was introduced in the CERT Extension and aimed to identify the most vulnerable by including households where specific benefits were claimed. *Please refer to the appendices for the exact DECC definition and the definition used in the customer survey element of this evaluation*

SWI: Solid Wall Insulation: energy efficiency measure where insulation is fitted to solid walls, either on internal or external walls. Most properties built before 1920 have solid walls. *Also see: EWI - External Wall Insulation; IWI - Internal Wall Insulation.*

Unadjusted CO_2 savings: Lifetime savings of carbon dioxide before uplifts

Uplift: An increase in the carbon saving delivered when bonus criteria was met.

VOC - Volatile Organic Compounds: Compounds that have a high vapour pressure and low water solubility.

Warm Home Discount (WHD): The Warm Home Discount (WHD) scheme came into operation on 1 April 2011 and requires domestic energy suppliers to provide approximately £1.13 billion of direct and indirect support arrangements to fuel poor customers over four years.

2. Background to CERT and CESP

This chapter gives a brief overview of the Carbon Emissions Reduction Target (CERT) and the Community Energy Saving Programme (CESP). This chapter outlines the nature and scale of the obligations, their anticipated costs, as well as summarising the delivery of the obligations.

The government introduced a range of policies to reduce the United Kingdom's greenhouse gas emissions by 80% by 2050. CERT and CESP were two main initiatives put in place to improve energy efficiency within domestic households in Great Britain. CESP was designed to improve domestic energy efficiency in the most deprived geographical areas across Great Britain, while CERT made energy efficiency measures available to all consumers[5] (but also required a proportion of reductions to come from low-income households (i.e. the Priority Group PG)). CESP was also designed to experiment with alternative models of delivery of energy efficiency measures.

2.1 Carbon Emissions Reduction Target (CERT)

From April 2008 to December 2012 CERT was the main legislative driver for improving the energy efficiency of existing households in Great Britain and contributed to the UK's legally binding emissions reduction commitments. From April 2008, it placed an obligation on the six major gas and electricity suppliers (British Gas, EDF Energy, E.ON, npower, Scottish Power and SSE) to meet a carbon emissions reduction target.

The Government amended the CERT legislation in 2009 and 2010 to restructure and extend CERT to 31 December 2012. The amendment in 2010, led to an extension of the scheme (from 1 March 2011), which included revisions to a number of the obligations of the scheme:

- Introducing a new Super Priority Group (SPG) as a subset of the Priority Group (PG);
- Introducing an Insulation Obligation (IO), requiring a proportion of the target to be delivered via insulation measures;
- Excluding Compact Fluorescent Lamps (CFLs) from the scheme; and
- Increasing the CO_2 target to 293 Million lifetime tonnes of CO_2.

The SPG created in the CERT Extension was a subset of the PG and included those on certain qualifying benefits, for example households in receipt of child tax credits and under an income threshold. The qualification requirements for the SPG and PG are set out in further detail in the appendices.

[5]Ofgem e-serve, The final report of the community energy saving programme (CESP) 2009-2012

2.1.1 Market innovation

There were two key strands to deliver market innovation under CERT; market transformation and demonstration actions. *Market transformation* refers to an uplift of CO_2 savings that applied to innovative measures such as microgeneration and solid wall insulation (SWI). The 50% uplift in CO_2 savings was also applied to measures that passed a 'significantly greater than' test (in terms of carbon savings) or a 'significantly different to' test (in terms of function) in comparison to measures delivered under the Energy Efficiency Commitment (EEC) - both for EEC1 or, for measures delivered on or after 1 April 2011, EEC2. *Demonstration actions* were trials for measures against which a quantified carbon saving could not be attributed. To qualify, the measure must have been reasonably expected to achieve a reduction in carbon emissions. Energy companies were credited with a carbon reduction that was based on their financial investment in the trial.

Carbon savings from market transformation actions were capped at 10% of an energy company's obligation[6].

2.1.2 Priority group flexibility and uplifts

Energy companies were allowed flexibility in reaching their target for carbon savings in the PG, by providing higher carbon savings for measures that met certain criteria. Carbon savings from this mechanism were capped at 12.5% of an energy company's PG obligations (5% of its main obligations). The measures which this related to were SWI (95% increase in carbon savings for internal SWI and 175% external SWI) and, up until 1 April 2011, ground source heat pumps (245%).

This flexibility was aimed at 'hard-to-reach' properties that were not connected to a gas supply. Carbon savings for SWI were based on fuel type. This meant that installations at properties without a gas supply received higher carbon savings. Ground source heat pumps could only be installed at properties without a mains gas supply. Householders eligible for these measures had to be in the benefits subset of the PG (those who were in receipt of the PG benefits or tax credits with income below a certain threshold). It did not apply to social housing properties.

2.1.3 Transfer of obligations

Obligated parties were permitted, with the approval of Ofgem, to transfer up to 100% of their qualifying actions between licenses and/or other obligated parties. The carbon obligations remained, however, with the original obligated party. This transfer activity was only allowed on the basis that it would support the achievement of the individual parties' obligations. The price of this transfer activity was agreed between the obligated parties.

2.1.4 Anticipated costs

The original CERT impact assessment outlined an expectation that a total of £4.3bn would be incurred in the delivery of the scheme[7]. These costs broke down as follows:

- Cost to energy suppliers to promote carbon reduction measures, which could potentially be passed on to customers (£2.8bn)

[6] Where at least 2 per cent of a supplier's carbon obligation was achieved by microgeneration promoted as market transformation action, the cap was 12 per cent. However, none of the obligated parties reached this level.

[7] Explanatory Memorandum to the Electricity and Gas (Carbon Emissions Reduction) Order 2008

- Costs to Local Authority Social Landlords contributing to the cost of measures installed (£0.2bn)
- Costs to householders to pay for the balance of installing carbon reduction measures (£1.3bn)

The impact assessment of the CERT Extension increased these estimates by £4.5bn between 2011 and 2012.[8]

2.2 Community Energy Savings Programme (CESP)

CESP was designed as a pilot to trial new approaches to delivering energy efficiency measures to inform the development of future energy efficiency policy. Like CERT, it was funded by a new obligation on energy suppliers but, unlike CERT, it also included an obligation on electricity generators. CESP required that energy saving measures were delivered in geographical areas (Lower Super Output Areas in England and Wales, and Data Zones in Scotland) selected using the Income Domain of the Indices of Multiple Deprivation (IMD) in England, Scotland and Wales. In England the lowest 10% of areas ranked in the IMD qualified and in Scotland and Wales the lowest 15% qualified.

The overall target for the Community Energy Saving Programme (CESP) was set at 19.25 million lifetime tonnes of carbon dioxide (Mt CO_2). This comprised a target of 9.625 Mt CO_2 for suppliers and 9.625 Mt CO_2 for generators. Suppliers and generators were to meet their obligations between 1 October 2009 and 31 December 2012. Targets were set (by Ofgem) for each of the obligated parties based on the number of domestic customers the company had (suppliers) or the amount of electricity it generated (generators).

2.2.1 Bonuses and uplift

As with CERT, CESP awarded an uplift on the carbon savings achieved for certain measures and certain circumstances. Energy companies achieved savings against their obligations by setting up schemes to promote and deliver energy saving measures to domestic energy users. The final Ofgem report on CESP noted that almost all CESP measures were delivered through partnerships with social housing providers (SHPs) or by direct promotion to private households. CESP was structured to incentivise the energy companies to install particular measures, and to undertake as much activity as possible in each house treated and in each area targeted. This was achieved using the following incentives:

- Individual measure adjustments ('uplifts') were applied to SWI (+200%), G-rated boiler replacements (+50%), renewable heat generation technologies (+50%) and micro combined heat and power (CHP) (+50%)[9];

- Whole house bonuses were triggered when two or more measures were fitted in a single dwelling; and

- An area bonus was triggered when at least 25% of all dwellings in a low income area were treated by the same supplier or generator.

[8]Carbon Emission Reduction Target – appliances and consumer electronics. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42587/899-ia-cert-role-appliances-consumer-electroni.pdf. Note that the price year was different for the original IA estimates and those of for CERT extension IA. The numbers are also presented in non-discounted terms, so will not align exactly with the estimates included in the IA.

[9] Cavity wall insulation and loft insulation were both dis-incentivised through a negative adjustments of -50%.

2.2.2 Whole house bonus

The whole house bonus triggered by one measure was applied to all other measures installed in the same property. Bonuses were applied as follows:

- Heating controls, draught proofing, double glazing and loft insulation: +10% for each measure
- Replacement of G-rated boilers, fuel switching and district heating connections, biomass boilers: +40%
- SWI: +50%[10]

2.2.3 Transfer of qualifying actions

As for CERT, obligated parties were permitted, with the approval of Ofgem, to transfer up to 100% of their qualifying actions between licenses and/or other obligated parties. The carbon obligations remained, however, with the original obligated party.

2.2.4 Anticipated costs

The CESP impact assessment document indicated that the overall cost of the scheme was estimated to be in the region of £403m (of which £332m were anticipated to accrue to obligated parties, and £70m incurred by other parties)[11].

[10] Further details can be found at http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/cesp/Pages/cesp.aspx

[11] Explanatory memorandum to electricity & gas (community energy saving programme) order 2009 http://webarchive.nationalarchives.gov.uk/20100404202125/http://man270109a.decc.gov.uk/Media/viewfile.ashx?FilePath=Consultations/CESP/1_20090710121840_e_@@_CESPIA.pdf&filetype=4

3. Delivery of the obligations against the targets

This chapter summarises the degree to which the obligations under the programmes were met, what was delivered under the programmes as reported by the energy suppliers (including by type of measure) and how delivery varied by region.

3.1 CERT

CERT energy companies were required to achieve an overall target of 293 Mt CO_2 which was split into three sub-targets. As stated in Ofgem's final report on CERT, by the end of 31 December 2012, energy companies had achieved 296.9 Mt of CO_2 savings, equivalent to 101.3% of the overall CERT target of 293 Mt CO_2. This included:

- 122.62 Mt of CO_2 savings (41.3% of overall carbon savings) to PG customers
- 16.6 Mt of CO_2 savings (5.6%) to SPG customers; and,
- 75.1 Mt of CO_2 savings (25.3%) by installing measures eligible under the IO[12].

Two of the energy companies did not reach their targets, though there was only significant under-performance with respect to a single obligated party's sub-target obligation. Detailed targets for each of the obligated parties are not publically available. However, progress against individual energy company targets is detailed below (Table 3.1), as reported in Ofgem's final report[13].

Table 3.1: Progress against CERT targets by energy supplier

	Performance against total obligation	Priority Group obligations	Super Priority Group obligations	Insulation obligations
British Gas	98.9%	109.4%	105.0%	95.5%
EDF Energy	103.0%	108.3%	116.1%	109.6%
E.ON	101.8%	102.5%	105.6%	104.4%
Npower	106.0%	100.2%	107.4%	109.2%
SSE[14]	98.6%	99.7%	73.8%	99.9%
Scottish Power	102.4%	102.0%	119.2%	106.2%

3.1.1 Measures delivered

In delivering the CERT obligations, the energy companies undertook a number of measures ranging from; insulation (loft insulation – both professionally installed and DIY – cavity wall insulation (CWI), SWI etc.), lighting (largely Compact Fluorescent Lights), heating (e.g. fuel switching), microgeneration & Combined Heat and Power (CHP), behavioural measures (Real-Time Displays and Home Energy Advice Packages), demonstration actions and appliances (such as TVs and cold appliances).

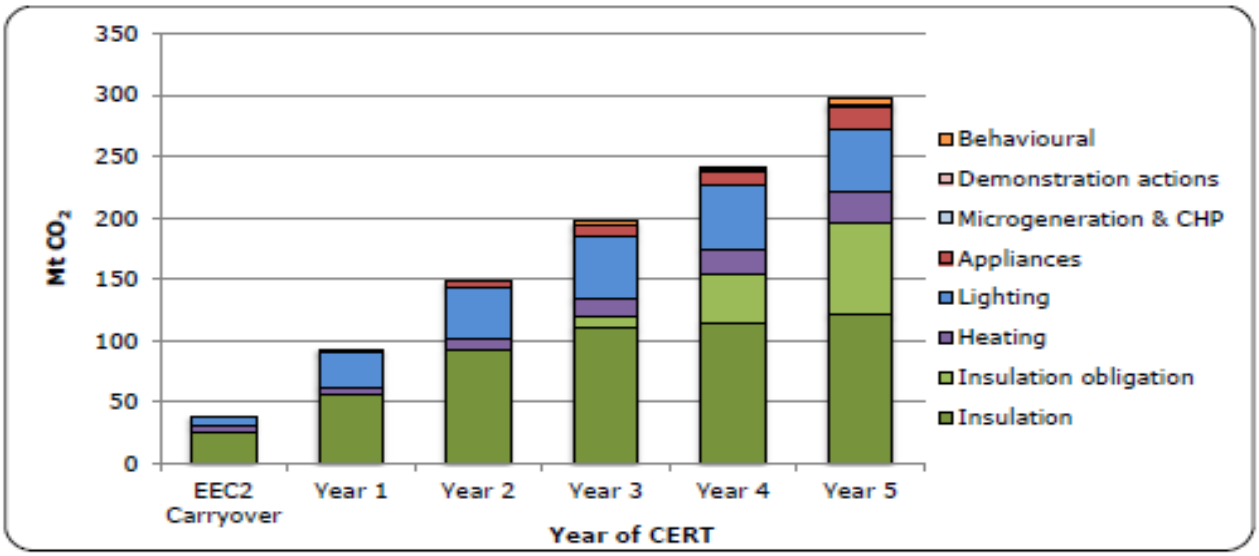
[12] NPG Co2 savings are not presented separately in Ofgem's final report on CERT.

[13] Carbon Emissions Reduction Target Final Report, Ofgem, 2013

[14] As noted in Ofgem's final report, information was submitted after the deadline by SSE meaning that it could not be taken into account in assessing its compliance. This information may have influenced SSE's final position in relation to its compliance.

Figure 3.1 displays the cumulative carbon savings achieved for each year of the programme, broken down by measure type. Insulation measures (including the IO) contributed the greatest proportion (66%) of carbon savings over the years of the programme.

Figure 3.1: Cumulative CERT carbon savings by type of measure



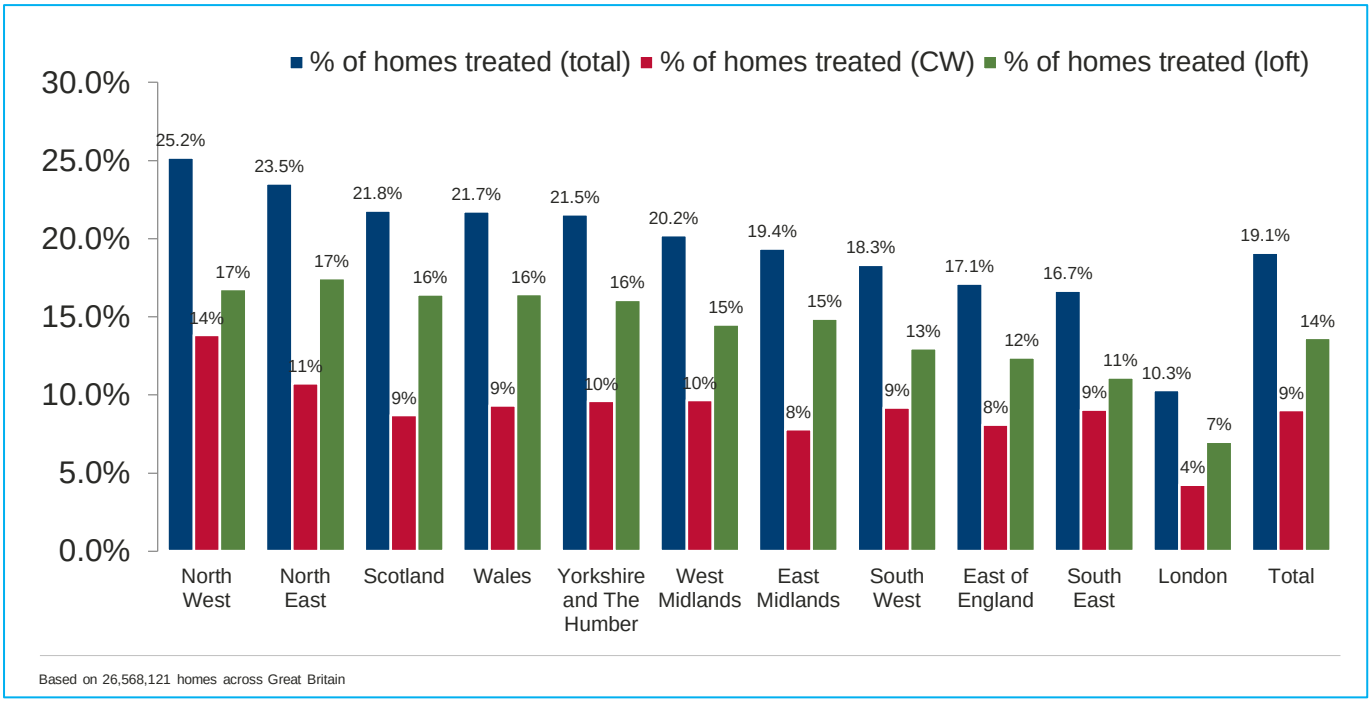
Source; Ofgem e-serve, The Final report of Carbon Emissions Reduction Target (CERT), 2008-2012

Delivery of CERT measures varied by region, as illustrated by Figure 3.2 below which presents the proportion of all domestic properties in each region that received a CERT measure during the course of the programme. This ranged from just over 10% in London to over 25% in the North West. It should be noted that these figures are not precise[15] but provide a good indication of the regional distribution of CERT measures.

A summary of some of the factors expected to play a role regional delivery (under both CERT and CESP) are further discussed in Chapter 5.

[15] Data is taken from EST's HEED. CERT data includes installations to the end of the scheme (31/12/2012). Some data (for example mitigation) is missing - the cumulative Data Gap for CERT (Standard Measures) is currently estimated to be 6.9%. Further information can be found on the EST website.

Figure 3.2: Distribution of CERT professionally installed measures (cavity wall and loft insulation) by region.



Source; Energy Saving Trust report based on HEED data.

3.2 CESP

The overall target for the Community Energy Saving Programme (CESP) was set at 19.25 million lifetime tonnes of carbon dioxide saved (Mt CO_2). This comprised a target of 9.625 Mt CO_2 for suppliers and 9.625 Mt CO_2 for generators. By the end of programme, 31st December 2012, energy companies had achieved 16.31 Mt CO_2, meeting 84.7% of the overall target. Again, detailed targets for each of the obligated parties are not publically available. However, progress against individual energy company targets is detailed in Table 3.1 below, as reported in Ofgem's final report[16].

Table 3:1 Progress against CESP targets by obligated party

Type	Company	% met obligation	Compliance
Energy Companies	British Gas	62.4%	Non-Compliant
	EDF Energy	133.0%	Compliant
	E.ON	116.5%	Compliant
	RWE npower	106.8%	Compliant
	SSE	90.9%	Non-Compliant
	Scottish Power	70.0%	Non-Compliant
Generators	Drax Power	37.1%	Non-Compliant
	Eggborough Power	100.5%	Compliant
	GDF Suez/IPM	38.6%	Non-Compliant
	Intergen	6.5%	Non-Compliant

Source; The final report on CESP, Ofgem, May 2013

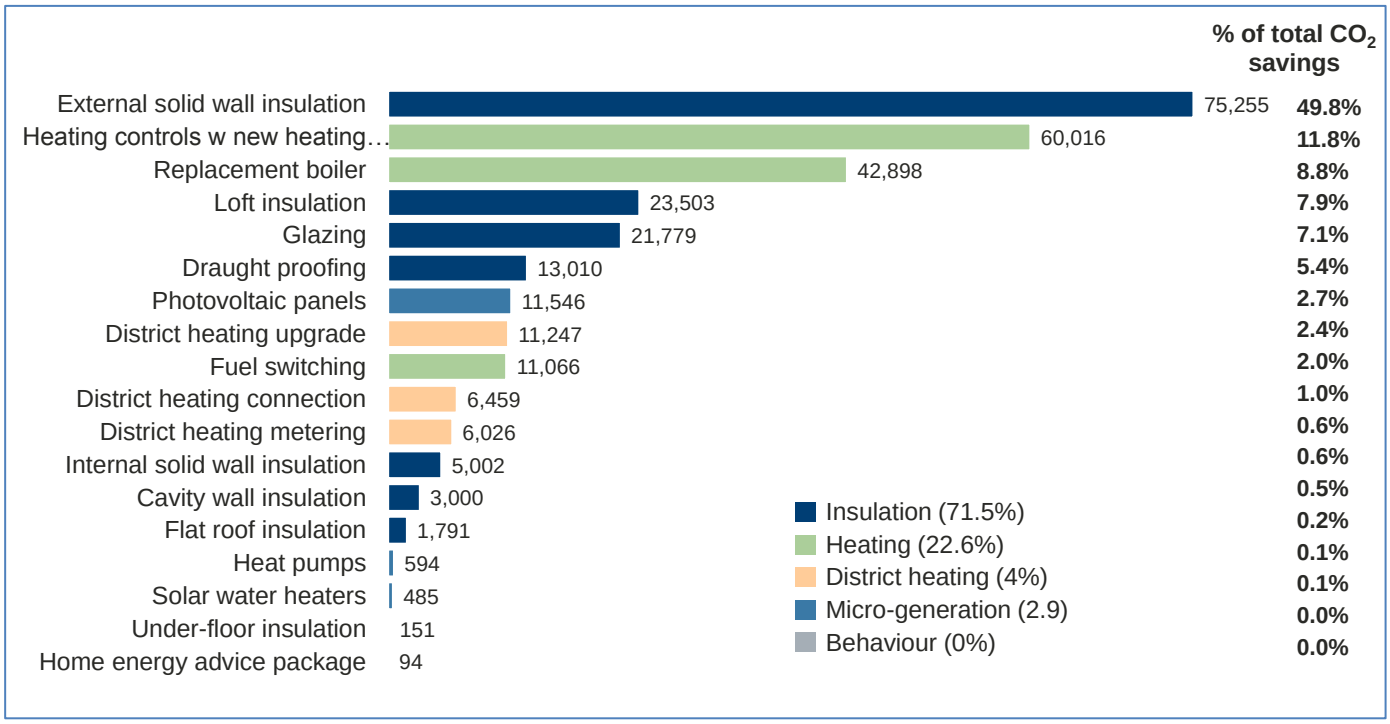
[16] Community Energy Savings Programme Final Report, Ofgem, 2013

3.2.1 Measures delivered

A total of 293,922 measures were installed through CESP, 49% of which were insulation measures and 39% were heating measures (Figure 3.3). The most prevalent measures were external SWI (26%), heating controls (20%) and replacement boilers (15%). External wall insulation contributed by far the largest proportion of total unadjusted CO_2 saved (49%). The next largest contribution was from fuel switching (12%), followed by replacement boilers (9%).

There were no substantial changes in the composition of measures delivered over time.

Figure 3.3: Breakdown of number of CESP measures installed and (unadjusted) CO_2 savings contributed by each measure



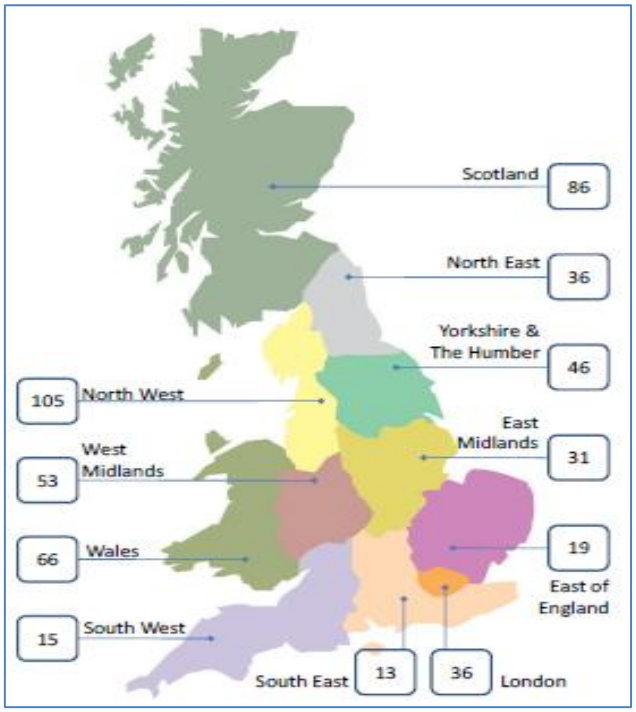
Source; The final report on CESP, Ofgem, May 2013

3.2.2 Regional breakdown

CESP was delivered through 491 individual schemes[17], many of which were delivered through social housing providers working in partnership with private households. Figure 3.4 illustrates the number of CESP schemes distributed across the UK. The largest number of schemes were delivered in North West of England (105), Scotland (86), and Wales (66).

[17] As reported in Ofgem's final report on CESP, May 2013. It should be noted this excludes schemes delivered as part of mitigation activity.

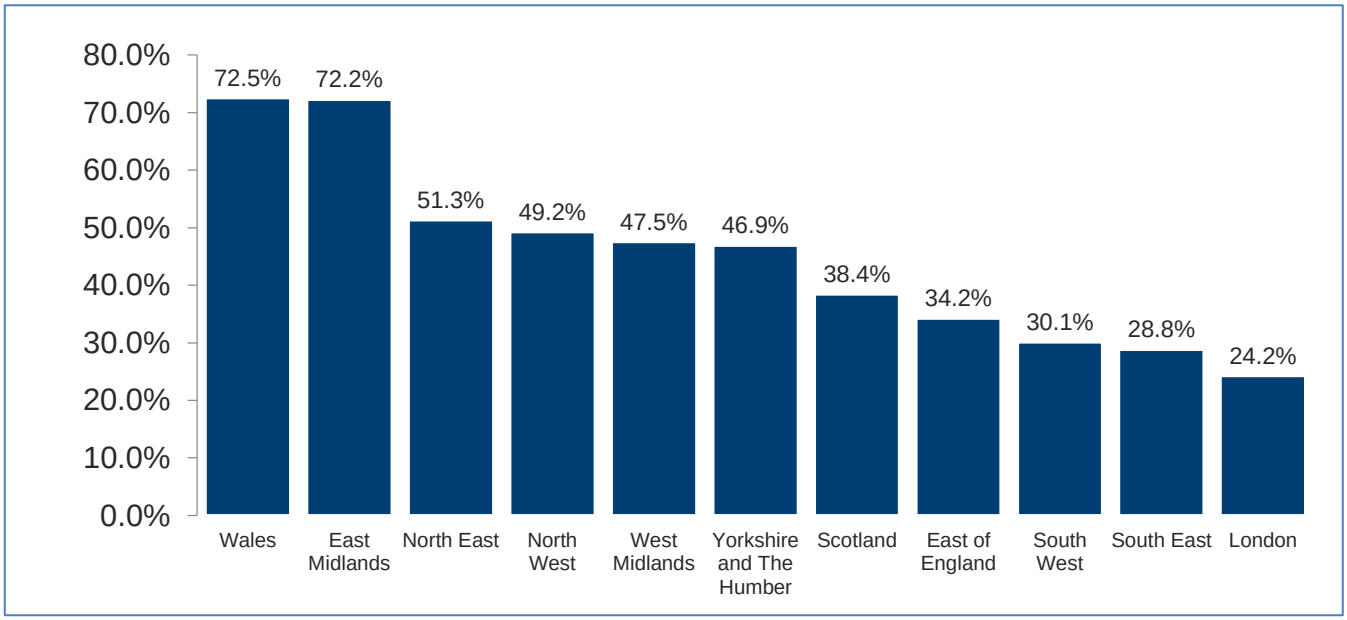
Figure 3.4: Breakdown of number of CESP schemes delivered in each region



Source; Community Energy saving programme update, May 2013

Given that CESP was designed to deliver measures in the most deprived areas of the country, there is naturally a weighting towards regions with a higher proportion of deprived communities. Figure 3.5 illustrates the degree to which eligible areas benefitted from CESP measures. This ranged from under 25% of eligible areas in London to over 70% in both the East Midlands and Wales.

Figure 3.5: Proportion of low income areas in each region with measures installed



Source; Ofgem final report on CESP, 2013.

4. Approaches to delivering the obligations

This chapter outlines how the obligated parties set out to deliver the programmes, including the CERT Extension.

4.1 Initial objectives

For the energy suppliers, the main objectives to delivering their carbon reduction obligations under CERT and CESP were broadly similar, with varying degrees of emphasis on each objective by each supplier. Generally speaking, they all reported that their first priority was to meet the obligation. Their second was to do so cost-effectively, in order to minimise the level of cost passed through to customer bills.

Some of the energy suppliers also identified 'adding value' to customers as an objective. This was partly about keeping pass-on costs as low as possible, but also about "giving something back" to their customers by providing them with energy saving measures and advice. One supplier also said that reputation was important, wanting to ensure they put their name to measures that were "genuinely energy saving". Finally, one supplier identified the development of their own energy services business as an objective under CERT (primarily through the CERT Extension), whilst the interim evaluation found that this was an objective for a number of suppliers under CESP.

For the four independent generators obligated under CESP, the situation was markedly different to that of the six energy suppliers. They stated that they felt that their inclusion in CESP had been inappropriate. They had no previous experience of energy company obligations, no experience of delivering domestic energy efficiency schemes, no existing relationships with household customers and limited in-house resources.

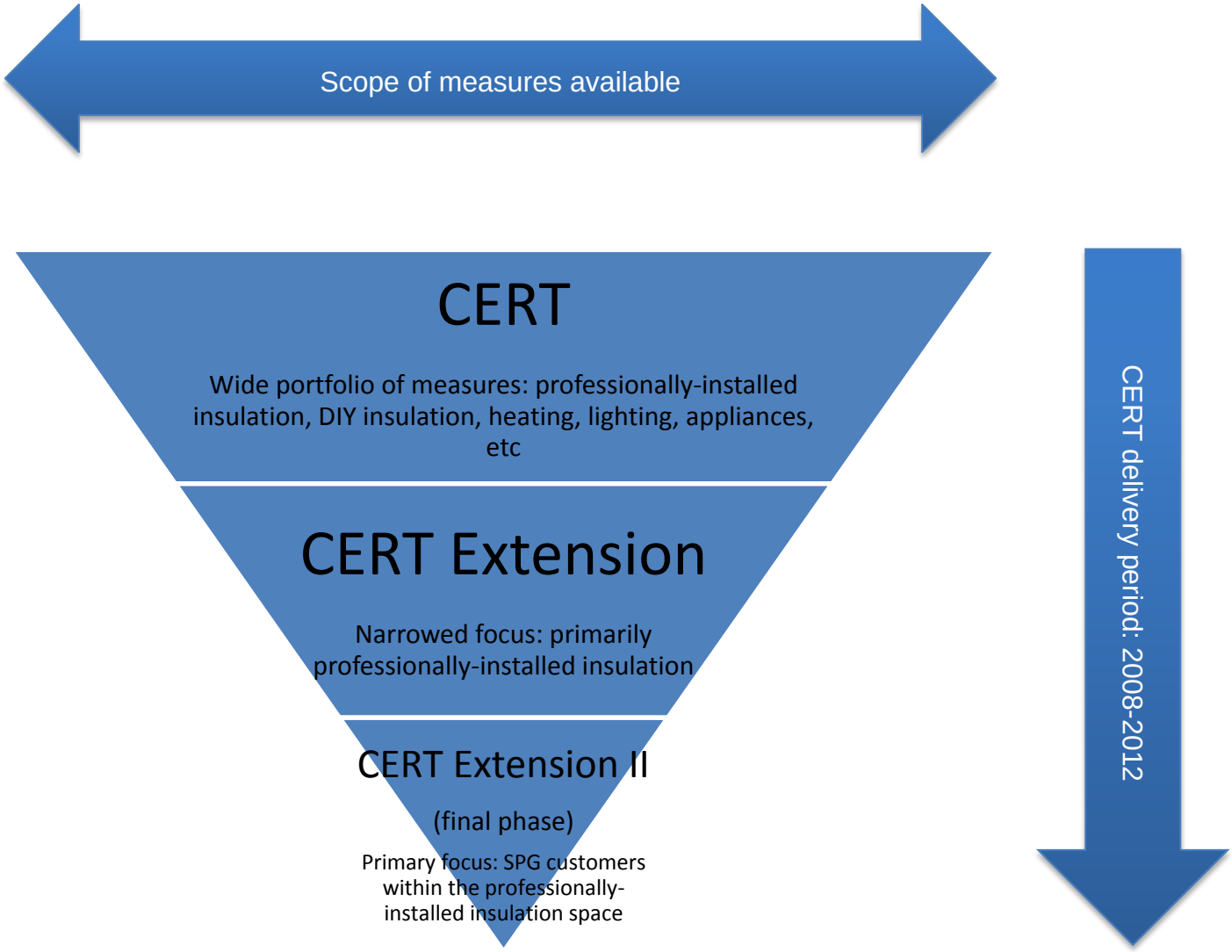
> *The CESP scheme was difficult and was outside of our range of capabilities. We had never had to deliver carbon savings in homes and so had no capacity or knowledge, so it was very much a surprise [to be obligated under CESP]. It was very difficult to start with and we had some unique challenges. There was a lot to learn.*
>
> *Independent Generator 4*

Like the suppliers, their initial objective was complying with the obligation. However, their objectives also focused around learning about the nature of obligations and how to approach the delivery of domestic energy efficiency projects more generally.

4.2 Approaches to delivering CERT

The approach taken by the suppliers to delivering their obligations evolved over time. Whilst each had their own strategy, this evolution can be broadly split into three phases. These are outlined in Figure 4.1 and described in more detail below. A more detailed description of the mix of measures delivered by the suppliers throughout CERT can be found in Ofgem's final report on CERT (2013).

Figure 4.1. CERT delivery pyramid



4.2.1 Delivery phase one: CERT 2008-10

The first phase, covering the initial CERT period (i.e. pre-CERT Extension) was characterised by delivery through a wide range of measures and different 'measure-mixes'. The energy suppliers had a wide variety of measures through which their obligation could be delivered: insulation (professionally-installed and DIY), heating, lighting, appliances, microgeneration & CHP, behavioural and demonstration actions. The wide and flexible choice meant that the suppliers chose differing measure-mixes and delivery routes to meet their obligations. Some suppliers described taking a 'broad portfolio' or 'balanced' approach. For example, one described a 'thirds' approach, with delivery broadly being one third professionally-installed insulation, one third DIY loft insulation and one third other measures (particularly lighting and appliances). Others said they focused more heavily on certain measure types. For example, one said that they contracted out their obligation to a third-party insulation and heating company, whilst another said that they focused a lot of their early activity on non-insulation measures.

4.2.2 Delivery phase two: CERT Extension

The second phase covers the first half of the CERT Extension period. The Extension introduced a number of changes which meant that each supplier had to adjust their approach to delivery. Three changes in particular were important, including two new sub-obligations:

1. **Significant restrictions on lighting measures**.
2. **The Insulation Obligation (IO)** - requiring the suppliers to deliver a large proportion of their obligation through professionally-installed insulation.
3. **The SPG Obligation** - requiring that a proportion of the obligation should be delivered to those on certain qualifying benefits, such as those in receipt of child tax credits and under an income threshold (further details are provided in the appendices).

In addition, CFLs were withdrawn under the CERT Extension (although other lighting measures were eligible), further restricting the delivery options available to suppliers under the CERT extension. The result was that professionally-installed insulation measures became a major focus for suppliers in delivering their obligations. Most of the suppliers also reported that they combined their strategies for meeting the IO and SPG by aiming to deliver their SPG obligation through IO measures in order to be as cost-effective as possible.

The Extension resulted in a period of adjustment for all of the energy suppliers. In some cases, these adjustments involved “fundamental” changes to their delivery approaches. Contracts with existing delivery partners had to be renegotiated or even terminated, a process which one supplier described as “expensive and painful”.

4.2.3 Delivery phase three: CERT Extension (final months)

The final phase covers the last few months of the CERT Extension period. Meeting the SPG obligation proved to be particularly challenging for the energy suppliers, even with targeted mailings and incentives (described in Chapter 5), whilst other sub-obligations had been more straightforward to deliver. So this final period was characterised predominantly by activity to meet the SPG obligation, mostly through professionally-installed insulation.

4.3 Approaches to delivering CESP

Under CESP, many of the obligated parties said that the CESP Impact Assessment (DECC, 2009) was influential in determining their initial approaches. This seems to be because for the obligated parties it was a ‘new’ type of scheme. For the energy suppliers[18], CESP was quite different to CERT in terms of the measures, the scoring system and the type of project which the scheme involved. CERT, on the other hand, had evolved from the previous EEC2, the previous energy efficiency obligation, which had given them experience of delivering something similar. For the independent generators, CESP was of course completely new.

For both sets of parties, the Impact Assessment therefore served as their starting point for informing their delivery strategy. The Impact Assessment for CESP, for example, envisaged around 100 schemes would be delivered, based on the assumption that the obligated parties would be able to secure the maximum bonuses and uplifts available under CESP for each scheme. A number of the obligated parties reported basing their pricing strategies on the expected CO_2 price set out in the Impact Assessment. In practice, however, the number of schemes delivered, and the average prices, were a lot higher than first expected.

4.3.1 Energy suppliers

The energy suppliers started with different strategies for delivering their CESP schemes. Some had envisaged taking a more ‘hands on’ approach to project management and delivery,

[18]Under CESP, the energy suppliers are sometimes also referred to as ‘vertically integrated energy companies’ as they had obligated subsidiaries with both supply (gas and electricity) and generation licenses.

particularly those with their own energy services arm[19]. Others took more of a funding-only approach: funding local authorities, housing associations and third-party delivery agencies to project manage and deliver CESP schemes. Regardless of their starting strategy, however, developing and delivering CESP schemes proved challenging. All of the suppliers therefore found that they had to be pragmatic in delivering their obligation to ensure it was met.

4.3.2 Independent generators

The approach of independent generators' was to either outsource their obligation by either contracting it out to a third-party delivery agency or trading a proportion of the obligation to another obligated party.

[19]Some of the obligated energy suppliers also sell energy services, such as boiler installation and repairs, and insulation measures.

5. Delivery of CERT and CESP schemes

This chapter presents the evaluation evidence in relation to CERT and CESP scheme delivery, focusing in particular on:

- Area-based delivery;
- Hard to treat homes;
- Customer engagement;
- Targeting vulnerable customers;
- Targeting private tenure housing;
- Partnership working; and
- Other delivery issues.

The focus of the chapter is on domestic retrofit projects, rather than retail schemes (lighting, appliances retail etc.) or other types of scheme also found in CERT.

5.1 Area-based delivery

5.1.1 Benefits of area-based approaches (CERT and CESP)

Previous studies (e.g. Cambium Advocacy, 2010; CAG Consultants, 2010a and 2010b; Sustainable Development Commission, 2010) have found that area-based schemes brought significant benefits in terms of take-up and cost-effective delivery of professionally installed insulation. They reported take-up was good where intensive marketing and engagement activities were delivered in a local area, with local authorities playing a central role in increasing trust and awareness. They also reported that the cost-effectiveness of schemes was helped by the geographical concentration, which delivered operational efficiencies in both surveying and installation, with good levels of take-up reducing the cost per lead.

Similar benefits were perceived by a significant number of local authorities, installers and energy suppliers interviewed during this evaluation. They also felt that an area-based approach offered benefits in terms of effective marketing (including word of mouth and involvement of community networks) and efficiency of delivery (including minimising waiting periods for customers, particularly in rural areas[20]).

> *The things that helped in terms of take-up were neighbour recommendation, using local volunteers, using community networks (but this takes a long time to build up) and using local authority branding.*
>
> Local Authority Stakeholder 2

[20] While not explicitly stated by the respondent, the interpretation is that batching jobs (through an area-based approach) reduced the time from initial enquiry to final delivery for customers, particularly in rural areas where installers might otherwise need to wait until they had amassed a few jobs to deliver in that particular area.

> *[The key lesson is] really focus the marketing on one area at a time, which maximises efficiency of delivery (very important in a rural area) and also ensure the customer doesn't have to wait too long for a survey/install.*

Energy Supplier 3

Most area-based schemes involved a significant element of community engagement, to inform local householders about the offer or impending works, and to get their support for the programme. This often involved partnering with organisations that already had a presence in the community.

> *By using a community-based approach, programmes and schemes become valued in communities and local agencies buy in. Through this network of relationships, programmes can be successful through building a community momentum.*

Supply Chain Stakeholder 9

5.1.2 CERT

CERT involved a significant amount of area-based delivery of energy efficiency measures, primarily loft and cavity wall insulation. Organisations such as 'Warm Zones', set up by the National Energy Agency, promoted a multi-agency, area-based approach to CERT delivery, often driven by fuel poverty objectives. Case Study E used an area-based model similar to a Warm Zone, without subscribing to the Warm Zone brand. Area-based CERT schemes generally involved intensive marketing of energy efficiency offers, endorsed by the local authority, to particular areas or streets that had been identified as being at risk of fuel poverty.

Several stakeholders commented that the success of area-based approaches under CERT depended a great deal on the local authority. While most stakeholders felt that local authority buy-in was essential, a small number of stakeholders highlighted that local authority motives would sometimes conflict with those of the programmes. A community delivery stakeholder, for example, commented that the areas that local authorities wanted to target were sometimes chosen on the grounds of politics rather than carbon savings, while a local authority stakeholder commented that local authorities tended to be more concerned about fuel poverty than carbon savings.

An energy supplier commented that the introduction of the SPG obligation made area-based schemes less effective under CERT, because SPG households had often been targeted for measures individually in advance of the schemes being delivered.

5.1.3 CESP

The design of the CESP programme further incentivised area-based approaches to delivery, both because the schemes had to be delivered in specific low income areas (as defined by LSOAs in England and Wales and by Data Zones in Scotland). An area bonus was activated when a scheme had treated at least 25% of all dwellings in a low income area. There was a consensus amongst stakeholders that CESP had succeeded in promoting area-based approaches to delivery. As the interim CESP evaluation reported (CAG Consultants, Ipsos MORI and BRE, 2011), however, schemes did not often achieve the density and take-up rates envisaged in the CESP Impact Assessment (DECC, 2009).

5.1.3.1 Area boundaries

The Hills report (2012) reported that the area-based approach had been effective under CESP, but suggested that the Index of Multiple Deprivation was not very effective in identifying areas of concentrated fuel poverty. The report commented that any area-based approach involved a trade-off between the cost-effectiveness of tackling a whole street, and the inclusion of many households who may not be fuel poor (but who could make a financial contribution to the costs of the measures in some cases).

Many stakeholders commented that the CESP boundaries did not fit natural community boundaries. Examples were cited of LSOA or Data Zone boundaries going through the middle of properties or blocks. This could cause resentment by householders if some people in the area received improvements to their property while their neighbours did not. Some schemes chose to fund improvements to households beyond the LSOA boundaries, to reduce this problem.

> *My biggest complaint about CESP was the postcode lottery. You could have two streets in the same estate with exactly the same house type, but one was in and the other was out.*
>
> Local Authority Stakeholder F3

> *CESP was a postcode lottery. We had around 300 houses in the neighbourhood we wanted to work on, but only 256 of those fell into the CESP qualifying LSOA. We had two semidetached houses where the postcode stopped in the middle of them meaning one was eligible and one was not! So we put some cash in to finish off the whole of the area.*
>
> Housing Sector Stakeholder E5

The boundary issue was also highlighted by the interim evaluation of CESP, and has been addressed in the design of ECO through the introduction of more flexible boundaries.

5.1.3.2 Area bonus

The achievement of the area bonus could significantly increase carbon scores for CESP schemes. However, stakeholders report that the area bonus could be difficult to achieve, particularly if housing types were varied in the area or if there was a significant proportion of private households. Also, one stakeholder commented that if several CESP schemes were targeting the same area, then achievement of the area bonus became more problematic.

> *[We] had so many companies going in [to an area] that they were losing out on the [area bonus]. If left to the local authority [there would have been] much better outcomes. We were losing that effect.*
>
> Local Authority Stakeholder G5

An evaluation of two early CESP programmes (Demos, 2011) identified a further limitation of the area-based approach under CESP. The evaluation reported limited success of the 'street-by-street' approach in these two schemes, primarily because of difficulty in bringing in private households. It reported that the visual impact of some houses not receiving external wall insulation (EWI) was widely considered a disappointment by residents, as it made non-treated homes look more run-down in contrast to the treated properties. The impact on the visual

appearance of communities is discussed further in Chapter 7, while the issue of targeting private households is discussed further below.

5.1.3.3 Other aspects of area-based delivery under CESP

Many stakeholders commented that the high visibility of CESP measures (particularly EWI) helped strengthen the success of area-based marketing for CESP schemes. A common strategy was to target a CESP project at a core of local authority or social housing stock, and then extend the offer to private occupiers within the CESP area. A number of stakeholders involved in the delivery of CESP schemes reported that delivery of CESP measures to social housing often stimulated interest amongst private households in the area, as a result of the aesthetic improvements as well as word-of-mouth about the physical benefits of the measures. One energy supplier used a strategy of building on schemes offered to social housing residents by offering measures to private households in the local area for £1. They reported that the area density bonus and the economies of scale made this an economic means of delivering their obligation.

> *For CESP projects, we found that if we had a core of local authority stock we could give a very good offer to private occupiers.*
>
> Community Delivery Stakeholder 4

One supply chain stakeholder found that private householders on the fringe of previous big social schemes were a good target audience, because they already understood and accepted the product (e.g. EWI) but had not previously been able to benefit from it.

5.2 Hard to treat homes

5.2.1 Targeting hard to treat homes

The interim evaluation found that CERT had successfully driven cost-effective delivery of relatively low-cost energy efficiency measures (especially loft and cavity wall insulation). A moderate amount of SWI was delivered to hard-to-treat homes under CERT (58,916 measures (Ofgem, 2013a)). A PG Flexibility Option was introduced to incentivise SWI. Eligible customers were those who lived in private homes where at least one householder was in receipt of certain benefits. It increased the carbon savings that could be claimed against the measure, for these customers, providing an incentive for suppliers to offer greater amounts of funding. This option is likely to have increased take-up of SWI, but nonetheless, many stakeholders agreed that it did not provide adequate incentives for more costly measures, which were, on the whole, less cost-effective to fund in terms of their carbon scores, compared to measures like loft and cavity wall insulation.

CESP was designed to incentivise SWI for hard to treat homes, to complement CERT and to build the supply chain for SWI. It was successful in generating greater volumes of SWI (75,255 EWI measures and 5,002 IWI measures (Ofgem, 2013b) in proportion to the overall size of the scheme. Every CESP scheme covered by this evaluation research, including all the case studies, involved SWI, with EWI featuring to a far greater extent than IWI.

There was some suggestion that internal wall insulation (IWI) was less acceptable to householders than EWI, although the latter generated more problems from a planning perspective.

> *There was strong resistance among many people to internal wall insulation. One scheme was forced to change from proposed internal insulation of house fronts to external insulation because of resistance from residents. In the end this delivered a take-up rate of 98%.*
>
> Local Authority Stakeholder C4

The Association of the Conservation of Energy (2011) reported that many houses with solid walls would require a combination of insulation measures (e.g. EWI and IWI) to account for planning, cost, access, aesthetics and so on. They also reported that many individual dwellings are made up of a combination of wall types, requiring different treatments. This is consistent with the wide variations in SWI cost data reported by stakeholders, as presented in Chapter 7.

The Association of the Conservation of Energy (2011) also reported that energy suppliers found that CERT and CESP scoring systems lacked the flexibility to develop carbon scores for different treatments to different parts of a property. However, this finding was challenged by Ofgem who reported that elements of flexibility were available, including:

- Properties that were larger than the standard base case were given an increased carbon score;
- Ofgem worked with one supplier around the treatment of hybrid (SWI and CWI) properties under CERT to develop a carbon score for this scenario;
- Manufacturers could apply for bespoke carbon scores for their products if they could demonstrate that they generated additional savings; and
- CESP promoted a “whole house” approach and suppliers were rewarded for using multiple measures when treating a property.

5.2.2 Build types

Several case study stakeholders commented that, in their experience, delivery of CESP was complicated by the variety of build types within one CESP area. Non-traditional build-types also tended to increase costs.

A community delivery stakeholder described finding a variety of house extensions and additions which presented a construction challenge as well as discrepancies in the level of carbon that could be banked.

5.2.3 Whole house approaches

As well as targeting ‘hard to treat’ homes, particularly those requiring solid wall solutions, CESP was also designed to encourage whole house treatments. Many stakeholders found that there were drawbacks to the scheme design which discouraged effective whole house treatments, with solutions often involving only one or two of the measures that homes required. This is discussed in further detail in the scheme design chapter.

However, the evaluation evidence revealed a number of instances where other sources of income had been used to deliver a more complete package of works to homes. In some cases, for instance, housing association funds were used to install energy saving measures that were not viable under CESP. In three of the case study areas (C, F and G), solar PV was integrated

into CESP schemes, using the Feed-in Tariff to help the funding arrangement for the work and provide microgeneration for the benefitting households.

5.3 Customer engagement

This section looks at general lessons and experiences from the evaluation on engaging customers. The sections that follow explore the specific issues in targeting vulnerable customers and private tenure households.

5.3.1 Energy company engagement routes

The energy suppliers reported that they utilised a range of routes for professionally-installed insulation measures under CERT. These included:

- Direct national offers by the energy suppliers, either to all households or their own customer base;
- Direct offers by installers and managing agents, often publicised through local advice centres, but also through direct advertising, employee schemes and door knocking;
- Offers in conjunction with local authorities, involving local schemes supported and 'badged' by the local authority;
- Offers in conjunction with housing associations, involving schemes supported and badged by the housing association; and
- Offers in conjunction with national government funding schemes, such as Warm Front in England, the Energy Assistance Package in Scotland or the Home Energy Efficiency Scheme in Wales; and
- Engagement by lead generation agencies, often involving direct tele-sales or door-to-door knocking to identify eligible customers for the CERT measures. Customer 'leads' were then sold on to the energy companies or installers.

All but the last of these routes were considered in more detail in the interim CERT evaluation.

Under CESP, engagement was carried out locally in the scheme area. The organisations undertaking the engagement varied from scheme to scheme, but included the energy companies, local authorities, housing associations, managing agents, community organisations and tenants groups.

5.3.2 Engagement methods

5.3.2.1 Overall approaches

The evidence from the stakeholder interviews is that there is no single 'right way' to carry out customer engagement. A number of stakeholders reported that a combination of different engagement methods is normally required. In Case Study C, for instance, stakeholders agreed that marketing worked best if a variety of methods was used, from leaflets to community meetings, as different people like to engage in different ways.

Evidence for the case studies also suggests that engagement also needs to be tailored to the specific needs of the area and the customers being targeted. In Case Study E, for example, the local authority and managing agent found that in urban areas, 50 might turn up to a meeting, but 16,000 could be reached via a mailshot. In contrast, they found meetings were more useful in rural areas where attendance was higher.

One managing agent described a six-step engagement process for CESP projects, from initial community engagement, through door to door visits, to a more in-depth survey, followed by contracting of works, carrying out works and checking quality.

Box 5.1 summarises the approach to customer engagement for CESP schemes carried out in one of the case study area D. It highlights the importance of multiple engagement routes, the presence of a trusted intermediary (in this case the local authority) and of developing tailored engagement routes.

Box 5.1. Case study: customer engagement in Case Study D

Initial marketing was carried out through local events and activities, through local officers, press materials, websites and occasional posters. This initial marketing used branding of the delivery partner and the local authority as a trusted intermediary. The focus was very much on promoting the benefits of the scheme and the choices available to householders, for example the final colour of the rendering on the property.

The principal stages of the direct recruitment process included;

- An initial personalised letter to all eligible residents, after the initial survey
- Ineligible residents were also notified, informed clearly why they were not eligible and were able to appeal, a process which may include a re-survey by the contractor
- Locally based open days with product displays and advisors on hand to answer queries. In one area these open days were particularly useful and managed as sign up days.
- Residents who did not attend could contact the council on a dedicated number.
- Door to door follow up.

Across the schemes these initial engagement activities were complemented by ongoing information and support in local newsletters, the local press and through Resident Liaison Officers. Other activities included fun events, including a visit from Father Christmas to the village scheme and a range of activities aimed at changing residents' behaviour.

Both schemes intended to recruit private householders and private landlords which have been recognised as hard to engage groups. However by adopting this personalised approach and taking great care with data protection very high levels of take-up were achieved.

The next sections explore some of the specific methods employed by stakeholders interviewed for this evaluation. In many instances, there was significant overlap between these methods.

5.3.2.2 Area-based marketing

All engagement under CESP was undertaken at an area-level by default. However, many stakeholders also felt that local schemes worked well for increasing take up under CERT. Working at an area-level enabled the involvement of local organisations with good relationships with householders, such as local authorities, housing associations and community groups.

> *For higher value projects and measures, we need to work on an area basis, working with organisations that have a local presence such as housing associations and the council.*
>
> Supply chain stakeholder G1

Area-based marketing resulted in two key peer-to-peer marketing routes: word of mouth and a tangible demonstration of the benefits. A number of stakeholders reflected that word-of-mouth marketing is often a natural consequence of any intensive area-based action and can help to increase take up rates.

> *The reality is there are often very strong communities in deprived areas. It gives you an immediate 'in'. Things just roll through word of mouth. The residents themselves, the community groups, the mosques - they are the real sales people for the scheme. We got over 90% take-up and these groups were critical in that.*
>
> Local authority stakeholder A3

This was also found to be the case in the customer qualitative research, in both CERT and CESP case study areas. A number of respondents referred to word-of-mouth as the way in which they either heard, or told others, about the schemes. These cases included approaching installers working in their local area, talking with neighbours and (with CERT) hearing from family or friends about offers on measures.

In regards to demonstration of benefits, in all four CESP case study areas where the qualitative customer interviews took place (case study areas A, D, C and G), there were attempts to demonstrate the tangible benefits of the measures to local residents. The approaches, take-up and interest varied between case study areas, but the experiences combined across all four areas illustrate the effect of this local marketing. For projects involving external wall insulation and other external measures, the aesthetic impact of the measures was also an important factor which could be emphasised. A number of different examples were cited, including:

- ‘Sign-up’ days at the local leisure centre, with displays showing the types of pebbledash finish available;
- One-day displays staged at the local community centre by the CESP scheme delivery partners;
- Signs left on front gardens advertising the measures installed; and
- Informal ‘demonstrations’ from neighbours of measures installed and the benefits experienced.

Two of the case study areas found that basing a scheme in an area enabled them to conduct local marketing campaigns. In Case Study C, for example, the installer undertook a campaign based on an invented energy efficiency ‘character’, using a slogan to support the message. The character became recognised and the installer reported this worked well in encouraging participation: where this was used, they reported that the refusal rate was 1% compared to an average of 5-10%. One managing agent reported that take up increased as a result of such factors once installations started. For CESP projects, they said they generally received 70% uptake, but those rose to 85% once the installations began.

5.3.2.3 Partnerships with local agencies

Linked to the point above, a number of stakeholders highlighted the importance of involving local organisations to enhance customer engagement and take up. In Case Study A, for example, high take up was achieved for the CESP scheme. The independent generator reported that the project benefitted from partnering with a local organisation that already had a presence in the community and had a brand that was known. Their reputation was further enhanced by being not for profit and having close links with council.

In social housing, housing associations often employed their own tenant engagement services, using established engagement routes. In some cases tenant groups were created to help this process where they weren't already in place.

In case study B, the involvement of the communities themselves was regarded as important in achieving take up, a tailored route that they felt was more effective than using local authority branding in this instance.

> *Two of the villages helped to push the community-led scheme themselves towards the end, to improve take-up. One used word of mouth marketing (in the pub, in the shop and so on), wrote articles in the parish newsletter and distributed leaflets in the shop.*
>
> Community delivery organisation B5

Local branding was considered important in order for customers to trust, and pay attention to, the offer being presented to them. Many stakeholders emphasised the importance of a scheme being badged by the local authority or other local organisations in order to enhance take up.

In case study B, for example, it was reported that the installer operating in the area had initially sent their own mail outs to residents to describe their CERT offer. Latterly, however, the installers funded and distributed a leaflet with the council logo on it, as this was found to generate a better take-up. There was a similar experience in Case Study E. Marketing letters for a CERT scheme were initially branded with the energy supplier logo, but only three replies were received from thousands of direct mails. The materials were then re-branded, featuring the local authority logos, and the response rate was much higher. They ensured that the logo was on the envelope so it was not thrown away, as well as on the letter.

These on-the-ground findings were supported my market research commissioned by the local authority in Case Study B in preparation for the Green Deal. The survey indicated that 65% of respondents would trust the council to assist them with decisions about energy efficiency improvements, while only 22% would trust energy companies and 21% would trust the Government. Family and friends were also highly trusted, by 57% and 44% of respondents respectively.

5.3.2.4 Door-knocking

Stakeholders highlighted the importance of a door-to-door delivery approach in both CERT and CESP. However, the effectiveness of this method appeared to depend on the degree to which it was employed with other methods. Where this was carried out with the endorsement and support of the local authority, for example, this added to the effectiveness of the engagement.

In a small area within Case Study F, door knocking was used for the initial survey to assess eligibility for loft and cavity measures. The high response rate (77-78%), was attributed partly to the wide availability of survey return points (e.g. doctor's surgery, village school) but also to the fact that the people doing the door knocking were well-known in the community, for example the local GP. In case study B, however, the installer did not do door-knocking in these schemes because of the cost involved, and because in their previous experience people tended not to be receptive to cold-callers. These perceived differences in the effectiveness of door-knocking appear to reinforce the importance of using local knowledge and experience to inform customer engagement strategies.

5.3.2.5 Direct marketing mail outs

Direct marketing mail outs were a common engagement route employed under CERT and CESP. As discussed above, mail outs branded by the local authority or other trusted local organisations were considered to be more effective than by the energy company or installer alone. In Case Study E, for example, a CERT mail out averaged a 2.5-3% return, with up to 5% for free schemes. Although this might appear to be low (it is also not possible to comment on how this compares to other response rates due to the paucity of this evidence), it was considered to be "very good" by the case study stakeholders, and compared to 0.2% for the mail out with the energy supplier's branding. Some stakeholders also emphasised the importance of ensuring mail outs were targeted as much as possible. Again, in Case Study E, if offering CWI they would target suitable properties using relevant housing databases.

5.3.2.6 Telephone advice services

The existence of a local telephone advice or call service was regarded as important by some stakeholders, particularly when using a freephone number and managed by a trusted independent organisation, such as the local authority and other local intermediary. In Case Study E, for instance, the managing agent provided the telephone service, run independently of the scheme.

> *The managing agent was independent of the scheme, which increased customer confidence. They had no hidden agenda – they were not working for the energy supplier. It was great to have a local call centre. This engenders customer trust and confidence.*
>
> Energy supplier E3

5.3.2.7 Demonstration homes

In CESP schemes in particular, demonstration homes were used to help secure resident buy-in. In Case Study E, for example, the delivery agents refurbished a void property (also used as a site office), to act as an open house to demonstrate the measures to residents.

5.3.2.8 Messaging

A small number of the stakeholders emphasised that the messaging in communications to customers was an important consideration. In Case Study E, for example, the managing agent found that messaging focusing on money saving, comfort and warmth, rather than carbon, worked well. In some cases, external measures (e.g. EWI) were promoted on the basis of the aesthetic improvement it would have for homes and the local area. In case study B, both the community representatives felt strongly that local materials should have emphasised more strongly that the scheme was a local one (the first leaflet did not do this). They also mentioned that emphasising eligibility criteria like benefits was inappropriate, since there could often be sensitivity about being on benefits.

5.3.2.9 Other communication routes

Other communication routes were also mentioned by stakeholders. Market research commissioned in Case Study B found that 55% of respondents reported a preference for contact via their council tax bill, while 42% suggested a letter and 36% suggested radio. Phone calls were suggested by only 6% of respondents. It should be noted that there was no evidence collected within this evaluation that council tax bills or radio adverts were used to communicate about the programmes. The efficacy of these approaches cannot therefore be commented on.

In a CERT project in Case Study C a 3-minute DVD was distributed to all residents in the target areas. The project's evaluation report found that this was watched by 58% of residents.

5.3.2.10 The 'too good to be true' challenge

Under both CERT and CESP, measures were offered free of charge to some residents. Under CERT, for example, professionally-installed insulation measures were typically offered for free to PG households for the lifetime of the obligation. SPG customers were also offered cash incentives towards the end of the Extension period (see targeting vulnerable customers section).

Some stakeholders reported that these free offers could often be viewed with suspicion by customers, who thought that the offers might be "too good to be true". To overcome such suspicions, stakeholders found trusted branding, the presence of a local independent advice service and the involvement of local organisations all helped to build trust with residents.

> *Work with community groups was also positive. At first they [residents] were nervous about free offers, but [the community groups] built trust over time.*
>
> Supply chain stakeholder C2

5.3.2.11 Marketing fatigue

Another concern expressed by some stakeholders was that many customers suffered from 'marketing fatigue', particularly in densely populated urban areas. Many households had already received numerous sales offers by various means and so ignored marketing efforts as a result.

> *Writing leaflets and letters is low cost but there is customer fatigue. People are sick of letters and ignore them.*
>
> Supply chain stakeholder G2

The presence of local branding and organisations was thought to have helped partially overcome this issue, although even this had its limitations.

> *When the council did the marketing it worked better but in the end everyone gets fed up if you sell too much.*
>
> Local authority stakeholder G5

5.4 Targeting vulnerable customers

5.4.1 Common themes across CERT and CESP

Both programmes aimed to help vulnerable households or low income households. However, there is no definition of what is meant by a 'vulnerable customer' in the CERT and CESP documents. Under CERT, the PG and SPG sub-groups, were to some extent used as a proxy for vulnerable customers. These categories included people of a certain age or on certain benefits (a summary in the appendices sets these out in full). Under CESP, 'low income households' were targeted by focusing the programme on areas that had the densest concentration of low income households, based on the IMD.

5.4.1.1 Tackling fuel poverty

There has been considerable policy debate about the extent to which CERT, and to a lesser extent CESP, benefitted the fuel poor. This is further complicated by the new definition of fuel poverty in England based on the recommendations of the Hills Review (2012)[21] (Scotland and Wales continue to apply versions of the '10%' measure of fuel poverty). The impact of these programmes on fuel poverty is discussed further in Chapter 8, but this section presents findings on how delivery methods affected fuel poverty alleviation.

Ekins and Lockwood (2011) report that finding the fuel poor is one of the major reasons why progress on alleviating fuel poverty has been so slow: although fuel-poor households often include the elderly, young children or long-term sick and disabled, only a minority of all households with these characteristics are in fuel poverty, so just using these characteristics to target support is very inefficient. Boardman (2012) expresses further concern that many of the fuel poor will not self-identify themselves for investment programmes and that this group is extremely difficult to help.

Cambium Advocacy (2010) argue that intensive area-based approaches can be effective in engaging and supporting hard to reach or 'hidden' fuel poor households, when they offer energy efficiency measures without means testing in areas with multiple factors of deprivation. Indeed, a number of stakeholders interviewed for this evaluation supported the argument that intensive local schemes, open to all, would eventually reach the fuel poor.

There are, however, inherent challenges of using an area-based approach to target the fuel-poor in this way. The investment required to effectively deliver schemes in an intensive way means that not all high fuel-poverty areas can be targeted at once. There is therefore a challenge in delivering such schemes in an equitable way.

5.4.1.2 Strategies for reaching vulnerable people

Rushton, Robinson and Ormerod (2012) found that personalised approaches and visits, including support from third sector organisations, were more appropriate to vulnerable households than phone lines, leaflets and advice at the door. They reported that many vulnerable people were not effectively supported by the energy companies or feel antipathy towards them, and that many vulnerable people would not seek support due to uncertainty, lack of awareness, lack of trust or pride.

Similarly, there was consensus amongst stakeholders that traditional marketing methods, such as mail-outs, were not generally effective in reaching vulnerable people.

> *It's difficult for energy companies, who are used to mass approaches, to reach the most vulnerable people in society. After all, what proportion of these people can read and write? Energy companies spent a fortune on letters at some points, which wasn't really going to work with this target group. The most successful approach was to engage by going into communities, being on the ground.*
>
> Supply Chain Stakeholder 12

Many delivery stakeholders in both CERT and CESP areas worked with intermediary organisations which knew their target group and/or were more trusted than the energy companies (e.g. the local authority, Age UK, Care and Repair services, the local mosque,

[21] For more information see: https://www.gov.uk/government/consultations/fuel-poverty-changing-the-framework-for-measurement

housing associations). Some area-based schemes had a community development manager or tenant liaison officer on the ground, who could run drop-in sessions and also visit vulnerable people. Local networks were also more effective in overcoming language barriers.

> *Local community centres helped to reach out to those whose first language was not English.*
>
> Energy Supplier C3

Local authorities and health services could also play an important role through referrals from their staff, including social workers, home helps and health visitors. However, this required commitment from the local authority and training for front line staff. Some stakeholders found that these workers were too busy to help on a significant scale.

> *We tried to work with social work departments, health visitors and so on – they know the vulnerable customers. We set up a system where they could refer people to us. That worked on a very small scale, it didn't result in huge numbers, but was useful on a smallish scale.*
>
> Community Delivery Stakeholder 1

Several Community Delivery Stakeholders ran energy advice services which were embedded in the community and which the stakeholders felt to be well placed to identify and help vulnerable callers. The breadth of these advice services was useful in making connections between retrofit and wider fuel debt or energy issues.

> *The advice line was giving other types of local advice too – quite general and quite broad. Someone could ring up and say 'I'm having problems with my fuel bills' or 'I'm thinking of buying a new fridge/freezer' – and then you could talk to them about retrofit as well. The more vulnerable people may ring up with a completely different question – if you can't answer their question, you miss the opportunity to reach them.*
>
> Community Delivery Stakeholder 5

Another common feature of area-based CERT and CESP schemes targeted at vulnerable people was that benefits checks were often offered as part of the package. This was cited as helping to increase the identification and engagement of vulnerable people. Chapter 8 shows that this could also generate significant positive impacts for some individuals.

> *One of the offers we made when bidding for CESP is using our two full time benefits advisers, who are funded by one of our partners. We would always do a benefits check with customers. Under CERT that was critical in identifying people who should have been on qualifying benefits. Under CESP, measures weren't means tested but we were still providing assessments for all householders.*
>
> Community Development Stakeholder 2

These types of approaches were best suited to an area-based delivery, because of the need to develop relationships with local organisations and networks.

> *It takes time to build up these relationships, so it is more easily done on a local scale.*
>
> Community Development Stakeholder 1

5.4.2 CERT Extension

As outlined in Chapter 4, the CERT Extension introduced a sub-obligation for an SPG, comprising people on specific benefits. In addition, the PG consisted primarily of people over 70 who were not on means-tested benefits.

Nearly all stakeholders agreed that there were major problems in finding enough SPG customers to enable the energy suppliers to meet their targets. This was exacerbated by lack of access to benefits data held by the Department of Work and Pensions (DWP). One of the few exceptions was a supplier which had been involved in Warm Front delivery, who had ready access to and knowledge of the SPG target group. Ofgem also reported that suppliers could use Warm Home Discount (WHD) "Core Group" data that was supplied to them as part of the rebate process. All members of the WHD core group were also eligible for SPG. This information was supplied to suppliers from DWP via DECC. There was a provision in the WHD Order that specifically allowed the data to be used for the purpose of promoting energy efficiency measures.

In the absence of DWP data to enable targeted marketing, various strategies were utilised to find SPG customers. All of these added to the costs of CERT delivery to this group:

- Offering measures free of charge, and in some cases offering cash incentives, for SPG customers;
- Tailoring mail-outs to benefit recipients or similar groups, using relevant data from local authorities or other agencies;
- Intensive surveying and door-knocking, sometimes linked to benefits advice services;
- Networking and referrals through trusted intermediaries in the community (e.g. Age UK);
- Purchasing SPG leads (or bundles of SPG with other leads) from lead generation agencies, at high cost;
- Employing staff to check identification, retrospectively, to verify whether customers were in fact SPG customers.

Many stakeholders commented on the lack of motivation for SPG customers to identify themselves, particularly since CERT offers to PG customers were usually already free. Asking customers about benefits was felt by many to be intrusive, particularly for vulnerable and elderly customers and those living in small rural communities.

> *It may well be that our elderly people, who have got all sorts of pride, have reasons for not disclosing what benefits they are on. Or they may not always be on the benefits they could be on because they have been used to surviving without it.*
>
> Housing Sector Stakeholder 1

Some installers overcame this by paying an incentive to the surveyor for identifying SPG customers. Most energy suppliers also began offering cash and other incentives to SPG customers. Without any financial incentive, many of the SPG search methods were not cost-effective.

> *For 3 months we had 250 full time equivalent [staff] going around the doors and on the phones to establish whether customers had been SPG. Often the customers had no idea why we were asking them questions about an installation that … had been delivered by third parties. All of that effort only pushed up our SPG by about 10%.*
>
> Energy Supplier 3

5.4.3 'Deeming' and 'data washing'

Two key processes enabled the energy suppliers to overcome the challenges faced in identifying and engaging with SPG customers.

Firstly, towards the end of CERT, the energy suppliers agreed with Ofgem that 32% of social housing tenants could qualify as SPG[22]. Whilst the energy suppliers reported that this action was very helpful in helping to meet their SPG targets, they also felt that if this process had been agreed earlier, significant costs could have been avoided in terms of searching for and identifying SPG customers in the social housing sector.

It is worth noting that Ofgem's role was to assess suppliers' proposals and ensure any proposal was statistically robust. Ofgem reported that discussions around alternative methods of evidencing were held throughout the extension period but no methodology that was acceptable to Ofgem was proposed by suppliers until the 32% of social housing was submitted in 2012. Had Ofgem accepted a methodology that was not robust, there would have been a risk that measures were not delivered to the intended recipients.

Secondly, after CERT had finished, but before the final figures were submitted to Ofgem, two energy suppliers retrospectively 'data-washed' their records against data held by the Department for Work and Pensions (DWP). This process involved reviewing customer records against the relevant benefit criteria to enable identification of customers who fell into the SPG group but had not been hitherto evidenced as such in their records. Other energy suppliers were then also offered the opportunity to do the same (this process is discussed in further detail in Chapter 10). The data washing process showed that there had previously been considerable under-identification of SPG customers.

> *The DWP data revealed that 50-60% of the PG were SPG[23], and 27-33% of the NPG [Able to Pay] were SPG*.
>
> Energy Supplier 3

The energy suppliers felt that .if the deeming and data-washing processes had been allowed from the beginning of the CERT Extension, the costs of delivering the SPG sub-obligation would have been considerably lower.

> *If we had known that we were going to be able to count these SPG customers, there's a whole lot of things we would have done differently. That's caused all sorts of windfalls, gains and losses between suppliers that shouldn't really have occurred.*
>
> Energy Supplier 5

5.4.4 Vulnerable customers reached by CERT

As shown by the national survey of CERT customers, and as illustrated by Table 5.1, CERT customers tended to be of a higher social profile than non-customers, indicating that CERT reached many households that would probably not be considered 'vulnerable'. As recorded by

[22] This matches the results of the Omnibus survey; 32% of all respondents living in social housing met the SPG eligibility criteria.

[23] The national omnibus survey revealed that 34% of all PG eligible households fell into the SPG category. It should be noted that there may be some under-reporting of eligibility where respondents feel unable or are unwilling to divulge information about receipt of benefits.

the survey, customers were more likely than non-customers to be a higher social grade, on higher incomes, and less likely to say their household financial position is 'bad'.

The survey also shows that SPG-eligible households were under-represented; 13% of the total sample were eligible, but only six per cent of customers surveyed were SPG customers. It should be noted that 13% is an under-representation as around 21% of GB households are considered to have been SPG[24]. This is to be expected; attributing SPG status is compromised by a number of factors including respondent reluctance or inability to provide information about their receipt of benefits, and these individuals (who by definition are vulnerable) potentially being reluctant to respond to a survey. However, even given this, the data (and supported by other evaluation evidence) suggest that SPG were challenging to reach.

Table 5.1: Profile of CERT customers, compared to non-customers, as recorded in the national omnibus survey[25].

Socio-demographic variable		CERT customer (Base: 278)	CERT Non-customer (Base: 1,335)
Priority Groups - Eligibility	Non-priority group	67%	66%
	Priority group	33%	34%
	Super priority	6%	13%
Quality of general health	Good	76%	78%
	Poor	14%	13%
Consider household financial situation	Good	61%	53%
	Bad	7%	12%
Age of respondent	65 years old or older	35%	21%
Household gross income	Up to £9,499	9%	12%
	£9,500 to £17,499	15%	16%
	£17,500 to £24,999	6%	7%
	£25,000 or more	41%	32%
Social grade	AB	34%	27%
	C1	28%	28%
	C2	21%	21%
	DE	17%	24%
ACORN category	Wealth achievers	26%	16%
	Urban prosperity	10%	14%
	Comfortably off	33%	29%
	Moderate means	16%	17%
	Hard pressed	14%	22%

5.4.5 CESP

It is difficult to know with certainty the extent to which CESP was an effective programme for targeting vulnerable customers as no monitoring took place of the demographics of households

[24] The CERT Extension Impact Assessment estimated that circa 6.5million households were SPG (around 21% of all GB domestic properties).

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48491/121-iacertextension.pdf

[25] It is important to note that the survey was only asked of people with sole or joint responsibility for financial decisions in their household (on the basis that non-decision makers would not be able to respond to questions about home energy efficiency measures or payment for them).

who received CESP measures. No considerations about identifying SPG customers were incorporated into the scheme design, since this sub-obligation did not apply to CESP.

However, the previous CESP evaluation found incidences of fuel poverty in CESP-eligible areas were higher than in other areas. BRE analysis of 2009 English Housing Survey (EHS) data, indicated that 22.4% of households in the bottom 10% of the IMD composite[26] in England were in fuel poverty (using the '10%' definition) compared to the national average of 18.4% (CAG Consultants, Ipsos MORI and BRE 2011).

5.5 Targeting private tenure households

5.5.1 Common themes across CERT and CESP

There were some common barriers to delivery of CERT and CESP in private tenure property, in terms of both availability of data and receptivity of households. The Committee on Climate Change (2012) found that while local authorities tended to have good information on social housing stock, there were wide variations in the private sector housing stock data held by local authorities. This acted as a barrier to delivery for targeting eligible private households (although arguably not to the door-knocking approaches used). Several stakeholders reported that private sector households could also be more sceptical of free offers.

> *People in private households are not used to getting things for free. They are often sceptical. You have to try and overcome this.*
>
> National Stakeholder 3

Particular challenges were encountered in the Private Rented Sector (PRS), owing to the number of actors involved, particularly under CERT, as discussed below.

5.5.2 CERT

CERT was widely, but not exclusively, delivered to private tenure households. Conclusive data on tenure is not widely available; however, data held by EST on domestic energy efficiency measures illustrates this weighting towards the private sector. Of all CERT measures recorded in EST's Home Analytics database[27] nine in ten (89%) were in owner occupied properties, compared to 63% of all homes across Great Britain[28]. This is also reflected by the results of the national omnibus data, where 90% of all households attributed as customers were private tenure.

---

[26] Note that the 2009 EHS data does not include the IMD income indicator used to determine CESP areas. The analysis used instead the IMD composite indicator. The income domain has a high weighting in the IMD composite indicator and is closely correlated with many of the other components (e.g. employment) so this should be a reasonable first proxy in the absence of the specific IMD income indicator used by CESP. Indeed, BRE analysis of 2005-07 EHS data using the IMD income indicator used in CESP showed not dissimilar results, finding that just over 20% of CESP targeted households were in fuel poverty, against a national average of 15%.

[27] http://www.energysavingtrust.org.uk/Organisations/Government-and-local-programmes/Home-Analytics-housing-data-and-analysis

[28] It should be noted that 15% of all measures in EST's data do not hold information on tenure, and this figure of 89% is based on only measures installed in properties where the tenure was known. Taken as a proportion of all measures, including those without a tenure record, 75% of all measures were in owner-occupied properties. It should also be noted that the data within Home Analytics is based on a number of different data sources (including returns from energy suppliers) but does not perfectly match figures in Ofgem final reports. It is however, a useful proxy indicator in the absence of a more comprehensive dataset.

Evidence from the stakeholder interviews also broadly supports this picture; one community development stakeholder provided data for a typical broad area-based scheme, largely funded by CERT, which showed that 73-87% of their customers were owner-occupiers in the years 2011 and 2012. The Local Government Group (2011) also cite an example of a CERT-funded scheme which offered free insulation to thousands of private homes in the city on an area by area basis.

However, within private tenure the PRS was under-represented. EST data suggests that just four per cent of all measures (in properties where tenure information is held) were in the private renting sector, compared to 16% across Great Britain as a whole (ONS, 2013). Again, this is supported by the national omnibus survey which indicated that 3% of all customers were in private renting. This under-representation is corroborated by Energy Supplier 1 whose customer records data showed that 91% of their private tenure CERT customers were owner-occupiers while 9% were private rented (compared to 79% owner-occupier and 21% private rented across the private sector stock in England as a whole).

The Energy and Climate Change Select Committee (2012) also found that CERT providers had been reluctant to engage with the PRS, due to the three-way nature of organising improvements, involving the tenant, landlord and installer. The Committee found that providers preferred easier delivery routes dealing only with owner occupiers or social housing providers, where there is a one to one relationship. Take-up of energy schemes had been very low in the PRS even when CERT subsidies meant that measures could be delivered at little or no cost to the landlord.

Many stakeholders also reported difficulties in engaging private landlords in CERT. Housing Sector Stakeholder 2 cited some local authority schemes which had tried to target the PRS and pointed out that CERT publicity needed to make clear that landlords could apply and that tenants should be encouraged to ask for Energy Performance Certificates for prospective properties.

> *[There were] indications that very few landlords took it up or were even aware they could apply for it – until the end when [energy suppliers were] really pushing to spend money.*
>
> Housing Sector Stakeholder 2

Housing Sector Stakeholder 3 reported that a key problem was that, to get funding through CERT, a landlord had to know every aspect of the tenant's family and financial situation, which the tenant may be reluctant to share. A further barrier was that, under CERT, work could not be done on empty properties between tenancies.

Other stakeholders pointed out that door-knocking involved contacting the tenant, not the landlord, but that contacting property owners tended to generate better take-up.

5.5.3 CESP

Many schemes started with a core of social housing and then extended the offer out to private households within the area. The visibility of EWI aided marketing to private households.

> *The social schemes would start on site, then the private occupiers would see the benefits and want to get involved.*
>
> National stakeholder 3

The Association of the Conservation of Energy (2011) reported that spill over to the private sector was incentivised by the area bonus, since significantly higher scores were awarded if a penetration rate of 25% of the eligible area was achieved. The Association of the Conservation of Energy went on to report that different subsidy levels offered to private sector households in CESP 'spill-over' areas led to vastly different levels of take-up, with higher subsidy levels leading to higher take-up.

Information held by EST also indicates that a significant proportion of measures delivered under CESP were in private tenure properties; around one in three (32%) of all measures[29]. This relates to only those measures against which tenure information is held. If taken as a proportion of all measures, including those where tenure is unknown, one in four (25%) were private tenure, although the actual figure will be somewhere between 25% and 32%.

This was supported by evidence from many stakeholders and case study areas, suggesting that wide take up of EWI by private householders was dependent on highly-subsidised offers. These became possible towards the end of CESP when carbon prices rose (see Chapter 9). As discussed above, this enabled one energy supplier to offer CESP measures for £1 to private households in their CESP scheme areas.

Case Study A and Case Study D were specifically targeted at private properties which were formerly council-owned. These and similar schemes were usually in low-income areas in need of renovation, often focused on houses of 'Wimpey No-Fines' construction[30]. These private-sector schemes achieved high take-up in both owner-occupied and private rented sectors, through free offers, concerted marketing and considerable investment in community engagement and liaison work. One scheme in Case Study D involved the installation of free measures in 2000 homes, 99% of which were in private ownership. Case Study A reported that they were dealing with 1,600 landlords, and used pre-survey condition photographs to prevent opportunism in claiming damage to properties during the works.

5.6 Partnership working

A common thread across the process case studies and many of the stakeholder interviews was the importance of effective, "genuine", partnerships between energy companies and delivery partners, including housing associations, community delivery organisations, supply chain stakeholders and others. Stakeholders from across different sectors identified local authorities as particularly important partners.

Such partnerships needed to be based on joint objectives, focusing on serving the community and producing real outcomes. In Case Study D, for example, this worked especially well where each partner had a clear role and contribution to make to the programme's final success and these roles were realistically resourced from within the programme. It is also clear that each partner had valued the contribution of the others and recognised their part in achieving programme goals. To further ensure the efficacy of each role in the partnership, all aspects of the work were underpinned by agreed and documented protocols.

> *A client-contractor relationship wouldn't work. It needs a genuine partnership approach to deliver the wider objectives.*
>
> Local authority stakeholder A3

[29] 32% of all measures against which tenure information is held.

[30] Wimpey No-Fines homes refers to houses built using a certain construction method, using designs produced by George Wimpey company, commonly used in social housing.

5.6.1 Characteristics of successful partnership working

The evaluation evidence suggests that effective partnership action involved a number of key characteristics:

- **Local knowledge**. Many stakeholders valued the local knowledge that local authorities and other local partners could bring to energy efficiency schemes. They could help to identify suitable areas for energy efficiency retrofit works, had links to residents and community groups, could identify local issues that needed to be addressed and promote offers through local communication channels. Local knowledge was seen as particularly effective at reaching 'hard to meet' community members. One community delivery organisation, for example, said that they worked with community leaders to reach these groups, for example by holding meetings in local mosques, forging relationships with the local Imam. In a Warm Zone scheme in Newham, the involvement of local organisations helped to ensure local issues were understood and the nine languages spoken in the area were taken into account.
- **Data.** Linked to the above, good housing stock data – held by both local authorities and housing associations - was identified as very important for developing effective schemes. The interim CESP evaluation found that a lack of effective housing stock data had sometimes been a barrier to scheme development. Maintaining a quality database can be time-consuming and resource-intensive, but energy suppliers and other stakeholders reported that good quality data makes potential schemes more attractive.
- **Trust**. A number of stakeholders found that the local branding was important in terms of gaining customer trust. In case study B, for example, the local authority assisted the installer with publicity and marketing for CERT materials, which both parties said had increased take up compared to similar efforts using only the installer's branding. One of the independent generators involved in Case Study A said that one of the reasons for high take-up in the CESP scheme was that the partnering organisations already had a presence in the community and a brand that was known. Their reputation was further enhanced by being not for profit and having close links to the local authority. They felt that this was a much better starting point for engaging the community.
- **Leadership**. In many examples cited by stakeholders, local partners – particularly local authorities but also local energy agencies, housing associations and others – had taken a lead role in identifying a suitable project and delivering it. In Case Study C, for example, the local authority identified a number of local areas that were in need of energy efficiency upgrades and then invited energy companies to tender for the work, for both CERT and CESP schemes.
- **Advice.** Local partners were also identified as being an important source of advice for local residents on energy efficiency. In Case Study B, for example, the local authority – in partnership with a neighbouring authority - funded an energy team which ran an advice and referral service, referring households to preferred installers for CERT measures, where appropriate. The advice service was in part funded through the referrals.
- **Holistic delivery.** The evaluation revealed a number of examples where the involvement of the local partners had broadened the scope and impact of CERT and CESP schemes, enabling them to achieve wider outcomes, beyond energy savings in the home. A number of schemes, for example, involved wider services for residents, such as energy advice, benefit entitlement checks, fire safety checks, security checks, public health referrals and Warm Front referrals. In case study B, funding from local authority referrals for CERT measures helped to support an energy advice service for residents. The local authority's own funding was combined with CERT funds to deliver a community initiative with rural villages targeted at vulnerable residents (as defined by the community itself) together with wider sustainability outcomes, such as community recycling or garden projects.

- **Resources.** In many cases, local partners had contributed their own resources to CERT and CESP schemes. This could be provided directly, as was often the case with local authorities and housing associations (although see 'limitations' section below). Local partners had also helped to secure other sources of income that had been matched with CERT and CESP funding to deliver energy efficiency projects. These included Decent Homes, CESP, Warm Front, Arbed, UHIS, European funding sources such as ERDF, as well as funding from local authority and housing association pots. This additional funding enabled contractors to deliver a range of additional outcomes agreed at a local level.

5.6.2 Limitations of, and barriers to, partnership working

Whilst the involvement of local partners was widely praised, a number of limitations were also identified by stakeholders.

- **Inconsistency.** Some stakeholders noted that there was inconsistency in terms of the leadership and expertise amongst local authorities and other local partners on energy efficiency and, consequently, variations in the extent and effectiveness of local authority involvement.
- **Competing priorities.** In some instances, stakeholders felt that obligated parties and local partners had different objectives, which could cause difficulties in agreeing the focus of a scheme. For example, an obligated party might primarily be interested in maximising carbon savings in order to meet its obligation, whilst a local authority's interests might be in reducing fuel poverty.
- **Resources.** While the addition of resources from local partners to CERT and CESP projects yielded benefits, described above, a number of stakeholders expressed concern that this involvement will become more limited as resources become more constrained within the public sector as a result of public expenditure cuts. Chapter 9 addresses the impact of these cuts on the costs of delivering CESP over time.
- **Skills.** Some stakeholders, mainly energy suppliers and supply chain stakeholders, also expressed concern that not all local authorities have the skills and expertise to effectively deliver schemes, especially given the resource cuts and consequent staff losses that local authorities have faced.
- **Programme timescales.** Stakeholders reported that developing effective partnership takes time. Many stakeholders felt that longer timescales, particularly for CESP and the CERT Extension, might have enabled the development of more holistic projects. The issue of timescales is also discussed later in this chapter.
- **Competition.** The design of the CERT, in particular, may have acted as a barrier to partnership working. CERT's design encouraged competition between the energy companies and their delivery partners to deliver energy saving measures to individual households. This meant that there were often competing offers and initiatives in the same local area. Some stakeholders felt that this could hinder joined-up working and potentially disadvantage smaller organisations with less access to the energy companies.

5.7 Other project delivery issues

5.7.1 Procurement

Local authority procurement processes were cited by many stakeholders, particularly energy suppliers, as a barrier to delivery, particularly for CESP given the requirement for local authority sign-off and the relatively short timescale for the CESP programme. As a result, some energy suppliers said that they tended to prefer working with housing associations, which had less onerous procurement processes.

A few local authority stakeholders had been able to avoid procurement processes, on the grounds that the local authority was not funding or contracting the programme. But reaching this position could sometimes be time-consuming in itself.

> *It took two years to persuade the local authority's procurement team that there was nothing to procure. There is no relationship between the council and the householder – it's a supplier scheme.*
>
> Supply Chain Stakeholder E2

One suggestion was that Official Journal tendering rules should apply to the size of a local authority's contribution to a project, rather than the whole project budget. Several stakeholders recommended that the Government should in future provide clearer guidance on procurement and/or provide frameworks and template documents to streamline procurement processes.

5.7.2 Programme timescales

A wide range of stakeholders commented that the timeframe for delivery of CESP was too short. This was partly due to the complexity of scheme development, in part a result of the nature of the works required (often large-scale construction projects) and partly down to the difficulty of delivering EWI during winter months, due to bad weather.

> *You want to have a CESP scheme in development about 6 months ahead of development - have the housing provider lined up etc.*
>
> Supply Chain Stakeholder 12

5.7.3 Planning

Several stakeholders commented on the inconsistency between local authorities in planning policy on EWI, particularly on pre-1919 properties. Acceptable approaches to external cladding were sometimes agreed by one authority but not by its neighbour.

Differences in heritage designations and conservation areas may have underlain some of these differences.

> *London schemes also had issues as social landlord buildings tend to be Victorian London brick and are listed so planning permission will often not be granted. [One] can get round this but the cost of such extra work is prohibitive.*
>
> Supply Chain Stakeholder 2

Several stakeholders asked for clearer guidance for local authorities on planning permission for EWI.

5.7.4 Geography

5.7.4.1 Regional differences

The evaluation evidence suggests that delivery of urban schemes tended to be more challenging in England, where matched funding was more difficult to obtain, than in Scotland and Wales, where national government funding was available. This reflects the regional variation of delivery as reported in Chapter 3.

A number of stakeholders suggested that variations in costs and other issues explained variations in regional delivery of CERT and CESP schemes. A small number of stakeholders felt that delivery was more attractive in the North of England because the cost of labour was cheaper.

> *CESP [was] hugely northern based - labour is cheaper so [the obligated parties] could fund work more cheaply. It took 10-15% off the cost of solid wall if [it was] in Leeds rather than London so then could fund a scheme more easily.*
>
> Supply Chain Stakeholder 2

As illustrated by Figure 3.2 in Chapter 3 (Distribution of CERT professionally installed measures - cavity wall and loft insulation - by region), only 10% of all properties in London received a CERT measure (CWI or loft insulation), compared to an average of 19% across Great Britain. Higher costs were cited by stakeholders as the reason for this under-delivery of CERT in London. The barriers identified during this evaluation and the interim CERT evaluation included parking charges and congestion charge, as well as property types (e.g. Victorian terraces) and heritage designations (e.g. conservation areas).

> *The area which I think really suffered with CERT and CESP was Greater London, not because there wasn't need but because it was so expensive and difficult to get into London to do things.*
>
> Housing Sector Stakeholder 1

5.7.4.2 Rural under-representation

In addition to regional variation in delivery, many stakeholders emphasised that remote and isolated communities faced particular issues of under-delivery. This assertion is supported by EST data on the rural breakdown of all CERT and CESP measures installed, compared to the national profile of all domestic properties, as illustrated by Table 5.2.

Table 5.2: Proportion of all CERT and CESP measures delivered that fall into rural and urban areas.

Rurality	GB profile[31]	EST - CERT	EST - CESP
Urban	82%	91%	>99%
Rural	18%	9%	<1%

Both CERT and CESP were also criticised by the Energy and Climate Change Select Committee (2012) for under-delivering in rural areas. As noted by DECC (2012), there is greater need in rural areas because of the higher percentage of off-gas and hard to treat homes in these areas. For CERT, the ECCC report attributed the rural under-delivery to the lack of economies of scale available in these areas.

For CESP, under-delivery was attributed to design features which made it challenging for projects to qualify for CESP in off-gas-grid areas. Evidence presented to the Committee suggested that CESP had failed to deliver in rural areas in Scotland primarily because the

[31] This indicates the proportion of the GB population that live in urban and rural locations, based on the 2011 census. Https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/261056/Population_and_Migration_Indicators_November_2013_v2.pdf

housing stock did not fall within eligible Data Zones This was partly because deprived households in rural areas tend to be dispersed rather than concentrated, and are 'averaged out' by small pockets of affluence, with the result that they are less likely to trigger the IMD criterion. Also, in Scotland, the rural housing associations were reported to have 'in principle' agreements with a utility but not all the same utility. Therefore there was little prospect of triggering the area bonus for rural schemes.

5.7.5 Failure rates and installation quality

There was a mixed view across the stakeholders interviewed for this evaluation about the quality of installations and service provided to customers under CERT and CESP. Some felt that standards were high and that issues were minimal as a result.

A number of stakeholders, however, reported concerns about the quality of works. As is discussed further in Chapter 8 and 9, pressure to keep prices low and deliver high volumes in short timescales were thought to be significant factors in promoting poor quality work. A report by the Office of Fair Trading (OFT) examining the insulation industry also found that they had received complaints about the quality of some insulation installations, although there was no clear picture of the scale of the issue (OFT, 2012). Evidence is available, however, on failure rates and customer experiences of installation.

Under CERT, Ofgem required the energy suppliers to monitor 5% of all professionally-installed measures. Quarterly figures from this technical monitoring show that failure rates[32] for measures were higher for CWI than for loft insulation. The energy companies also submitted summaries of their technical monitoring results at the end of the programme. These revealed that the aggregated failure rate for insulation was 10.9% across the energy suppliers.

Table 5.3: Aggregated technical monitoring results for CERT. Source: Ofgem

Measure	Percentage of each measure technically monitored	Percentage of monitored measures failing technical monitoring
Insulation measures	6.7%	10.9%
Heating measures	6.9%	5.3%
Microgeneration measures	5.6%	1.5%

All measures identified as failing technical monitoring were required to have remedial action completed.

As with CERT, the obligated parties under CESP were required to undertake technical monitoring on at least 5% of each measure installed using a suitably qualified agent. As Table 5.4 illustrates, technical monitoring for CESP revealed that failure rates ranged from 0% to 4.3% for different measures. The failure rate for SWI was 1.1%. Loft insulation measures reported the highest failure rate at 4.3%. Ofgem reported that this is likely to be a result of instances where the work required was not feasible. The loft hatch not being draught-proofed or insulated, for example, could result in a failure, but doing this might have restricted the function of the hatch or loft ladder (Ofgem, 2013a).

[32]Proportion of measures which did not pass the technical monitoring process.

Table 5.4: Aggregated technical monitoring results for CESP. Source: Ofgem

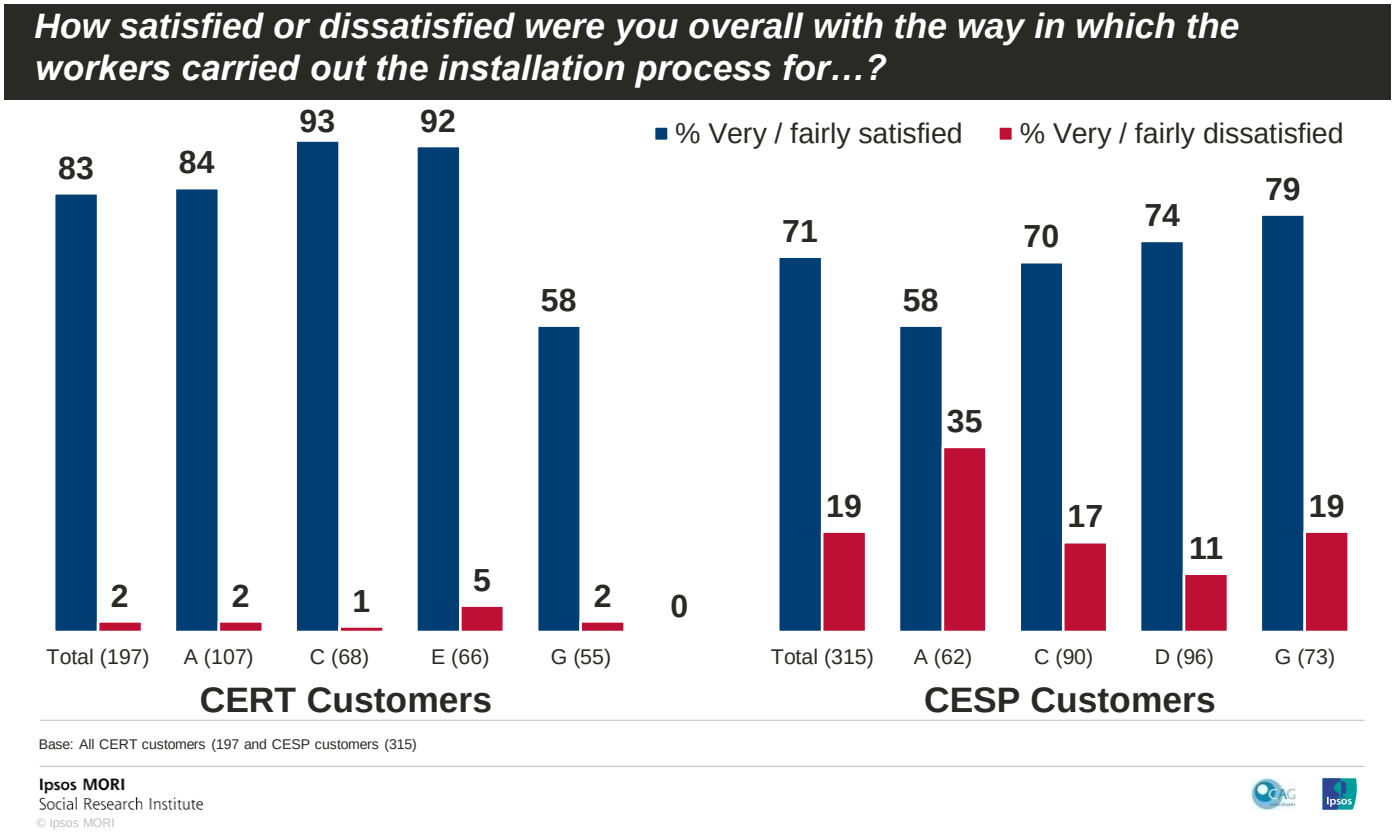
Measure	Percentage of each measure technically monitored	Percentage of monitored measures failing technical monitoring
Loft insulation	8.6%	4.3%
Fuel switching	8.2%	1.7%
Cavity wall insulation	7.7%	1.2%
Solid wall insulation	8.7%	1.1%
Draught proofing	6.4%	0.4%
Heating controls	7.0%	0.3%
Glazing	7.0%	0.1%
Replacement boiler	7.4%	0.1%
Under-floor insulation	6.0%	0.0%
Flat-roof insulation	10.3%	0.0%

5.7.6 Installation – customer experiences

Those identified in the national survey who received professionally installed loft insulation or top-up loft insulation were asked how satisfied they were with the way in which the workers carried out the installation. The overwhelming majority (89%) of CERT customers said they were satisfied, with nearly two thirds (64%) very satisfied. This broadly reflects the failure rate of all insulation measures, with around nine out of every ten measures passing the assessment as part of the technical monitoring.

While customer satisfaction with the installation process was also generally high overall across CERT and CESP areas, it was significantly lower among CESP customers than CERT customers. Looking across all measures installed in the CERT case study areas, four in five (83%) CERT customers were either very or fairly satisfied, with nearly two thirds (64%) saying they were very satisfied. In contrast, seven in ten (71%) CESP customers were satisfied (45% very satisfied).

Figure 5.1: Satisfaction with way workers carried out installations



There was considerable variation in satisfaction by CESP case study area. There were also a number of household characteristics in CESP areas that are associated with greater dissatisfaction with installation, including:

- CESP customers in poor health were significantly more likely to be dissatisfied (28%) than those in good health (15%).
- CESP customers who rent from a housing association were also significantly more likely to be dissatisfied (27%) than those who own their home outright or are buying it (15%).
- CESP customers living in the oldest properties – built in 1929 or earlier - were significantly more likely to be dissatisfied (31% vs. 19% overall).
- Levels of *dissatisfaction* with the installation process were particularly high in CESP Case Study A. Over one third (35%) of customers were dissatisfied compared with one in five (19%) overall. Evidence from qualitative interviews with customers indicates a number of problems with installation of measures in this area. These issues are discussed in more detail below.

It should be noted that CERT and CESP customers are not significantly different on these first two factors (health and tenure), suggesting that these issues are not driving the difference in dissatisfaction with installation between the two programmes. CESP customers are, however, more likely to be living in in pre-1930 properties (19% vs 3% of CERT customers)

The same pattern also emerges with views towards the level of disruption during installation; CERT customers tended to be more satisfied than CESP customers (87% and 70% respectively) with the amount of disruption to their daily lives.

Mirroring views on installation, dissatisfaction with the level of disruption was by far the most pronounced in Case Study A (40% of customers were dissatisfied). Some of the possible reasons for views are discussed further below.

5.7.7 Specific problems encountered with measures

A number of stakeholders reported issues regarding the selling, installation and quality of measures installed under CERT and CESP. These could not always be substantiated, although a failure rate of over 1 in 10 CERT insulation measures does support the view that issues were prevalent. Some supply chain stakeholders felt that the rush to install measures at the end of CERT and CESP, together with the pressure to keep costs low (particularly under CERT), contributed to a number of the issues raised.

The range of issues raised by stakeholders is presented in Table 5.5

Table 5.5: Issues raised by stakeholders on the selling, installation, quality and reporting of measures

Issue	Concerns raised by stakeholders
Loft insulation	• No BBA[33] accreditation for loft insulation (CWI had BBA accreditation). A voluntary BBA scheme was created for loft insulation, but there was low uptake by the industry); • Installation quality was not as high for lofts as it might have been, even if the installations met technical monitoring requirements; • Some instances of 'under-manned' installations, with companies sending out one-man rather than two-man gangs to install measures; • Inappropriate products and solutions being applied to properties; • Failure to ventilate lofts adequately in some instances.
Cavity wall insulation (CWI)	• Instances of large-scale remedial works being carried out to counter poor installations; • Concerns that long-term issues will continue to be found as a result of poor quality or inappropriate installation; • Absence of long-term monitoring of installations means there is a lack of evidence of the long-term quality of measures.
External wall insulation	• Concerns about quality of installations e.g. detailing not good, thermal bridges left, damp caused as a result of incomplete coverage of insulation (the latter issue was widely reported in Case Study E, with all installations being replaced after 18 months) ; • Long-term difficulties might arise as a result of poor initial installation.
Selling of measures under CERT	• Concerns that householders encountered cold-call 'pressure-selling' from telephone and door sales people; • Instances of installers falsely claiming to be part of a local energy efficiency initiative in order to win work from householders; • Pre-installation surveyors recommending inappropriate insulation solutions to householders; surveyors being paid on commission were incentivised to sell rather than provide the 'right solution'.
Fraudulent behaviour	• Instances of installers false reporting measures to energy companies or selling measures to more than one supplier (not widespread); • Mis-selling of DIY insulation to the professional installation trade. (It should be noted that only a very small number of incidences were recorded via technical monitoring).

A number of issues and concerns were also raised by customers during the qualitative interviews, a summary of which is presented in Table 5.6. It is important to note that the incidence of these issues cannot be quantified, as the quantitative survey did not seek to understand the prevalence of particular reasons for dissatisfaction with measures or their installation. The following are as reported to the evaluation team during the qualitative interviews with customers and should only be considered as an indication of the types of installation problems faced by customers, rather than a conclusive or quantified examination of them.

[33] British Board of Agrément

Table 5.6: Issues raised by customers on the quality of installations, and quality of service[34]

Issue	Concerns raised by customers
Damaged property	Reports of damage to properties (mostly in Case Study A and Case Study D by CESP customers, and by CERT customers in Case Study E) including: damage to guttering, roofing, fences and external pipework. A number of these issues resulted in internal damage to plastering and paintwork as the result of leaks, internal damp and cracks to surfaces.
Disruption due to delayed removal of materials	Multiple reports by CESP customers in Case Study A of scaffolding left up for five to six months after installation. This had a number of implications for households including: difficult access for disabled householders in and out of home; Complaints that the whole local area looked like a construction site; and that youths began playing and running along scaffolding.
Post-installation clear-up	Almost all CESP customers interviewed in Case Study A and Case Study D reported problems with clearing up after installations in both public spaces and in residential properties, including: render from ESWI blocking drains and requiring unblocking; scaffolding and used material (e.g. render syringes, EWI block off-cuttings) left in alleyways between homes; paint staining pavements.
Replaced loft insulation	Loft insulation under CERT being inspected after initial installation and then installers revisiting to add/top-up existing insulation (in Case Study C and Case Study A).
Appearance of properties	Most CESP customers in Case Study D felt that the pebble-dashing finish applied to ESWI on their properties was not maintaining the appearance they were expecting.

[34] The issues listed in this table were cited in the qualitative interviews. They should not be considered as representative of the experiences in each area but they do illustrate the types of problems that were encountered by customers during the course of the programmes.

6. Impact of the programmes on industry

This chapter looks at the impact of the programmes on the energy efficiency industry (or specific sub-sections of it), as reported by energy suppliers, other industry stakeholders and as reported in other secondary evidence.

The evaluation evidence suggests that CERT and CESP were key drivers in generating demand for domestic retrofit measures, particularly insulation. This supports findings from the Office of Fair Trading's (OFT) 2012 report on *Home Insulation* (OFT, 2012), which concluded that insulation measures in existing buildings were "strongly driven" by government targets and schemes.

Moreover, estimated figures on the number of domestic properties across Great Britain that were insulated, as of January 2013, indicate that a significant proportion had been delivered via the two programmes, as illustrated by Table 6.1. The SWI industry was largely (68% of all measures) driven by CERT and CESP. It should be noted that only three per cent of domestic solid wall properties were estimated to have been insulated by this time (DECC, 2013), but the industry was clearly driven by the programmes.

Within the cavity wall housing stock, almost 20% of all installations resulted from CERT – a significant proportion of such as well-developed market (70% of all GB domestic properties are estimated to be insulated (DECC, 2013)).

Table 6.1: Solid and cavity wall GB homes insulated, and contribution by measures delivered under CERT and CESP[35].

	Total GB properties insulated (DECC, Jan 2013)	Total CERT installations (Ofgem, 2013a)	% of total GB installations via CERT	Total CESP installations (Ofgem, 2013b)	% of total GB installations via CESP	TOTAL CERT & CESP installations	% of total GB installations via CERT & CESP
SWI	204,000	58,916	29%	80,257	39%	139,173	**68%**
CWI	13,320,000	2,568,870	19%	3,000	0.02%	2,571,870	**19%**

Source: Ofgem and DECC

The evaluation evidence also suggests that there was very little self-generated consumer demand during the lifetime of CESP. For example, very few private tenure householders paid anything for the measures they received (8% of all case study installations in private tenure households), and social housing tenants had very little say (often none) in the process of receiving measures).

The impact of the financial subsidy is less clear-cut for CERT, however. Two in three (68%) of all CERT customers in the national survey said they would have installed energy efficiency measures even if they had not received the subsidy. However, many respondents in the qualitative interviews were not informed of the level of the discount they received and had no idea of the real market value of the measure. The measures available under CERT are not likely

[35]These figures are based on English Housing Survey data, as of 2008, to which has been added known measures delivered through Government schemes (these include CERT, CESP, Warm Front, Green Deal (including cashback) and the Energy Company Obligation (ECO)). This is supplemented with data on house building published by Communities & Local Government to provide an estimate for the latest quarter. Neither the DECC nor Ofgem figures include mitigation measures.

to have been promoted as strongly without the programme, so this level of interest in non-subsidised energy-efficiency measures should be treated with caution as it probably exaggerates the true extent of consumer demand.

6.1 CERT

6.1.1 Levels of activity supported

The energy companies achieved carbon savings of 296.9 Mt CO_2 during the lifetime of CERT. CERT supported considerable levels of activity in the insulation sector, as already discussed. Insulation measures accounted for just under two thirds of the total carbon savings achieved, including:

- Professionally installed loft insulation in nearly 3.9 million households
- DIY loft insulation in approximately 2.8 million households
- CWI in over 2.5 million households
- SWI in just under 59,000 households (Ofgem, 2013a).

A number of supply chain stakeholders thought that without CERT, there was unlikely to have been much activity in the professionally-installed sector, resulting in unemployment and business closure. They cited the relative lack of consumer demand and consequent activity for loft and cavity wall insulation under the Green Deal and ECO as evidence of this assertion.

> *If there wasn't CERT then there wouldn't be much of an industry. You can see that now as the schemes have finished and Green Deal and ECO are not picking up the slack.*

Supply chain stakeholder 13

Similarly, one DIY retailer noted that there was significantly more promotion of DIY loft insulation under CERT than there would have otherwise been, because it was worth a lot of money to the retailers involved.

Some supply chain stakeholders felt that volumes were substantial because CERT was based around insulation measures that could be installed relatively easily in a range of different property types across Great Britain. They reported that many organisations grew quite substantially over the CERT period, accompanied by the development of new skills and standards into the marketplace. The CERT Extension period drove particularly high levels of activity as a result of the IO.

6.1.2 Profile of activity

A common criticism of CERT by supply chain stakeholders was that they felt there were significant peaks and troughs in professionally-installed insulation activity through the lifetime of the programme. The OFT report explored this variability in activity and concluded that the uneven utilisation of capacity might lead to higher than average prices of installation. As highlighted in Chapter 8, high demand at the end of the CERT Extension period was a driver behind price rises.

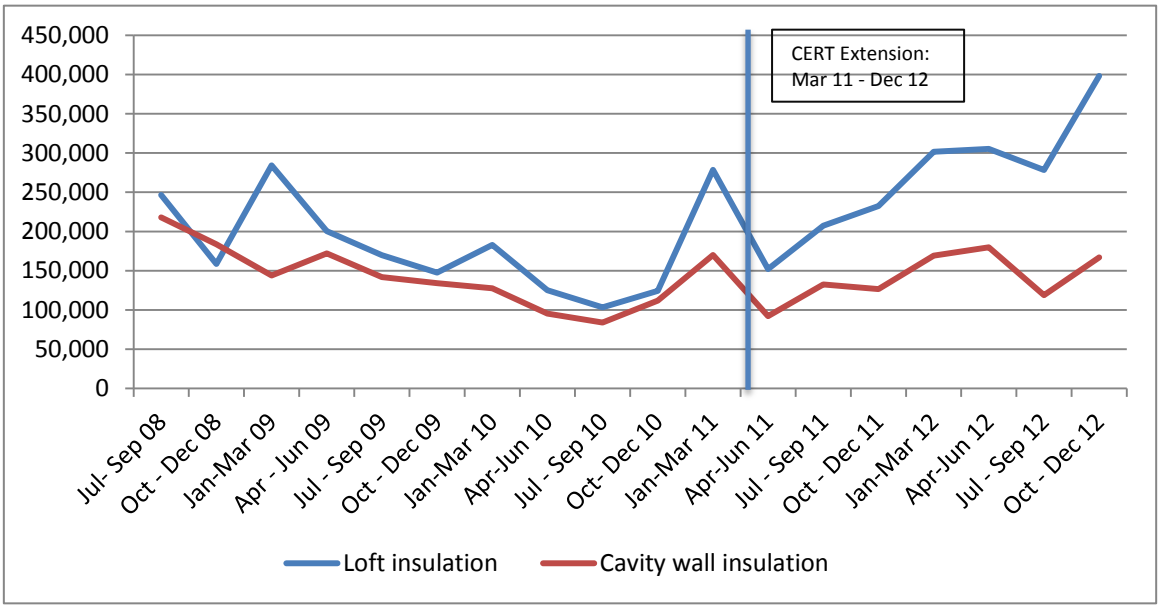
As shown in Figure 6.1, the profile of activity was relatively variable over the lifetime of CERT[36]. While this data may not precisely reflect the timing of when measures were delivered (as it is

[36] Note that these figures were originally published as a cumulative total each quarter by Ofgem. They were based on assumed numbers of installations based on estimated figures provided by the suppliers at the time, but may not be completely reflective of the actual delivery profile.

based on estimated figures each quarter), it does provide an indication of the longer term trend in delivery. Fluctuations were more marked for professionally-installed loft insulation than for CWI. Loft insulation saw three major peaks of activity: the first quarter of 2009 (284,174 measures), the first quarter of 2011 (278,458 measures) and then a substantial rise during the CERT Extension period to an end point of 398,293 measures in the final quarter of 2012. Levels dropped to a low of 103,361 measures in the third quarter of 2010.

The delivery profile for CWI remained more stable. The peak in delivery came at the beginning of the programme, as a result of rollover from EEC2. Whilst the profile is flatter than for loft insulation, there were still variations in delivery over time; from a low point in delivery of 83,921 measures in the third quarter of 2010, installations more than doubled by the first quarter of 2011 (170,088 measures) and reached a similar level by the final quarter of 2012 (167,025 measures).

Figure 6.1: Number of professional installed loft and cavity wall insulation measures delivered under CERT Source: Ofgem quarterly CERT updates



Three possible reasons for these fluctuations emerged from the stakeholder evidence:

1. **Seasonality**. Demand for insulation measures rose during the winter months when people wanted to take action to combat cold weather and energy bill price rises. This can be seen in Figure 6.1 with peaks in the first quarter of each year, including when the longer-term trend is downwards.
2. **The design of the scheme**. The original CERT period was due to end in March 2011, and some suppliers reported that their strategy had been to deliver a significant proportion of their obligation in the first half of CERT before 'winding down' activity to the end of the obligation. When the consultation for an extension to CERT was announced in June 2010, this also contributed to some degree of a slowdown in activity, as the energy suppliers waited for confirmation of the shape and scope of the extension. These factors might help to explain the downward trend from early 2009 to late 2010. When the extension began, some energy suppliers reported a period of adjustment as they revised their delivery strategies and put new contracts in place; one energy supplier likened changing direction during an obligation to changing the direction of an oil tanker. The ramp up in delivery towards the end of the CERT Extension was partly to correct this readjustment period, but also because meeting the obligation and sub-obligation targets

were challenging, particularly the SPG sub-obligation, as discussed elsewhere in the report.

3. **The energy suppliers' delivery strategies**. There were also some suggestions that in some cases the energy suppliers deliberately held back their funding for measures in order to secure better prices, although this was not a view supported by the evidence from the energy supplier interviews.

Supply chain stakeholders reported that these fluctuations raised a number of issues for the industry including labour management, skills retention, business survival and cash flow. One supply chain stakeholder, for example, described needing to train hundreds of people at short notice in order to meet demand. The impact of the fluctuations on this particular company is illustrated by the number of delivery teams they used to meet demand. At the outset of CERT they began with 10 delivery teams but by the time of the first peak in the first quarter this had increased to 40 teams. The workforce then dropped down to 20 teams when demand subsided, before expanding again to 80 teams by the end of the CERT Extension period.

The fluctuations made it difficult for the industry to forward plan. This was considered to be a greater issue for CWI, which requires a skilled workforce to deliver, often on permanent contracts. Loft insulation, on the other hand, was regarded as a 'less skilled' activity which made it easier to manage labour numbers. The loss of skilled staff raised a concern that this had impacted negatively on quality.

Some supply chain stakeholders argued that greater transparency about energy supplier progress in delivering their obligations would have enabled them to forward plan more effectively.

> *A key problem for our company is that we would see an opportunity, anticipate demand and gear up accordingly, recruiting staff and so on. But then we would find that nothing would come through. So there was a cycle of taking on and laying off staff. There needed to be more transparency.*
>
> Supply chain stakeholder 14

6.1.3 Contractual arrangements

The evaluation interviews suggest that the energy suppliers took fairly consistent approaches to working with installers. This provided some level of certainty for the industry over the lifetime of CERT, despite the fluctuations in demand.

> *Over time there was a consistency of approach by different suppliers that was helpful in allowing the supply chain to engage and work in a similar way. It was predictable what one needed to provide.*
>
> Supply chain stakeholder 5

All of the energy suppliers had bilateral arrangements with one or more large installer for the installer to 'self-generate' some or all of the suppliers' share of carbon savings through professionally-installed insulation. These arrangements involved the installer finding leads and delivering the work, then selling back the carbon to the supplier. Installers also worked as contractors to deliver work secured through direct offers from suppliers to customers, as well as other routes, such as local authority or housing association schemes.

In terms of the 'self-generation' agreements, contracts with installers generally seemed to be agreed on the basis of delivering a certain volume of Mt CO_2 at an agreed price per tonne.

Prices varied across sub-obligations, with rates for SPG carbon securing the highest prices (see Chapter 8). Towards the end of CERT, energy suppliers also typically requested that installers deliver a certain ratio of carbon across the different obligation groups, to ensure the mix reflected the size of each-obligation.

The length of contracts seemed to vary slightly from supplier to supplier, ranging from having contracts in place for the length of the initial CERT period, to rolling contracts throughout the programme, with periodic price reviews.

Once up and running, supply chain stakeholders generally felt that arrangements worked well and that payment was timely. However, a number of supply chain stakeholders reported that prices could periodically change at short notice. This made some installers wary of committing expenditure based on agreed prices.

> *Generally the contract was in place and it was operating and they would just suddenly say that actually the market price has changed, we are only paying you X for that work. So that was one of the things that kind of exposed us.*
>
> Supply chain stakeholder 4

During the first phase of CERT, a number of installers felt that the energy companies were able to dictate prices and volumes to the industry, as supply was plentiful (the suppliers had other, non-insulation routes available). The size and nature of the obligation meant that the demand was not high in relative terms and there were just six players in the market.

> *One of the downsides was the fact that there were only six energy companies and they very much were the dominant players. You know, if they want you to do something regardless of what is in the contract you kind of have to do it…that's just the nature of what it is.*
>
> Supply chain stakeholder 4

The most extreme example of this provided in the evaluation interviews was of a supply chain stakeholder reported that an energy supplier had reneged on a contract with them at the end of CERT, resulting in a £1.5 million shortfall for the organisation.

This balance appeared to shift under the CERT Extension, as alternative supply routes were effectively restricted (e.g. lighting and DIY insulation), the size of the obligation was increased, the IO was introduced and the introduction of the SPG obligation resulted in particular delivery challenges. As described in Chapter 8, this meant that installers were able to capitalise by charging higher prices.

The need to identify SPG customers also resulted in the prominence of ‘lead generation agencies’ during the CERT Extension period. These companies generated leads through telemarketing and door-to-door sales, before selling leads onto installers on the energy suppliers. This contributed to the rise in prices (discussed further in Chapter 8).

6.1.4 Industry response to CERT

Given the fluctuations of demand for insulation from the energy suppliers, a key challenge for the industry was ensuring capacity was in place. Overall, the industry appears to have been largely successful in meeting increases in demand. One energy supplier reported that although there were constraints around the capacity of the industry to deliver at times, it was not a major issue. Similarly, one installer reported being able to deliver significant volumes (400 insulation jobs per week) with no problems for its supply chain.

As Figure 6.1 indicates, energy supplier demand at the end of CERT was mainly met through increased delivery of loft insulation measures. As discussed above, loft insulation was regarded as a relatively 'unskilled' job by many stakeholders, making it straightforward for new entrants to the market and for existing companies to employ additional staff.

> *It [supply chain capacity] seems to have all been added in loft so, you know, I characterise summer 2012 as almost a Wild West in the insulation industry … you just needed to go to a build centre and buy some rolls of insulation, hire a van and you can set up on your own quite easily.*
>
> Energy supplier 1

Both energy suppliers and supply chain stakeholders expressed concerns that meeting demand and responding to fluctuations were not without their consequences however. Concerns were raised that quality may have been compromised as a result of inexperienced, unskilled labour coming to the market, combined with the drive to keep costs low.

6.1.5 Transition to ECO

Many stakeholders felt strongly that the transitional arrangements from CERT to ECO and the Green Deal had a negative impact on the industry. Whilst the ECO and Green Deal are not within the scope of this evaluation, it is worth noting that the design of CERT and its successor obligations contributed to a "cliff edge" for the loft and cavity wall insulation industry. The industry expanded rapidly in 2012 to meet demand, but then saw activity levels fall rapidly in 2013. No wider industry data, which presents a consistent measure of the scale of the industry over time, could be found as part of this evaluation with which to support this finding.

Several case study stakeholders complained that some energy suppliers had withdrawn funding with little notice at the end of CERT because they had met their targets under the programme. This had led to awkward situations where clients had signed up for insulation but there was no funding to deliver it.

In Case Study B, the local authority had significant problems at the end of CERT, when offers were free to all but then suddenly withdrawn when funding was pulled. Supply Chain Stakeholder B2 reported that the energy suppliers differed in when they withdrew funding, affecting 2000 of their clients across the country. Some households had installations booked but then withdrawn in December 2012. Local Authority Stakeholder B1 reported that a couple of hundred households were affected in their area.

Similar problems were reported in Case Study E, where the local authority ended up having to find money to deliver insulation for some customers who had already had a survey, after the energy company withdrew funding.

The end of CERT was ridiculous. Everyone knew it was coming from two years ahead; it got to October and the energy company said that was it, they'd met their target, they were not doing anything more.

Local Authority Stakeholder E4

Funding can be switched off at a day's notice – can find 3,000 letters have just been sent out and then 3 days later you cannot honour them.

Supply Chain Stakeholder E2

A number of stakeholders felt that consideration should be given to the design of future schemes to ensure that this cliff-edge scenario is prevented or at least minimised. ECO commenced in October 2012 and there was therefore a three month overlap between the programmes. Nonetheless, many stakeholders felt that ECO had started slowly, for various reasons, which had negated any benefit for the industry of this overlap. Scheme design and lessons for future policy design are discussed in more detail in Chapter 11.

There were also concerns that CERT had helped a legacy of expectations amongst customers that energy efficiency measures, particularly loft insulation and cavity wall insulation, should be free or very low cost. A number of stakeholders reported that this had resulted in difficulties in promoting these measures under Green Deal and ECO.

6.2 CESP

6.2.1 Levels of activity supported

CESP supported delivery of a range of insulation, heating, microgeneration and district heating measures. A total of 293,922 measures were installed altogether. The most prominent measure was external wall insulation (75,255 measures), followed by heating controls with a new heating system (60,016) and replacement boilers (42,898) (Ofgem, 2013b).

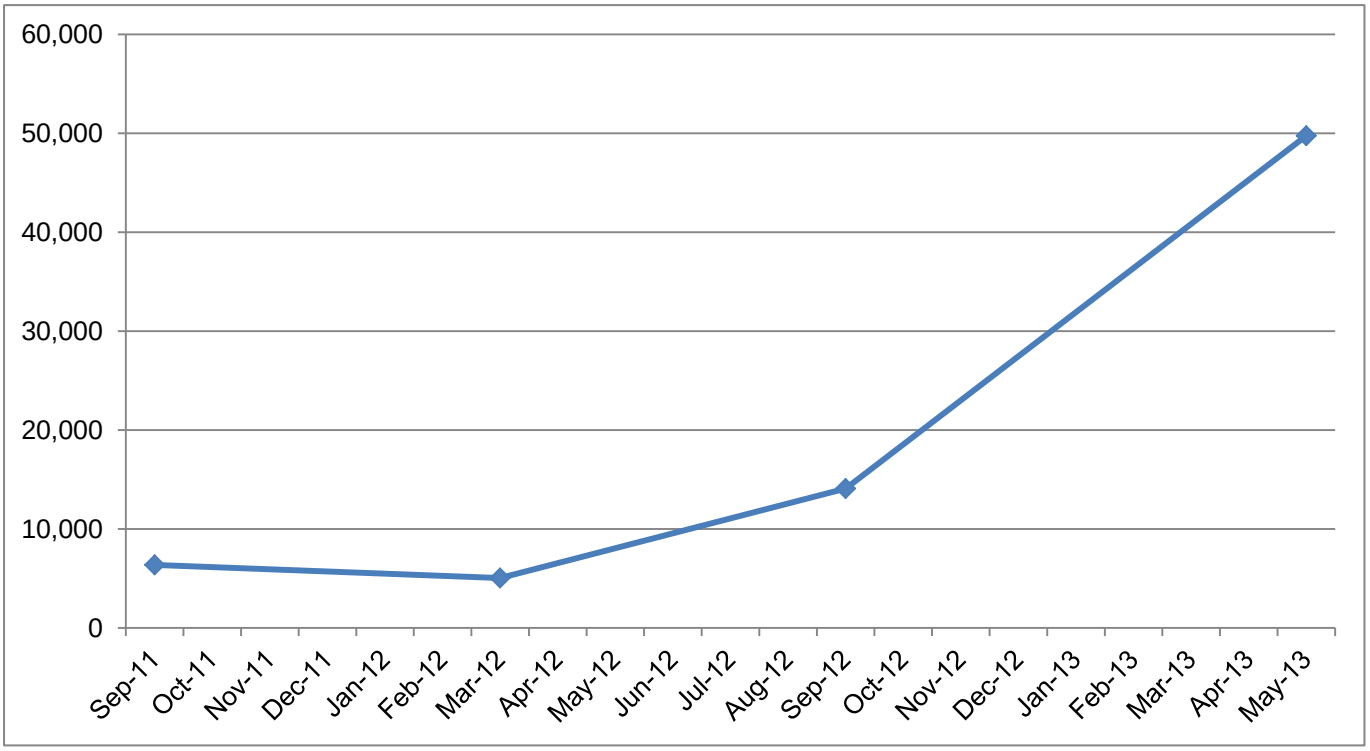
Many stakeholders involved in the delivery of CESP thought that the scheme had helped to develop the external wall insulation industry, supporting an expansion of capacity, skills and expertise. Table 6.1 supports this view.

6.2.2 Profile of activity

As reported in the interim CESP evaluation, there was a slow start to activity in CESP. This was due to a combination of factors including the complexity of the scoring system, delays in the scheme approval process, long timescales for scheme development and long project delivery timescales.

This resulted in a significant back-loading of activity towards the latter stages of the programme. As Figure 6.2 shows, In September 2011, Ofgem reported that 6,367 EWI measures had been delivered under CESP, compared to a final figure of 49,756 EWI measures delivered by the end of the programme.

Figure 6.2: Number of external solid wall insulation measures delivered under CESP. Source: Ofgem quarterly CESP updates



This back-loading was widely forecast within the industry and raised concerns about the capacity of the industry to respond to the anticipated demand. A report for Consumer Focus in 2011 (Association for the Conservation of Energy, 2011) found that stakeholders were concerned that the number of trained and professional installers was insufficient to deal with the likely demand for external wall insulation created in the final year of CESP.

6.2.3 Impact on the industry

6.2.3.1 Capacity

The industry did meet this capacity challenge, but there were consequences of doing so. Several supply chain stakeholders reported shortages in materials needed for the work, particularly scaffolding. A number said that the industry did make efforts to increase the skills base to meet demand, but that finding appropriately skilled staff was a challenge. There were reports that labour gaps were met through employing workers from Ireland and Eastern Europe. Stakeholders reported that these shortages reduced the quality of work delivered and contributed to a rise in prices. These issues are explored in Chapters 5 and 9 respectively.

6.2.3.2 Under-performance

Some of the independent generators entered into contracts with third parties to deliver some or all of their obligations. In some cases, the third parties were unable to deliver these contracts, leaving the independent generators with significant shortfalls in meeting their obligations. Failure to deliver appeared to be the result of the original contract prices with the third parties, which did not enable the third parties to compete as market prices rose over time, as well as more general difficulties in identifying and securing schemes across the market. At least one of the independent generators interviewed reported that they were likely to seek redress from the third party as a result.

More generally, the independent generators in particular experienced a wide variety in performance and reliability of contractors. Independent generator 2, for example, reported that the first organisation they contracted failed to deliver. They then contracted another three companies, at the same time, with considerable variation in success of delivery. They found that one of the contractors was very effective:

> *They were very good at contacting Ofgem direct; delivered on time, delivered the quantity of tonnes they promised, and didn't ask for price rises after the scheme had been delivered.*
>
> Independent generator 2

However, the other two contractors provided a very contrasting experience. One scheme, for instance, set out to deliver 100,000 tonnes at £45 per tonne, but only delivered 60,000 tonnes at £55 per tonne, with delays in delivery. The independent generator felt that this was down to the contractors' lack of experience and reflected more generally a dearth of expertise in the market.

6.2.3.3 Access to the market

A small number of supply chain stakeholders reported that CESP discouraged smaller installers from entering the market. The nature of the projects – major building works – meant that some smaller organisations did not have the capacity to deliver them. Frameworks and tenders also set limits, such as the requirement to have a minimum turnover, which also excluded smaller installers, although work could sometimes still be accessed through subcontracts. This situation contrasted with CERT, where a small contractor could self-generate volumes of work at more attractive rates.

6.2.3.4 Contractual arrangements

Stakeholders reported that the nature of the CESP's design and administration made contractual and financial arrangements challenging in some cases. The amount of carbon delivered for each CESP scheme was often not known until the project end, when the number of uplifts and bonuses, and therefore total carbon saving, could be confirmed. The methodology for calculating bonuses and uplifts was made available to obligated parties by Ofgem, however, and obligated parties could calculate these themselves. Final calculations were not carried out by Ofgem until the completed report for each scheme was approved by Ofgem following full compliance checks on the measures notified. Bonuses and uplifts could only be applied to approved schemes. In some cases therefore, payment by the obligated party was only made once carbon scores were approved. This meant that CESP projects could carry significant financial risk for delivery partners.

In one instance, a community delivery stakeholder reported that they had been in discussions with an obligated party to deliver a scheme. The stakeholder carried out the works believing that the obligated party would buy the CO_2 saving, but no contract was put in place and the party decided not to buy the CO_2.

However, this was not always the case. One energy supplier, for example, said that they took on the risk for CESP projects, paying for delivery of the works irrespective of the final carbon scores for schemes.

6.2.4 Transition

As under CERT, stakeholders reported that transitional arrangements from CESP to successor policies had negatively impacted on the industry. A drop-off in activity led to supply chain

companies scaling back the size of their operation as the levels of demand created under CESP were not maintained into 2013.

7. Impact of the programmes on individuals and communities

This chapter explores the impact of the programmes on local communities and on the households who received measures. It focuses on the impacts on:

- Satisfaction with the home;
- Heating behaviour;
- Thermal comfort;
- Health;
- Unintended consequences;
- Energy bills and affordability of heating;
- Perceived impact on the local area, including employment and wider regeneration.

This chapter also considers non-customers and reasons given for non-participation.

This chapter is based primarily on perceptions of survey respondents – both the national Omnibus and also the case study surveys and qualitative interviews. This is supported, where possible, by evidence from the stakeholder interviews. It should be noted that the impacts listed above are not isolated for specific measures installed, due to the low base sizes involved for different types of measure, and the difficulty of distinguishing impacts where customers received multiple installations.

7.1 Overall opinion on the programmes

The overall opinions of the programmes are discussed here in terms of customers' perceptions on the measures they had installed, satisfaction with their home and/or the local schemes they participated in. The overall picture is encouraging, with most customers reporting positive experiences of the programmes overall.

7.1.2 Satisfaction with home as a place to live

Satisfaction with homes has improved to a greater extent among CESP customers than non-customers. More than three in ten (31%) CESP customers were more satisfied with their home as a place to live than they were before the scheme began. This compares to just 14% of non-customers. Only one in eight (13%) customers were less satisfied.

This scale of improvement in satisfaction with home is not seen for CERT customers, however; one in five (20%) were more satisfied than they were before the scheme. Moreover, they are no more likely to be satisfied than households that have not received a CERT measure (19%). However, CERT non-customers were more likely to be *less* satisfied with their home as a place to live since the schemes began than customers (21% vs. 17%).

To attribute respondents' recent changes in satisfaction (and in particular to assess whether it was related to the CERT and CESP programmes), respondents were asked why they were more or less satisfied with their homes. Nearly half (48%) of CESP customers who were happier

with their home credited this to *the energy efficiency measures* that were installed under the programmes.[37] This equates to 15% of all CESP customers who were more satisfied with their home than before the scheme and who cite the energy efficiency measure as the prime reason for this. In contrast, less than one in ten (8%) CERT customers who were happier with their home attributed it to the CERT measure they received (2% of all CERT customers).

Many CERT and CESP customers attributed their increased satisfaction to *their own initiatives or home improvements* they had undertaken (63% and 20% respectively) or to general improvements in the *local area* (15% and 19%). These two reasons may in some part reflect the activity of CERT and CESP, however it cannot be certain to what extent they relate directly to the them. Due to low base sizes, differences between case study areas cannot be commented on.

There are only very few cases of CERT or CESP measures contributing to increased dissatisfaction with customers' homes. Of those who were less satisfied with their home as a place to live, no CERT customers and only five per cent of CESP customers directly referenced *the energy efficiency measures* as a reason for their increased dissatisfaction.[38] The most prevalent reason was that the *local area had got worse* (32% of CERT customers, 41% of CESP customers), with customers also mentioning the impact of their *own initiatives or home improvements* (6% and 12% respectively) or *their home has become more run down* (12% and 7% respectively).[39] Due to low base sizes, differences between areas cannot be commented on.

7.1.2.1 Benefits of measures

A great majority of customers felt their household has benefited from the measures installed under the two programmes. Seven in ten (69%) CERT case study customers considered they had benefited a great deal or a fair amount from the measures installed (Figure 7.1), while for CESP customers the figure is even higher at eight in ten (81%). Very few CERT and CESP customers (both at three per cent) considered they had not benefited at all from the measures. However, CERT customers were more likely to state they did not benefit very much from the measure than CESP customers (24% vs. 10%).

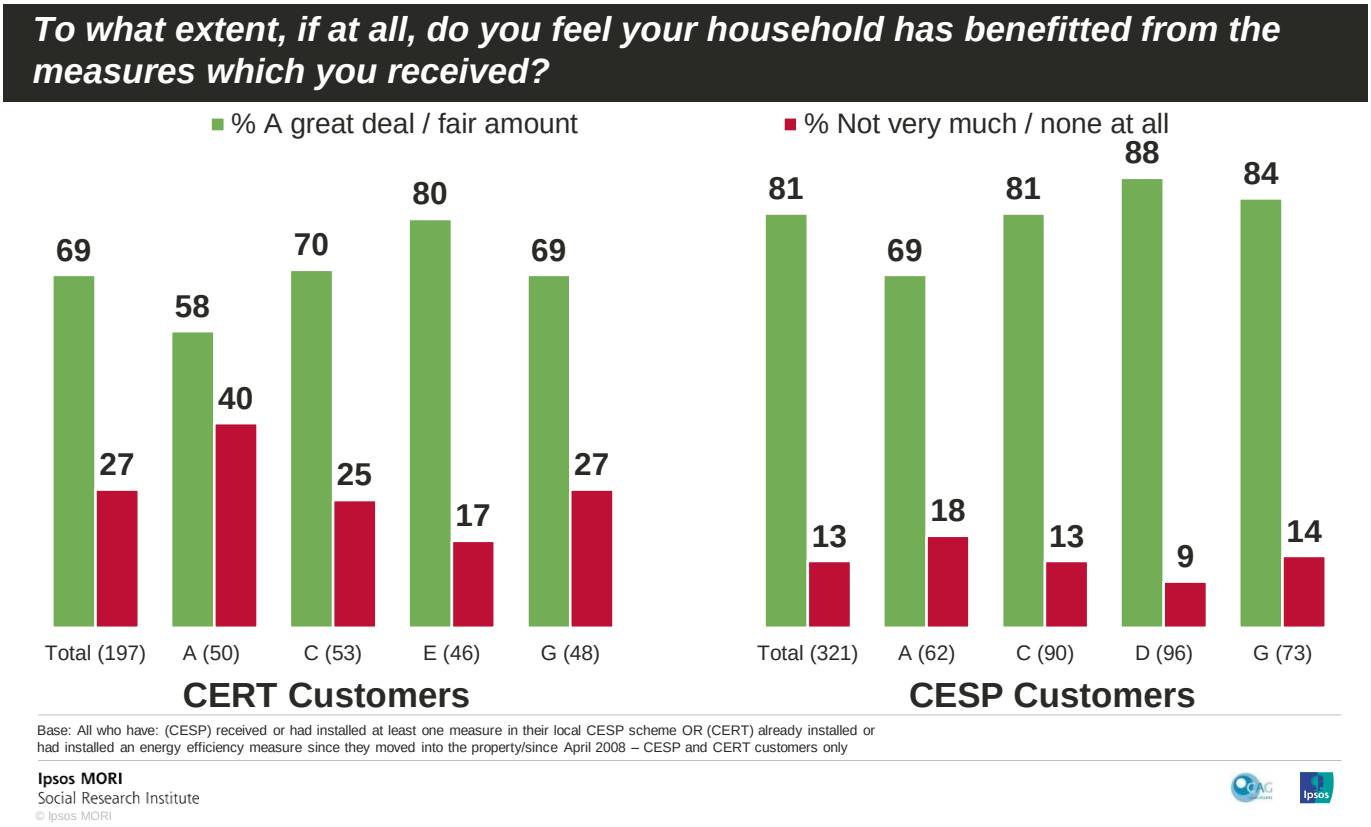
There was some variation between case study areas in the degree to which customers believed they benefitted from the measures, both for CERT (ranging from 58% to 80%) and CESP (69% to 88%).

[37] Note this is from a small base size: 40 for CERT customers.

[38] Small base size: 34 for CERT customers, 41 for CESP customers.

[39] Small base size: 34 for CERT customers, 41 for CESP customers.

Figure 7.1: CERT and CESP customers' perceptions of the benefit the measures have had on their household. Results are shown by overall total and by case study area.



The quantitative data does not allow (due to small base sizes) us to draw definitive conclusions on these differences by case study area. The qualitative research, though not offering concrete explanation, does assist in identifying factors (tentatively deductible from the quantitative data) that may play a part in the variation seen. For instance, CESP customers in Case Study A are less likely than those in Case Study D (where similar levels of EWI were installed) to say they have benefited from the measures. This may be due to the length of time the EWI had been installed – customers in Case Study A tended to have only received their measure within the last year, as opposed to Case Study D where installations occurred a number of years ago. Further anecdotal evidence from the qualitative research suggest that the type of measures installed and the quality of the housing stock also play a part in informing customers' opinions on the benefit of measures.

Those with poorer health were less likely to consider that they had benefited from the measures installed. Over three in four (77%) CERT customers who consider the quality of their general health to be either excellent or very good said they benefited from the measures compared to three in five (62%) of those with fair or poor health. This difference does not exist in CESP customers. However, differences by health do exist in terms of advocacy of the local CESP scheme (see below: *Advocacy of Local CESP scheme)*.

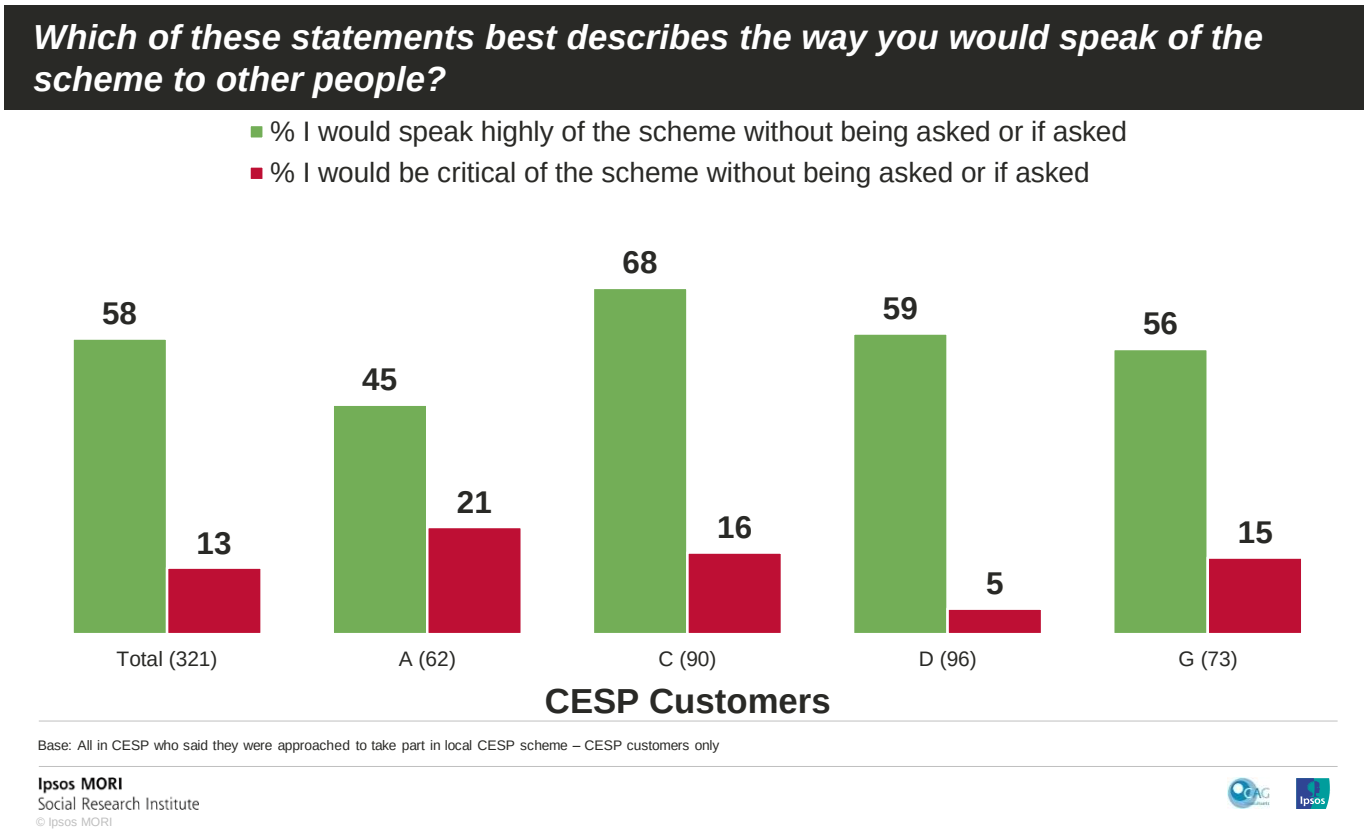
7.1.2.2 Advocacy of local CESP scheme

Of all customers approached to take part in their local CESP scheme, advocacy of the scheme was high. Overall, nearly six in ten (58%) customers would speak highly of the scheme, with around one in eight (13%) who would be critical. Around two in ten (18%) would be neutral about the scheme (Figure 7.2). Of the 15 respondents who were approached to take part in

their local CESP scheme but did not participate, four would speak critically of the scheme; three would speak highly and three would be neutral (five stated don't know).

Some variation does exist by case study area and by self-reported health in advocacy of local schemes. Fewer than half (45%) of CESP customers in Case Study A would speak highly of the scheme, compared to almost seven in ten (68%) in Case Study C. Those customers who consider their general health to be poor were more likely to be critical of the scheme (24%) than those whose health is either excellent or very good (11%) or fair (11%).

Figure 7.2: Advocacy of CESP customers of the scheme they participated in. Results are shown by overall total and by case study area.



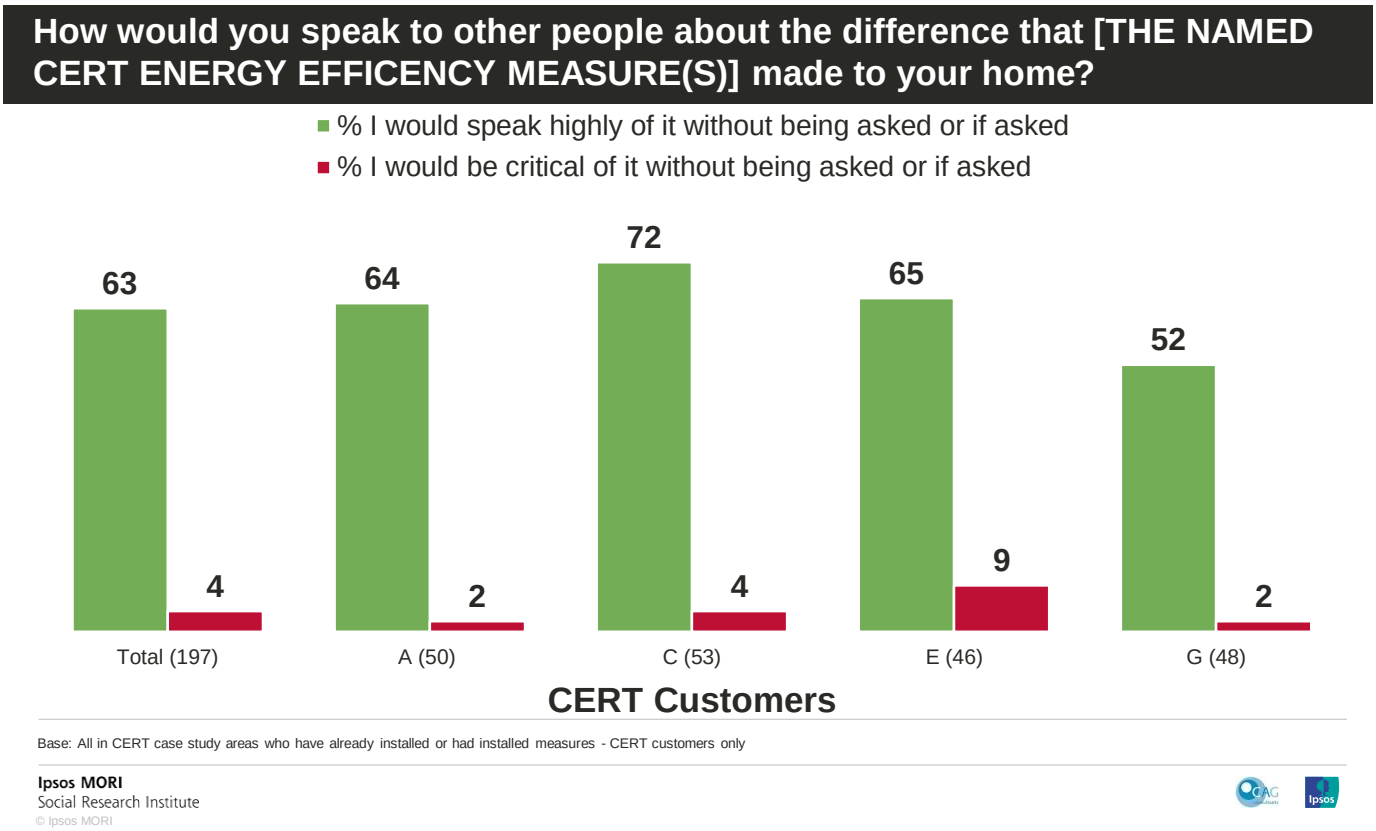
7.1.2.3 Advocacy of CERT measures

Nationally, many CERT customers surveyed speak highly of the CERT measures they have received. Overall, over half (54%) of customers would speak highly of the difference the measure has made to their home and only two per cent would be critical. However, just under half (43%) of CERT customers would be neutral suggesting they have not experienced a noticeable impact.

More than six in ten (63%) CERT case study customers would speak highly of the difference the energy efficiency measures have made to their home, with just four per cent who would be critical. Around three in ten (31%) customers said they would be neutral. Customers in Case Study C tended to be more positive (72%), with those in Case Study G (52%) less so (Figure 7.3). One hypothesis that may be developed from the qualitative research, is that this higher level of advocacy of the impact of measures is due to the tenure of customers; those in Case Study C were more likely to be owner occupiers (most in Case Study G lived in housing association properties) and therefore would have been more involved in the decision to receive

the measure. It could be argued that customers who owned their property would be more engaged with the measures installed, and the impact they had on their property.

Figure 7.3: Advocacy of CERT customers of the difference the measures have made to their home. Results are shown by overall total and by case study area.



7.1.3 Impact on households

The impact of the two programmes in improving the energy efficiency and comfort of housing stock is a key focus of the customer phase of the evaluation. The national and case study surveys attempted to quantify positive or negative impacts identified by customers, with the follow-up depth interviews focusing on understanding the nuances and underlying reasons.

7.1.3.1 Impact on heating behaviour

The evaluation sought to uncover to what extent the two programmes have had an impact on customers' behaviour in terms of energy consumption in the home. This outcome could be precipitated through a variety of channels, such as information provision, customers' renewed engagement with home energy efficiency measures or increased control over their heating systems. To identify the scope of any behavioural change, two questions on energy use (to heat homes and for lighting and appliances) were asked in all case study areas and the CERT national survey.[40]

[40] These questions were asked at the beginning of the surveys before any questions on energy efficiency measures and/or the schemes to avoid leading respondents. The first question asked "I am going to show you a number of statements about **how you use energy, for example gas or electricity, to heat your home**. Please tell me which of the following statements most closely relates to you", with the second asking "I am going to show you a number of statements about **how you use electricity in your home for lighting and appliances, but not heating**. Please tell me which of the following statements most closely relates to you". The answer codes provided were: A) I haven't tried to reduce [the energy I use to heat my home / the electricity I use], and do not want to. B) I haven't tried to reduce [the energy I use to heat my home / the electricity I use], but would like to. C) I have tried to

On a national level, the majority of CERT customers surveyed said they have *been able to reduce* either the energy they use to heat their home (67%) or the amount of electricity they use in their home (63%). However, they were no more likely than non-customers to claim this (63% and 65% for non-customers respectively). Furthermore, customers were equally as likely as non-customers to say they *have not tried to reduce* the energy they use to heat their home (15% vs. 20%) or their electricity usage (17% vs. 19%).

Within the CERT case study areas, a similar story exists, where a majority of customers *have reduced* the energy they use to heat their home (57%) or their electricity usage (56%), but this does not differ significantly from non-customers (62% and 59% respectively).

In the CESP case study areas too, the majority of customers have *been able to reduce* either the energy they use to heat their home (57%) or the amount of electricity they use (55%). However, as with CERT customers, CESP case study customers are no more likely than non-customers to have exhibited these positive behaviours (reduced energy use for heating - 53% - or electricity - 58%).

All CERT and CESP customers were also asked directly whether they were more aware of how much energy their household consumes since the energy efficiency measures were installed.[41] In a more positive note than the findings above, customers (when directly asked) did consider they were more aware of how much energy their household consumes. More customers agreed than disagreed with the statement across all three surveys - CERT national survey (59% vs. 17%), CERT case study (42% vs. 28%) and CESP case study areas (47% vs. 21%).

However, when trying to assess potential differences in energy efficiency behaviours between customers and non-customers, it should be noted that here are limitations in doing so through self-reported perceptions alone. Furthermore, the lack of differences between customers and non-customers reducing their energy use may reflect wider societal trends that have had greater impacts than the programmes could deliver – such as changes in attitudes to household expenditure brought about by the wider economic environment or greater general awareness of ways to reduce household energy consumption. Moreover, as discussed later in section 7.1.2.4, there is limited evidence (based on customers' recollections) of widespread provision of information on energy saving behaviours.

Within the process case study research, anecdotal evidence suggests some existence of changes in CERT customers' heating behaviour. Two community members in Case Study B who had been directly involved in scheme design and delivery cited cases of residents who were increasingly setting their thermostat at a lower temperature or heating their homes for shorter periods of time than they were previously doing.

This was echoed in the customer research, where a number of customers (who were positive about the impact of the measures on their home) referred to new behaviours such as setting lower temperatures using the radiator thermostatic valves and no longer having the "*heating on full"* (CESP customer, Case Study D). Many customers interviewed also cited greater control of the heating of their home as a result of the measures.

---

reduce [the energy I use to heat my home / the electricity I use], but have found it hard. D) I have reduced [the energy I use to heat my home / the electricity I use], but could reduce it further. E) I have reduced [the energy I use to heat my home / the electricity I use] as much as I possibly can.

[41] The wording of these two statements differed between the national and case study surveys. All were asked if they agreed or disagreed with the statement, but the national survey statement was "I am now more aware of my energy consumption since the measure(s) were implemented", compared to "I am now more aware of how much energy my household consumes since the measures were installed" in the case study survey.

The household survey findings and stakeholder interviews suggest that the two programmes have brought about some positive behavioural changes in regards to energy use. For instance, many customers felt they are more aware of the energy they consume since they had the measures installed (on a self-reported measure). However, due to the lack of any baseline data on behaviour, it is difficult to draw definitive conclusions.

7.1.3.2 Improving thermal comfort

A majority of customers (72%) in the CERT national survey either strongly or tended to agree that their home feels warmer since they had energy efficiency measures installed. Moreover, CERT customers were also more likely than those installing non CERT measures[42] (61%) to say their home now feels warmer with the measure. One possibility is that this indicates that the supporting advice alongside CERT measures has helped increase their impact, or that CERT customers were more in need of improved thermal comfort than non-customers. However, based on the degree to which customers recall receiving advice on how to use their energy efficiency measure (relatively few do), and the fact that CERT customers tend to have higher incomes than non-customers (see later in this chapter for further details), this difference is likely to be a result of the types of measures, or combination of measures, that CERT customers have received.

A similarly positive picture emerges in the case study areas; three quarters (75%) of CESP, and nearly two thirds (63%) of CERT, customers in case study areas agreed. This greater impact in CESP rather than CERT case study areas was echoed by stakeholder views. Stakeholders reported that the primary benefit of CERT and CESP schemes had been to improve the energy efficiency of homes and reduce bills, but the impact appeared to be more marked for CESP than CERT, because of the greater thermal impact of CESP measures. In the qualitative interviews with customers, many participants gave evidence to supplement their reasoning. Examples provided included no longer needing to use blankets around the home, using less bedding during the winter, wearing fewer layers of clothing and generally warmer rooms.

> *When I'm watching TV sitting in the lounge I don't put a blanket on when I'm sitting there anymore. That's something I did notice. I have sometimes worn my coat [*before the measures were installed*] but I don't think I'll have to do that anymore.*
>
> CESP customer, Case Study A

> *You can feel the difference the loft insulation has made when you go up the stairs. The rooms feel a lot warmer. In the last couple of winters since it was put in, I don't use the same amount of blankets on top of my duvet as I used to as I get too hot during the night.*
>
> CERT customer, Case Study C

> *Coming into the house from outside used to be like stepping in from a fridge into a freezer.... We used to have just one gas fire in our front room to heat the whole house – over both floors… The walls in the bathroom have been covered in ice before. The house isn't like that anymore.*
>
> CESP customer, Case Study A

However, the follow-up customer interviews also raised some missed opportunities with regard to fully realising the potential benefits of the warmth of homes. For instance, one CERT

[42] By non-CERT measures this refers to any energy efficiency measure that does not meet the criteria set out in Appendix A7.

customer in Case Study E stated that the external wall insulation on their property had not led to any perceived improvement in the warmth of their home due to the poor quality of their old, single-glazed windows. In Case Study A, a CESP customer indicated that a poor quality outside door and window meant that part of the property was not much warmer after the installation of multiple measures (EWI, loft insulation, new boiler) than the difference made in other parts. This also raises the question of whether the thermal efficiency of homes was always to a suitable standard before measures were installed).

7.1.3.3 Managing heating

More than two thirds of CESP (67%) and CERT (69%) customers in the case study surveys considered they have a great deal of control over setting the temperature in their home. However, non-customers are equally as likely to report this (59% and 70% respectively). The lack of difference between customers and non-customers may be attributable to lack of relative experience on the part of non-customers (i.e. non-customers have not had many measures installed so have not experienced the amount of control customers now have) or perhaps that non-customers have relatively high quality heating systems already.

Nevertheless, a recurring theme in the qualitative research amongst a number of customers was their improved ability to control the temperature in their home through the measures installed under CERT and CESP (particularly the impact of new boilers and controls). Interviewees referred to control in relation to the ability to heat selected rooms, or being able to warm their home quicker

> *When I went on holiday I could turn off all the radiators that wouldn't be used by my boys, as they spend all their time in their rooms. So I just had those [radiators] on and in the kitchen, I haven't been able to do that before. It saved [her sons] wasting money whilst I was away.*
>
> CERT customer, Case Study C

> *[Before cavity wall and loft insulation were installed] we had to run [the heating] at a higher level in order to maintain a decent temperature. Now with the cavity walls and the loft insulation we run it at a lower level and still maintain the same temperature more easily.*
>
> CERT customer, Case Study G

Some stakeholders also echoed these sentiments, suggesting that energy efficiency and fuel switching measures enabled people to heat their homes more effectively therefore reducing under-heating. For instance, this had enabled them to heat, and use, their whole home, rather than one room.

> *People crank up their heating so the savings are not much. If you don't have gas central heating – and you use two-2 bar fires instead – the heating bill would be £2000, so you under-heat the house. With gas [central heating] they can actually heat their homes. Families are able to use the whole house as heating is more affordable*
>
> Supply Chain Stakeholder G1

However, the qualitative research also highlighted missed opportunities in which customers were not able to manage their new measures effectively. A number of customers both demonstrated and discussed that they were either not using the installed heating controls at all (for example, switching the boiler on and off to warm the home) or to their full potential (such as

not using timers or different temperature settings). In many cases, a lack of knowledge of how to use the controls was the main factor for not using them correctly.

> *None of us understand [the thermostat], I just switch it on and off here [the main switch] and try and set the temperature. It seems to have a mind of its own though, the temperature goes up and down all the time. My sons are really good with technology but they have read the instructions for [the thermostat] and still can't to get it to work.*
>
> CERT customer, Case Study A

Several case study stakeholders commented on the importance of energy advice, including understanding of existing heating systems, being part of the delivery package. For example, an energy consultant in Case Study C reported that much needed to be done to engage with residents on behaviour change. He found that there was enormous diversity in what people living in similar properties were spending on energy, with residents overheating and under-heating to a large degree. Also, in Case Study G, an energy agency was employed by the council to provide advice to householders through an advice centre.

CESP schemes which involved replacement of heating systems also generated a further need for advice about how the new systems worked. One local agency (in Case Study C) was involved in supporting residents who found that the residents' homes were being overheated after measures were installed as the residents were not aware of how to control the temperature. The agency therefore provided advice to these residents on how to use their heating controls. Similarly a housing association in Case Study G reported that it was still dealing with issues now of explaining to people how their new heating system works.

Further evidence of this emerged from the CESP householder qualitative interviews in Case Study G, where some residents seemed unsure about how to use their thermostat. For example, in one property the householder controlled the temperature by turning the boiler on and off, but without adjusting the thermostat. At the time of the interview the temperature was observed by the interviewer to be very warm. In this particular case, this issue may have been exacerbated by the installation engineer's instructions of how to use the boiler.

> *"He said to leave it at 25 [degrees Celsius] and not to change it at all."*
>
> CESP customer, Case Study G

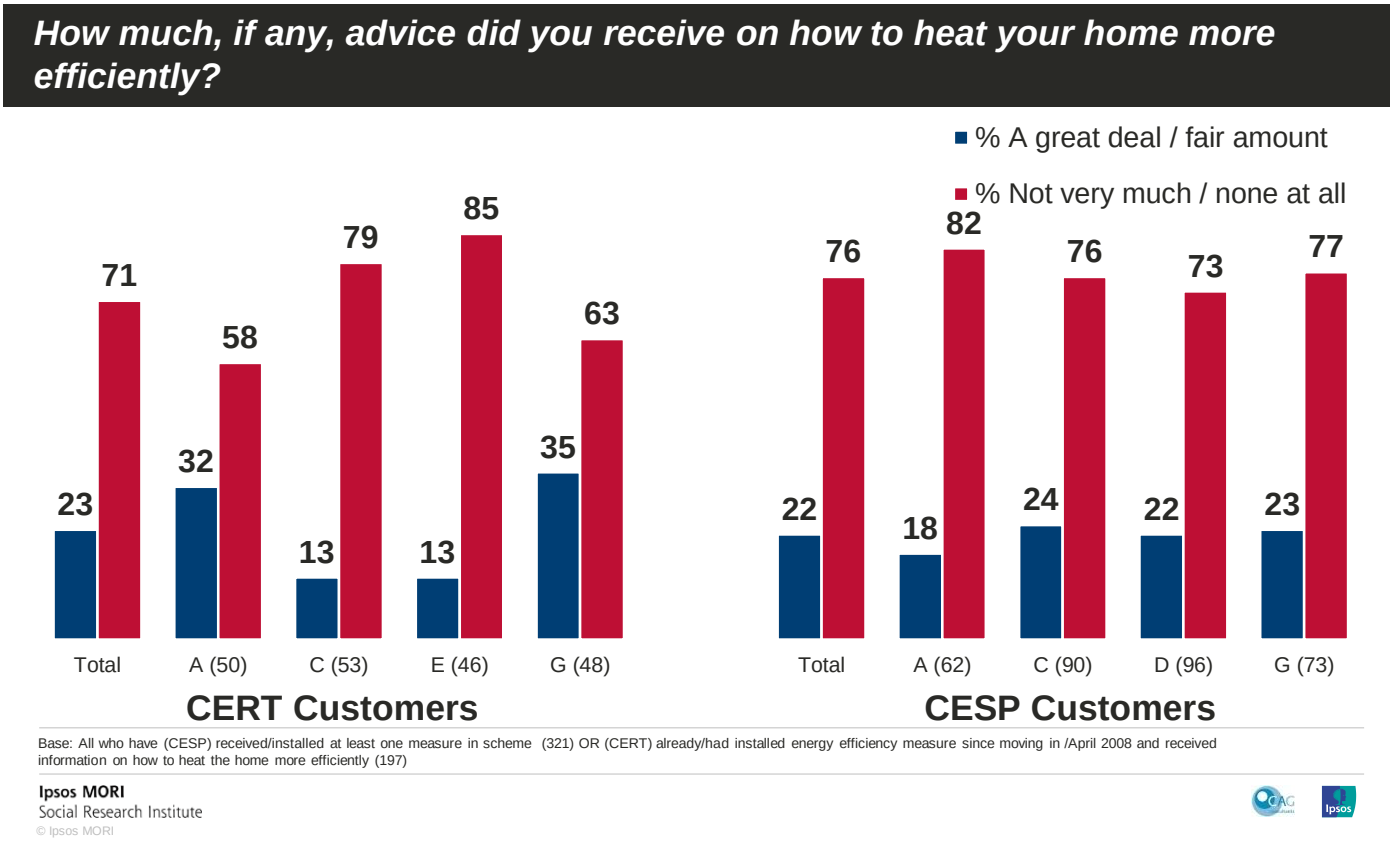
The degree to which customers were informed of ways to improve their energy efficiency is discussed in the following section.

7.1.3.4 CERT and CESP case study areas: information received on heating the home more efficiently

The degree to which customers say they received information or advice on how to control their heating system varies. Around two in five CERT (39%) and three in ten CESP (31%) customers say they received a great deal or fair amount of information (Figure 7.4).

Overall, fewer recall receiving information on how to heat their home more efficiently; less than one in four said they received a great deal or fair amount of information (23% in CERT areas and 22% in CESP areas).

Figure 7.4: Advice that customers received on energy efficiency. Results are shown by overall total and by case study



The qualitative interviews with householders also indicated that there was generally little recollection of receiving information on heating the home more efficiently as part of the CERT or CESP schemes. It should be noted, however, that in some cases these interviews were conducted a number of years after the energy efficiency measure was installed which may have influenced levels of recall.

Of the minority who did receive information about more efficient heating, nearly three-quarters of CESP customers (72%) and nine in ten (91%) CERT customers said they understood it well. A sizeable minority of CESP customers (26%) said they did not understand it well, however.

Most CERT and CESP customers found the information useful (84% and 66% respectively). Again, a quarter (27%) of CESP customers did not find it useful, compared to just 13% of CERT customers.

These results suggest that while important as part of the wider 'energy efficiency package', advice and information on how to get the most out of CERT and CESP measures was not always fully available or utilised. This may undermine the potential carbon savings that could have been achieved as a result of the programmes.

7.1.3.5 Unintended consequences (overheating of homes and increased condensation)

Despite customers on the whole noticing the benefit of the warmth their home, the evaluation also aimed to determine if there is any evidence of unintended consequences such as overheating of homes or increased prevalence of condensation. To identify any existence of this, the case study survey indirectly asked respondents (i.e. before they had been prompted

about their energy efficiency measures) whether they opened their windows more or less often now than before the schemes started, either to *let cool air in* or *due to condensation*.

There is no evidence from the case study survey that CESP measures have led to widespread over-heating of homes; customers are no more likely than non-customers to report an increase in opening the window to allow cooler air in. This is the case in both CERT (6% vs. 6%) and CESP (10% vs. 9%) case study areas.

With opening windows more often due to condensation, CESP customers overall are slightly more likely to report doing this more often than non-customers (9% vs. 1%). However, no notable difference exists between CERT customers and non-customers (7% vs. 6%).

These findings suggest that overheating has not been a significant negative impact of the two programmes. Only eight per cent of all customers over both CERT and CESP case study areas reporting they open their windows more to let cooler air in (vs. seven per cent for all non-customers). Similarly, eight per cent of all customers now open their windows more due to condensation (vs. five per cent for all non-customers). This lack of any significant difference between customers and non-customers, as well as the fact that there is little variation by type of energy efficiency measure, suggests the two programmes have had limited impact on over-heating.

7.1.3.6 Impacts on heating bills

A number of different questions were asked in the case study survey to identify whether customers' heating bills had increased or decreased due to the energy efficiency measures they had installed.

The first set of questions asked about changes in expenditure on heating over the winter months since either the start of CERT in April 2008 or the start of their local CESP scheme.[43] Overall, in households where someone is responsible for paying the heating bill, the majority considered their monthly household expenditure on heating during the winter months to have increased (70% of everyone in CERT areas and 64% in CESP areas). Just one in twenty (5%) in CERT, and one in eight (12%) in CESP, areas believed their winter bills had decreased.

In CESP areas, customers are no more likely than non-customers to say their bills have gone down (13% vs. 10%). However, CERT customers were more likely than non-customers to say their bills had increased (78% vs. 63%). While this may appear to be counter intuitive, it may be due to a number of factors, such as the fieldwork taking place over a period of heightened media interest in energy bills and the most recent winters having been unusually cold and therefore being top-of-mind for respondents. These background issues are no different for customers than non-customers, however, it is possible that CERT customers are generally more engaged with energy efficiency, and consequently, their energy bills.

National Energy Efficiency Data-Framework (NEED) data shows that recipients of these measures in 2011 did benefit from reduced energy use. Observed cumulative gas consumption savings delivered through a combination of CWI, loft insulation and a new boiler were measured

[43] Question wording: Compared to [CESP: the year before the scheme started / when you first moved into the property] / [CERT: April 2008 / when you first moved into the property] to what extent has your monthly household expenditure on heating during the winter months increased, decreased or stayed about the same?. Asked of those who live in a household where someone is responsible for paying the heating bill (excluding electric heaters)

to be 19.7% through NEED data, and individual gas consumption savings were as high as 14.2% for SWI.[44]

However, the qualitative research phase illustrated the difficulties that many respondents (both customers and non-customers) had with making an informed and accurate assessment of changes in their energy bills. The main reason that many had difficulties in doing so was attributed to ongoing rises in energy prices.

> *I haven't noticed them [the energy efficiency measures] reducing my bills, but at the same time energy bills have gone up and my grandson is using more electricity as he is getting older and older.*
>
> CERT customer, Case Study A

Over the duration of the programmes, average annual domestic electricity bills have increased in real terms by 20.1% (between 2007 and 2013), while average annual domestic gas bills rose by 43.0% (2007-13).[45] Other factors such as using pre-payment meters, energy costs being included in service charges, changing on to different energy tariffs and the 'erratic' nature of the weather over the last couple of years were all cited as additional issues hampering customer's ability to comment on the impact of measures on energy bills.

> *With my meter [pre-payment meter] I don't really have much idea how much I using over time as I don't get regular bills.*
>
> CESP customer, Case Study G

> *I have a pre-payment card for my gas and the electricity is direct debit. I just put money on the card when we need it, I don't really keep track. With the electricity, the amount I pay is the same every month, so I can't really say if that bill has increased as well.*
>
> CERT customer, Case Study A

It is also worth noting that some of the CESP customers interviewed in the case study areas received their measures less than a year before the survey. The impact of these measures may therefore not yet have been fully realised.

Those respondents saying they had seen a reduction in their heating bills were asked for their explanation for this, providing respondents the ability to directly attribute any decreases to the energy efficiency measures installed under the scheme.[46] As so few customers believed that their bills had decreased, there is limited scope to analyse differences between CERT and CESP customers. However, on a combined level, more than seven in ten (72%) case study customers over the two programmes referred to the energy efficiency measures as the reason for their heating bill reduction. It is important to note that this equates to only seven per cent of all CERT and CESP customers that have experienced a decrease in their energy bills and attribute it to the energy efficiency measures installed.

While few said their bills had fallen when compared to previous winters, there appears to be a more significant impact when asked directly about the measures installed. The second set of

[44] https://www.gov.uk/government/statistics/national-energy-efficiency-data-framework-need-report-summary-of-analysis-2014

[45] https://www.gov.uk/government/statistical-data-sets/annual-domestic-energy-price-statistics

[46] Question wording: You said earlier that compared to when [you moved into the property/April 2008] your household expenditure on heating has [decreased/increased]. What is this mainly due to?

questions directly asked respondents' about the extent to which they agreed or disagreed that *on average, the amount my household spends on [heating / electricity] has decreased since the energy efficiency measures were installed.* More CESP (39%) than CERT (24%) customers agreed that their household spending on heating has decreased since the energy measures were installed.

A similar pattern is seen for spending on electricity. More CESP customers agree than CERT customers (31% vs. 19%) that their expenditure on electricity has decreased. While these questions were not directly related to the measure that had been installed (the question asked *since* the measures were installed, not *due* to), it does suggest that CESP customers were more likely to benefit from reduced energy bills.

Beyond the quantitative surveys, there was also anecdotal evidence from case study stakeholder interviews that some customers did benefit from reductions in heating bills. Stakeholders reported that heating bill savings tended to be more significant for CESP than for CERT, owing to the number and nature of the measures installed.

> *Estimated [fuel bill] savings range from around £150 per annum for simple measures to in excess of £500 per annum where multiple measures have been installed.*
>
> Local authority stakeholder G5

Case study stakeholders cited a range of anecdotal savings made by residents. One stakeholder reported a saving of £120 per year as a result of a CERT scheme. Other stakeholders quantified the CESP savings in terms of the proportion of the bill reduced. Some claimed that CESP residents had made savings of 30 to 50 per cent off their bills, whilst another reported that key meter usage had been reduced by a quarter.

> *I have anecdotal feedback about key meter usage being down from say two visits a week to one every fortnight or every week.*
>
> Housing Sector Stakeholder E5

It should be noted that, as already discussed, savings on this scale were not reported by customers. This may reflect the difficulty that many customers had with identifying the impact of the measure in isolation from external factors. Indeed, whilst many case study stakeholders were enthusiastic about the savings made from CERT and CESP schemes, a few expressed a concern that rising energy prices might cancel out the savings made by the measures – a thought echoed in the customer qualitative interviews.

> *Energy prices have gone up anyway, so I hope that the overall increase in bills had not outweighed the savings.*
>
> Community Delivery Stakeholder C2

7.1.3.7 Affording to heat homes adequately

To investigate the impact on the ability to heat homes to an acceptable level affordably, the CERT national survey asked respondents the extent to which they agreed or disagreed that "*before the measures were installed, it was too expensive to heat the home adequately*".

Similarly in the case study survey, customers were asked whether *"the new measures mean I can now afford to heat my home to an adequate level".*[47]

One in three (32%) CERT customers in the national survey agreed that before the measures were installed, it was too expensive to heat their home adequately (Figure 7.5). The equivalent figures were 37% and 53% in CERT and CESP case study areas respectively, indicating that the programmes did have some success in reaching those who were at risk of fuel poverty (on the basis of a self-reported measure rather than official measures of fuel poverty).

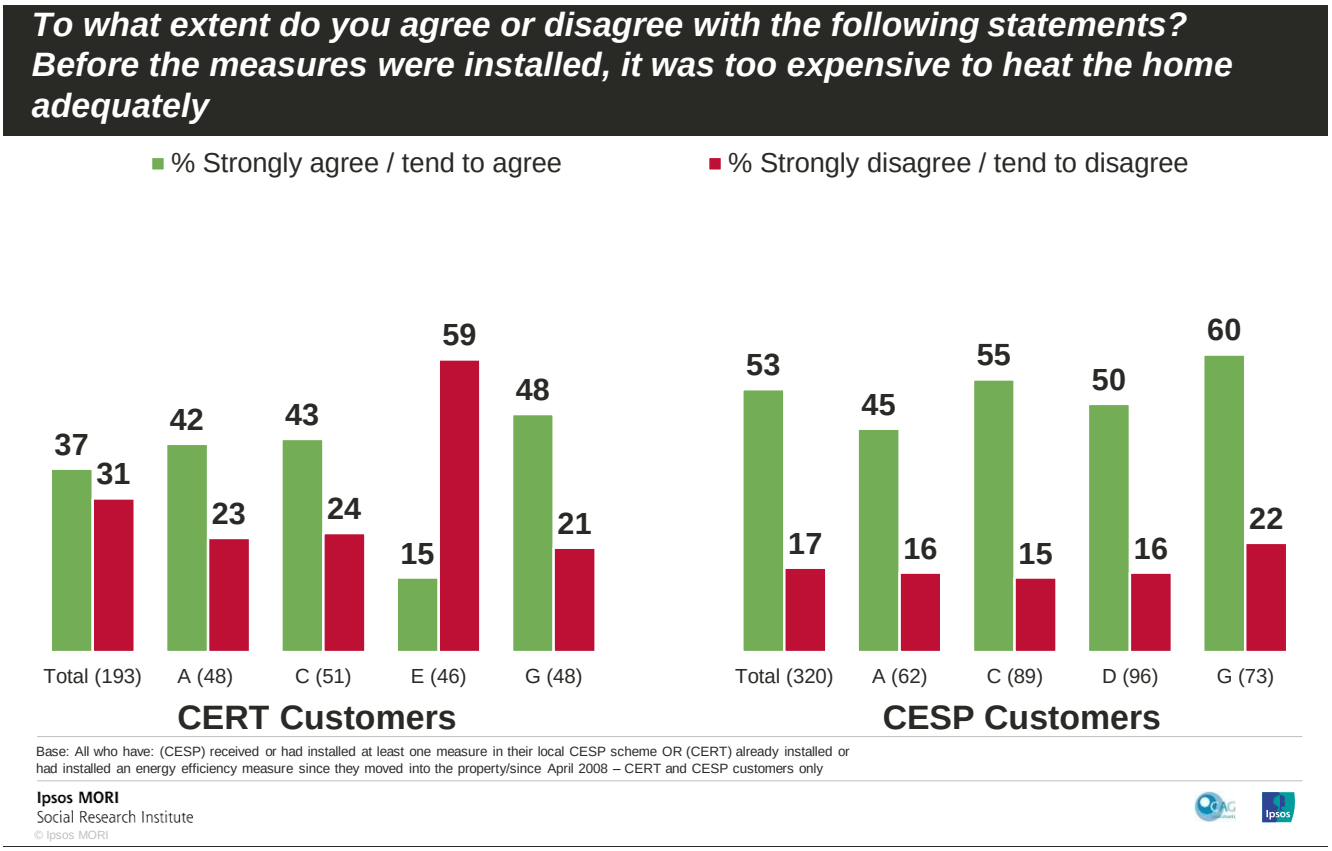
More than four in ten (44%) CERT, and around six in ten (58%) CESP, case study customers agreed that they can now afford to heat their home adequately. The impact of the programmes on those who were previously struggling to afford energy is clear; 82% of all CESP customers who previously could not afford to heat their homes said they can now afford to do so to an adequate level (46% of all customers). For CERT customers, seven in ten report this (70% and 28% of all customers).

This indicates that, although many customers say their energy bills have increased, a significant proportion do believe the measures they received have cut their spending. This is almost certainly overshadowed by the extent of price increases over the course of the programmes. Furthermore, around half of customers say they can now afford to heat their homes adequately which many previously were not able to do.

Differences are evident amongst case study areas, with CERT customers in Case Study G (54%) more likely to agree than those in Case Study C (34%) and CESP customers in Case Study G (77%) more likely to agree than any of the other CESP case study areas.

[47] Though an identical statement to the CERT national survey is asked in the case study survey, this statement is used as it is asked of all – the corresponding statement is not asked in the case study survey if the respondent is not responsible for paying their heating bills.

Figure 7.5: Perceptions of CERT and CESP customers on the affordability of heating their home adequately before the measures were installed. Results are shown by overall totals and by case study area.



7.1.3.8 Health impacts

The evidence on impacts of CERT and CESP measures on customers' health is mixed.[48] Around one in ten customers said their general health has been either a little or a lot better due to the energy efficiency measures installed (10% in the CERT national survey, 9% in CERT case study areas, 10% in CESP case study areas). No more than three per cent (across all surveys) reported their health to have worsened due to the measures installed. Though clearly some have benefited, the impact appears to have been marginal.

Customers (CERT and CESP combined) in case study areas[49] who self-report as having poor general health are split equally between those who believe their health has deteriorated as a result of the measures (12%) and those who think it has improved (13%). However, it should be noted that many serious health conditions would not be improved by improved thermal comfort of the home.

These are very small proportions of customers; a great majority consider their general health has stayed about the same; around three quarters of CERT (70%) and CESP (77%) case study

[48] The questions record the health of the respondent, rather than the household as a whole.

[49] Small base sizes limit this analysis for customers identified in the CERT national survey.

customers (stating their general health is poor) reported that their general health was unaffected.[50]

However, health improvements should not be overlooked as a minor impact for two reasons. Firstly, impact on health is likely to be underestimated. The evidence presented here is reliant on respondent recall (e.g. some may find it difficult to isolate the energy efficiency measures as a particular factor amongst all the others that might impact on their health) and that the survey participants with poorer health (who are more likely to identify benefits) may be less likely to participate in a face-to-face survey.

Secondly, the depth interviews did identify considerable, tangible improvements on peoples' lives in the context of their health. Some participants noted the ways that they felt more comfortable and mobile in their home as a warmer home had associated improvements in health.

> *"I have Raynaud's disease, so I really do feel the cold. Since they've put in cavity wall and loft insulation, with the new boiler too, I don't need to walk around the house with gloves and a coat like used to; some days I used to wear a woolly hat indoors. I now feel as comfortable in my house as my partner does."*
>
> CERT customer, Case Study C

As such, these quantitative and qualitative findings do provide some evidence to support the several case study stakeholders who cited ways in which CERT and CESP schemes generated health benefits (but who did not always have evidence to substantiate their expectations). For example, a stakeholder in Case Study E reported that a CERT scheme had reduced referrals to other services. Whilst one of the energy suppliers felt that CESP had helped to improve respiratory illness and other health impacts.

> *It improved people's health, particularly people with things like asthma or breathing difficulties because it reduced VOC's[51] in the atmosphere. It reduced mould out of people's properties.*
>
> Energy Supplier 1

7.1.3.9 Impact on fuel poverty

The true extent of CERT and CESP's impact on fuel poverty is very difficult to ascertain. Assessing the impact of CERT on low-income households and the fuel poor is hindered by the fact that there was no requirement to monitor the delivery of measures to these specific groups. The introduction of the SPG in the CERT Extension went some way to addressing this, but this only applied to the latter half of the programme.

Whilst many stakeholders felt that CERT helped to reduce fuel bills and improve homes, one local authority stakeholder questioned whether CERT measures were adequate to lift households out of fuel poverty, suggesting that more of a whole house would be needed to achieve this. This is a view supported by a study by Ekins and Lockwood (2011), which reported that much of CERT funding goes to households who do not need help and are able to pay for measures themselves.

[50] Note this is from a small base size: 37 for CERT customers and 61 for CESP customers.

[51] Volatile Organic Compounds

Results from the national CERT survey align with this assessment, as the figures below illustrate (all differences are statistically significant). CERT customers are more likely than non-customers to be:

- In **higher social grades[52] -** 34% vs. 27% in social grade AB;
- **Classified as 'Wealthy Achievers'** in the Acorn classification (26% vs. 16%);[53]
- Judge the **current financial situation of their household as good (61% vs. 53%)**
- Have a total **household income per year of more than £25,000** (41% vs. 32%)[54]
- Be an **owner occupier** (90% vs. 64%)[55]

Other studies, however, found that CERT had helped to reduce fuel poverty to some extent. The Hills Review final report to DECC 'Getting the Measure of Fuel Poverty' (2012) referred to CERT and CESP being regressive in that only a proportion of benefits accrued to low income households. They showed CERT resulting in a small increase in the number of fuel poor households, since CERT is targeted across the income distribution and as such does not improve the relative position of fuel poor households. DECC's report 'Trends in fuel poverty – 2003-2011 – 10% definition' (2013) found that CERT had some success in targeting resources to households with elderly occupants, owing to the PG sub-obligation. This report found that fuel poverty in households where the oldest occupant was 75 or over fell from 29 per cent of households in 2008 to 24 per cent in 2011.

It is also difficult to assess the impact of CESP on fuel poverty and low income groups given the lack of socio-demographic information on customers who received measures. However, as already discussed, almost half of all CESP customers surveyed in the case study areas went from a position of struggling to afford their heating to being able to do so, as a result of the measure they received. Moreover, over half of customers in three of the four case study areas had a gross annual household income of less than £16,000[56]. While just a snapshot of selected case studies, this suggests that CESP did reach and support many low-income households.

7.2 Wider impacts on local communities

7.2.2 Overall regeneration of local area - CERT

[52]Social grade is a demographic classification system, split into six groups (A, B, C1, C2, D, E). This classification is derived from the British National Readership Survey (NRS). The classification is based on the chief income earner in a household. Social grade A refers to high managerial, administrative or professional workers, with B as intermediate managerial, administrative or professional workers. Further detail can be found at: http://www.ipsos-mori.com/DownloadPublication/1285_MediaCT_thoughtpiece_Social_Grade_July09_V3_WEB.pdf

[53]Acorn is a geodemographic classification system that segments UK postcodes and neighbourhoods into 6 Categories. The Wealthy Achievers is described as "These are some of the most successful and affluent people in the UK. They live in wealthy, high status rural, semi-rural and suburban areas of the country. Middle-aged or older people predominate, with many empty nesters and wealthy retired. Some neighbourhoods contain large numbers of well-off families with school age children, particularly in the more suburban locations." (http://www.esds.ac.uk/doc/6069/mrdoc/pdf/6069_acorn_userguide.pdf)

[54] From all sources, before tax and other deductions,

[55] This aligns with data from the EST, where 89% (of known) CERT energy efficiency measures were installed by owner occupiers.

[56] It is difficult to comment on the fourth case study area as over half of customers refused to divulge information on their income. Even taking this into account, 36% of all customers in this area had an income of less than £16,000.

The regeneration impact of CERT was generally reported to be relatively limited, because the measures had no visible aesthetic impact on properties. However, a stakeholder in Case Study A reported significant impacts from benefits advice that was offered as part of a multi-agency approach to CERT. The stakeholder reported that the advice had generated in excess of £1million of benefits payments over three years.

7.2.3 Overall regeneration of local area – CERT CESP

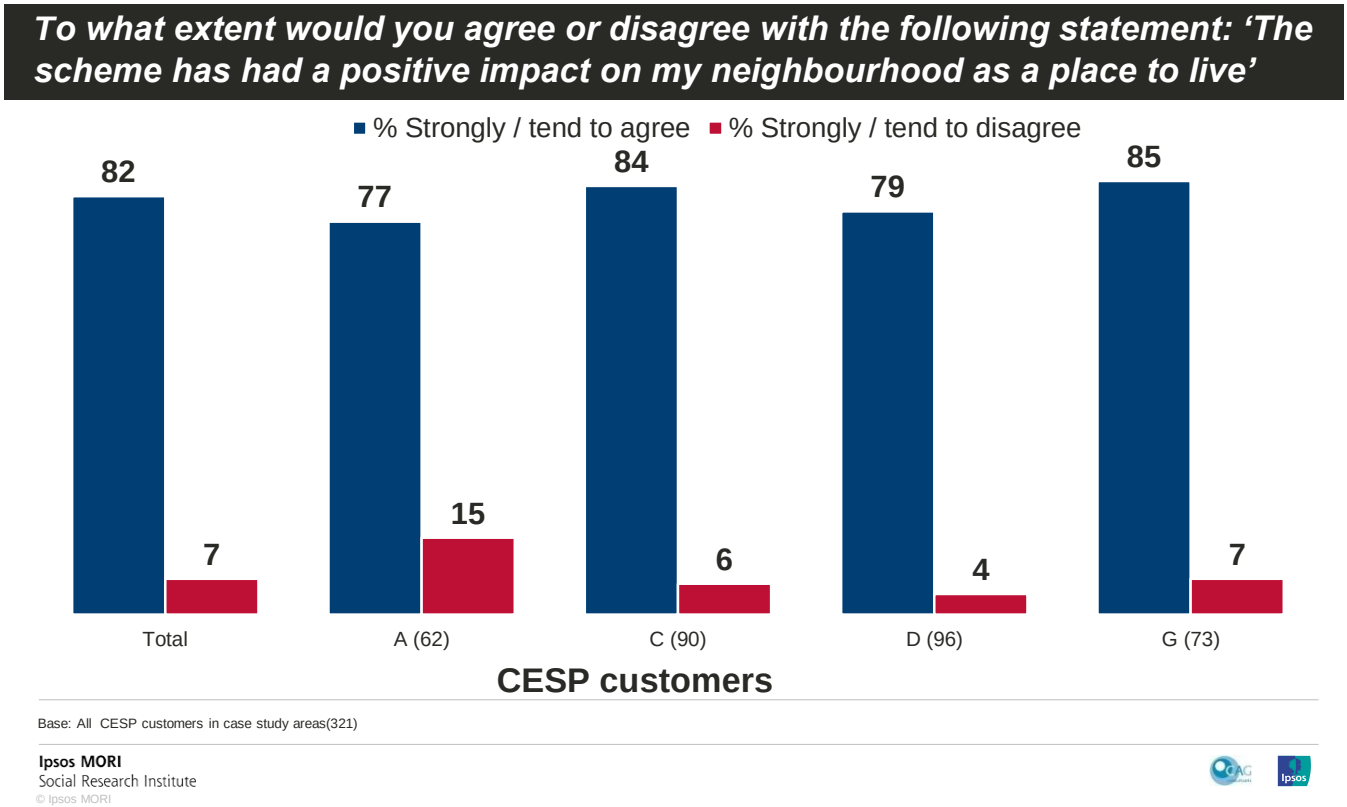
All the case studies and many national interviews generated evidence of significant regeneration impact of CESP schemes. The visual improvement of CESP areas, largely through external wall insulation, was reported to be one of the biggest benefits.

7.2.3.1 Impact on visual appearance of the neighbourhood

Perceptions of impacts on the wider community were explored in the CESP case studies (via both the surveys and qualitative in-home interviews). It was not covered in the CERT surveys however. This was because CESP schemes were delivered locally within defined boundaries, whereas CERT, a national scheme, was not delivered in this way. The impact of CESP activity on a neighbourhood tended therefore to be more obvious and easier for respondents to comment on.

CESP case study respondents (customers and non-customers) overwhelmingly agreed that '*the scheme has had a positive impact on my neighbourhood as a place to live*', with over three quarters (77%) agreeing (Figure 7.6). Views of CESP customers were even more positive; with eight in ten (82%) believing it had a beneficial impact (N.B. non customers were no more negative than customers; 59% agreed it had a positive impact and just nine per cent disagreed, however, a greater proportion – 15% - could not offer a view).

Figure 7.6: Perceptions of CERT and CESP customers on the impact of the schemes on their neighbourhood



Participants in qualitative interviews in CESP areas also tended to speak highly of schemes in terms of neighbourhood impact, focusing primarily on the physical appearance of the area. Social housing tenants were particularly impressed with improvements in this respect. This was often where external wall insulation had been applied across a whole estate, driven by the housing provider.

> *"[The measures installed] makes it look more respectable, a more green neighbourhood. [It is] quite nice all the houses look the same now. Some of them don't look older than others. They look modern. Other people must be happy like I am."*
>
> CESP customer, Case Study D

Results were similar across most of the CESP case studies with the exception of Case Study A. Respondents here were significantly less likely than overall to agree the scheme had a positive local impact (65% vs. 77% overall), reflecting the concerns about installation already discussed.

The impacts in terms of improving the appearance of the neighbourhood were felt by some non-social housing tenants to be patchier. Customers interviewed in Case Study A (where measures were specifically targeted at private households) reported that, where the majority of properties had measures installed, the measures generally transformed the look of the area for the better. However, they also echoed the assessment of the Demos report that it had also led to a more 'mis-matched' appearance where some homes were left out.

In Case Study G, one participant contrasted the majority of properties on the estate which were owned by the housing association and had all received external wall insulation, with a minority of residents who had exercised their right to buy and had refused the measure.

"You can tell the bought houses, some of them haven't had the work done"

CESP customer, Case Study G

The visual appearance of the measures and the impact on the local area were cited as important factors in the schemes; in Case Study D, interviewees explained that both the way they were approached and their reasoning for having the EWI installed were primarily focused on the aesthetics.

The visual improvement of CESP areas, through external wall insulation, was the most commonly reported to be one of the biggest benefits seen. In some cases, stakeholders had observed this had knock-on effects in terms of improving the local economy (through property prices and letting rates). Other benefits cited included increases in community pride and activity (for example through the formation of tenant groups and community projects), reductions in antisocial behaviour and improved school attendance.

The regeneration is huge. The whole area has been transformed. People are saying that it's the best thing that's ever happened to the area. In one street, they decided to move on to other things – a community gardening project, hanging baskets, they have taken over care of public realm and they're getting kids and schools involved.

Local authority stakeholder A1

Two case studies (A and C) mentioned that CESP schemes had prevented some housing developments from being demolished. The delivery of the schemes had not only extended the life of the homes and regenerated the neighbourhood, but had been done at lower cost and with less disruption than the original demolition and regeneration programme.

The fact that the CESP scheme took place in an area which had been subject to partial demolition under the Housing Market Renewal scheme generates interesting comparisons between the two approaches. The Council see the CESP scheme as delivering regeneration of the area and point out that they are now in a position to sell some of the vacant land in the area for redevelopment. The Council suggest that this was delivered through a relatively small investment compared to the Pathfinder programme and with a fraction of the disruption to the community.

Local authority stakeholder A3

7.2.4 Local employment

Most case studies reported that both CERT and CESP schemes had generated some employment.

"The managing agent uses local contractors for scaffolding, insulation, and boiler installations, thereby promoting local employment and economic growth. They report that 500 people were employed in delivering the scheme in November 2012."

Community delivery stakeholder A2

"In terms of the local economy the work has had a benefit as had a huge influx of operatives – up to 200 people. Some local employment though largely unskilled and admin. The energy supplier also operate an employment initiative where they recruit trainees locally."

Housing sector stakeholder G4

A housing association in Case Study F included social inclusion clauses in their procurement frameworks specifying, for example, that all contractors had to provide local employment and training opportunities. They believe that this generated significant levels of employment during both CERT and CESP. They deliberately avoided schemes which required them to use the energy companies' own supply chains, partly because they did not deliver these wider local benefits.

Some stakeholders felt that the impacts on local employment had been relatively limited and short-term, particularly for CERT. In Case Study C, there had also been some employment creation though this had been limited in terms of the communities concerned owing to lack of appropriate skills. One community delivery stakeholder reported that they employed 20 locally-based surveyors at one point during CERT.

7.2.5 Other economic impacts

7.2.5.1 Social return on investment value

A stakeholder in Case Study C felt that more evaluation is needed about the extent to which the programmes benefited local economies through increased spending from reducing fuel debt. They felt that this needs to become a motivating factor for more activity on energy efficiency. This reflected a more general finding from the evaluation research that relatively little monitoring and evaluation of CERT and CESP schemes seems to have taken place to ascertain their wider impacts.

However, a study of a CESP-funded scheme in the New Barracks Estate in Salford (Arup, 2012) does provide evidence on the social return on investment (SROI) of the scheme. The scheme was a £1.9m retrofit project on 78 properties to bring them up to Decent Homes Plus standard. CESP funding contributed £292,842 to the project. The study calculated that the aggregated monetised value of benefits to all relevant stakeholders was £3.4m. This was the equivalent of at least £1.58 of social value for every £1 invested in the scheme. The social value had been created in the form of energy bill savings, income for businesses, reduced CO_2 emissions, employment creation, avoided health costs to society, increased government tax revenue and saved maintenance time.

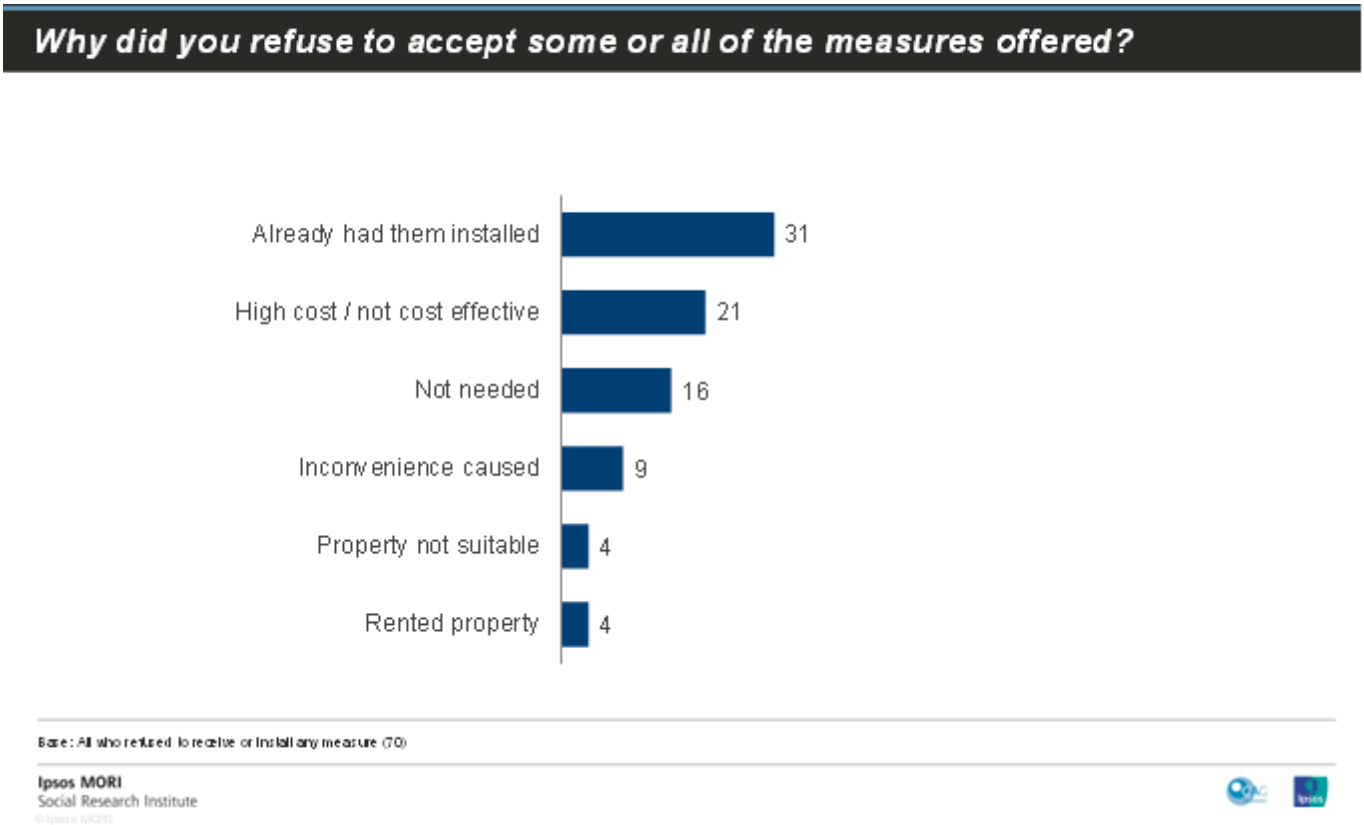
7.3 Barriers to participation

7.3.2 CERT and CESP Case Study Areas

The case study area surveys asked participants who refused to receive or install any measures offered as part of the local scheme why they had declined to take part.[57] The base sizes are too small to look at CERT and CESP findings separately (Figure 7.7). The single most frequently cited reason for declining measures was that they already had it installed (31%). A further one in five (21%) mentioned the high cost of measures or that they were not cost-effective.

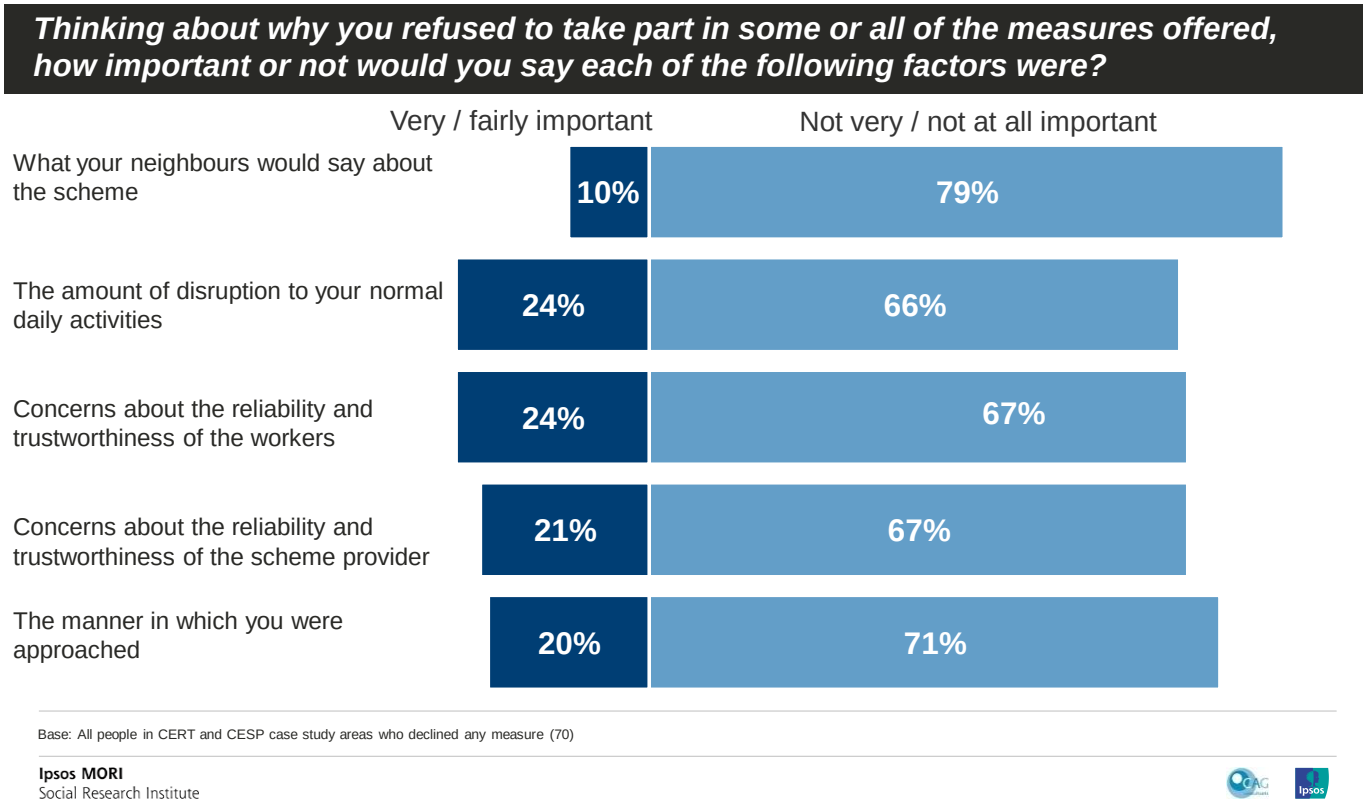
[57] It should be noted that the findings reported here are from a small base size (only 70 respondents said they refused measures). Overall figures for both CERT and CESP combined are therefore presented here. Evidence from the qualitative se findings cannot be used to add to this analysis; it is not possible to ask non CERT customers why they did not participate due to the inability to refer to a specific scheme they may have been aware of. In most of the CESP case study areas the majority of people interviewed took part in the scheme, and of those who did not, very few were willing to be interviewed in the qualitative phase. As a result there are too few qualitative interviews with non-customers on which to report on barriers to participation.

Figure 7.7: Reasons for refusal of measures



Participants were also asked about the extent to which a number of factors were important in their decision to decline measures (Figure 7.8). No one factor emerged as particularly important: for each factor, only a minority said it was very or fairly important. Worries about the amount of disruption to daily activities and concerns about the reliability and trustworthiness of workers were the two factors most commonly cited (each mentioned by around a quarter (24%) of respondents).

Figure 7.8: Importance of reasons for refusing measures offered



7.3.3 Identifying impacts – future evidence

Several case study stakeholders mentioned studies on CESP schemes to measure changes in heating behaviour, energy bills, warmth and wider impacts such as health. These were either underway - because of the long-term nature of these benefits and the need to study impacts over successive heating seasons - or yet-to-be commissioned. For example, in Case Study A, the council intended to commission a study of the wider benefits, encompassing fuel bill savings, health, crime, fear of crime, anti-social behaviour, educational benefits, emergency admissions to hospital and resultant NHS savings, and benefits to the local economy. They expected the research to demonstrate financial savings from reduced emergency admissions. The findings from these were not available at the time this report was produced.

Some case study stakeholders said that they were commissioning more detailed studies to quantify energy bill savings. For example one housing association in Case Study F reported that they have commissioned academic research to ascertain whether the carbon and fuel bill savings predicted under CESP have been delivered, which will involve detailed monitoring of 4 to 5 properties. While results of these separate studies are not, at the time of writing, available, they may provide additional evidence on the impacts of the schemes.

8. Costs of delivering the programmes - CERT

This chapter provides an analysis of the costs incurred by obligated and other parties in the delivery of the Carbon Emissions Reduction Target (and, where possible, underlying drivers of those costs). This chapter is based on the information provided by all parties obligated under CERT.

The cost calculations are based on cost data submitted by all obligated parties. It is beyond the scope of this report to look into the methodology and/or accuracy underpinning the submissions on cost made by each obligated party.

8.1 Overall costs to obligated parties

As part of the data collection exercise outlined in Chapter 1, obligated parties were asked to report their costs in two key areas: (1) the costs incurred in their management and administration of the scheme (ranging from compliance costs through to marketing), and (2) the costs incurred through installation of eligible measures under the obligations. Attempts were made to ensure that the data collected covered as comprehensive range of costs incurred as possible, though in some cases obligated parties could not provide all information required (for example, in instances where administration costs could not be straightforwardly attributed to the programme). Overall estimates of the costs incurred by obligated parties are set out in Table 8.1[58].

Table 8.1: Estimated Total Costs Reported Incurred by Obligated Parties, CERT and CERT Extension, 2012/13 prices

Cost Element	CERT	CERT Extension	Total
Administration costs	£47.8m	£62.5m	£110.7m
Delivery Costs	£2,175m	£1,361m	£3,535m
Total	£2,222.8m	£1,423.5m	£3,645.7m
Costs anticipated in impact assessment	£3.4bn	£2.0bn	£5.4bn

8.1.1 Administration costs

Obligated parties had a number of difficulties in isolating the management and administration costs associated with the delivery of CERT. Not all parties employed a dedicated team to manage their delivery of the obligations, making it difficult to separate staff and overheads from wider costs that would have been incurred in the absence of the obligation. Five of the six parties were able to provide estimates of the administration costs involved, reporting an overall administrative cost of £95.2m over five years in nominal terms (this will be an underestimate at the margins as one party was unable to separate the costs of delivery from management and administration in 2008/09 and 2009/10). These costs were estimated at £98.0m in 2012/13 prices (using the HM Treasury GDP deflator to account for price movements).

Administration costs represented around three per cent of total costs to obligated parties (although this varied from one per cent to six per cent). The submissions received covered 88%

[58] Obligated parties also provided estimates of mitigation costs though these have not been included here as they have not been verified by Ofgem.

of the total delivery costs reported by obligated parties. Assuming that the final supplier incurred administrative overheads in line with other parties, it is estimated that these costs totalled £107m across all suppliers in nominal terms (£111m in 2012/13 prices).

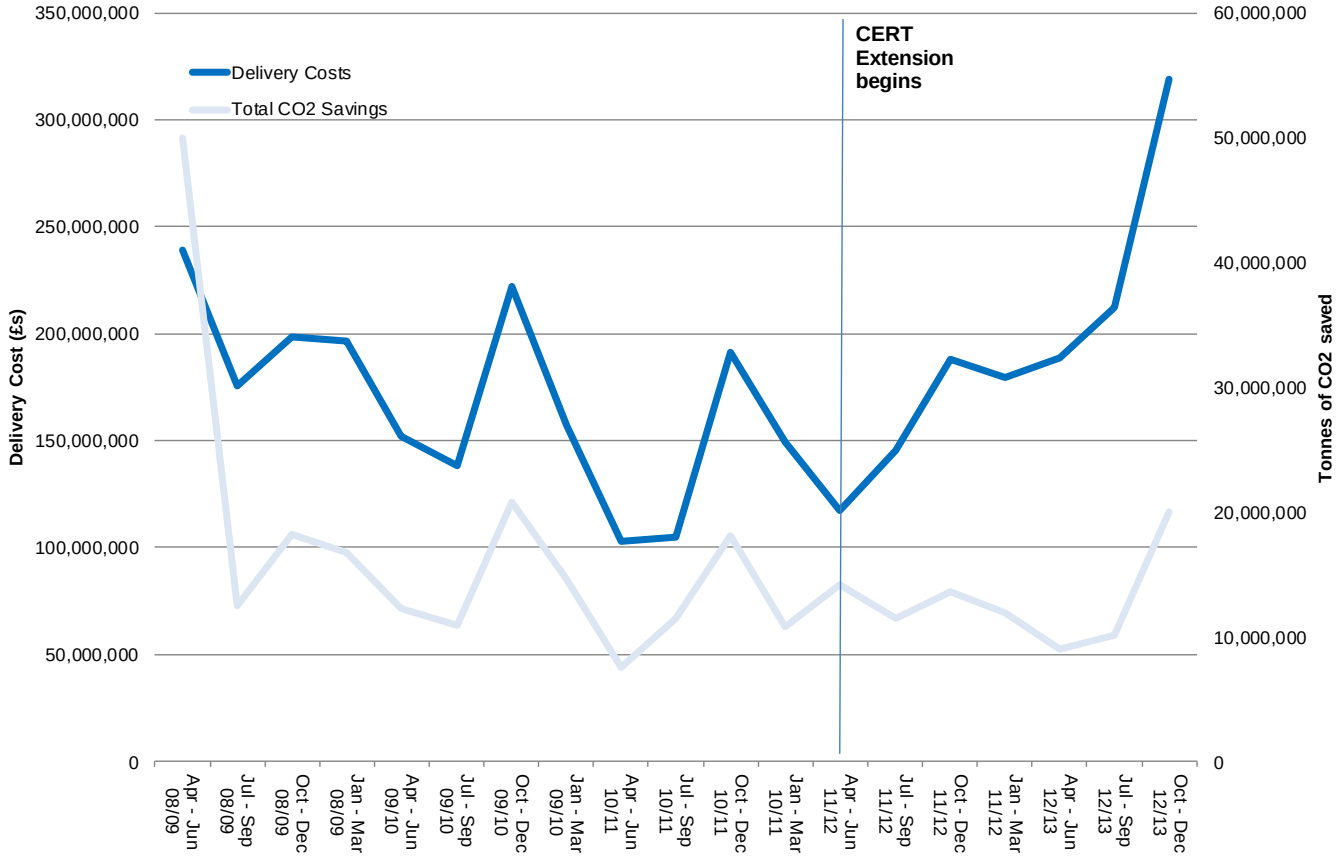
8.1.2 Delivery costs

The overall costs of delivery were provided by all six obligated parties. Total delivery costs of £3.4bn were reported across the submissions (in nominal terms), covering 294 Mt CO_2 savings (this is closely aligned with the Ofgem reported figure of 296 Mt CO_2). These costs do not include the cost of carbon savings carried over from EEC (though carry-over is included in reported CO_2 savings, which would depress estimates of the cost of delivery in unit terms if they were included in price calculations). Again, using the HM Treasury GDP price deflator, it is estimated that these costs totalled £3.6bn in 2012/13 prices (£2.2bn for CERT, and £1.4bn for the CERT Extension). This is considerably lower than estimated in the original Impact Assessment, (estimated at £3.4bn for CERT, and £2.0bn for the CERT Extension).

Figure 8.1 illustrates the quarterly breakdown of overall carbon savings and delivery costs reported by the six obligated parties. The large volume of CO_2 savings reported in quarter one can primarily be attributed to EEC carryover (the final Ofgem report suggests that a total of 37.8 million tonnes of CO_2 savings were carried over from EEC by the obligated parties). The evidence shows seasonal fluctuations, with annual peaks in the levels of carbon savings achieved peaking in the third quarter each year.

The evidence on delivery of CO_2 savings does not perfectly match the pattern reported by Ofgem in the quarterly reports. This largely reflects the difference between the delivery of carbon savings and when they were logged with Ofgem. Evidence from consultations with stakeholders suggested obligated parties gave their best estimates of progress to Ofgem before final reporting (i.e. provisional estimates that were unverified by Ofgem). Delivery costs rose in the latter phases of the scheme, while carbon savings remained relatively static. As set out in section 8.7, this is driven both by a combination of factors, including a change in the mix of measures delivered, the introduction of further sub-obligations including the IO and the SPG in particular, in addition to there being some evidence that supply side constraints helped drive costs upwards.

Figure 8.1: CERT delivery costs and carbon savings by quarter



8.2 Price

The evidence presented above was used to estimate the overall price at which carbon savings were achieved. As the evidence collected does not permit consistent treatment of carry-over from EEC across obligated parties, the first quarter has been excluded. It is estimated that, overall, CERT was delivered at an average cost to obligated parties of £13.17 per tonne of CO_2 saved in nominal terms (£13.79 in 2012/13 prices; Figure 8.2). The original CERT obligation was delivered at an estimated average cost of £11.60 per tonne of CO_2 saved (£12.44 in 2012/13 prices) and the CERT Extension at £15.00 per tonne of CO_2 saved (£15.08 in 2012/13 prices). This is compared to £18.4 for the CERT and CERT Extension Impact Assessments.

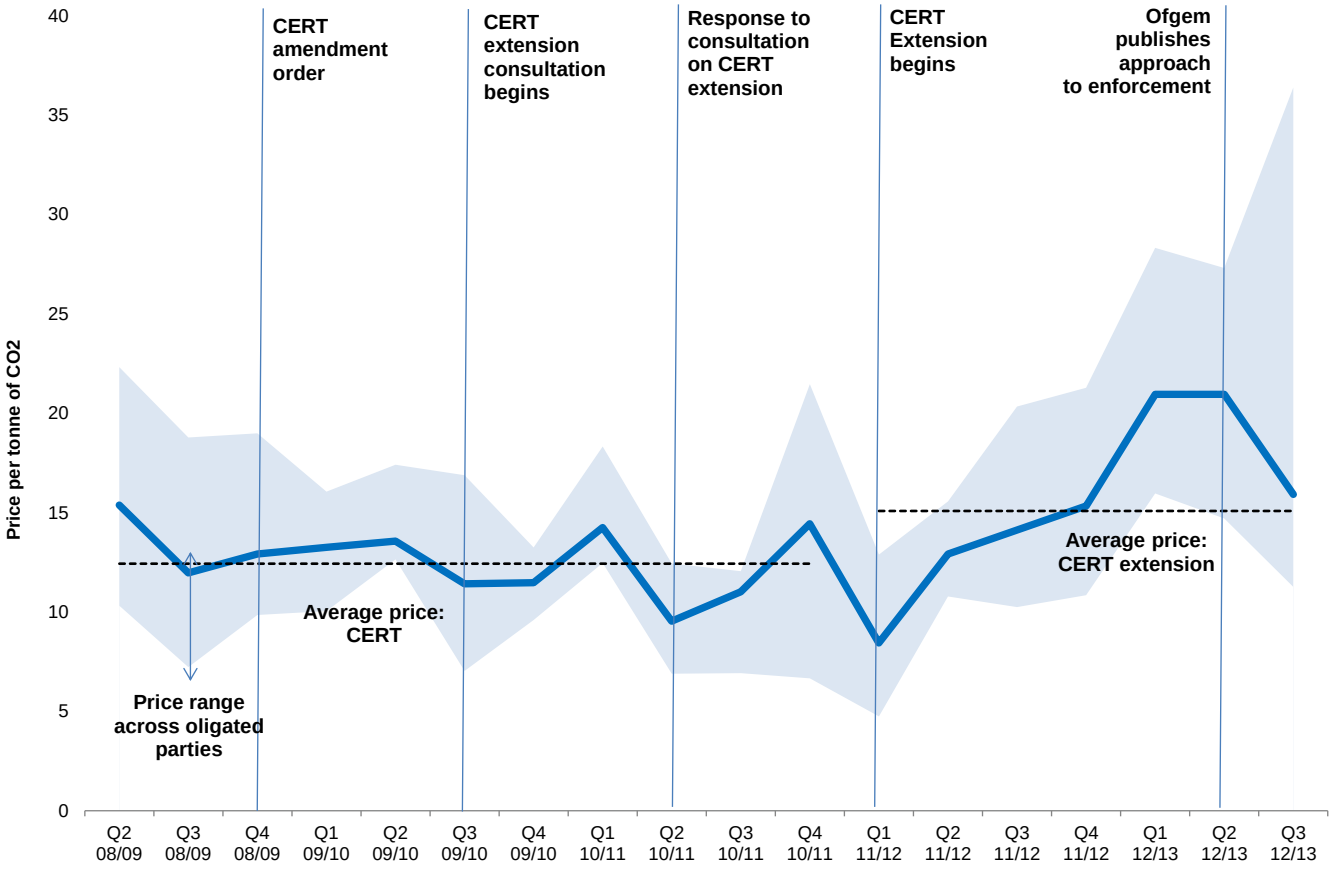
Table 8.2: Price per tonne of CO_2 saved (2012/13 prices)

Cost Element	CERT	CERT Extension	Total
Price per tonne of CO_2 saved	£12.44	£15.08	£13.79

While the prices secured by individual obligated parties varied, average prices were relatively stable between 2008 and 2011 (between £10 and £12 per tonne of CO_2 saved on average; Figure 8.2). However, prices rose steadily following the introduction of the CERT Extension, from £8.30 at the beginning of 2011/12 to a peak of £21.00 at the end of quarter two 2012/13. The variance in the prices secured by obligated parties also increased substantially: although the average price fell to £15.20 per tonne of CO_2 in the final quarter, this reflected a range of £11.30 to £36.40 per tonne of CO_2 saved. This was partly due to changes in the measure mix (including a higher percentage of professionally installed measures), alongside aforementioned

issues relating to the introduction of the SPG and supply side constraints. This is further discussed in section 8.7.

Figure 8.2: Price per tonne of CO_2 by quarter (2012/2013 prices)

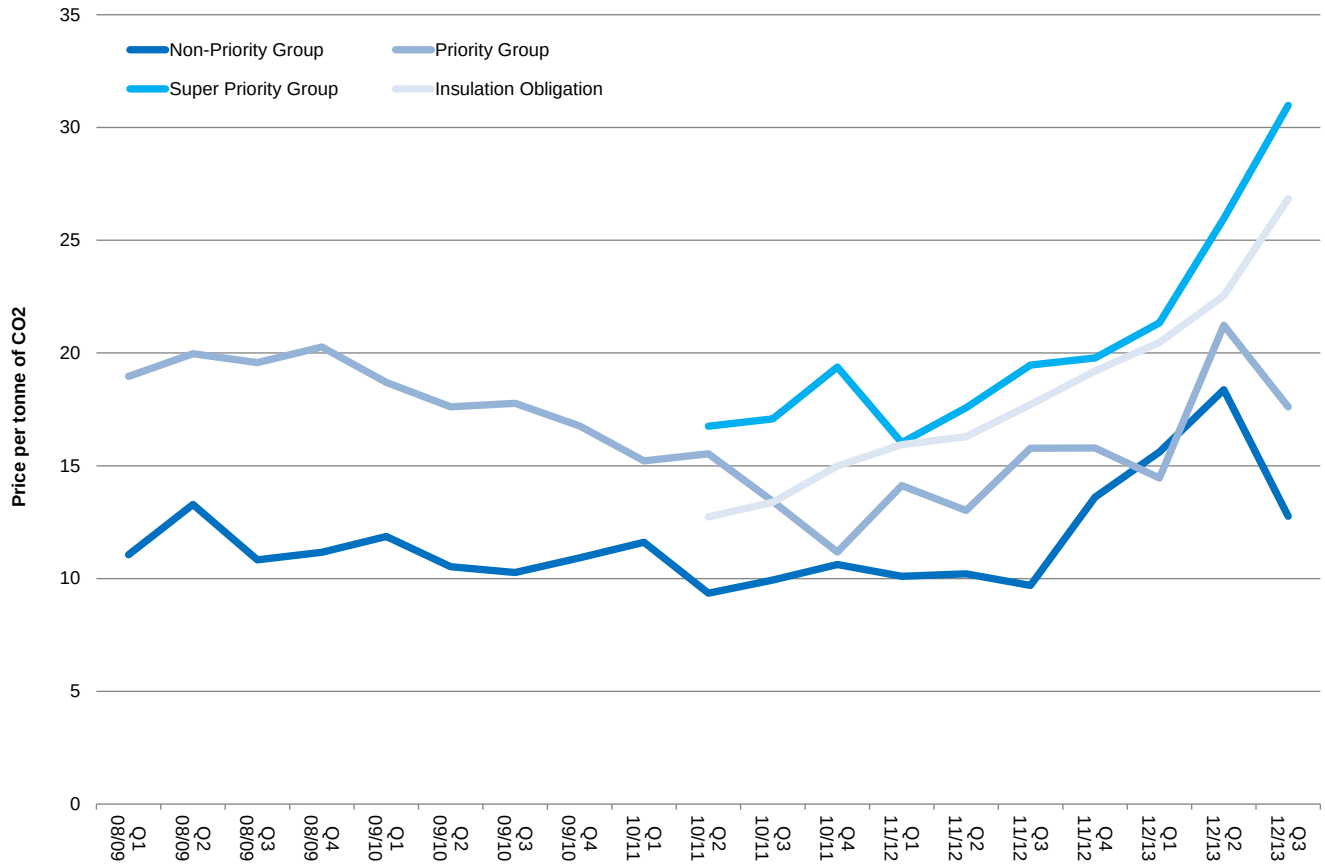


8.3 Variation across sub-obligations

Two obligated parties provided sufficient information on the cost and carbon savings to explore variations in the cost of delivering different sub-obligations (covering around 30% of the costs incurred). Figure 8.3 provides indicative prices per tonne of CO_2 saved by quarter under each of the four sub-obligations. The average price per tonne of CO_2 saved was relatively stable at around £10 for NPG group customers until the CERT Extension, with prices for PG customers falling steadily from £16 to just over £10 over the same period.

The introduction of the SPG and the IO placed upward pressure on the cost of the scheme overall, as illustrated in the chart (with the average of price per tonne of CO_2 saved rising as high as £31 amongst SPG customers). However, the observed increase in prices under the CERT Extension cannot exclusively be attributed to the additional sub-obligations: prices rose across every customer group between 2011 and 2012 (though more rapidly for the IO and the SPG). Additionally, changes in the measure mix (in particular, a higher share of professionally installed measures) will have contributed to the observed change in prices. Additionally, some care is needed in interpreting the figures below as in some cases, obligated parties have treated the SPG as a subset of the PG (while others have treated them as being mutually exclusive). This may lead to an upward bias in the prices associated with the PG.

Figure 8.3: Price per tonne of CO_2 by quarter and sub-obligation (2012/2013 prices)



These figures broadly align with prices reported in the qualitative stakeholder interviews and the surveys with local authorities, housing associations and installers. Stakeholders reported receiving a range of prices for SPG customers of between £19 and £40 per tonne of CO_2. SPG prices were at their highest towards the end of CERT ranging from £30 to £40 per tonne of CO_2. Prices for NPG measures ranged from around £8.50 per tonne of CO_2 (in the first two years) rising up to £24 per tonne of CO_2 in the final year of CERT. PG prices were reported as between around £16 per tonne of CO_2 at the beginning of CERT rising to £24 per tonne of CO_2. Note that many stakeholders reported that prices for NPG and PG CO_2 per tonne prices equalised in the latter stages of CERT where the main focus was on meeting SPG sub-obligation targets.

The energy suppliers reported similar ranges to the other stakeholder types. They reported SPG prices per tonne of CO_2 ranging from £17 to £45, NPG prices ranging from £9 to £24 and PG prices falling between £13 and £24. Again, the energy suppliers all reported that prices for all categories rose in the latter stages of CERT to the higher ends of these ranges towards the end of CERT.

One energy supplier said they did some 'spot' purchases of SPG only from installers but this was very expensive (most energy suppliers said they could generally only purchase SPG installations from installers if they also bought NPG and PG too). They were paying £60+ per tonne of CO_2 for fuel switching to SPG customers. The same supplier believed that the true marginal cost (i.e. the resource cost of acquiring one additional customer) of purchasing SPG customers was possibly £100 per tonne of CO_2.

8.4 Difference by measure

8.4.1 Price by measure

The reported prices from stakeholders in the previous section primarily concern prices for professionally-installed insulation measures. Professionally-installed insulation measures accounted for a very large proportion[59] of the total CO_2 delivered under CERT, particularly after the CERT Extension which introduced the IO. As such, the primary focus for this evaluation was on professionally-installed insulation.

However, some limited data was provided in the stakeholder interviews on prices for non-insulation measures. Prices for CFLs, for example, were reported by two energy suppliers as ranging from £1 to £10 per tonne of CO_2 depending on how customers were reached (i.e. through a mail out direct to the energy supplier's customers, or through subsidised retail sales). £5 per tonne of CO_2 was deemed to be a typical cost for CFLs.

For DIY loft insulation, one energy supplier said that its DIY contracts worked out at around £10 per tonne of CO_2. A supply chain stakeholder, however, reported that DIY schemes were being delivered at £2.50 per tonne of CO_2 in the first two years of CERT, with prices rising to £9 to £10 per tonne of CO_2 towards the end of the programme.

These figures are based on small samples and are therefore qualitative. In the absence of more comprehensive data, they do provide some context and a point of comparison to the cost information reported elsewhere. These findings indicate that DIY loft insulation and CFLs were relatively inexpensive measures for the nominal carbon savings they provided.

8.4.2 Cost by measure

The literature reviewed for this evaluation suggests that there have been economies over time through scale and learning. DECC's 'Final Stage impact assessment for the Green Deal and ECO' (2012) states that the cost of CWI fell by 50% before CERT, between 1995 and 2005.

DECC's Impact Assessment also gives detailed tables of delivery costs, based on a call for evidence from the industry in 2009. The figures in Table 8.3 were compiled by the Energy Efficiency Partnership for Homes based on 300 responses[60].

Table 8.3: Delivery costs and costs to customers of cavity wall insulation and loft insulation

Measure	Installation costs	Additional cost to householder[61]
CWI – easy to treat	£500	£78
CWI – hard to treat	£1,875	£78
Loft insulation top-up (professional – 150 to 250 mm)	£300	£103

Through the qualitative interviews with stakeholders, a range of costs of delivering measures were provided.

[59] Insulation measures accounted for 66% of the total CO_2 saved, with professionally installed loft insulation the most prevalent type of insulation (3.9million households in total).

[60] Figures taken from DECC (2012), *Final Stage Impact Assessment for the Green Deal and Energy Company Obligation*, June 2012

[61] Average cost paid by householder for the installation. The remainder was subsidized through CERT.

Further information on the costs of measures was provided through the evaluation case studies, stakeholder interviews and cost surveys. This data suggests a range of cost for installing insulations measures:

- CWI, from £250 to £600 (based on 6 sources only);
- Professional loft insulation, from £252 to £650 (based on 6 sources only);
- Loft insulation top-up: £150 (based on one source only).

Some stakeholders suggested the cost depended on the size of the home being insulated and is likely to be a key explanatory factor for the wide range of costs for each measure.

It is difficult to know from the evidence the extent to which these costs changed over time. Several stakeholders suggested that the costs of labour and materials remained fairly stable throughout the CERT period. However, the costs of identifying suitable properties and customers did rise (see 'costs of lead generation' below). This will have added to the overall costs of delivering measures. For example, a community delivery organisation supplied average costs for delivering loft and cavity wall insulation during the CERT period. The nominal costs of these rose from £325 in 2008-09 to £438 in 2002-13. This is likely to have been a result of increased search costs.

8.4.3 Delivery cost by region

The initial analysis of evidence also suggests that there were some regional differences in the costs of delivery. Many reported that costs in more remote areas, such as rural Scotland, were higher because the economies of scale employed in more urban locations were not logistically possible. London was also an area that stakeholders said involved higher delivery costs due to factors such as increased parking costs, labour costs, storage costs, time, planning and congestion. However, there was no agreement and how much higher costs were as a result. At the highest end, one installer believed that installation costs were up to 20% higher in London than other urban areas such as Leeds or Nottingham. One energy supplier, however, believed the costs were only 'marginally' higher.

It is not possible from the energy company submissions to determine the variation in delivery cost by region, as no geographical marker was included for scheme level data.

8.4.4 Cost of lead generation

Stakeholders reported that the price of 'leads' (finding or contacting households interested in installing measures) could be a significant cost for professionally-installed insulation measures. Lead fees varied throughout CERT according to the market. In the interim CERT Evaluation, for example, one energy advice centre reported that the market value of a lead or referral (determined primarily by the price set by energy suppliers for carbon savings through installed measures) was typically £25-30, but that this price rose to as much as £90 in the North of England during 2010, when suppliers urgently needed to meet their targets - before the CERT Extension was announced.

In the evaluation case study areas, the CERT scheme in case study area A, running from 2008 to 2011, reported that the typical rate for a lead was £35 for CWI and £10 for loft insulation. In case study area B, installers paid a referral fee to the local authority for leads generated through its energy advice service and associated marketing: reports differed as to whether this was £15 per measure or (for SPG customers) £25 per measure. These figures correspond with figures

provided by other stakeholders. One community delivery stakeholder, for example, said that they received between £15 and £30 for referrals for most of CERT.

Data from a number of the stakeholder interviews suggests that lead generation costs rose significantly towards the end of CERT. This was largely explained by the increasing demand to find verifiable SPG customers, in order to meet the SPG sub-obligation, and the need to deliver very high volumes of professionally-installed insulation measures more generally in a short space of time towards the end of the programme. For example, one installer quoted the cost of customer-identification surveys as £350 per lead overall in 2012, with lower rates for NPG customers (£250 per lead) and higher rates for PG customers (£350 per lead) and SPG customers (£450 per lead). In the absence of further data, at present, it is not clear how the cost of customer-identification surveys relates to the price at which leads were traded.

The need to identify SPG customers in particular opened a space for 'lead generation' agencies to operate in the CERT market to a greater extent. As the cost per CO_2 tonne for SPG customers rose, one supply chain stakeholder said the cost of SPG leads[62] from such agencies reportedly rose to £150-200 per lead. One energy supplier reported that they paid as much as £300 for an SPG lead towards the end of CERT, which could be as much as the cost of the installation itself.

Care needs to be taken in translating lead fees into delivery costs, as not all leads were 'converted' into delivery of measures. The interim evaluation reported that conversion rates varied between about 20% and 60% depending on the methods used by the organisations involved and their systems for contacting customers.

Verifying SPG customers also incurred other costs. One energy supplier said that they employed 250 full-time equivalent staff to visit customer's homes and call them by phone to establish whether customers that had received CERT measures paid for by the company were eligible as SPG. The exercise only pushed up the company's SPG total by 10%. At the end of the CERT period they then paid the Department of Work and Pensions (DWP) a fee to 'wash' their data to identify SPG customers that had not been verified.

8.5 Contribution from other sources

Overall, the evidence from the evaluation cost surveys and the qualitative interviews provided some limited data on the contributions of other sources to CERT delivery. The data is not from a large enough sample to provide a robust estimate of the total cost contributions from these other sources, but does indicate that there was wide variation in the level of contributions to CERT measures made from other sources.

The most frequently cited financial contributors to CERT delivery, other than the energy suppliers themselves, were local authorities and housing associations. Again, from the evaluation evidence, it is difficult to identify the typical scale of the contribution from these organisations. What is more straightforward to identify, is the type of contribution made: In the evaluation case study areas for example:

- **Financial contributions:** The evidence highlighted a number of CERT schemes where local authorities and housing associations made direct financial contributions to area-based CERT activity. In many cases, the direct funding enabled the scheme to fund extra activity, beyond CERT measures. For example, in case study B:

[62] Note that the evidence did not specify whether these leads were 'pre-qualified' or not. In other words, the figures do not distinguish between whether some leads had been checked for eligibility prior to contact with the customer or not.

  - The local authority funded an energy team costing £55,000 per year to run an energy advice and referral service linked to CERT and later schemes; and

  - The housing association contributed towards the funding of measures to non-SPG customers, to equalise the offer made to different customer groups (non-PG, PG and SPG).

- **Staff time and resources:** In addition to financial contributions, local authorities and housing associations also provided staff time and resources to schemes. In a local authority scheme in Scotland example, a £531,000 grant from Scottish Government through the Universal Home Insulation Scheme (UHIS) was combined with CERT funding. The local authority contribution was 100 staff days per annum.

- **Scheme development:** Staff time and resource were also required for scheme development. The local authority and housing association cost survey indicated a wide variation in scheme development costs for these two sectors. One joint UHIS and CERT scheme required five days of development time, according to the local authority. Another joint UHIS and CERT scheme was reported to involve £21,000 of staff time over the period November 2011 to March 2012 (for a project totalling around £1 million).

This is not to say that all CERT schemes delivered with local authorities and housing associations involved significant contributions from these sectors. A small number of respondents to the local authority and housing association survey, for example, reported that loft and cavity wall measures were 'fully funded' under CERT or that there were 'no further costs' beyond the energy company's contribution.

The qualitative stakeholder interviews and local authority and housing association cost surveys also highlighted other sources of income that had been matched with CERT funding to deliver energy efficiency projects. These included Decent Homes, CESP, Warm Front, Arbed, UHIS and European funding sources like ERDF. The Warm Zones area-based energy efficiency schemes, for example, are known to have integrated funding from CESP, CERT, Warm Front, Decent Homes and local authority and housing budgets and other funding streams.

8.5.1 Development costs

The qualitative research provided limited evidence on the development costs of CERT schemes for delivery partners such as local authorities and housing associations. From the evidence collected, it appears that CERT schemes could involve significant resource costs, depending on the nature and size of the scheme. The responses also indicate, however, that development costs for CERT schemes were generally a lot less than for CESP schemes.

In the cost survey, one local authority described a CERT scheme as taking five days of officer time to develop. Another said that it took two days a week, over an unspecified period, while another estimated that staff time had cost £21,000 over a four-month period. In case study area B, the housing association reported that they had one staff member working two to three days a week to manage their loft and cavity insulation schemes. They liaised with managing agents and procured a panel of 3 installers.

8.6 Consumer costs

This section considers the financial costs incurred by CERT customers (i.e. householders). All CERT customers interviewed in the national survey were asked if they paid anything for their energy efficiency measure(s), and if they did, what they paid. Given the level of take-up of CERT measures, and the fact that many (56%) who had installed a measure could not

remember how much they paid for it, the sample sizes on which these average prices are based are small (and should be treated with some caution). Additionally, costs relating to inconvenience associated with installation costs were not captured through the survey.

Table 8.4 shows the average price reported for subsidised CWI and subsidised professionally installed loft insulation. Many CERT measures (60% of CWI and 73% of professionally installed loft insulation) were fully subsidised. Solar water heating and SWI have been excluded due to the low number of observations involved. The survey results also suggested Priority and Super Priority Group customers were substantially more likely to receive CERT measures at a fully subsidised rate (86% of all PG measures installed, compared to 58% of NPG measures installed).

Table 8.4: Prices paid by CERT customers recorded in the national survey

Measure	Average (mean) price paid[63]	Percentage fully subsidised	Number of observations
Cavity Wall Insulation	£51.53	60	67
Loft Insulation or Top-up	£29.99	73	152
DIY[64] installation	£169.23	-	40

The qualitative interviews with stakeholders revealed that there were variations in offers in relation to professionally-installed loft and cavity wall insulation. PG customers were typically offered the same measures (loft and cavity wall insulation) for free throughout the obligation period.

At the beginning of CERT, prices for NPG customers generally ranged from £49 to £250 for both loft insulation and cavity wall insulation. These offers varied over time to allow the energy suppliers to manage supply and to incentivise take-up during quieter periods.

> *[The offer to NPG customers] was generally around £250. It moved down to £200 in 2010 at some point. Sometimes we would have a discount down to say £99, or £149 in the summer to keep up utilisation rates.*
>
> Energy supplier 1

At least one energy supplier also covered the costs of ancillary work which needed carrying out to install the measure, such as installing a loft hatch or erecting scaffolding.

Energy suppliers reported that their offers were often only a small part of the measures being delivered under their obligations. Much of their measures were delivered by installers who would self-generate installations. The energy company offer might act as a guide for the installer, but it would ultimately be up to the installer to set its own price for customers. For example, one energy supplier reported that their offer acted as a ceiling, but that their contracted installers were free to make more competitive offers to customers if they deemed it necessary. For stakeholders, this led to a confusing market for customers, with offers often fluctuating.

[63] Inclusive of fully subsidised measures. Respondents were asked how much did their household paid in total for the measure (including all costs for professional installation).

[64] DIY loft insulation refers to loft insulation, including top-up, installed by the householder, a family member or friend.

> *Offers were continually changing. Some householders would phone up one week and be told one thing then the next week the situation would have changed, particularly for 'able to pay' [NPG] customers*[65]
>
> Community delivery stakeholder 5

The introduction of the SPG and IO obligations under the CERT Extension triggered a downward shift in pricing offers to customers. Most of the energy suppliers reported that by 2012 they were offering loft and cavity wall insulation for free to both NPG and PG customers. SPG customers were also offered free measures. To incentivise this customer group to provide the necessary SPG-eligibility documentation, the energy suppliers all moved to a model offering cash to these customers. The amounts being offered to SPG customers increased towards the end of the scheme, rising as high as £100. Supermarket vouchers were also used in addition to cash incentives.

Some schemes used local authority or national government funding to extend eligibility for free or to increase the subsidy of measures to 'vulnerable' customers outside these groups. For example, in case study area A, a CERT scheme running from 2008 to 2011 used local authority funding to pay for free measures to customers who were in the NPG category but who were identified as being in fuel poverty. In case study area E, local authority funds were used to extend CERT offers (e.g. for loft top-up), and to ensure that measures to SPG customers were really free, by paying for extras such as loft hatches and scaffolding, where required. The higher price per tonne of CO_2 for SPG customers meant that extras such as loft clearance could be included in their free offer.

In Scotland, UHIS enabled free offers of loft insulation, cavity insulation and loft top-up to be made to all households in an area, with CERT being used to fund eligible loft and cavity wall work within the UHIS package. Arbed funding[66] was also used to match CERT funding in Wales.

Loft top-ups were more expensive because they generated less carbon in relation to their cost. For example, if there was already 150mm in the loft, the CERT funding was reported to be around £30. At the time of the interim evaluation, in March 2011, the price to consumers of loft top-up ranged from £175 in an urban case study area in Scotland to £375 in an urban case study area in England.

As with virgin loft and cavity wall insulation, other sources of funding were used to subsidise offers on loft top-up. In case study area A, the local authority contributed funding for measures that would not otherwise have qualified under CERT, including making loft top-ups free to customers. In case study area B, local authority funding was used to make all loft and cavity wall insulation offers (including loft top-up) free to all suitable properties in areas taking part in a green community scheme.

Stakeholders reported that DIY insulation rolls were sold at between £1 and £3.50 per 5m roll. In the interim evaluation of CERT, there was a report of highly discounted offers being made by DIY stores, offering insulation at 'a penny a roll' during cold snaps in the winter.

[65]The term 'able to pay' was often used by stakeholders to describe customers who fell into the Non-Priority Group.

[66]http://wales.gov.uk/topics/environmentcountryside/energy/efficiency/arbed/?lang=en

8.7 Price drivers

The analysis of available evidence suggests that there were a number of key drivers that affected the price of delivering a tonne of CO_2 under CERT. These price drivers are discussed below.

8.7.1 Scheme design

The price graph in section 8.2 shows a relatively stable price curve until the start of the CERT Extension period, after which the price steadily rose. There are a number of aspects of the CERT scheme design which appear to have had an impact on prices:

- **Flexibility and competition**: at the beginning of CERT, there were fewer constraints on how the energy suppliers could meet their obligation. They had a wide range of measures to choose from across different sectors (e.g. lighting, DIY insulation, professionally-installed insulation, heating, appliances). The introduction of the CERT Extension constrained energy supplier choice. The introduction of both the IO and the SPG sub-obligation increasingly meant that energy suppliers had to focus primarily on one sector (professionally-installed insulation) and were more constrained about the customers they could deliver to. It also meant that large 'off-the-shelf' schemes, like contracts with retailers to subsidise DIY loft insulation were less viable.

- **Timescale**: the relatively short duration of the CERT Extension and the narrowed focus on measures and customer types also lead to price pressures. Energy suppliers had to meet their targets in a short timeframe, and for those who had not previously been delivering significant numbers of professionally-installed insulation, there was also a period of adjustment as they set up new supply routes and shut down existing ones. The insulation industry also needed to step up its capacity to meet the increased demand in this sector.

  > *If you knew you had five years you could have found more efficient ways to engage [SPG customers] but there was no time to be innovative*
  >
  > Energy supplier 1

- **Scale**: the scale of the obligation also added to price pressure, particularly with the increase in the overall CERT target.

Other factors described below were largely a direct result of this design.

8.7.2 Compliance rates by suppliers

There was a view amongst some stakeholders that energy companies were slow in achieving the necessary 'run rates' required to meet their IO and SPG obligations. At least two energy suppliers reported that they were initially behind on achieving the rates required when the CERT Extension started. This was because they knew that non-insulation measures (particularly lighting) would be removed under the CERT Extension, which meant there was more of a focus on getting these done at first, then extra pressure on insulation measures later on. It also took them a few months after start of extension started to set up new contracts with the supply chain, which meant that delivery was back-loaded into the final 18 months of the scheme.

8.7.3 Supply side response

There is some evidence that the increase in demand from energy suppliers was constrained to a small extent by the installation capacity in the market. This appears to have been more the case for CWI, which requires greater levels of skill to install. It was not regarded as an issue for loft insulation which stakeholders felt required less skill making it easier to recruit labour to expand capacity. Overall, however, supply side issues were not a key driver. The feedback from the stakeholder interviews was that the industry was largely successful in meeting increases in demand.

8.7.4 Search and verification costs

As discussed in Chapter 5, there were increasing search costs for installers and energy suppliers in finding appropriate properties in which to install insulation. In part, this simply reflected the fact that as more houses were fitted with insulation, it became harder to find un-insulated properties that fitted the scheme criteria. But as described in Chapter 5, finding SPG customers also involved higher costs. In addition, there was also a challenge to persuade them to provide the documentation needed to verify that they fell into the SPG category, particularly towards the beginning of the CERT Extension period when both PG and SPG customers were being offered measures for free. Cash incentives were introduced for SPG customers later on to differentiate these offers. Some suppliers suggested that this added to their costs, although it is possible that cash incentives may have helped to reduce search costs in some cases, as some customers may have been more proactive in their responses to the offer.

8.7.5 Competitive pricing by installers

With supply constrained and demand high, installers were able to raise their prices. There is evidence from the stakeholder research that installers tried to maximise profits during this period, selling insulation measures to energy companies who were willing to pay the highest prices. There were also suggestions from some stakeholders that some installers were ‘holding back’ installations and selling them when prices rose. This is hard to verify, however, and it is important to stress that there were no suggestions the installers colluded in doing this.

9. Costs of delivering the programmes - CESP

This section provides an analysis of the costs incurred by obligated parties through CESP. This section is based on returns supplied by all ten obligated parties under the programme. Scheme level information, describing start and end dates, adjusted (i.e. including bonuses) and unadjusted (excluding bonuses) carbon savings, and delivery costs, was received from all suppliers covering some 531 schemes (and 20.2 million tonnes of adjusted carbon savings). This is higher than the 491 schemes (delivering 16.31 million tonnes) recorded in Ofgem's final report on CESP. However, mitigation activity was not included within the figures reported by Ofgem, whereas it is included in the data presented here.

9.1 Overall costs to obligated parties

Obligated parties were asked to report information of the total costs incurred through the delivery of the CESP programme, including total administrative costs and scheme level information covering total carbon savings and costs. All cost calculations are based on cost data submitted by all obligated parties. It is beyond the scope of this report to look into the methodology and/or accuracy underpinning the submissions on cost made by each obligated party. Overall estimates of the costs incurred by obligated parties are set out in Table 9.1.

Table 9.1: Costs incurred by obligated parties in the delivery of CESP

Cost Element	Costs (nominal prices)
Administration costs	£37.1m
Delivery costs	£665m
Total delivery costs	£702.1m
Costs estimated in impact assessment	£332m (2012/13 prices)

9.1.1 Administration costs

Seven of the ten obligated parties provided information on the administrative costs incurred through the delivery of the programme. These costs cover the internal costs incurred by energy companies in the management and delivery of the CESP programme, including the costs of developing schemes and other marketing costs.

These parties covered almost 70% of the carbon savings delivered under CESP[67], and reported total administrative costs of £25.3m (in nominal terms). Administrative costs represented six per cent of the overall cost of the programme (although this varied from one per cent to nine per cent across the obligated parties).

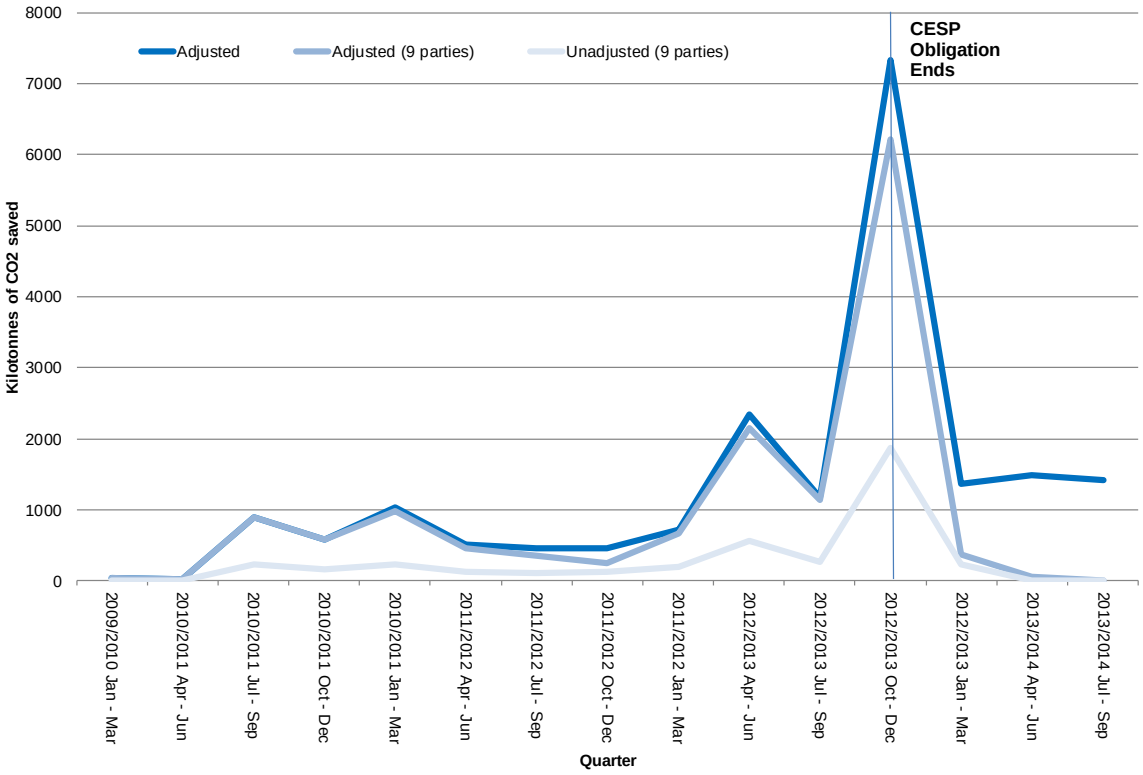
Assuming that administrative costs would also be incurred in line with overall carbon savings delivered, the administrative and management overhead associated with the schemes might be estimated at £37.1m. Insufficient numbers of obligated parties provided figures broken down on an annual basis to estimate these costs in real terms.

[67] This is the percentage of total carbon savings reported to the evaluation team by the obligated parties (rather than figures that have been verified and validated by Ofgem).

9.1.2 Delivery

Returns provided by suppliers suggested that a total of 20.2m Mt CO_2 savings (including uplifts and bonuses) were achieved by obligated parties (covering 100% of the obligation). Figure 9.1 illustrates these savings by the end date of the schemes in both adjusted and unadjusted terms (one supplier only provided figures in adjusted terms, so adjusted carbon savings are presented with and without this supplier). The returns suggested that a high volume of schemes were completed towards the end of 2012/2013, with comparatively little progress made in earlier years of the scheme, reflecting the slow start to the programme already discussed in Chapter 5 (and as section 8.7 on price drivers suggests, the complexity of construction works associated with CESP schemes and their long planning periods). Around 4 Mt of CO_2 savings were achieved in 2013 as mitigating activity (around 21% of the total).

Figure 9.1: Carbon Savings under CESP by scheme end date



9.1.3 Delivery costs

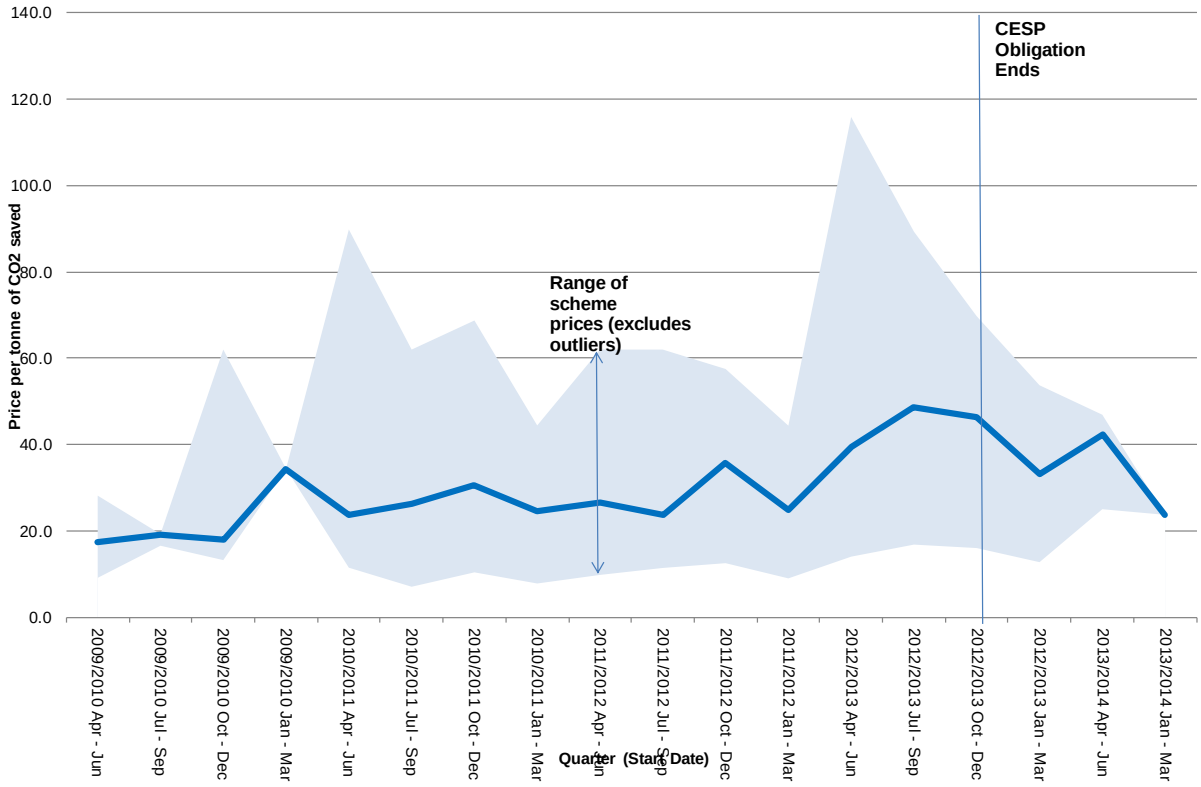
The total cost reported by obligated parties totalled £665m (in nominal prices; Table 9.1). The scheme level data provided gives start and end dates for schemes, but does not describe how expenditure was incurred over time so it is not possible to provide a robust picture of annual delivery costs (and for similar reasons, it is not possible to provide these costs in real terms). This total delivery cost is considerably higher than expected in the original CESP Impact Assessment (332m in 2012/13 prices including around £318m in delivery costs and £14m in administration costs, although these are not directly comparable).

9.2 Price

Returns provided by suppliers on total costs and the volume of CO_2 savings associated with individual CESP schemes were combined to provide an estimate of the carbon price associated with each scheme. The returns from obligated parties are based on spreadsheets completed using a pro-forma. Again, Ipsos MORI has not attempted to verify the accuracy of these returns by sampling actual documents associated with the data to determine if they can be reconciled with the returns.

The scheme overall was achieved at a price to obligated parties of £32.85 per tonne of CO_2 saved (estimated on the basis of reported start dates of schemes as this will provide the best estimate of the time at which prices and contracts were agreed)[68]. Prices rose substantially over time, from just under £20 per tonne of CO_2 saved to a peak of almost £50.00 per tonne (before falling again for mitigation measures; Figure 9.2). The spike in prices is not as pronounced as the spike in delivery, and this is likely due to the phasing and completion of schemes (peaks tended to be shown in the summer months, when weather patterns and temperatures were more amenable to the types of construction activity involved).

Figure 9.2: Carbon price under CESP by scheme start date



The pattern was reflected in the information on transfers of CESP obligations obtained through the data capture exercise. Although this information was not complete, the evidence suggested that early trading of obligations priced adjusted carbon savings at around £17 to £18 per CO_2 savings, while trades occurring at the end of the scheme were achieved at a price close to £50 per tonne of CO_2 saved.

The prices above are based on scheme start dates provided to us by the obligated parties. Following interviews with these parties it is apparent that these dates do not provide a completely true reflection of market prices over time. The obligated parties and other delivery

[68] I.e. total costs divided by Mt of CO_2

partners reported that it could take a year from the start of conversations to the commencement of a scheme. The contract price would have been agreed at some stage during this scheme development phase and potentially some months before the actual scheme start date.

Broadly speaking the trend of average price seen in Figure 4.2 is corroborated by the qualitative interview findings. The obligated parties reported that the Impact Assessment price of £16.16 (based on the CESP impact assessment, in 2009 prices) set initial expectations and acted as a guideline for initial price negotiations for schemes. Thus the obligated parties and other stakeholders reported prices of between £14 and £20 per tonne of CO_2 for contracts agreed towards the beginning of CESP. The obligated parties reported that they won a proportionality small (for the size of their obligations) amount of work at these initial prices.

For some energy suppliers with energy services arms, prices could vary according to whether delivery was carried out by the supplier or by another organisation. For example, one energy supplier reported that its price point was £18 per tonne of CO_2 for schemes that they installed themselves through their own delivery arm. For those not installed by the supplier, the pricing strategy was £16 per tonne of CO_2.

Two energy suppliers reported moving their pricing strategy in the third quarter of 2010 to a little above these initial starting prices (one reported the price at £22 to £24 per tonne of CO_2). This strategy was successful for both parties in securing them some further schemes. Many obligated parties then reported prices rising throughout 2011 and through to 2012. Those parties that were compliant generally reported prices peaking in late 2011 and early 2012 (suggesting there may be lag in the price figures above based on scheme start dates), with prices up to £50 per tonne of CO_2. As most CESP schemes took some months to deliver, they had generally contracted all of their work by the beginning of 2012 and so there was little inflationary activity for them beyond this point. Non-compliant parties reported paying prices above this amount, up to £60 per tonne of CO_2, although this is higher than the costs reported to us in the cost submissions by the obligated parties.

Another complicating factor in tracking market prices over time is that prices could also change within a scheme. One energy supplier, for instance, reported that this happened in up to a dozen of its schemes. In one of its largest schemes the initial contract price was £16.80 per tonne of CO_2 set in the first half of 2010. Then in 2012 the scheme partner said they could deliver more, but at a rate of £30 per tonne of CO_2. This means the overall cost of the scheme reported to the evaluation team would include just one start date but reflect both prices. In another of its largest schemes the price started at £22 then rose to £40 to £45 in a later phase.

9.3 Contributions from other sources

Overall, the evidence from the evaluation cost surveys and the qualitative interviews showed that contributions from the obligated parties to CESP measures ranged from 10% to over 100%. The contributions at the lower end tended to be early schemes, including one pilot scheme, whilst the fully funded schemes tended to come later on in the programme. In some cases the obligated parties also funded additional works beyond the CESP measures (hence rising beyond 100% of the total cost).

In terms of seeking contributions towards the costs of delivering CESP schemes from delivery partners, many obligated parties reported that their initial strategy was based in the Impact Assessment assumptions that there would be contributions from local authority and housing association delivery partners. They reported seeking contributions of between 30 and 70% from delivery partners in the initial stages.

As discussed in the cost drivers section below, however, the obligated parties found it challenging to achieve these levels of contributions, particularly after public sector spending cuts were announced in the 2010 Comprehensive Spending Review (CSR). This meant that the obligated parties eventually moved to fully funding CESP schemes, pushing the price of CO_2 per tonne for the obligated parties upwards.

> *We were looking to get 30, 50, 70% contributions early on. So we were getting prices as low as £16 [per tonne of CO_2]. That quickly dried up and forced us to put the prices up. In other words we paid 100% contributions.*
>
> Energy supplier 2

This evolution of approach can be seen in case study area A. The local authority reported that the obligated parties they were having discussions with initially wanted a contribution of £1million from the local authority, but that this was not feasible following the CSR. Two obligated parties then responded to the local authority's request for more favourable offers in late 2011. One party would have required a local authority contribution of £800,000, while another party offered to provide full funding. The local authority entered into a partnership with the latter party, who invested an initial £3.85 million in the scheme (and a further £2.1 million to extend the scheme). The local authority contributed £700,000 for non-qualifying remedial works (e.g. guttering, drainpipes and other fixtures and fittings). The energy company contribution was therefore upwards of 89% for the scheme as a whole, although it was 100% of the CESP measures.

As in the example above, the interim CESP evaluation found that it was very common in CESP schemes that non-qualifying but necessary ancillary works had to be carried out alongside the CESP measures. This was an additional 'hidden' cost often picked up by local authorities and housing associations.

In addition, CESP measures sometimes formed much wider packages of regenerative works. In one CESP scheme in case study area D, for example, the CESP measures were almost entirely funded by an energy company (99%), but were complementing a wider town centre regeneration scheme that had brought in more than £200 million of public and private investment.

Beyond local authority and housing association funding, many CESP schemes also pulled in funding from other sources. One of the CESP schemes in case study area D, for example, combined CESP funding with funds from ERDF funds, monies from 'Renewables and Energy Efficiency in Community Housing' (REECH) and additional investment from the housing association. In case study area C, CERT and CESP work was being carried out in parallel with a large-scale Decent Homes Programme. Elsewhere, there were several examples of CESP funding being compared with Arbed funding in Wales.

9.3.1 Development costs

Evidence from both the interim evaluation and this evaluation suggests that development costs for CESP were significantly higher than CERT. Negotiations with energy companies were often reported to last several months, and in some cases over a year.

Several local authorities provided data on staff time involved in developing schemes. This ranged from 10 days to 300 officer days. Most estimates were at the higher end of this range. There were also costs in terms of funding housing stock surveys or data purchases. Some local authorities reported these could cost £20-40,000. Social housing providers had also contributed significant time inputs (ranging from 20-700 days, with several contributing more than 100

days). Again, they had also funded surveys, data or legal advice costing £10-20,000. In one case, a survey was co-funded by the energy company.

9.3.2 Costs of 'aborted' schemes

A range of different delivery stakeholders also noted that significant resources had been put into identifying or developing potential CESP schemes that did not go ahead. One energy supplier said that of the opportunities discussed with potential delivery partners, around 15% of these resulted in schemes being delivered.

> *"In order to contract £150m worth of schemes we had to have conversations on around £1billion of work".*
>
> Energy supplier 1

This had cost implications for the obligated parties as well as delivery partners. In the evaluation cost survey, for example, one local authority said that it had invested around 75 staff days and £15,000 for feasibility surveys during 2011. This led to at least one CESP scheme, but they reported that some schemes could not go ahead due to difficulties in delivering them within the CESP timescale.

In another example, one community delivery organisation described putting in time to scope the potential for CESP schemes and had several discussions about schemes with various energy suppliers but nothing came of them. Others reported that they put in a small amount of groundwork into identifying schemes but were discouraged by the programme's complexity and the uncertainty of funding that would be received (which could vary according to whether uplifts and bonuses were achieved).

9.4 Consumer costs

The cost to customers was a relatively straightforward proposition under CESP, compared to CERT. For social housing tenants, which early Ofgem reports suggest were a significant proportion of the beneficiaries under CESP (supported by the data held by EST on energy efficiency measures which indicates that 61% of all CESP measures were in social housing[1]), measures were installed at no cost to the tenant.

In private housing there were a variety of offers. There were a number of schemes that offered free or 'as-good-as' free measures to householders, One energy supplier, for example, offered CESP measures to households in existing schemes for £1[2]. This enabled them to achieve the area density bonus, which made the schemes more cost-effective.

In other schemes, private households were asked to pay a contribution towards the costs of measures. In one case study scheme in the interim evaluation, for example, private households were offered SWI for £3,000.

The survey of case study areas indicated that 96% of all measures received by customers were for free, with four per cent requiring a financial contribution. In four of the five case study areas at least 99% of measures were free, while in one case study area 10% paid part of the cost. The level of payment varies by tenure, as follows:

- Rent from housing association or local authority: 100% of measures for free
- Rent from private landlord: 100% of measures for free

[1] It should be noted that this is based only on measures for which information about the tenure of the property is known. 48% of all measures were in social housing if taken as a proportion of all measures including those without tenure.
[2]The charge was to demonstrate that a contract was in place between the householder and the installer.

- Owned outright or buying with mortgage: 91% of measures for free

9.5 Price drivers

The analysis suggests that there were a number of key drivers that affected the price of delivering a tonne of CO_2 under CESP. These are set out below.

9.5.1 Scheme design

The evaluation findings suggest that a number of facets of the scheme design contributed to price levels and delivery costs:

- **The Impact Assessment**: many of the obligated parties reported that they used the CO_2 price estimated in the Impact Assessment as a benchmark for initial pricing strategies. Similarly, some said they had also based expectations on contribution levels from local authorities and housing associations on the Impact Assessment. This differs from CERT, where energy suppliers reported using their own models to determine pricing strategies and forecast costs. The difference between these approaches may be explained by the fact that CERT was an evolution of previous obligations which had provided experience and knowledge to inform expected costs and prices. CESP, however, was quite different from any obligation that had been placed on the providers before, so the Impact Assessment is therefore likely to have been more influential in setting expectations and initial pricing behaviour during the early stages of the obligation.

- **Complexity of scoring**: the complex scoring system involving a number of uplifts and bonuses (described in Chapter 2), made it difficult to predict what actual costs and prices of delivering CO_2 would be, particularly as there was often imperfect data about the housing stock in eligible LSOAs.

- **Scope**: CESP had a narrower scope of measures than under CERT, which restricted energy company choice – and therefore competition between different measure types - about what could be delivered. Promotion (through uplifts) of SWI in particular, an expensive measure compared to cavity wall or loft insulation, also increased the price of delivering a tonne of CO_2 under CESP.

- **Timescales**: the CESP delivery period (three years and three months) was a relatively short timescale given (a) the complexity of the programme and (b) the nature of the works (see below). The complexity of the programme meant that it took some time before obligated parties, the administrator and delivery parties fully understood the technical complexities that would be encountered in the properties targeted. To ensure measures being claimed were compliant and to enable obligated parties to receive the maximum (correct) scores for the work carried out, Ofgem and the obligated parties jointly set up technical working groups, working collaboratively to understand and overcome these technical difficulties and devise workable solutions.

  > *CESP was complex. It was a bit like a monopoly, so took a long time for people to get their heads round it. If the scheme had been longer term, people could have planned ahead, and there wouldn't have been the rush. You could have got contributions from housing associations and councils and householders.*
  >
  > Supply chain stakeholder 3

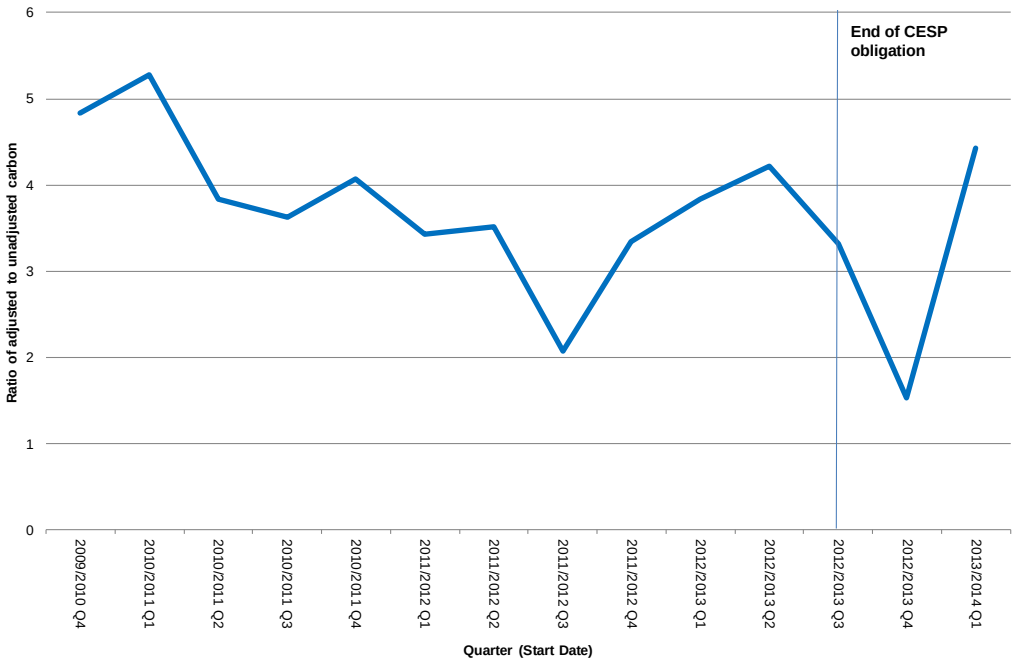
- **The nature of the works and schemes**, which typically involved large-scale regeneration schemes – meant that each scheme required long delivery times. The

works were often weather-dependent which could further delay work. Both factors also meant that scheme development was also time-consuming. The average length of schemes (on the basis of start and end dates provided by obligated parties) was around 9.5 months, though this varied substantially, with the longest scheme taking almost three years from start to completion.

9.5.2 Scarcity

A paucity of cost-effective schemes was a key driver behind the rising prices paid per tonne of CO_2 over time. The most cost-effective schemes would typically involve higher CO_2 uplifts per measure installed (other things being equal), and this would be partly reflected in higher ratios of adjusted to unadjusted carbon savings. As illustrated in Figure 9.3, the ratio of adjusted to unadjusted carbon savings over time fell over time. As such, there was a downward trend in the efficiency of CESP schemes (as those schemes offering the greatest bonuses would give the highest ratio of adjusted to unadjusted carbon savings).

Figure 9.3: Ratio of adjusted to unadjusted carbon savings by scheme end date



A limited number of schemes in the market place meant competition was high and prices were driven up as the obligated parties sought to secure schemes (and their associated carbon) in order to be compliant.

Related to this was the availability of skilled labour, as raised in Chapter 6. Stakeholder reports of needing to look to labour from outside of the UK brought delays and associated increase in prices to the obligated parties.

9.5.3 Availability of wider funds

One of the key factors in driving prices up over the lifetime of CESP was the availability of funds from delivery partners. The Impact Assessment helped to set expectations in the CESP market that local authorities and housing associations would be able to provide financial contributions to schemes. However, the impact of public sector spending cuts following the Comprehensive Spending Review in 2010 brought significant reductions to the contributions to schemes. It also resulted in the loss of key local authority staff, which hampered scheme development, and also

delayed the progress of the local authority letter which needed to be signed for schemes to be approved by Ofgem.

9.5.4 Competitive auctioning

With demand high and supply low, local authorities and housing associations sought to drive the best deal for their schemes. This could happen formally through competitive tendering processes or informally through discussions with obligated parties about the deals they could offer.

10. Scheme administration and management

This chapter presents an overview of the role played by Ofgem – as administrator of the programmes – and DECC – as the Government department responsible for design of the programmes and setting the overall targets. This chapter makes an assessment of the strengths and weaknesses of each party's delivery of these roles, on the basis of evidence provided by stakeholders involved in the evaluation.

10.1 Role of Ofgem

Ofgem was responsible for administering the CERT and CESP schemes. It had previously also administered the forerunners to CERT, the Energy Efficiency Commitment (Phase 1, 2002-2005 and Phase 2, 2005-2008).

Ofgem's role included calculating the individual targets of qualifying energy companies, approving energy companies' proposals for complying with their obligations, determining the reduction in carbon emissions resulting from energy companies' activities, reporting to the Secretary of State and initiating enforcement action where appropriate.

10.1.1 CERT and CESP

One of the challenges in assessing Ofgem's performance as a scheme administrator for CERT and CESP is determining whether issues were the result of legislative requirements or the way in which Ofgem chose to interpret this legislation and exercise their role. This confusion was very much reflected in the stakeholder interviews, where critiques of the legislation and scheme design itself, were sometimes perceived by stakeholders to be issues with Ofgem's performance as an administrator.

What is clear, however, is that the legislation underpinning obligations can be complex. The CESP legislation was regarded as particularly complex by a number of stakeholders. Interpretations of how Ofgem could have exercised their duty in administrating the programme varied across stakeholder types, with Ofgem and the obligated parties often having different views. In any case, a number of stakeholders recognised that Ofgem had a challenging role in administering CESP, given the complexity of the scheme.

> *The difficulty, and it's a genuine difficulty, is what the energy companies might like would be a bit more relaxation on Ofgem's part: 'this is proving particularly difficult in reality so can't we take it down a notch?', that kind of thing. Ofgem will tell you that's not how the law works, and actually it's true, that's not how the law works in the programme.*
>
> National stakeholder 5

Ofgem noted that the obligated parties had the opportunity to present proposals to Ofgem and DECC where they felt there could be changes or amendments. Legislation and supplier guidance were also the subject of consultation.

A number of stakeholders, across all sectors, also felt that Ofgem's remit could have been broadened to include engagement with other key delivery sectors. Ofgem were clear, that their legislative remit was in respect of the obligated suppliers and generators, and guidance was

published accordingly. However, there were suggestions from stakeholders that this remit should have been expanded to allow for the provision of guidance, support and engagement to local authorities and parts of the supply chain in order to improve their understanding of, and engagement with, the programmes. These suggestions were also levelled at Government (see below).

> *I think in general the schemes could have been smoother if you had a regulator who when writing guidance were thinking of who is going to read it – not just British Gas who have 30 lawyers to help them interpret it, but also Doncaster Council, for example, who might just have one part-time officer working on it.*
>
> National stakeholder 5

It should be noted that whilst no formal guidance was produced, Ofgem reported that they met with DECC and the LGA to discuss issues around the engagement of local authorities in CESP. This resulted in the publication of an LGA guidance document on CESP and the roles of local authorities within CESP (Local Government Association, date unknown).

10.1.2 CERT

Overall, many stakeholders were supportive of Ofgem's performance in administering CERT, particularly prior to the extension. Administration of the CERT Extension was generally regarded as more problematic as a result of the increased complexity it introduced to the scheme.

10.1.2.1 Strengths

From the stakeholder interviews, the main strengths of Ofgem's approach to administering CERT were that:

- Ofgem staff were robust and diligent in administering the programme;
- It put in place straightforward, easy-to-understand systems in place for the obligated parties, with continuity from the systems used under EEC2. Stakeholders generally felt that the design of the scheme enabled this in that the scheme - prior to the CERT Extension - was relatively simple to understand and deliver, and was also an evolution of the EEC2, rather than a radically different obligation;
- The administration systems, and the scheme itself, provided the energy suppliers with certainty about the carbon scores they would achieve for measures delivered by keeping carbon scoring simple and easy to interpret;
- Ofgem provided quarterly and annual reports throughout the lifetime of CERT, the frequency and nature of which were welcomed by a number stakeholders;
- Ofgem staff were regarded by the obligated parties as being straightforward to deal with and were generally felt to have the requisite expertise, experience and resource levels to administer the programme;
- A number of stakeholders also felt that Ofgem had taken a pragmatic and flexible approach to administering the programme, for example the decision in 2012 to allow a proportion of measures delivered to social housing residents to be assumed to be SPG-qualifying measures (see also chapter 6).

10.1.2.2 Weaknesses

Stakeholders identified a number of perceived weaknesses of Ofgem's administration of the programme, including:

- Stakeholders felt that Ofgem could have provided greater transparency on energy supplier progress in complying with their obligations. This was something that supply chain stakeholders in particular felt would have enabled them to forward-plan more effectively;
- A number of energy suppliers and supply chain stakeholders also felt that the evidence requirements for SPG measures were too onerous. As discussed in chapter 6, one of the challenges in meeting the SPG sub-obligation was that it was not straightforward to persuade SPG customers to provide the evidence required to prove that they fell into this category. Some energy suppliers therefore felt a more flexible approach, such as allowing an assumed percentage of SPG customers from the beginning of the CERT Extension period, would have enabled more cost-effective delivery of the obligation. However, the deeming of the percentage of social housing residents that were SPG was only possible once the energy suppliers had provided evidence to support an assessment of social housing residents that were likely to fall into the SPG category. This evidence was not available to suppliers when the CERT Extension period started;
- Some stakeholders believed that Ofgem could have intervened more proactively in amending, or encouraging Government to amend, scheme requirements. The most commonly cited example was the issue of CFLs. It should be noted, however, that Ofgem's role was to administer the scheme in accordance with the legislation and the powers afforded within it. Policy and legislative amendments were DECC's responsibility.

10.1.3 CESP

Broadly speaking, stakeholders were more critical of the way Ofgem administered CESP, compared to CERT. The interim CESP evaluation found that the administration of CESP had been problematic. They believed this was in part due to the complex legislative requirements set for CESP, but also because of the way Ofgem had interpreted and enforced these requirements (CAG Consultants, Ipsos MORI and BRE, 2011). The evidence from this evaluation supports these findings.

10.1.3.1 Strengths

The strengths of Ofgem's administration of CESP, as identified by the stakeholders interviewed for this evaluation were that:

- Ofgem provided a strong compliance message throughout CESP. A number of stakeholders felt that Ofgem, with Government, were clear that the obligated parties must meet their targets in full or be subject to enforcement action, despite the challenges being faced in meeting these targets. They felt this was important for ensuring the integrity of the obligation and future obligations;
- Whilst stakeholders raised a number of issues in relation to the administration of CESP, a number of them felt that Ofgem's performance improved over time. They recognised that the complexity of the scheme and the fact it was very different in nature to CERT and its predecessors, partly explained early issues with administration.

10.1.3.2 Weaknesses

Key issues highlighted by stakeholders regarding Ofgem's administration of CESP were:

- **A low scheme approval process**. As the interim evaluation found, a key concern for the energy companies and many of their delivery partners was large delays between initial submissions of schemes by energy companies and their eventual approval by Ofgem. The obligated parties felt that this process was in part due to Ofgem's 'overly

burdensome' administrative requirements for CESP scheme approvals, as well as the complexity of the scheme itself. Ofgem, however, commented that there were several factors that contributed to delays:

1. In many cases scheme submissions were incomplete and the provision of required information by obligated parties was slow.
2. Technical complexities which had not been encountered in previous schemes also contributed to delays, particularly in relation to the treatment of old and diverse housing stock with SWI. Ofgem's responsibility was to ensure compliant measures were installed and claimed so an understanding of these complexities was necessary before schemes could be approved.
3. Local authority declarations: Ofgem could not approve a scheme without a correct local authority declaration however local authorities often refused to sign these declarations.. Ofgem reported that this was one of the key factors that delayed scheme approvals.

- **A lack of technical expertise within Ofgem**. A number of stakeholders felt that Ofgem staff lacked the technical expertise on key, but complex, measures such as SWI and district heating. They felt this hampered its ability to set up and define administrative systems and evidential requirements, process information, and define scoring rules. As highlighted above, the level of technical complexity encountered in CESP schemes was unexpected by all involved. Ofgem reported that it outsourced technical issues to technical experts in the initial period of CESP, set up technical working groups with obligated parties to work together to find solutions and set up an in-house technical team to resolve the technical issues to speed up approvals.
- **Resources**. A number of stakeholders felt that insufficient staff resources had been allocated to administer the scheme. Some felt that this was an issue with DECC not allocating Ofgem with sufficient resources, while others felt that Ofgem itself should have made greater resources available. It should be noted that the Impact Assessment had an expectation that there would be 100 CESP schemes in total. The final number of schemes was 491. Ofgem reported that the budget allocated by DECC was based on the Impact Assessment and so until it was increased in 2012 Ofgem was unable to allocate further resources to the scheme.

10.1.4 Learning

There are a number of findings that provide lessons in relation to the design of the administration of similar policies. These include:

- Scheme design appears to have a large influence on the administrative burden involved in obligations. CESP and the CERT Extension were more complex than the original CERT programme, and involved more complex administrative requirements as a result.
- The original CERT programme also benefitted from being an evolution of the previous obligation, EEC2. CESP, on the other hand, was very different in nature, both in terms of the scoring system, but also in terms of the nature of the works required to deliver the programme. This suggests that 'new' and more complex future obligations might benefit from a longer lead-in period to the obligation, to allow Ofgem and the obligated parties to prepare for the programme, and greater programme flexibility to allow for initial teething problems.
- Legislation and policy should account for situations in which there are differences in the intended outcomes of a scheme and the way in which they are delivered and

administered. Clearer legislation would remove uncertainty about administrator interpretation.

- The administrative requirements for a scheme need to be anticipated by Government during the scheme design to ensure that the administrator has adequate resources and expertise in place, and to allow it to develop guidance and processes in advance of the scheme start.

10.2 Role of Government

DECC was responsible for the policy design of CERT and CESP and for setting the overall targets for CERT and CESP. Government also played a role in making 'softer' interventions in delivery of the schemes, such as promotion to key audiences and liaison with the obligated parties and the administrator.

The evaluation evidence highlighted four key issues in relation to Government's role, outlined below.

10.2.1 Promotion and communication

Many stakeholders felt that DECC could have played a more proactive role in communicating and promoting CERT and CESP through:

- Promotion of energy efficiency more generally, to increase consumer demand for, and understanding of, energy efficiency requirements; and
- Provision of guidance for local authorities, housing associations and other key delivery partners, such as generic easy-to-understand guides for key sectors, as well as specific support on key issues such as procurement and planning (see also Ofgem section above).

10.2.2 Intervention

There were mixed views amongst stakeholders about the effectiveness of Government interventions in CERT and CESP:

- Many stakeholders felt that the Government should have intervened more quickly when unintended consequences became apparent, for example by acting sooner to prevent CFLs being distributed so widely under CERT;
- However, this was contradicted by a view that the Government should not generally intervene in energy company obligations and that once they are launched, government should step back.

10.2.3 Data

As already discussed, in early 2013 two energy suppliers managed to negotiate a 'data washing' process with the DWP, being very concerned about the possibility of missing their CERT SPG targets. This enabled the energy companies to carry out a process of retrospective 'data-washing' of their CERT supplier records against benefits data held by the DWP, to identify measures delivered to SPG customers that had not previously been identified as such. The data washing process showed that there had previously been considerable under-identification of SPG customers. Ofgem then informed all energy suppliers obligated under CERT that the data washing methodology had been approved and other suppliers could pursue this option.

There was frustration and anger amongst a number of the energy suppliers that the data washing process had not been transparent. Suppliers reported that the DWP and the two energy suppliers involved had not notified the other four suppliers about the process and therefore felt that they had been unfairly disadvantaged as a result. They believed that the two energy suppliers who had carried out the process with DWP only met their SPG obligation as a result of this process, whilst others had achieved it during the compliance period and at significantly higher cost as a result of the high costs of delivering SPG measures.

Furthermore, all the energy suppliers felt that more could have been done to introduce the process for suppliers at an earlier stage. They felt that many of the search costs of finding and checking documentation for SPG customers could have been avoided, and that the way data washing was arranged was unfair to some suppliers.

11. Conclusions

This final chapter of the report concludes with a summary of the successes and failures of the original CERT programme (2008-11), the CERT Extension (2011-12) and CESP. It also relates the findings of this evaluation to the original policy objectives of each programme (see appendices for the programme objectives). It is important to note that the policy objectives did not set out completely clear expectations in terms of specific targets or milestones to be reached. The objectives were also not built into the design of the programmes through any formal monitoring mechanisms to assess progress in achieving them. For these reasons, assessing the extent to which they were reached is challenging. We have therefore provided a general assessment of the programme's achievements rather than considering each individual policy objective in turn.

11.1 CERT

11.1.1 Reducing domestic carbon emissions

In many ways, CERT was a successful vehicle for reducing household carbon emissions across Great Britain. The overall carbon targets were, broadly speaking, achieved. CERT delivered a high volume of carbon savings, with 296.9 Mt CO_2 being achieved, as reported by Ofgem, in excess of the 293 Mt CO_2 required by the obligation. This was, largely, due to the wide range of measures that were eligible under the programme.

These savings are based on the assumed lifetime carbon savings brought about by measures, and it is not possible to know at the time of writing whether these savings will be achieved in reality. There is no monitoring of the measures in-use, and some stakeholders expressed concerns that not all measures were leading to savings; the over-delivery of free CFLs being the most commonly cited reservation. Anecdotal evidence also indicates that the impact of some measures can be lessened by low consumer awareness of how best to use the measures, faulty installations and/or deficiencies in the existing energy efficiency of recipient's homes.

However, the assumed lifetime carbon savings set out in Ofgem's technical guidance did take into account comfort taking and other factors that would reduce the measures' potential savings. Ofgem also conducted a monitoring exercise on the CFL activity and reduced the carbon savings claimed by suppliers in accordance with the findings of this exercise.

Furthermore, by providing a suite of options and measures to the energy suppliers to deliver their obligations, consumers benefitted from activity and offers on energy across the home, including insulation, heating, appliances and lighting. This element of the design meant that CERT was an inclusive scheme, in that all homes in Great Britain had the potential to benefit from the programme. The aspiration to report on the number of measures delivered was also achieved, contributing to a greater understanding of the scale of energy efficiency measures across the domestic housing stock.

CERT had some success in overcoming barriers to take up of energy efficiency measures; while not an effective vehicle for promoting large-scale uptake of microgeneration, it successfully delivered high volumes of 'quick win' forms of insulation, such as loft and cavity insulation, and lighting (although stakeholders disagreed about whether the latter were effective in delivering carbon saving due to concerns about the extent to which light bulbs were used by consumers).

In terms of the Extension, the IO was successfully achieved and the extension raised levels of insulation considerably (particularly professional loft insulation).

11.1.2 Equity

In terms of CERT's equity, it was arguably more equitable than CESP, given that anyone across Great Britain could participate. However, CERT's incentive structure encouraged delivery of lowest-cost measures, which in turn resulted in an emphasis on easier to treat properties and properties in more accessible areas. This focus on the 'low hanging-fruit' left more challenging measures and/or barriers largely side-lined. Homes in less accessible areas, such as remote areas of Great Britain and dense urban areas (such as inner city London where access costs were higher) were less likely to benefit.

There was also under-representation of the social housing sector and PRS sector within CERT (roughly 90% were in owner occupied households). There were some reports of reluctance from the energy suppliers to engage with the PRS, but the barriers to engagement with this sector (primarily in reaching landlords and negotiating the three-way nature of organising improvements between the tenant, landlord and installer) were certainly also a factor.

11.1.3 Costs of measures to consumers and impacts on fuel poverty

Costs of measures to consumers were kept relatively low (although potentially contributing to a legacy of inflated consumer expectations of the cost of energy efficiency measures), and the PG and SPG obligations encouraged redistribution of the benefits to those most in need. Five of the six energy suppliers met their PG and SPG targets, suggesting that CERT did succeed in reaching a certain number of vulnerable households. It is likely that fewer suppliers would have met their SPG target without the retrospective 'data-washing' exercise with DWP. Engaging SPG customers proved particularly challenging for the energy suppliers. They were difficult to identify and engage with; personalised approaches involving locally-based, trusted organisations and community groups were more effective in reaching this group than generic marketing approaches. When they were reached, it was often difficult to obtain the evidence required to prove they fell into the SPG category; energy suppliers used cash and other incentives to help overcome this barrier.

The true extent of CERT's impact on fuel poverty is very difficult to ascertain. Assessing the impact of CERT on low-income households and the fuel poor is hindered by the fact that there was no requirement to monitor the delivery of measures to these specific groups. The introduction of the SPG in the CERT Extension – while not specifically targeting the fuel poor - went some way to addressing this, but this only applied to the latter part of the programme.

Most PG and SPG customers received insulation measures for free, with many NPG customers also not paying anything for measures. These findings indicate the relative success of the programme in delivering measures to those who could probably ill afford them in normal circumstances. However, the available evidence explored in this evaluation indicates that CERT beneficiaries were often not the neediest; they were more likely to be on higher incomes and less likely to be concerned about their household's financial situation. Financial motivations were the most common reason given by CERT customers for installing measures, but the impact of the subsidy they received is less clear. A relatively high proportion of customers claim that they would have gone ahead without the discount (although it should be noted that there is likely to be some over claim in this). For these reasons, it is questionable whether the additionality delivered by CERT was fully maximised. It is not possible however, to provide a quantitative assessment on additionality.

11.1.4 Cost effectiveness of CERT

It should be noted that given the lack of data on the costs to households and local authorities, and some of the benefits to households (such as bill savings) it is only possible to undertake a

partial view on CERT's cost effectiveness (based on obligated supplier costs and estimated carbon saved).

Based on the notional lifetime carbon savings reported, both CERT and the CERT Extension were delivered at a lower unit cost (cost per tonne of CO_2 saved) than originally anticipated in the impact assessment. It was also delivered more cost-effectively than CESP and in this sense CERT did offer relatively cost-effective carbon reductions.

However, the introduction of the SPG and the IO led to higher unit costs under the CERT extension (average price per tonne during the Extension was 129%of the average cost during the pre-Extension period) with costs rising particularly rapidly in the final quarter of the programme. Five of the six energy suppliers achieved their SPG targets, but the overall target was not reached and there were significant challenges and costs in delivery.

There was some evidence from the evaluation that the introduction of the SPG led to unnecessary deployment of resources in lead generation owing to difficulties in verifying SPG status of potential customers. In particular, the 'data-washing' exercise undertaken by one of the obligated parties suggested that high proportions of measures installed for PG customers were in actuality delivered to SPG customers. As such, it is likely that the original CERT scheme was effective in reaching this group at a substantially lower unit cost. The evidence would therefore suggest had data-washing been available and in-use earlier in the scheme, the search and verification costs for meeting the SPG Obligation could have been lower.

It should also be noted that during the later stages of CERT there was considerable variation in cost effectiveness of delivery across suppliers. During the last quarter of the programme the highest prices per tonne of carbon saved were in excess of £35 per tonne; well in excess of twice the average price at that point in time and three times the level of the lowest. Due to the lack of any cost information for specific measures, or on the socio-demographic background of the recipients, it is not possible to make any judgements about the cost-effectiveness of different measures delivered under the programme, or on the extent to which delivering to different demographic groups impacted on costs.

The key cost drivers under CERT were:

- **The design of the scheme:** The flexibility and non-prescriptive nature of the scheme at the beginning of CERT helped to drive competition and keep costs down. However, the CERT Extension removed some of this flexibility, focusing delivery on insulation measures more than other sectors. The short timescale and challenging targets of the Extension were also a factor in driving prices upwards;

- **Adjustment to Extension:** The CERT Extension also led to a 'set up and adjustment' period for some suppliers as they renegotiated contracts and revised their delivery approaches. This meant greater levels of activity were needed as the Extension progressed, raising demand and therefore prices;

- **Supply side constraints:** There was some limited evidence that supply side constraints in relation to CWI capacity may have affected prices under the CERT Extension;

- **Finding SPG customers:** The challenges of engaging SPG customers meant that search and verification costs added to the price of carbon for this group; and

- **Rush to deliver:** Installers sought to maximise their profits as demand rose from the suppliers, particularly given industry uncertainty about future support for the sector under Green Deal and ECO.

The scheme involved significant peaks and troughs of activity throughout its lifetime. This was partly due to change in the scheme, particularly the extension, as well as seasonality and the energy suppliers' own strategies. This made it difficult for installers to forward plan and manage demand. Concerns were also raised that the rush to meet targets at the end of CERT attracted many new entrants to the market, leading to negative impacts on the quality of service and installation for customers.

11.2 CESP

11.2.1 Reducing domestic carbon emissions and improving energy efficiency of housing stock

The carbon savings delivered under CESP were a fraction of those achieved under CERT, and the programme failed to achieve the overall carbon savings it originally set out to deliver. However, scale was not the primary focus of CESP and reports from stakeholders and also customers are that it did transform the housing stock of areas in which CESP activity was located. All of the case studies and many national interviews generated evidence of the significant regeneration impact of CESP schemes. The visual improvement of areas was particularly considered to be a success of the programme, and additional benefits have been cited including increased employment and protection of entire estates from demolition.

According to recent estimates, CESP also contributed significantly to the SWI industry during its lifetime. Approximately 39% of all measures installed in British homes were delivered through CESP. It should be noted that only three per cent of domestic solid wall properties were estimated to have been insulated by the beginning of 2013 (DECC, 2013), but the industry was clearly driven by the programmes.

11.2.2 Equity

In terms of the equity of CESP, the scheme set out to reach those in low income areas rather than take a broad brush approach as CERT did. No monitoring requirement of customer characteristics was built in to the programme, and it is not possible to conduct a national survey of CESP areas. For these reasons, it is difficult to ascertain the 'profile' of CESP customers and therefore the degree to which they could be considered low income households. However, the case study surveys and anecdotal evidence from the qualitative interviews does suggest that relatively high proportions of customers were on low incomes and in difficult financial positions.

Unlike CERT, CESP was successful in incorporating a significant degree of social housing properties into the programme. It also reached the private sector (around a third of measures were in owner-occupied households), often through extension of subsidised measures initially targeted at social housing.

11.2.3 Costs of measures to consumers and impacts on fuel poverty

As with CERT, the lack of any customer monitoring data prevents an accurate assessment of CESP's impact on fuel poverty. For the same reason, it is also difficult to judge the extent to which fuel bills were reduced (although this issue is tackled in a combined section for both CERT and CESP later in this chapter).

CESP did target disadvantaged areas through focusing schemes in the most deprived 10% of LSOAs across the country. However, those living in fuel poverty are not necessarily area (LSOA) based (data from the interim evaluation suggested that fewer than a quarter of

households in the bottom 10% of the IMD composite[69] in England were in fuel poverty – slightly above the national average of 18%). The obligated parties therefore had limited ability to target those in fuel poverty specifically, and had no requirement to monitor income levels of those they engaged with. This raises the question of whether this design might have been more difficult than a registry-drawn selection might have been, with the assistance of relevant Departments.

There were also problems encountered with delivering measures in rural areas, as well as London – as experienced with CERT – meaning that low-income populations in these areas were less likely to benefit.

11.2.4 Cost effectiveness of CESP

As with CERT, the lack of data on some of costs and benefits mean that it is only possible to undertake a partial view on CESP's cost effectiveness (based on obligated supplier costs and estimated carbon saved).

In contrast to CERT, the costs incurred by obligated parties associated with the delivery of CESP were substantially higher than anticipated, and average cost per tonne of CO_2 were some 2.5 times higher than for CERT. This was partly driven by the bonus structure: the supply of schemes offering the high carbon uplifts required to attain the anticipated unit costs was not as strong as anticipated. However, the complexity and difficulty of the construction projects involved, and their long lead-in times, also likely inflated costs (and also led to aborted schemes). This might be somewhat expected, given the schemes focus on innovation and trialling new approaches.

There was also wide variation in costs per tonne of CO_2 (on a scheme level) between the different obligated parties; the most expensive scheme exceeded £100 per tonne. In addition, the decline in availability of alternative funding sources (primarily from Local Authorities) during the latter years of the programme also contributed to an increase in the cost to the obligated parties.

The lack of information on the delivery costs for specific measures, or detailed information about how the schemes were delivered, mean it is not possible to explain the high level of volatility of prices by scheme. However, a number of themes arose that help explain the drivers of costs.

Key price drivers under CESP included:

- **The scheme design:** As CESP was quite a different scheme to previous obligations, stakeholders reported that the Impact Assessment was important in determining initial delivery strategies and prices. CESP also involved a narrower scope than CERT (particularly pre-Extension) and therefore provided fewer opportunities for competition between energy saving sectors. The complex scoring system created uncertainty about the carbon scores that schemes would achieve (and therefore their worth) and added to the administrative and management costs. A relatively short delivery window (for the nature of the works required) also put pressure on prices.

[69]Note that the 2009 EHS data does not include the IMD income indicator used to determine CESP areas. The analysis used instead the IMD composite indicator. The income domain has a high weighting in the IMD composite indicator and is closely correlated with many of the other components (e.g. employment) so this should be a reasonable first proxy in the absence of the specific IMD income indicator used by CESP. Indeed, BRE analysis of 2005-07 EHS data using the IMD income indicator used in CESP showed not dissimilar results, finding that just over 20% of CESP targeted households were in fuel poverty, against a national average of 15%.

- **Wider funding:** An initial expectation that local authority and housing associations would be able to contribute significant funds to schemes, but public spending cuts limited their ability to do so, driving up the price of carbon and the cost of schemes for the obligated parties;

- **Scarcity:** there was a paucity of cost-effective schemes (those that optimised the uplifts and bonuses available under CESP); and

- **Competitive auctioning:** as demand rose for schemes, many local authorities and housing associations sought to maximise the value they secured from the obligated parties.

Stakeholders also reported regional variations in cost-effectiveness, with schemes being most costly in rural areas, as well as London. The higher costs in these areas certainly contributed to the lower level of delivery in these areas.

11.2.5 Piloting new approaches

CESP did incentivise area-based delivery but not as intensively as hoped. There were barriers to delivering CESP measures in certain tenures - for private dwellings and to a larger extent the PRS - which hampered the ability to maximise localised delivery. The fact that LSOA boundaries often cut across communities (and even properties or blocks) made equitable delivery a challenge.

The area-based approach did help bring some benefits including promotion of the scheme by word of mouth, and cost-efficiencies in marketing and the practicalities of delivery. However, this impact on cost effectiveness was largely outweighed by the impact of the programme's complexity (e.g. the variety of build types and complexity of design).

Partnerships were important vehicles under CESP, as well as CERT. Where effective, the involvement of local partners in scheme delivery brought: important local knowledge; data on housing stock and residents; local leadership; advice services; delivery of wider services and outcomes; and additional resources.

There is some evidence that CESP encouraged effective partnership working, but longer timescales and greater support, guidance and resources for key delivery partners might have strengthen these and make them more consistently effective and holistic.

The emphasis on, and incentive structure to enable, whole-house delivery did encourage delivery of multiple measures. However, it could not truly be considered a 'whole-house' solution as not all measures required for a genuine whole-house solution were always eligible or available under CESP.

11.2.6 CESP Design

There are question marks over how appropriate it was to obligate the independent generators in the delivery of CESP; they had no previous experience of energy company obligations, no experience of delivering domestic energy efficiency schemes, no existing relationships with domestic customers and limited in-house resources. This may be reflected by the fact that three of the four independent generators failed to meet their targets.

Those involved in the delivery of CESP also raised the question of whether CESP was run as a pilot, as originally expected. While it trialled new approaches and encouraged innovation, the

obligated parties were bound by the targets set under CESP and faced fines for failure to deliver against them.

11.3 Engaging customers – CERT and CESP

There are a number of issues related to customers, such as the impact on heating behaviour and thermal comfort, which do not differ markedly between the CERT and CESP programmes. The following section therefore takes a thematic approach, assessing each issue for both programmes, but identifying any differences where they exist.

11.3.1 Impact of measures on bills and affordable thermal comfort

The ability of this evaluation to determine the extent to which costs of delivery, incurred by the obligated parties, have been passed on to consumers is hampered, primarily, by two factors; firstly, the paucity of information on energy supplier pricing mechanisms in this respect, and secondly, the absence of baseline data on customer's bills. Most customers surveyed reported an increase in their bills when compared with the period before they received any measures, but it is not possible to isolate the contribution made to this by the CERT and CESP programmes. Furthermore, NEED data shows that households with energy efficiency measures have saved money when compared to households that have not received measures.

Increases in fuel prices over-shadow actual and/or perceived savings that might be attributed to the energy efficiency measures. However, while a backdrop of steadily increasing energy prices muddies the waters, the indications are that many – particularly CESP - customers have attained affordable thermal comfort as a result of the programmes. A significant proportion of CESP customers (almost half) have been lifted out of a position of being unable to afford satisfactory heating. While lower than CESP, around a quarter of CERT customers are in the same position. Consequently, the indications are that the programmes -particularly CESP - have helped low-income customers to reduce under-heating of their homes.

It should be noted that in some cases (certainly only a small minority) the existing thermal efficiency of the home has lessened or impeded the benefit of the measure received, and therefore the impact it might have had on customers' bills.

The programmes have had more of a noticeable impact on thermal comfort. Both CERT and CESP customers, on the whole, perceive that the measures installed have made their homes warmer. Moreover, CERT customers were also more likely than those installing non CERT measures to say their home now feels warmer with the measure (likely a function of the measures received, or combination of measures when added to existing ones).

11.3.2 Impact of measures on behavioural change

It is difficult to ascertain the impact that receipt of measures through the programmes may have had on delivering positive behavioural changes. This is because of the lack of baseline data to analyse changes over time; the wider context of changing energy prices and consumption and the general difficulty (due to social desirability bias) of accurately assessing positive behavioural change through self-reported measures alone. While many customers report reductions in their energy use, incidence of this is no higher than for non-customers.

Anecdotal evidence from stakeholders and customers highlights some positive effects on energy efficiency behaviour but this was not found to be widespread. There was some evidence of an increased level of control over heating of the home, particularly where new boilers and/or heating systems were received.

Although not a core element of the programmes, there is some evidence that a lack of customer understanding of, and potentially availability of information on, how to use the energy efficiency measures received, may undermine the potential carbon savings that could be experienced. This raises the question of whether, as part of the delivery mechanism, more appropriate training provided by qualified individuals, or an alternative method of disseminating the necessary advice, could be built in.

11.4 Scheme design

11.4.1 CERT

Table 11.1 summarises the key strengths and weaknesses of the design of the CERT scheme, many of which have been covered in the previous sections. The strengths and weakness of the CERT Extension are considered in Table 11.2.

Table 11.1: The strengths of weaknesses of the design of CERT (2008-11)

Element of design	Strengths	Weaknesses
Flexibility	Flexible means of delivery: options through different sectors including insulation, lighting, microgeneration, appliances, behavioural measures, etc.	Flexibility led to unintended consequences, such as the 'over-distribution' of CFLs
CO_2 scoring system	Simple scoring system created certainty	A perception among some obligated parties that deemed carbon savings were an oversimplification
Delivering CO_2 savings	Supported high volumes of measures at lowest cost	No mechanism to distribute the carbon savings to the most vulnerable Hard-to-treat measures not promoted: primarily focused on 'low-hanging fruit'
Beneficiaries	Inclusive, wide scope: potential for most households to benefit	A lack of equity: hard-to-treat homes, private rented sector and less accessible areas all under-represented
Link to predecessor schemes	Evolution from previous supplier obligation helped to smooth transition	
Administration	Administrative systems simple	

11.4.2 CERT Extension

Table 11.2: The strengths of weaknesses of the design of the CERT Extension

Element of design	Strengths	Weaknesses
Scope	A more prescriptive set of options for delivery created greater certainty about outcomes	Narrower scope and limited flexibility contributed to increased costs and prices
Targeting the vulnerable	Targeted vulnerable customers	SPG evidential requirements challenging; SPG obligation not a cost-effective means of targeting the most in need
Supporting industry	Supported a growth in the insulation industry as a result of the IO	Succession planning post-CERT did not provide certainty about transition arrangements and hindered ability of industry to plan and develop longer-term
Timescale		Short delivery timescale and inelastic demand led to higher prices

11.4.3 CESP

Table 11.3 summarises the key strengths and weaknesses of the design of the CESP scheme.

Table 11.3: The strengths of weaknesses of the design of CESP

Element of design	Strengths	Weaknesses
Objectives and scoring	The objectives and principles of CESP were widely supported by stakeholders	A complex scoring system: promoted lack of certainty and increased the administrative burden of the scheme
Focus on measure types	Successfully promoted delivery of SWI and multiple measures	Not truly a 'whole-house' scheme as some key measures not eligible or applied
Timescale		Short delivery timescale and inelastic demand led to rising prices
Area based	Promoted area-based delivery	LSOAs and Data Zones cut across community boundaries
Partnerships	Promoted partnership working	But timescale and complexity hindered consistent development of effective partnerships
Pilot	Promoted as an opportunity to pilot new ways of delivery	Obligation not run as a pilot: flexibility not built into the design

11.5 Learning for future policy

This evaluation set out to provide evidence to inform future energy efficiency policy design. This section summarises the key findings and the author's opinions of their implications for the development of related policy.

Programme delivery

- Longer delivery timescales are required for the successful delivery of complex schemes, particularly where there is not a comparable precedent from which to learn.
- Due to the skills, enthusiasm and resources they provide, the role of Local Authorities is critical in successful delivery of area-based energy efficiency schemes.
- In designing domestic energy efficiency policy, consideration should be given to the reporting periods that obligated parties must abide by, and their possible impact on the profile of delivery and, consequently, the impact on industry.
- The degree to which obligated parties and delivery partners provide guidance to consumers on how to most effectively use energy efficiency measures they receive, can impact on the efficacy of those measures. The same is also true of the message delivered alongside the installation.

Policy design and administration

- Additional support and guidance may be required for independent generators if they are to be obligated to deliver ‘pilot’ programmes aimed at consumers.
- There is an important balance to aim for between simplicity of programme design and certainty of outcome.
- Where possible, transitional arrangements to replacement obligations should be established to minimise industry uncertainty.

Reaching the fuel poor and equity

- Where the target customer is not bound by a pre-defined geography, alternative approaches to those using defined boundaries may be required.
- Without a structure of incentives, delivery to different tenures may be uneven.
- Co-ordination between different Departments should be encouraged to help minimise administration (e.g. customer search) costs and streamline delivery.

Evaluating and monitoring success

- Ex-post evaluations should be planned at the beginning of programmes to ensure the necessary structure is in place to assess performance of the policy.
- Ex-ante evaluations require clarity on the expectations for the programme and the development of a baseline against which to compare to the ex-post evaluation.
- Long-term monitoring of the quality of energy efficiency measures would be required to ensure that carbon savings are as expected.

Appendices

A1: CERT and CESP policy objectives

Box A1. CERT objectives

The policy objectives of CERT were to:

- Reduce household carbon emissions by overcoming barriers to uptake of cost-effective energy efficiency measures, across all households in Great Britain;
- Promote the delivery of microgeneration and other measures for reducing the consumption of supplied energy, in addition to energy efficiency measures;
- Introduce new approaches for innovation and flexibility;
- Keep costs at a reasonable level (and thereby minimise the cost passed through to consumers);
- Maximise cost-effective carbon savings;
- Maintain equity and contribute to the delivery of our statutory fuel poverty objectives; by ensuring that low-income households benefit; and
- Collect and report on numbers of measures delivered.

Box A2. CESP objectives

In addition to the objectives set out in Box A1, CESP aimed to:

- Reduce the fuel bills of low income households across Great Britain;
- Improve the energy efficiency of the existing housing stock in order to reduce the UK's CO_2 emissions; and
- Pilot new approaches to delivering energy efficiency measures, including:
    - Area based street-by-street approach to delivery;
    - Partnerships;
    - Tackling hard to treat homes;
    - Whole house retrofits involving major measures; and
    - Targeting disadvantaged areas.

A2: References

Arup (2012), *New Barracks Estate Retrofit: Post Retrofit Evaluative Social Return on Investment,* January 2012, a report for Salix Homes. Available at: http://www.salixhomes.org/documents/Salix_SROI_-_Post_Retrofit_2012.pdf [Accessed 13 January 2014]

Association for the Conservation of Energy, (2011), *Scaling the Solid Wall,* November 2011, a report for Consumer Focus. Available at: http://www.consumerfocus.org.uk/files/2011/11/scaling_the_solid_wall.pdf [Accessed 13 January 2014]

Boardman, B. (2012), *Fuel poverty syntheses, lessons learnt, action needed*, Energy Policy, Vol 49.

CAG Consultants (2010a), *Review of area-based initiatives in Scotland,* a report for Consumer Focus. Available at: http://www.cagconsultants.co.uk/resources/tm/area-based_review_main_report.pdf [Accessed 13 January 2014]

CAG Consultants (2010b), *Power to our neighbourhoods: towards integrated local sustainable energy solutions. Learning from success*, June 2010, a report for the Ashden Awards for Sustainable Energy. Available at: http://www.ashden.org/files/pdfs/reports/Full_Report_Power_to_our_neighbourhoods.pdf [Accessed 13 January 2014]

CAG Consultants, Ipsos MORI and BRE (2011), *Evaluation of the Community Energy Saving Programme,* October 2011, a report for the Department for Energy and Climate Change. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48210/3342-evaluation-of-the-community-energy-saving-programm.pdf [Accessed 13 January 2014]

Cambium Advocacy (2009), *Achieving our potential: an analysis of area-based approaches to improving energy efficiency in Scotland's homes,* a report for WWF Scotland and the Energy Agency. Available at: http://assets.wwf.org.uk/downloads/achieving_our_potential.pdf [Accessed 13 January 2014]

Committee on Climate Change (2012), *How local authorities can reduce emissions and manage climate risk*, May 2012. Available at: http://www.theccc.org.uk/publication/how-local-authorities-can-reduce-emissions-and-manage-climate-risks/ [Accessed 13 January 2014]

DECC (2009), *Impact Assessment of proposals for implementation of the Community Energy Savings Programme (CESP),* May 2009.

DECC (2012), *Final Stage Impact Assessment for the Green Deal and Energy Company Obligation*, June 2012. Available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf [Accessed 13 January 2014]

DECC (2013), Estimates of home insulation levels in Great Britain: July 2013. Available at https://www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics#energy-efficiency-statistics[Accessed 13 January 2014]

Demos (2011), *The Warm-Up – evaluation of CESP programmes*. Available at: http://www.demos.co.uk/files/The_Warm-Up_-_web.pdf?1332860609 [Accessed 13 January 2014]

Ekins, P. and Lockwood, M. (2011), *Tackling fuel poverty during the transition to a low-carbon economy*, a report for the Jospeh Rowntree Foundation. Available at: http://www.jrf.org.uk/publications/tackling-fuel-poverty-low-carbon-economy [Accessed 13 January 2014]

Energy and Climate Change Select Committee (2012), *Fuel poverty in the private rented and off-grid sectors*.House of Commons. Available at: http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenergy/1744i_ii/1744i_ii.pdf [Accessed 13 January 2014]

Energy Efficiency Partnership for Homes (2008), *An assessment of the size of the UK energy efficiency market.*

Hills, J. (2012) *Getting the Measure of Fuel Poverty: Final Report of the Fuel Poverty Review.* DECC, March 2012. Available at: http://sticerd.lse.ac.uk/dps/case/cr/CASEreport72.pdf [Accessed 13 January 2014]

Local Government Association (date unknown), *Information note; The Community Energy Saving Programme.* Available at: http://www.local.gov.uk/climate-change/-/journal_content/56/10180/3483171/ARTICLE [Accessed on 13 May 2014]

Local Government Group (2011), *Warm and Healthy Homes*, 30 June 2011. Available at: http://www.local.gov.uk/c/document_library/ [Accessed 13 January 2014]

Knauf Insulation, (2012), *Open letter to Ed Davey - 16,000 job losses in insulation industry*, 10 October 2012. Available at: http://www.knaufinsulation.co.uk/en-gb/press-releases/all-press-releases/open-letter-to-ed-davey-16,000-job-losses-in-insulation-industry.aspx#axzz2qIoR3UwG [Accessed 13 January 2014]

Ofgem (2013a), *The final report of the Carbon Emissions Reduction Target (CERT) 2008-2012,* May 2013. Available at: https://www.ofgem.gov.uk/ofgem-publications/58425/certfinalreport2013300413.pdf [Accessed 13 January 2014]

Ofgem (2013b), *The final report of the Community Energy Saving Programme (CESP) 2009-2012,* May 2013. Available at: https://www.ofgem.gov.uk/ofgem-publications/58763/cesp-final-report-2013final-300413.pdf [Accessed 13 January 2014]

Office for National Statistics (2013) *2011 Census: Tenure - Households, local authorities in the United Kingdom - TableQS405UK*. Available at: http://www.ons.gov.uk/ons/datasets-and-tables/index.html?pageSize=50&sortBy=none&sortDirection=none&newquery=tenure&content-type=Reference+table&content-type=Dataset [Accessed 13 January 2014]

OFT (2012), *Home Insulation: A report on the Call for Evidence carried out by the OFT,* August 2012. Available at: http://www.oft.gov.uk/shared_oft/markets-work/energy-efficiency/oft1433.pdf[Accessed 13 January 2014]

Rushton, N., Robinson, Dr. Z. and Ormerod, Prof. M., *Evaluating in-the-home fuel poverty alleviation interventions in North Staffordshire*, Keele University. Available at: https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxjaGVzc2hpcmVsZWhtYW5ufGd4OjNiNTY0NjA1OGIyYmVjMmM [Accessed 13 January 2014]

Sustainable Development Commission (2010), *The future is local: empowering communities to improve their neighbourhoods,* 6 July 2010. Available at: http://www.sd-commission.org.uk/publications.php?id=1093 [Accessed 13 January 2014]

A3: Case study selection

Qualitative and quantitative interviews were conducted in seven case study areas in England and Scotland to find out customer, non-customer, obligated party and delivery partner experiences of the programmes. The case studies were selected to reflect areas of varying levels of CERT or CESP activity. The other main criteria on which the selection of case study areas was based were:

- Predominant tenure type (social rented, private rented or home ownership)
- Area of the country
- Proportion of the local housing stock consisting of flats
- Proportion of households on the gas-grid

The aim of these criteria was to achieve a broad mix of different types of area and, by extension, a variety of approaches to implementing CERT and CESP measures.

The starting point for selecting the case study areas was the EST Home Analytics database; consisting of profile data and analysis on the housing stock of all 26 million homes in the UK at address-level. This was used to identify a 'long list' of potential case study areas based on the criteria outlined above.

This report refers to evidence collected from seven case study areas (A to G). However, for two case study areas (B and F), customer quantitative and qualitative research was not undertaken – only the stakeholder interviews were conducted. Both of these case studies were originally selected for inclusion in the project's scoping phase. However they were removed from the customer element of the research for the following reasons:

- Case Study B was removed due to budgetary constraints; and
- A CESP case study area in rural Wales (Case Study F) was also selected originally. However, sourcing the sample (an initial list of addresses that were targeted by the local CESP scheme) from local housing providers in time to complete fieldwork and enable findings to feed into the report was not possible and this area was therefore not included in the customer element of the research.

As such, evidence from case study areas B and F is presented in this report from the process evaluation, but not from the customer element of the research.

A4: Breakdown of householder interviews conducted

The table below summarises the qualitative interviews completed with householders (customers and non-customers) in each case study area, and how this broke down across key variables.

Case Study	CERT/ CESP	TOTAL	Customer				Non Customer				Tenure		
			Customer Total	Non-priority group	Priority group	Super-priority group	Non-customer Total	Non-priority group	Priority group	Super-priority group	Social housing	Owner-occupier	Private rented
A	CERT	**4**	4	0	1	3	0	0	0	0	1	2	1
A	CESP	**4**	4	N/A							0	3	1
C	CERT	**5**	4	1	2	1	1	0	1	0	3	2	0
C	CESP	**4**	4	N/A							1	2	1
D	CESP	**6**	6	N/A							0	4	1
E	CERT	**5**	3	1	1	1	2	0	1	1	4	1	0
G	CERT	**5**	2	1	1	0	3	0	3	0	3	1	1
G	CESP	**5**	4	N/A							5	0	0
OVERALL TOTAL		**38**	**31**	**3**	**5**	**5**	**7**	**0**	**5**	**1**	**17**	**15**	**5**
TOTAL CERT		**19**	**13**	**3**	**5**	**5**	**6**	**0**	**5**	**1**	**11**	**6**	**2**
TOTAL CESP		**19**	**18**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**6**	**9**	**3**

A5: Case study customer survey fieldwork timings

The table below indicates the dates that fieldwork was conducted in each case study area, for the quantitative survey and also the follow-up qualitative interviews.

		Fieldwork Duration	
		Quantitative survey	Qualitative interviews
CERT	**Case Study A**	5th August - 31st August 2013	28th November 2013
	Case Study C	3rd August - 29th August 2013	16th October 2013
	Case Study E	12th August - 9th September 2013	21st October 2013
	Case Study G	5th August - 20th September 2013	18th October 2013
CESP	**Case Study A**	22nd October - 18th November 2013	29th November 2013
	Case Study C	20th August - 19th September 2013	15th October 2013
	Case Study D	22nd October - 16th November 2013	19th November 2013
	Case Study G	26th August -11th September 2013	17th October 2013

A6: Omnibus survey methodology

The CERT national survey was run on Capibus, Ipsos MORI's face-to-face weekly omnibus. The research was conducted between 28th June and 4th July 2013. Capibus interviews around 2,000 adults aged 15+ in Great Britain each week. For the CERT national survey module, only those aged 16+ in Great Britain who were either solely or jointly responsible for financial decisions in their household were interviewed (total unweighted sample is 1,613). The rest of this section details the sampling and weighting procedures used on Capibus.

Sampling:

Capibus uses a two stage random location design to select respondents to take part in the weekly survey. The two stages are as follows:

Selection of Primary Sampling Units

The first stage is to define primary sampling units which will be fixed for at least one year. A total of 154-180 Local Area Authorities are randomly selected from the stratified groupings with probability of selection proportional to size. This ensures that the most populated areas in Britain are always represented in the sample.

Selection of Secondary Sampling Units (currently use Double OA's)

The second stage of sampling happens every week on Capibus. At this stage, two output areas (DOA) are randomly selected from each Local Area Authority; this then becomes the secondary sampling unit. Capibus then use the CACI ACORN geodemographic system in the selection process to assist in eliminating possible bias in the sample caused by interviewing people all with the same background. Using CACI ACORN allows the selection of OA's with differing profiles to ensure the interviewing a broad cross-section of the public (rather than using basic quotas on gender, age and/or social grade).

Weighting:

The results detailed in this report have been weighted to the known GB profile population (the total weighted sample is 1,639). Capibus uses a 'rim weighting' system which weights to National Readership Survey (NRS) defined profiles for age, social grade, region, tenure, ethnicity and working status - within sex.

A7: Defining a CERT customer via the national survey

Within the CERT Omnibus survey and CERT case study area surveys all respondents were categorised as either CERT customers or non-customers. There are a number of reasons why it is challenging to accurately ascertain whether someone is a CERT customer from a self-reported survey alone. These include:

- The lack of any nationwide 'branding' of CERT. It is therefore not possible to ask respondents outright whether any energy efficiency measures they have installed were delivered through CERT (in contrast to CESP where we could refer to the local scheme and the delivery partners involved);
- The wide range of measures offered as part of the scheme;
- Possible issues over accurate recall[70] of when the measures were installed (and therefore whether they were during CERT's lifetime);
- Related to the above point, respondents may not have been in the property at the time of installation and may therefore not have been aware of measures that were previously installed in their property;
- The existence of other energy efficiency initiatives that might have been in operation at the same time as CERT; and
- Beneficiaries of CERT measures might not necessarily have known that the measures were subsidised.

However, taking these limitations into account, it is useful to attempt to identify individuals who have benefitted from a CERT-qualifying measure in order to understand their experiences and inform an assessment of how well certain target groups have been engaged. A similar approach has been taken as the one used in the interim evaluation to determine which households were CERT 'customers'. However, where possible, additional validations[71] have been made to improve the accuracy with which customers are determined.

A respondent was identified as having had a CERT measure installed if:

[70] This might be expected to be marginal given that respondents were being asked about the recent past. However, 39% of all respondents that said they installed a measure "from 2008" provided an installation date either before April 2008 or after 2012.

[71] Through cross referencing with EST's Home Analytics database and asking about year of installation.

1. **They report having installed a measure (loft/top-up insulation, CWI, SWI, solar panels for heating, ground source heat pumps and air source heat pumps[72]) since April 2008, And**

2. This could be separately verified by asking the respondent the year and month the measure was installed (to establish if between April 2008 and December 2012), **And**

3. They say they paid part of the cost of the cost of the measure, **or**

4. The measure was installed free of charge[73] and this could be verified by cross-referencing against EST's Home Analytics[74] Database to determine that the individual measure is recorded as a CERT measure in this household.

The exception to this was Loft insulation/top-up loft insulation, for which there is a relatively high likelihood that it could be installed by a non-professional. In this case a CERT measure was identified if the respondent

1. The respondent reported having installed loft insulation or top-up insulation since April 2008, **And**

2. This could be separately verified by asking the respondent the year and month the measure was installed (to establish if it was between April 2008 and December 2012), **And either**

3. It was installed professionally and they paid part of the cost or the measure was installed free of charge, and this could be verified by cross-referencing Home Analytics data to determine that the measure is recorded as a CERT measure in this household, **Or**

4. It was a DIY installation (by themselves, a family member or a friend), including if they paid the full cost, part of the cost, or they had it installed free of charge and this could be verified by a cross reference against Home Analytics data to determine that the measure is recorded as a CERT measure in this household.

[72] These were the measures included in the interim evaluation in determining CERT customers. Other measures were deemed too problematic to assume they were delivered as part of CERT.

[73] The year of installation was not asked if the measure was received free of charge, hence this additional validation was made. Not all responses were checked against the Home Analytics database - not all addresses could be matched between the datasets and Home Analytics, while has a certain degree of accuracy, is itself drawn from a number of different sources.

[74] http://www.energysavingtrust.org.uk/Organisations/Government-and-local-programmes/Home-Analytics-housing-data-and-analysis

A8: Profile of CERT customers and non-customers from national Omnibus survey

The table below presents the profile of CERT customers and non-customers on key socio-demographic variables. Green shading indicates where there is a statistically significant difference between the profile of customers and non-customers. The sample size for SPG customers surveyed (n. 20) is too small to allow for separate analysis.

Socio-demographic variable		CERT customer (Base: 278)	CERT Non-customer (Base: 1,335)
Priority Groups - Eligibility	Non-priority group	67%	66%
	Priority group	33%	34%
	Super priority	6%	13%
Quality of general health	Good	76%	78%
	Poor	14%	13%
Property Type	Detached	16%	17%
	Semi-detached	42%	31%
	Terraced	34%	33%
	Bungalow	6%	5%
	Flat-block	*%	8%
	Flat-house	1%	4%
Heating type	Gas central	87%	86%
	Oil central	4%	4%
	Electric heaters	3%	5%
	Other	6%	5%
Consider household financial situation	Good	61%	53%
	Bad	7%	12%
Age of respondent	65 years old or older	35%	21%
Household gross income	Up to £9,499	9%	12%
	£9,500 to £17,499	15%	16%
	£17,500 to £24,999	6%	7%
	£25,000 or more	41%	32%
Social grade	AB	34%	27%
	C1	28%	28%
	C2	21%	21%
	DE	17%	24%
Tenure	Own outright	50%	32%
	Buying with mortgage	40%	32%
	Rent from local authority	7%	15%
	Rent private	3%	20%
	Other	0%	1%
ACORN category	Wealth achievers	26%	16%
	Urban prosperity	10%	14%
	Comfortably off	33%	29%
	Moderate means	16%	17%
	Hard pressed	14%	22%
Children in household	No children younger than 16 in household	74%	67%

A9: Definition of CERT Priority Group and Super Priority Group

A key aim of this evaluation was to understand the extent to which the CERT Extension reached and engaged vulnerable households. The measures used by DECC to determine vulnerable households were the Priority Group (PG) and – a subset of the PG – the Super Priority Group (SPG). Within this evaluation these definitions have been used to identify households which fall into these categories, through recording the relevant information in the customer surveys. It should be noted that this is dependent on respondents being fully aware of the benefits that household members are in receipt of.

Priority Group

According to the Electricity and Gas (Energy Efficiency Obligations) Order 2004, a household was in the PG if they received any of the following:

- council tax benefit
- housing benefit
- income support
- income based jobseekers allowance
- attendance allowance
- disability living allowance
- disablement pension which includes a constant attendance allowance
- war disablement pension which includes a mobility supplement or a constant attendance allowance
- state pension credit
- child tax credit (where the household income is £15,592 or less)
- working tax credit (where the household income is £15,592 or less)

The CERT amendment Order July 2009 updated the income threshold from £15,592 (set originally) to £16,040 whilst also providing for the inclusion of "an income-related employment and support allowance under the Welfare Reform Act 2007". The CERT Extension order July 2010 amended the income threshold to £16,190. Ipsos MORI's omnibus collects income data in set bands with the closest to the CERT definition being £17,499.

Under CERT, the PG includes any households where there is an inhabitant aged 70+. Ipsos MORI's omnibus does not collect this information and so, for the purposes of this analysis, respondents have been included in the PG if they themselves are aged 70+.

The **SPG** is made up of a sub-set of the CERT PG. Eligibility for this group is dependent on being in receipt of one of:

- Pension Credit

- Child Tax Credit under £16,190 income threshold
- Income-based Job Seeker's Allowance, Income-related Employment and Support Allowance (that includes a work-related activity or support component) or Income Support, and at least one of the following:
    - Pensioner premium
    - Disability or severe disability premium
    - Award of child tax credit that also includes an element for a disabled, or severely disabled, child or young person
    - Child under the age of five.

A10: Statistical reliability – national CERT Omnibus survey

Because a sample, rather than the entire population of the GB population, was interviewed the percentage results are subject to sampling tolerances. This means that we cannot be certain that the figures obtained are exactly those we would have if everybody had been interviewed (the 'true' values). We can, however, predict the variation between the sample results and the 'true' values from a knowledge of the size of the samples on which the results are based and the number of times that a particular answer is given.

The table below illustrates the predicted range for different sample sizes and percentage results at the '95% confidence interval' – i.e. the confidence with which we can make this prediction is 95%, that is, the chances are 95 in 100 that the 'true' value will fall within a specified range.

The tolerances that may apply in this report are given in the table below.

Overall statistical reliability[75]			
Size of sample on which survey result is based	***Approximate sampling tolerances applicable to percentages at or near these levels***		
	10% or 90%	**30% or 70%**	**50%**
	±	±	±
All 1,613 respondents	**2**	**2**	**2**

Source: Ipsos MORI

For example, with a sample of 1,613 people where 30% give a particular answer, the chances are 19 in 20 that the 'true' value (which would have been obtained if the whole population had been interviewed) will fall within the range of plus or minus 2 percentage points from the sample result.

It should be noted that confidence intervals do not apply for the case study surveys. The limited number of address points available (those provided by the delivery partners of where measures were offered) means that it was not possible to set quotas to achieve a truly representative sample. However, given the small number of properties across which these schemes took place, the survey results are broadly reflective of the local CESP scheme.

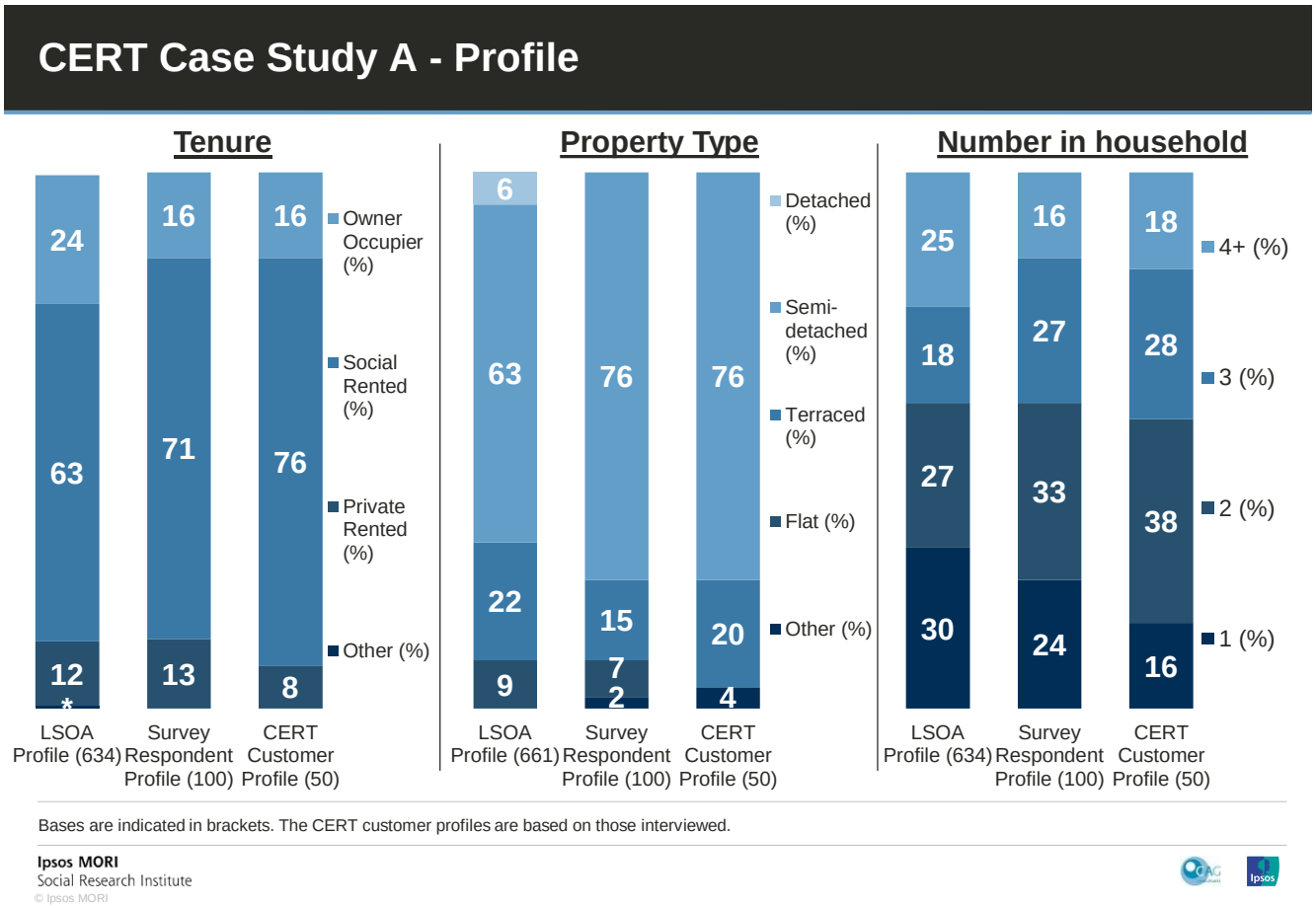
[75]Strictly speaking the tolerances shown here apply only to random samples; but in practice good quality quota sampling has been found to be as accurate.

A12: Demographic profile of case study areas included in the household survey

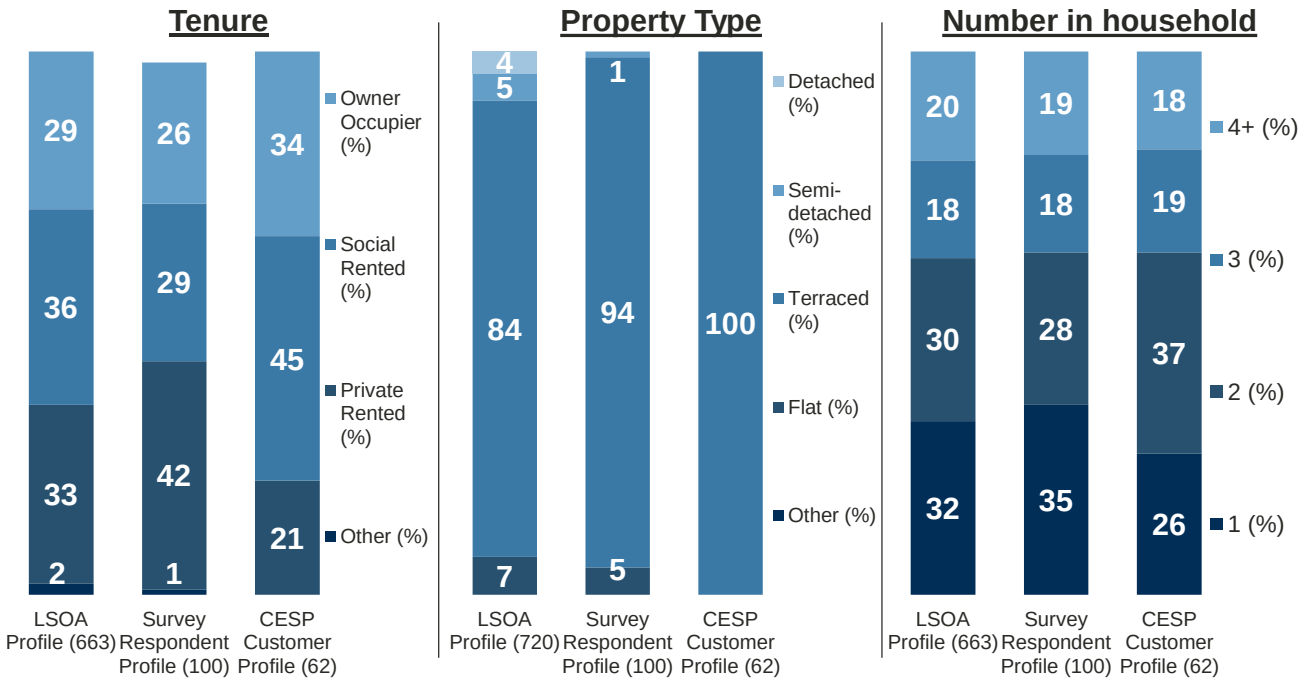
The below tables illustrate the demographic profile of each of the case study areas in which household surveys were carried out. Each chart presents the profile of the local area (LSOA, or in some cases combined LSOAs), and compares it to the profile of (a) everyone surveyed and (b) all CERT or CESP customers interviewed in each case study area. In must be noted that some of these are based on small base sizes.

It was impossible to know at the sampling stage what the profile of CERT or CESP customers were in each area. Moreover, given the relatively precise local area in which interviews were conducted, there were a limited number of households from which to achieve the target number of interviews. For these reasons no quotas were set to meet a certain demographic profile. As such, these tables are included to illustrate that those surveyed were broadly in line with the profile of the LSOA, and to compare this with the profile of customers of the programmes in these areas.

At the time of writing, no up-to-date (i.e. 2011 census data) has been released for Scotland, so only the case study areas in England are provided.

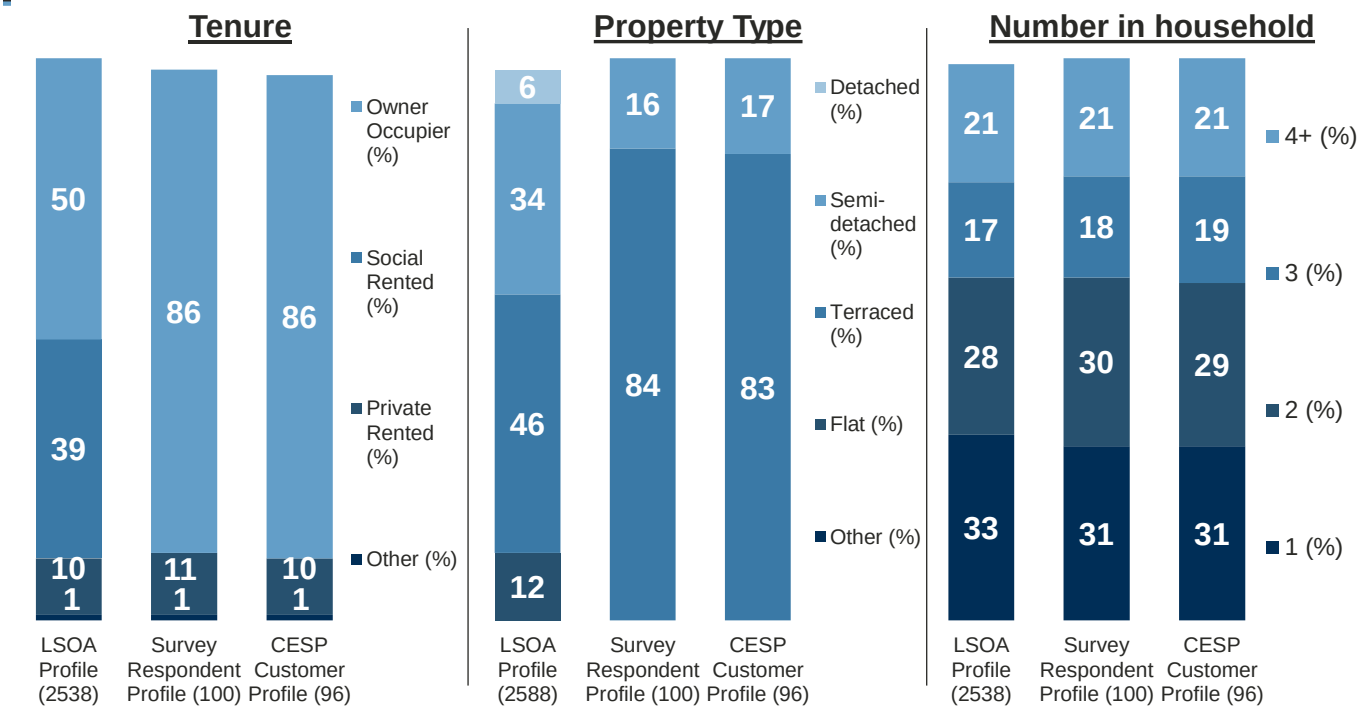


CESP Case Study A - Profile



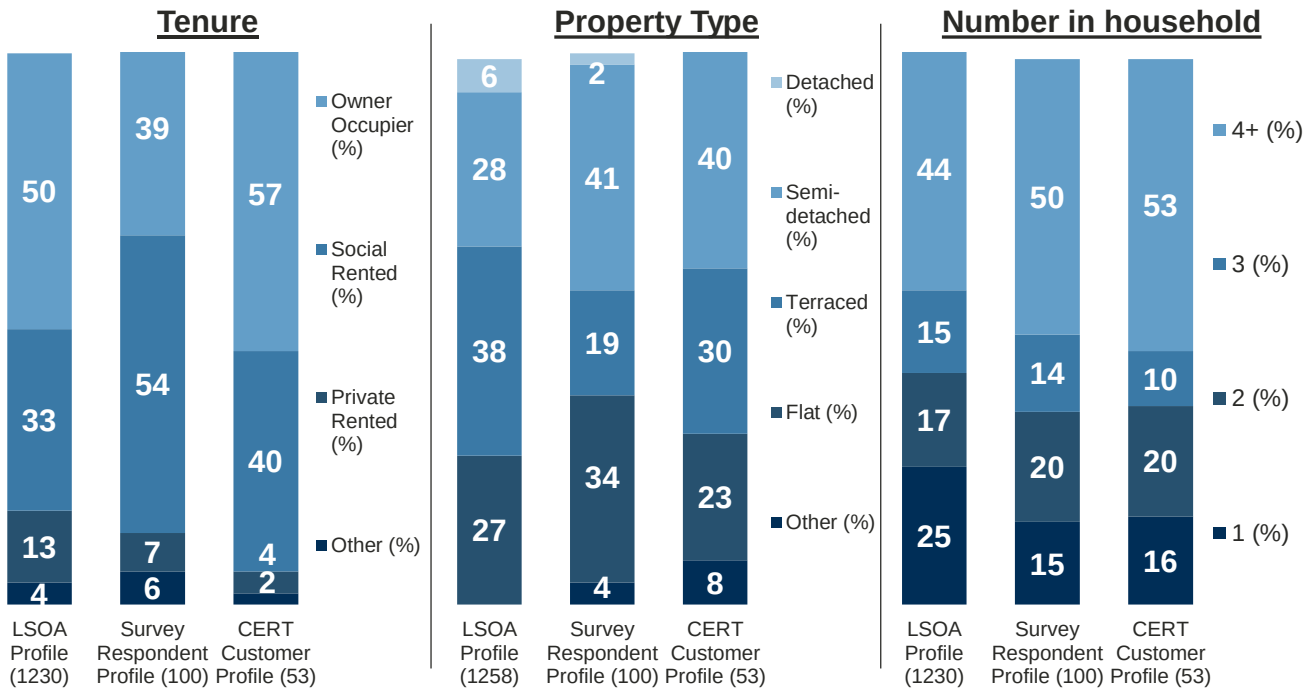
Bases are indicated in brackets. The CESP customer profiles are based on those interviewed.

CESP Case Study D - Profile



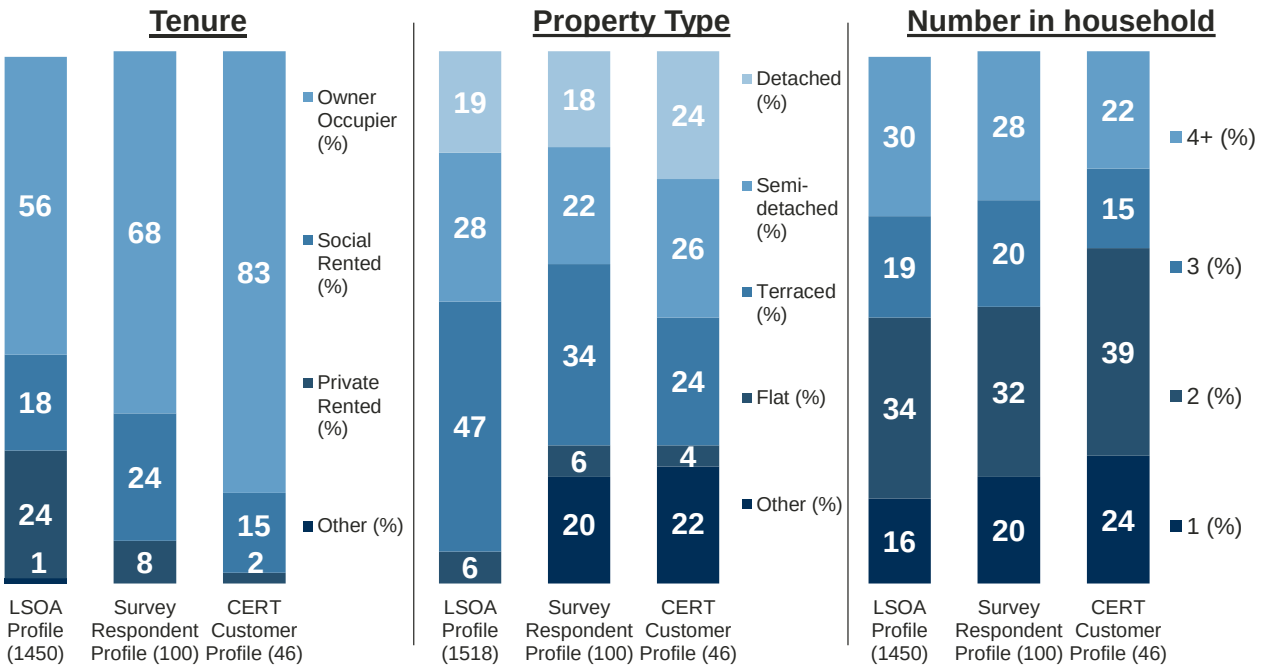
Bases are indicated in brackets. The CESP customer profiles are based on those interviewed.

CERT Case Study C - Profile



Bases are indicated in brackets. The CERT customer profiles are based on those interviewed.

CERT Case Study E - Profile



Bases are indicated in brackets. The CERT customer profiles are based on those interviewed.