

Retrofitting the existing housing stock in the South East

A strategy to reduce carbon emissions and alleviate fuel poverty: 2008-2011

Prepared by: Centre for Sustainable Energy
Association for the Conservation of Energy
Dr Richard Moore



On behalf of: The South East England Development Agency (SEEDA)
Government Office for the South East (GOSE)
South East Regional Assembly
Energy Saving Trust
Climate South East



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Executive Summary

This Strategy, commissioned by the South East England Development Agency (SEEDA), in conjunction with the Government Office for the South East (GOSE), the Regional Assembly and Climate South East, was developed through regional modelling and stakeholder engagement and is based on achieving the following two key targets:

CO₂ reduction target: To achieve a 20% reduction in residential CO₂ emissions by 2016, relative to 2003, working in partnership with and through national programmes, regional organisations, and local partners.

Fuel poverty target: To eliminate fuel poverty where practicably possible in the South East by 2016, with the aim to improve all properties to a minimum standard of efficiency i.e. SAP 65

Below is a summary of the findings from the regional modelling along with the resulting overarching aims and priority areas for the Strategy and the accompanying Action Plan.

Baseline emissions and fuel poverty

The end use of fossil fuels and electricity in the 3.4 million households in the South East was responsible for 22.5 MtCO₂ in 2003. The region has set a target to reduce CO₂ emissions by 20% by 2016 based on a 2003 baseline, which equates to a reduction of 4.5 MtCO₂.

169,000 (4.9%) households in the South East were fuel poor in 2005. The rising cost of energy over the last four years¹ has been the main reason for fuel poverty more than doubling in the region to an estimated 360,000 (10.2%) by the end of March 2008. Fuel price scenarios have been used to project estimates of fuel poverty in the future. Under the worst-case scenario of high fuel prices increases, there will be an estimated 875,000 fuel poor households in the South East by 2016. Even under the low fuel price scenario, this number would still be high compared to today at 460,000. The baseline scenario estimates 610,000 fuel poor households in 2016.

Achieving targets through a 'SAP 65' scenario

Several scenarios were modelled to assess their impact on fuel poverty and CO₂ emissions. One of these, the 'target SAP 65 all' scenario, included the installation of measures that would enable all households in the region to achieve a SAP rating of 65. A SAP 65 is notionally thought to protect householders from fuel poverty; that is, the thermal efficiency of their property is no longer the overriding factor that causes them to experience fuel poverty.

The modelling found that it would cost just over £6.5 billion to install the measures required to raise all fuel poor households to SAP 65, which equates to an average cost of £1,923 per household. This would result in the average SAP rating rising from 52.8 to 69.2.

Even with all the identified measures installed to raise all fuel poor households to SAP 65, 43% still remain in fuel poverty. This is likely to be due to a combination of very low incomes; severe under-occupancy; and insufficient energy improvements, resulting from the criteria imposed in the model (e.g. restrictions for listed buildings) and/or because it is otherwise hard to treat.

¹ Since 2003, the cost of gas and electricity has risen by 50% and 40% respectively (BERR 2008b).

In terms of the CO₂ emissions savings under the SAP 65 scenario, it was found that the installation of measures under this scenario could reduce CO₂ emissions by 7.5 MtCO₂ (33.5% of the regions 2003 emissions). This surpasses the 2016 regional target and also comes close to the UK's NEEAP target for 2020 (assuming for simplicity's sake it is assigned proportionately across regions and sectors): a 31% reduction on 1990 levels or 14.7 MtCO₂.

Overarching aims and priority areas

The regional modelling discussed above and stakeholder engagement activity (both discussed in chapters 3 to 6) has identified 33 actions detailed in this, the main Strategy. The combination of the evidence base provided by the modelling and the focus of these actions has led to the identification of five overarching aims and priority areas for action. The Action Plan that accompanies this Strategy provides a summary of the actions identified, the overarching aim they are designed to support and the priority areas they help to deliver. Whilst these actions often identify succinct tasks, a number of them relate to the improved coordination of sustainable energy programmes – the first of the Strategy's overarching aims.

Strategy's overarching aims

- A1. To provide a regional framework that stimulates increased deployment of sustainable energy and water efficiency measures in existing housing, working in conjunction with existing national, regional and local initiatives
- A2. To ensure the most energy inefficient properties are improved to a minimum standard of efficiency, that is SAP 65
- A3. To identify and develop opportunities for new sources of funding to retrofit the existing housing stock
- A4. To support the development of community focussed sustainable energy initiatives
- A5. To promote and help generate long-term behavioural change at the household level

The primary focus of this Strategy is the end use of energy in the home. The region plans to develop complimentary research that supports the delivery of regional targets for residential water efficiency and sustainability as defined by the South East Regional Economic Strategy.

Priority areas for action

The implementation of a more sustainable energy future is a complex one with many interlinking barriers and opportunities. The priority areas for action and the relevant sections of the Strategy that relate to them are shown below.

- P1 Targeting the G and Fs in private sector housing (sections 2.1, 5.3.1, 5.4.1, 6.1.2, 7.3)
- P2 Planning gains for the existing stock (section 6.3)
- P3 Sustaining local support for residential sustainable energy initiatives (sections 5.2, 5.3.2, 6.1.3)
- P4 Further reaching community energy initiatives (section 5.3.2, 5.4.2, 6.1, 6.2.2)
- P5 Innovative funding structures for able to pay households (section 5.4.1, 7.1)

1 National and regional targets

The UK Government has set a number of targets for both climate change and fuel poverty. Whilst there are no statutory targets for reducing carbon dioxide (CO₂) emissions from the residential sector, the Government is legally committed to eradicating fuel poverty in vulnerable homes by 2010 and all homes by 2016 in England where ever practically possible. Fuel poverty targets do not currently sit with the regions or local authorities, although the new local government performance framework will include both fuel poverty and climate change performance indicators which will be assessed in each authority's Comprehensive Area Assessment.

It is also clear that the Government's currently funded fuel poverty programmes – Warm Front and the Carbon Emissions Reduction Target (CERT) Priority Group programme aimed at low-income households – do not provide the measures required to meet these fuel poverty and climate change targets. This is because they do not necessarily provide the energy efficiency and renewable technologies required to achieve significant improvements in the 'hard to treat' housing stock such as off-gas properties and solid-walled housing.

Regional agencies and local authorities therefore need to gain an understanding of the gap in required measures and funding, so that they can set their own priorities for their regional housing allocation and associated housing renewal budgets, and also lobby central Government for the funds required to meet their targets.

The UK's residential sector greenhouse gas emissions were 45.8 megatonnes of carbon equivalent (MtC) in 1990, of which 42.4 were CO₂ emissions². The Government has made a number of announcements and commitments to reduce CO₂ emissions. Most recent of these is the National Energy Efficiency Action Plan (NEEAP³), which has as its objective a reduction of emissions from the UK's housing stock to 29.3 MtC (a 31% cut) by 2020.

At time of writing, the Climate Change Bill going through Parliament proposes a legally binding target to reduce CO₂ emissions by 60% on 1990 levels by 2050. Following further developments and improvements in climate modelling it is now widely accepted that stabilising atmospheric CO₂ at 450 ppm (parts per million) is necessary⁴ to avoid dangerous climate change. This would require a UK cut of at least 80% of 1990 emissions by 2050⁵. The Government has undertaken to review the 2050 target in the light of this new scientific evidence. The Bill also proposes an interim carbon reduction target of between 26 and 32% by 2020 but at present does not contain separate sectoral targets (e.g. for domestic, transport, industry etc). If the Bill's overall 60% target is applied proportionately to housing, this would mean reducing emissions to 17 MtC by 2050.

² Defra 2006

³ Defra's NEEAP covers energy efficiency measures, renewables and CO₂.

⁴ BBC 2006

⁵ Höhne, Philipsen and Moltmann 2007 (SEEDA 2007)

1.1 How do national Government policies and targets map out regionally?

Regional strategies

Regional Economic Strategy

The vision for the Regional Economic Strategy 2006-2016 is that by 2016 the South East will be a world class region achieving sustainable prosperity. Three headline targets⁶ will be adopted. Progress towards all three of these will provide evidence of overall progress against the vision:

- Achieve an average annual increase in gross value added (GVA) per capita of at least 3%
- Increase productivity per worker by an average 2.4% annually, from £39,000 in 2005 to at least £50,000 by 2016 (in constant prices)
- Reduce the rate of increase in the region's ecological footprint (from 6.3 global hectares per capita in 2003, currently increasing at 1.1% per capita per annum), stabilise it and seek to reduce it by 2016

The Strategy is structured around three interlinked objectives aligned with the challenges reflecting the challenges facing the region: global competitiveness (achieving it); smart growth (spreading the benefits of competitiveness); and sustainable prosperity (ensuring that competitiveness is consistent with the principles of sustainable development). Actions are focused on achieving measurable targets for these objectives:

- Climate Change and Energy - reduce CO₂ emissions attributable to the South East by 20% from the 2003 baseline by 2016 as a step towards the national target of achieving a 60% reduction on 1990 levels by 2050, and increase the contribution of renewable energy to at least 10% of energy supply in the South East by 2010 as a step towards achieving 20% by 2020.
- Sustainable Consumption and Production - reduce per capita water consumption in the South East by 20% from 169 litres per day in 2003/04 to 135 litres per day by 2016, and achieve a 30% increase over the 2003 baseline in GVA generated per tonne of materials entering the waste stream by 2016.
- Natural Resources and the Environment – achieve measurable improvements in the quality, bio-diversity and accessibility of green and open space.
- Sustainable Communities - enable more people to benefit from sustainable prosperity across the region and reduce polarisation between communities.

Regional Spatial Strategy

The South East Regional Spatial Strategy (RSS), *The South East Plan*⁷, covers the period 2006-2026. Its vision is to be 'The Healthy Region', with "a sustained improvement in its quality of life over the period to 2026, measured by the wellbeing of its citizens, the vitality of its economy, the wealth of its environment and the prudent use of natural resources." The South East Plan has 13 cross-cutting themes, of which the following are relevant here:

⁶ SEEDA 2007

⁷ SEERA 2006; the South East Plan was submitted to Government on 31st March 2006. In July 2008, more than two years after the Assembly submitted the Plan, the Government launched a public consultation on its proposed changes. Consultation runs from 17 July to 24 October 2008. Further information is available on GOSE's website at www.gose.gov.uk/gose/planning/regionalPlanning.

- Sustainable Development
- Climate Change
- Resource Use
- Sustainable Construction

In terms of carbon, the RSS requires regional and local authorities and others to have policies to help reduce the regions CO₂ emissions by at least 20% below 1990 levels by 2010 and by at least 25% below 1990 levels by 2015. More generally, the RSS has a target of stabilising the South East's ecological footprint by 2016, and to reduce it after this date.

The RSS emphasises increased resource efficiency, including energy efficiency in new and existing development. It says that energy efficiency standards in new construction and refurbishment should exceed current Building Regulations and reflect best practice, and that Local Development Documents should encourage the incorporation of high standards of energy efficiency in all development, subject to economic viability considerations. The importance of behaviour change in improving resource efficiency is also noted.

The national fuel poverty target is mentioned in the RSS, as is the national target to improve all social housing to the Decent Homes standard by 2010.

South East Regional Housing Strategy

The South East Regional Housing Strategy⁸ covers the period 2008-2011, and one of its priorities for 2008-2011 is meeting the Decent Homes Standard (DHS) in both social and private sector housing.

Within this, the delivery of energy efficiency measures is emphasised. The most common reason for failure to meet the DHS in the South East is the absence of adequate insulation⁹. The Regional Housing Board (RHB) estimates that achieving DHS in the homes of low-income households will lift 20,000 people out of fuel poverty.

The following actions are included in the Regional Housing Strategy:

- Provide support to local authority (LA) partnerships in developing forms of loans, such as equity release, to enable home owners to finance essential improvements to their homes (Action for the Government Office for the South East (GOSE) for 2008-9)
- Look at financial barriers to achieving higher design and environmental standards, including level 4 and above of the Code for Sustainable Homes (Action for the South East Regional Assembly, South East England Development Agency (SEEDA) and the Housing Corporation for 2009-10).

Regional Planning Guidance for the South East (RPG9)

This Regional Planning Guidance for the South East (RPG9) covers the period up to 2016 setting the framework for the longer term future. The guidance's primary purpose is to provide a regional framework for the preparation of local authority development plans. Chapter 10 of the RPG9 covering energy efficiency and renewable energy was updated in 2004. The following minimum regional targets for electricity generation from renewable

⁸ SEERA 2008

⁹ The EHCS 2005 conflicts with the South East Regional Housing Strategy which suggests it is adequate.

sources should be achieved by the development and use of all appropriate resources and technologies:

Table 1.1: Regional renewable energy targets

Year / timescale	Installed capacity (MW¹⁰)	Electricity generation capacity
2010	620	5.5%
2016	895	8.0%
2026	1,750	16.0%

The renewable energy resources with the greatest potential for electricity generation are onshore and offshore wind, biomass, and solar. The renewable energy resources with the greatest potential for heat generation are solar and biomass. The guidance states that Local Development Documents should include policies and development proposals that as far as practicable seek to contribute to the achievement of the following regional and indicative sub-regional targets for land-based renewable energy.

Table 1.2: Regional and sub-regional targets for land-based renewables (MW)

Sub-region	Installed capacity 2010	Installed capacity 2016
Thames Valley & Surrey	140	209
East Sussex & West Sussex	57	68
Hampshire & Isle of Wight	115	122
Kent	111	154

Local authorities should collaborate and engage with communities, the renewable energy industry and other stakeholders on a sub-regional basis to assist in the achievement of these targets through:

1. Undertaking more detailed assessments of local potential.
2. Encouraging small scale community-based schemes.
3. Encouraging development of local supply chains, especially for biomass.
4. Raising awareness, ownership and understanding of renewable energy.

The United Kingdom assigns and reports the CO₂ emissions associated with electricity use to the end user, unlike other European countries who report these emissions in relation to the energy producer. The decarbonisation of the electricity supply will therefore be a key component in the reduction of residential emissions to 2016 and 2050.

The Government has stated its commitment to delivering the UK share of the European Union (EU) target of sourcing 20% of energy (i.e. electricity, heat and transport fuels) from renewable sources by 2020. The EU's draft Renewable Directive proposes a UK target of 15%. The 2008 UK Renewable Energy Strategy consultation is consulting on the measures required to meet a 15% target. At present only 2% of the UK's energy comes from renewable sources (approximately 5% of UK electricity is generated from renewable sources)¹¹. If the UK is to meet the EU targets then a far higher proportion of its electricity must come from

¹⁰ megawatt

¹¹ BERR 2008a

renewables by 2025 (potentially 30 to 35%) with significant growth in the deployment of renewable heat and sustainable bio-fuels.

1.2 How do national Government targets map out locally?

A review of all local authority websites was undertaken to ascertain:

- The extent to which national Government targets were reflected in local strategies and action plans, where evident.
- The extent to which national Government schemes were reflected in local or regional level schemes, where evident

It was found that:

- Few local authorities published strategies on their websites for housing (35/74), energy efficiency (6/74), fuel poverty (9/74) or climate change (10/74).
- Those that did publish strategies, generally referred to the relevant policies and activity arising from national Government
- Twenty local authorities made direct reference to CERT, the Energy Efficiency Commitment (EEC) or the British Gas council tax rebate scheme
- Twenty-five local authorities made reference to Warm Front
- Whilst not completely clear, it appeared that approximately 45 local authorities made use of some form of national programme (primarily CERT and Warm Front) through schemes variously branded
- Fewer than five local authorities made reference to the Low Carbon Buildings Programme
- One third of websites provided the contact details of their local Energy Saving Trust Advice Centre (ESTAC).

2 Baseline of efficiency, fuel poverty and emissions

2.1 The state of the housing stock

In December 2005 SEEDA commissioned the University of Birmingham's Centre for Urban and Regional Studies to investigate the problems of poor housing conditions in the private sector in South East England. Their report¹² identified key issues and where efforts needed to be focused:

- The need to build capacity and increase collaboration within the region to tackle the issues;
- The need to consider new mechanisms for maximising resources available for renewal such as equity release, loans etc;
- The need to respond to more dispersed properties in rural areas;
- The need to improve engagement with private sector landlords, particularly with houses in multiple occupation;
- The opportunity to actively promote preventative strategies in the region;
- The continuing need to obtain more reliable data.

Table 2.1: Progressive improvements in SAP¹³ (using SAP 2005 from the EHCS 2005¹⁴)

Government office region	1996 Average SAP	2001 Average SAP	2003 Average SAP	2004 Average SAP	2005 Average SAP
North East	43.7	47.7	49.6	49.9	51.0
Yorkshire and The Humber	41.2	44.8	46.5	46.8	47.2
North West	43.5	45.9	46.8	47.5	48.5
East Midlands	39.9	43.8	45.2	45.7	46.5
West Midlands	38.9	43.8	44.6	45.2	45.9
South West	39.3	43.4	44.8	45.6	45.8
East of England	42.3	45.4	46.1	47.2	47.8
South East	43.4	46.4	47.6	48.0	48.8
London	46.0	49.0	49.2	50.6	51.2
Total	42.2	45.7	46.7	47.5	48.1

Table 2.1 shows that the South East region has the third most efficient housing stock in England with an average SAP of 48.8 compared to a national average of 48.1 (in 2005). Nevertheless, the region still offers huge potential for energy efficiency improvement.

¹² Groves and Sankey 2006

¹³ Standard Assessment Procedure; measure of energy efficiency and likely running costs per m² in homes

¹⁴ English House Condition Survey

Table 2.2: Decent Homes Standard compliance (EHCS 2005)

DHS	South East (millions)	England (millions)
Decent	2.595	15.5
	76%	73%
Non-decent	0.824	5.639
	24%	27%
Total	3.418	21.13

The Government has two key regulatory policies to tackle the most energy inefficient dwellings, namely the implementation of the DHS and the Housing Health and Safety Rating System (HHSRS). In 2005, 824,000 homes failed the DHS in the South East which represents 24% of the housing stock, slightly lower than the national average of 27%. Of these, 634,000 failed the thermal comfort criterion of the DHS (Table 2.2).

Table 2.3: Decent Homes Standard compliance (EHCS 2005)

Thermal criterion	South East (millions)	England (millions)
Pass	2.784	16.7
	81%	80%
Fail	0.634	4.135
	18.6%	19.6%
Total	3.418	21.13

The region had the fifth highest proportion across all English regions (18.6% against a national average of 19.6%) of homes failing the DHS on the thermal comfort criterion in 2005 (Table 2.3). Table 2.4 shows that for those homes in the South East failing this criterion, 84% fail due to insulation measures alone (lack of cavity wall insulation and less than 200mm of loft insulation in properties without mains gas heating being the primary reasons – see Annex I).

Table 2.4: Decent Homes Standard compliance (EHCS 2005)

Reason failed	South East (millions)	England (millions)
Heating measures only	0.065	0.63
	10%	15%
Heating and insulation measures	0.037	0.233
	6%	6%
Insulation measures only	0.532	3.272
	84%	79%
Total	0.634	4.135

Table 2.5: SAP 65 & 35 (using 2001 SAP) thresholds (EHCS 2005)

SAP/million households/column %

South East	1996	2001	2003	2004	2005
SAP 65+	0.367	0.716	0.745	0.758	0.797
	11.8	21.6	22.2	22.4	23.3
SAP 35 to 65	2.163	2.168	2.166	2.210	2.228
	69.8	65.5	64.5	65.2	65.2
SAP < 35	0.571	0.425	0.448	0.421	0.393
	18.4	12.8	13.3	12.4	11.5
SE Total	3.101	3.308	3.359	3.390	3.418
	100.0	100.0	100.0	100.0	100.0

Table 2.5 shows the proportion of housing in the South East that falls below SAP 35 and above 65. Homes with a SAP below 35 (based on the 2001 methodology) may be deemed seriously unhealthy under the HHSRS as this is taken as a proxy for a 'Category 1 Hazard' of excess cold. Local authorities are able to enforce remedial action in these cases and the majority of the region's regional housing allocation schemes offer grants or loans to low-income and vulnerable private sector households. In the South East 11.5% or 393,000 households have a SAP below 35 which compares to 12.1% nationally (see annexes for national breakdowns).

The proportion of households achieving SAP 65 or above is of direct relevance to the South East Low Carbon Building and Affordable Warmth Strategy. In Table 2.5 the growth in households achieving SAP 65 or above appears predominantly due to the construction of new homes, as the total growth in new homes matches the growth in this band.

Table 2.6: Trends in EPC¹⁵ thresholds in the South East (EHCS 2005)

million households/column %

South East	1996	2001	2003	2004	2005
C+ (69 -100)	0.072	0.15	0.213	0.226	0.266
	2.3	4.5	6.4	6.7	7.8
D (55 - 68)	0.625	0.865	0.914	0.979	1.03
	20.2	26.1	27.2	28.9	30.1
E (39 - 54)	1.324	1.43	1.418	1.37	1.339
	42.7	43.2	42.2	40.4	39.2
F (21 - 38)	0.852	0.697	0.647	0.672	0.642
	27.5	21.1	19.3	19.8	18.8
G (1 - 20)	0.228	0.168	0.167	0.143	0.142
	7.4	5.1	5.0	4.2	4.1
SE Total	3.101	3.308	3.359	3.390	3.418
	100.0	100.0	100.0	100.0	100.0

Energy Performance Certificates (EPCs) provide the region and also the new South East ESTACs with an opportunity to engage households in improving the most inefficient housing. In October 2008, the requirement for an EPC will be extended to rented properties. Table 2.6 shows the total numbers of homes by energy performance band and their proportion. In total

¹⁵ Energy Performance Certificate

over 783,000 households (22.9%) in the South East had an F or G rating in 2005, this compares to 20.8% nationally.

The analysis has shown that an E-rating can be achieved with relative ease for the majority of properties (cavity walled properties, flats and mid-terrace solid walled properties) through the installation of low energy light bulbs, insulation and modern condensing boilers. Ensuring these cost effective measures are offered to households that need them (i.e. their cavity or loft is unfilled) in an engaging format will be key to delivering the South East's CO₂ emission reduction targets.

2.2 Current emissions (MtCO₂)¹⁶ and proposed targets

The end use of fossil fuels and electricity in the 3.4 million households in the South East was responsible for 22.5 MtCO₂ in 2003 (Table 2.7). The region has set a target to reduce CO₂ emissions by 20% by 2016 based on a 2003 baseline, which equates to a reduction of 4.5 MtCO₂. The region has chosen 2003 as a baseline¹⁷ as this corresponds to the South East Regional Economic Strategy. Based on the 1990 baseline of total UK residential emissions of 156 MtCO₂ (42.4 MtC)¹⁸ and the distribution of CO₂ emissions in the UK, the region would need to reduce total residential emissions to 8.5 MtCO₂ to achieve a 60% reduction by 2050.

Table 2.7: National and regional emissions and targets for 2016 and 2050 (MtCO₂)

	1990 emissions	2003 emissions	2005 emissions	2016 targets	2050 targets
UK	155.5	163.7	149.5	121.4	62.2
England	130.1	136.6	122.1	101.6	52.0
South East	21.8	22.5	20.4	18.0	8.5

The UK and England 2016 targets are taken from the Defra's NEEAP, and represent a 22% reduction of 1990 levels. In order for the South East to meet the NEEAP targets regionally a 5.8 MtCO₂ reduction would be needed, which represents a 26% reduction on 2003 emissions i.e. the reduction is more challenging than the existing 20% cut.

The emissions in 2005 are shown here because the model used to determine changes in emissions utilises 2005 consumption data. This also represents the starting point for future analysis of performance against the new national indicator on local area CO₂ emissions, known as NI 186. Figure 2.1 and Table 2.8 below show the breakdown of 20.4 MtCO₂ domestic emissions in the region in 2005, by fuel type and housing tenure. As the figures show, the private sector accounts for nearly 90% of emissions (18.2 MtCO₂). Gas is the dominant fuel source in the private sector, which reflects the presence of gas central heating in private dwellings. Emissions from the social housing are very low in comparison, with electricity accounting for a slightly higher proportion than gas. This is likely to be due to the different heating systems used in social housing (e.g. electric storage heaters).

Furthermore, public sector dwellings are more energy efficient than private sector homes, as a result of past efforts to improve the thermal efficiency and requirements to meet the Decent

¹⁶ Megatonnes of CO₂

¹⁷ Defra revised its methodology for calculating emissions statistics when producing the 2005 data. It is important to note that residential emissions in the South East fell by 10% between 2003 and 2005 which may in part be related to the revised methodology.

¹⁸ Defra 2006

Homes Standard. This is shown by the EHCS 2005 average SAP ratings, which stand at 51.5 for the private sector, but 61.4 for the public sector.

Figure 2.1: South East England's emissions (MtCO₂) in 2005 by fuel type and sector

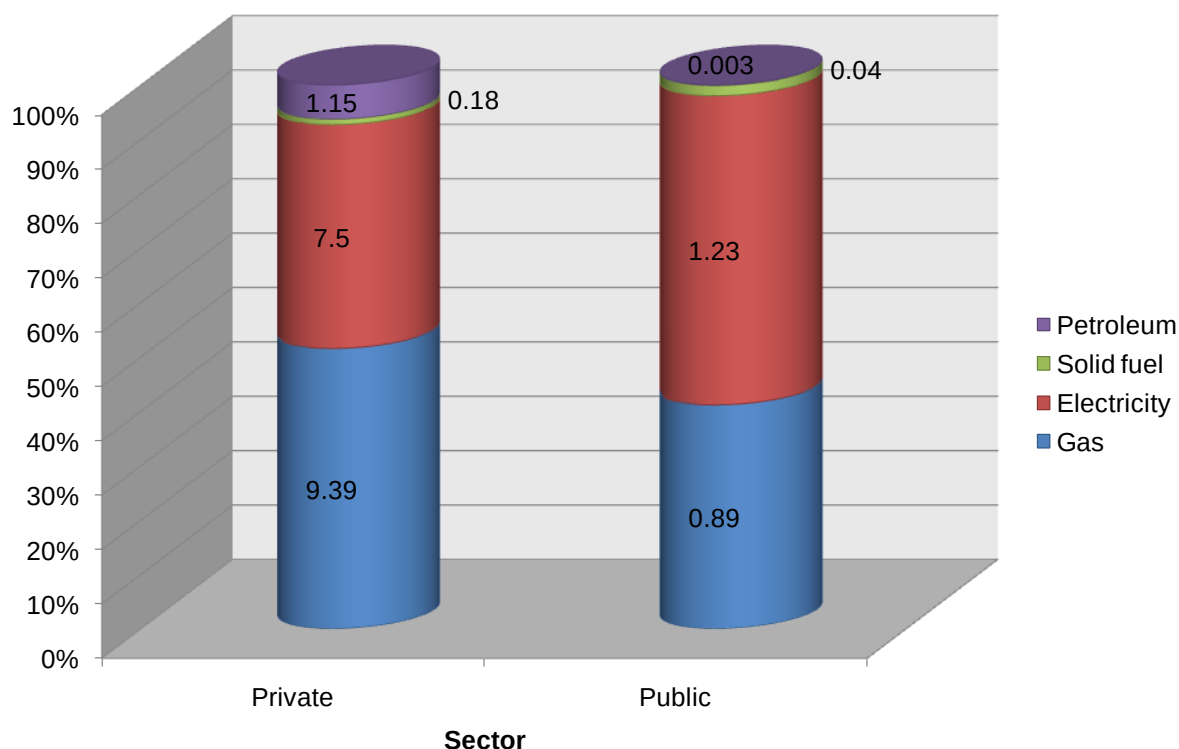


Table 2.8: Proportional emissions by tenure and fuel in 2005

Fuel	Private	Public
Gas	46.1%	4.4%
Electricity	36.8%	6.0%
Solid fuel	0.9%	0.2%
Petroleum	5.7%	0.0%
Total	89.4%	10.6%

2.3 The distribution of emissions by local authority classification

The table below shows the distribution of per capita and domestic per capita emissions for the South East, by local authority classification in 2005 (please see Annex III for an explanation of the classification system). The 'count' gives the number of local authorities, which shows an approximately even spread across the three classifications, with just over a third classified as 'mixed' and just under a third as urban and rural. Average per capita and average domestic per capita emissions are higher in rural areas and lowest in urban areas. This is partly due to the higher population of urban areas, as shown by Table 2.10 below – total domestic emissions in rural areas are actually very similar to urban domestic total emissions. (A breakdown of per capita emissions by the six urban/rural classifications (Major Urban, Large Urban, Other Urban, Significant Rural, Rural-50, Rural-80) is included in Annex III).

Table 2.9: Average local authority emissions by rurality in 2005

Local authority classification	Domestic per capita CO₂ tonnes				
	Mean	Min	Max	Median	Count
Urban	2.47	2.13	3.00	2.45	21
Mixed	2.52	2.05	3.03	2.48	26
Rural	2.75	2.41	3.22	2.77	20
	Per capita total CO₂ tonnes				
	Mean	Min	Max	Median	Count
Urban	7.71	4.88	17.53	6.95	21
Mixed	8.39	4.94	13.44	8.49	26
Rural	9.56	6.56	17.27	8.71	20

Table 2.10: Total emissions and households by rurality in 2005

Local authority classification	Domestic (MtCO₂)	Total (MtCO₂)	Households (1,000s)
Urban	6.04	18.44	2,479
Mixed	8.31	27.98	3,305
Rural	6.05	20.60	2,216
Total	20.4	67.0	8,001

2.4 The distribution of emissions, energy demand and improvement opportunities

The Centre for Sustainable Energy's (CSE) recent work examining the social distribution of CO₂ emissions for the Department for Environment, Food and Rural Affairs (Defra) has shown that households with the highest incomes also emit the most CO₂ emissions¹⁹. These results reinforce the findings of market analysis performed by the Energy Saving Trust (EST) during the development of their 'Market Segmentation' tool. The tool identifies the 'Environmentally Mature' as an affluent group of rural and suburban dwellers that emit the most emissions (both road and household). The distribution of actual household emissions from the Expenditure and Food Survey (EFS) 2002 to 2005 has been explored here for the South East (see Annex II for further information on the EFS). The drivers of household emissions have also been explored and then contrasted with the opportunity to reduce emissions identified through the EHCS 2005.

¹⁹ Defra 2008

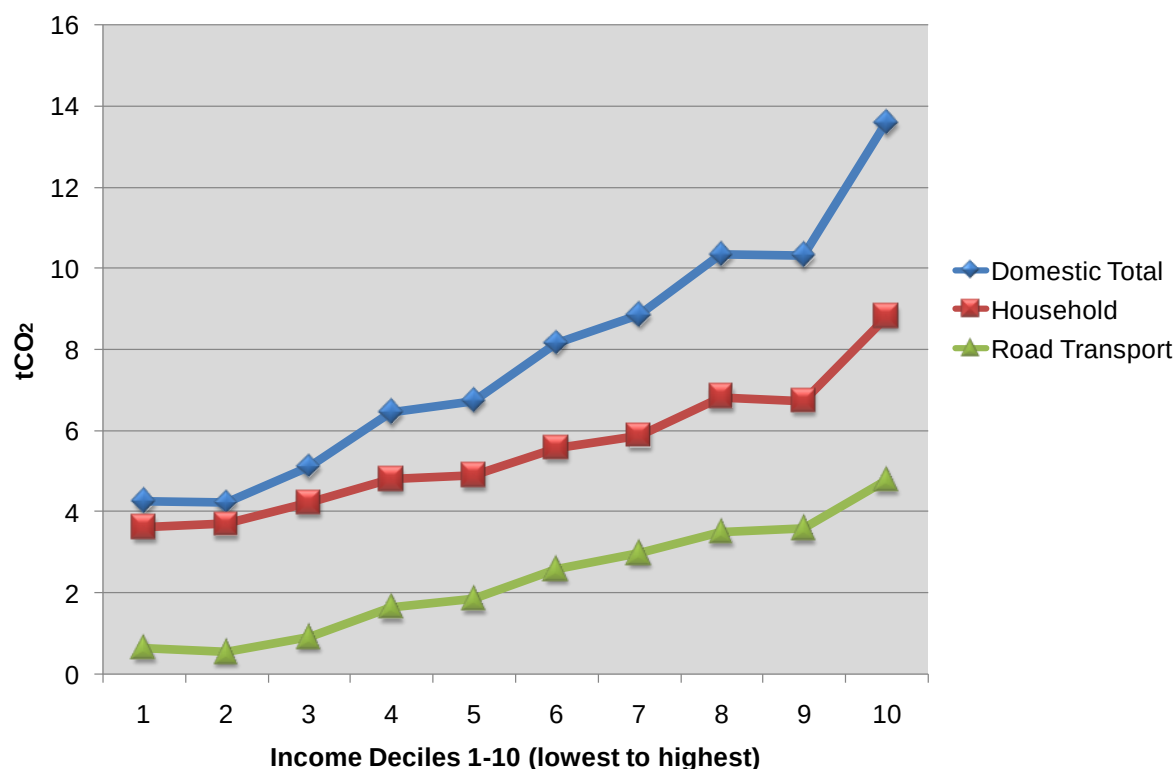
Figure 2.2: CO₂ emissions (t) by Disposable Income Deciles for the South East (EFS 2002 to 2005)

Figure 2.2 above shows the profile of domestic CO₂ emissions in the South East based on household fuel and petrol consumed. The chart clearly shows that, on average, emissions increase with disposable income. The delivery of the Strategy's targets requires the deployment of sustainable energy measures in significant numbers (see sections 0 through 4.7); Income deciles seven and above provide the most attractive carbon savings. These households are also more likely to be able to pay for the measures recommended (see chapter 10 (Annex II) for the bands of income associated with EFS Disposable Income Deciles).

CSE's work for Defra examining the social distribution of CO₂ emissions in the UK identified factors (based on variables provided in the EFS) that were the best predictor of total household emissions (which include personal travel by private vehicle). Main heating fuel used was identified as a key predictor of household emissions. Table 2.11 below shows average yearly emissions by sector for the main heating fuels: households using oil and gas have the highest mean values, with domestic emissions for oil users (including road) being more than two and a half times that for gas at 21.4 tCO₂ per year. The emissions for households with no central heating and electric heating appear low; however, more detailed analysis has shown that small low-income households are the predominant users of these heating systems.

Table 2.11: Average annual emissions by main heating fuel (tCO₂)

	No central heating	Electric	Gas	Oil	Solid fuel	Other
Road transport	1.74	1.49	2.58	3.93	2.58	2.92
Household	4.40	3.13	5.53	17.49	4.15	6.22
Domestic total	6.14	4.62	8.11	21.42	6.72	9.14

(See Annex II for breakdowns of emissions by tenure, built form and number of rooms)

The opportunity to reduce emissions in the households surveyed by the EFS is unknown as the survey does not record housing condition. The EFS and EHCS are both designed to be representative at a regional and national level. It is therefore not possible to compare the opportunity to reduce emissions by income deciles using the EHCS. Indeed the distribution of energy need by income deciles for the EHCS also produces a linear trend, increasing from deciles one to ten in a way analogous to domestic CO₂ emissions in the EFS.

CSE's analysis of the EFS demonstrated the importance of main heating fuel and income in predicting household emissions. These factors have therefore been included in the tables below, which show opportunity to reduce household emissions, based on wall type and loft insulation levels (see Table 2.12 and Table 2.13 below). The results show that 921,000 households in the highest full income deciles (deciles 7 to 10) have unfilled cavity walls and 619,000 households have 100mm of loft insulation or less.

Table 2.12: Income deciles 7 to 10 main heating fuel and wall type (1,000s of households)

Main fuel type	Cavity with insulation	Cavity un-insulated	Solid	Total hhlds deciles 7 to 10
Gas fired system	517	837	325	1,679
	31%	50%	19%	100%
Oil fired system	20	39	46	105
	19%	37%	44%	100%
Solid fuel fired system	1	1	4	6
	13%	4%	63%	100%
Electrical system	30	44	24	98
	30%	45%	25%	100%
Total	568	921	399	1,888
	30%	49%	21%	100%

The South East has a lower proportion of 'off-gas' households than the rest of England, with 11% compared to 15% nationally²⁰. However, the tables above show a significant opportunity for cavity wall and loft insulation, for both gas and oil fired properties. Those properties heated by oil provide the largest opportunity to reduce CO₂ emissions, as this is a carbon intensive fuel. The new ESTACs in the South East should ensure that targeted mailings to properties with cavity and loft opportunities also include 'off-gas' areas, using higher-cost fuels, such as oil and LPG²¹.

Furthermore, the economics of low and zero carbon²² (LZC) technologies are therefore more favourable in these areas than those areas connected to the gas network, and switching a household's dependence from fossil fuels offers substantial carbon and financial savings. CSE's previous analysis of the EST's Market Segmentation tool in the South West Avon and Somerset area has shown that 47% of 'Environmentally Mature' households live in 'off-gas' areas.

²⁰ CSE 2006a

²¹ liquefied petroleum gas

²² renewables and low carbon technologies (e.g. micro-renewables, micro-CHP and heat pumps)

Table 2.13: Income deciles 7 to 10 main heating fuel and loft insulation opportunity (1,000s)

Main fuel type	Level of loft insulation				Total hhlds
	none	less than 100mm	100 up to 150mm	150mm or more	deciles 7 to 10
Gas fired system	45	500	732	356	1,633
	3%	31%	45%	22%	100%
Oil fired system	6	41	32	27	105
	5%	39%	31%	25%	100%
Solid fuel fired system	-	4	-	2	6
	0%	66%	0%	34%	100%
Electrical system	5	19	23	14	61
	8%	32%	38%	22%	100%
Total	56	564	788	398	1,806
	3%	31%	44%	22%	100%

2.5 Fuel poverty in 2008

As shown in Table 2.14 below, 169,000 (4.9%) households in the South East were fuel poor in 2005. The rising cost of energy over the last four years²³ has been the main reason for fuel poverty more than doubling in the region to an estimated 360,000 (10.2%) by the end of March 2008. A recent major study funded by Eaga PCT and prepared by CSE, ACE and Richard Moore has estimated that at least 40% of the fuel poor are currently ineligible for Warm Front grants²⁴. This is due to the increases in fuel prices and the distribution of incomes in the UK²⁵. As a result, there are likely to be in the region of 150,000 fuel poor households in the South East that are not eligible for the Government's primary fuel poverty reduction programme.

Table 2.14: Fuel poverty in 2005 and 2008 (1,000s of households)

Full income definition ²⁶	South East		England	
	2005	2008	2005	2008
Vulnerable fuel poor	125	295	1,194	2,578
	5.1%	11.7%	7.8%	16.7%
Vulnerable households	2,451	2,529	15,230	15,470
Fuel poor	169	360	1,529	3,183
	4.9%	10.2%	7.2%	14.7%
Total households	3,418	3,530	21,130	21,660

²³ Since 2003, the cost of gas and electricity has risen by 50% and 40% respectively (BERR 2008b).

²⁴ Preston, Guertler and Moore 2008: 'How much? The cost of alleviating fuel poverty in England'

²⁵ Moore 2006

²⁶ 'Full income' implies all benefits are counted towards households' disposable incomes [officially used for measuring fuel poverty].

2.6 Fuel poverty in 2010, 2016 and 2030

Fuel price scenarios have been used to project estimates of fuel poverty in 2010, 2016 and 2030. Four different scenarios were modelled- a low, medium, high and a baseline scenario. The results are presented in Figure 2.3 and Table 2.15 below.

Figure 2.3: Projected fuel poverty totals be fuel price rise scenario in the South East

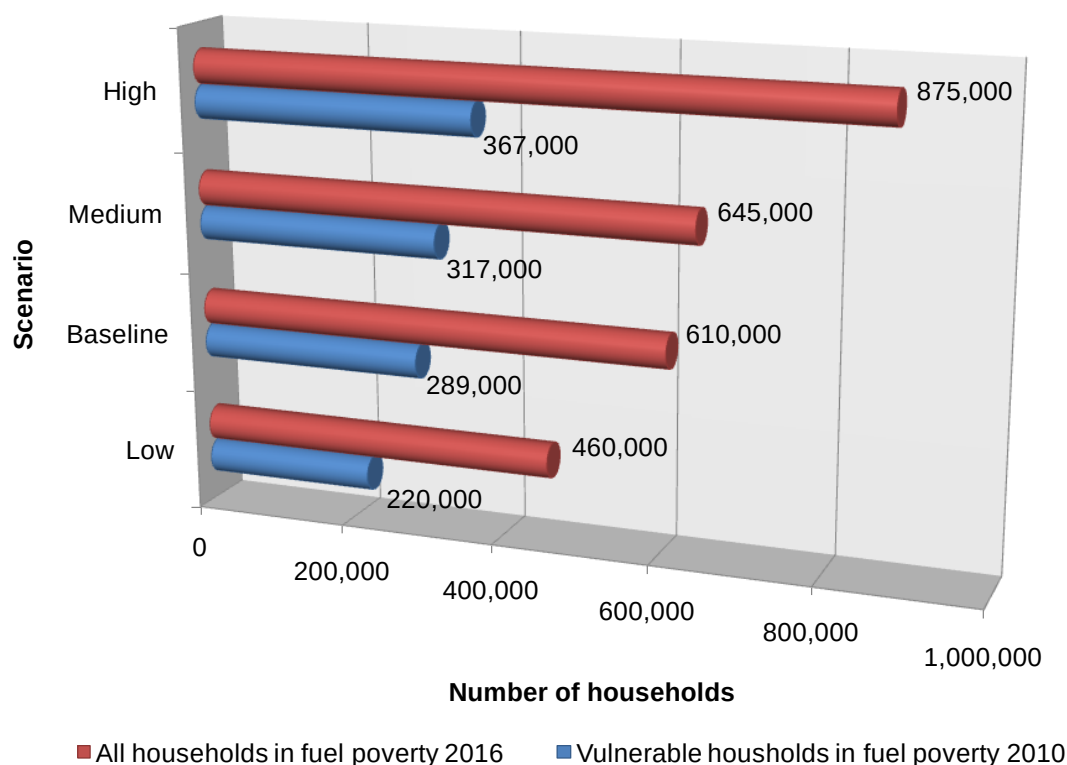


Table 2.15: Fuel poverty projections based on the full income definition (1,000s)

	South East			England		
	2010	2016	2030	2010	2016	2030
High scenario	524	875	1,110	4,180	6,406	7,216
	14.8%	24.8%	31.4%	19.3%	29.6%	33.3%
Medium scenario	473	645	819	3,756	4,845	5,459
	13.4%	18.3%	23.2%	17.3%	22.4%	25.2%
Baseline scenario	424	610	774	3,475	4,598	5,180
	12.0%	17.3%	21.9%	16.0%	21.2%	23.9%
Low scenario	304	460	584	2,611	3,479	3,920
	8.6%	13.0%	16.6%	12.1%	16.1%	18.1%
Total households	3,530	3,530	3,530	21,664	21,664	21,664

Under the worst-case scenario of high fuel price increases, there will be an estimated 875,000 fuel poor households in the South East by 2016. Even under the low fuel price scenario, this number would still be high compared to today at 460,000. The baseline scenario estimates 424,000 fuel poor households in 2010, rising to 610,000 and 774,000 by 2016 and 2030 respectively (See Annex I for estimates of fuel poverty in vulnerable households).

3 Residential targets and scenarios

3.1 Residential targets

The targets shown here have been developed in consultation with the Strategy's steering group and those stakeholders engaged to date. The consultation process was designed to ensure that the framework identified by this Strategy includes the necessary partners and partnerships. This Strategy is accompanied by an Action Plan that will enable the region to realise its full potential for economically, socially and environmentally beneficial sustainable energy improvements in its homes and communities.

CO₂ reduction target:

To achieve a 20% reduction in residential CO₂ emissions by 2016, relative to 2003, working in partnership with and through national programmes, regional organisations, and local partners.

Fuel poverty target:

To eliminate fuel poverty where practicably possible in the South East by 2016, with the aim to improve all properties to a minimum standard of efficiency i.e. SAP 65

3.2 Monitoring progress

In order to monitor progress against the targets proposed in this Strategy it will be necessary to review activity and performance at regular intervals. It is therefore the region's intention that the progress of all local authorities against National Indicators 186 and 187²⁷ will be tracked on an annual basis, with GOSE extracting the relevant sections from the National Audit Office reports. The region also plans to formally review its progress in the final quarter of 2010 and the first quarter of 2013. These two dates furthermore offer an opportunity to:

- Review the regional impact of CERT activity and set priorities for CERT's successor, the Supplier Obligation
- Review the region's progress in eradicating fuel poverty in vulnerable households
- Review the implementation of the Code for Sustainable Homes – level 3 of the Code will be mandatory from 2010
- Review progress against carbon budgets as defined by the Committee on Climate Change under the forthcoming Climate Change Act
- Review progress of the current SEEDA corporate plan, which ends on the 31st March 2011, and inform the subsequent plan

3.3 Scenarios to be modelled

The scenarios modelled in this Strategy have all been subject to a series of overriding selection criteria designed to ensure that their deployment matches the limitations of the locality. For example, external wall insulation is not selected for listed buildings with solid walls or homes in a conservation area. Annex V contains a detailed breakdown of the limiting criteria applied in the development of this Strategy.

²⁷ 'Per capita CO₂ emissions in the local authority area' (186) and 'Tackling fuel poverty - % of people receiving income based benefits living in homes with a low and high energy efficiency rating' (187).

Fuel Poverty - Threshold model

The threshold model represents an ideal scenario to address fuel poverty in the short to medium-term. The model is founded on a 2007 baseline used in the aforementioned Eaga PCT-funded study²⁸. The measures and expenditure represent the minimum required to alleviate fuel poverty by reducing each household's fuel costs to as close to 10% of their income as possible. For example, if a household only required draught proofing this is the only measure it would receive. There are three key reasons why the costs represent minimum expenditure:

- The 'threshold' approach assumes perfect targeting of fuel poor households. This would not be achievable in practice. A target SAP approach has been modelled which shows the cost of achieving SAP 65 in the homes of the current fuel poor and all households;
- To just achieve fuel costs of 10% of income, the model allows for partial improvements, whereas in practice it might often be more sensible and economical, in the long-term, to undertake more comprehensive improvements above and beyond those only required to eliminate fuel poverty;
- The 'threshold' model does not eliminate fuel poverty in all fuel poor households. The results show that 26% of fuel poor households remain in fuel poverty after energy improvements and these will require additional financial support to avoid being fuel poor, without re-housing.

In practice further expenditure will be required to both identify and target the fuel poor and offset the impact of fuel price rises beyond 2010. It is also important to note that the costs shown in this Strategy are based on competitive quotes for insulation and heating works. For example, a replacement (condensing) gas boiler is priced at £1,500 in the model. The costs of heating measures delivered through national schemes such as Warm Front are likely to be higher as they contain a two year warranty for every heating system installed.

Target SAP 65

In the analysis, the 'Target SAP 65' scenario also examined the package of measures needed to enable all households in the region to achieve a SAP rating of 65, and its impact on fuel poverty levels and CO₂ emissions. SAP 65 is notionally thought to protect households from fuel poverty; that is, the thermal efficiency of their property is no longer the overriding factor that causes them to fall into fuel poverty. It is worth noting that rising fuel prices are likely to have moved this threshold to SAP 72, however, SAP 65 is now intrinsically linked with NI 187 as well as many regional and local housing strategies and as such remains appropriate.

The model utilised in the South East Strategy selects individual or packages of energy improvements if they achieve SAP 65 for the minimum installation cost. No action is modelled in the 19% of dwellings that already have SAP ratings of 65 or above, even if they were occupied by fuel poor households.

²⁸ Fuel poverty was estimated to be 293,000 in 2007, having subsequently risen to 360,000 in 2008 (Preston, Guertler and Moore 2008).

Climate Change

The Strategy has examined the impact of four scenarios on CO₂ emissions from the South East's housing stock. The key selection criteria for each scenario were:

Scenarios to 2016:

1. Scenario 1a – The Government's pledge on 'cost-effective measures', defined by the then Chancellor Gordon Brown in the 2007 Budget statement²⁹
2. Scenario 1b – Going beyond the basics on a firm financial footing – i.e. the measures and packages thereof deemed cost-effective as a result of having positive net present value
3. Scenario 1c – Going beyond the basics and allowing for the value of carbon – i.e. the measures have a positive net present value when the economic value of abated CO₂ has been included

Scenarios to 2050:

4. Scenario 2a – Doing all we can – i.e. all measures applied by the model
5. Scenario 2b – Additionally, going further in reducing emissions from areas not covered by the model, such as stronger assumptions about the decarbonisation of energy supply

The five scenarios should not be viewed as alternatives, but rather each subsequent scenario requires virtually all the same activity as the scenario numbered before it, whilst doing more to achieve greater emissions reductions. Each scenario broadly represents a different level of potential emissions cuts to either 2016 or 2050. The different types of potential are explained, along with the descriptions of each scenario, in Annex IV.

The mix of sustainable energy measures applied under each scenario was subjected to a set of criteria that limited their application to suitable locations and situations. The model accounts for the local vernacular and landscape – for example, if the building is listed or situated in an Area of Outstanding Natural Beauty (AONB).

AONBs and Listed Buildings

- External wall insulation is not selected for listed buildings with solid walls or homes in a conservation area.
- Internal wall insulation is not selected for individually listed buildings with solid walls and/or where the habitable rooms are already small.
- Solar hot water and photovoltaic (PV) installations are not selected for flats or houses/bungalows in AONBs³⁰.

Demolition and replacement

The study does not specify any demolition and any additional new build beyond business as usual, as the demolition and replacement costs are up to ten times³¹ more than those for refurbishment. Unfortunately there is a zero rate of VAT on new build, compared to 17.5% VAT on refurbishment and this actively encourages developers to opt for the more 'destructive' option. In terms of the energy balance between demolition / new build and refurbishment, there are varying schools of thought, but rigorous reuse of materials and aggregates through effective interpretation of planning locally is one way of minimising the additional energy use and emissions embodied by new construction. It should also be noted

²⁹ HM Treasury 2007

³⁰ It could be argued that planning restrictions in AONBs need to be eased.

³¹ SDC 2007

that there can be multiple external drivers affecting the case for refurbishment in preference to demolition and rebuild, such as community cohesion.

3.4 Additional non measures based carbon savings

Table 3.1 summarises the assumptions made under each of the five scenarios for each of the factors affecting residential CO₂ emissions which are unrelated to physical refurbishment of the existing housing stock (see Annex IV for further information).

Table 3.1: Assumptions made for each scenario

Additional savings	Scenario 1a	Scen. 1b and 1c	Scenario 2a	Scenario 2b³²
New build between now and 2016	0.97 MtCO ₂	0.97 MtCO ₂	0.97 MtCO ₂	0.77 MtCO ₂
Decarbonisation of electricity	n/a	n/a	0.215 kgCO ₂ /kWh ³³	0.215 kgCO ₂ /kWh
Green gas (heat)	n/a	n/a	n/a	10% of overall grid gas supply
Improved efficiency of appliances ³⁴	MTP ³⁵ 'Policy' scenario in 2020	MTP 'Early Best Practice' scenario in 2020	MTP 'Policy' scenario in 2050	MTP 'Early Best Practice' scenario in 2050
Behavioural change	5% of remaining emissions	5% of remaining emissions	10% of remaining emissions	15% of remaining emissions

³² Scenario 2b assumes a 20% improvement in the efficiency of new homes built before 2016 by 2050 – i.e. improved appliances.

³³ standard measure of carbon intensity per unit of energy (per kilowatt hour)

³⁴ modelling based on 'What if?' tool (MTP 2007)

³⁵ Market Transformation Programme – Funded by Defra, the Market Transformation Programme 'supports UK Government policy on sustainable products. Its aim is to achieve sustainable improvements in the resource efficiency of products, systems and services where these are critical to the delivery of Government commitments in areas including climate change, water efficiency and waste reduction' (MTP 2008).

4 Scenario outputs

4.1 Fuel poverty

Success in delivering fuel poverty targets

Table 4.1 shows that the total cost of applying measures to all fuel poor households (293,000) in the South East in 2007 is nearly £526 million, an average cost per household of £1,792. It is important to note that the scenario is based on perfect targeting of households i.e. the scheme is able to identify those people in fuel poverty and provide them with measures. As discussed in section 3.1 this does not reflect the delivery of measures nationally and regionally, the cost of delivering the threshold model is likely to be twice as high.

The average SAP rating after measures have been applied to all fuel poor households is 64.4. This average approaches the nominal SAP target of 65. By contrast, the measures required to raise all fuel poor households to SAP 65 (the target SAP 65 scenario) would cost significantly more at over £6.5 billion, although the resulting average SAP rating is also higher at 69.2.

Table 4.1: Headline findings for South East fuel poverty scenarios

Scenario	Average SAP		Average	Total	Households	
	before	after	cost (£)	cost (£bn)	(1,000s)	percent
Full definition 10% target	39.4	64.4	1,792	0.526	293	8.7%
Target SAP 65 all	52.8	69.2	1,923	6.518	3,390	100%
Target SAP 65 private sector	51.5	68.3	2,079	6.108	2,938	87%
Target SAP 65 public sector	61.4	75.5	908	0.410	452	13%

Even with all the identified measures installed in all fuel poor households (under the 10% threshold scenario), 26% still remain in fuel poverty (Table 4.2 below). This percentage is greater still under the target SAP 65 scenario, at 43%. The reason this percentage is higher is because under the threshold scenario, many more fuel poor homes achieve a SAP rating well above 65.

Table 4.2: Success of scenarios in achieving fuel poverty (FP) targets (1,000s of households)

Scenario	Households no		
	longer in FP	Remaining in FP	
	(1,000s)	(1,000s)	
Full definition 10% target	217	77	26%
Target SAP 65 all*	169	125	43%
Target SAP 65 vulnerable	139	100	42%
Target SAP 65 private sector	145	113	44%
Target SAP 65 public sector	24	12	32%

* - 22,471 Fuel poor households achieve SAP 65 prior to measures

The majority of households that remain in fuel poverty (26% under the 10% threshold model) were in serious (15 to 20% of disposable income spent on fuel) or severe (20% and above spent) fuel poverty prior to the energy improvements (see Table 4.3 below). This is likely to

be due to a combination of very low incomes; severe under-occupancy; and insufficient energy improvements, resulting from the criteria imposed in the model (e.g. restrictions for listed buildings) and/or because it is otherwise hard to treat.

Table 4.3: Fuel poverty status before and after in 1,000s of households (10% threshold model)

Fuel poverty status 2007 baseline	Required fuel costs after improvements					Still in FP	Total
	up to 5%	5 to 10%	10 to 15%	15 to 20%	over 20%		
Moderate fuel poverty (10 to 15% of income)	2	175	38	0	0	38	215
	0.8%	81.4%	17.8%	0.0%	0.0%	17.8%	100%
Serious fuel poverty (15 to 20% of income)	0	19	15	9	0	24	43
	0.0%	44.8%	34.4%	20.8%	0.0%	55.2%	100%
Severe fuel poverty (Over 20% of income)	5	16	7	4	5	15	36
	14.1%	44.0%	18.3%	10.3%	13.3%	41.9%	100%
Total fuel poor (All over 10% of income)	7	210	59	13	5	77	293
	2.3%	71.6%	20.3%	4.3%	1.6%	26.2%	100%

Table 4.4 provides results on the 'income gap' (the additional income required for a household's fuel costs to equate to 10% of income) for all fuel poor households in the South East. It shows the income gap before any improvement measures for all fuel poor households and households remaining in fuel poverty, and the income gap after improvement. It also compares the total income gap for all households with the improvement costs.

Table 4.4: Income gap of before and after measures (10% threshold model)

Statistics	Before measures		After measures
	all in FP	left in FP	
Number of households	293,000	77,000	77,000
Average income gap (£)	3,066	4,173	1,836
Median income gap (£)	1,931	3,293	1,320
Minimum income gap (£)	0.26	420	35.34
Maximum income gap (£)	41,836	14,171	8,829
Sum of income gaps (£m)	899.5	320.3	140.9
Improvement costs (£m)	525.7	265.6	
Improvement + income additions (£m)	666.7	406.5	

Interestingly, all fuel poverty could be eliminated with total income additions of less than twice the total cost of improving the dwellings of the fuel poor (just under £900 million to cover one year's energy bills compared to the £526 million cost of measures). For those left in fuel poverty after the installation of measures, the improvement costs already expended on this group plus the cost of subsidising the remaining income gap would be greater than supplementing this group's income prior to any energy improvements (£407 million, compared with £320 million to cover one year's bills). However, as well as alleviating fuel poverty more lastingly, improving the stock obviously has additional advantages, such as

shielding future occupants from fuel poverty; improving the thermal comfort of occupants; potential reductions in CO₂ emissions; and added value to the economy.

Table 4.4 showed that for those left in fuel poverty, the improvement measures reduce the income gap significantly. While some households still require substantial additional incomes, some constitute a relatively modest amount (the minimum is as low as £35) after energy improvements.

Carbon savings associated with fuel poverty targets

Due to the relatively small sample of households in the EHCS (when looking only at one region) it was not feasible to explore carbon savings under the 10% threshold scenario (which only includes fuel poor households, of which there are 223 in the survey), hence CO₂ emissions savings under the SAP 65 scenario (which includes all households below SAP 65, of which there are 3,458 million in the survey) are shown instead (Table 4.5). The figures show that the installation of measures under the target SAP 65 scenario could reduce CO₂ emissions by 7.5 MtCO₂ (33.5% of the regions 2003 emissions). This surpasses the 2016 regional target and also comes close to the UK's NEEAP target for 2020 (assuming for simplicity's sake it is assigned proportionately across regions and sectors): a 31% reduction on 1990 levels or 14.7 MtCO₂.

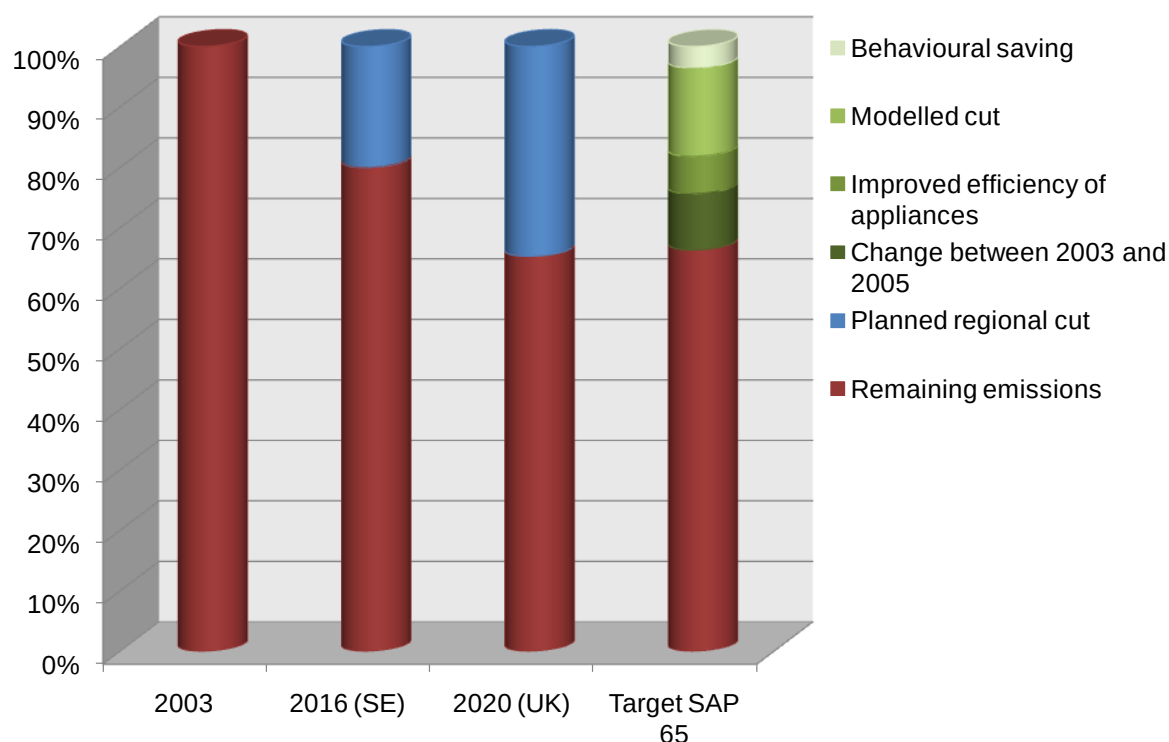
Table 4.5: Target SAP 65 modelled carbon savings (MtCO₂)

Breakdown of emissions & savings	2003	South East 2016	UK 2020	Target SAP 65*
Remaining emissions	22.5	18.0	14.7	15.0
Planned regional cut		4.5	7.8	
Modelled energy savings				
Change between 2003 and 2005				2.1
Improved efficiency of appliances				1.4
Modelled reduction (including lighting)				2.0
Decarb. assumed by BERR ³⁶ to 2016				1.3
Behavioural saving				0.8

* Includes increased emissions from new housing

The breakdown of the emissions reductions for the Target SAP 65 scenario has been compared with the region's target to reduce emissions by 20% by 2016 in the chart below.

³⁶ Department for Business, Enterprise & Regulatory Reform

Figure 4.1: Progress to 2016 and 2020 targets under Target SAP 65 scenario

4.2 Headline findings for carbon reduction scenarios

The average SAP rating and cost of improvements under four of the carbon reduction scenarios is shown in Table 4.6 below. Scenario 1a, based on the Government's definition of cost-effectiveness, has the lowest average cost and lowest resulting average SAP rating of 68.9. Scenario 1c, which includes an economic value for carbon, costs over four times as much as scenario 1a, but raises the average SAP to 98.4. Scenario 2 requires all the available measures in the model to be applied by 2050, and this achieves the highest average SAP of 100.1.

Table 4.6: Total costs and SAP improvements for South East scenarios

Scenario	Average SAP		Average cost per home (£)	Total cost (£bn)	Households (millions)	
	before	after				
Scenario 1a	52.8	68.9	926	3.1	3.39	100%
Scenario 1b	52.8	90.7	3,973	13.5	3.39	100%
Scenario 1c	52.8	98.4	4,210	14.3	3.39	100%
Scenario 2	52.8	100.1	5,862	19.9	3.39	100%

Table 4.7: Total CO₂ emissions and percentage reductions for South East scenarios

Scenario	Total (MtCO ₂)	Reduction
1990	21.2	
2003	22.5	
2005	20.4	
SE 2016 target	18.0	20.0%
SE 2020 (UK NEEAP) target	14.7	30.9%
Target SAP 65	15.0	33.5%
Scenario 1a real (2016)	17.9	20.4%
Scenario 1a (2016)	14.3	36.6%
Scenario 1b (2016)	13.6	39.4%
Scenario 1c (2016)	13.5	40.1%
Scenario 2a (2050)	7.1	68.6%
Scenario 2b (2050)	5.6	75.0%

Table 4.7 shows that scenario 1a achieves emissions reductions of 37% from 2003 levels, which would surpass the regions 2016 target of 20% and the Government's own NEEAP target of 22% (apportioned to a residential sectoral target for these purposes). Arguably, achieving scenario 1a is unrealistic without direct regulation – that is for example to ensure every loft is 'topped up' to 270mm of insulation and every partial cavity is filled. Indeed, the savings apportioned to loft top-ups under CERT are not sufficient for energy suppliers to fund the measure in isolation, unless the property presently has 60 to 70mm³⁷ of loft insulation or less. Therefore, the reduced savings associated with a lower penetration of lofts and cavities has been taken into account under the '1a real' scenario. It is thus more likely that the savings associated with 1a would be in the region of 20% or 4.6 MtCO₂. It is important to note that 2.1 MtCO₂ of this saving, or 46%, is attributed to the fall in residential emissions between 2003 and 2005. Defra's methodology for reporting CO₂ emissions was altered in 2005 to ensure that medium-sized businesses are correctly categorised. The saving of 2.1 MtCO₂ may therefore represent an over-estimate of the reduction in residential emissions.

To ensure that the 2020 target is met, a more challenging scenario of investment and improvement is required. The aim should therefore be to achieve as much of Target SAP 65 and scenario 1a as possible by 2016, whilst ensuring that more measures in scenario 1c are also brought forward. The target SAP 65 threshold also provides the region with a clearer dual stimulus for activity – both in terms of CO₂ emissions and fuel poverty.

An alternative definition of cost-effective (i.e. refurbishments that achieve a positive net present value) – used for scenario 1b – could reduce UK residential emissions by a further 19% compared to the real potential of 1a, which exceeds both the Climate Change Bill targets and those for 2020 from the NEEAP. This scenario requires the deployment of significant numbers of solid wall insulation and LZC technologies, for which adequate provision is not made under current implementation or funding policies. Implementing these measures by 2016 would require a step-change in the capacity to install them. For example, implementing scenario 1b would require in the region of 35,000 solar water heating systems to be installed each year, a tenfold increase on the current level of activity.

³⁷ National Energy Action 2007

Concurrently, the Government will need to implement the above range of supporting fiscal and behavioural change policies to educate and provide incentives for households to take action. Households need to have a better understanding of their own energy use and CO₂ emissions and a vested interest in improving them.

4.3 Carbon reduction scenarios to 2016

CO₂ emissions savings under the three 2016 scenarios are shown in table 4.8 below. The figures show that the installation of measures under all scenarios surpasses the planned reduction in emissions. Scenario 1a could reduce CO₂ emissions by 8.2Mt (over 36% of the region's 2003 emissions), therefore reducing the region's emissions to 14.3MtCO₂. However, as discussed previously, it is more likely that the savings associated with 1a would be in the region of 5.6 MtCO₂ or 20%.

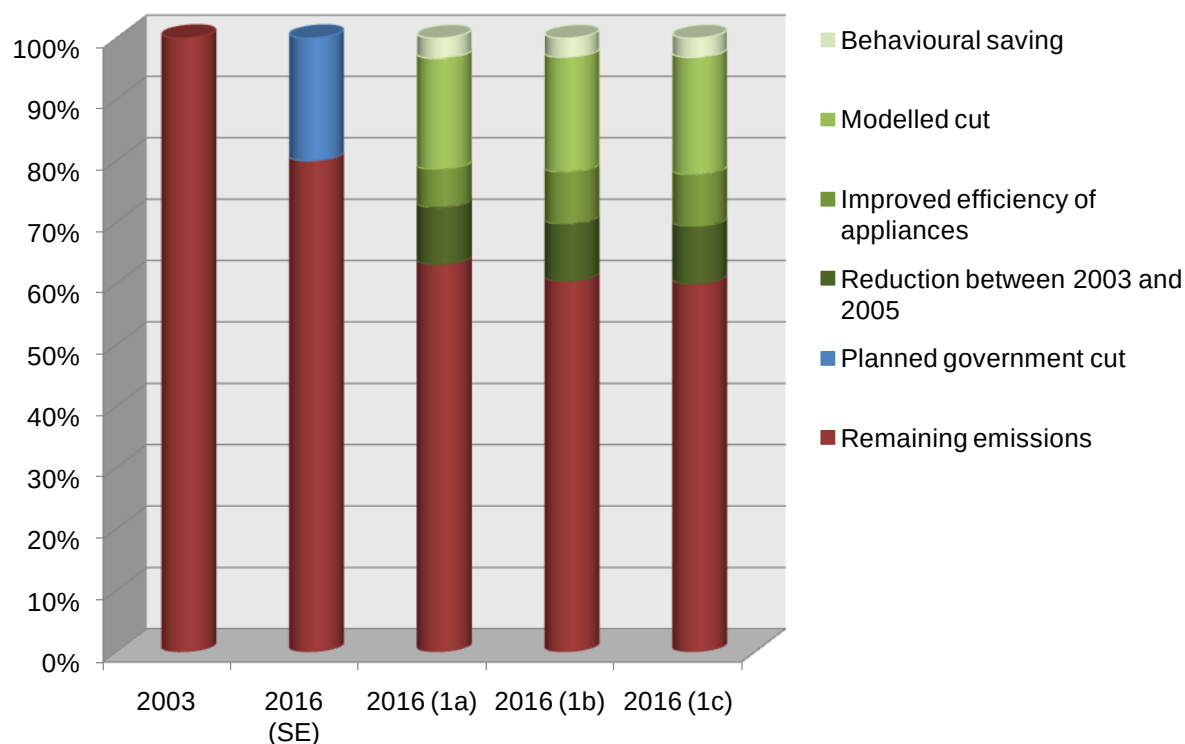
Table 4.8: Carbon reduction scenarios modelled savings to 2016 (MtCO₂)

Scenario and year	2003	2016	2016	2016	
		South East	(1a)*	(1b)*	(1c)*
Remaining emissions	22.5	18.0	14.3	13.6	13.5
Planned regional cut		4.5			
Modelled energy savings					
Reduction between 2003 and 2005			2.1	2.1	2.1
Improved efficiency of appliances			1.4	1.9	1.9
Modelled reduction (including lighting)			2.8	2.9	3.0
Decarb assumed by BERR to 2016			1.3	1.3	1.3
Behavioural saving			0.75	0.72	0.71

* Includes increased emissions from new housing

Scenarios 1b and 1c achieve greater emissions reductions still at 8.9 and 9.0 MtCO₂, exceeding the target by around 4.5 MtCO₂. This is illustrated in Figure 4.2 below, where the green-shaded areas, showing the modelled reductions, are clearly greater than the target reductions shown in light blue under all scenarios.

The breakdown of the emissions reductions achieved by 2016 has been compared with the region's target to reduce emissions by 20% by 2016 in the chart below.

Figure 4.2: Progress to 2016 targets under carbon reduction scenarios

4.4 Carbon reduction scenarios to 2050 (60% on 1990)

Table 4.9: Carbon reduction scenarios modelled savings to 2050 (MtCO₂)

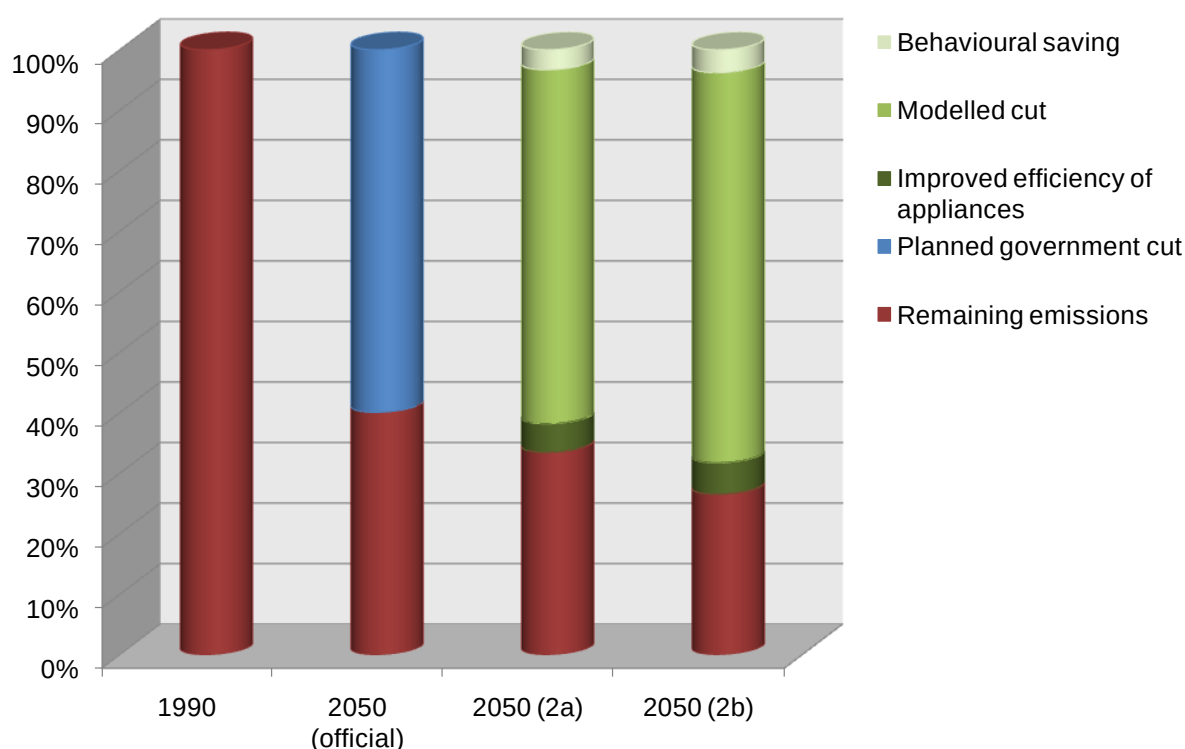
Breakdown of emissions and savings	1990	2050 60%	2050 2a*	2050 2b*
Remaining emissions	21.2	8.5	7.1	5.6
Planned Government cut		12.7		
Modelled carbon savings				
Improved efficiency of appliances			1.0	1.1
Modelled reduction (including lighting)			6.0	6.2
Decarb assumed by BERR to 2016			6.4	6.4
Green gas				1.0
Behavioural saving			0.7	0.8

* Includes increased emissions from new housing

A 60% reduction in residential emissions by 2050 is achievable under both scenario 2a and 2b, which achieve a 69% and 75% reduction on 1990 levels respectively (Table 4.9). This requires: the implementation of the sustainable energy improvements in homes described in 1b; an increase in the energy efficiency of household appliances; a reduction in the carbon content of electricity through improved generation and distribution efficiency and an increase in the share of renewables in electricity generation; the use of green gas from waste or other organic matter and a 15% improvement in people's behaviour to further reduce home energy use. In order to implement scenario 2b by 2050, scenario 1b will first need to be implemented. Given the urgency of the issue, it is critical that the Government implements a strong set of policies now to facilitate this by 2020. The breakdown of the emissions

reductions achieved under scenarios 2a and 2b compared with the Government's target reduction for 2050 are illustrated in the chart below.

Figure 4.3: Progress to 2050 targets under carbon reduction scenarios



4.5 Costs and benefits associated with delivering scenarios to 2016

Table 4.10: Summary of total economic benefit for 2016 scenarios (£m)

Scenario (millions)	Target SAP 65	Scenario 1a 2016	Scenario 1b 2016	Scenario 1c 2016
Total measures	5,162,000	7,319,000	6,216,000	6,434,000
Modelled savings (MtCO ₂)	3.39	3.73	3.80	3.97
Total costs	£6,518	£3,139	£13,470	£14,269
GVA	£1,900	£839.2	£3,999	£4,237
Lifetime fuel savings	£8,254	£11,410	£7,184	£7,834
Value of carbon economic	£433.6	£540.5	£554.2	£578.1
Value of carbon social	£1,295	£1,423	£1,451	£1,515
Total benefit lower	£10,500	£12,750	£11,700	£12,610
Total benefit upper	£11,330	£13,670	£12,630	£13,590
Net benefit (lower)	£3,979	£9,614	-£1,765	-£1,658
Net benefit (upper)	£4,812	£10,530	-£831	-£684

Table 4.10 summarises the potential total economic costs and benefits of installing the energy improvements required under all scenarios. Measures installed under the target SAP 65 scenario cost over £6.5 billion with a GVA of £1.9 billion. The estimated total cost of the 7.3 million measures required by 2016 (including 918,000 low energy light bulbs) for scenario 1a stands at just over £3 billion, with a resultant GVA of nearly £850,000 (see Annex I for GVA assumptions).

For scenario 1b, the number of measures required by 2016 is 6.2 million, with subsequent total costs of approximately £13.5 billion and a GVA of £4 billion. The number of measures required is lower than Scenario 1a, as lofts with 150mm or more of insulation are not improved. This marginal improvement is not deemed cost-effective under this scenario and reflects the energy suppliers' delivery of CERT targets – i.e. marginal lofts are unlikely to receive funding in isolation.

Scenario 1c requires a total expenditure of over £14 billion, with a GVA of £4.2 billion. Measures installed here are cost effective (have a positive net present value) when the value of carbon is included and result in savings of nearly 4MtCO₂.

These results show that there is considerable potential economic benefit of the proposed activity for the insulation, heating and renewables sectors. The four scenarios summarised all demonstrate that every £3-4 spent on sustainable energy measures in the UK result in approximately £1 generated for 'UK plc'. In addition to the annual investment in UK industries, these households will also benefit from reduced energy bills and associated financial savings. Table 4.10 also shows the long-term monetary value of these savings. The savings shown assume a 20 year lifetime for the measures installed and account for long-term fuel price projections.

For every £1 invested in measures under the SAP 65 scenario, approximately £1.27 of lifetime fuel savings is generated. This more than doubles to savings of £3.63 for every £1 invested under scenario 1a. These measures will provide considerable benefit to the 293,000 fuel poor households in the South East.

If a value is assigned to saved CO₂ emissions (as shown in Table 4.10 above), the SAP 65 scenario generates between £1.61 and £1.74 for every £1 invested, rising to between £4.06 and £4.35 under scenario 1a. The higher figure represents a carbon cost of £70 per tonne ('social' in Table 4.10), while the lower figure represents a carbon cost of £26.5 per tonne³⁸ ('economic' in the table). Under scenario 1b and 1c, the total benefits per £1 invested are less than £1. However, the cost of £1.4 to £1.5 billion per year required to deliver the residential sector measures in both scenarios is minimal compared to the cost of doing nothing. The Stern Review estimated the cost to the economy of mitigating the harmful impacts of climate change to be ten times that of acting now.

The total emissions reductions achieved and gross cost per tonne of CO₂ saved in doing so, for each of the four scenarios, is shown in Figure 4.4 below. Scenario 1a has the lowest cost per tonne of carbon at £842, whilst still achieving a reduction in emissions of 3.7 MtCO₂.

³⁸ Defra 2007a

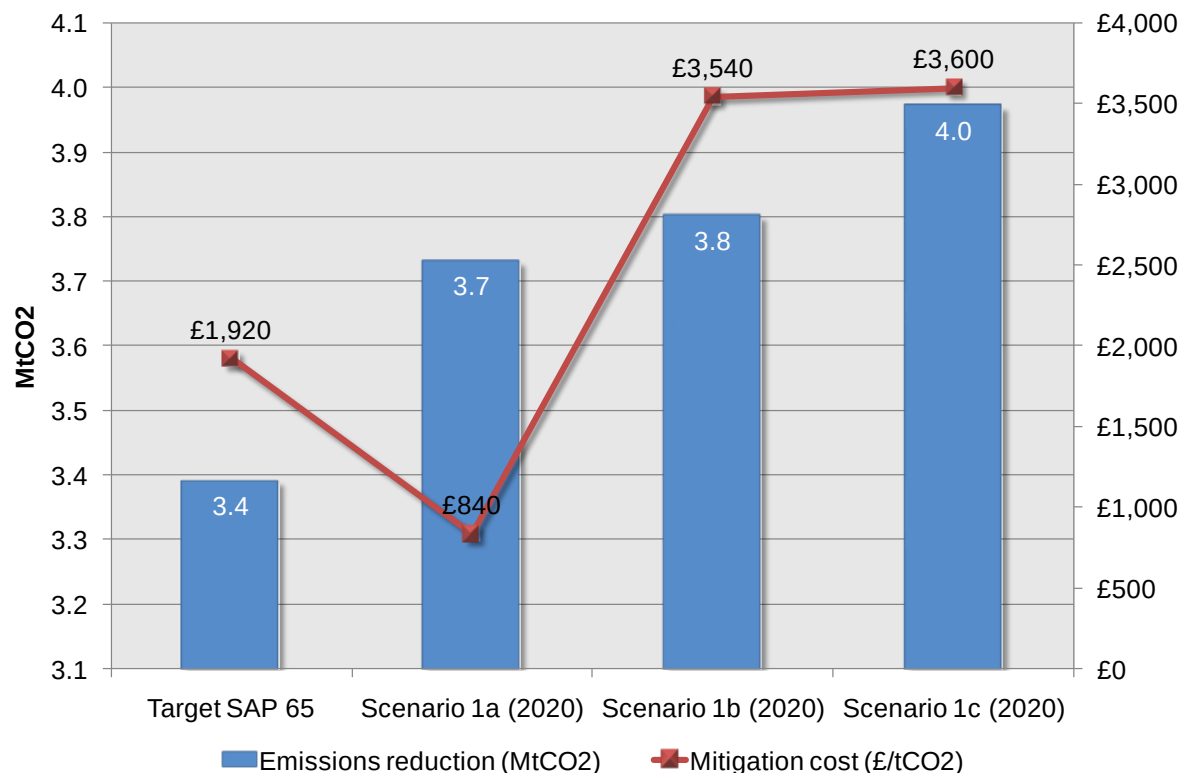
Figure 4.4: Emissions reductions (MtCO₂) and cost per tonne saved (£/t)

Table 4.11 below shows the level of employment generated in the region under the four scenarios, including how many full-time equivalent (FTE) jobs would be created under each scenario compared to the current number of FTEs. The SAP 65 scenario would require an increase of 2,381 FTE positions to complete the necessary installations, with an estimated GVA of over £8,000 per position. Scenario 1a results in the creation of 1,426 FTE jobs, each adding just over £3,500 of GVA. Scenario 1b results in the creation of 4,014 FTE jobs, with each adding a significant GVA of £17,762, with scenario 1c being higher still. The reason that the number of FTE jobs created in scenario 1b and 1c is so much higher is the inclusion of LZC technologies such as ground source heat pumps, which have a longer installation time than the other LZC technologies modelled.

Table 4.11: Annual employment generated by scenario to 2016

Scenario	2008 total staff FTE	Installers - scenario FTE/year	Ancillary staff - scenario FTE/year	Total staff* - scenario FTE/year	Required increase in FTE	GVA / FTE (£)
Target SAP 65	3,433	2,289	5,722	6,537	2,381	8,918
Scenario 1a 2016	1,342	895	2,237	2,141	1,426	3,566
Scenario 1b 2016	3,434	2,289	5,724	13,658	4,014	17,672
Scenario 1c 2016	3,434	2,289	5,724	13,939	4,096	18,035

*Total staff only relates to measures in the scenario

4.6 Step-change in activity required to implement scenarios

Table 4.12 below shows the total number of measures required under each scenario, the associated annual costs and benefits (GVA) and how these compare to the situation at present. Under the 10% threshold scenario the annual costs are actually lower than the current expenditure. This is because under this scenario the model only improves the homes of the fuel poor (see section 3.3).

Table 4.12: Total measures and investment to 2016

Scenario	Total measures (1,000s)	Total costs (£ millions)	GVA (£ millions)
Current	539	£679	£210
10% threshold	602	£525	£151
Target SAP 65	5,162	£6,518	£1,900
Scenario 1a 2016	7,319	£3,139	£839
Scenario 1b 2016	6,216	£13,470	£3,999
Scenario 1c 2016	6,434	£14,270	£4,237

Figure 4.5 illustrates the differences in annual costs and benefits associated with the installation of measures under each scenario. The delivery of all other scenarios requires an increase in the annual number of installations, albeit only a slight increase under the SAP 65 scenario. Scenario 1b requires a 28% increase on the current number of measures installed annually, rising to an increase of 33% under 1c and 50% under scenario 1a.

Scenario 1a demonstrates the highest rate of increase from 539,000 measures per year to 813,000. The additional numbers of loft-top ups and low energy bulbs are the primary driver of this increase. However, as discussed in section 4.2 the threshold for loft top-ups under CERT means that deployment of these numbers is unlikely.

Figure 4.5: Total annual cost and GVA associated with each scenario

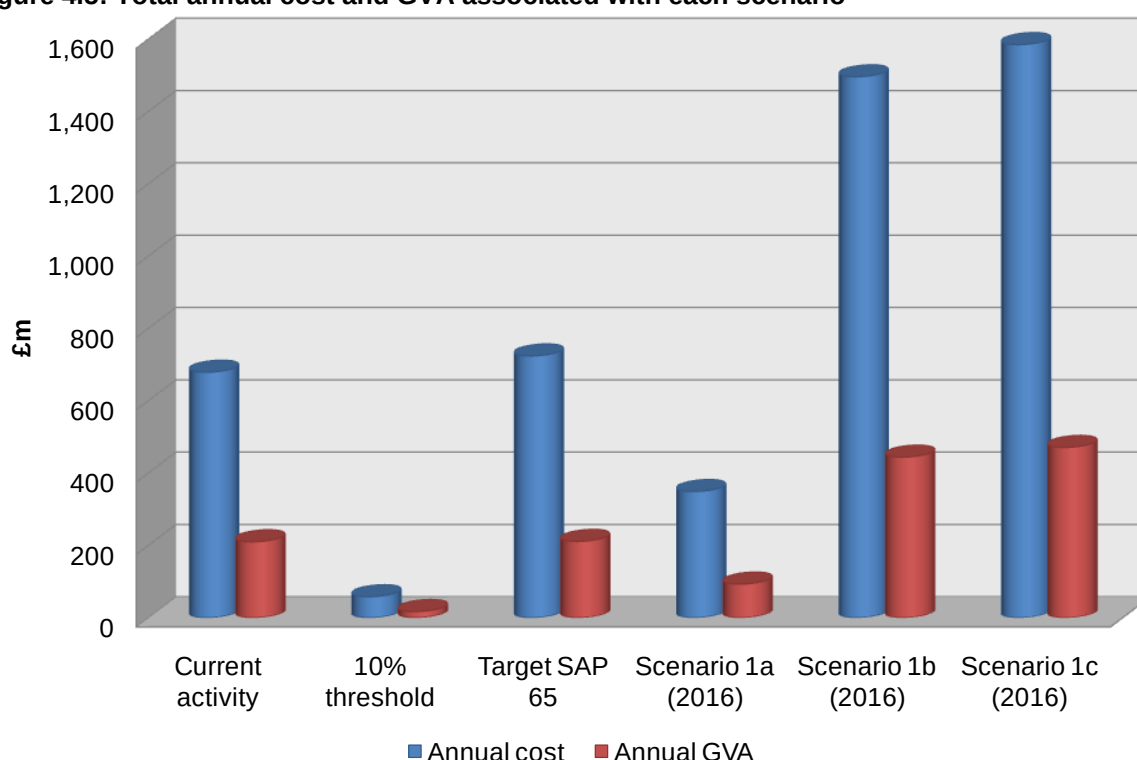


Table 4.13: Change in rate of installation per measure (2016)

Measure	Scenario 1a	Scenario 1b	Scenario 1c	Target SAP 65
Cavity wall insulation	0.6	0.7	0.7	0.3
Loft insulation	2.8	0.8	0.8	1.3
Draught proofing	3.1	1.7	1.7	1.6
Solid wall insulation		5.9	5.9	2.9
Double glazing		<0.1	<0.1	0.1
Gas central heating	0.6	0.3	0.3	0.5
Oil central heating	1.2	<0.1	<0.1	0.5
Micro CHP ³⁹	n/a	n/a	n/a	n/a
Ground source heat pumps		6,927	6,883	355
Air source heat pumps		15	23	57
Biomass boilers				60
Solar photovoltaics		294	585	
Solar water heating		83	83	288
Wind turbine				

Recent announcements regarding future spending indicate that £2.3 billion will be available over the next three years, encompassing Warm Front (England) and CERT (Great Britain)⁴⁰. This translates into approximately £113 million annually for the South East. Figure 4.5 shows that a range of £349 million (for scenario 1a) to £1.5 billion (for scenario 1c) would be required per year to implement the discussed scenarios; the relative funding gap is therefore of the magnitude of three to 13.

In order to inform the development of this Strategy, CSE and the Association for the Conservation of Energy (ACE) have undertaken an extensive consultation of regional stakeholders (see section 5.1 for further information). As part of this survey, two stakeholders involved in CERT (an energy supplier and a contractor responsible for installing measures) were questioned on their ability to ramp up their activity if the CERT targets were to be doubled. According to the energy supplier, it is too early to say at this stage because CERT, which doubles the targets from the preceding programme EEC-2, has only just begun. However, he noted that ultimately CERT is funded by their customers and only some customers benefit from the programme. Therefore if the targets were doubled, some customers could end up paying an extra £30-£40 a year with no benefit from this. The contractor thought that the industry would not be able to cope with another doubling of the targets. He noted that many in the industry think that the market for CERT is dwindling with fewer and fewer properties available to target, which are becoming harder to find even with the same level of activity. This highlights the need for the focus of CERT to shift from the installation of measures such as cavity wall insulation and loft insulation, to measures aimed at hard to treat homes and micro-generation technologies.

In terms of access of the South East region to CERT measures, the energy supplier interviewed thought that the region would access significant numbers of measures through CERT in 2008/09 compared to other regions. The contractor thought that there would be

³⁹ combined heat and power

⁴⁰ Defra 2007b

differences between regions and noted that in the past the North-West/East regions and South Wales accessed a higher number of measures due to the high levels of fuel poverty in these areas. However, with the introduction of the over 70s into the Priority Group, this has reduced the pressure to find Priority Group members in areas with high levels of fuel poverty, which will change the map of CERT installations.

Nine stakeholders from Regional Housing Consortia and Community Energy Efficiency Fund (CEEF) projects were interviewed on the details of their projects. In terms of the measures covered by the projects, they were mostly offering standard measures, although one project is using solar water heating because of its impact on fuel poverty, and another project aims to reach 1,000 hard to treat properties, offering measures such as biomass boilers, solid wall insulation (including insulation for park homes) and insulation for hard to reach lofts. Most of the stakeholders were not able to provide exact numbers of the measures to be installed by their projects at this stage, although one stakeholder was able to say that they aim to reach 8,000 households over four years to install insulation in 1,200 lofts and 900 cavity walls.

4.7 Deployment of measures to 2025 as a long-term step to 2050

To ensure that the Strategy's targets for fuel poverty and CO₂ emissions are met by 2016 the region must ensure that a more challenging programme of investment and improvement is stimulated. In order to achieve its 2016 targets the region must ensure that it achieves as much of the 'Target SAP 65' and '1a' scenarios as possible by 2016.

Deployment of measures to 2016

"Energy improvement programmes must therefore aim to ensure that a target SAP 65 is achieved where ever possible, in addition to installing those short payback measures included in scenario 1a"

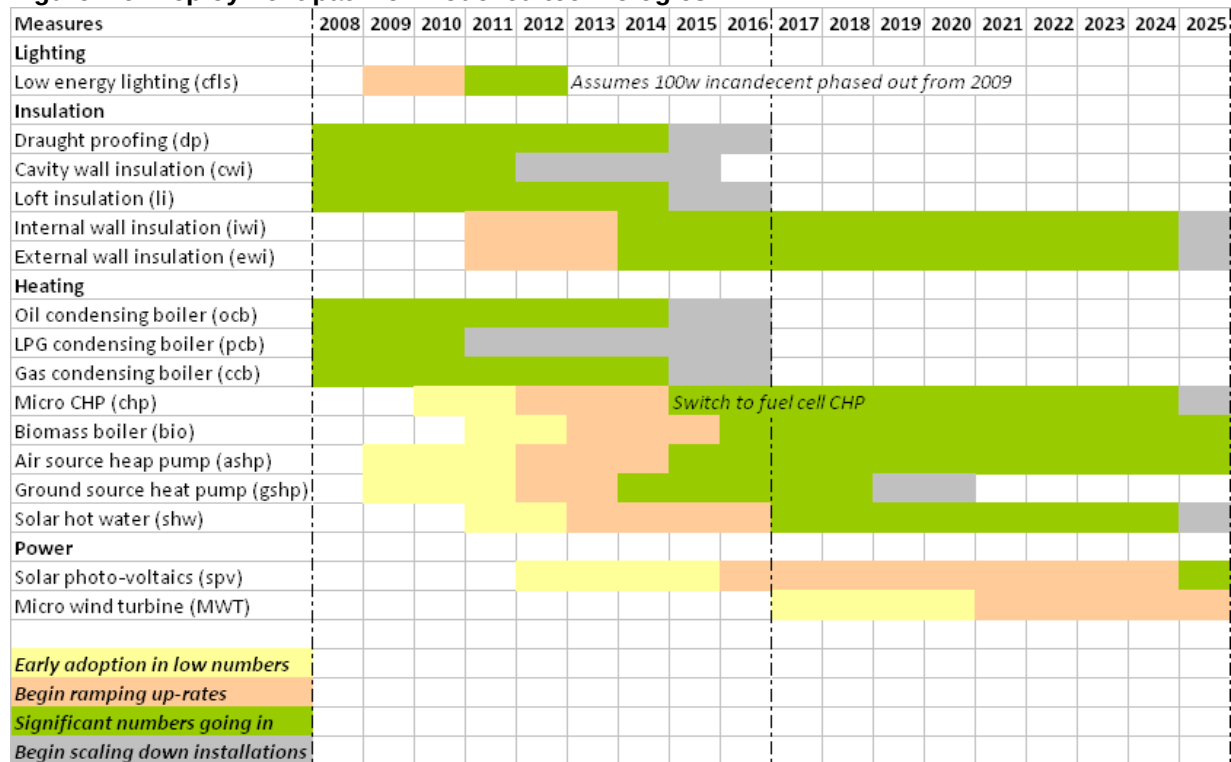
The region's progress towards a 2016 target should be seen as springboard to achieve longer-term national 2020 and 2050 targets for CO₂ emissions. The deployment of the 'Target SAP 65' scenario will provide the necessary market stimulation to increase the capacity to install solid wall insulation and renewables on a significant scale. The region would then be well placed to ensure that the measures deployed under scenarios 1c are deployed between 2016 and 2025.

Given that delivering this Strategy will require the implementation of solid wall insulation and a range of LZC technologies, stakeholders involved in CERT were asked about their ability to deliver these measures. The CERT contractor interviewed said that they are already installing LZC technologies and external wall insulation for solid-walled homes. They started LZC measures 18 months ago, starting with micro-wind turbines and moving on to solar hot water systems, solar photovoltaic panels, and air source heat pumps, which they see as the technologies with the greatest potential.

The energy supplier noted that they are increasing their capacity for installing low carbon and renewable energy technologies, but they are still at the early stages. One key issue identified was the lack of companies to provide sufficient numbers of these measures- with ground source heat pumps used as an example. The supplier thought that the industry would be able to skill-up in three years as long as there was sufficient growth in the industry coupled with significant incentives. It would also be possible for local businesses to diversify and fill the gap in the market, although he noted that this is not a straight-forward process, given the large differences in the way in which the different sectors operate.

Figure 4. shows the timeline for the deployment of those technologies included in the model. The selection of LZC technologies and their relative role in delivering a 60% reduction by 2050 is an important issue. In particular, the region must avoid locking itself into long-term technologies that fail to deliver the predicted savings.

Figure 4.6: Deployment path for modelled technologies



The modelling employed in this study is based on the most up-to-date information available on technologies. However, the following factors should be noted:

- Micro-CHP is an emerging technology
- Further longitudinal research into the performance of heat pumps in a variety of locations is required
- District-level CHP should be prioritised in the short- to medium-term where possible for clustered accommodation where there is a central point for the management of heat distribution and payment (see section 6.2.3 CHP for the existing housing stock)

Micro-CHP is a near to market technology with a relatively short lifetime (ten to 15 years) that avoids any major lock-in issues. The modelling has coupled micro-CHP with high heat demand houses where the long lead times for heat maximise the technology's efficiency. Its carbon savings are high while the grid intensity of carbon is relatively high; however, as the electricity grid is decarbonised the carbon savings associated with the technology fall. However, micro-CHP and also district CHP also have an important role to play in managing future demand for energy because they produce electricity when it is needed most.

The decarbonisation of grid distributed electricity supply will be fundamental to the region meeting its long-term 2050 target for a 60% reduction in CO₂ emissions (see section 3.4). The need to decarbonise the electricity supply to meet CO₂ emissions reductions targets is supported by reports published by the Institute of Public Policy Research (IPPR), Friends of

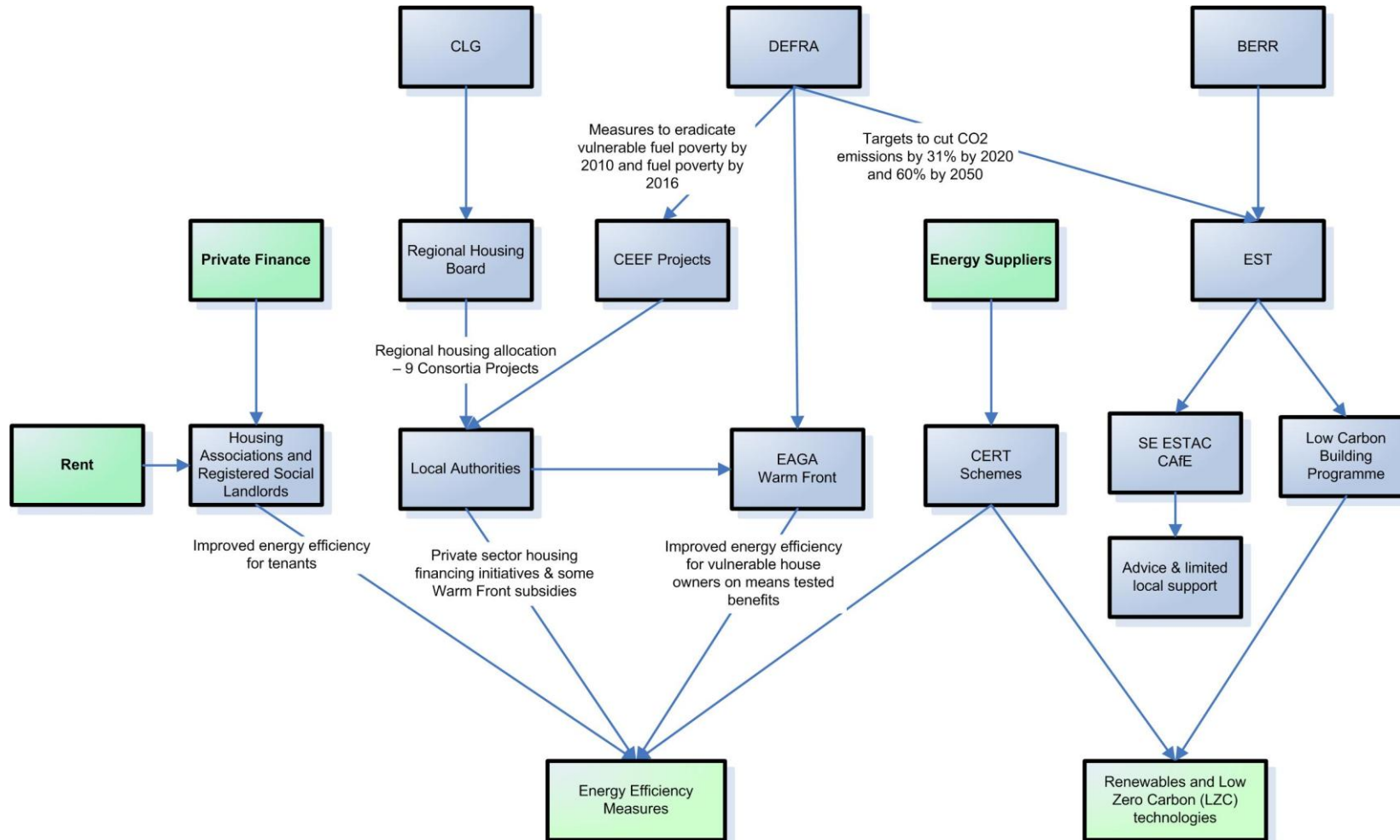
the Earth (FoE) and WWF UK⁴¹. Heat pumps and biomass provide the main solutions to residential heating demand. The long-term success of heat pumps is dependent upon the decarbonisation of the electricity supply and may also facilitate a shift to a new, collection and distribution system. The role of biomass in the residential sector is limited by demands for biomass fuel from businesses, transport and large-scale power generation facilities such as co-firing at coal power stations.

The main focus of this Strategy is the target to reduce residential CO₂ emissions by 20% by 2016. In the deployment timeline shown in Figure 4., 2012 is the first year that any technology is likely to experience significantly ramped-up installation rates. The region should therefore ensure that the 'flexibility' funding available through CERT (see section 5.3.3) is used to trial the deployment of all LZC technologies in the short- to medium-term.

⁴¹ IPPR, WWF and RSPB 2007

5 What are the current regional opportunities?

Figure 5.1: Stakeholder map and drivers



5.1 Engaging regional stakeholders

CSE and ACE have undertaken an extensive consultation of regional stakeholders as part of this Strategy's development. The engagement process has been designed to capture stakeholder's views on a range of issues, nurture a sense of ownership and also capture any examples of best practice which could be replicated elsewhere. In particular the survey attempted to explore stakeholders':

- Understanding of national, regional and local targets
- Drivers for action on fuel poverty and / or climate change
- Relationships with other organisations and how these then help them deliver sustainable energy measures within the region
- Views on existing policies and initiatives
- Views on new initiatives or policies that could help achieve significant additional delivery
- Experience of delivering action on fuel poverty and / or climate change, in particular the barriers they face and the support they receive from within their own organisations

In identifying examples of good practice, the Strategy has also attempted to identify the ways in which such practice was developed by the local authority or regional body. In this way, good practice examples can potentially provide more detail on how to build the necessary bridge from the more usual, 'less-good-practice' to the good practice being described. The findings of the exercise are discussed in chapters 4, 5 and 6 of this Strategy with the identified actions being listed at the end of each section in chapters 5 and 6 (where relevant). The Action Plan that accompanies this Strategy provides further details on the accompanying tasks, lead organisations and necessary partners.

In addition to the stakeholder survey, CSE facilitated a consultation workshop at Gatwick, in July 2008, which was attended by nearly 100 'stakeholders' - from regional and local government, advice providers, the insulation sector, energy suppliers and housing associations. The event enabled stakeholders to comment on the targets contained in section 3.1 and the aims and priority areas shown in chapter 8. The event identified a number of additional actions and areas of focus which have subsequently been captured in this Strategy (Annex VI contains the event reportage).

5.2 Existing policies and drivers

5.2.1 Awareness of national and regional targets

The Strategy gauged the awareness of regional targets amongst all stakeholders contacted. The region has a number of regional targets as defined by the strategies and policies discussed in section 1.1. The following summarises the awareness of regional targets:

- A relatively high awareness of the Regional Economic Strategy (RES) target to reduce CO₂ emissions, amongst stakeholders working for regional agencies
- A relatively low awareness of the RES target to reduce CO₂ emissions, amongst all other stakeholders
- A lower awareness of targets for renewable energy amongst regional agencies
- A number of local authorities and sub-regional agencies highlighted the 2010 and 2016 target for renewables
- A high awareness of national fuel poverty targets amongst all sub-regional agencies, local authorities and delivery agents

The Strategy has therefore identified a relatively low awareness of regional targets. The stakeholder consultation event and the launch of this Strategy therefore provide an opportunity to raise the profile of the RES target to reduce CO₂ emissions from all sectors by 20% by 2016.

The consultation exercise asked stakeholders if they felt that a 20% reduction by 2016 was attainable within the region. Despite some optimism amongst stakeholders, the majority felt that a 20% reduction target for residential emissions by 2016 would be both difficult and challenging. The key barriers identified included:

- Political will both nationally and locally. Stakeholders felt that national and local politicians were unwilling to impose costs or lifestyle changes upon people
- High numbers of hard to treat⁴² (HTT) homes, which require solid wall insulation and LZC technologies, neither of which are funded in significant numbers by national programmes
- A lack of local coordination and support for local authorities at sub-regional and county level, which could help engage less wilful individuals and councils
- The 'rebound effect'⁴³, where savings generated are simply offset elsewhere by the purchase of new products and appliances, which in turn increase emissions
- The loss of the Decent Homes Standard and Public Service Agreement 7⁴⁴ for Private Sector Housing post-2010
- The end of the Home Energy Conservation Act (HECA) and the uncertainty about the National Performance Indicators' ability to stimulate continued local authority action on both climate change and fuel poverty
- Data sharing and the ability to target individual households and streets based upon their eligibility, efficiency and / or opportunity
- A lack of incentives for both large, community and small-scale renewables
- Population growth and the development of new housing creating additional emissions

The majority of stakeholders identified the Climate Change Bill as the most important policy instrument, which will set emissions reduction targets in law and ensure regular monitoring against the targets. However, as highlighted by one stakeholder:

"The biggest problem at the moment is the differences between government rhetoric that climate change is a huge issue, with little action to back this up – we are still acting like its business as usual."

⁴² homes with solid walls and/or without access to the gas network and/or no loft space under the roof and/or in high-rise buildings

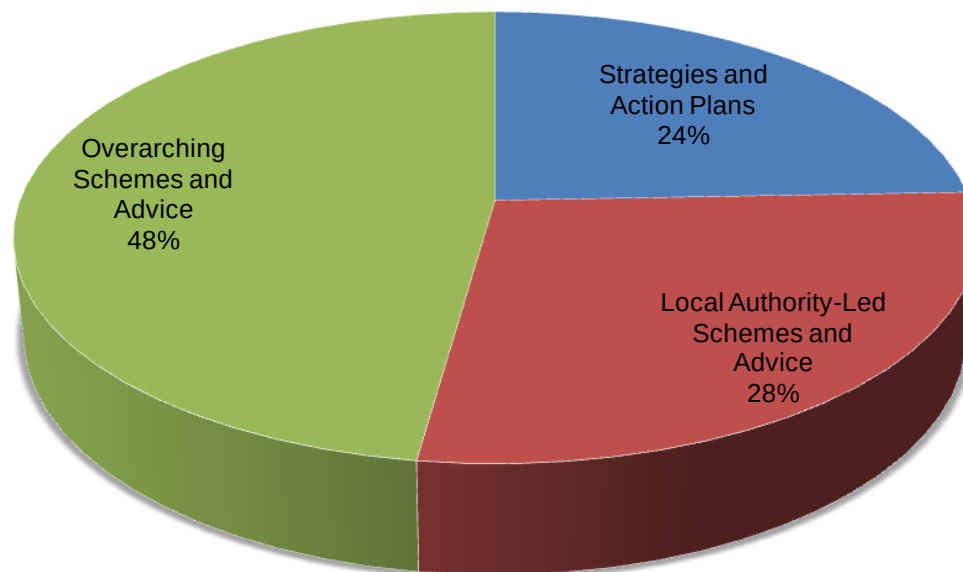
⁴³ It is as yet unclear how the effect of rapidly rising oil prices in 2007 and 2008 will translated to improved energy behaviour in the home.

⁴⁴ See CLG 2007.

5.2.2 Local and sub-regional strategies and coverage

A mapping exercise was undertaken to assess local authority websites in the region and establish the composition and range of information and support available to the public. Figure 5.2 shows that website information fell into three broad categories: strategies or action plans, council-led schemes and advice, and over-arching schemes and advice.

Figure 5.2: Local authority activity by type



Strategies and action plans

Evidence of strategies and/or action plans for housing, climate change, fuel poverty, and energy efficiency was sought. It was found that:

- Housing strategies were most common by a wide margin, with around half of all local authorities posting these documents on their websites. Of these, most contained a section dedicated to improving the energy efficiency of the housing stock. References to fuel poverty were either made within this section, or under a separate heading
- Energy efficiency or fuel poverty strategies, and climate change strategies and action plans were less evident, appearing on 7-14% of websites

Local authority-led schemes and advice

In total, 60% of all websites provided pages dedicated to energy efficiency, 11% had pages dealing with climate change and 12% promoted the local authorities own energy efficiency initiatives. Web pages focusing on energy efficiency generally contain behaviour-based energy-saving tips and related benefits, and often links to particular grants or schemes made available by the local authority or other organisations. In some instances they also provide

information and links to the local Energy Advice Centre, to charities working in the field, and to related local strategies and action plans.

Overarching schemes and advice

Nottingham Declaration

Of all the overarching initiatives made use of by local authorities this is by far the most popular, with over 50 signatories from the region. Essentially the Declaration:

- Acknowledges climate change and its anticipated effects
- Welcomes both Government initiatives to tackle these issues and the opportunity to contribute at the local level
- Commits the signatory to develop and publicly declare appropriate strategies and plans of action to reduce greenhouse gas emissions - both within the council and in the wider community.

A minority of signatories to the Declaration had not made this visible on their websites.

Cocoon

Nearly 20% of all local authorities refer website visitors to Cocoon. Cocoon is a service offering free, independent advice on the best available insulation packages for home owners, private tenants and landlords.

Solarsavers

Nearly 20% of all local authorities refer website visitors to Solarsavers, which once offered independent advice on installers of solar water heating and solar photovoltaic panels. However, Solarsavers has now closed.

Heat Project

Managed by Enact Energy in partnership with local authorities across the UK, the Heat Project makes use of CERT funding to offer insulation packages to households. Five local authorities refer to the Heat Project on their websites.

KASH

Kent Action to Save Heat is a locally-branded scheme offering discounts on heating and efficient boilers. Whilst KASH now includes all 13 Kent local authorities, six make reference to the scheme on their websites.

SHECANE

All 14 Hampshire and Isle of Wight local authorities are part of a collective organisation known as the Southern Home Energy Conservation and Action Network (SHECANE). The initiative aims to support representation, consultation and policy development for its members' HECA Officers. It also undertakes a variety of domestic energy-efficiency-based projects and points those wishing to make use of grants for insulation to local EEACs. Two member local authorities make reference to SHECANE on their websites.

Climate South East (of which SEEDA is a member)

There are 26 local authorities that are members of this organisation, which comprises a variety of public and private sector organisations that jointly aim for an integrated response to the challenges of climate change. References to this Partnership were found on three local authority websites.

Sun Rise

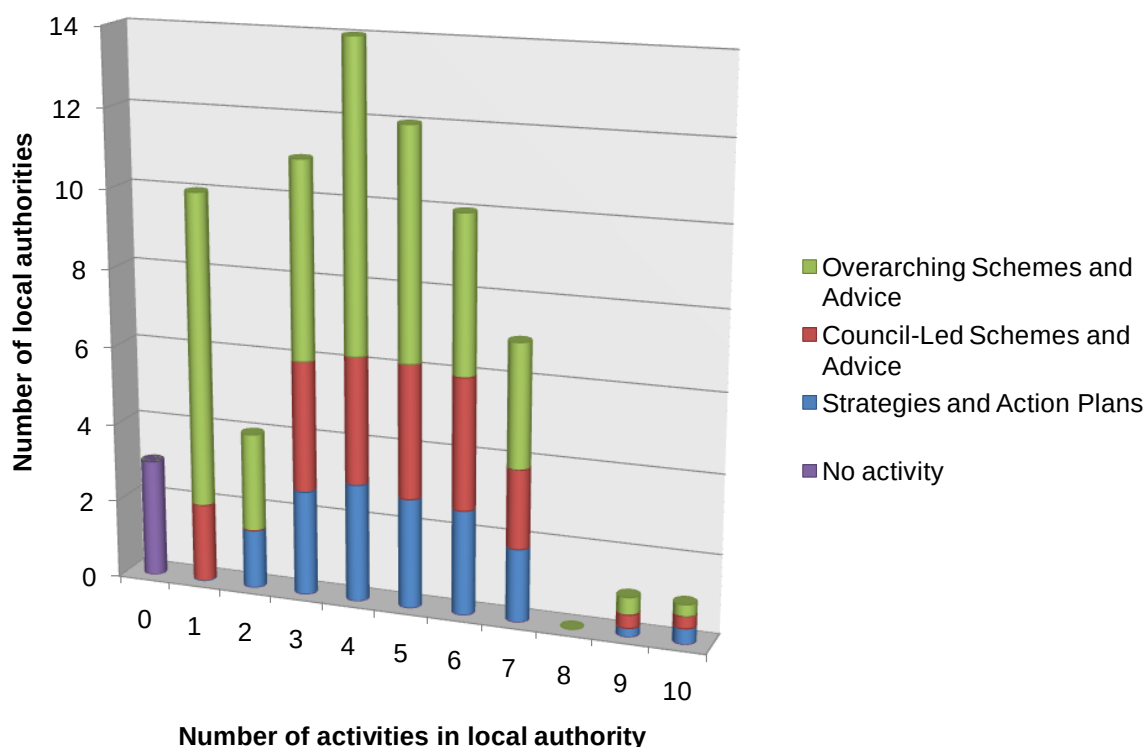
Sun Rise is a solar hot water installation scheme that offers advice, discounts and interest free loans on installations in connection with the Kent Energy Centre. There are 13 local authority members in the region and one reference to the Scheme was found on a local authority website.

British Gas Council Tax Rebate Scheme

This CERT-based scheme avails a rebate of up to £100 to residents of member councils when investing in insulation from British Gas. References to the Scheme were found on the websites of seven of the 13 member local authorities in the South East.

Gaps in activity – conclusions

Figure 5.3: Number of activities per local authority



Based upon the information presented on websites, there is no general picture to be painted of local authority activity supporting the reduction of fuel poverty and/or CO₂ emissions in housing: at one extreme there are those that make no mention of either, and at the other, there are those who have developed a series of targeted and integrated strategies and action plans, provide their own schemes and sources of advice, and make use of broader networks, funding schemes and resources. However, no website reviewed presented a complete picture: in all cases, a mutually supportive, integrated set of current strategies and separate action plans was not evident. Strategies and action plans could include integrated strategies and separate action plans on:

- Energy efficiency
- Fuel poverty
- Climate change

The mapping exercise has shown that local authority participation in strategic-level alliances or networks is evident in many but not most cases. Strategic partnerships can build

consensus and support for wider schemes and initiatives, help secure economies of scale, and inform the overall strategic direction of activity.

The overall web-offering of most local authorities failed to identify a consistent set of cross-referenced web pages each dedicated to the areas of climate change, home energy efficiency, affordable warmth and housing. The web offering of local authorities could contain:

- Simple advice as to how to take action either directly or by contacting listed support schemes
- Support schemes should be coherent with a straight forward mix of local, regional or national schemes, preferably packaged into a one-stop shop
- Links to all relevant strategies and action plans
- Links to the EST South East ESTACs

5.2.3 The future of the Home Energy Conservation Act (HECA)

HECA was introduced in 1995 and was amongst the first pieces of legislation to directly address emerging concerns about increasing emissions of CO₂ and the need to improve energy efficiency. HECA places a duty on all Energy Conservation Authorities⁴⁵ to produce improvement plans aimed at achieving a voluntary 30% energy efficiency improvement within ten to fifteen years i.e. by 2006 or 2011.

The future of HECA is still unclear. Energy Conservation Authorities' HECA responsibilities come to an end in 2010 and the Government has no plans to extend the Act. Defra has undertaken a review of HECA, as implemented in England, to assess its continued success in delivering improvements in energy efficiency and options for the future. Defra's consultation states that authorities have reported an overall improvement in domestic energy efficiency of the housing in their area over a 10 year period (1st April 1996 to 31st March 2006) of approximately 19.26%, as measured against a 1996 baseline. Defra's recent review suggests there is little evidence that the HECA is, in itself, driving these improvements in household / residential energy efficiency.

The HECA Act placed a yearly duty on Energy Conservation Authorities to report on improvements in energy efficiency. Whilst the quality of these reports and their use has been questioned in the recent review, the reporting function meant that a local authority officer was assigned the role of HECA officer. The level of resources available to HECA officers varies dramatically according to the size and commitment of an authority. For example a small but committed local authority may make more funding and staff time available to an officer than a larger but less committed local authority. Whilst it is difficult to assess the role of HECA in enabling carbon savings, previous reviews⁴⁶ by Government have suggested that the majority of Energy Conservation Authorities believe that HECA has resulted in an increase in resources allocated to energy efficiency.

The consultation exercise has engaged a number of local authority officers fulfilling roles in HECA, private sector housing, and environmental health teams. The level of resources available to local authorities within the region varies dramatically, with the overall size of the council being the predominant factor, so larger councils and budgets provide greater resources and activity. However, a number of wilful individuals in smaller local authorities

⁴⁵ Energy Conservation Authorities are all local authorities with housing responsibilities

⁴⁶ Defra 2007c

were spoken to whose historical HECA activity had cultivated longer term senior executive support for their work on domestic energy efficiency.

5.2.4 National Performance Indicators – NI 185, 186 & 187

Local authorities will be assessed against National Performance Indicators as part of the Comprehensive Performance Assessment (CPA), and, from April 2009, as part of the successor to the CPA, the Comprehensive Area Assessment⁴⁷. Local and Multi Area Agreements will also be based on up to 35 of the new performance indicators.

Three of the National Performance Indicators deal specifically with CO₂ reduction and fuel poverty. For the purpose of domestic CO₂ emissions NI 186 and 187 are relevant but 185 has been described here as it has relevance for the delivery of the RES's all sectors' CO₂ emissions reduction targets of 20% by 2016.

NI 185 CO₂ reductions from local authority operations

Local authorities will provide information on their energy use in a spreadsheet format. The indicator will show the percentage reduction in CO₂ emissions against a 2008-2009 baseline.

NI 186 per capita reduction in CO₂ emissions in the local authority area

This will be based on data provided by Defra, using a 2005 baseline, which has already been published (and is used to provide some of the statistics in this Strategy).

NI 187 Tackling fuel poverty – people receiving income based benefits living in homes with a low energy efficiency rating

This is based on data provided by the local authority and measures the proportion of households on income based benefits living in homes with a low and high energy efficiency rating.

The future of HECA is of less relevance if the new National Performance Indicators guarantee sustained local authority action on domestic energy efficiency across all councils. The uptake of these indicators has not been mandated by Government and there is therefore no guarantee that NI 186 and 187 will be taken up. In the absence of HECA or these indicators, there is therefore no guarantee that local authorities will continue to support activity in this area. GOSE has helped the region secure a relatively high take up of NI 186 (per capita reduction in CO₂ emissions in the local authority area); however, the profile of energy efficiency and carbon reduction targets needs to be retained across all local authorities. A regional awareness-raising campaign that helps identify energy efficiency and climate change champions at local authority member level would help sustain regional activity on fuel poverty and climate change.

Local authorities are currently in the process of negotiating performance targets against NI 186 and 187 with GOSE. Defra is also in the process of formulating and issuing the regions with guidance on the assessment process needed to determine performance against these targets. The stakeholder engagement process sought views on both NI 186 and 187 from local authorities and sub-regional agencies. The key issues and opportunities have been summarised here for each indicator.

⁴⁷ The Comprehensive Area Assessment will focus not just on the performance of individual institutions and local authorities but, more widely, on outcomes for the area as a whole and its people, secured by local authorities working alone or in partnership.

National Performance Indicator 186 (NI 186)

NI 186 was felt by stakeholders to be a relatively well defined and meaningful indicator. Local authorities who included the indicator in their Local Area Agreement (LAA) felt that it would help them sustain activity on residential emissions and develop further action in this sector. The inclusion of the indicator requires local authorities to indicate the extent to which they plan to reduce emissions within their area. The majority of respondents indicated that 10% by 2010 on a 2005 baseline may be a reasonable target; however, the extent to which this target can be delivered is also dependent on the national Government delivering its own policies for carbon reductions. The wording of any agreement is therefore key to local authorities' LAAs and accordingly the example below is reproduced here:

"We (the Local Strategic Partnership) will use our best endeavours to reduce carbon emissions per capita (as assessed under NI 186) by X% by 2010 from a 2005 baseline of Y tCO₂ per capita, through planned improvements to our own performance in influencing carbon emission reductions in our locality (as outlined in a delivery plan) and through the effective and timely implementation and delivery by national Government of its carbon reduction policies and programmes"

The indicator has been taken up by over 70% of local authorities in the South East, making it the 7th most popular NI taken up by local authorities in their LAAs. GOSE will be able to use Defra's yearly per capita emissions statistics to assess the performance of individual local authorities against their own targets. However, comparing local authority performance relative to other councils will require the region to identify groups of similar authorities whose emissions can then be compared fairly. For example, it wouldn't be fair to compare the performance of Gravesham, which has a relatively low population and a very high proportion of emissions from industrial and commercial sources, with Brighton and Hove, which has a far higher population and proportion of emissions from the residential sector.

The possibility of creating groups of local authorities with a set of local factors⁴⁸ that can explain their emissions distribution was explored. The analysis started from the initial exploration of local factors associated with CO₂ emissions as identified in the CSE study for the Local Government Association. 'CHAID'⁴⁹ analysis was performed on an extensive local authority dataset. CHAID analysis is a technique that is used to create groups sharing properties which distinguish them from other groups. The analysis identified 12 groups of English local authorities, ranging from 16 to 110 members (average 32). The groups created provide broadly 'sensible' groups with common characteristics such as rurality; however, there were some large ranges of current CO₂ emissions per capita within groups.

Another option explored was the possibility of using the Chartered Institute of Public Finance and Accountancy's new 'nearest neighbour' comparison model being used by Government Offices to assess performance on waste management. This is an updated version of the system used by the Audit Commission for 'value for money' comparisons and is based on a set of Office for National Statistics (ONS) variables which include population density, various wealth / deprivation factors and proportion of housing tenure. The model uses 'euclidean distance' to find each local authority's 'nearest neighbours' in a space determined by these 20 variables. This creates a set of 15 'nearest neighbour' comparators for each local authority (London Borough; Metropolitan/Unitary; County; District). The model provides groups that provide a better predictor of emissions by sector and as such should be used to

⁴⁸ socio-economic and demographic data

⁴⁹ Chi-squared Automatic Interaction Detector

assess local authority performance against other local authorities who set targets against NI 186.

Once a local authority has set their NI 186 target they must then prioritise those actions that will enable them to meet their target. When setting their local priorities it is important that they identify areas that they can influence and then translate these into actions that will create tangible carbon savings. For example, it may seem obvious that Gravesham should prioritise the industrial and commercial sector and target the highest emitting companies in the district; however, if they do not have the powers to influence these companies then this activity would not provide the best use of their resources.

Local authorities need additional advice as to the actions they can take and how these will impact on emissions. There are a number of tools which local authorities can use to assess their current performance and identify those areas where improved performance will reduce CO₂ emissions. The EST and Defra have both developed matrices that enable local authorities to identify those areas where they can influence emissions. It is recommended that local authorities couple this analysis with Defra's per capita emissions statistics to develop their own NI 186 action plans.

GOSE should commission guidance to local authorities wishing to develop their own NI 186 action plan. Local authorities can also access free support from the EST via the ESTAC run '121 local authority support programme', subject to available annual resources.

National Performance Indicator 187 (NI 187)

NI 187 was felt by stakeholders to be a useful method of sustaining local authority action on fuel poverty. However, achieving the target does not equate to tackling fuel poverty, as the receipt of means tested benefits is a poor proxy for fuel poverty. The 'How much?' study examined the proportion of fuel poor households who were eligible for Warm Front in April 2006. The study found that 40% of the fuel poor were currently ineligible as their incomes were not low enough for them to qualify for a 'passport' means tested benefit or a benefit that enables them to qualify for measures. Whilst the inclusion of all over 70s in the Priority Group for CERT will ensure more measures are available for fuel poor households, rising fuel prices will have brought more families with marginal incomes into fuel poverty thus further increasing the number of ineligible households.

The following barriers and opportunities associated with NI 187 have been identified:

- Local authorities reporting against NI 187 will need to be careful that their sampling methodology produces valid numbers. If the survey is not designed rigorously, any sampling error could be higher than the actual change detected
- Local authorities and registered social landlords should already have good quality data on their own stock, and there is therefore little value in them collecting NI 187 data from social housing
- Local authorities should put together a more rigorous fuel poverty monitoring indicator that also allows them to report on NI 187
- Local authorities should make sure that their standard housing benefit and council tax benefit forms allow them to use the data collected to inform households about other benefits to which they are entitled and for monitoring and policy development purposes
- Compiling a good quality property database should be as central to monitoring fuel poverty as it is for monitoring energy efficiency and CO₂ emissions

- Local authority fuel poverty data should be collected to common standards, centrally collated and centrally reported on
- Taking a consortium approach to procurement, data collection and delivery will provide local authorities with lower costs and increased resources
- Local authorities with housing responsibilities should be required to produce affordable warmth strategies (as in Wales and Scotland) that meet certain minimum standards (including collection of baseline information and annual monitoring of this)
- Following Defra's release of the final guidance for NI 187 reporting, GOSE should commission procurement guidance for local authorities tendering for reporting and monitoring services, thus ensuring consistent delivery across all local authorities signed up to NI 187.

Proposed actions for section 5.2

- AP1 Raise awareness of the region's Regional Economic Strategy and Renewable Energy targets
- AP2 Sustain and generate the support of stakeholders
- AP3 Ensure local authority officers, senior executives and members are engaged and actively working on energy issues
- AP4 Establish interim targets to track the Strategy's progress
- AP5 Ensure local authorities identify areas that they can influence and then translate these into actions that will create tangible carbon savings
- AP6 Ensure local authority reporting on NI 187 is delivered consistently across the region

5.3 Existing national schemes and delivery projects

As discussed previously, approximately £113 million of CERT and Warm Front funding could be available annually in the South East. Furthermore, there are no sub-regional restrictions on the allocation of national funding, so this figure could be increased if the South East is able to secure more than its 'fair share' of national funding.

5.3.1 Current targeting

The method of targeting sustainable energy measures is critical to the success of this Strategy and the delivery of both local and national targets. The two broad aims of this Strategy are the eradication of fuel poverty by 2016 and a 20% reduction in residential emissions to the same time horizon. The deployment of energy efficiency measures is currently defined by the following criteria for the two main national schemes:

- **CERT non-Priority Group** – targets the lowest cost carbon abatement opportunities in the highest numbers, for example, lofts with less than 60mm of insulation and unfilled cavities
- **CERT Priority Group** – targets low-income households eligible for means tested benefits and over 70s with the lowest cost carbon abatement opportunities in highest numbers
- **Warm Front** – targets low-income households eligible for means tested benefits, with efficient heating and standard⁵⁰ insulation measures

The two national schemes supporting energy efficiency measures both target the same group of low-income households with similar insulation measures. The provision of the most effective and lowest cost insulation measures would be expected for a scheme designed to reduce CO₂ emissions; however, Warm Front is designed to reduce fuel poverty and does not offer solid wall insulation for the 50%⁵¹ of fuel poor who live in HTT homes in England.

The mix of measures provided by Warm Front is outside the scope of this Strategy. However, there is an opportunity to maximise the potential benefit of measures provided to low-income households by combining the two grant schemes, for example by ensuring the delivery of heating measures from Warm Front and standard insulation measures from CERT Priority Group. This enables the household to gain maximum benefit from the heating measures and avoids the issue of grant top-ups, where the total cost of measures exceeds the Warm Front grant maxima.

The integration of the two schemes has worked well in a collection of the CEEF pilots. However, this practice could be standardised across the region with better coordination and dialogue between the energy suppliers, Eaga and the local delivery partner (either the local authority or local energy agency). It is therefore important that the region explores what the best method of integrating the delivery of measures across the South East is.

The target of reducing residential emissions by 20% will require the targeted improvement of the most inefficient stock by targeting the worst properties with measures provided under the nationally funded schemes. The baseline of energy efficiency (see 2.1) has shown that 784,000 households in the South East in 2005 were in bands G and F. Those properties in band G and the majority of properties in band F fail the HHSRS on the excess cold

⁵⁰ gas and oil condensing boilers, loft insulation, cavity wall insulation, draught proofing, hot water tank jackets

⁵¹ Preston, Guertler and Moore 2008

criterion⁵². The HHSRS can be used to enforce action in all tenures except local authority owned stock, but it is most likely to be used in private sector homes.

Under the HHSRS, local authorities have a legal duty to take 'appropriate action' wherever a property is found to have a 'Category 1' hazard. Local authorities have a legal duty to arrange for an inspection of any premises to determine whether there is a hazard following a well-founded complaint or request. Impetus Consulting Limited recently conducted a study⁵³ for the Energy Efficiency Partnership for Homes which identified a failure in many local authorities to implement the HHSRS effectively. Furthermore, very few were carrying out their duty, as specified in the Housing Act, to carry out systematic reviews of the housing stock in their area for Category 1 and 2 hazards.

The Regional Housing Allocation projects discussed in section 5.4 represent an excellent example of intervention and targeting based upon the thermal efficiency of housing. However, these projects tend to focus on low-income consumers rather than able to pay consumers with higher CO₂ emissions living in homes unfit for human habitation. ***Prioritising resources to target the G and Fs should therefore be a regional priority*** for advice delivery and intervention schemes focussed on reducing CO₂ emissions.

Targeting the G and Fs will require stakeholders such as local authorities, energy agencies and the EST Advice Centres to pinpoint these properties. The Home Energy Efficiency Database (HEED, see section 6.1.2) could potentially become a central repository for Energy Performance Certificates. However, stakeholders face similar issues to those associated with accessing EEC-2 data stored on HEED – the data will be made available at Output Area for reasons of data protection. In reality, stakeholders need the address of the property so that they target properties that have not received measures and need them.

5.3.2 Warm Front

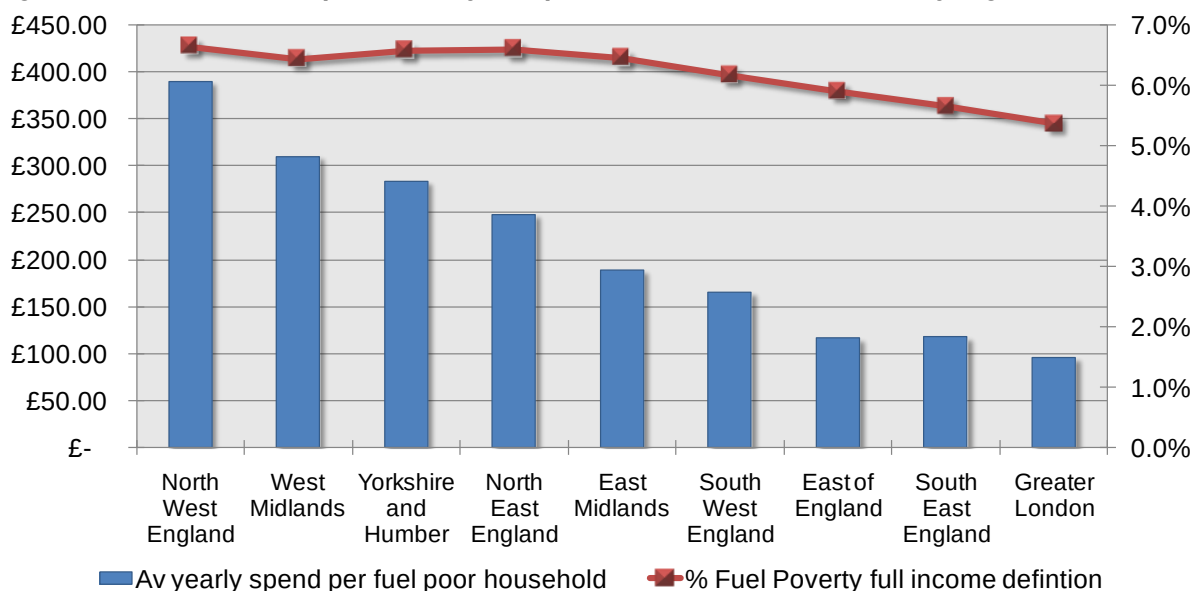
The South East is not presently accessing its fair share of Warm Front compared to other English regions. Table 5.1 and Figure 5.4 show yearly expenditure per household between 2006 and 2007 of £6.16, which is the third lowest of all English regions. This trend matches that for the proportional number of households in fuel poverty in 2003, with the region experiencing the second lowest proportion of 5.7%. It is important to note that fuel prices have risen significantly since 2003 with fuel poverty more than doubling; however, CSE's Fuel Poverty Indicator is the most up-to-date source of data for local and regional data on fuel poverty.

⁵² Excess cold is deemed a 'Category 1' hazard. Category 1 hazards are deemed serious, whereas Category 2 hazards are deemed less serious.

⁵³ Impetus Consulting 2008

Table 5.1: Warm Front expenditure 2006 to 2007 by region

Region	Av yearly spend per household	Av yearly spend per fuel poor household	Fuel poverty 2003
North West England	£24.41	£390.30	6.7%
West Midlands	£19.07	£310.70	6.5%
Yorkshire and Humber	£17.62	£284.01	6.6%
North East England	£15.41	£248.51	6.6%
East Midlands	£11.49	£189.08	6.5%
South West England	£9.75	£165.81	6.2%
East of England	£6.57	£116.43	5.9%
South East England	£6.16	£117.75	5.7%
Greater London	£5.11	£96.15	5.4%

Figure 5.4: Warm Front expenditure by fuel poor household 2006 to 2007 by region

The differential in expenditure per household should not be a concern if those fuel poor households within the region receive a similar level of resource per property to others nationally. However, Figure 5.4 shows that the fuel poor in the South East receive less per household than all other regions apart from London. London has well known issues associated with high proportions of solid wall properties and less attractive profit margins for contractors working in there.

The regional prevalence of HTT housing could be a factor which influences the amount of Warm Front funding spent in the South East because of the limited number of measures for HTT homes. However, Table 5.2 shows that the South East has a relatively low proportion of HTT housing compared to other English regions. For example, Yorkshire and Humberside has higher proportions of both off gas and solid wall properties than the South East, whilst expenditure per fuel poor household is double that for the South East. This trend suggests that fuel poor homes in the South East are either by their nature hard to find, or there is a fundamental difference in regional and local infrastructure.

Table 5.2: Prevalence of HTT⁵⁴ housing by region

Region	Solid wall households	Off-gas households	Total households
East Midlands	490,822 27%	538,213 29%	1,842,349
East of England	536,196 23%	754,998 32%	2,339,238
London	1,197,515 39%	134,776 4%	3,054,922
North East	262,143 23%	87,668 8%	1,135,974
North West	847,499 28%	179,017 6%	2,996,300
South East	835,000 23%	401,696 11%	3,562,785
South West	597,558 27%	431,604 20%	2,192,274
West Midlands	521,021 23%	239,539 11%	2,264,112
Yorkshire and The Humber	555,417 25%	492,863 22%	2,192,477

Warm Front expenditure also varies significantly by local authority within the South East region. Table 5.3 shows the top 15 local authorities in terms of cumulative Warm Front expenditure between March 2003 and March 2007. The table also shows the proportion and number of fuel poor households in 2003 for each local authority (using the 'full income' definition of fuel poverty), the local authority's ranking for Warm Front spending and the rurality of the housing stock. As expected, those local authorities with the highest number of fuel poor households tend to dominate the top 15 by total Warm Front expenditure. However, there are notably some smaller local authorities included in the top 15 – such as Havant and Worthing – that have relatively low numbers and proportions of fuel poor households.

Figure 5.5 shows the variation in total expenditure per fuel poor household in the South East for all local authorities. It has not been possible to include all of the names of local authorities in the South East due to the size of the chart and those shown are chosen at random by Microsoft Excel. The chart shows the considerable variation around the regional average with smaller local authorities with high total expenditure again showing relatively good performance. The presence of a strong affordable warmth partnership in the West Sussex area, the West Sussex Healthy Homes Partnership, may be a driver behind the relatively high total expenditure per fuel poor households in West Sussex e.g. £734.65 and £633.20 respectively in Arun and Worthing. Indeed, the area has seen awards granted to Chichester District Council for their innovative 'Prescribing Warmth' scheme and also to the Partnership's coordinator.

⁵⁴ CSE 2006b

Table 5.3: Warm Front expenditure between 03/07 by local authority (top 15)

Local authority	FPI ⁵⁵ 2003	Rank FPI	nfull	Rank nfull	Households	Rurality	CEEF Projects	Total spend four years (excl. CFLs ⁵⁶) (millions)	Rank total spend
Medway	6.2%	7	6,202	2	99,476	Mixed		£3.606	1
Brighton	5.6%	24	6,467	1	114,631	Urban	Yes	£2.776	2
Southampton	6.1%	10	5,554	3	91,276	Urban		£2.728	3
Isle of Wight	6.7%	1	3,844	7	57,612	Rural		£2.690	4
Arun	5.5%	33	3,470	10	62,623	Urban		£2.549	5
Portsmouth	6.6%	2	5,207	4	78,704	Urban		£2.517	6
Thanet	6.6%	3	3,654	8	55,294	Mixed	Yes	£2.391	7
Hastings	6.6%	4	2,487	37	37,689	Mixed		£1.900	8
Havant	5.7%	19	2,787	25	48,521	Urban		£1.784	9
Swale	6.3%	6	3,140	17	49,545	Mixed	Yes	£1.622	10
Worthing	5.6%	28	2,459	41	44,079	Urban		£1.557	11
New Forest	5.5%	34	4,006	6	72,376	Mixed		£1.540	12
Eastbourne	5.9%	15	2,425	43	41,060	Mixed		£1.281	13
Wealden	5.7%	20	3,343	14	58,208	Rural		£1.238	14
Dover	6.5%	5	2,883	23	44,299	Rural	Yes	£1.220	15

The majority of stakeholders see Warm Front as one of the most important programmes to deliver on targets for climate change and fuel poverty (together with CERT). Warm Front (again, together with CERT), is seen as a key delivery mechanism for the deployment of energy efficiency and renewable energy measures as part of this Strategy.

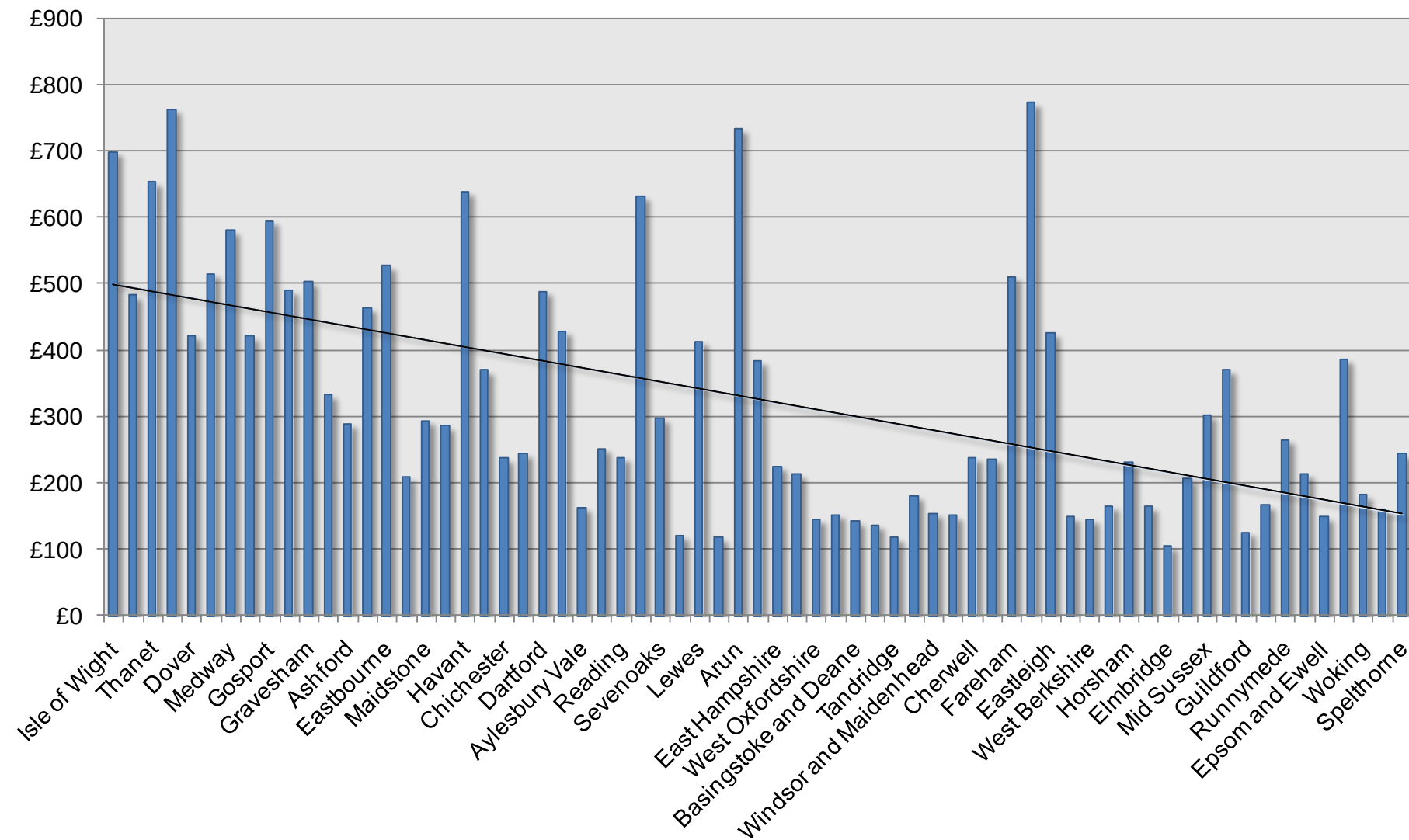
Although stakeholders recognised the importance of Warm Front, some also highlighted several issues with the programme:

- It currently takes too long to install measures (up to six months) and therefore the supply chain needs to be improved and the programme needs greater support
- There is variability between the costs of contractors across the region
- Fuel poverty is increasing but the budget for Warm Front has been cut
- Sub-regional partners and local authorities have experienced difficulties in accessing data on the deployment of measures
- The level of funding available per household needs to be raised

Although addressing these issues is outside the scope of this Strategy, the last point could be addressed by combining CERT and Warm Front to ensure the delivery of heating measures from Warm Front and standard insulation measures from CERT Priority Group (see discussion in section 5.3).

⁵⁵ CSE Fuel Poverty Indicator; 2003 estimate of fuel poverty incidence

⁵⁶ compact fluorescent lamps

Figure 5.5: Warm Front expenditure per fuel poor household (03/07) by local authority (left to right: highest to lowest incidence of FP)

The stakeholder engagement process identified a desire for funded sub-regional affordable warmth coordination, with a number of stakeholders reporting improved communication with Eaga and the energy suppliers when the EST's Local Energy Support Programme facilitated county level affordable warmth partnerships. The EST does not have a key performance indicator relating to fuel poverty and the primary focus of the ESTACs will therefore be the delivery of carbon reduction targets. In the absence of direct funding from Defra or the region, it is unclear where funding and support for sub-regional level affordable warmth programmes would come from. GOSE should examine the role of regional support for sub-regional affordable warmth partnerships. However, it is important that this links to the ESTAC's own work to improve sub-regional coordination of sustainable energy activity.

In terms of the future delivery of Warm Front and the measures that will be offered to low-income households, there are not likely to be wholesale changes, particularly given that the overall budget has been reduced. Eaga are likely to begin renewables installations through arrangements they make separately with utilities using flexible funding deals. Although this will not technically be part of Warm Front, there is an opportunity for proactive local authorities to stimulate installations in their area.

5.3.3 Carbon Emissions Reduction Target (CERT)

CERT came into effect on the 1st April 2008 and will run until 2011. CERT is an obligation on energy suppliers to achieve targets for promoting reductions in CO₂ emissions in the household sector with a doubling of the level of activity of its predecessor EEC. It is estimated that CERT will deliver overall lifetime CO₂ savings of 154 MtCO₂, equivalent to annual net savings of 4.2MtCO₂ by 2010 and equivalent to the emissions from 700,000 homes each year.

The majority of stakeholders identified CERT as the most important programme to deliver on targets for climate change and as a key mechanism for the deployment of energy efficiency and renewable energy measures in the South East. Several respondents also thought that the public would be most responsive to the CERT programme and to home insulation in general because of its cost-effectiveness.

Stakeholders saw the formation of strong working relationships and partnerships between energy suppliers, CERT contractors, regional government and local authorities as crucial in order to stimulate the mass take-up of measures through the programme. A key limiting factor identified, which could impact on the ability for the South East and the UK to achieve their fuel poverty and climate change targets, is the lack of qualified installers. There is not a clear channel of recruitment for the industry. This issue needs to be addressed by investment in training, vocational support and recruitment.

It was not possible to obtain comprehensive data on the current rates of regional activity or projected rates based on CERT targets. The EST HEED database (see 5.1.2) should become a central repository for CERT data relating to measures installed. Once this data has become available the region will be able to assess historical activity compared to other regions and within the region itself.

Under the CERT obligation, suppliers must direct at least 40% of carbon savings to a Priority Group of low-income and elderly consumers. The Priority Group has been extended to include the over 70s, which has helped include a large number of fuel poor households, who were not previously eligible for support. Several stakeholders saw the inclusion of over 70s in the CERT Priority Group as a positive step. However, a CERT contractor noted that this will have the effect of shifting CERT away from traditional Priority Group households on benefits

to the able-to-pay sector, which could have an impact on fuel poverty. One stakeholder commented that CERT needs to be promoted to the able-to-pay sector.

Energy suppliers are allowed to spend up to 5% of their Priority Group obligation on what is called 'flexible measures'. This can include behavioural change initiatives (e.g. smart metering or better feedback on consumption on bills), or the use of non-traditional insulation measures, or the use of renewable micro-generation. This flexibility funding provides an opportunity to stimulate the market for micro-generation in the South East. It is likely that suppliers will spend their flexible funding through pilot schemes delivered by organisations like Eaga, energy agencies and other installers as a way of testing what works best and how they can get the highest CO₂ savings per pound invested. These pilots are likely to be geographically limited but presumably the results of this approach will feed into the Supplier Obligation, CERT's successor post-2011.

One stakeholder noted that some suppliers are committed to providing insulation measures through CERT but are less concerned with renewable energy measures. It was therefore seen as important to find ways of funding measures for hard to treat properties. The CERT contractor interviewed noted that cavity wall insulation and loft insulation were their main CERT measures, but they are now also tackling solid walls using external wall insulation and installing some micro-wind turbines, solar hot water systems, solar photovoltaic panels, and air source heat pumps. The supplier interviewed stated that they are going to look at installing micro-generation and low carbon technologies, but they are still at the early stages.

Proposed actions for section 5.3

- AP7 Improve sub-regional coordination of sustainable energy activity
- AP8 Explore opportunities to secure additional funding for a more ambitious and holistic programme of activity that also tackles the wider carbon footprint targets in the Regional Economic Strategy
- AP9 Ensure the region hosts a number of CERT Priority Group pilots for hard to treat measures and low and zero carbon technologies
- AP10 Improve the integration of CERT and Warm Front delivery across the South East region
- AP11 Ensure that more consistent levels of Warm Front take-up are achieved across the region
- AP12 Examine new technological options for thermal imaging

5.4 Existing regional schemes and delivery projects

There are currently several regional schemes and delivery projects already in place. These include:

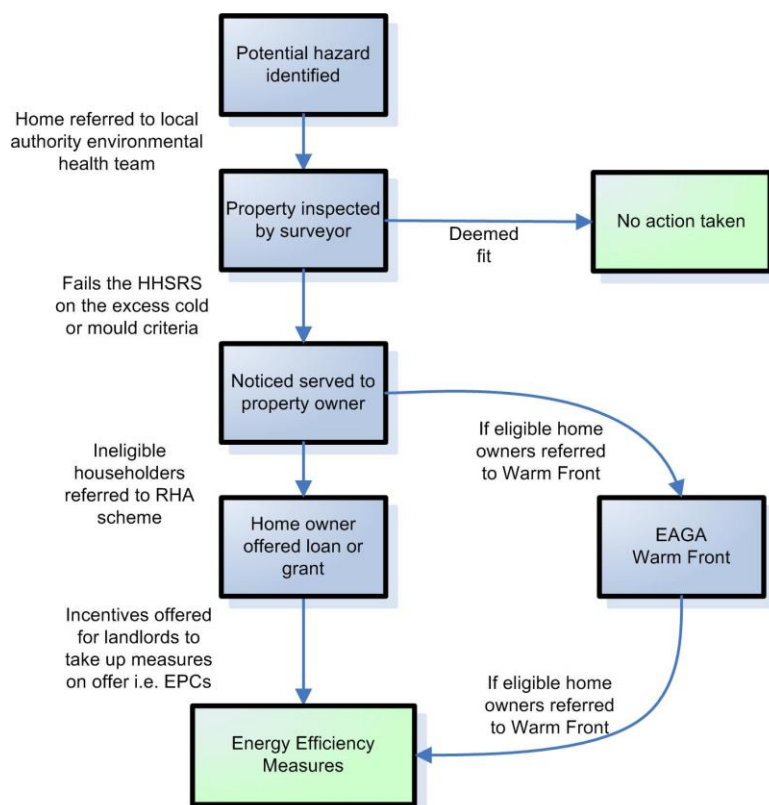
- Regional Housing Allocation (9 consortia projects)
- Five Community Energy Efficiency Fund (CEEF) projects
- Innovative local authority activity, for example energy services companies (ESCOs), GIS thermal imaging etc.

The RHA and CEEF projects are discussed in further detail below.

5.4.1 Regional Housing Allocation (RHA) - Supporting residential measures

The recent round of Regional Housing Board funding through the RHA has led to the creation of nine consortia offering a range of financial packages for the least efficient private sector vulnerable and low-income households. The financial packages on offer are predominantly a combination of grant or loan assistance to help achieve Decent Homes Standard and HHSRS targets, with some specific enhanced grants or top-ups for Warm Front.

Figure 5.6: Engagement process for RHA schemes



The success of RHA schemes offering innovative financing packages to improve private sector housing will depend upon their ability to create structures that work, and more importantly to recruit households to them. One benefit of local authorities offering 0% interest loans to householders is that they are not required to create new organisational structures to

do this as long as the loan is secured against the property and repaid at the point of sale. In addition, the loan must be registered with the land registry.

The stakeholder engagement process sought views from the lead partners for all of the RHA projects. Lead partners had often had previous experience of deploying the HHSRS and supporting loan structures that accompany the measures on offer. It was felt that there was a range of knowledge amongst partners and a workshop for RHA projects may be a good method of sharing progress and issues identified. Table 5.4 summarises each of the consortia's main area of activity and focus.

Table 5.4: Summary of RHA activity

Consortium	LAs	Type of activity and focus
BEST	6	Grant focussed scheme to help LAs achieve their Public Service Agreement 7 DHS targets
East Kent Private Sector Housing Partnership	5	Dual loan and grant programme for vulnerable / fuel poor owner occupiers. Specific support for HTT / renewables measures and the ineligible fuel poor (Landlords, private-rented sector (PRS) also targeted)
East Surrey Private Sector Renewal Partnership	4	Predominantly grant focussed programme with expansion of existing loan services. Designed to provide heating to homes identified as a category 1 hazard through HHSRS. Some renewables provision to 7 homes
North & West Kent Private Sector Renewal Partnership	8	Ensure loan based equity release products (build on <i>Houseproud</i>) are developed to assist home owners and landlords to improve their homes – expand offering to alleviate fuel poverty in PRS and rural communities
Partnership for Urban South Hampshire (PUSH) (sub-group excluding members of SHLP, see below)	7	Packages of loans to make the homes of vulnerable people decent and accessible – including grants to complement the Warm Front, and landlord empty property loans
PUSH - Southern Home Loans Partnership Core group	4	Assistance packages and loans to residents and enabling vulnerable people achieve a decent home – loans focussed to complement Warm Front (landlord loans for PRS)
South East Region Local Authority Lending Partnership	17	Equity release scheme offering low interest loans to supplement existing grant funding – aims to increase number of decent homes
Surrey and Hants Improvement Partnership (SHIP)	8	A recyclable equity based loan package to support home improvements in the private sector with an enhanced grants programme to tackle fuel poverty for vulnerable owners and tenants of hard-to-heat homes (in partnership with other agencies) – Empty homes initiative for the PRS
West Sussex Partnership	6	Enhanced Warm Front activity to help identify and prioritise non decent homes with top up funds for grant excesses

Below is a summary of the different approaches taken to financing the measures required to pass the HHSRS.

PUSH – No-interest loans linked to the HHSRS

The PUSH (excluding the Southern Homes Loans Partnership group) and East Kent Private Sector Housing Partnership consortia work with local environmental health teams to identify households living in Category I homes under the HHSRS. Low-income households are referred for financial assistance if the household has failed on excess cold (SAP 35 or below), mould and damp, fire and / or fall criteria. In the case of excess cold, if these households are ineligible for existing grant funding through Warm Front or EEC then they are able to access 0% interest loans for the measures required to improve their property. Both schemes offer loan assistance and warm front top-ups for standard insulation measures and condensing boilers. The household can repay the loan when the property is sold, or in the case of East Kent Private Sector Housing Partnership they can choose to make monthly repayments.

The two schemes also offer loan assistance for non-traditional measures such as solar water heating and solid wall insulation. East Kent's older rural and coastal housing means there are high numbers of solid walled properties. This has led them to also include loans for solid wall insulation with a loan maximum of £8,000. The PUSH scheme offers qualifying households solar water heating as this measure provides the greatest assistance to fuel poor households in a predominantly urban area.

North & West Kent Private Sector Renewal Partnership - equity release packages

Equity release schemes need to provide consumers with confidence in a time of financial uncertainty. North & West Kent Private Sector Renewal Partnership plans to use the Home Improvement Trust's *Houseproud* package. This package facilitates equity release loans using regulated lenders with a 'no repossession' clause secured on the equity in a property. The loan can be capital and interest repayment, interest only or interest roll-up (where interest is compounded and no money is paid until the sale of the property). All loans are subject to repayment when the property is no longer the principal home of the applicant(s), unless beneficiaries wish to retain ownership. Whilst the *Houseproud* package offers a degree of consumer protection, interest only mortgages or loans may be harder to secure in a time of rising interest rates and falling house prices.

Southern Home Loans Partnership (SHLP)

This partnership is comprised of South Coast Moneyline and five local authorities in the South Hampshire area. The scheme provides low interest loans to help home owners finance essential work to their properties. The scheme endeavours to help household's improve their property without having to compromise their standard of living. South Coast Moneyline aims to:

- Help those who are finding it difficult to access financial assistance elsewhere
- Help people that are on low incomes or are in receipt of means-tested benefit
- Offer lower rate loans that are individually tailored to ensure that repayments are affordable

Engaging Landlords – Improving the Private-rented Sector (PRS) stock

The PRS has a large proportion of thermally inefficient housing stock both nationally and regionally with 19.2% and 18.3% below SAP 35 respectively. Households in the private rented sector that qualify for assistance are offered support in over half of the regional

housing allocation schemes. The take-up of measures is dependent upon the landlord agreeing to their installation which has traditionally been relatively low. Rather than discussing the package of measures on offer for each scheme, below is a description of the incentives offered to recruit landlords.

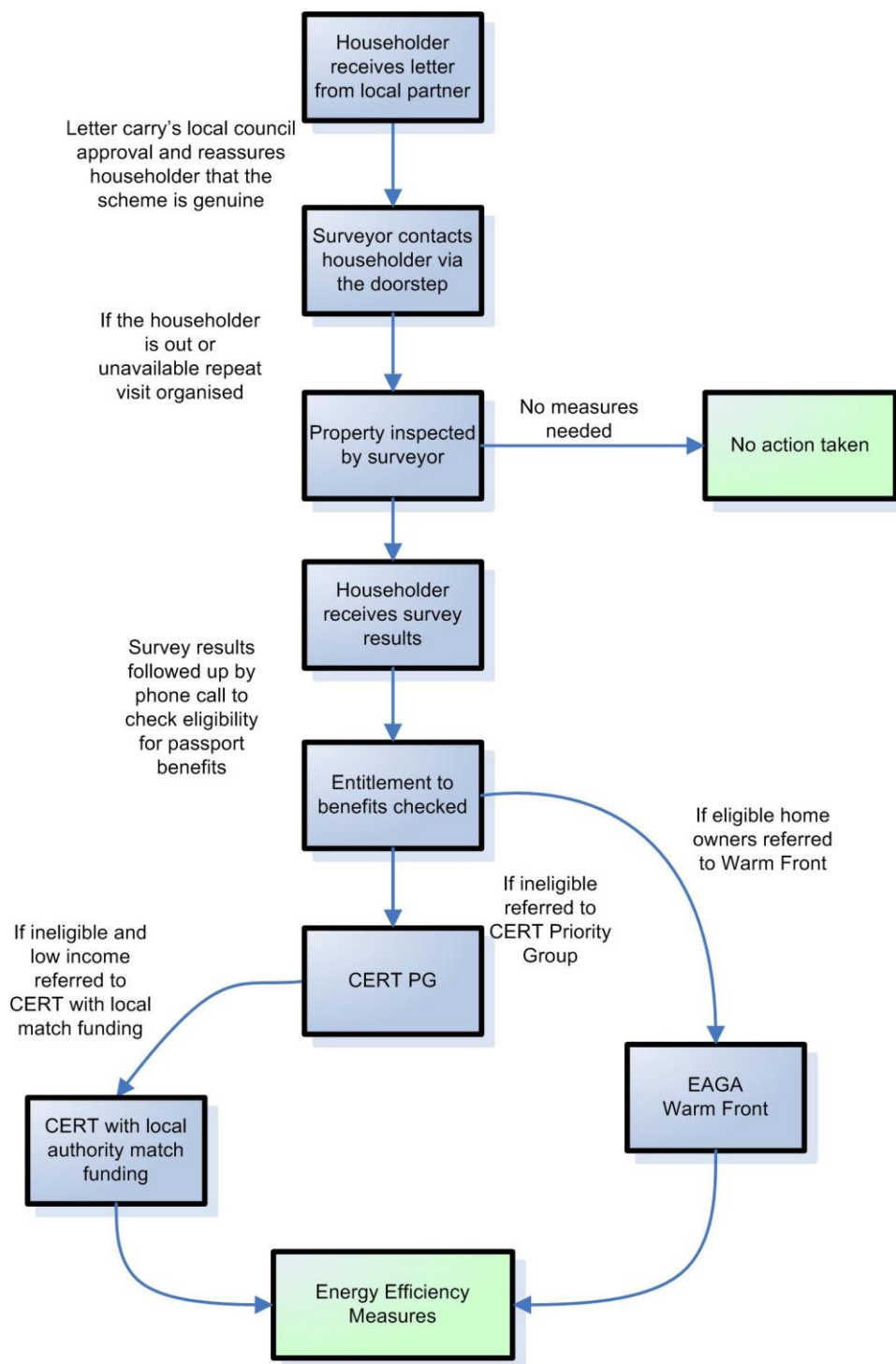
The schemes offer landlords the opportunity to gain accreditation as part of the provision of measures. Landlord accreditation schemes help private sector housing teams ensure a higher standard of rented accommodation is offered locally and encourage landlords to take part in the schemes not only to improve their housing stock but also their reputation. Local authorities have also been working with landlords to identify further incentives that would encourage landlords to undergo the accreditation process and receive the energy efficiency assistance on offer such as grants or loans. The most engaging package on offer would include free Energy Performance Certificates, gas safety certificates and other health and safety testing.

5.4.2 Community Energy Efficiency Fund (CEEF) Projects

CEEF was launched by the Government to provide financial support to projects to improve the effectiveness and coordination of Warm Front and Energy Efficiency Commitment delivery through an area-based approach. Forty nine projects in England were supported by the CEEF, which aimed to reach 300,000 of the most vulnerable households. Defra's own reporting predicts successful projects reaching 600,000 households across England over the next three years.

Projects under CEEF could be delivery projects (e.g. an injection of cash to provide a step-change in delivery of existing projects) or development projects (e.g. the establishment of a pilot to test an approach where area-based initiatives are not currently under way). Projects used area-based approaches to identify households and provide the right coordinated set of advice and measures to them, typically using doorstep targeting.

The funding was available for six months only to support the set-up costs for new area-based approaches. The aim was to develop partnerships and commercial relationships that would ensure that the ongoing running and programme costs could be met through commercial arrangements with bodies who deliver programmes such as CERT and Warm Front. For development projects this would mean a small pilot and a period of business planning with one or more utility partners to ensure ongoing funding for both the administrative and management functions of the scheme as well as the funding towards measures in residents' homes. CEEF pilot funding ceased at the end of March 2008.

Figure 5.7: Typical CEEF scheme diagram

Bids to CEEF were required to demonstrate as a minimum that they had already established buy-in from local authority Chief Executives in the proposed project area, along with commitment from other housing providers and local partners. Four regional projects and two other innovative projects in London and the South West were interviewed as part of the stakeholder survey.

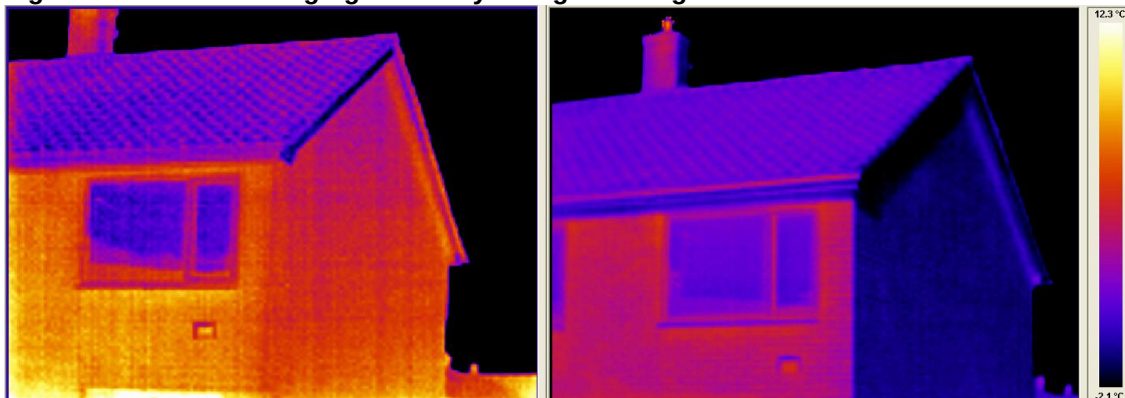
The level of CEEF funding received by the South East projects ranged from £44,000 to £151,000 which typically represents 4% to 10% of the total budget over the next three years.

For example, the funding secured by Brighton and Hove represents 4% of the total budget of £3.9 million. Whilst many stakeholders felt it was too early to judge their projects relative success, the majority had achieved their targets for the pilot period and they were all planning to role the initiative out in some format.

The continuation of additional services such as audits and benefit entitlement checks were key issue identified by all of the CEEF winners within and outside of the region. The CEEF projects rely on referral fees to energy supplier CERT schemes to help finance their overall delivery. The funding provided by Defra had enabled projects to provide enhanced and innovative services; however, the referral fees generated by the ongoing schemes are unlikely to provide sufficient funds to support these.

The BioRegional CEEF project provided 200 households with sustainability audits covering waste, food, energy and water. The free audits are part of a wider 'one planet living' campaign and proved popular with households. The survey took half an hour to complete. Participants were then provided with a tailored report suggesting energy measures that they could install and a directory of where to source more sustainable food. The sustainability audits may be of interest regionally as RES includes targets for sustainable prosperity.

Figure 5.8: Thermal imaging⁵⁷ used by Slough Borough Council



Slough Borough Council employed an innovative technique to engage households when making door-to-door visits. Households were shown the thermal imaging picture above to visibly demonstrate the loss of heat from an un-insulated home. Slough has recently conducted a thermal imaging fly-by of the district and they are using this to engage households by showing them a thermal imaging picture of their house from above (see HEED in section 6.1.2 for further discussion). Slough's *Energycare* insulation scheme currently signs up over 100 households per week for at least one measure, with a total of 2,444 cavities and 1,503 lofts installed since the end of July 2007.

The CEEF winners all expressed a strong interest in offering renewables to low-income households through the CERT flexibility fund. However, the uplift for these technologies does not seem sufficient to enable their inclusion and the energy suppliers continue to prioritise traditional insulation measures. In some cases local authorities are offering renewables and solid wall insulation; however, these are not funded by CERT or Warm Front. In the case of renewables, Brighton and Hove currently provides grants of £1,000 for able to pay households interested in solar water heating. It is therefore important that the region works with energy suppliers to ensure that local authorities delivering against NI 187 targets for fuel poverty gain maximum benefit from the CERT flexibility funding for the Priority Group.

⁵⁷ Images captured courtesy of InfraRed Integrated Systems Ltd.

Proposed actions for section 5.4

- AP13 Support the delivery of RHA schemes across all consortia partners
- AP14 Ensure that data sharing opportunities are maximised to avoid duplication and improve targeting
- AP15 Ensure the health sector are actively engaged at the regional level
- AP16 Ensure local health agencies and workers are engaged in the referral process for local delivery schemes

6 Deployment opportunities

6.1 Advice delivery

6.1.1 South East, Energy Saving Trust Advice Centres (ESTACs)

The EST has recently appointed Creative Environmental Networks (CEN) and United Sustainable Energy Agency (USEA) to deliver energy advice services within the South East. The two agencies will each manage a sub-regional ESTAC as part of the EST's overall strategy to develop a new network of Advice Centres covering the UK. The new approach is designed to:

- Achieve a step-change in scale and capacity
- Provide a greater level of consistency and quality of service delivery
- Provide greater regional coordination and joined-up delivery
- Meet clearer targets and a broader remit for cost effective carbon savings

The South East ESTACs are an exciting opportunity for the region that should provide a range of high quality, region-wide services to help individuals and organisations take steps towards reducing their CO₂ emissions. Taking the place of the existing Energy Efficiency Advice Centre (EEAC) network, it is likely that the new South East ESTACs will provide:

- A range of advice services for households (covering energy efficiency, renewable energy, transport, water and waste) via a range of routes (telephone, outreach events, visits)
- Local authority tailored one-to-one support
- Support for government, businesses and communities
- Regionally coordinated but locally specific promotional and marketing activity (e.g. regional media campaigns, and activity in support of local promotions)

Table 6.1: Combined lot 1 and 2 targets for the South East ESTACs to 31st March 2009

Annual targets	Customer led advice	Advice mailings	Targeted carbon savings: proactive targeting / in-depth support	Total
Customers	33,750	59,100	n/a	n/a
tC	55,050	96,350	76,450	227,850

Table 6.1 shows the combined lot 1 and lot 2 targets for the two South East ESTACs. The centres will be expected to achieve a total lifetime carbon reduction of 227,850 tonnes by 31st March 2009, which equates to 835,450 or 0.84 MtCO₂. The ESTAC target approximately represents a 0.4% annual reduction in emissions on the current regional baseline of 20.4 MtCO₂.

The new ESTACs will employ more sophisticated targeting and marketing techniques to ensure a greater take up of advice services and, ultimately, sustainable energy measures. The managing agents will be expected to produce detailed plans for their data mining and targeting techniques. It is likely that these plans will draw upon their own data, local authority stock data, the EST Home Energy Efficiency Database (HEED) and the EST Market Segmentation tool. It is likely that the short to medium-term focus of the ESTACs will be on the proactive promotion of 'standard' technologies to households across the region, including in particular:

- Cavity wall insulation
- Loft insulation
- Low energy lighting
- A+ and A++ rated appliances (given their potential for savings over 'standard' A-rated equipment and current lack of awareness due to the label itself only displaying 'A'⁵⁸)

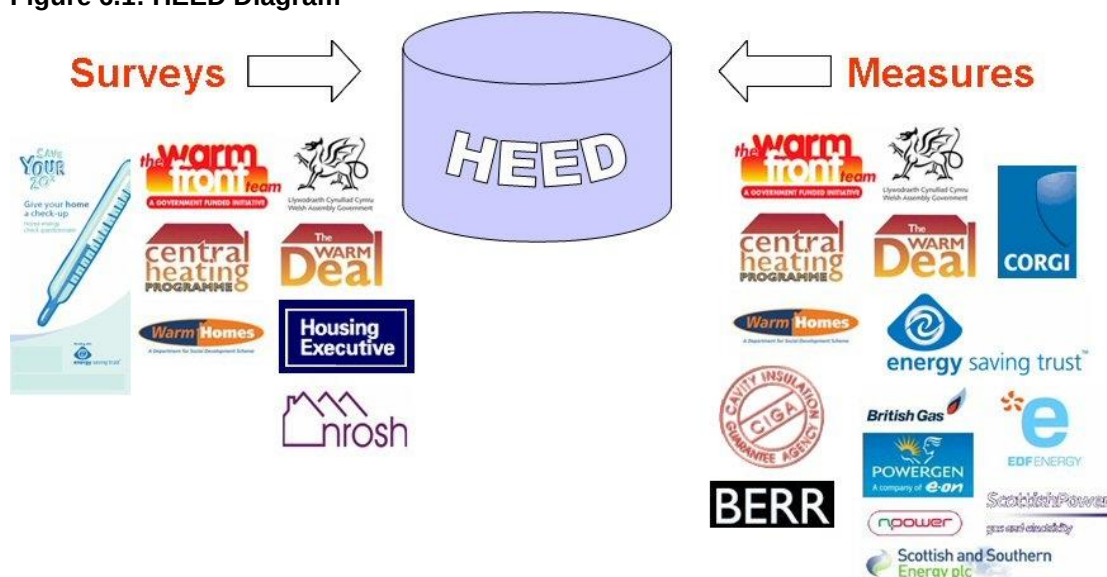
It is likely that there will be some scope in the medium to longer term to promote LZC technologies to certain household groups such as rural, high disposable income groups, and hard to treat properties. The delivery of this Strategy will require stimulation of the market for LZC technologies and mobilising these households, where the economics are most favourable in terms of current fuel expenditure and high potential savings. Focusing on those able to pay for LZC technologies should be a priority.

The stakeholder consultation explored the potential role of the South East ESTACs in the delivery of this Strategy. Stakeholders felt the Strategy should be central to their overall objectives. As discussed previously, the EST prioritises CO₂ emissions over fuel poverty, and as such the ESTACs would only focus on the carbon reduction elements of this Strategy (see 5.1.3 for advice provision to the fuel poor).

6.1.2 Energy Saving Trust, Home Energy Efficiency Database (HEED)

The EST has developed HEED to help profile the current energy efficiency of the housing stock and help track the uptake of sustainable energy measures throughout the UK. HEED currently collects data on energy efficiency via Home Energy Checks submitted to Energy Efficiency Advice Centres (EEACs). The database also acts as a central repository for historical data on Warm Front and EEC installations.

Figure 6.1: HEED Diagram



The database currently allows users to produce reports on property type, tenure, loft insulation, cavity insulation opportunity and a number of other household efficiency criteria.

⁵⁸ SE² 2007

These queries enable users to produce reports at national, regional, local authority and ward level. Whilst this represents a significant step forward in both the collection and availability of data, this does not currently allow users to identify un-insulated houses or streets of houses with high potential (see section 5.3.1 for issues associated with targeting).

The EST is continually improving HEED and plans to:

- Develop functionality to enable users to query the dataset at Output Area⁵⁹ level
- Capture data on EEC-2 installations from energy suppliers and make this available at Output Area level
- Explore the possibility of incorporating thermal image surveys within HEED and overlaying this on existing data

The inclusion of thermal image surveys and combination with HEED data is particularly relevant to the South East, as several local authorities have recently commissioned thermal image surveys and could feed into this process. Thermal image surveys require a relatively high capital outlay and represent a snapshot in time; this means that a survey carried out in one evening may therefore not identify an un-insulated home if the occupants were away. However, they do provide local authorities with a tangible targeting map for the most thermally inefficient properties.

The targeting of F and G-rated homes (as discussed previously in section 5.3) as a priority for action between now and 2016. Indeed, at a recent event Hilary Benn MP, Secretary of State for Environment, Food & Rural Affairs, stated that the Government planned to contact every F and G household in the country in an attempt to reduce CO₂ emissions⁶⁰.

SEEDA, WWF UK, FoE and Oxford University Environmental Change Institute (ECI) have all shown an interest in the use of Energy Performance Certificates as a method of targeting thermally inefficient homes. FoE and WWF UK have both proposed that minimum standards for efficiency be used at point of sale to help transform the efficiency of the housing stock (see section 7.3).

The HEED database could help target Fs and Gs if it were to become a central repository for EPCs, which would necessitate overcoming data protection issues and enabling the EST to directly mail these households. The Government is currently consulting on whether HEED, which is maintained by the EST, should be the repository for EPC data.

Another focus of the current consultation is access to the EPC data. Local authorities would also be keen to access EPC data themselves to enable them to better target measures in their area. The main barrier to the provision of EPC data at property level is data protection legislation. There may be a case for making this data publicly available under the Environmental Information Regulations⁶¹ (EIR); however, it may be simpler for local authorities to work with the EST to ensure that an EPC-related mail-out includes information on local schemes and grants. The region and the ESTACs should therefore host a biannual data working group to facilitate collaborative targeting and engagement of households in order to ensure data is shared wherever possible and appropriate.

⁵⁹ Output Areas were created by ONS for the collection and reporting on the Census and typically contain 125 households.

⁶⁰ energywatch and EST 2008

⁶¹ Information Commissioner's Office n.d.

6.1.3 Advice provision to the fuel poor

The rollout of the new ESTACs should lead to greater consistency of advice provision across the different advice centres with respect to meeting the advice needs of higher income groups. Defra's carbon reduction performance indicator leads the EST to focus on advice to higher income households since this is the sector with the greatest potential for carbon reduction. Low-income households are, in general, already 'low(er) carbon' and consequently there is less imperative to provide advice to this group. Whilst the core advice service is available to all income groups, the primary focus of marketing and targeting techniques will be high-income households.

A number of the current EEACs in the South East have a long and proven track record of providing energy efficiency advice to low-income households. The advice needs of low-income households are often different to higher income households and this has implications for both the nature of advice provided and the format in which it is provided. Important lessons include:

- Advice to low-income households stresses the importance of staying warm. In some cases this may mean increasing energy use to maintain comfort levels. This runs counter to the generic advice to turn thermostats down by 1 degree.
- Advice will focus on no cost and low cost measures, plus referrals to grant aid such as Warm Front for costlier measures.
- Advice is often best provided face to face and in many cases through home visits.
- Community outreach, work with 'trusted intermediaries' and community development activities represent important methods for reaching low-income households. Such households are often distrustful of 'official' and fuel supplier communications.
- Written and verbal advice needs to be given in plain English and made available in non-English languages.
- Low-income households will often require advice on a wide range of topics such as debt, financial literacy, benefits and independent living, as well as energy efficiency. Although households may only seek one form of advice, sensitive probing will reveal multi-faceted advice is required. However, the more often a household has to make a separate application for assistance, the more likely it is the household will 'drop out'.
- Meeting the need for multi-faceted advice requires, for example, common referral systems, reciprocal awareness training between different specialist advice providers and common referral application forms.
- Low-income households will often require support throughout the advice process, for example with filling in grant application forms, chasing up grant providers and follow-up advice once measures have been installed.
- Advice often needs to be repeated at regular intervals, for example on making optimal use of heating controls.

The provision of advice to low-income households in the South East has required EEACs and energy agencies to seek supplementary funds from a wide range of bodies, often locally based, to provide an effective advice service to this sector. Provision therefore varies considerably between different sub-regional areas and depends on individual organisations to recognise the needs of low-income households.

However, there is an opportunity to seek funding to provide advice and support to fuel poor households across the South East. There are three broad options that could be pursued:

1. Defra provide further funding to ESTACs
2. The EST re-orientate its provision to place more emphasis on low-income households

3. Local authorities and other agencies fund specific advice provision to low-income groups

The most attractive option would be the provision of further funds to the ESTACs via Defra, energy suppliers and/or local partners. The infrastructure to provide advice to fuel poor households already exists in the form of the ESTAC network; it would be uneconomic to create another set of independent advice centres to fulfil this role. Diverting funds from ESTACs is likely to undermine its ambitious CO₂ emissions reduction targets which are a fundamental component of this Strategy's deployment. A regional partnership including SEEDA, GOSE and the EST should therefore explore the possibility of securing regional funds for advice provision to the fuel poor.

6.1.4 Regionally supported community sustainable energy initiatives

There are no official statistics available on the carbon impact of the community and charitable sector. However, the influence of this sector over others is more important than its direct emissions. It is able to reach into the community at a more grassroots level than a local authority, has opportunities to spread the word about energy efficiency and to identify where people are living in fuel poverty. Furthermore, community-led initiatives often help to meet other objectives such as community cohesion and health improvement.

Local communities within the UK and the South East are increasingly seeking to gain a better understanding of their own emissions and also what climate change means for them. There are a number of successful community initiatives in the South East mobilising both able to pay and fuel poor households to take action on climate change. Many of the initiatives are working with regional agencies, regional partnerships and sub-regional local authorities. For example, Kent County Council are funding CEN to manage six community-led initiatives in Kent, involving both communities of geography and of interest.

The Greening Campaign is the most successful regional example of a community-led initiative that has subsequently rolled their approach out to other areas. The campaign was originally launched in Petersfield, Hampshire and now works with other communities to help them develop their response to climate change. The campaign provides materials and expert technical support; however, the overall aims and priorities are set by the local community. The campaign has received funding from SEEDA, county councils and local parishes; wherever possible the Greening Campaign helps local groups access funds that may be available to them.

Climate South East is also working with a number of organisations and individuals actively involved in community initiatives. Within the Climate South East partnership there are 20 to 25 organisations that are actively involved in their 'Communities Group' (primarily councils, non-governmental organisations, rather than the communities themselves). The South East's community projects provide a good engagement opportunity for the delivery of this Strategy. Climate South East is looking at how these models could support local authorities delivery on Local Area Agreements. The two South East ESTACs and regional agencies could also play an active role in encouraging county and unitary councils to support local community-led initiatives with clear signposting to the EST Community Action for Energy programme's services for those that are not funded.

The Co-operative Bank and Defra, via the Environmental Action Fund, have funded Wiltshire Wildlife Trust to conduct a survey of community groups in the South West region, which includes Hampshire. The survey demonstrated a desire for better communication and networking amongst communities regionally. Climate South East is currently exploring the potential to fund a similar survey in the South East.

6.1.5 Sustainable Energy Education

The Energy Efficiency Partnership for Homes' (EEPfH) Education and Community Group commissioned a study which examined how to engage young people with sustainable energy through effective education. The paper highlights the role of young people as significant consumers of energy in their own right, and the opportunity they provide to stimulate behavioural change at the household level.

Teenagers today consume about 30% more energy than the previous generation⁶². And, despite awareness of climate change, 85% of 16-year-olds never unplug their mobile phone chargers and 86% of 10-year-olds consistently leave their TVs on standby⁶³. These groups can be motivated to change; when pupils are engaged with curriculum-linked energy education programmes, 76% of their families changed behaviour or invested in energy saving improvements⁶⁴. Children can become effective 'energy advisers' for their own families and alter their own behaviour.

Education on energy issues and their links with climate change feature in a range of different policy and programme initiatives. For example, policy on Education for Sustainable Development (ESD) is clear that sustainable energy is a key component and has a place in the new 'Curriculum for a Changing Society'. Similarly the sustainable schools agenda⁶⁵ highlights energy performance, as does the school rebuilding programme⁶⁶. This range of initiatives can give the impression that sustainable energy is 'covered' and will therefore inevitably and systematically feature in education. Experience suggests that this is not the case.

The study identified a significant gap between current rhetoric on energy education and action in schools. The majority of schools are not currently engaging effectively with the issues of sustainable energy – even when they are engaging with the wider issues of ESD. Energy and water is one strand of eight within the ESD framework, all of whom then compete for prominence in an already stretched curriculum. As a result, educationalists stay with what they find easy to tackle, leaving key areas in the fight against climate change, like energy efficiency, to compete for attention in the classroom.

Teachernet contains a dedicated page⁶⁷ highlighting South East regional support for sustainable schools work, which links to several county council websites. Hampshire County Council's page provides links to several useful energy management resources and guides, whilst Buckinghamshire County Council contains links to a useful Key Stage 2 and 3 Science Transition project on penguins. The project covers the role of insulation in keeping penguins warm but does not focus on climate change and its effect on their habitat. The resource itself is designed to link to the keeping warm aspect of the science curriculum rather than a wider sustainability or citizenship agenda.

Eco-Schools has a dedicated website with almost 40% of English schools now signed up to the programme. The website contains a lot of useful information for schools but there are

⁶² EC 2006

⁶³ E.ON 2007

⁶⁴ CSE 2004

⁶⁵ teachernet 2006

⁶⁶ BRE's Environmental Assessment Method for Schools (BREEAM for Schools) is a mechanism for assessing and certifying the environmental performance of a school design.

⁶⁷ teachernet 2008

currently no dedicated resources that help schools and pupils establish and identify priorities. Where schools have been able to identify their key priorities, there are not any supporting lesson plans and resources that enable them to empower young people to become energy champions in their own homes. In addition to *Eco-School's* own website, local authorities will typically have their own eco-schools page with the contact details of the officer responsible for coordinating activity in their area (if they have one).

Energy education in schools provides the opportunity to influence and change the current energy-consuming behaviours of young people, their families and their school communities. Ensuring young people in the South East have more sustainable attitudes to energy use means that the energy users of tomorrow will be better equipped to live and work in a low carbon economy. In order to maximise the potential of young people in delivering long-term behavioural change, the region needs to ensure that:

- Eco-schools are able to access a free and impartial tool that enables pupils to discuss, explore and then prioritise areas for action;
- Teachers are able to access resources and lesson plans that encourage pupils to become energy ambassadors in their schools, communities and homes.

Proposed actions for section 6.1

- AP17 To make significant annual household carbon savings in the SE (estimated 400,000 tonnes carbon per annum)
- AP18 To provide a bespoke, free, impartial, accurate and locally relevant advice service on energy efficiency, renewable energy and low carbon transport (estimated 200,000 homes per annum)
- AP19 Target affluent and receptive 'off-gas' households with both insulation and renewables
- AP20 Ensure that targeting the G and Fs is carried out systematically across the region
- AP21 Examine the role of the HHSRS in targeting G and F properties in the privately rented sector
- AP22 Ensure that schemes target those households that need measures and that these measures match the opportunity
- AP23 Unlock the potential for community sustainable energy initiatives
- AP24 Cultivate more widespread locally led community sustainable energy initiatives
- AP25 Examine the possibility of providing a more comprehensive hand-holding advice service for households that does not require significant subsidy
- AP26 Ensure that schools in the South East are engaged with the Strategy and produce energy ambassadors of the future
- AP27 Help develop consumer confidence in the building sector

6.2 Regional growth areas

6.2.1 Defining areas for growth

The new Regional Economic Strategy (RES) for the South East identifies eight potential 'Diamonds for Growth' – cities and major towns which, with their broader *hinterlands*, are major centres of economic activity and can act as catalysts to stimulate prosperity. Together, the nine cities and towns at the heart of these areas account for around one third of the South East's population, and a similar proportion of its economic contribution or GVA. When taking into account their wider *hinterland* the 'Diamonds' collectively accounted for 61% of total regional GVA in 2004 and 55% of total regional employment.

The ability of the region to maintain its role of a key economic driver for the national economy depends on the Diamonds being a cultural destination of choice for business, visitors and investors. Working together, the nine core cities and towns have identified three common aims that they believe are essential to ensure the region's continued success:

- Sustainable prosperity
- Social justice
- Improved infrastructure

In addition to the 'Diamonds for Growth' the region also contains 'Growth Areas' and 'Growth Points'. The Growth Areas are defined by central Government's £164 million Growth Area's fund which aims to facilitate more rapid local development of housing by supporting key projects and developing enabling partnerships.

Table 6.2: Areas designated for growth in the South East

Growth Areas	Growth Points	Diamonds for Growth (Regional Economic Strategy)
Milton Keynes and Aylesbury Vale Thames Gateway Ashford	Basingstoke Didcot Maidstone Oxford Reading Reigate and Banstead South Hampshire Milton Keynes and Aylesbury Vale Ashford	Urban South Hampshire (inc. Portsmouth and Southampton) The Gatwick Diamond – centred on Crawley Brighton & Hove Thames Gateway Basingstoke and Deane Reading Oxford Milton Keynes

The 'Growth Points' initiative is designed to provide support to local communities who wish to pursue large-scale and sustainable growth, including new housing, through a partnership with Government. In 2005, the Government invited local authorities to submit strategic growth proposals which were sustainable, acceptable environmentally and realistic in terms of infrastructure to be assessed by Government and its agencies. There are 29 Growth Points across the East, South East, South West, East Midlands and West Midlands. If all of the proposed growth is realised Growth Points would contribute around 100,000 additional homes by 2016, an increase of around 32% on previous plans for housing supply in these areas.

The areas designated for growth represent an opportunity for retrofitting the existing stock as they should provide a focus for regional investment and coordination. The Strategy has identified 'Low Carbon Zones' and district-level CHP as the key priorities for these areas. In the case of district CHP, LPAs should explore the possibility of supplying existing homes with heat and power where a new development is planning to use CHP.

6.2.2 Low Carbon Zones – street by street approaches

Low Carbon Zones (LCZs) have been proposed⁶⁸ as an effective and engaging method of stimulating local authority action on residential CO₂ emissions. This area-based approach could be more engaging and politically acceptable than statutory targets for wider residential CO₂ emissions, which local authorities may not even be able to control or influence. For example, CSE's work for the London Borough of Islington and the Local Government Association's Climate Change Commission suggests that the quality of a local authority's commitment and action can only have limited⁶⁹ impact on the level of carbon reductions in their area.

LCZs would support SEEDA's own corporate priorities; the quote below is from SEEDA's Corporate Plan 2008 to 2011:

SEEDA will bring national, regional and local partners together to deliver large-scale energy and water efficiency retrofitting of existing buildings, and the take-up of mass market renewables in both new-build and existing buildings. The aim will be to saturate a local area, for example Urban South Hampshire, North Kent Thames Gateway, Ashford, or Milton Keynes, demonstrating that local retrofitting and renewables approaches can work to stimulate the supply chain. SEEDA will work with local authorities and the private sector to develop innovative funding solutions including a carbon off-setting scheme for the South East and a revolving fund for retrofitting.

CSE and FoE are advocating a statutory duty on local authorities to establish a LCZ in their area. The authors of this strategy believe that a LCZ would provide a stimulus for local political support and provide a focus for joined-up activity. The terms of reference for LCZs have not yet been defined but it is likely that they would follow a street-by-street approach to the implementation of measures within well-defined geographical areas.

This street-by-street approach has been tested previously as a method of alleviating fuel poverty in the Warm Zones and CEEF pilots (see section 5.4.2). Whilst the CEEF pilots' performance varied, they demonstrated the added value of local partnership-working and joined-up delivery of Warm Front, CERT and local authority-funded measures.

SEEDA have expressed an interest in exploring the possibility of creating a series of LCZs in the South East. These areas would naturally fit with the region's 'Diamonds for Growth'⁷⁰ approach to focused regional development.

The South East has five CEEF winners covering 20 local authorities. The experience and lessons learned in the delivery of these programmes has been fed into the LCZ development

⁶⁸ Boardman 2007

⁶⁹ perhaps 7.5% of the current UK Climate Change Programme

⁷⁰ When taking into account their wider hinterland the 'Diamonds' collectively accounted for 61% of total regional GVA in 2004 and 55% of total regional employment.

process. CSE has drawn up the following terms of reference for a possible zone (where possible the Diamond targets have been taken into consideration).

Low Carbon Zones should:

- Utilise a street-by-street approach to the delivery of sustainable energy measures
- Be of a meaningful size that posits a realistic local target; e.g. groups of electoral wards
- Be prioritised to identify areas that offer a combination of the high carbon savings and receptive able to pay consumers
- Work with other socially motivated partners to ensure that low-income households are offered free measures
- Feature community partnerships to help ensure local involvement, ownership and mobilisation are at their heart⁷¹
- And could be extended to cover CO₂ emissions from all sectors; legal precedents for this include Smokeless Zones and Air Quality Management Zones

The terms of reference above provide a relatively simple set of boundaries that have parallels to those employed by Warm Zones and many CEEF winners. The key differences will stem from the method of prioritising areas and the community partnerships formed.

CEEF projects are designed to help Defra deliver both the Government's fuel poverty and carbon reduction targets. The majority of CEEF schemes rely on the deployment of those measures already funded by existing schemes in areas with high levels of potential for new gas central heating, cavity wall and loft insulation.

LCZs should be designed to maximise carbon savings at minimum cost to the region or local authority. This may result in a local authority working with an affluent⁷² hard to treat⁷³ community which may offer far higher carbon savings than an area of cavity-walled properties. Local authority and sub-regional partners ought to be looking to deploy insulation measures subsidised by CERT in combination with effective advice and support. It is important that engaged able to pay households choose the heat and power technologies most appropriate to their needs. If the LCZ ensures that those vulnerable and low-income households are offered free hard to treat measures then it would also help to alleviate some of the most severe cases of fuel poverty.

The types of community partnerships needed in LCZs are likely to be radically different to those utilised previously in Warm Zones. Warm Zones and CEEF projects typically feature partnerships and/or separate community partnerships which bring together a range of stakeholders working with vulnerable and low-income households. LCZ will need to ensure that these groups are not excluded but they will also need to link into existing mobilised community groups to help normalise the behaviours and actions on offer. These might involve or be provided by the local community hub in that area, schools, the Women's Institute, FoE, and so on.

The Thames Valley area may provide an opportunity for a LCZ as there is considerable redevelopment currently taking place and further growth planned. There are two possible areas that may provide an opportunity for a regionally funded pilot, the Isle of Sheppey and

⁷¹ CSE and CDX 2007

⁷² Wilton 2008

⁷³ Hard to treat is defined here as properties that are off the gas network and / or have solid walls.

North Fleet. The Isle of Sheppey has potential overlap with one of CEN's community-led initiatives and their existing CEEF project. In addition to this existing activity the EST has announced a new future scheme to fund 'Green Neighbourhoods' to begin in 2009. The region would be well placed to access funds for LCZs in the South East if the community partnerships were to be prioritised and identified.

6.2.3 CHP for the existing housing stock

District heating (DH) and CHP are both technologies that can achieve cost-effective carbon savings. There are many large-scale industrial heat users that could benefit significantly from the implementation of CHP. The inclusion of 3MW+ heat users in the second phase of the EU emissions trading scheme should further the economic case for CHP by assigning a value to carbon in these instances.

The feasibility of installing CHP and district heating in the existing housing stock is often dependent on local circumstances and the organisation leading the development. There are a number of circumstances where CHP or district heating may be suitable to retrofit housing, including:

- housing only;
- housing with public sector buildings, such as hospitals and schools;
- housing with large business heat and power users; and
- housing with public sector buildings and businesses.

The most cost-effective schemes are often large-scale. The International Energy Agency (IEA) performed a comparison of distributed CHP/DH with large-scale CHP/DH. It concluded that a city-wide DH system supplied by a large combined cycle gas turbine (CCGT) power station would be most effective from a cost and carbon perspective. However, such a scheme would require significant investment and strong local political leadership.

London is the only region in the UK that boasts such strong leadership and is therefore currently best placed to deliver a large-scale or borough wide scheme. The London Energy Partnership commissioned Sustainable Energy Action (SEA) and Renewable Energy in the Urban Environment (RENUE) have developed a 'stretch' target for the reduction of CO₂ emissions from buildings in London to 2026. The target reduction chosen was 27% of 2000 emissions from buildings.

SEA/RENUE produced five scenarios showing how this target could be reached in London's buildings sector. The large CHP option had the highest net present value and carbon savings. In this scenario it is assumed that 2,400MW_e (electrical capacity) of large gas CHP would be installed by 2026. The report does not assess the feasibility of this scale of installed capacity, although it notes that current UK capacity is approximately 1,800MW_e of installed CHP.

In reality, large-scale schemes are difficult to implement in the existing housing stock as the upfront capital cost of retrofitting a heat distribution system are sometimes high and there are additional risks associated with the long-term security of customers below.

An additional significant inhibiting factor on most potential CHP developments is the aspect of project management across a large number of separate businesses and residences. Local authorities or public bodies are often the only organisations that own or operate enough heat-load to make a sizeable CHP development financially viable and practical from a management perspective, as is the case in Woking Borough Council with Thamesway.

The current regulatory system and financial incentives therefore mean that the involvement of a local authority or housing association would be essential to implementing this type of scheme – that is a not-for-profit organisation willing to take on the perceived risks of the development. Retrofitting CHP and district heating in the existing housing stock is likely to require leadership from an agency with a vested interest in the carbon or fuel cost savings achieved. If the agency is based locally and/or has an existing relationship with households, then securing a supply contract is likely to be more straightforward.

CHP for clusters of social housing

The Aberdeen Heat & Power Co⁷⁴ is an example of an arms-length management organisation (ALMO) specifically set up to facilitate the installation of CHP in four multi-storey blocks, totalling 19 storeys and 288 flats. The council-owned properties were of pre-cast concrete panel, cavity construction with electric storage heating. Residents were experiencing significant levels of fuel poverty and the council undertook a feasibility study to identify the most cost effective method of alleviating fuel poverty. The study considered various heating options for externally insulated and un-insulated flats, and heat options included; individual storage heaters; a central gas boiler; and a gas CHP plant.

The CHP plant delivered a heat cost of £3.65 per week to each flat which was only marginally higher than the cost for CHP and external cladding of £3.18. The additional £4.4 million cost of over-cladding was prohibitive considering the additional benefit so the CHP-only option was selected. The council's capital budget would not have been able to meet the £1.6 million capital cost of the project. An ALMO was therefore set up to coordinate loan and grant financing with the council making annual contributions of £215,000 until the loans will have been repaid. While the driver for the project was fuel poverty, the CHP scheme provided the highest carbon savings of the heat-only options and the highest net present value of all options.

Opportunities for district-level CHP

1. SEEDA should work the South East HECA Forum to identify proactive local authorities with medium and high-rise clustered accommodation suitable for district-level CHP; once identified the region should facilitate a meeting with the Aberdeen Heat Co to help explore the next steps for deployment
2. SEEDA to work with the areas designated for growth to ensure that new developments maximise the opportunity for district-level CHP supplying existing homes via section 106 agreements with developers (see section 6.2.3).

Proposed actions for section 6.2

AP28 Develop a series of low carbon zones across the region

AP29 Develop a series of district-level CHP schemes

AP30 Ensure opportunities for retrofitting district-level CHP are maximised (in association with major new developments including Strategic Development Areas)

⁷⁴ King 2007

6.3 New housing developments and opportunities for retrofitting the existing stock

6.3.1 Ensuring planning policies provide additionality

The region is keen to explore the possibility of maximising opportunities for the existing housing stock from new developments. The two main opportunities regionally are:

- The improvement of energy efficiency when an extension is built on a new property
- The creation of a fund for carbon abatement which developers pay into when they are unable to meet a local planning authority's (LPA) targets for energy efficiency or sustainability

The crucial issue associated with the second bullet point is the 'additionality' of the carbon fund. In other words, that the carbon fund supports measures that achieve at least the same reductions in CO₂ emissions as the loss on the proposed new development. There is a risk that the fund creates a distance between the proposed development and the actual carbon savings, and that this distance then obscures the savings achieved. The management of the fund and the delivery agent of the measures are therefore a critical path to achieving the savings.

There are precedents for the establishment of a carbon fund regionally. Milton Keynes LPA has introduced a Local Development Plan that includes a carbon tariff to be paid into a fund (see 5.3.3). In this case, USEA is managing the deployment of measures in the locality.

In order for a LPA to implement this policy they must be in the process of developing their Local Development Frameworks. The timeline for their production is dependent on the existing Local Development Plan and as such each LPA will undertake this exercise at different times.

6.3.2 Uttlesford District Council's Supplementary Planning Document on home extensions⁷⁵

Uttlesford District Council's Supplementary Planning Document sets out a requirement for cost effective energy efficiency measures to be implemented throughout the existing building as a condition of planning consent for a home extension. It is the first of its kind in the UK. The energy efficiency 'condition' also applies to properties undergoing loft and garage conversions and has been extended to include properties with new annexes being built that may be totally separate from the main house.

The following statement is included in the Uttlesford's Supplementary Planning Document, which was adopted in November 2005:

The council will require simple, cost effective energy efficiency measures to be carried out on the existing house if possible and practical. These measures could include upgrading loft insulation, insulating cavity walls, improving draught-proofing, improving heating controls, installation of reflective panels behind radiators, installation of low energy lighting or upgrading the boiler.

⁷⁵ For more information see EST 2007a.

The eight measures that can be specified under the policy were specifically chosen as they are highly likely to be cost effective under typical circumstances. 'Cost effective' is defined in the guidance as having a simple payback of seven years or less. The household is required to complete a home energy check prior to work commencing which is then returned to building control at the council. The household will then receive a home energy efficiency report, recommending measures that they can take.

Once building work has commenced on the home extension, the building surveyor will confirm in writing the exact programme of measures to be carried out, having completed a physical check of the property. Upon completion of the work to the house extension, the building surveyor will advise the planning section if the energy efficiency condition has been fulfilled or if energy measures are still to be installed at the property.

The energy efficiency condition applies to all applications for home extensions submitted after

1 April 2006. In terms of CO₂, it is estimated that the average household subject to the condition will save around 0.44 tCO₂ per year, resulting in total savings of around 159 tCO₂ per annum. SEEDA and the Regional Assembly should encourage LPAs to implement Supplementary Planning Documents that ensure cost effective carbon reduction technologies are implemented when extensions are built on existing homes.

6.3.3 Milton Keynes Local Development Plan – carbon tariff

In 2005, Milton Keynes Council adopted a new local plan⁷⁶ for the period to 2011. The plan sets out how the city will be developed in the future and includes details such as the amount and location of housing, employment, shopping and community facilities.

A new planning policy ('D4') within the local plan called for all new developments exceeding five domestic dwellings or those that incorporate over 1,000m² of floor space to include the following:

- Energy efficiency by siting, design, layout and buildings' orientation to maximise sunlight and daylight, avoidance of overshadowing and use of passive ventilation systems
- Grouped building forms in order to minimise external wall surface extent and exposure
- Landscaping or planting design that optimises screening and improves individual buildings' thermal performance
- Renewable energy technologies
- Sustainable urban drainage systems including rainwater and waste water collection and recycling
- Significant use of building materials that are sustainable or recycled
- Waste reduction and recycling measures
- Carbon neutrality or financial contributions to a carbon offset fund to enable CO₂ emissions to be offset elsewhere

Developments that do not meet the planning policy criteria pay money into a central carbon neutrality fund, which allows a very cost effective and simple alternative option for developers where carbon neutrality is difficult to achieve on-site. In April 2007, a Supplementary Planning Document was adopted by the council. This helps applicants to comply with the

⁷⁶ See EST 2007b.

council's planning policy and provides details on what information is required from developers at the planning stage, such as how to calculate energy demand, CO₂ emissions and the amount of renewables required. It has also been devised to be consistent with the Government's Code for Sustainable Homes in terms of the standards that need to be met and the methodology to be used.

Milton Keynes Council have now appointed a Carbon Management Officer whose role covers managing USEA's delivery of the fund. The council recently provided USEA with £220,000 and expect to raise £400,000 per year between now and 2010, equating to an average of £400-500 for every new home built. The South East Regional Spatial Strategy recommends annual development of 28,900 to 32,000 homes per annum which in principle represents a total funding opportunity of £13-14m.

6.3.4 Community Infrastructure Levy (CIL) – Ashford

In publishing the Planning Reform Bill in November 2007, the Government concluded that the best way to increase contributions towards infrastructure is the introduction of a CIL which would enable councils to apply a levy to all new developments (residential and commercial) in their area, subject to a low *de minimus* threshold. The CIL would supplement a negotiated settlement which may be received for site-specific matters including affordable housing. The Planning Gain Supplement (PGS) is not to be preceded with a CIL. It is expected that Ashford's CIL (subject to approval from CLG) will follow the principles of Milton Keynes's carbon tariff.

The CIL is to be based on a costed assessment of the infrastructure requirements arising specifically out of the proposals contemplated in the development plan for the area, taking account of land values and potential uplifts. Standard charges would be set, which may vary from area to area and according to the value of the developments proposed. Developers in Ashford building below Code for Sustainable Homes level 6 would be required to pay into a fund with the tariff falling as the level of the Code increases – meaning that constructing to Code level 3 rather than 6 will cost more than building to Code level 4.

The South East Centre for the Built Environment conducted a review of South East LPAs' emerging Local Development Frameworks to identify progress and problems in the development and implementation of sustainable construction policies. In order to ensure that the region maximises retrofit investment opportunities from all new developments, it is important to establish a timeline for the implementation of local planning authorities' Local Development Plans. The region can then ensure that any opportunities for carbon tariffs or infrastructure levies are maximised.

Proposed actions for section 6.3

- AP31 Ensure that a minimum standard of efficiency is achieved when an extension is built on any home in the region
- AP32 Ensure that the region maximises retrofit investment opportunities from all new developments
- AP33 Ensure that local planning authorities, planning officers and councillors understand the potential opportunities for retrofitting the existing stock when extensions or new homes are built

7 Policy gaps regionally and nationally

The following policies represent significant future opportunities which regional stakeholders should be made aware of. Whilst the region cannot directly influence these policies, it is likely that central Government will hold consultation on future legislation that could influence them.

7.1 Low interest loans for energy (German model) – 2008 to 2020

Borrowers are able to take out low interest loans for measures that help older properties reach new-build standard through refurbishment (only pre-1984 dwellings are eligible for the loans scheme). Upon reaching this standard the Government will repay 10% of the loan to the household. Prior to June 1 2006, the Government repaid 15% for meeting this condition. The reason the contribution fell from 15% to 10% is the increase in people reaching new-build standard with their refurbishments. In other words, this has been a huge success, with solely voluntary take-up at present.

Up to date features of the loans include:

- Fixed (and heavily subsidised) interest rate for ten years - the rate varies depending on loan amount and duration, and is revised annually
- Repayment over four to 30 years
- Up to €50,000 per dwelling, regardless of which package (see below) is chosen
- Loans can cover 100% of the investment as well as labour cost, and secondary costs, such as scaffolding
- Flexible repayment (increasing repayments incurs no additional cost)
- Can be used in combination with other (non-energy) refurbishment loans - for example, additional subsidised finance can be used for including added individual measures (the CO₂ refurbishment programme can only finance packages of measures, see below)
- ESCOs carrying out refurbishments are eligible for the loan

Furthermore, the programme takes a 'whole house' view. To be eligible for finance, refurbishments must achieve a reduction in CO₂ emissions of 40kg/m²/year. This is to be achieved through one of five packages of measures on offer. Packages one to four are different combinations of: loft insulation, wall insulation, basement ceiling / ground floor insulation, window renewal, heating renewal, and fuel switching. These packages can be applied to most dwellings, and are 'guaranteed' to achieve the required reduction if fully applicable. Package five is designed for unusual cases or buildings which already have some measures installed, and is more tailor-made. Under package five, a certified expert will help determine the measures necessary for achieving the emissions reduction.

7.2 Fiscal Incentives – 2008 onwards

It is vital that central Government uses economic instruments to encourage the development of more energy efficient homes (and sustainable homes more broadly). In particular, the report recommends the Government reduces the rate of VAT on all energy efficiency measures, introduces stamp duty rebates (which could be easily linked to the deployment of minimum energy standards at point of sale), and ensures grant funding for fuel poverty measures (via Warm Front) and LDC technologies (via the Low Carbon Buildings Programme) are sustained and increased in line with the identified need.

Value Added Tax (VAT)

The rate of VAT on energy efficiency measures should be reduced to five per cent or zero on: the supply and installation of energy efficient products or materials; DIY energy saving materials bought by households; and the most energy efficient equipment on the market such as appliances. It is recommended the equipment that could be covered by reduced VAT, includes energy efficient products such as micro-CHP, lights, insulation and appliances⁷⁷.

Stamp duty rebates

There should be a differential stamp duty to incentivise improved energy efficiency of housing at point of sale (see minimum standards at point of sale). In order to ensure that all homes could benefit from this policy recommendation, it is suggested that the rate of stamp duty for home owners who improve the energy performance rating (as defined by their Energy Performance Certificate) to a higher band be reduced. The relative rate of the reduction could in turn be linked to the number of bands or points achieved.

Grant funding for sustainable energy measures

The Government is not on course to meet its statutory obligation to end fuel poverty in vulnerable households by 2010. Whilst it is acknowledged that rising fuel prices have been the principal cause of this increase, the Government is planning to reduce the budget for Warm Front which is already lower than that recommended by the Fuel Poverty Advisory Group (FPAG)⁷⁸. The deployment of all scenarios is dependent upon deploying energy efficiency measures in all homes (including those of the fuel poor); the Government should increase rather than decrease the budget for this work. In addition to this, Government funding allocated to Warm Front and Low Carbon Buildings Programme should be increased to support the deployment of far higher numbers of LZC technologies.

7.3 Minimum standards at point of sale – 2008 to 2020

Friends of the Earth's *Home Truths* report recommends that all homes being sold should meet a minimum level of energy efficiency⁷⁹. The mechanism described below would support the implementation of scenario 1a by ensuring that all homes reach their cost-effective carbon reduction potential by 2020.

Taken from *Home Truths*:

“Energy Performance Certificates, which rate houses from A to G, are rolled out for every home in the UK (not just those being sold or let) from 1 January 2008. A minimum standard is set and progressively tightened to transform the housing sector by making it illegal to re-sell (or let) the most energy-inefficient houses. Houses in bands F and G have such low levels of thermal comfort they are officially a health hazard – there are 3 million such homes in the UK today. They have to be improved before they can be re-sold. No G-rated property can be re-sold after 2010, no F-rated after 2013 and no E-rated ones after 2016.

⁷⁷ defined as A-rated / Energy Saving Recommended (ESR)

⁷⁸ FPAG 2007

⁷⁹ Boardman 2007

It is the authors' understanding that an F rating could be achieved with relative ease through the installation of low energy light bulbs, loft insulation and modern condensing boilers. For cavity walled properties, flats and mid-terrace solid walled properties an E-rating could again easily be achieved through the implementation of these measures. The 'minimum standards' at point of sale policy therefore seems a relatively straightforward, and low cost to Government, method of implementing the measures in scenario 1a.

7.4 Reform the energy market – 2008 to 2050

A feed-in tariff must be adopted for electricity generated by micro-generation, guaranteeing a premium price for exported electricity that reflects the true cost of installing the equipment. This is a recognised method of encouraging the installation micro-renewables for electricity, which has been effective in Germany and Spain⁸⁰. In Germany (perhaps the most effective system, developed and supported politically since 1990), feed-in tariffs have helped them become a world leader in renewable energy. It is estimated that the policy has generated in the region of 250,000 jobs, saves around 100 million tonnes of CO₂ annually, at the cost of around \$1.80 per household, per month.

A renewable heat obligation should be introduced requiring a proportion of household heat to come from LZC sources. It should be complemented by a properly delineated and monitored green gas tariff. Energy tariffs need to be reformed to reward energy saving rather than high consumption.

7.5 Supplier Obligation – 2011 to 2020

The Supplier Obligation is the successor to CERT 2008-11, (which itself is the successor to the Energy Efficiency Commitment), and will start in 2011. The Government is currently examining options for the Supplier Obligation.

A recent (August 2007) study by CSE – in response to the Government's call for evidence as part of the process of developing the Supplier Obligation – examined the social impacts relating to a cap-and-trade supplier obligation. Such a supplier obligation would potentially create far more significant changes in energy supplier practices compared with the possible alternative of a further development of a measures-based approach (as characterised by EEC and CERT). Not least amongst these proposed changes is that suppliers could be required to reduce the CO₂ emissions of only their own customers; measures-based approaches have not, to date, featured this focus.

7.6 Personal Carbon Trading (PCT) / carbon taxes – 2015 /2020 to 2050

Personal Carbon Trading (PCT) is potentially a very effective, fiscally progressive measure for carbon reduction in the household sector, but further research is needed into the likely equity and distributional impacts of such a system, and its technical feasibility, before public acceptability is tested. Under a system of PCT a trusted agency or body would set the overall cap for emissions with the size of the cap defining the carbon saving achieved.

A possible outcome of PCT would be that richer households, which tend to be high carbon emitters, will seek measures to reduce CO₂ emissions from their household energy use, or buy carbon allowances from others. Those with carbon allowances to sell are likely to be less well-off households, who may then use the money they gain from selling allowances to take

⁸⁰ Mendonça 2007

measures to reduce their energy use, freeing up more carbon allowances for them to sell in the future.

Carbon taxes are a more regressive⁸¹ measure which are easier to administer than a system of PCT. However, their ability to reduce CO₂ emissions is dependent upon the elasticity of the market place – the rate at which the change in cost is translated to a change in demand. The price of cigarettes is an excellent example of a commodity where increasing price has had little effect on demand, which is of course in part linked to the end users' nicotine addiction. It could be argued that society is addicted to oil with petrol prices now equalling the highest point in the 1970s. These prices have not resulted in a wholesale change in end-user transport behaviour towards cycling or public transport, so why would one assume carbon taxes would do so the future?

Prior to the introduction of either carbon taxes or PCTs, Government must seek a better understanding of the distribution of emissions by household, those households that stand to lose and gain, and the opportunities that these households have to reduce their emissions. The impact of PCTs depends upon the cap placed on total emissions and the associated share distributed to the public. It's likely that the first five years of a PCT scheme would cut the wastage that can easily be trimmed by simple behavioural changes and consumer purchasing decisions.

⁸¹ Wikipedia 2007

8 Overarching aims and priority areas

The regional modelling and stakeholder engagement activity discussed in chapters 3 to 6 has identified 33 actions detailed in this, the main Strategy. The combination of the evidence base provided by the modelling and the focus of these actions has led to the identification of five overarching aims and priority areas for action. The Action Plan provides a summary of the actions identified, the overarching aim they are designed to support and the priority areas they help to deliver. Whilst these actions often identify succinct tasks, a number of them relate to the improved coordination of sustainable energy programmes – the first of the Strategy's overarching aims.

8.1 Strategy's overarching aims

- A1. To provide a regional framework that stimulates increased deployment of sustainable energy and water efficiency measures in existing housing, working in conjunction with existing national, regional and local initiatives
- A2. To ensure the most energy inefficient properties are improved to a minimum standard of efficiency, that is SAP 65
- A3. To identify and develop opportunities for new sources of funding to retrofit the existing housing stock
- A4. To support the development of community focussed sustainable energy initiatives
- A5. To promote and help generate long-term behavioural change at the household level

The primary focus of this Strategy is the end use of energy in the home. The region plans to develop complimentary research that supports the delivery of regional targets for residential water efficiency and sustainability as defined by the South East Regional Economic Strategy.

8.2 Priority areas for action

The implementation of a more sustainable energy future is a complex one with many interlinking barriers and opportunities. The priority areas for action and the relevant sections of the Strategy that relate to them are shown below.

- P1 Targeting the G and Fs in private sector housing (sections 2.1, 5.3.1, 5.4.1, 6.1.2, 7.3)
- P2 Planning gains for the existing stock (section 6.3)
- P3 Sustaining local support for residential sustainable energy initiatives (sections 5.2, 5.3.2, 6.1.3)
- P4 Further reaching community energy initiatives (section 5.3.2, 5.4.2, 6.1, 6.2.2)
- P5 Innovative funding structures for able to pay households (section 5.4.1, 7.1)

9 Annex I – Detailed tables and outputs

Annex Table 9.1: EHCS requirements to pass thermal comfort criterion

Requirement to pass decent homes thermal comfort criterion	South East England	
	East	England
Gas central heating	56,480 9%	568,051 14%
Storage heating	8,112 1%	61,804 1%
Cavity wall insulation	361,322 57%	1,951,998 47%
50mm loft insulation	40,673 6%	400,556 10%
Gas central heating & cavity wall insulation	10,935 2%	75,305 2%
Gas central heating & 50mm loft insulation	4,959 1%	47,834 1%
200mm loft insulation	72,876 11%	520,905 13%
Cavity ins & 200mm loft insulation	57,353 9%	398,775 10%
Cavity insulation and storage heating	4,134 1%	22,170 1%
200mm loft insulation & storage heating	11,216 2%	69,636 2%
Cavity insulation & 200mm loft insulation & storage heating	6,184 1%	17,578 0%
Total	634,244 100%	4,134,612 100%

Annex Table 9.2: Fuel poverty projections based on the full income definition for vulnerable

Vulnerable - full income	South East		England	
	2010	2016	2010	2016
High scenario	366,934 14.5%	752,778 29.8%	2,836,406 18.3%	3,796,808 24.6%
Medium scenario	316,521 12.5%	551,849 21.8%	2,836,406 18.3%	3,796,808 24.6%
Base case	289,396 11.4%	518,566 20.5%	2,836,406 18.3%	3,796,808 24.6%
Low scenario	220,394 8.7%	388,629 15.4%	2,091,434 13.5%	2,835,286 18.3%
Vulnerable households	2,528,963	2,528,962	15,464,756	15,464,754

Breakdown of measures by scenario for the South East Region

Annex Table 9.3: 10% Threshold model

Measure	Total Measures	Measures/yr	Labour/job (days)[1]	Installer (FTE)[2]	Installer (FTE) /yr	Plus ancillary staff[3,4]	Plus ancillary staff /yr	Average cost (model)	Total costs	Total costs/yr	GVA	GVA/yr	GVA/FTE	GVA/ FTE all staff
low energy lighting	160,713	17,857	0.01	9	1	6	1	25	£3,983,720		£0	£0	£0	£0
Cavity Wall Insulation	45,197	5,022	0.4	103	11	68	8	278	£12,560,392	£1,395,599	£5,024,157	£558,240	£48,911	£29,464
Loft insulation	108,124	12,014	0.3	154	17	101	11	378	£40,889,042	£4,543,227	£10,222,260	£1,135,807	£66,558	£40,095
Draught proofing	106,362	11,818	0.3	181	20	120	13	198	£21,071,265	£2,341,252	£2,107,127	£234,125	£11,622	£7,001
External wall insulation	478	53	15.0	41	5	27	3	4575	£2,186,743	£242,971	£546,686	£60,743	£13,419	£8,084
Internal wall insulation	1,399	155	6.0	48	5	31	4	1838	£2,570,983	£285,665	£642,746	£71,416	£13,477	£8,118
Double glazing	8,631	959	3.0	147	16	97	11	5632	£48,606,735	£5,400,748	£14,582,021	£1,620,225	£99,117	£59,709
Gas central heating	71,697	7,966	1.6	650	72	429	48	1446	£103,665,892	£11,518,432	£31,099,768	£3,455,530	£47,868	£28,836
LPG central heating	3,586	398	2	41	5	27	3	1200	£4,303,200	£478,133	£1,290,960	£143,440	£31,680	£19,084
Oil central heating	6,370	708	2	72	8	48	5	2546	£16,215,492	£1,801,721	£4,864,648	£540,516	£67,204	£40,484
Micro CHP	4,847	539	2	55	6	14	2	2500	£12,117,500	£1,346,389	£3,635,250	£1,090,575	£66,000	£52,800
Ground Source Heat Pumps	11,718	1,302	13	866	96	216	24	5853	£68,590,369	£7,621,152	£20,577,111	£2,286,346	£23,774	£19,019
ASHP	658	73	4	13	1	3	0	5500	£3,619,000	£402,111	£1,085,700	£120,633	£82,971	£66,377
Solar water heating	72,145	8,016	6	2,459	273	615	68	2569	£185,368,227	£20,596,470	£55,610,468	£6,178,941	£22,611	£18,088
Total	601,925	66,881		4,838	538	1,802	201		£ 525,748,560		£ 151,288,900			£22,783

Annex Table 9.4: Target SAP 65

Measure	Total Measures	Measures/yr	Labour/job (days)[1]	Installer (FTE)[2]	Installer (FTE) /yr	Plus ancillary staff[3,4]	Plus ancillary staff /yr	Average cost (model)	Total costs	Total costs/yr	GVA	GVA/yr	GVA/FTE	GVA/ FTE all staff
low energy lighting	918,536	102,060	0.01	52	6	34	4	28	£25,717,478	£2,857,498	£0	£0	£0	£0
Cavity Wall Insulation	200,362	22,262	0.4	455	51	301	34	266	£53,309,249	£5,923,250	£21,323,700	£2,369,300	£46,827	£28,209
Loft insulation	866,034	96,226	0.3	1,230	137	812	91	406	£351,837,075	£39,093,008	£87,959,269	£9,773,252	£71,502	£43,074
Draught proofing	520,891	57,877	0.3	888	99	586	66	237	£123,284,582	£13,698,287	£12,328,458	£1,369,829	£13,885	£8,365
External wall insulation	8,483	943	15.0	723	80	477	54	7485	£63,495,975	£7,055,108	£15,873,994	£1,763,777	£21,956	£13,227
Internal wall insulation	47,117	5,235	6.0	1,606	178	1,060	119	2125	£100,131,208	£11,125,690	£25,032,802	£2,781,422	£15,585	£9,388
Double glazing	97,166	10,796	3.0	1,656	184	1,093	123	7223	£701,803,188	£77,978,132	£210,540,956	£23,393,440	£127,120	£76,578
Gas central heating	898,886	99,876	1.6	8,145	905	5,376	603	1415	£1,272,198,868	£141,355,430	£381,659,660	£42,406,629	£46,856	£28,226
LPG central heating	3,656	406	2	42	5	27	3	1398	£5,110,490	£567,832	£1,533,147	£170,350	£36,903	£22,231
Oil central heating	43,085	4,787	2	490	54	323	36	1690	£72,829,067	£8,092,119	£21,848,720	£2,427,636	£44,625	£26,883
Micro CHP	92,728	10,303	2	1,054	117	263	29	2668	£247,362,138	£27,484,682	£74,208,641	£22,262,592	£70,425	£56,340
Ground Source Heat Pumps	51,931	5,770	13	3,836	426	959	107	6478	£336,416,814	£37,379,646	£100,925,044	£11,213,894	£26,311	£21,049
ASHP	22,031	2,448	4	438	49	110	12	4992	£109,988,000	£12,220,889	£32,996,400	£3,666,267	£75,314	£60,251
Biomass boilers	4,355	484	8	198	22	49	5	3703	£16,127,073	£1,791,897	£4,838,122	£537,569	£24,441	£19,552
Solar water heating	993,935	110,437	6	33,884	3,765	8,471	941	2644	£2,628,223,630	£292,024,848	£788,467,089	£87,607,454	£23,269	£18,616
Total	4,769,196	529,911		54,697	6,077	19,942	2,226		£6,107,834,835		£1,779,536,003			£23,842

Annex Table 9.5: Scenario 1a

Measure	Total Measures	Measures/yr	Labour/job (days)[1]	Installer (FTE)[2]	Installer (FTE) /yr	Plus ancillary staff[3,4]	Plus ancillary staff /yr	Average cost (model)	Total costs	Total costs/yr	GVA	GVA/yr	GVA/FTE installer	GVA/ FTE all staff
low energy lighting	2,454,729	272,748	0.01	139	15	92	10	27	£66,472,133	£7,385,793	£0	£0	£0	£0
Cavity Wall Insulation	408,425	45,381	0.4	928	103	613	69	215	£87,676,866	£9,741,874	£35,070,747	£3,896,750	£37,782	£22,760
Loft insulation	1,943,594	215,955	0.3	2,761	307	1,822	204	369	£718,036,285	£79,781,809	£179,509,071	£19,945,452	£65,021	£39,169
Draught proofing	1,087,475	120,831	0.3	1,854	206	1,223	137	254	£276,605,767	£30,733,974	£27,660,577	£3,073,397	£14,922	£8,989
Gas central heating	1,073,272	119,252	1.6	9,726	1,081	6,419	720	1391	£1,493,007,951	£165,889,772	£447,902,385	£49,766,932	£46,054	£27,743
LPG central heating	237,603	26,400	2	2,700	300	1,782	200	1304	£309,764,999	£34,418,333	£92,929,500	£10,325,500	£34,418	£20,734
Oil central heating	114,160	12,684	2	1,297	144	856	96	1638	£186,993,332	£20,777,037	£56,098,000	£6,233,111	£43,243	£26,050
Total	7,319,258			19,405	2,156	12,807	1,436		£ 3,138,557,334		£ 839,170,279			

Annex Table 9.6: Scenario 1b

Measure	Total Measures	Measures/yr	Labour/job (days)[1]	Installer (FTE)[2]	Installer (FTE) /yr	Plus ancillary staff[3,4]	Plus ancillary staff /yr	Average cost (model)	Total costs	Total costs/yr	GVA	GVA/yr	GVA/FTE installer	GVA/ FTE all staff
low energy lighting	856,606	95,178	0.01	49	5	32	4	24	£20,293,745	£2,254,861	£0	£0	£0	£0
Cavity Wall Insulation	506,557	56,284	0.4	1,151	128	760	85	177	£89,807,176	£9,978,575	£35,922,870	£3,991,430	£31,203	£18,797
Loft insulation	549,687	61,076	0.3	781	87	515	58	372	£204,742,170	£22,749,130	£51,185,542	£5,687,282	£65,555	£39,491
Draught proofing	577,232	64,137	0.3	984	109	649	73	206	£119,127,206	£13,236,356	£11,912,721	£1,323,636	£12,107	£7,294
Double glazing	16,125	1,792	3.0	275	31	181	20	4617	£74,452,942	£8,272,549	£22,335,883	£2,481,765	£81,263	£48,954
External wall insulation	2,279	253	15.0	194	22	128	14	8956	£20,411,157	£2,267,906	£5,102,789	£566,977	£26,271	£15,826
Internal wall insulation	114,493	12,721	6.0	3,903	434	2,576	289	1585	£181,495,149	£20,166,128	£45,373,787	£5,041,532	£11,625	£7,003
Gas central heating	617,972	68,664	1.6	5,600	622	3,696	414	1374	£848,867,117	£94,318,569	£254,660,135	£28,295,571	£45,476	£27,395
LPG central heating	3,428	381	2	39	4	26	3	1488	£5,099,168	£566,574	£1,529,750	£169,972	£39,270	£23,657
Oil central heating	4,125	458	2	47	5	31	3	4322	£17,827,710	£1,980,857	£5,348,313	£594,257	£114,097	£68,733
Micro CHP	1,432,638	159,182	2	16,280	1,809	4,070	452	2725	£3,903,686,085	£433,742,898	£1,171,105,825	£351,331,748	£71,935	£57,548
Ground Source Heat Pumps	1,080,296	120,033	13	79,795	8,866	19,949	2,217	5809	£6,275,163,352	£697,240,372	£1,882,549,006	£209,172,112	£23,592	£18,874
ASHP	6,544	727	4	130	14	33	4	5178	£33,882,000	£3,764,667	£10,164,600	£1,129,400	£78,107	£62,486
Solar PV	135,565	15,063	4	3,081	342	770	86	6500	£881,172,500	£97,908,056	£264,351,750	£29,372,417	£85,800	£68,640
Solar water heating	312,635	34,737	6	10,658	1,184	2,665	296	2527	£790,023,724	£87,780,414	£237,007,117	£26,334,124	£22,237	£17,790
Total	6,216,182	690,687		122,966	13,663	36,081	4,018		£ 13,466,051,200		£ 3,998,550,089			£25,141

Annex Table 9.7: Scenario 1c

Measure	Total Measures	Measures/ yr	Labour/job (days)[1]	Installer (FTE)[2]	Installer (FTE) /yr	Plus ancillary staff[3,4]	Plus ancillary staff /yr	Average cost (model)	Total costs	Total costs/yr	GVA	GVA/yr	GVA/FTE installer	GVA/ FTE all staff
low energy lighting	897,705	99,745	0.01	51	6	34	4	24	£21,283,176	£2,364,797	£0	£0	£0	£0
Cavity Wall Insulation	528,817	58,757	0.4	1,202	134	793	89	177	£93,625,133	£10,402,793	£37,450,053	£4,161,117	£31,160	£18,771
Loft insulation	581,303	64,589	0.3	826	92	545	61	372	£216,507,203	£24,056,356	£54,126,801	£6,014,089	£65,551	£39,489
Draught proofing	608,865	67,652	0.3	1,038	115	685	77	206	£125,223,993	£13,913,777	£12,522,399	£1,391,378	£12,066	£7,269
External wall insulation	5,543	616	15.0	472	52	312	35	8956	£49,644,161	£5,516,018	£12,411,040	£1,379,004	£26,271	£15,826
Internal wall insulation	112,220	12,469	6.0	3,826	425	2,525	283	1589	£178,346,785	£19,816,309	£44,586,696	£4,954,077	£11,655	£7,021
Double glazing	16,125	1,792	3.0	275	31	181	20	4617	£74,452,942	£8,272,549	£22,335,883	£2,481,765	£81,263	£48,954
Gas central heating	607,999	67,555	1.6	5,510	612	3,636	408	1370	£832,824,113	£92,536,013	£249,847,234	£27,760,804	£45,348	£27,318
LPG central heating	3,428	381	2	39	4	26	3	1488	£5,099,168	£566,574	£1,529,750	£169,972	£39,270	£23,657
Oil central heating	4,125	458	2	47	5	31	3	4322	£17,827,710	£1,980,857	£5,348,313	£594,257	£114,097	£68,733
Micro CHP	1,401,016	155,668	2	15,921	1,769	3,980	442	2729	£3,823,740,457	£424,860,051	£1,147,122,137	£344,136,641	£72,053	£57,642
Ground Source Heat Pumps	1,073,538	119,282	13	79,295	8,811	19,824	2,203	5811	£6,238,305,732	£693,145,081	£1,871,491,720	£207,943,524	£23,602	£18,881
ASHP	10,536	1,171	4	210	23	52	6	4702	£49,540,500	£5,504,500	£14,862,150	£1,651,350	£70,933	£56,747
Solar PV	269,694	29,966	4	6,129	681	1,532	170	6500	£1,753,011,000	£194,779,000	£525,903,300	£58,433,700	£85,800	£68,640
Solar water heating	312,635	34,737	6	10,658	1,184	2,665	296	2527	£790,023,724	£87,780,414	£237,007,117	£26,334,124	£22,237	£17,790
Total	6,433,549	714,839			125,498	13,944	36,821	4,100	£ 14,269,455,796		£ 4,236,544,593			£26,100

Annex Table 9.8: Scenario 2

Measure	Total Measures	Measures/ yr	Labour/job (days)[1]	Installer (FTE)[2]	Installer (FTE) /yr	Plus ancillary staff[3,4]	Plus ancillary staff /yr	Average cost (model)	Total costs	Total costs/yr	GVA	GVA/yr	GVA/FTE installer	GVA/ FTE all staff
low energy lighting	654,044	72,672	0.01	37	4	25	3	24	£15,988,510	£1,776,501	£0	£0	£0	£0
Cavity Wall Insulation	419,963	9,767	0.4	954	22	630	15	165	£69,240,023	£1,610,233	£27,696,009	£644,093	£29,017	£17,480
Loft insulation	489,030	11,373	0.3	695	16	458	11	377	£184,479,227	£4,290,215	£46,119,807	£1,072,554	£66,393	£39,996
Draught proofing	465,426	10,824	0.3	793	18	524	12	176	£81,791,841	£1,902,136	£8,179,184	£190,214	£10,310	£6,211
External wall insulation	44,974	1,046	15.0	3,833	89	2,530	59	7728	£347,553,272	£8,082,634	£86,888,318	£2,020,659	£22,668	£13,656
Internal wall insulation	3,230	75	6.0	110	3	73	2	1866	£6,026,362	£140,148	£1,506,590	£35,037	£13,682	£8,242
Double glazing	57,742	6,416	3.0	984	109	650	73	4187	£241,781,901	£26,864,656	£72,534,570	£8,059,397	£73,696	£44,395
Gas central heating	453,602	10,549	1.6	4,110	96	2,713	64	1272	£576,997,946	£13,418,557	£173,099,384	£4,025,567	£42,112	£25,369
LPG central heating	3,428	80	2	39	1	26	1	1411	£4,836,890	£112,486	£1,451,067	£33,746	£37,250	£22,440
Oil central heating	18,452	429	2	210	5	138	3	1684	£31,068,128	£722,515	£9,320,439	£216,754	£44,450	£26,777
Micro CHP	1,365,784	31,762	2	15,520	361	3,880	90	2791	£3,811,603,778	£88,641,948	£1,143,481,134	£343,044,340	£73,677	£58,941
Ground Source Heat Pumps	926,724	21,552	13	68,451	1,592	17,113	398	5780	£5,356,901,978	£124,579,116	£1,607,070,593	£37,373,735	£23,478	£18,782
ASHP	385,235	8,959	4	7,661	178	1,915	45	4054	£1,561,865,000	£36,322,442	£468,559,500	£10,896,733	£61,162	£48,930
Biomass boilers	9,464	220	8	430	10	108	3	3279	£31,033,437	£721,708	£9,310,031	£216,512	£21,642	£17,314
Solar PV	834,110	19,398	4	18,957	441	4,739	110	6500	£5,421,715,000	£126,086,395	£1,626,514,500	£37,825,919	£85,800	£68,640
Solar water heating	296,006	6,884	6	10,091	235	2,523	59	2520	£746,000,497	£17,348,849	£223,800,149	£5,204,655	£22,178	£17,742
Wind turbine	361,407	8,405	2	4,107	96	1,027	24	3809	£1,376,625,713	£32,014,551	£412,987,714	£9,604,365	£100,560	£80,448
Total	6,788,621	220,409			136,984	3,275	39,070	970	£ 19,865,509,503		£ 5,918,518,989			£33,618

10 Annex II – The Expenditure and Food Survey

The Expenditure and Food Survey is designed to be representative of household expenditure at the dataset level, but not at the individual case level. Much of the data is derived from an expenditure diary, whereby respondents record all expenditure on particular items, including some household and vehicle fuels, over a short (typically two-week) period of the year. This results in some apparently very high annual expenditure figures (for example if a household happened to drive a long distance during the diary period) and some artificially low or zero figures (e.g. if the household happened not to buy any vehicle fuel during the diary period).

Although the survey is designed so that the total annual expenditure from this diary data is representative of all UK households, the results for an individual household cannot be relied upon. A further implication of this is that the distribution of household expenditure (and consumption derived from it) cannot be taken as accurate. This precludes certain detailed analyses of the distribution of emissions at the level of individual households.

This non-representativity at the case level leads to the requirement for creating groups of cases, from which the mean (but not the internal distribution about that mean) can be taken as accurate. This approach also has the advantage of creating clusters of similar (in terms of the values of the independent variables) households which can be analysed from a socio-economic and demographic perspective in terms of the between-group variations.

Annex Table 10.1: South East EFS Disposable Income Deciles

Disposable income deciles	Mean	Minimum	Maximum	Median
1	£4,495	£0	£6,640	£5,690
2	£8,310	£6,669	£9,997	£8,320
3	£11,479	£10,024	£13,083	£11,568
4	£14,974	£13,110	£16,642	£14,949
5	£18,586	£16,682	£20,616	£18,519
6	£22,761	£20,661	£24,860	£22,686
7	£27,489	£24,888	£29,810	£27,504
8	£32,765	£29,859	£36,267	£32,488
9	£41,359	£36,276	£47,115	£41,184
10	£73,830	£47,189	£1,050,612	£61,753

11 Annex III – The Local Authority Rurality Classification

The Local Authority Rurality Classification was introduced in 2005 as a Defra initiative and was delivered by the Rural Evidence Research Centre at Birkbeck College. Many statistics are only available at local authority level. In order to differentiate between rural and urban for these statistics it was necessary to classify the local authorities based on their rurality. The same methodology was then applied to Primary Care Trusts. The new local authority classification is a 'spectrum', or graded system, and replaces the earlier Tarling binary local authority classification, which was also based on settlement type.

The new local authority Classification gives 6 Urban/Rural Classifications:

- Major Urban
- Large Urban
- Other Urban
- Significant Rural
- Rural-50
- Rural-80

These are defined as follows:

- Major Urban: districts with either 100,000 people or 50 percent of their population in urban areas with a population of more than 750,000.
- Large Urban: districts with either 50,000 people or 50 percent of their population in one of 17 urban areas with a population between 250,000 and 750,000.
- Other Urban: districts with fewer than 37,000 people or less than 26 percent of their population in rural settlements and larger market towns.
- Significant Rural: districts with more than 37,000 people or more than 26 percent of their population in rural settlements and larger market towns.
- Rural-50: districts with at least 50 percent but less than 80 percent of their population in rural settlements and larger market towns.
- Rural-80: districts with at least 80 percent of their population in rural settlements and larger market towns.

Annex Table 11.1: Mean per capita domestic emissions by local authority classification

Local authority classification	Domestic per capita CO ₂ tonnes				
	Mean	Min	Max	Median	Count
Major urban	2.63	2.24	3.00	2.54	8
Large urban	2.37	2.13	2.59	2.34	13
Other urban	2.40	2.05	2.91	2.35	13
Significant rural	2.64	2.38	3.03	2.61	13
Rural-50	2.73	2.41	3.22	2.77	14
Rural-80	2.78	2.59	3.00	2.76	6

Annex Table 11.2: Mean per capita emissions by local authority classification

Local authority classification	Per capita total CO ₂ tonnes				
	Mean	Min	Max	Median	Count
Major urban	9.67	5.31	17.53	9.06	8
Large urban	6.51	4.88	7.82	6.47	13
Other urban	7.29	4.94	10.00	6.81	13
Significant rural	9.50	7.16	13.44	8.80	13
Rural-50	10.08	6.56	17.27	9.33	14
Rural-80	8.34	6.85	10.52	8.36	6

12 Annex IV – The scenarios outlined

What is deemed cost-effective by 2016?

Scenario 1a (2016) – market potential

Scenario 1a modelled the implementation of measures in the housing stock based on the 'intention' stated in the 2007 Budget 'that, by the end of the next decade, all households will have been offered help to introduce energy efficient measures with the aim that, where practicably possible, all homes will have achieved their cost-effective energy efficiency potential'. The measures seen as cost-effective in the Budget include 'particularly cavity wall, loft and hot water cylinder insulation, draught proofing, efficient boilers and heating controls'⁸². Scenario 1a models these measures, including low energy lighting and assuming 'efficient boilers' to include gas, oil and LPG condensing boilers, as being installed in all applicable⁸³ dwellings⁸⁴.

In principle, this scenario represents what is taken to be the *market potential* for emissions reductions – i.e. reductions in emissions that in theory should come about with little to no government intervention because they are highly cost-effective. In practice, for many reasons including public apathy and a lack of buy-in as to their environmental necessity and benefit, these measures are often not taken up in a free market system.

Scenario 1b (2016) – economic potential

Scenario 1b was developed according to two criteria. The first was to consider individual measures or combinations of measures to be cost-effective if they carried a positive net present value over their lifetime. The second was not to include micro-wind turbines. The discount rate used was the Treasury's own discount rate⁸⁵ for appraising public policy – 3.5%. This more pragmatic definition of cost-effectiveness significantly expanded the measures and combinations thereof⁸⁶ that were applied to the housing stock.

In principle, scenario 1b represents the *economic potential* for reducing emissions from the existing stock – i.e. cost-effective emissions reductions that are not normally achievable without government intervention because of barriers such as high initial required investment or lack of information about the economic benefits of the investment.

⁸² HM Treasury 2007; in the *How Low?* model, all new boilers are assumed to be fitted with modern efficient heating controls – i.e. room thermostat, timer and thermostatic radiator valves.

⁸³ 'Applicable', in the context of all modelled scenarios, means that a combination of measures installed into any one dwelling takes account of the energy improvements already present.

⁸⁴ For the full set of selection criteria for all scenarios, see Annex V.

⁸⁵ In economic theory, consumers value a benefit in the future less than a benefit today. Discount rates are used to take account of this.

⁸⁶ Individual measures in addition to scenario 1a: air- and ground-source heat pumps, external and internal wall insulation, photovoltaic panels, biomass boilers, micro CHP, solar hot water systems, double-glazing.

Scenario 1c (2016) – the ‘real’ economic potential

Scenario 1c was also developed according to two criteria. The first was to consider individual measures or combinations of measures to be cost-effective if they carried a positive net present value over their lifetime when the shadow cost carbon was included. The second was not to include micro-wind turbines. The discount rate used was the Treasury’s own discount rate for appraising public policy – again 3.5%. This more pragmatic definition of cost-effectiveness significantly expanded the measures and combinations thereof that were applied to the housing stock.

What is technically feasible by 2050?

Scenario 2a (2050) – technical potential⁸⁷

Scenario 2a was developed to consider the potential carbon savings if all current measures, regardless of cost-effectiveness, were applied. The scenario represents a pragmatic appraisal of the carbon savings that could be achieved in the housing stock from energy efficiency and LZC technologies. The scenario includes constrained levels of both PV and micro-wind turbine installations (see Annex I for a full breakdown of the constraints applied under each scenario).

The modelled savings associated with these measures alone thus represents the *technical potential* for reducing emissions from the existing stock – i.e. the emissions reductions achievable from the set of currently available technologies.

Scenario 2b (2050) – theoretical potential

Scenario 2b represents the *theoretical potential* for reducing emissions from the existing stock. It makes stronger assumptions than the other scenarios about less certain factors, not covered by the model. These include the volume of emissions reductions, based on improving and new technologies and behavioural change. How the assumptions for each of these factors have been made for each scenario, including 2b, is briefly outlined below.

CO₂ emissions reductions not predicted by the *How Low?* model

The *How Low?* model does not consider all aspects of emissions from the existing housing stock. Emissions reductions/increases not dynamically predicted by the model include:

1. New build between now and 2016;
2. Decarbonisation of electricity;
3. Green gas;
4. More carbon conscious energy use in the home; and
5. Improved efficiency of electrical appliances (other than lighting, covered by the model).

⁸⁷ Policy makers will no doubt attempt to compare the findings of this study with those recently published in the ‘Home Truths’ report by the ECI for Friends of the Earth and the Co-operative Bank (Boardman 2007). However, scenario 2a shows the savings associated with energy improvement measures alone. The main differences in measures applied are the exclusion of large scale / community CHP, the higher prevalence of heat pumps and the inclusion of residential biomass central heating rather than stoves.

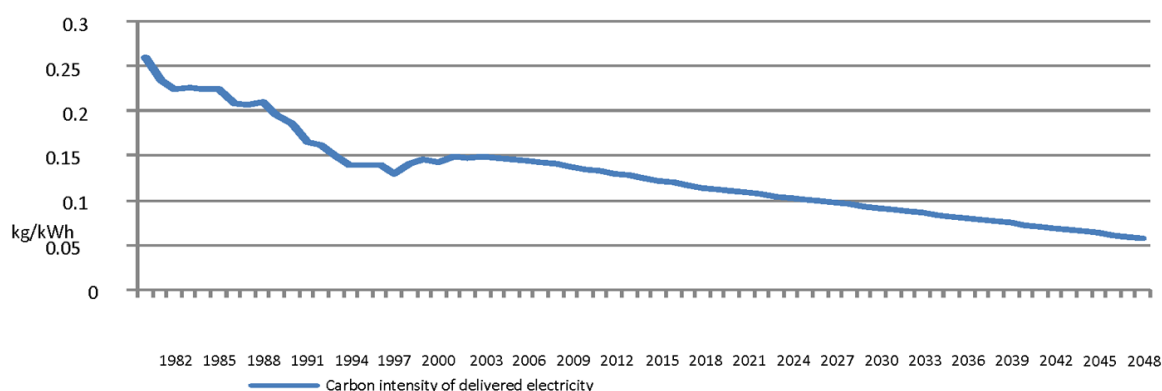
New build between now and 2016

Based on the EST's published figures, the study has assumed total emissions of 6.96 MtCO₂⁸⁸ for new homes built in the UK between now and 2016. Under current legislative plans, all new homes built from 2016 onwards will be zero carbon⁸⁹ and should therefore impose no additional carbon burden. It is possible that future new build design may further reduce carbon impacts, resulting in homes that produce more energy than they use over the year, with the excess flowing back into the wider system, but that has not been accounted for here, as it is outside the scope of this Strategy.

Decarbonised electricity

Decarbonising electricity reduces the amount of carbon released for each kWh used in the home and requires the source of generation to be either: renewable; or low carbon and / or technically innovative – for example, carbon capture and storage technologies applied to gas- and coal-fired power generation plants. The projected carbon intensity of delivered electricity (2008 to 2020)⁹⁰ has been linearly extrapolated to estimate a 2050 carbon factor of 0.059kgC/kWh – as shown in Annex Figure 12.1.

Annex Figure 12.1: Projected decarbonisation of electricity



By 2020, renewable energy should account for 20%⁹¹ of the EU's final energy consumption (8.5% in 2005). To meet this common target, each Member State must increase its production and use of renewable energy in electricity, heating and cooling, and transport. The UK is obliged to increase its share of renewable energy from less than 2% now to 15% of the country's total energy needs by 2020⁹². This will require a large proportion of electricity to come from renewables (30%-35%).

The vision of decarbonised electricity has been significantly bolstered by the Government's recent commitment to investigate the deployment of up to 7,000 offshore wind turbines by 2030. Just 2% of the UK's energy comes from renewable sources,

⁸⁸ Zavody 2007

⁸⁹ CLG 2007

⁹⁰ Market Transformation Programme (MTP) published figures for carbon content of electricity, 1980 to 2020.

⁹¹ Council of the European Union 2007

⁹² BERR 2008c

and wind is the source for less than half a gigawatt (GW). The Government hopes that off-shore wind could provide around 14 GW by 2020⁹³ with a further 14 GW from onshore developments within the same timeframe.

The recent study by the IPPR, the RSPB⁹⁴ and WWF, to identify whether it would be possible to reduce the UK's CO₂ emissions by 80% of 1990 levels by 2050, identified decarbonised electricity as a key measure⁹⁵. The study used two models: the 'MARKAL-MACRO' model, used for 2007's Energy White Paper; and a model developed by Professor Dennis Anderson of Imperial College for the Stern Review.

Both these cost minimisation models concluded that it is feasible to reduce the UK's emissions by 80% by 2050, at costs that are not prohibitive. The models do this mainly by decarbonising electricity supply, in particular through the use of carbon capture and storage to make fossil fuelled power generation carbon-free, and on and off-shore wind power. For reasons of caution (see Annex VI) this study has not assumed as high a level of decarbonisation as the IPPR report, which serves to highlight that there is room to manoeuvre and go beyond an 80% cut in the residential sector⁹⁶.

Green gas (for heat)

Green gas would be produced from the treatment of waste and the anaerobic digestion of agricultural organic matter and/or landfill. This gas could then be injected into the natural gas grid network. Green gas could be sold to households in a similar way to green electricity, with households paying for an equivalent amount to that used in their own home. It would be necessary to ensure these green gas tariffs were certified to robust standards of compliance to agreed standards.

Ernst & Young's recent examination of the initial business case for supporting the UK renewable heat sector did not examine the feasibility of biogas injection to the domestic gas supply network. However, a response to the Renewable Heat Obligation consultation by Panthol Ltd⁹⁷ (a supplier of domestic oil and biofuels) stated that the UK could possibly secure 10% of its current natural gas energy needs, or 15% of its current electricity needs, by 2020, through the production and use of biogas from indigenous UK agricultural output. This study has therefore made a moderately conservative assumption of a total residential green gas supply – of 10% by 2050.

Behavioural change and improved efficiency of appliances

Assumptions about the improved efficiency of UK electrical appliances by 2050 (other than lighting, as lighting is dealt with by the *How Low?* model) were based on the Market Transformation Programme's⁹⁸ 'Early Best Practice' scenario (extrapolated from 2020 to 2050) – as shown in Annex Figure 12.2.

⁹³ BERR 2007; 33GW includes the 8GW already planned

⁹⁴ Royal Society for the Protection of Birds

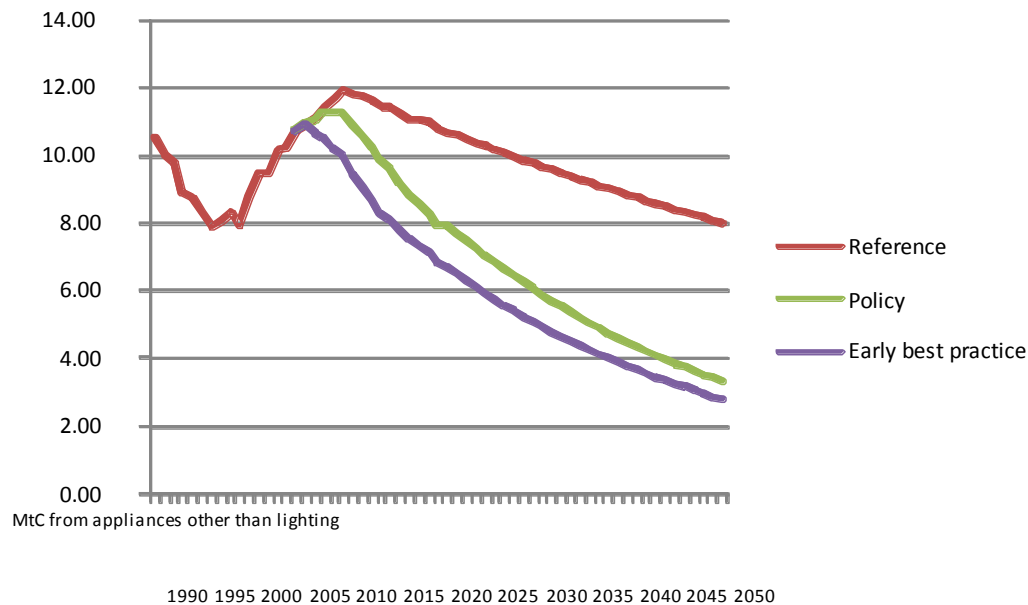
⁹⁵ IPPR, WWF and RSPB 2007

⁹⁶ This would increase carbon savings in 2050 by 3MtC.

⁹⁷ Panthol Ltd 2007

⁹⁸ Funded by Defra, the Market Transformation Programme 'supports UK government policy on sustainable products. Its aim is to achieve sustainable improvements in the resource efficiency of products, systems and services where these are critical to the delivery of government commitments in areas including climate change, water efficiency and waste reduction' (MTP 2008).

Annex Figure 12.2: Market Transformation Programme scenarios for household electrical appliances other than lighting



As regards the impact on emissions of more carbon conscious behaviour in the home, it was assumed that behavioural change could reduce remaining emissions (i.e. after all of the above) by 5%-10%^{99 100}, depending on the scenario.

⁹⁹ Not 5% of the 1990 baseline emissions.

¹⁰⁰ This estimate is based on a review of the literature on direct feedback from metering, billing and energy displays – carried out for Defra by Oxford University's ECI – which was higher at between 5% and 15% of energy demand (Darby 2006).

13 Annex V – Overriding selection criteria

The platter of measures applied under each scenario was then subjected to the following criteria that limit their application to suitable sites and ensure that the most pragmatic measures are in some cases applied.

General criteria

- Where they can be fitted, low cost insulation measures such as draught-proofing, loft insulation and cavity wall insulation (plus cols – low energy light bulbs) are fitted in preference to all other measures.
- Where property is in a gas supply area, a gas condensing boiler is next selected if the above insulation measures fail to provide the required saving.
- Where the property is off-gas, an oil condensing boiler is generally selected as the next most appropriate measure.
- An LPG condensing boiler may be next selected where there is already an existing LPG boiler and bulk storage tank and the property is off-gas.
- Renewable energy measures are applied only where the above heating and insulation measures fail to provide the required saving.
- Heating measures are only selected without insulation measures where the dwelling already has a satisfactory existing level of draught-proofing, loft insulation and cavity wall insulation.
- In solid wall dwellings, condensing boilers alone can be installed if there is no external or internal insulation, provided the other elements are insulated to a satisfactory standard.
- Ground or air source heat pumps are only installed where the dwellings are fully insulated, including solid wall insulation.

Specific criteria for insulation measures

- Draught stripping is confined to single glazed windows and doors.
- Double glazing is confined to single glazed windows and doors.
- Existing draught-proofed and double glazed windows are considered to be already satisfactorily draught-proofed, but double glazing can be installed to replace fully draught-proof single glazing.
- Loft insulation is only installed in houses and not flats. (The latter includes top floor flats as the model does not provide energy savings from loft insulation for these.)
- Insulation for flat roofs is assumed to give the same savings as loft insulation but to cost three times as much to install.
- Loft insulation, including top-up insulation, is limited to dwellings that have existing loft insulation of below 125mm.
- Existing loft insulation greater than 125mm is considered to be already satisfactory.
- All totally un-insulated cavity walls are assumed to be suitable for cavity insulation, unless in a severely exposed location.
- External wall insulation is not selected for listed buildings with solid walls or homes in a conservation area.
- Internal wall insulation is not selected for individually listed buildings with solid walls and/or where the habitable rooms are already small.

Specific criteria for heating measures

- A condensing boiler is not selected where the existing boiler is a condensing or combi boiler or CHP system and less than five years old.

- A condensing boiler is not selected where the existing boiler is another type and less than three years old.
- Boilers of less than three and five years old can be replaced if another fuel and/or heating system is required.
- Oil and LPG-fired heating is only upgraded using the same fuel in off-gas areas.
- Ground source heat pumps are only selected for houses and bungalows (not flats) and where the garden is 25 metres in depth or larger.
- Air source heat pumps are only selected where the total floor area of the house, bungalow or flat is less than 60 square metres.
- Biomass boilers are not selected where the area has gas, for flats, or where the youngest occupant is aged 60 years or over.
- Solar hot water installations are not selected for flats or houses/bungalows with flat roofs or for any dwellings that are listed or in a conservation area. The model also limits the application to a representative number of south-oriented roof spaces.

The model does not record the separate savings or installation cost of improved heating controls, but allows for modern heating controls in the savings and installation costs given for new heating appliances. The latter are thereby included in the model wherever a new heating boiler/system is installed. Similarly, the model does not include hot water tank insulation, but again this is covered where new heating is installed, for example by using a condensing combi boiler.

Specific criteria for electricity generation measures

- Solar photovoltaics are not selected for flats or houses/bungalows with flat roofs or for any dwellings that are listed or in a conservation area. The model also limits the application to a representative number of south-oriented roof spaces.
- Depending on the scenario, the model has applied a 6kW Proven and an Ampair 600 to the housing stock. The model limits the application to exposed sites with sufficient numbers of storeys (dependent upon exposure).

14 Annex VI – Stakeholder event reportage

Group work session 1: Targets and aims

CO₂ target

To achieve a 20% reduction in CO₂ emissions by 2016, relative to 2005, working in partnership with and through national programmes, regional organisations, and local partners

Clarify what the target includes

The most widely raised issue with the CO₂ target was a lack of clarity regarding what it includes e.g. does it only apply to the residential sector? Does it include all housing or only existing housing?

Ensure consistency with existing targets

Several work groups noted that the target should be in line with existing national targets. The origin of the 2016 deadline was queried as was the use of a 2005 baseline, particularly since the Regional Economic Strategy target has a baseline of 2003¹⁰¹.

Achievability of the target and barriers

There were no work groups that thought that the CO₂ target was unachievable per se, although several groups thought that achieving the target would only be possible if certain key barriers were overcome. These barriers include getting stakeholder engagement and buy-in to the target, raising awareness amongst households and providing significant financial incentives to motivate action, particularly for landlords in the private rented sector.

Two work groups suggested that the target should include interim targets and milestones, with one suggesting the inclusion of a road map to 2050.

Fuel poverty target

To eliminate fuel poverty where practicably possible in the South East by 2016

Several work groups queried the use and definition of the words “*practicably possible*”, noting that they weaken the fuel poverty target. Two groups suggested that the target should also include achieving SAP 65 for housing in the South East by 2016. This would ensure that the focus of the target would be on energy efficiency rather than on energy cost, which was seen as important in a climate of rising fuel prices.

It was also suggested that the target include year-on-year interim targets.

Achievability of the target and barriers

Several work groups thought that the fuel poverty target is not achievable. Key barriers to achieving the target are rising fuel prices, data protection issues hindering the process of

¹⁰¹ The Regional Economic Strategy 2006-2016 has the following climate change and energy target “Reduce CO₂ emissions attributable to the South East by 20% from the 2003 baseline by 2016 as a step towards the national target of achieving a 60% reduction on 1990 levels by 2050, and increase the contribution of renewable energy to at least 10% of energy supply in the South East by 2010 as a step towards achieving 20% by 2020”. The Strategy can be accessed here: www.seeda.co.uk/res/RES_2006-2016/index.asp

identifying the fuel poor and inaccurate targeting of the fuel poor (for example, people on benefits that receive energy efficiency grants and people receiving winter fuel payments are not necessarily fuel poor. It was suggested that winter fuel payments be ear-marked for spending on fuel bills only).

There was also concern regarding the Government's commitment to eliminating fuel poverty and whether or not they would be taking action that would support this target.

Aim 1 – Regional framework

To provide a regional framework that stimulates increased deployment of sustainable energy and water efficiency measures in existing housing, working in conjunction with existing national, regional and local initiatives

This aim was seen as important for maximising opportunities by linking up and coordinating currently disjointed programmes and initiatives as well as stakeholders and potential partners. It was thought that the framework should include/allow for:

- The provision of additional funding
- Simplified access to existing funding
- Specific actions
- Cover the whole process from raising awareness to providing smooth routes to installations
- Link to water and waste efficiency
- Training at a regional level
- Data analysis at a regional level

One work group thought that it was not possible to have a regional framework in so diverse an area. Instead they suggested supporting local authorities to create their own local-specific frameworks.

There were also several suggested changes to the terminology used, in particular “*deployment*”, “*sustainable energy measures*” and “*initiatives*”.

Aim 2 – Energy inefficient properties

To prioritise the improvement of the most energy inefficient properties

A commonly discussed theme for aim 2 was what properties should be prioritised for improvement. Suggestions included prioritising the most carbon-emitting homes; prioritising both those with the greatest potential CO₂ savings and vulnerable households; prioritising fuel poor households as well as the most energy inefficient properties; prioritising the replacement of prefabs and pre-cast reinforced concrete homes; and prioritising all households using an area-based approach. Identifying properties for improvement was also raised as an issue.

Another widely raised issue was the problem of how to prioritise and improve Hard to Treat Homes due to the high cost of the measures required and the lack of funding for these properties given the current grant structure.

Several work groups commented that “*improvement*” needs to be more specific, with one group suggesting that the aim should specify a minimum of SAP 65.

One work group noted the need to take a holistic approach and include tackling the behaviour of households as well as making improvements to the property, to ensure that energy savings made by installing measures are not negated by household behaviour.

Aim 3 – Funding

To identify and develop opportunities for new sources of funding to retrofit the existing housing stock

Work groups discussed potential sources and types of new funding, including:

- Using planning gains from new developments for the existing housing stock
- Providing incentives for action to landlords and home owners e.g. council tax rebates, stamp duty rebates, council tax based on CO₂ emissions
- Using CERT to fund newer technologies
- Providing 'green' loans, particularly for renewables
- Accessing funding from private companies as part of their corporate social responsibility (CSR) programmes
- Accessing funding from water companies
- Link with other agencies e.g. Primary Care Trusts

The need for improved coordination of existing funding was stressed, in order to overcome the current fragmented approach and simplify and accelerate access to funding.

Aim 4 – Community initiatives

To support the development of community-led and other local sustainable energy initiatives

This aim was seen as important for raising awareness, encouraging lifestyle and behavioural changes, promoting energy champions and sharing best practice amongst communities and stakeholders.

However, some work groups thought that the wording of aim 4 is too weak, particularly the term “support”. This tied into the point raised that the support would need to include significant financial support, which led one group to question the feasibility of the aim. Suggested changes to the wording included changing “support” to “support and promote” or replacing “support” with “encourage” or “fund”.

It was also noted that local authorities may have to take the lead in local initiatives or even ‘create’ the community, particularly in areas where nothing is currently taking place. It was therefore suggested that “community-led” be changed to “community involved”.

Additional aim

There were two suggestions for the addition of a 5th aim. One work group thought that there should be an aim focused on education and encouraging behavioural change. Another work group suggested having an aim focused on engaging hard-to-reach groups.

Key points, barriers and opportunities

Each work group was asked to provide two key points relating to the targets and/or the aims. Work groups were also asked to identify key barriers and opportunities for delivering the targets and aims. Most of the key points, barriers and opportunities have already been discussed in the relevant sections above. Below is a summary of the more general and

widely raised key points. Where key points were also identified as a barrier and/or an opportunity, this is denoted by the letters in brackets at the end of each key point (B = barrier, O = opportunity):

- **Coordination-** there needs to be improved coordination and joining up of plans, initiatives and funding (B, O)
- **Partnerships-** stakeholders need to work in partnership to avoid duplication and take opportunities to make links to other relevant areas, such as health (O)
- **Stakeholder engagement-** overcoming apathy of stakeholders, including the public, is crucial. In order to engage stakeholders and confirm their buy-in and action, there needs to be greater education, awareness-raising, behavioural change and community involvement (B,O)
- **Best practice-** best practice should be identified and shared amongst all relevant stakeholder e.g. local authorities, HECA network, agencies, professional bodies, utilities etc (O)
- **Funding-** there is a lack of funding sources and incentives, which are needed to deliver the targets and aims of the Strategy. The Strategy could be a lever for funding (B,O)
- **Aims-** currently the aims are framed as missions instead of being SMART (Specific, Measurable, Achievable, Realistic and Time-framed)
- **Training-** there is a lack of industry understanding regarding renewable energy technologies. This needs to be overcome through training, accreditation and certification, supported by a regulatory or policy framework. There is the potential to expand the renewables market and create jobs (O)
- **Incentives -**need to create more universally attractive offers and provide positive incentives, including incentives for landlords (O)

Further key barriers identified include:

- 'Flat-lining' economy at present
- Local authorities themselves can be a barrier due to lack of expertise/engagement
- Lack of real political support for support delivery

Further key opportunities identified include:

- Increased demand for measures will drive down costs and encourage innovation
- Carbon off-setting could be used where reasonable
- Energy price rises will improve payback periods

Group work session 2: Priority areas to actions

Priority area 1 – Targeting the Fs to Gs in private sector housing

Identification

Work groups discussed the issue of appropriate and effective techniques to identify the worst-performing / most thermally inefficient homes in the stock. In at least one work group, the proposed objective was ambitious – to identify all F and G rated properties in the South East. Furthermore, one work group thought it was important to establish a common process that all local authorities could use to identify these homes, possibly sign-posting local authorities to the appropriate stage in the process, depending on their existing level of housing stock knowledge – a role that could be facilitated by the EST's Practical Help

service. There were two main approaches to identification, which may work best when applied in combination.

First was the collection of new local data on the housing stock. An example of this was highlighted in Linzi Bagshaw's earlier plenary presentation of aerial thermal imaging carried out in Slough Borough Council. It was suggested that SEEDA, GOSE and the Building Research Establishment (BRE) investigate optimal ways of identifying the worst-performing properties, potentially with a view for employing new technological applications for thermal imaging.

The second approach was to share and use existing datasets on the housing stock more effectively. A potential cornerstone for this approach is the use of the HEED for EPC data which provide the A to G rating, so suggestions for better use and sharing of stock information revolved around EPCs and HEED. For this, considerable lobbying by local authorities of Defra may be required, as street level data from HEED is at present unlikely to be made available to local authorities. The CSE's 'off-gas' database was repeatedly highlighted as a source of information for identifying properties with potentially high running costs. Finally, one work group identified the need to systematically pull together all existing data on housing energy performance from various surveys and databases¹⁰².

Targeting and implementation

Following effective identification of F and G-rated homes, households will need to be targeted effectively. The question is how these properties can be prioritised more than others in light of existing mechanisms targeting energy efficiency improvements at households, in particular energy suppliers under CERT. A theme that emerged from the work session was to make it easier for energy suppliers to channel energy efficiency improvements into these properties in particular. Local authorities and Energy Advice Centres (including the EST) would need to play a key role in this, for example by lobbying energy suppliers with the aid of data collected in the process of identifying the worst-performing homes. A further point noted, though not explained, was the notion of using 'green' residential letting agencies.

However, a key concern arose during discussions regarding what measures need to be implemented in F to G-rated properties. What emerged was that these properties are by no means uniform. Some may still have the capacity for 'low-hanging fruit' energy improvements to be installed (such as cavity wall insulation or condensing boilers), whilst many others are poorly rated simply because they are hard-to-heat (and possibly hard-to-treat), necessitating more expensive, 'non-standard' measures such as solid wall insulation, heat pumps and/or micro-generation to bring the rating up.

What may be necessary to achieve effective targeting of F and G-rated homes in the private sector and subsequent installation of energy improvements is the 'bundling' of local authorities' clout by way of enhanced regional coordination of existing housing improvement projects as well as efforts to secure CERT schemes and funding – as well as pooling administrative capacity to channel advice and follow-through (potentially via a 'light' version of London's 'Green Concierge' service) on subsequent action. No lead organisation for doing this was identified during the work session. At the same time, in order to address the segmentation of the F to G-rated market, preferred suppliers and installers would need to be identified for the various improvement measures needed, possibly with Energy Advice Centres compiling such a directory at regional / sub-regional level.

¹⁰² These might include the EHCS, the Survey of English Housing, the Centre for Sustainable Energy's Fuel Poverty Indicator and off-gas database, HEED, studies commissioned by the Energy Efficiency Partnership for Homes etc.

No specific suggestions for additional resources required and sources of funding were made.

Priority area 2 – Planning gains for the existing stock

Receptive environment

One work group deemed the current economic climate as politically suitable for using planning gains to reduce CO₂ emissions from the existing housing stock. Concerted support by council leaders could provide fertile ground for introducing this approach regionally. This was deemed important by another work group in order to ensure there is a level playing field across local authorities in the South East, in particular at a time when house-building needs and reality are increasingly divergent.

Developing capacity

Regardless of the means by which a mechanism, or mechanisms, of using planning gains for the existing stock might be implemented across the South East, it would need the support and understanding of elected Members, LPAs and built environment professionals to ensure it has an impact. Resource would be required to develop and provide appropriate training and raise awareness. One work group suggested that EST, the Building Research Establishment (perhaps as training provider), SEEDA and universities would need to be involved, with funding for developing the training role coming from central Government (CLG/BERR/Defra).

Effective incentives

Much discussion in the work session focused on making sure the incentives for using planning gains for the existing stock were designed carefully, incorporating the 'judicious' use of both carrots and sticks. For example, in order to enable energy improvements for existing homes that are having an extension built, the idea of using council tax breaks proved popular, in addition to the requirement to install cost-effective energy efficiency measures when planning permission for an extension is sought. The overall level of tax breaks offered should be equivalent to the amount raised for carbon reductions via planning gains. At the same time, the concern was raised that any incentive implemented along these lines must be designed in a manner that does not duplicate or undermine the efforts of existing grants and discounts for energy improvements¹⁰³. One possibility to ensure this is achieved is that local authorities investigate such incentivisation options in partnership with energy suppliers.

Much consideration also to be given to the level of 'local carbon tax' developers may be required to pay should they be unable to meet LPAs' targets for energy efficiency on new developments.

Getting the 'mix' of carrot and stick right, for both developers and home-owners would require, pending further research, the close involvement of local authority finance officers, with regional coordinating activities led by SEEDA, EST and the Regional Assembly, to ensure the aforementioned level playing field. Nevertheless, at least one work group did urge to build on existing experience, proposing a phased regional introduction of the 'Milton Keynes Rule', backed by central Government.

¹⁰³ Such as the British Gas council tax rebate scheme.

Priority area 3 – Sustaining local support for residential sustainable energy initiatives

Raising and maintaining awareness and profile of housing and sustainable energy

One work group put proposed the use of a clear and concise carbon management matrix for climate change officers to convey progress on NI 186 to senior managers and secure their backing in local authorities. Furthermore, the South East HECA Forum was identified as a potential regional hub or knowledge bank to exchange best practice and experience on housing energy improvement initiatives amongst local authorities, in an effort to minimise effort duplication. To some extent, a prerequisite for this would be to maintain continued support for the Home Energy Conservation Act's requirement that local authorities act as Energy Conservation Authorities. Individual local authorities voluntarily benchmarking their performance on NI 186 and 187 against the performance of others may spur further local authorities to adopt the indicators. The emerging idea behind the wide sharing of best practice and experience is to demonstrate that it is entirely possible across the region for local authorities to choose adopt these indicators (in Local Area Agreements) and perform very well against them.

Similarly, though as an alternative to the south east HECA Forum acting as a hub was to develop a knowledge network of local authority housing energy champions, at Member level, with individual champions identified by local authorities. SEEDA and the Regional Assembly could provide support for this by commissioning research into regional, national and even international good practice and feeding this into the energy champions network or south east HECA Forum.

Reaching outside of the local authority sphere, energy suppliers, community and not-for-profit organisations and residents groups should place pressure on their Council to adopt indicators NI 186 and 187. The means by which such activity would be galvanised was not specified.

Maintaining momentum and attracting further funding

More regular events such as the one held at Gatwick may prove critical in maintaining a sense of regional momentum to underpin better information sharing, coordination and delivery.

Higher-level support within local authorities for residential sustainable energy initiatives, in particular in the case of retaining HECA obligations and or adopting NI 186 and 187, should ensure Officers have the backing needed to place renewed or continued emphasis on securing external funding and agreements for housing energy improvements. Many local authorities in the South East are already well versed in brokering relationships with contractors and reaching framework agreements for suppliers of sustainable energy goods and services, particularly under CERT and Warm Front. However, as mentioned in the briefing for the workshop, access to this funding across the region is below the English average and amongst local authorities it is highly variable.

Proposals for seeking or attracting funding beyond the 'usual suspects' of Warm Front and CERT focused in particular on the Regional Housing Board, which potentially could provide revenue funding for the coordinating the delivery of sustainable energy measures. It was suggested by one work group that £10K annually could suffice to provide part-time support to LPA groups focusing on maximising the use of planning gains to refurbish the existing housing stock. Careful consideration needs to be given, in particular by the Regional Housing Board, to ensure coordination between regional housing funding and other sources, as well as across local authority boundaries.

For example, good added value can be appropriated by using disabled facility grants for hard to treat homes in appropriate cases.

Furthermore, continued efforts should be made to develop so called 'shared means, different objectives' agendas between local authorities, Primary Care Trusts, the voluntary sector and Local Strategic Partnerships with respect to housing and energy, and fuel poverty in particular¹⁰⁴. It was suggested that fuel poverty coordinators at sub-regional level be jointly funded by such 'shared means' partnerships. On the targeting side, the shared means approach has great potential for ensuring positive messages about saving energy and increasing comfort reach households by permeating many social institutions and groups.

Priority area 4 – Further-reaching community energy initiatives

Community mobilisation

Many proposals were put forward by work groups during the session with respect to empowering community groups to take action in areas relating to the low carbon housing and affordable warmth strategy. One group put forward a partnership of SEEDA, the Regional Assembly, GOSE, local authorities, the south east HECA Forum and Energy Advice Centres to provide a 'community network resource' to facilitate community groups' activities. This resource would bring together all existing community initiatives to systematically share ideas, and identify and consolidate core messages. Underpinning this could be a mapping process clarifying the 'myriad' of organisations, schemes and government programmes relating to community initiatives to avoid duplication of effort. This could then be augmented by a 'greening community' road show across the region to mobilise community action and identify community leaders, followed by a 'champions' training day for the latter. A proposed lead or sources of funding for this were not recorded.

However, another group recorded that regional bodies should not be involved in community mobilisation as they are too far removed from what are predominantly grassroots initiatives.

Community support

It was suggested that SEEDA support for securing corporate sponsorship to promote localised voluntary sector 'green campaigns', perhaps based in and around schools, involving competitions, challenges and nominating 'green heroes'. This could be tied together with open 'eco-homes' to demonstrate the energy improvements and behavioural changes required to the public. In parallel to corporate sponsorship, tenant participation organisations and housing associations could offer funds that community groups with innovative engagement ideas could bid for. There was no mention of the additional resources and funding required¹⁰⁵.

Priority area 5 – Innovative funding structures for able-to-pay households

Piloting options

Most of the discussion under this priority area focused on the merits of different incentivisation mechanisms to 'unlock' able-to-pay households' own resources for funding energy improvements in their homes. There did not appear to be a firm view on 'what mechanism works best', with a number of groups identifying a need for further research and piloting to establish the most effective mechanisms for the regional/sub-regional context. One

¹⁰⁴ Such as in the West Sussex Healthy Homes Partnership.

¹⁰⁵ Though this could potentially represent a successful bid for the Energy Saving Trust's Community Action for Energy funding, which is then redistributed at even more local level. See www.energysavingtrust.org.uk/cafe/welcome.

group suggested a formal options appraisal of green mortgages, government approved low-interest loans, council tax rebates and equity release schemes (though a degree of scepticism emerged amongst a number of groups regarding the latter¹⁰⁶, with a slight overall preference for low-interest loans), followed by a pilot of and public consultation on the best options. The involvement of SEEDA, consultants (e.g. CSE, TEN) and local authorities would be required to carry out an options appraisal, with local authorities, energy suppliers, banks / building societies, home-owners and estate agents, along with formal central Government approval put forward for the pilot and consultation phases.

Funding

Financial resources are required to 'unlock' able-to-pay households' investment in cost-effective energy improvements. One oft-cited resource was to tap into (particularly South East-based) businesses' CSR objectives. SEEDA and local business groups could take the lead on drawing attention to CSR-based opportunities in the South East, such as 'adopt a green community' schemes or accredited carbon-offsetting for businesses pledging to go carbon neutral. It was put forward that CSR-based carbon-offset payments could be ideal for establishing a revolving and regularly topped-up low-interest loan fund (as carbon offsets are annual).

Administration

A recurrent theme in the discussions about targeting of and marketing to households is the issue of trust – that the financial incentives, accompanying measures on offer for home improvement are reliable and do pay off as promised. The organisations offering these must be equally reliable and trustworthy (a requirement which is even more salient as regards lower income and more vulnerable households). As regards the organisation(s) that actually administer the financial scheme or funding structure (particularly a low-interest loan scheme), this would need to be not-for-profit and with well-established trust credentials – potentially a credit union or cooperative form of financial institution. Regionally active banks and building societies should be approached by SEEDA in the first instance.

Marketing/targeting

It did not clearly emerge whether chosen funding structures should be marketed at regional or sub-regional level. What is clear is that a considerable marketing effort would be required to result in significant enough uptake. This ought to involve local authorities, EST, energy suppliers, universities and estate agents. Additionally, one group proposed the (re-)training of domestic energy assessors issuing EPCs to market financial schemes direct to households. Again, estate agents, EST, energy suppliers, but also training organisations and SEEDA would need to be closely involved.

The notion of a specific campaign targeting private landlords was raised, via an energy improvement handbook pointing to steps necessary to achieve Housing Health and Safety Rating System accreditation. For owner-occupiers, one proposal suggested adding financial in addition to grant advice to the services offered by the region's Energy Advice Centres in order to establish a complete 'one-stop-shop' for the able-to-pay sector.

¹⁰⁶ In particular regarding elderly households, as well as in the context of the current economic climate.

15 Abbreviations used

ACE	Association for the Conservation of Energy
ALMO	arms-length management organisation
AONB	Area of Outstanding Natural Beauty
BERR	Department for Business, Enterprise & Regulatory Reform
BRE	Building Research Establishment
BREEAM	BRE Environmental Assessment Method
CEEF	Community Energy Efficiency Fund
CEN	Creative Environmental Networks
CERT	Carbon Emissions Reduction Target
CFL	compact fluorescent lamp
CHAID	Chi-squared Automatic Interaction Detector
CHP	Combined Heat and Power
CIL	Community Infrastructure Levy
CLG	Department for Communities and Local Government
CO ₂	carbon dioxide
CPA	Comprehensive Performance Assessment
CSE	Centre for Sustainable Energy
CSR	corporate social responsibility
Defra	Department for Environment, Food and Rural Affairs
DH	district heating
DHS	Decent Homes Standard
Eaga PCT	Eaga Partnership Charitable Trust
ECI	Environmental Change Institute (at Oxford University)
EEAC	Energy Efficiency Advice Centre
EEC	Energy Efficiency Commitment
EEPfH	Energy Efficiency Partnership for Homes
EFS	Expenditure and Food Survey
EHCS	English House Condition Survey
EPC	Energy Performance Certificate
ESCO	energy service company
ESD	Education for Sustainable Development
EST	Energy Saving Trust
ESTAC	Energy Saving Trust Advice Centre
EU	European Union
FoE	Friends of the Earth
FP	fuel poverty
FPAG	Fuel Poverty Advisory Group
FPI	Fuel Poverty Indicator
FTE	full-time equivalent
GOSE	Government Office for the South East
GVA	gross value added
GW	gigawatt
HECA	Home Energy Conservation Act
HEED	Home Energy Efficiency Database
HHSRS	Housing Health and Safety Rating System
HTT	hard to treat
IPPR	Institute of Public Policy Research
KASH	Kent Action to Save Heat
kWh	kilowatt hour
LA	local authority
LAA	Local Area Agreement
LCZ	Low Carbon Zone

LPA	local planning authority
LPG	liquefied petroleum gas
LZC	low and zero carbon (technologies)
MtC	million tonnes of carbon
MtCO ₂	million tonnes of carbon dioxide
MTP	Market Transformation Programme
MW	megawatt
MW _e	megawatt electricity
NEEAP	National Energy Efficiency Action Plan
NI	National Indicator
ONS	Office for National Statistics
PCT	Personal Carbon Trading
PG	Priority Group
ppm	parts per million
PRS	private-rented sector
PUSH	Partnership for Urban South Hampshire
PV	photovoltaic
RENUE	Renewable Energy in the Urban Environment
RES	(South East) Regional Economic Strategy
RHA	Regional Housing Allocation
RHB	Regional Housing Board
RPG	Regional Planning Guidance
RSPB	Royal Society for the Protection of Birds
RSS	(South East) Regional Spatial Strategy
SAP	Standard Assessment Procedure
SE	South East
SEA	Sustainable Energy Action
SEEDA	South East England Development Agency
SEERA	South East England Regional Assembly
SHECANE	Southern Home Energy Conservation and Action Network
SHLP	Southern Home Loans Partnership
SMART	Specific, Measurable, Achievable, Realistic and Time-framed
USEA	United Sustainable Energy Agency

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