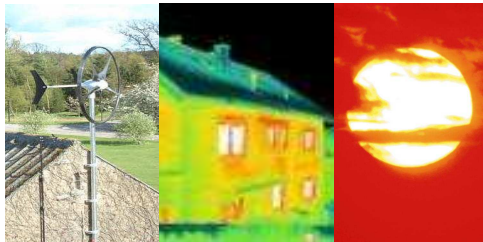


SOUTH WEST REGIONAL TARGETS FOR LOW CARBON HOUSING AND FUEL POVERTY



FINAL REPORT

NOVEMBER 5TH 2006

**GOVERNMENT OFFICE FOR THE SOUTH WEST
TOGETHER WITH REGIONAL PARTNERS**

ACKNOWLEDGEMENTS

This strategy and action plan was developed on behalf of regional partners by Peter Capener (independent consultant), Dr Richard Moore (Warwick University) and Centre for Sustainable Energy.

Dr Richard Moore carried out the modelling on the English House Condition Survey as outlined within Annex 4 and also contributed to the analysis. Centre for Sustainable Energy carried out the modelling of carbon emissions as outlined within Annex 7 and also contributed to the analysis and the baseline research. The drafting of the strategy and action plan together with the data analysis has been carried out by Peter Capener, who also led the project delivery and the consultation process.

In addition to the consultation process that involved a wide range of regional partners, particular contributions to the development of the strategy and action plan were made by Government Office for the South West, NEA, the Association for the Conservation of Energy, Energy for Sustainable Development and the Energy Efficiency Advice Centres within the South West.

The development of the strategy and action plan was funded by Government Office for the South West and the Energy Saving Trust and was overseen by a steering group that involved, Government Office for the South West, the Energy Saving Trust, the Regional Assembly, the Regional Development Agency, the Environment Agency, Future Foundations, the South West HECA Forum, the Housing Corporation, Regen SW, NEA, the National Landlords Association and those organisations hosting Energy Efficiency Advice Centres within the South West, Dorset Energy Advice Centre, Severn Wye Energy Agency, Wiltshire Wildlife Trust, Centre for Sustainable Energy, West Country Energy Action Trust and Community Energy Plus

CONTENTS

Executive Summary	- 1 -
Regional Targets for Low Carbon Housing and Fuel Poverty	- 1 -
A step change in understanding and action	- 2 -
Developing a regional response	- 3 -
Section 1: Background	- 4 -
1.1 Scope of Regional Target Setting	- 4 -
1.2 National Policy Framework	- 5 -
1.3 The National Regulatory Framework	- 7 -
1.4 Summary of Key Regional Policy	- 7 -
1.5 Understanding Householder Definitions	- 9 -
Section 2: Where Are We Now? – Setting The Baseline	- 11 -
Section 3: What Can Be Achieved? - Modelling Future Potential	- 18 -
Section 4: Where Do We Want To Get To? - Setting Regional Targets	- 32 -
4.1 Setting Regional Carbon Targets	- 32 -
4.2 Setting Regional Fuel Poverty Targets	- 32 -
4.3 Regional Measures of Success	- 32 -
4.5 Summary of Regional Priorities for Target Delivery	- 33 -
4.6 Implications for Regional and Local Action	- 33 -
4.7 Implications for National Action	- 34 -
Annexes	- 35 -
Annex 1 – National Regulatory Framework	- 36 -
Annex 2 – Baseline Energy Efficiency Data	- 45 -
Annex 3 – Current Activity: Installations, Advice & Economic Impacts	- 56 -
Annex 4 – Modelling Methodology: Installation Forecasts and Fuel Poverty Assessment	- 65 -
Annex 5 – Impact of Delivering SAP Benchmarks	- 84 -
Annex 6 – Detailed Fuel Poverty Analysis	- 90 -
Annex 7 – Modelling Methodology: Carbon dioxide emission scenarios	- 97 -

LIST OF FIGURES

Figure 1: Relationship of Key Household Definitions.....	- 9 -
Figure 2: Overlap between Warm Front Recipients and the Fuel Poor	- 10 -
Figure 3: Impact of Fuel Price Increases on Numbers in Fuel Poverty within South West	- 12 -
Figure 4: Distribution of SAP (SAP 2001) Ratings by Fuel Poor Households in 2003 and 2005 and by hard to treat properties	- 12 -
Figure 5: Warm Front Expenditure by Eligible Household and Local Authority Area	- 15 -
Figure 6: Combined activity levels for the South West Energy Efficiency Advice Centre for 2004/2005 (HEC = Home Energy Check).....	- 16 -
Figure 7: Regional SAP profiles assuming a range of SAP benchmarks as used within the carbon modelling scenarios and the fuel poverty assessment..	- 19 -
Figure 8: Total carbon dioxide emissions for the South West with a range of assumptions for new build standards and electricity demand.....	- 20 -
Figure 9: Carbon impact of a range of scenarios to 2016 with reference to the 1990 baseline	- 21 -
Figure 10: Installation rate increase required to deliver scenario 3 – Regional Housing Strategy ‘Plus’	- 22 -
Figure 11 : Impact of industry constraints/opportunities on installations within existing housing	- 23 -
Figure 12: Carbon dioxide emission reductions from to 2020 and allowing for industry and funding constraints	- 24 -
Figure 13: Contribution to carbon dioxide emission reductions in 2020 (from figure 12) by measure	- 25 -
Figure 14: Impact of increased installation rates on the delivery of energy advice (background assumptions in table 8).....	- 26 -
Figure 15: Growth in economic benefits 2003 to 2020	- 27 -
Figure 16: Impact of rising fuel prices and energy efficiency improvements on SW fuel poverty Q1 2003 – Q4 2005.....	- 28 -
Figure 17: Variation in key factors between failing SAP 65 and reaching SAP 65 samples	- 29 -
Figure 18: Variation in key measure installation between failing SAP 65 and reaching SAP 65 samples	- 30 -
Figure 19: Increase in SAP rating following a range of measures.....	- 31 -

LIST OF TABLES

Table 1: Annual CO2 emissions arising from the domestic sector within the South West for 2003 baseline	- 11 -
Table 2: Key Energy Indicators for the English Regions	- 11 -
Table 3: Carbon Emission Factors.....	- 11 -
Table 4: Regional Indicators by Tenure	- 13 -
Table 5: Potential for Key Insulation Measures within South West	- 13 -
Table 6: Potential for Energy Efficient Lighting, Heating and Controls within South West	- 13 -
Table 7: Annual installation rates within existing housing, employment and GVA by measure (2005).....	- 14 -
Table 8: Conversion rates	- 17 -

Figures and tables in annexes listed separately in annexes document

GLOSSARY

CABE	Commission for Architecture and the Built Environment	NHS	National Health Service
CCP	Climate Change Programme	ODPM	Office of the Deputy Prime Minister
CHP	Combined Heat and Power	OSR	On-site renewables
CITB	Construction Industry Training Board	PCT	Primary Care Trust
CO ₂	Carbon dioxide	RA	Regional Assembly
CPD	Continuing Professional Development	RDA	Regional Development Agency
CSE	Centre for Sustainable Energy	RHB	Regional Housing Body
DEFRA	Department for Environment, Food and Rural Affairs	RIBA	Royal Institute of British Architects
DTI	Department for Trade and Industry	RSL	Registered Social Landlord
EAGA	Energy Action Grants Agency	RSS	Regional Spatial Strategy
EEAC	Energy Efficiency Advice Centre	SAP	Standard Assessment Procedure
EEC	Energy Efficiency Commitment	SEC	Sustainable Energy Centre
EHCS	English House Condition Survey	SEN	Sustainable Energy Network
EST	Energy Saving Trust	SW	South West
EU	European Union	SW COPROP	South West Association of Chief Corporate Property Officers in Local Government
GIS	Geographical Information System	SWRSP	South West Regional Skills Partnership
GOSW	Government Office for the South West	SWSEP	(The proposed) South West Sustainable Energy Partnership
GSHP	Ground Source Heat Pump	TCPA	Town and Country Planning Association
GVA	Gross Value Added	UK	United Kingdom
HE/FE	Higher Education/Further Education	URC	Urban Regeneration Company
HEC	Home Energy Check		
HECA	Home Energy Conservation Act		
HERDA SW	Higher Education Regional Development Association South West		
LGA	Local Government Association		
NAO	National Audit Office		
NEA	National Energy Action		
NGO	Non Governmental Agency		

EXECUTIVE SUMMARY

“Climate change is probably the greatest long-term challenge facing the human race.” Tony Blair, Forward to the Climate Change Programme 2006

“Climate change is the biggest issue for us to face this century. It's manmade. The science is done. It's complete. It's a matter of political understanding” - Sir David King, UK Government's Chief Scientist, giving evidence to House of Lords select committee (March 2004)

“If we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% ... to 20% of (global) GDP or more. In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year.” Sir Nicholas Stern, The Stern Review: The Economics of Climate Change 2006

“Fuel Poverty is a major social problem which, as energy prices rise, is affecting an increasing number of people. It is a disgrace that people are still living in cold, damp and poorly insulated homes in fear of debt to their energy supplier. Failure to (take action) will leave millions in hardship whilst continuing to waste energy” Alan Simpson MP, Chairman Parliamentary Warm Homes Group 2006

Regional Targets for Low Carbon Housing and Fuel Poverty

In response to the massive threat posed by climate change and fuel poverty, the South West will establish the following headline targets:

<p>Carbon dioxide emissions - 17% cut by 2010, 30% cut by 2020, leading to at least a 60% cut by 2050 from a 1990 baseline. Fuel poverty – Eradication of fuel poverty by 2010 in vulnerable households and in all households by 2016</p>

These targets mirror those set by national government. Current climate science suggests that deeper cuts will be required to alleviate the worst impacts of climate change. However the analysis underpinning this strategy and action plan suggests that the region will require stronger intervention from national government for these targets to be exceeded by any degree.

The threat of climate change, with associated sea level rises, more extreme weather events, high peak summer temperatures and high intensity precipitation, will have far reaching implications for the region. We have a responsibility to future generations to act with urgency to alleviate the worst impacts of climate change, impacts that are already beginning to affect the region. The domestic sector generates just under 30% of carbon emissions within the UK, which in itself is significant. However the impact of domestic sector action goes beyond the confines of the related emissions, as householders may also take improved awareness into their work lives and into their choices about transport.

Climate change can not be addressed without being mindful of the impact on the most vulnerable. As a result, this strategy and action plan looks to integrate where possible and appropriate, the twin domestic sector priorities of low carbon housing (including both energy efficiency and on site renewables) and fuel poverty (the inability to adequately heat the home without spending more than 10% of household income). Living in cold damp homes exacerbates the incidence of cold-related illness and is linked to the incidence of excess winter mortality. The medical intervention of those preventable illnesses places a huge burden on the NHS. In addition, a cold damp home has impacts on the quality of life, affecting levels of social interaction and children's educational attainment.

In the South West, the 2003 English House Condition Survey indicates 6.5% or just under 140,000 households as being in fuel poverty. However, rising fuel prices have substantially increased fuel poverty numbers. By the end of 2005 the numbers in fuel poverty had increased to around 225,000, by 2006 these numbers will have again increased significantly.

A step change in understanding and action

Nothing less than a transformation in the way we prioritise and act on energy issues will be sufficient to meet and exceed the regional targets outlined above. In the South West, we will need to increase installation rates for key energy efficiency measures and on site renewables by a factor of 3.5 to 4¹.

This will require a similar increase in the numbers of householders that are engaged by the regional energy advice network, such that over 10-12% of householders in the South West are receiving energy advice every year. This will need to be backed by a massive increase in the profile associated with energy issues in order to support the step change in householder attitudes and behaviour required to underpin the required take up of measures.

Whilst nationally available funding may deliver a 2.5 to 3 fold increase in installation rates for energy efficiency measures by 2010, the region will have to punch above its weight in drawing in additional funding to the region on energy efficiency. Given that there is some evidence that the region is currently securing below average levels of funding on energy efficiency, this is a significant challenge. It is unclear at the moment where the funding for on site renewable technologies will come from over this timescale.

However the region is starting from a low base. 43% of all households still have unfilled cavity walls, 30% have less than 100mm of loft insulation, and just under 60% have no low energy lights at all. Given the cost effectiveness of all these measures, this represents a poor response to the problem to date. The region has the least energy efficient housing of all government regions (all be it by a small margin), the highest level of failures on the thermal conditions within the Decent Homes Standard and a higher than average level of fuel poverty.

As a minimum, by 2020 the region should have no unfilled cavity walls and no poorly insulated lofts. However in itself this will not be sufficient. 20% of the regions housing will not be able to meet an acceptable standard of energy efficiency, even when all the basic cost effective measures have been applied. Unless the region is able to deal with these particularly 'hard to treat' properties, then neither carbon targets nor fuel poverty targets will be met. This will require more expensive solid wall insulation and greater up take of on site renewables. In addition there will need to be agreement on acceptable approaches to dealing with the region's protected buildings, either listed or in conservation areas (approx 6-7% of the region's properties).

Action within existing housing will provide up to 85% of the carbon savings required to deliver the 2020 target. Energy efficiency measures (including reducing electricity demand) will deliver in the order of 85-90% of the target carbon savings by 2020. However, the medium to long term importance to carbon targets of new build and on site renewables should not be underestimated.

The carbon footprint of new build will be increasingly important as the scale of new development expands. As such the draft Regional Spatial Strategy policies on sustainable construction will be significant, not only laying the foundation for significantly reduced carbon emissions but also providing an insurance against increased fuel poverty if future fuel prices were to rapidly rise.

¹ Whilst this factor increase is from a 2003 baseline, the analysis assumed the installation rates achieved over 2003-2005 was split equally over the three years. The effective required increase takes into account the significant increases already achieved during Energy Efficiency Commitment 1 (EEC1), the additional increases are effectively running from 2006 to 2010 covering EEC2, 2005-2008 and EEC3, 2008 to 2011 and Warm Front.

A short term focus on on-site renewables will also be essential to securing the longer term carbon saving required by growing targets, as well as securing appropriate and quality installations now and maximising the potential value to the region from a rapidly growing sector. Within the short term, on-site renewable technologies can also play an important role in helping to alleviate fuel poverty, particularly within the region's hard to treat properties where standard energy efficiency measures are not available or insufficient.

The huge increase in numbers of energy efficiency measures and the rapid increase in percentage terms for on-site renewables in both existing housing and new build, bring opportunities and challenges. The demand for skills within a rapidly expanding sector will place significant pressures on training provision in order to ensure quality installations. However an emphasis on growing the South West energy efficiency and renewable energy sectors will also help to secure the maximum potential benefit from the economic value that will be generated by the sector over the next 10-15 years.

Developing a regional response

Key regional bodies, such as the Regional Development Agency, Government Office, Regional Assembly and the Environment Agency, among others, have a huge influence on the region, either directly or through funding programmes.

Currently the South West does not fully utilise the potential offered by the activities of these regional organisations when it comes to the support that could be afforded to local action on low carbon housing and fuel poverty.

The South West Low Carbon Housing and Fuel Poverty Strategy and Action Plan published alongside this report, will address this gap by delivering action that can't be done at either national or local levels, securing maximum benefit from the national framework and supporting, enhancing and promoting the step change required in action at the local level.

The regional programme of action is designed to deliver against five key themes or aims:

1. Securing ownership
2. Enhancing the regional policy framework
3. Co-ordinating and enhancing regional communication
4. Supporting implementation of low/zero carbon development
5. Enhancing support for innovation and training

Work on existing housing, whilst not a separate aim, cuts across aims 1, 2, 3 and 5.

One of the priority actions is establishing some form of South West Sustainable Energy Partnership that can take ownership of this strategy and action plan and link the delivery of action in this area with the wider sustainable energy agenda. Clearly this partnership once established will need to review and adapt, as appropriate, the actions outlined within the annex. However given the short times scales and urgency driving the need for action, the plan has been presented in full with the intention that priority actions can be identified and progressed with a minimum of delay.

Along side an enhanced programme of regional action, a significant expansion of concerted action by the wide range of local stakeholders will be required in order to promote, support and deliver the step change in installation rates necessary to achieve the regional targets.

SECTION 1: BACKGROUND

1.1 Scope of Regional Target Setting

The approach to developing targets and the associated strategy and action plan recognises the need to place responses to climate change within the wider context of sustainable development. As a result, the analysis and modelling outlined within this document will address the severe social impacts of fuel poverty within the South West alongside the identification of the potential economic opportunities and benefits open to the region in developing a robust domestic sector response to the challenge of mitigating climate change and eradicating fuel poverty.

The primary purpose of the modelling is to assess the scale of the task facing the region in seeking to meet central government targets on climate change and fuel poverty within the domestic sector. The outcomes of this analysis will then inform the development of the South West Low Carbon Housing and Fuel Poverty Strategy and Action Plan, published alongside this report.

The modelling and analysis will address key issues relating to energy use within the domestic sector. For purposes of clarity four key definitions are outlined below that are central to the modelling and analysis outlined within this document.

- **Low carbon housing** - including energy efficiency and on-site (or micro) renewable technologies. Within this document low carbon technologies will be used as a term to cover both energy efficiency and on-site renewables. The strategy is not technology specific i.e. it does not have sections on individual technologies. As a regional strategy it instead focuses on laying the foundations for local decisions on the application of appropriate technology. The strategy does not cover CHP except where it refers to micro CHP or district heating.
- **Low/zero carbon development** - within this document low/zero carbon development is defined as being development that generates low or zero net emissions of carbon into the atmosphere as a result of building use. This definition includes all building emissions both regulated and non regulated, but does not include embodied energy nor carbon offsetting. This may or may not be the same definition that is adopted by the Regional Spatial Strategy in the light of the additional work currently underway on carbon neutral development and the final pronouncements by central government on the Code for Sustainable Homes.
- **Fuel poverty** - including the delivery of affordable warmth within the home and enhancing benefit take up as a means of income maximisation and providing passport benefits to securing grants for installing low carbon technologies. A fuel-poor household is one which needs to spend more than 10% of its income to heat its home to an adequate standard of warmth (21 °C in the living room and 18 °C in the other occupied rooms). As such fuel poverty is closely linked to poor household insulation levels, inefficient heating systems, rising fuel prices and low incomes and debt.
- **Hard to Treat Properties** - Hard to treat properties are considered to be properties that have a restricted number of cost effective energy efficiency measures available for improvement and include properties with solid wall and that are not connected to the gas grid. The 2003 English House Condition Survey suggests that just over 37% of properties in the South West fall into this category. However the analysis outlined within this report suggests that this definition needs some refinement as some properties that currently fall into this category are in fact very good in terms of energy efficiency. The analysis suggests that 20% of properties within the South West are particularly 'hard to treat' in that they will not reach a reasonable level of energy efficiency even after the installation of all available standard energy efficiency measures. This 20% overlaps, but is not totally covered by, the 37% of properties within the region commonly termed hard to treat. See section 3 for further analysis.

1.2 National Policy Framework

Climate Change Policy

Climate change is now widely acknowledged as the greatest environmental challenge to face the world today. The UK's response to this challenge encompasses a number of key targets and goals for greenhouse gas emissions reduction. For further details on how Climate Change is affecting the South West please see <http://www.oursouthwest.com/climate/>.

The Kyoto Protocol, signed in 1997, commits industrialized countries to reduce their collective emissions of greenhouse gases by 5.2% over 1990 levels by the commitment period of 2008-12. Targets were differentiated across countries to reflect their national circumstances and needs with the UK committing to a 12.5% cut. Over 160 countries have now ratified the Protocol, including the UK, sufficient for the Protocol to be legally binding for the ratifying parties. The Protocol was a landmark in international climate change negotiations, and remains so despite the well publicized position of a minority of countries such as the US and Australia whose Governments have not yet ratified the Protocol.

In 1997, the UK Government declared its own national policy goal to go beyond the Kyoto Protocol and achieve a more challenging 20% cut in Carbon Dioxide (CO₂) emissions on 1990 levels by 2010.

The Government published its Energy White Paper in 2003, following an extensive review of all aspects of energy policy by the Performance and Innovation Unit of the Cabinet Office (now the Strategy Unit). The Energy White Paper outlined a vision for achieving a 'low carbon economy', with a strong focus on decentralized power sources such as renewable energy, and the need for demand reduction. Among measures announced was a new goal of generating 20% of UK electricity from renewable sources by 2020 and a longer term goal to put the UK on a path to reduce carbon emissions by some 60% by 2050, with 'real progress' by 2020². This is in line with the recommendations of the Royal Commission on Environmental Pollution which warned that such a cut would be vital if the UK were to play its part in avoiding the worst effects of climate change³. The 60% cut equates to atmospheric concentrations of CO₂ of around 550ppm based on evidence available at the time. However recent research highlighted in the revised Climate Change Programme suggests that stabilisation of global concentrations of CO₂ needs to take place at 450ppm or even lower to avoid the worst impacts of climate change.

Given that current concentrations are around 380 ppm with annual increases in the region 1-2 ppm it is clear that action needs to be robust, quick and assume the government's targets as a starting point rather than the final word.

Unfortunately progress towards these targets has to date been mixed. The Government published its revised Climate Change Programme in March 2006, within which it highlighted current forecasts for greenhouse emissions in 2010. This suggests that by 2010 the UK is likely to have cut greenhouse gas emissions overall by 19.5% thereby exceeding the Kyoto commitment. However in terms of CO₂ alone, the UK is likely to have only made a 10.5% cut by 2010, as opposed to the target requirement of a 20% cut. As a result, within the revised Climate Change Programme the government announced a range of additional measures that reduce CO₂ emissions further to achieve a forecasted cut of 15-18% by 2010 on 1990 levels, still short of the original target of 20%.

The government also recently announced an Energy Review that will publish its results later in 2006. Whilst the review will be looking across the energy agenda, a central issue will be the future of nuclear power, a question which the White Paper had previously left open. The Review asks a number of key questions about the role of nuclear and gas in the light of the need for emissions reduction and improved security of energy supply.

² Energy White Paper, 'Our Energy Future – Creating a Low Carbon Economy', 2003.

³ 'Energy: The Changing Climate', RCEP, 2000.

The resurgence of interest in nuclear power has raised concern among some of what may happen to priorities on demand reduction and renewable energy supply, if new nuclear power stations are given the go-ahead. However as the Sustainable Development Commission has recently highlighted⁴, even a doubling of existing nuclear capacity would only save around 10% of the UK's CO₂ emissions. This is still a long way short of the long term target of a 60% cut in CO₂ by 2050. It is clear then that, nuclear or no nuclear, significant and sustained action will still be needed in areas of energy demand reduction and renewable energy generation, of the sort outlined in this strategy, if we are to make serious inroads to averting the threat of climate change.

Fuel Poverty Policy

The health and social implications of fuel poverty are immense and cry out for greater attention. For further information on fuel poverty within the South West see the guidance note produced for PCTs and health professionals by NEA. http://www.nea.org.uk/downloads/publications/GNote_fuelpoverty.pdf.

The Home Energy Conservation Act 1995 (HECA) requires every UK local authority with housing responsibilities to prepare, publish and submit to the Government an energy conservation report identifying practicable and cost-effective measures to improve the energy efficiency of all residential accommodation in their area. Regular progress reports are required. The Act includes a target for improving energy conservation in dwellings in England & Wales by 30% over a 10-15 year timeframe (from 1996 levels). While the role of local authorities in many cases is mostly as a facilitator of change, HECA has helped to focus their attention more closely on developing an integrated approach to their housing and energy efficiency strategies.

The Warm Homes and Energy Conservation Act 2000 requires the Secretary of State to publish and implement a strategy for reducing fuel poverty, and to set targets for the implementation of that strategy. It is in response to this Act that the Government published its UK Fuel Poverty Strategy in 2001⁵. The Fuel Poverty Strategy set out a goal to 'end the blight of fuel poverty for vulnerable households by 2010', with vulnerable households defined as older householders, families with children, and householders who are disabled or have a long-term illness. Fuel poverty in other households was to be tackled once progress is made on the priority vulnerable groups. In England the strategy defined an interim target to assist 800,000 vulnerable households through the Home Energy Efficiency Scheme (now known as the Warm Front programme, and the Government's principle tool for tackling fuel poverty in England) and to bring 400,000 social sector properties up to a 'decent standard' by 2004.

The National Service Frameworks for Coronary Heart Disease and Older People, together with Tackling Health Inequalities – A Programme for Action and the latest health white paper with its emphasis on independent living, all published by the Department of Health, all provide a clear case for the importance of addressing the health issues relating to fuel poverty. See <http://www.warmerhealthyhomes.org.uk/> for more information on fuel poverty and health policy links.

The Energy White Paper, published in 2003, set out a further commitment to 'ensure that every home is adequately and affordably heated', with the aim that as far as reasonably practicable no household in Britain should be living in fuel poverty by 2016-18.

Following on from the Fuel Poverty Strategy, in November 2004 DEFRA published 'Fuel Poverty in England: The Government's Plan for Action'. This Action Plan mainly contained announcements of changes to the Warm Front programme, including a target to improve the SAP rating of properties benefiting from the scheme to a minimum of 65 where possible. Progress against the goals in the strategy is monitored and reported on annually, with the most recent report⁶ stating that the number of vulnerable UK households in fuel poverty had fallen from 1.7 million to 1.2 million since 2001. However in the same document government estimates suggest that fuel price rises between 2003 and 2006 could put an extra 600,000 households within England into fuel poverty.

⁴ 'The Role of Nuclear Power in a Low Carbon Economy', SDC, 2006.

⁵ http://www.dti.gov.uk/energy/consumers/fuel_poverty/strategy.shtml

⁶ The Fuel Poverty Strategy 3rd Annual Progress report 2005

1.3 The National Regulatory Framework

Within England the government has established, or is in the process of establishing a range of mechanisms and/or instruments that require, support or encourage greater action on low carbon housing and fuel poverty, including:

- The Building Regulations
- The Standard Assessment Procedure (SAP)
- The Code for Sustainable Homes
- The Eco Homes Standard
- The Energy Performance in Building Directive (European legislation)
- The Home Information Pack
- The Decent Homes Standard
- The Housing Health and Safety Rating System
- The Landlords Energy Saving Allowance
- The Renewables Obligation
- The Energy Efficiency Commitment
- Warm Front
- Low Carbon Buildings Programme (formerly Clear Skies)

Annex 1 provides a brief summary of each of these initiatives.

1.4 Summary of Key Regional Policy

Regional Spatial Strategy (RSS)

The RSS will take the place of the Regional Planning Guidance and sets out the spatial strategy for growth and development in the region, and the strategic policies which will shape this. The RSS has been submitted to government by the Regional Assembly in draft and is now out for public consultation until August 2006. The draft document has a range of key policies of relevance to low carbon housing, in particular:

- Setting renewable electricity and renewable heat targets for the region (policies RE1 and RE3)
- Establishing a requirement for all larger scale developments (10 or more dwellings) to reduce carbon dioxide emissions by 10% from on site renewables (policy RE5)
- Requiring all new development and refurbishment to meet level 3 of the new Code for Sustainable Homes (equivalent to Eco Homes 'Very Good') and all larger scale development to meet level 5 (carbon neutral) (Development Policy G)

Regional Economic Strategy (RECS)

The RECS was published in 2006 by the Regional Development Agency and describes Sustainable Development as underpinning the approach to economic development within the region, with climate change and energy established as one of four themes. Environmental technologies (especially renewable energy and waste) are established as one of a range of key sectors, whilst regional priorities such promoting innovation, delivering skills and encouraging new enterprise all have significant implications and value for private sector growth within the energy efficiency and on site renewables sectors.

The RECs highlights the importance of having a fundamental review of the strategy in 2010 and outlines the RDA's intention to establish debate around five key themes that will influence that review, one of which focuses on the energy challenges facing the region.

The Integrated Regional Strategy (IRS)

The IRS ('Just Connect') was published in 2005 by the Regional Assembly. It establishes overarching strategy for the region and sets key aims and objectives that express the overall needs for the South West. Two of the five aims are particularly relevant

- To harness the benefits of population growth and manage the implications of population change – relevant 'crunch' objectives include:
 - to ensure that growth and development is sustainable supporting environmental quality, managing resource consumption and waste generation, promoting sustainable communities and supporting economic prosperity
 - to adapt to unavoidable climate change impacts and minimise any further impacts on a growing region
- To enhance our distinctive environments and the quality and diversity of our cultural life – relevant 'crunch' objectives include:
 - To ensure our natural resources are used much more wisely, minimising waste and increasing recycling, using renewables and promoting sustainable construction and good design

The Regional Housing Strategy (RHS)

The RHS was published in 2005 by the Regional Housing Body and is now being delivered via a series of five delivery groups, one covering sustainable construction (led by English Partnerships) and another covering the quality of existing stock (led by Government Office for the South West).

The RHS sets several relevant outcome targets including

- Average SAP ratings of properties housing vulnerable households will be higher than 65 by 2010 and for all the remaining housing stock by 2016
- 50% of new development will meet the requirements of the Code for Sustainable Homes
- All social stock will meet the Decent Homes standard by 2010 and at least 70% of vulnerable households in the private sector in the region will live in homes that meet the Decent Homes standard

Regional Environmental Strategy (RENS)

The RENS was published in 2004 by the Regional Assembly and establishes climate change as a cross cutting theme with a clear regional objective to minimise greenhouse gas emissions and respond to the risks, challenges and opportunities presented by climate change. The RENS supports the development of a regional sustainable energy strategy as well as the integration of climate change issues at local level through support for Local Strategic Partnerships and the development of sub regional/local sustainable energy plans

The Regional Sustainable Development Framework (RSDF)

The RSDF was published in 2001 by the Regional Assembly and Sustainability South West and is currently being revised by Sustainability South West. The RSDF establishes climate change as one of 15 themes with the regional renewable energy targets set as headline indicators in the absence (at that time) of more detailed regional data on carbon emissions.

1.5 Understanding Householder Definitions

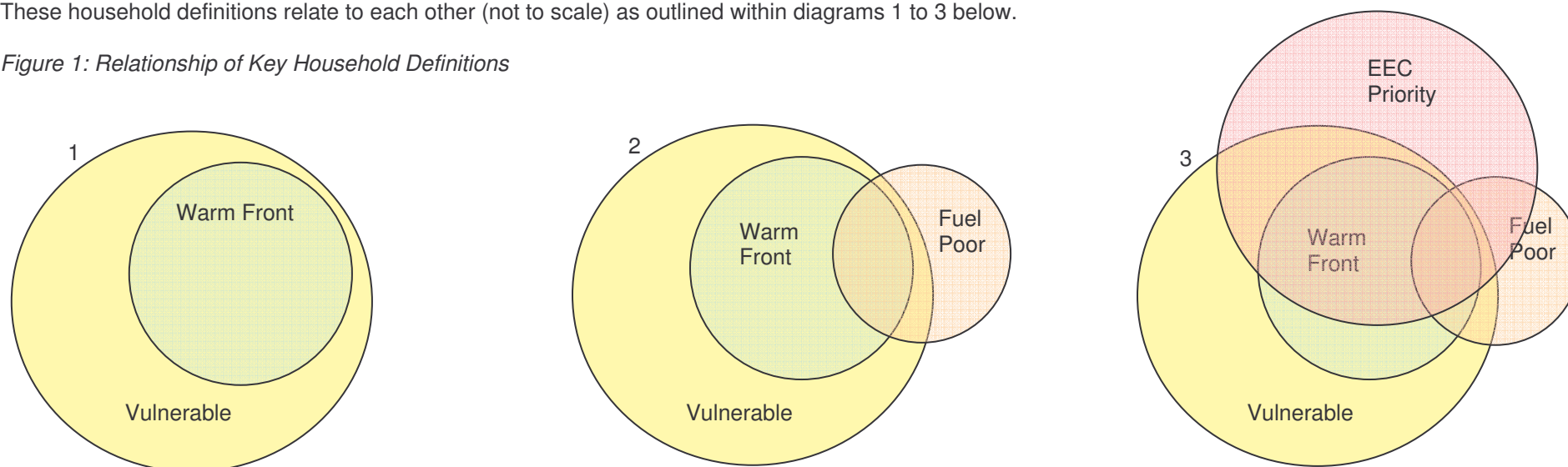
When considering existing housing there are a range of household definitions used depending on the context. When it comes to considering issues like targeting and how to address fuel poverty in particular, it is important to be able to relate these different definitions and understand the extent to which they do and don't overlap.

The principle definitions include:

- Priority households – 50% of the energy savings from Energy Efficiency Commitment funding must accrue to priority households, which include those households where one or more of the occupants receive one of the qualifying benefits. Priority households represent approximately 35% of all households on a national bases or roughly 770,000 households in the South West
- Vulnerable households – Just under 70% or roughly 1,500,000 South West households are defined as being vulnerable, which includes all those households with young children, occupants aged over 60 or occupants who are disabled or suffering from some form of long term illness
- Warm Front eligible households – Eligible households are those vulnerable households where one or more occupant is in receipt of one of the qualifying benefits. In the South West, EAGA estimate there to be in the order of 330,000 eligible households or roughly 15% of all households
- Fuel poor households – A fuel poor household needs to spend more than 10% of its income to heat its home to an adequate standard of warmth (21 °C in the living room and 18 °C in the other occupied rooms). The 2003 English House Condition Survey estimated there to be roughly 140,000 fuel poor households or 6.5% of the total. Fuel price rises have increased that number, see section 4 for more details

These household definitions relate to each other (not to scale) as outlined within diagrams 1 to 3 below.

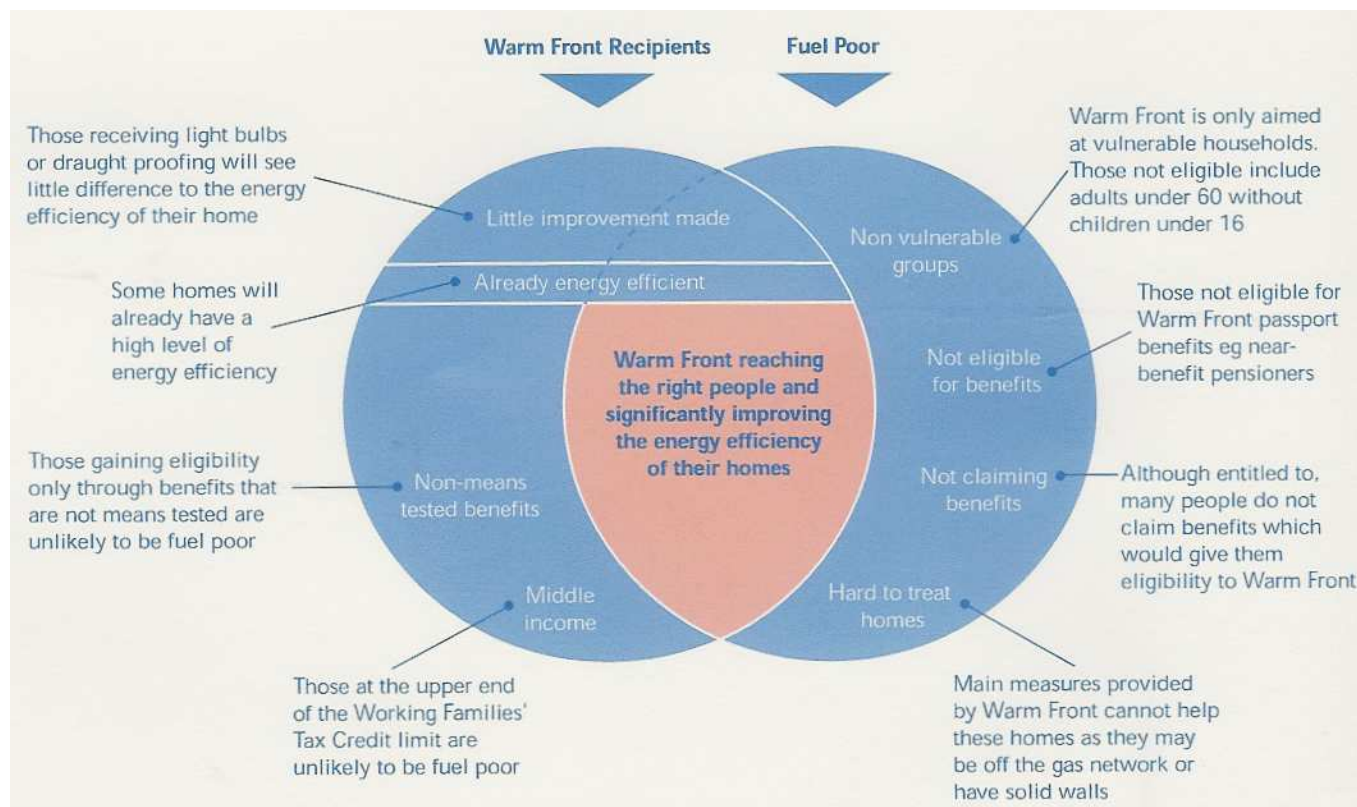
Figure 1: Relationship of Key Household Definitions



The diagrams illustrate a fundamental problem when it comes to addressing fuel poverty. The primary national funding mechanisms for improving the energy efficiency of fuel poor homes, the Energy Efficiency Commitment and Warm Front, will not reach all fuel poor households. This highlights the vital role local authorities have in supplementing the nationally available funds to target the fuel poor with local sources e.g. through regeneration funding

The relationship between warm front eligible households and the fuel poor was considered in more detail in the NAO report on Warm Front in 2003.⁷ The report clearly highlighted the mismatch between warm front eligible households and the fuel poor and the restrictions facing the scheme in taking households out of fuel poverty, even when fuel poor households were reached, as summarised in the diagram below.

Figure 2: Overlap between Warm Front Recipients and the Fuel Poor



Source: National Audit Office

These considerations have significant impact on how targets are developed to meet specific outcomes, for example eradicating fuel poverty and how strategy and actions need to be designed to deliver targets.

⁷ Warm Front: Helping to combat fuel poverty – National Audit Office 2003

SECTION 2: WHERE ARE WE NOW? – SETTING THE BASELINE

Table 1: Annual CO2 emissions arising from the domestic sector within the South West for 2003 baseline

Carbon dioxide emissions in the South West, domestic sector	GWhs	Percentage	Million tonnes	Percentage
	45,915	100%	13.44	100%
Gas	27,806	60.6%	5.62	41.8%
Electricity	11,413	24.8%	6.14	45.7%
Oil, Coal, and LPG	6,696	14.6%	1.68	12.5%

Source: DTI Energy Trends and Netcen/DEFRA

Table 3: Carbon Emission Factors

Fuel Type	Carbon factor kg CO2/kWh
Gas	0.19
Electricity	0.54 ⁸
Oil	0.25
Coal	0.3
LPG	0.21
Biomass	0.025

Source: DEFRA 2005

Table 2: Key Energy Indicators for the English Regions

GO Regions	Average SAP	% in fuel poverty*	% vulnerable	% hard-to-treat**	% failing DHS-TC***	Excess winter deaths 04/05	Total no. of households
North East	54.8	8.7	76.6	21.8	15.5	1,500	1,091,972
Yorks & Humber	51.5	8.6	73.5	29.8	23.7	3,200	2,089,786
North West	52.5	6.3	73.2	26.7	24.0	4,500	2,827,661
East Midlands	51.1	6.3	70.7	37.6	18.1	2,500	1,777,207
West Midlands	49.6	6.7	71.6	40.1	23.4	3,600	2,163,226
South West	49.3	6.5	69.7	37.6	27.7	3,200	2,136,132
East England	51.1	5.1	68.8	38.7	19.5	3,400	2,267,996
South East	52.4	4.4	71.1	30.0	21.6	4,500	3,359,097
London	52.4	3.6	68.0	66.3	21.8	3,400	3,011,077
England Total	51.6	5.9	71.1	37.8	22.1	29,700	20,724,154

** All households with solid walls, of pre 1981 non-traditional construction or in a postcode with no gas supply.

*** Decent Homes Standard Thermal Component

Source: ODPM 2003 English House Condition Survey

The South West has on average:

- The most energy inefficient housing of all the English regions
- The highest proportion of homes failing the decent homes standard on thermal performance
- A higher proportion of households in fuel poverty than the average for England as a whole

The South West has a significant level of hard to treat properties within the region, with 16% of all properties off the gas grid and over 6% of properties either listed or in conservation areas (see annex 3 for more details on protected buildings)

⁸ Netcen/DEFRA assume 0.54 kgCO₂/kWh rather than the standard 0.43 when calculating carbon emissions for electricity. This represents the actual value calculated for emissions in 2003. This is the figure that is then used through the modelling outlined within this report. See annex 7 for further discussion of the implications of this point

The 2003 English House Condition Survey indicates 6.5% or just under 140,000 households as being in fuel poverty. However, rising fuel prices have substantially increased fuel poverty numbers. By the end of 2005 the numbers in fuel poverty had increased to around 225,000⁹. Though figure 2 suggests that 99% of fuel poor households still have SAP ratings of less than 65.

Figure 3: Impact of Fuel Price Increases on Numbers in Fuel Poverty within South West

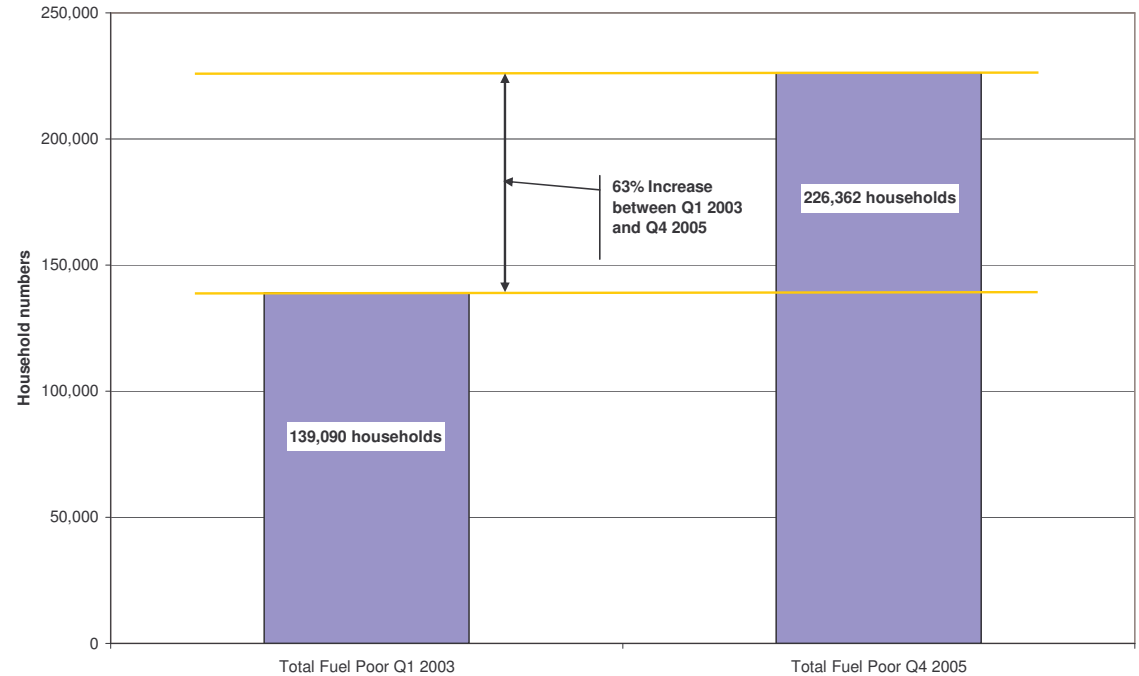
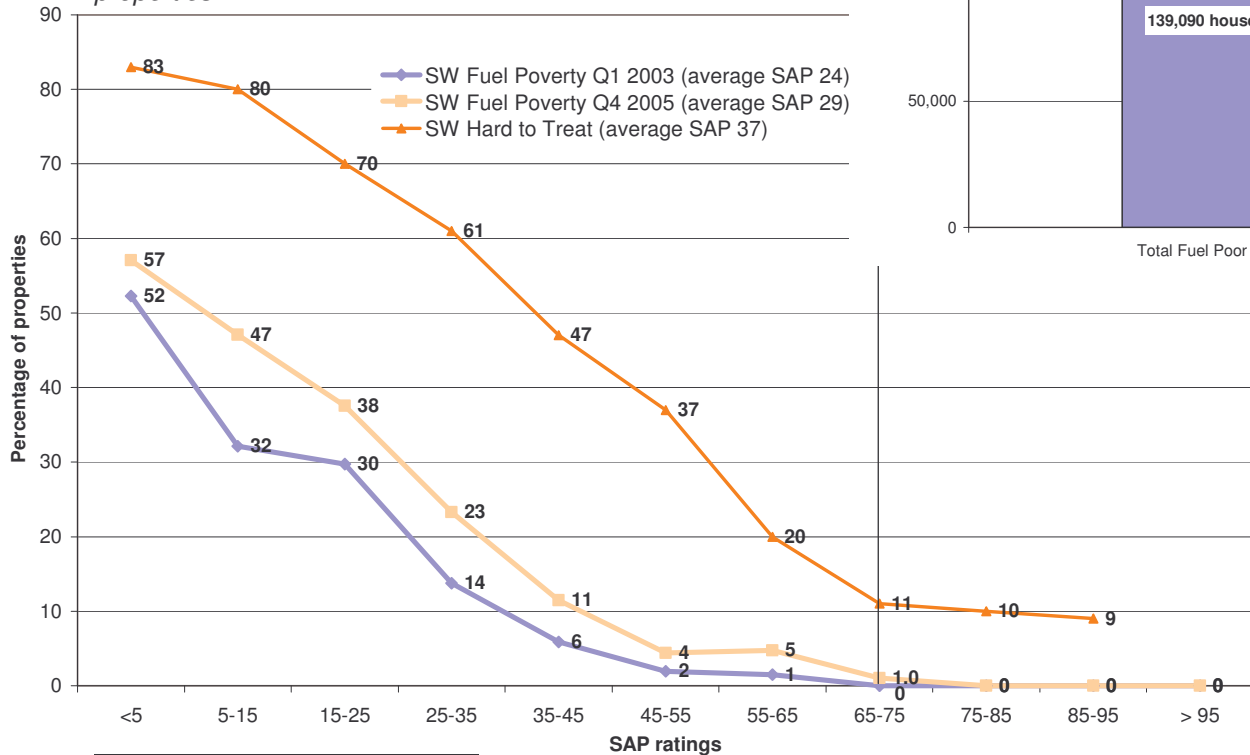


Figure 4: Distribution of SAP (SAP 2001) Ratings by Fuel Poor Households in 2003 and 2005 and by hard to treat properties



Source: Based on 2003 English House Condition Survey and the fuel component of the DTI Retail Price Index which indicates an increase in real terms of 25.8% for gas, 16.8% for electricity, 15.9% for coal and 54.3% for oil/LPG during the period 2003 to 2005

The average SAP rating (a measure of home energy efficiency on a scale to 120) across fuel poor households within the South West is 24 compared to all households where the average is 49. Whilst the average of hard to treat properties is 37 (less than the regional average), it is clear that a significant number of the so called hard to treat are actually very energy efficient.

⁹ Based on modelling undertaken as part of this project and based on increases in the fuel component of the DTI's retail price index to Q4 2005, the latest available data

Table 4: Regional Indicators by Tenure

Data for SW only	Average SAP	% in fuel poverty	% vulnerable	% hard-to-treat**	% failing DHS-TC	Number of households
Tenure						
Own with mortgage	49.9	3.1	58.0	38.2	22.1	946,000
Own outright	47.7	11.0	83.1	30.7	28.9	677,000
Private Rented	42.3	12.2	51.0	55.4	42.8	227,000
Local Authority	54.9	3.6	92.1	40.5	32.4	141,000
RSL	58.6	1.8	90.8	35.0	31.2	145,000

Table 5: Potential for Key Insulation Measures within South West

% of all properties	Lofts insulated		Cavity Walls	Un-insulated cavity walls	Solid walls	Un-insulated solid walls
	None	<100mm				
Fuel poor households	10%	40%	57%	49%	43%	27%
All households	2%	28%	72%	43%	28%	19%

Table 6: Potential for Energy Efficient Lighting, Heating and Controls within South West

% of all properties	Low energy lights		Heating system >12yrs old	Heating controls		Average SAP rating
	None	>60%		No programmer	No thermostat	
Fuel Poor Households	50%	1%	69%	35%	26%	24
All households	59%	3%	44%	8%	5%	49

Source: ODPM 2003 English House Condition Survey

Private sector housing including owner occupied and private rented has a lower SAP rating than social housing. Private rented housing also has the highest proportion of households failing the Decent Homes Standard on thermal performance, the highest proportion of hard to treat homes and the highest percentage of fuel poor households.

There is massive potential for higher levels of energy efficiency and the installation of on-site renewables, for example:

- 43% of all households in the SW have un filled cavity walls (30% of households have filled cavities with the remaining 27% with solid walls)
- 30% have less than 100mm of loft insulation
- 59% have no low energy lighting at all
- The only renewable energy technology being installed in any numbers within homes is solar water heating

Fuel poor households have on average far lower levels of energy efficiency and overall more solid walls

Initial estimates (see table 7 below) suggest that the current SW installer base within existing housing, currently employs 400-450 full time equivalent staff and generates GVA worth approximately £12-12.5 million annually to the regional economy (not including mainstream activity that has an energy efficiency impact like glazing and boiler upgrades or activity that involves DIY installation like low energy lighting or electrical appliances). See annex 3 for more detail.

Table 7: Annual installation rates within existing housing, employment and GVA by measure (2005)

Measure	Total Measures	Labour/job (days) ¹⁰	Employment (FTE) ¹¹	Plus ancillary staff ¹²	Installed cost/measure ¹³	Total Cost	GVA ¹⁴	
Cavity Wall Insulation	28,000	0.6	95	159	350	£9,800,000	£3,920,000	
Loft insulation top up	30,000	0.4	68	114	340	£10,200,000	£4,080,000	
Draught proofing	6,000	0.1	3	6	170	£1,020,000	£408,000	
Hot water tank Insulation	7,500	0.3	13	21	60	£450,000	£180,000	
External wall insulation	600	15	51	85	11,800	£7,080,000	£2,832,000	
Internal wall insulation	100	6	3	6	1,300	£130,000	£52,000	
Double glazing	90,000	3.0	1534	2557	2200	£198,000,000	£79,200,000	Mainstream - i.e. all windows or boilers now installed are energy efficient and therefore numbers unlikely to grow significantly
A & B rated boilers	115,000	2.0	1307	2178	1800	£218,500,000	£65,550,000	
Central heating controls upgrade	70,000	0.3	119	199	150	£11,200,000	£3,360,000	
Ground Source Heat Pumps	40	13	3	5	6,300	£252,000	£75,600	
Biomass boilers	10	8	0	1	6,000	£60,000	£18,000	
Solar water heating	630	6	21	36	2,300	£1,449,000	£434,700	
Solar PV	65	4.0	1	2	12,000	£780,000	£234,000	
Micro wind	20	1.2	0	0	2,000	£40,000	£12,000	
Total			3221	5369		£458,961,000	£160,356,300	
Total ex mainstream measures			261	435		£31,261,00	£12,246,300	

Source: EAGA Ltd, Energy Saving Trust, FENSA, DEFRA, and assumptions derived from discussions with industry

This assessment doesn't suggest that this represents the number of employees working in the region in this part of the sector, merely that this is the number that might be supported by the current level of installation. It doesn't take into account the fact that for some technologies like solid wall insulation, the majority of the work is done by out of area companies and for some on-site renewables technologies there are significant levels of out of area work done by SW companies

The analysis doesn't include other related activity including consultancy, advice, R&D, equipment supplies, manufacturing etc and only covers the domestic sector. For example a study of the renewables sector by DTZ for Regen SW suggested that well over 50% of employment within the region's renewable energy sector was in consultancy, R&D, manufacture and supply of equipment.

The DTZ study suggested that in 2005 the renewables sector in the South West employed approximately 1,100 full time equivalent staff and generated GVA worth 33.8 million per year. Given a similar proportion of staff and GVA generated within the non installation sub sectors as highlighted by the DTZ study for the renewables sector, then the domestic low carbon technology sector will be generating a similar scale of economic benefits to the region.

¹⁰ Labour requirements per job derived from discussions with South West installers

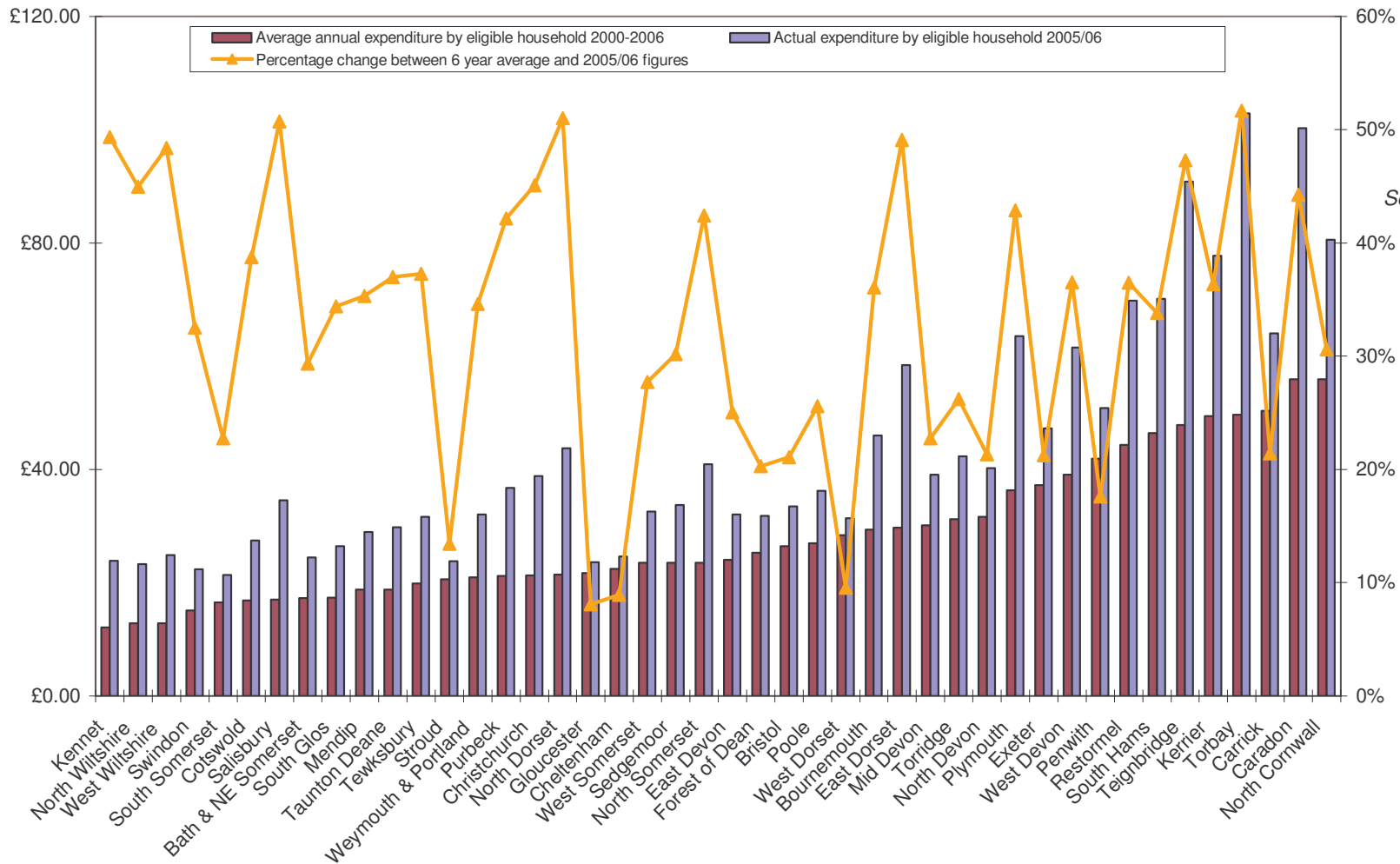
¹¹ Assumes 220 days in working year and a productivity rate of 80%

¹² Assumes within companies installing measures, 60% of staff are actually installers, the other 40% include administration, management, technical support/monitoring etc

¹³ Installed costs based on average costs generated for installations within the South West from the modelling summarised in annexes 4 and 5

¹⁴ Assumes GVA or Gross Added Value is taken to be turnover less the cost of materials, components and services and represents approximately 40 or 30% of total installed costs depending on the measure - based on a review of selected annual accounts and discussions with the sector

Figure 5: Warm Front Expenditure by Eligible Household and Local Authority Area¹⁵



Data provided by EAGA Ltd, managing agents for the Warm Front programme within the South West and outlined within figure 5, demonstrates the huge range of take up levels within local authority areas within the region. If the lowest level of take up was increased to the highest it would increase funding availability within the region by a factor of 2.5.

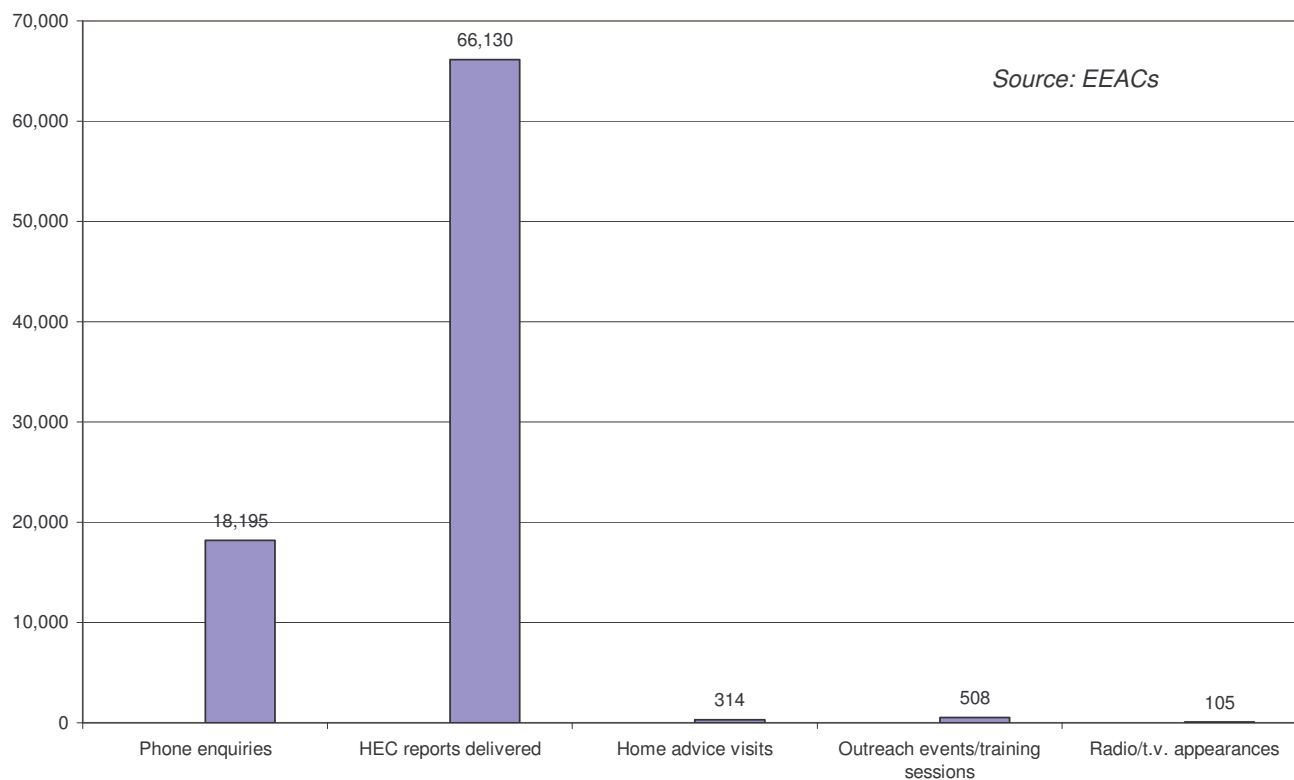
¹⁵ The data on eligible households has been estimated by EAGA using statistical modeling of a range of factors. In addition, council housing and housing association housing are taken out, as the Warmfront grant does not apply to this group along with those households who have already received a Warmfront grant. The Isles of Scilly have been excluded due to the very small sample sizes available for this area

This analysis does not demonstrate which areas are securing the highest level of funding in total as some areas may be getting a far higher proportion of funding through the Energy Efficiency Commitment rather than through Warm Front.

Data available nationally would suggest that the region is only claiming 70-80%¹⁶ of its fair share of Warm Front funding. Information on take up of Energy Efficiency Commitment funding is not currently obtainable at a regional level.

The analysis in section 3 assumes the region currently installs a proportional share of the national breakdown of installed measures. If in reality, installation rates within the South West that are lower than the region's share, the scale of the task to achieve the regional targets will be even greater.

Figure 6: Combined activity levels for the South West Energy Efficiency Advice Centre for 2004/2005 (HEC = Home Energy Check)



The South West has an active Energy Efficiency Advice Centre (EEAC) network that is the most significant source of energy advice for householders. Energy suppliers run their own energy advice services but the level of contact with householders is a lot lower than through the Energy Efficiency Advice Centres.

EEAC clients currently deliver in the order of 20-30% of all SW installations for selected key measures, with conversion rates of 15-19%.

In 2005 EEACs secured in excess of £2 million per year in revenue funding to support the delivery of advice and action at a local level, with core expenditure on energy advice in the order of £900k, including Local Authority partnership funding. Advice Centres also employ in the order of 43 full time equivalent staff with approximately 22 full time equivalent staff engaged in core advice delivery, the balance involved in supporting local authorities and outreach work. See annex 3 for details.

The EST is currently piloting an approach that builds upon the work of the Energy Efficiency Advice Centre network to develop a number of

¹⁶ Based on a comparison of the Warm Front take up from 2000 to 2005 within the South West and nationally, with what might be considered a 'fair share' based on household numbers. The 70% will need to be updated based on eligible households rather than all households.

Sustainable Energy Centres, operating as part of a Sustainable Energy Network. The roll out of the programme will take place during 2007/08

Sustainable Energy Networks will provide advice (currently delivered through the Energy Efficiency Advice Centres) as part of an integrated approach to changing consumer behaviour on a much larger scale, covering energy efficiency, on-site renewables and personal transport.

Table 8: Conversion rates

	% of EEAC clients taking up measure ¹⁷	Measures installed by SW EEAC clients/yr ¹⁸	EEAC clients as % of total SW installations	% of SW properties needing measure	No. of EEAC clients requiring measure	EEAC client conversion rate
Loft insulation top ups	10%	7,000	30%	69%	48,000	15%
Cavity wall insulation	8%	5,600	20%	43%	30,000	19%

¹⁷ Based on national market research carried out by the EST (currently unpublished). Variations in South West take up will have a significant impact on the analysis.

¹⁸ Assuming a total of 70,000 individual contacts per year made by the EEACs in the SW as there will be some overlap between phone enquiries and HECs

SECTION 3: WHAT CAN BE ACHIEVED? - MODELLING FUTURE POTENTIAL

A range of potential scenarios have been developed to help inform the setting of regional targets. The analysis of these scenarios will enable the region to:

1. Understand the extent to which existing regional targets relating to housing will deliver the South West's contribution to national targets on fuel poverty and carbon reduction, providing the evidence base for additional regional targets if required
2. Estimate the level of domestic energy improvements required to meet regional targets and therefore provide an additional tool to aid policy makers and practitioners in the process of prioritising, targeting, monitoring and evaluating the impact of activity within the region

The key regional targets that have a tangible impact on energy and are therefore used as the basis for the modelling include:

- The commitment in the Regional Housing Strategy to raise all properties with vulnerable households to an average of higher than SAP 65 by 2010 and all properties within the region to an average of higher than SAP 65 by 2016
- The policies in the draft Regional Spatial Strategy requiring all development to conform to level 3 of the Code for Sustainable Homes, equivalent to the Eco Homes Very Good' standard and all major development to conform to level 5, equivalent to zero carbon emissions carbon neutral development. See annex 7 for information on what it has been assumed level 3 equates to in terms of energy standards, as this has not yet been made clear by government. Reference will also be made to the policy requiring all major development to contribute 10% of the carbon savings from on site renewable energy technologies.

The data analysis and modelling uses the South West sample of properties from the 2003 English House Condition Survey, the SAP 2001 algorithms, together with the revised Climate Change Programme forecasts of carbon emissions as baseline and comparator and a range of assumptions that are outlined within Annexes 4 and 7. The analysis covers both carbon dioxide emissions and fuel poverty. In particular, the fuel poverty assessment also considers the additional impact of fuel price rises from 2003 to the end of 2005.

The modelling of future potential provides a series of snapshots of what could be achieved within existing housing against a range of SAP benchmarks. The scenarios for future carbon dioxide emissions have been developed by combining forecasts of future new build, changes in electricity demand with these SAP snapshots linked with particular time periods as outlined below. This approach does not take into account future changes in carbon emission factors (table 1) particularly relevant to changes in the electricity generation mix. Figure 7 summarises the impact of the SAP benchmarks employed in each scenario on the SAP profile for the South West Housing stock.

Four scenarios have been developed.

Scenario 1 – Base case: Assumes all new developments meet building regulations (2006), together with increasing demand for electricity at 1.5% per year (average since 1990) - no energy efficiency

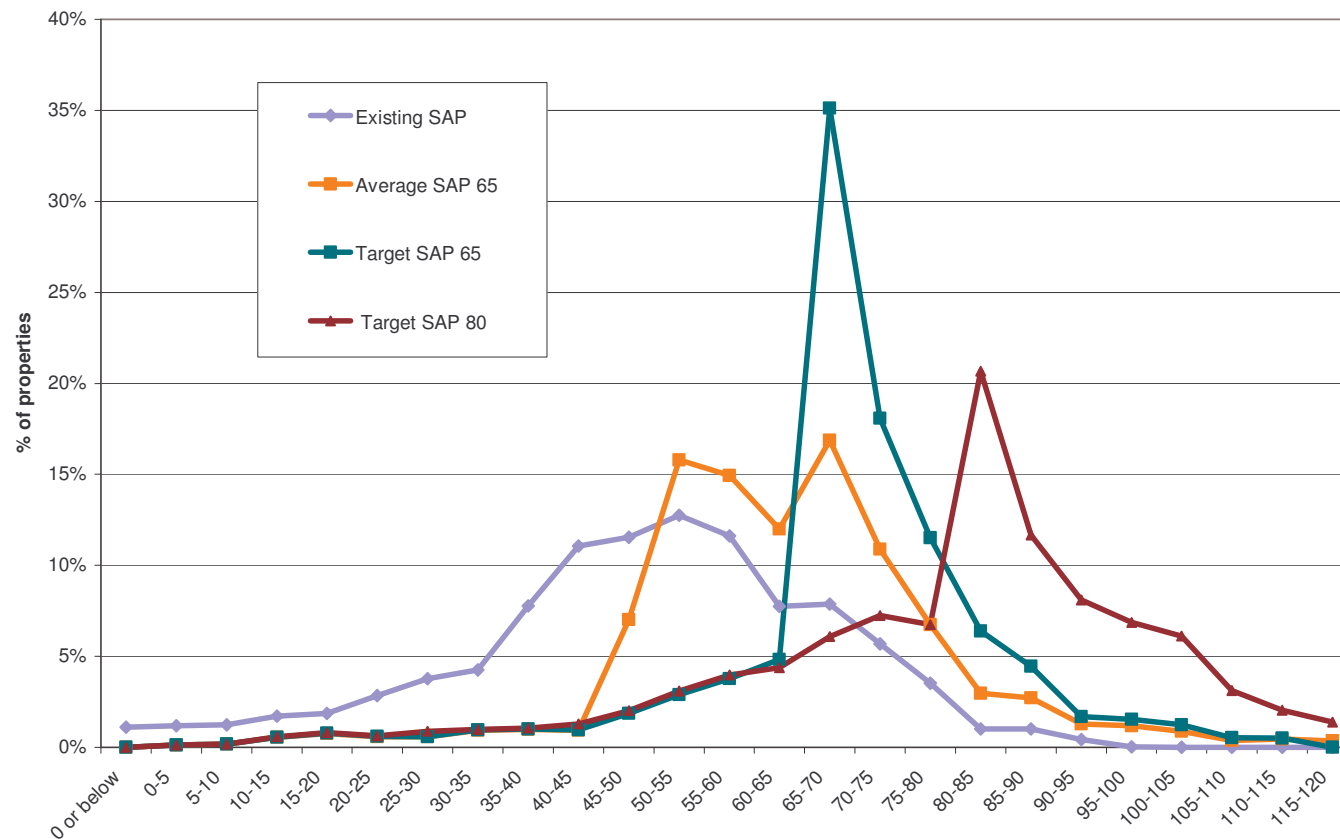
Scenario 2 – The Regional Housing Strategy (RHS): Assumes all new development meets standards as outlined within the Regional Spatial Strategy and *where possible* existing properties with vulnerable households are raised to an average of SAP 65 by 2010 and all properties likewise by 2016

Scenario 3 – The Regional Housing Strategy 'Plus' (RHS+): Assumes all new development to meet standards as outlined within the Regional Spatial Strategy and *where possible* existing properties with vulnerable households are raised to a target of SAP 65 by 2010 and all properties likewise by 2016. This scenario is extended to 2020 by raising *where possible* all existing properties to a target of SAP 80

Scenario 4 – The Regional Housing Strategy 'Plus Plus' (RHS++): Constrains some measures employed in scenario 3 in the light of assumptions around industry capacity and funding limits

This approach also does not take into account future changes in either fuel prices or incomes. As such the fuel poverty assessment is taken from a 2003 base and does not utilise the scenarios developed for the carbon modelling.

Figure 7: Regional SAP profiles assuming a range of SAP benchmarks as used within the carbon modelling scenarios and the fuel poverty assessment



Source: Modelling based on the 2003 English House Condition Survey data set

Below SAP 65 the impact of both target SAP 65 and target SAP 80 programmes are very similar, in both cases leaving approximately 400k properties (or just under 20% of the total SW housing stock) unable to reach SAP 65. This is a vitally important factor influencing the outcomes of both the carbon modelling and the fuel poverty assessment and has significant implications for how the region approaches it's more difficult to treat properties.

Whilst it has not been possible to estimate what the additional impact of raising all properties to SAP 65 would have been, it is clearly significant. In particular it reduces significantly the impact of the target SAP 80 programme as will be seen within both the carbon modelling and the fuel poverty assessment. Figures 17 and 18 provide a more detailed assessment of the causes of this shortfall.

Figure 8: Total carbon dioxide emissions for the South West with a range of assumptions for new build standards and electricity demand

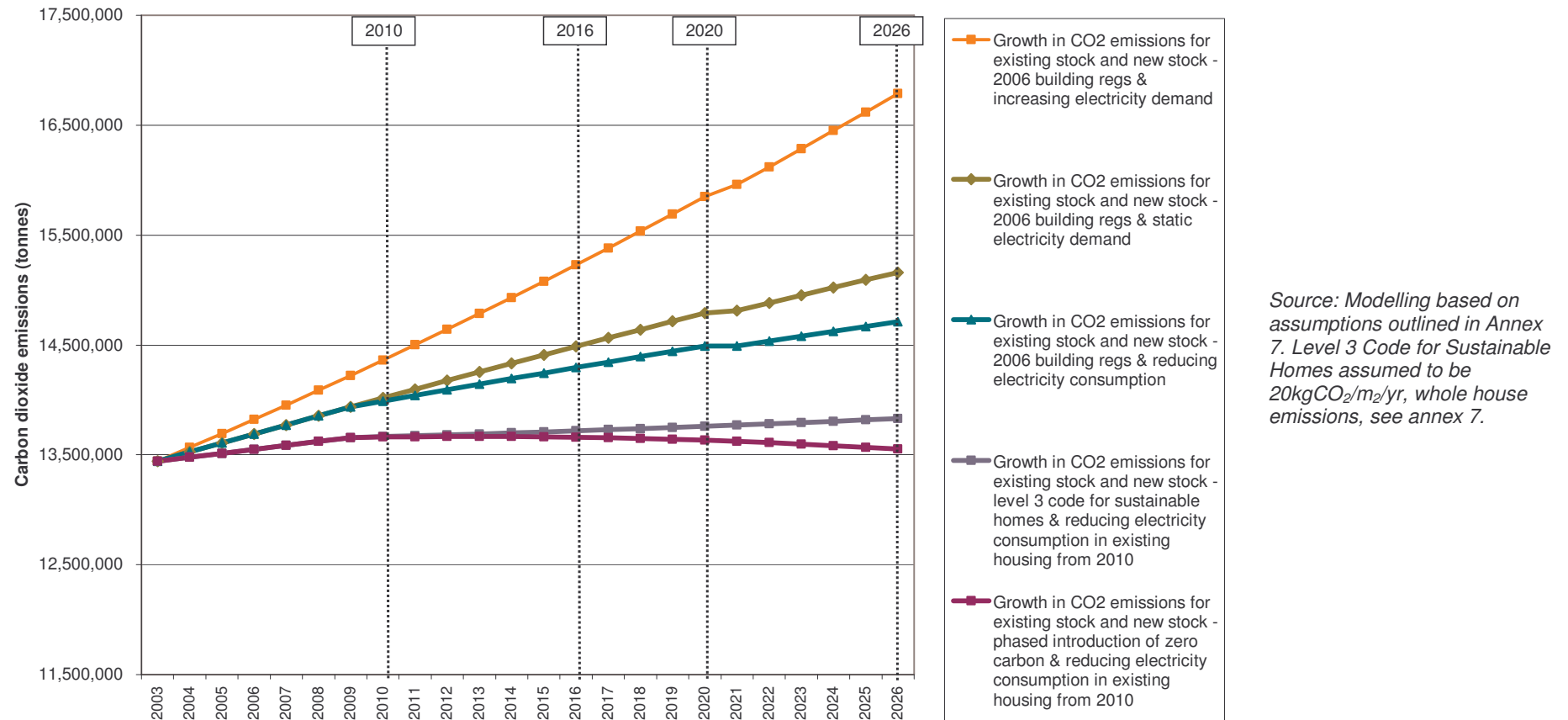


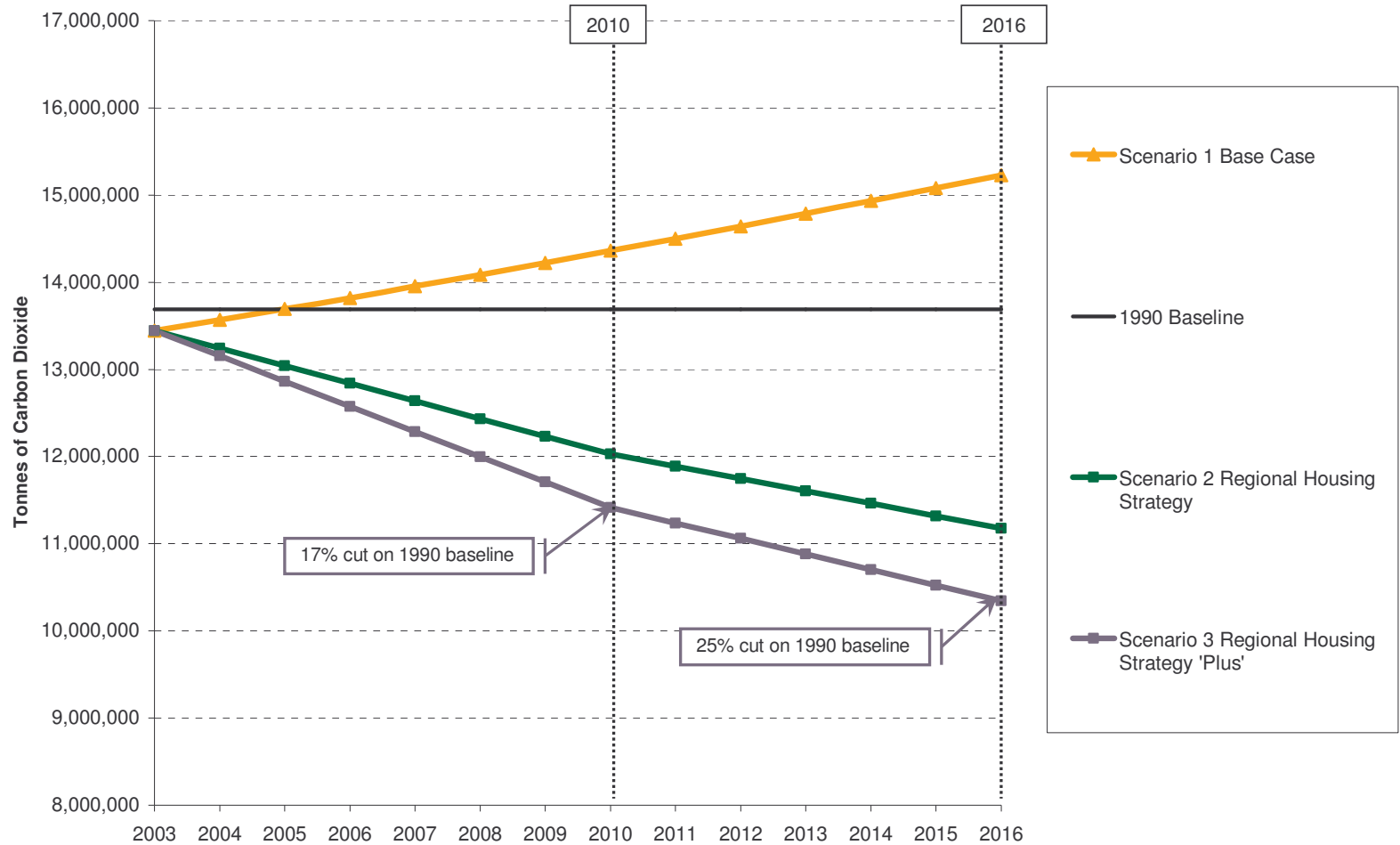
Figure 8 (and figure 13) demonstrates the significant impact electricity demand, particularly in existing housing has on overall carbon emissions within the region.

Securing level 3 standards from the Code for Sustainable Homes within new build has significant short term benefits. Due to the assumed phasing in of the draft policy in the Regional Spatial Strategy on zero carbon/carbon neutral development (conservative estimate of 50% compliance by 2020), the benefits will be accrued towards the end of the Regional Spatial Strategy period and onto 2050. See annex 7 for assumptions on standards.¹⁹

¹⁹ The latest indications from ongoing discussions around the code for sustainable homes suggest that this report’s assumptions may be too stringent. However reducing standards to 35kgCO₂/m²/yr from 20 for level 3 for all household emissions (not just emissions covered by the building regulations) will cause a reduction of around 2-3% in the savings achieved at the regional level by 2020. In order to compensate for this reduction, the region would need to fully implement the Regional Spatial Strategy policy by 2020 rather than secure only 50% compliance as currently assumed.

The robust approach to sustainable construction adopted by the draft Regional Spatial Strategy should be welcomed and will play an important role in the region's response to climate change in both short and long terms

Figure 9: Carbon impact of a range of scenarios to 2016 with reference to the 1990 baseline

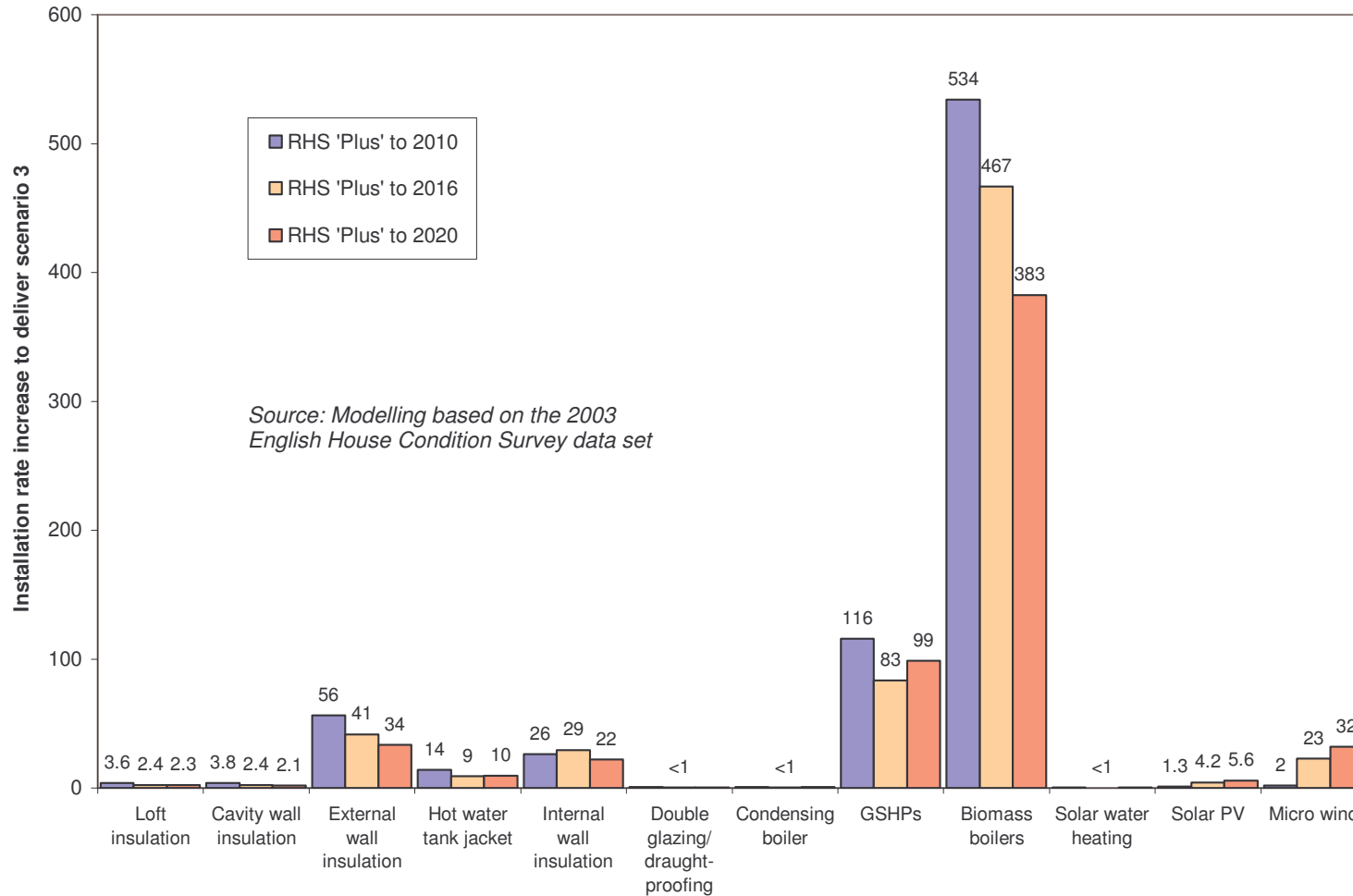


Source: Modelling based on the 2003 English House Condition Survey data set and assumptions outlined in Annex 7

None of the scenarios considered achieve the governments original target of 20% cut in carbon emissions by 2010

The Regional Housing Strategy 'Plus' scenario will match the governments assumptions for domestic sector carbon emission reductions for 2010, as outlined within the revised Climate Change Programme (just under 17% within the domestic sector by 2010). However, The current commitment within the Regional Housing Strategy to achieve higher than average SAP of 65 will not deliver sufficient carbon savings in either short or longer terms

Figure 10: Installation rate increase required to deliver scenario 3 – Regional Housing Strategy 'Plus'



Delivering minimum SAP 65 across the region's housing stock by 2016-2020 will require installation rates for key energy efficiency measures like cavity wall insulation and loft insulation to increase by a factor of between 2 and 2.5. This is probably achievable given the increased funding regimes proposed by government within the revised Climate Change Programme.

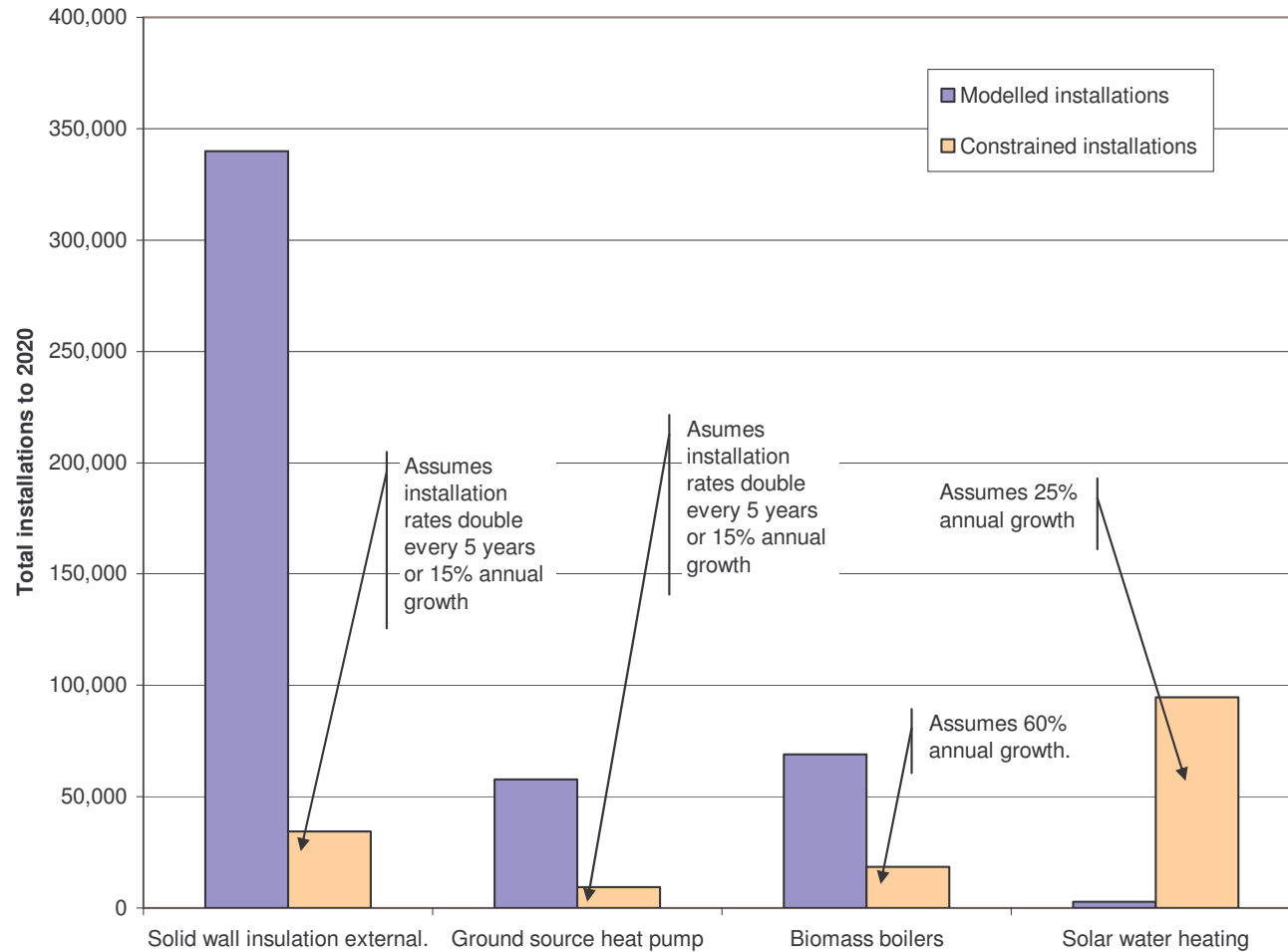
Delivery by 2010 in vulnerable households raises concerns about the rate of increase across all measures but may be just about achievable in terms of standard energy efficiency measures, depending on the confirmation of government plans for EEC 3 and the region's ability to secure above average levels of funding, see figure 12.

Required installation rates for solid wall insulation and on-site renewables are however very high

This is however with the exception of solar water heating where the potential has been underestimated by the modelling as current installations far exceed what might be considered on economic grounds alone

Discussions with industry representatives were used to test possible growth rates. Figure 11 outlines the conclusions.

Figure 11 : Impact of industry constraints/opportunities on installations within existing housing



Source: Based on modelling outputs and discussions with industry representatives

According to the industry, current growth rates for GSHPs and biomass boilers are currently doubling every year, all be it from a very low base.

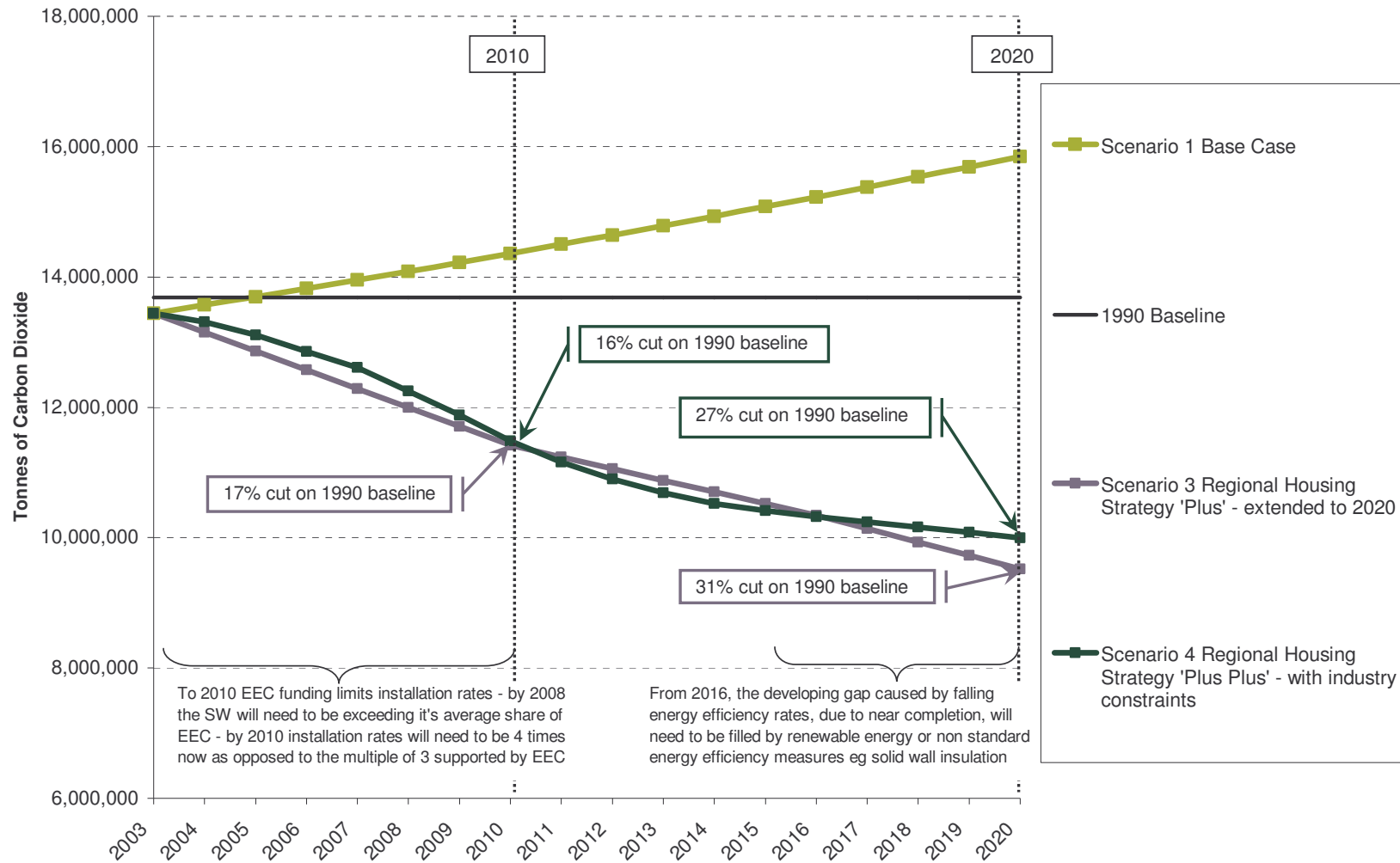
The figures used here assume a lower level of growth, as it is uncertain whether current growth is sustainable, particularly given the likely constraints on grant funding for on-site renewables. In addition new build will drive short term installations, with 4-5 times as many installations in new build by 2020 as through retrofit, assuming an average of two renewable energy technologies per new build dwelling to meet required standards.

Growth in GSHPs were reduced further due to the additional constraints associated with retrofit, i.e. space and integration with conventional heating distribution systems

The growth in solar water heating reflects the underestimate made by the modelling highlighted above. The level of installations suggested within the original modelling could have been delivered in 3 to 4 years at current installation rates, as opposed to the 15 years to 2020.

Even with this level of additional constraint the funding levels for on site renewables will need to increase by 10-12 fold to 2020, either through the existing Low Carbon Buildings Programme or through integration with the Energy Efficiency Commitment

Figure 12: Carbon dioxide emission reductions from to 2020 and allowing for industry and funding constraints

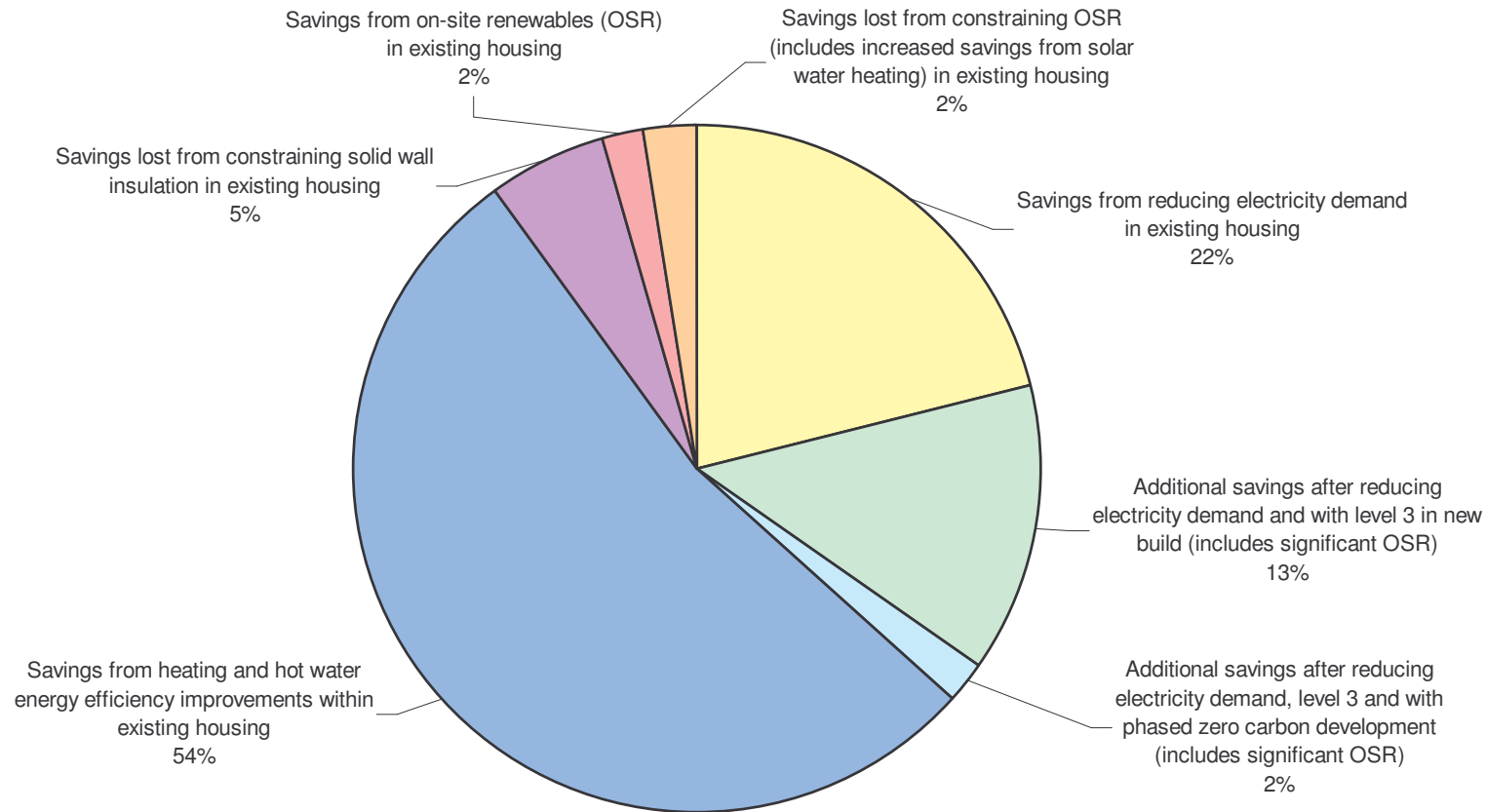


Source: Modelling based on the 2003 English House Condition Survey data set and assumptions outlined in Annex 7

Given assumptions based on potential funding for energy efficiency to 2010, it may be possible to deliver savings equivalent to the region’s contribution to the revised government expectations for carbon dioxide emissions reductions by 2010.

However the modelling suggests that a funding gap for on-site renewables and solid wall insulation, together with some concerns around industry capacity, could create a potential shortfall in carbon emission reductions by 2020

Figure 13: Contribution to carbon dioxide emission reductions in 2020 (from figure 12) by measure

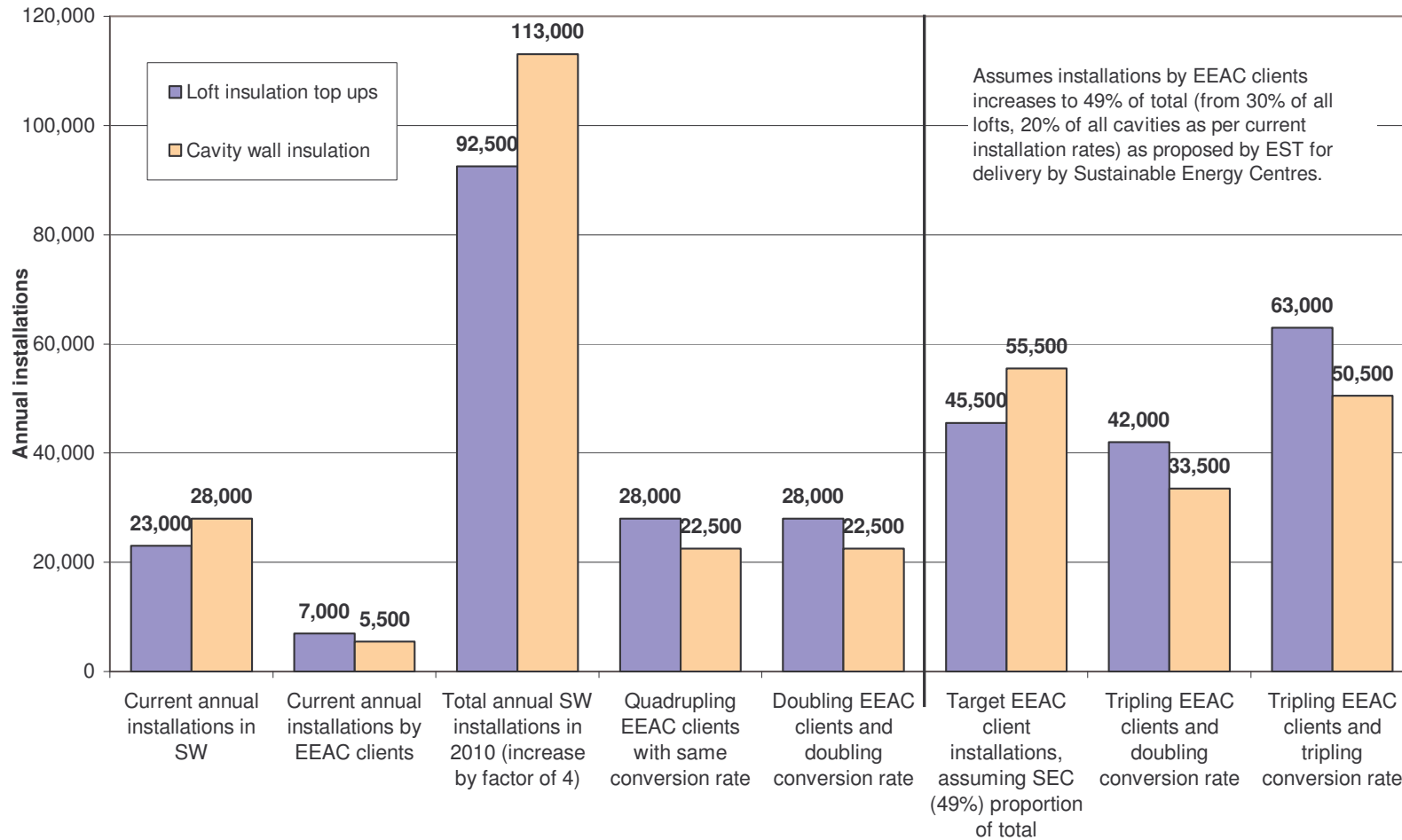


The single largest contributor to potential carbon reductions by 2020 will still be energy efficiency and together with the significant impact of reducing electricity demand in existing housing the modelling emphasises the huge impact that householders can make from utilising existing technologies and minor behavioural changes. These messages will need to remain as the principle focus for proactive energy advice within the short term.

Whilst the impact of on-site renewables in existing housing is more limited, when considered together with the additional requirements for renewables to meet new build standards, led by the Regional Spatial Strategy policies, by 2020 there will need to be a massive growth within the domestic renewable energy sector over a relatively short period. There is likely to be 4-5 times as many on site renewables technologies installed between now and 2020 within new build as through retrofit, assuming an average of two technologies per new build dwelling to meet required standards.

High quality energy advice surrounding what renewables measures to install and how to do it will need to be provided to householders to minimise the risk of poor and/or inappropriate installations.

Figure 14: Impact of increased installation rates on the delivery of energy advice (background assumptions in table 8)



Increasing installation rates by a factor of four by 2010 will require a significant increase in the required level of energy advice

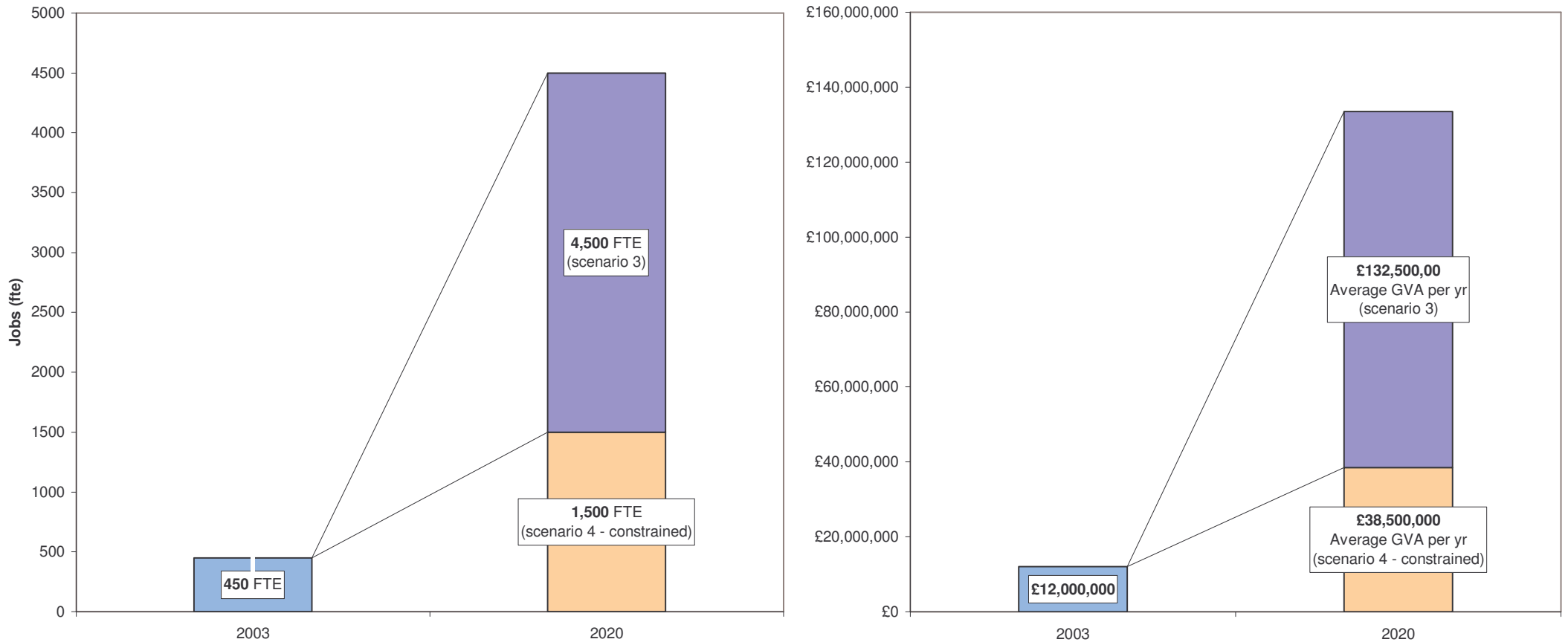
Conversion rates, i.e. the percentage of clients that go from advice to actually installing a measure, has a significant impact on the overall level of advice required to meet installation targets.

Table 8 on page 19 suggests that current conversion rates may lie between 15-19% depending on the measure. These rates may need to be doubled or even tripled in order to meet installation targets.

These figures are based on national assumptions for take up of measures by EEAC clients. The analysis may need to be increased or reduced depending on how take up in the South West compares with the national picture.

Within their proposals for the development of Sustainable Energy Centres, the EST assume that SECs will have contact with 49% of all clients interested in seeking advice on what action to take. The other 51% will be dealt with by the rest of the supply chain or nationally through websites. This analysis assumes that conversion rates across all routes will be the same, so that the 49% figure can be used to break down installations as well as advice. This will not be the case in practice, but is a reasonable assumption for the purpose of this broad assessment.

Figure 15: Growth in economic benefits 2003 to 2020

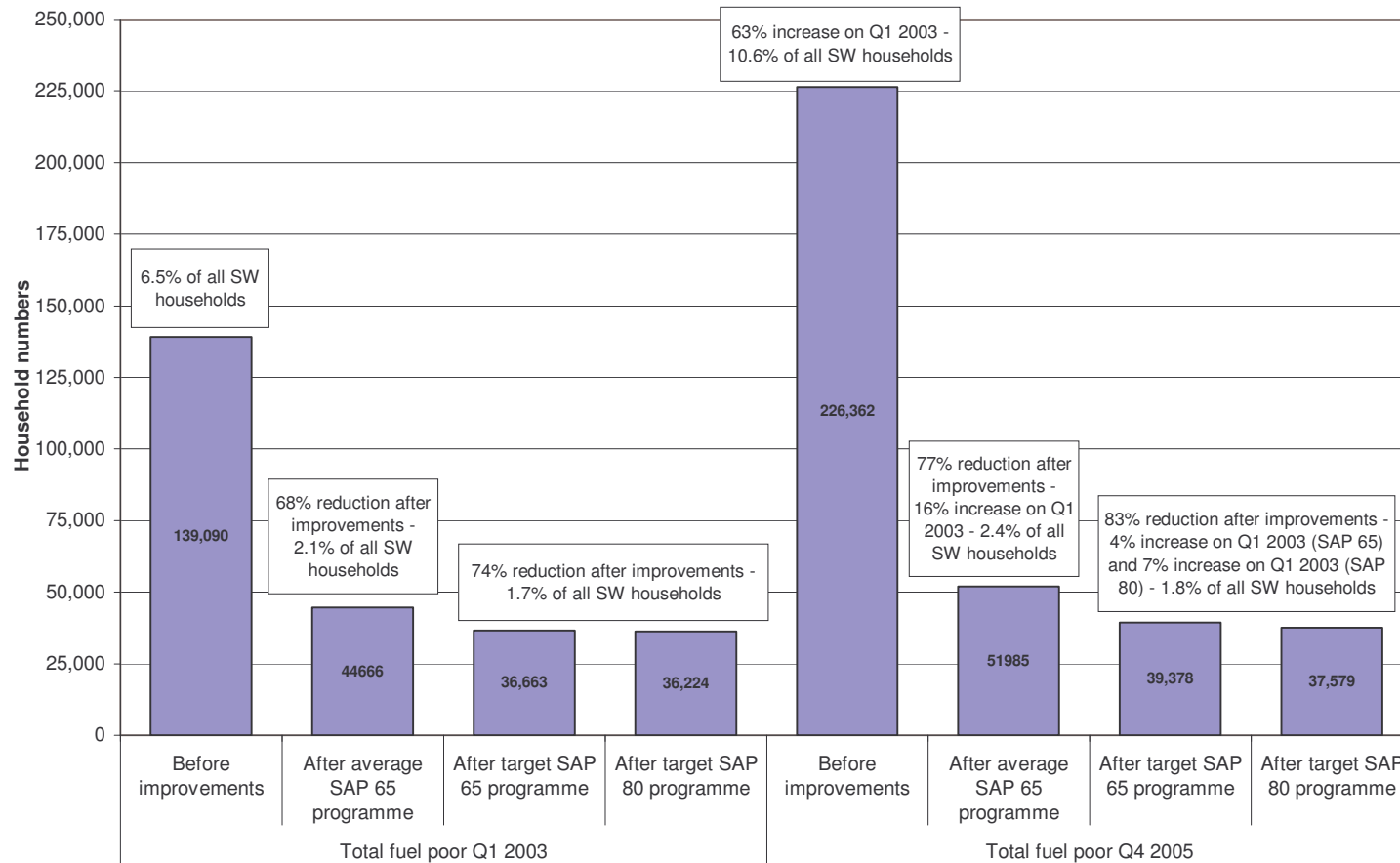


Source: Modelling based on the 2003 English House Condition Survey data set

By 2020 growth in installation of low carbon technologies within existing housing could be employing between 1,500 and 4,500 full time equivalents and generating GVA to the region worth between £40-130 million depending on the degree to which the growth of key high value technologies are constrained, such as solid wall insulation and on site renewables. These figures exclude economic benefits from mainstream technologies such as condensing boilers and double glazing. This simple analysis makes the same assumptions and has the same limitations as outlined within section 2.

Whilst a growth in installation costs by a factor of 3.5 (same growth factor as for GVA) by 2020 appears manageable, it covers up the 12 fold increase required for the on-site renewables technologies, even in the constrained scenario. This places a significant expectation on national government in terms of additional funding. However it also stresses the importance of building on renewables visibility and experience with solar water heating to encourage investment from householders as a 'tangible demonstration of action being taken'.

Figure 16: Impact of rising fuel prices and energy efficiency improvements on SW fuel poverty Q1 2003 – Q4 2005



The numbers in fuel poverty have grown by 63% following fuel price rises to the end 2005, though following energy efficiency improvements fuel poverty grows by considerably less, 16%, 7% and 4% for the average SAP 65, target SAP 65 and target SAP 80 programmes respectively

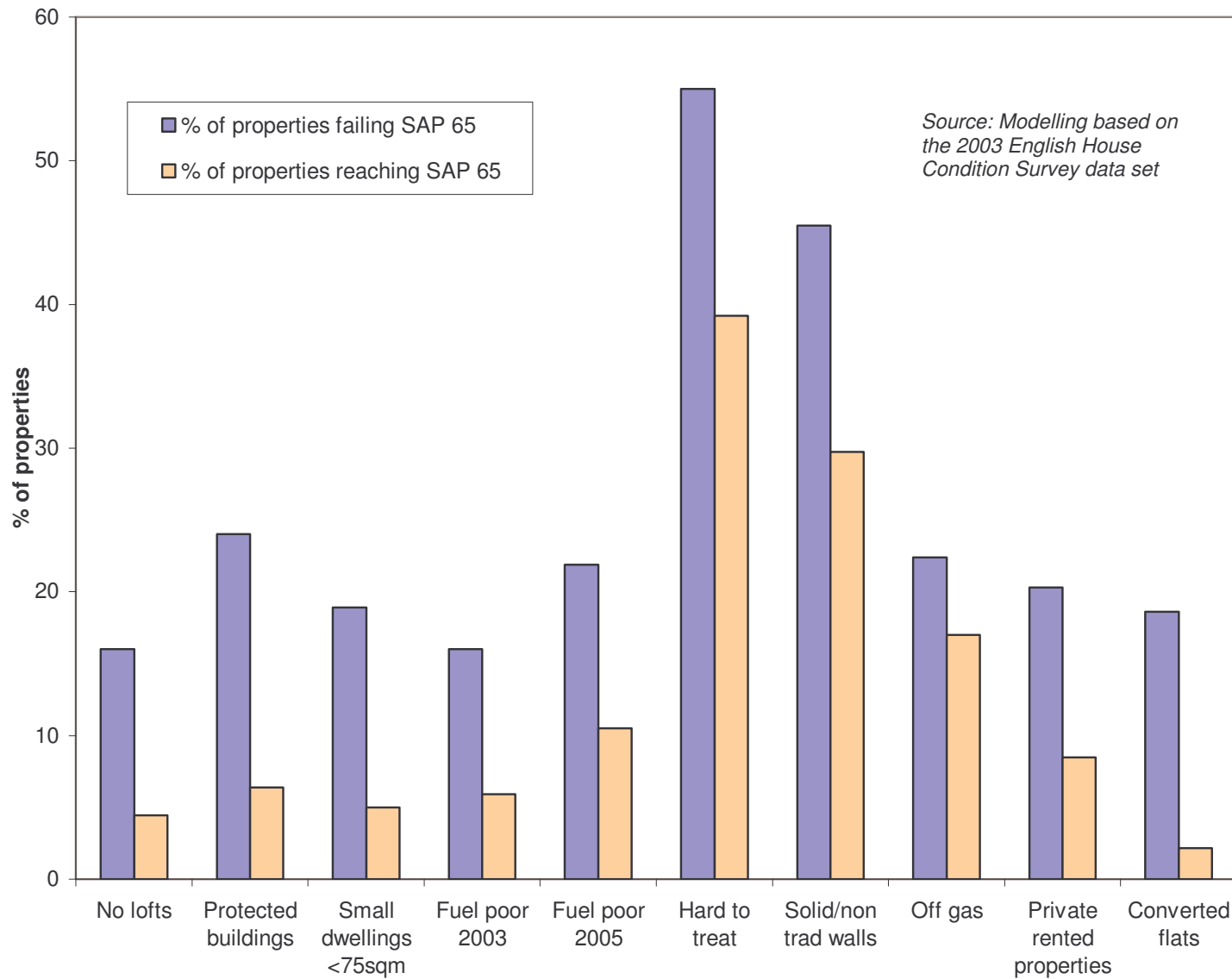
For more details on the fuel poverty assessment see Annex 6
There is only a marginally increased impact on fuel poverty following the attempt to raise all properties to SAP 80 as opposed to SAP 65, whereas the impact of both is significantly more than that achieved through the average SAP 65 programme

This is partly explained by the far larger increase in marginal fuel poverty than in severe fuel poverty with the 'new' fuel poor having higher SAP rating and higher income levels meaning that they are easier to take back out of fuel poverty again.

However the more significant cause for the reduced impact of the SAP 80 programme lies in the number of properties that fail to reach SAP 65 in both target SAP 65 and target SAP 80 programmes

Source: Based on 2003 English House Condition Survey and the fuel component of the DTI Retail Price Index which indicates an increase in real terms of 25.8% for gas, 16.8% for electricity, 15.9% for coal and 54.3% for oil/LPG during the period 2003 to 2005

Figure 17: Variation in key factors between failing SAP 65 and reaching SAP 65 samples



Source: Modelling based on the 2003 English House Condition Survey data set

Those properties that fail to reach SAP 65 following the target SAP 65 programme (just under 20% of all properties) have a markedly higher than average proportion of hard to treat properties, properties with no lofts, converted flats, private rented properties, fuel poor households, listed properties or properties in conservation areas (see annex 3 for information on protected buildings) and small (<75m2) properties

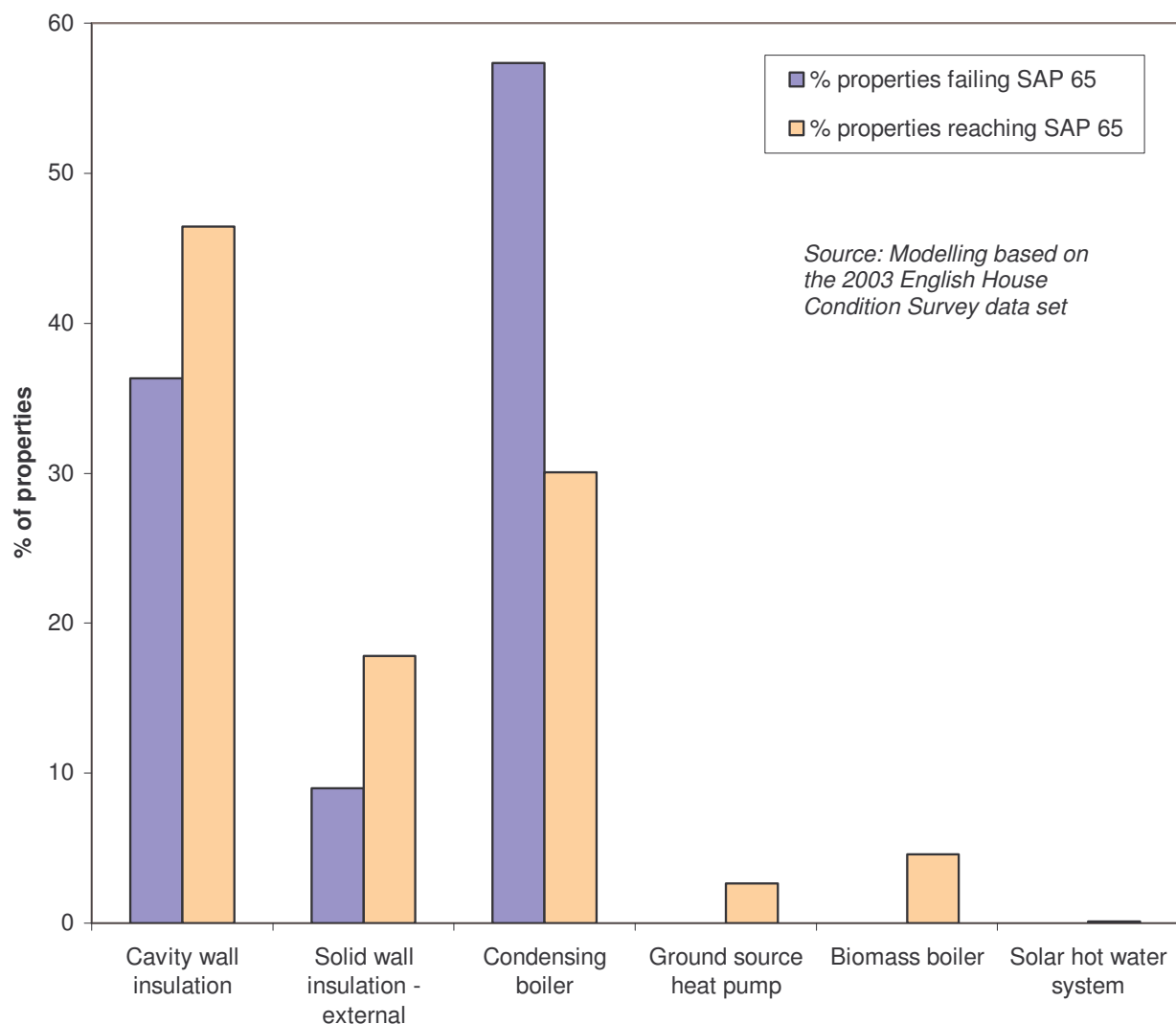
The difference between the off gas samples is smaller than might be expected due to the criteria employed by the model that allows on-site renewables only in off gas areas

All these factors influence the ability of these properties to be improved in terms of energy efficiency and/or renewable energy

Whilst 'Hard to Treat' has been defined as either solid walled properties or off gas properties, it is clear that these properties are not necessarily the most difficult to deal with in terms of their carbon footprint.

It is these 20% of properties that are the real 'hard to treat'. As a result it may be necessary to adapt the definition to focus on the real problem buildings.

Figure 18: Variation in key measure installation between failing SAP 65 and reaching SAP 65 samples



As might be expected, those properties failing SAP 65 have a lower percentage of installed cavities and insulated solid walls. Though the higher percentage of installed lofts is surprising, given the very much higher percentage of properties that do not have a loft as identified in figure 17.

The most marked difference is perhaps the total absence of any renewables technologies in the failing SAP 65 properties

The percentage of condensing boilers is higher in the failing SAP 65 sample in part to compensate for the lack of renewables technologies

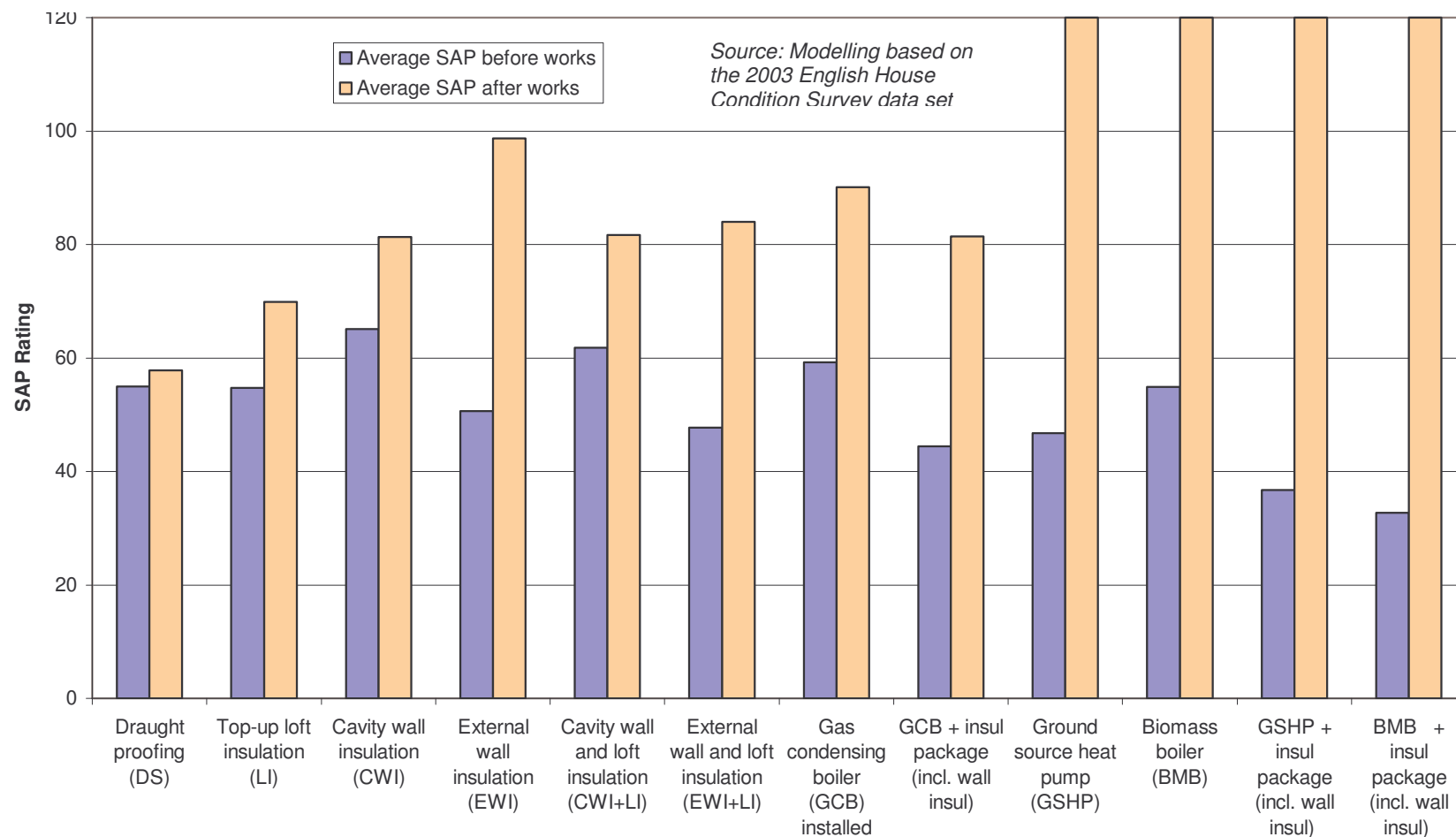
If renewables had been installed at the same rate as in those properties that reached SAP 65, there might have been a further 27,000 biomass boilers and ground source heat pumps.

This will have little impact on overall carbon emissions due to the relatively low numbers. However, with 60,000 fuel poor households in 2003 and 82,000 fuel poor households in 2005 in properties that fail to reach SAP 65, the absence of on-site renewables in these properties could be having a significant impact on fuel poverty.

Demolition rates in the South West are well below national averages. Whilst they are unlikely to reach the levels proposed in the 40% House report²⁰, it may be that further work on the cost/benefit of demolition versus refurbishment within the context of meeting SAP targets and Decent Homes standards, including the new Health Housing and Safety Rating System, may help inform future practice.

²⁰ 40% House, Boardman et al, Environmental Change Institute. The report illustrates how the UK residential sector can deliver a 60% cut in carbon dioxide emissions by 2050

Figure 19: Increase in SAP rating following a range of measures



Whilst these changes in SAP rating should not be directly compared as they are average changes generated on different household samples, they do illustrate the scale of SAP improvement resulting from different approaches. In particular they illustrate the level of increased impact that renewables technologies have on SAP ratings as compared to conventional boilers and energy efficiency measures

The graph also illustrates the importance of not setting a maximum target, or anything that could be implied to be a maximum target in terms of SAP levels, at the risk of limiting improvements, particularly in properties where it is relatively straightforward to generate very high SAP ratings during refurbishment

SECTION 4: WHERE DO WE WANT TO GET TO? - SETTING REGIONAL TARGETS

4.1 *Setting Regional Carbon Targets*

Headline Target – 2010

Based on the modelling and consultation undertaken during the development of this strategy and action plan, the region should aim to achieve cuts in overall carbon emissions within the domestic sector of **17% from a 1990 baseline**. This is equivalent to the governments revised expectations outlined within the latest Climate Change Programme published in May 2006.

Headline Target – 2020

Based on the modelling and consultation undertaken during the development of this strategy and action plan, the region should aim to achieve cuts in overall carbon emissions within the domestic sector of **30% from a 1990 baseline**. This is equivalent to the governments aspirations as outlined within the Energy White Paper published in 2003.

Beyond 2020 to 2050

The region should be aiming to achieve cuts in overall carbon emissions within the domestic sector of at least **60% from a 1990 baseline**. However given the developments in understanding of climate science it may well be the case that cuts of greater than 60% will be required.

Higher targets in 2010 and 2020 may also need to be set, but will require enhancements within the national policy and funding climate in order to support such increases.

4.2 *Setting Regional Fuel Poverty Targets*

Headline Target – 2010 & 2016

The region should seek to deliver the national government target to eradicate fuel poverty in vulnerable households by 2010 and in all households by 2016.

The modelling undertaken during the development of this strategy and action plan suggests that around 80% of fuel poverty can be eradicated through the installation of standard energy efficiency and on-site renewables, assuming that grants are made available to all fuel poor households. The remaining fuel poor households will need to be addressed through a combination of targeting those properties that fail to reach SAP 65 and income maximisation activities.

4.3 *Regional Measures of Success*

In order to deliver these headline targets the region will need to establish, deliver and monitor against a range of key indicators within the following areas:

- New build - for example numbers of new housing constructed to level 3 and level 5 within the Code for Sustainable Homes (set appropriate percentage levels following discussions with Regional Assembly)
- Existing housing refurbishment - for example, 95% of properties raised to a minimum SAP of 65 (SAP 2005) during refurbishment and 30% of properties raised to a minimum SAP of 80 (SAP 2005) during refurbishment (set measures following discussions with local authorities, levels should be reviewed)

periodically and revised upwards as appropriate). By 2015-2020, SAP 80 should be the norm following refurbishment rather than SAP 65. See annex 1 for further discussion on SAP and the implications of utilising SAP 2005 as opposed to SAP 2001.

- Measure installation - for example: 600k lofts and 600k cavities insulated by 2010 and 1 million lofts and 900k cavities insulated by 2020, from a 2003 base
- Funding take up - for example secure regionally 50% above national average funding for energy efficiency capital measures by 2010
- Hard to treat - for example number of properties addressed per year (level to be set locally?)
- Benefit take up - for example, percentage of take up for key benefits, e.g. pension credit (needs more work, little data collected at regional level)

Measures of success should also include headline figures relating to carbon emissions per household (maybe based on the Dwelling Emission Rate established within SAP 2005 and the 2006 Building Regulations) and numbers of fuel poor households.

Further work will be required to finalise an appropriate set of indicators that can be populated with accessible data and to secure the buy in from key stakeholders regarding monitoring, see action plan within section 5.

4.5 Summary of Regional Priorities for Target Delivery

In order to deliver the regional targets as outlined within section 3, the region will need to establish and act on the following priorities:

- Within the short term, energy efficiency will be the primary mechanism for delivering carbon dioxide emission reductions, with all standard energy efficiency measures installed by 2020
- The reduction of electricity demand is a key requirement underpinning the delivery of carbon dioxide emission reductions
- Within the short term on-site renewables will play a vital role in helping the region address fuel poverty, particularly within hard to treat properties, as well as forming the foundation of the regions ability to meet challenging standards for new build housing
- The region will need to increase its share of nationally available funding for capital measures, increase the number of householders provided with energy advice and increase the conversion rate from advice to action based on a step change in householder awareness, attitudes and behaviour
- The definition of 'Hard to Treat' properties will need to be refined and our understanding of how to tackle these properties in the SW enhanced. Targeting those properties that fail to reach SAP 65 will be more important in the short term than securing higher energy efficiency standards at the top end of the region's housing stock.
- The step change in practice that will be required by the Regional Spatial Strategy policies on sustainable construction will require the region to raise the level of understanding and mainstream application of low and zero carbon development
- The low carbon housing and fuel poverty targets and their implications will need to be integrated more fully within the regional policy framework
- Far stronger links with mainstream social policy need to be established, for example through Local Area Agreements. Energy action can go so far, but it won't be able to fully address the wider issues of deprivation that are integral to the incidence of fuel poverty
- The step change in installation rates required by the targets will require the region to support the sustainable growth of the energy efficiency and on-site renewables industries

4.6 Implications for Regional and Local Action

The regional targets outlined within section 3 and the regional priorities outlined above, will require action at a regional level (as opposed to locally) within the following areas:

- Establish a clear locus for the regional advocacy and accountability necessary to oversee the successful delivery of this strategy and action plan

- Integrate targets within regional policy
- Enhance regional communication with local stakeholders to build on existing experience and to consolidate key messages about increasing take up, integrate energy issues with local policy and strategy development and to engage non energy stakeholders within the energy agenda
- Increase support to public and private sectors in delivering low/zero carbon development
- Enhance innovation and training provision to support the growth of supply and develop new approaches to increasing demand and maximising take up

These areas of action form the core of the action plan outlined within the South West Low Carbon Housing and Fuel Poverty Strategy and Action Plan.

Along side an enhanced programme of regional action, a significant expansion of concerted action by the wide range of local stakeholders will be required in order to specify, promote, support and deliver the step change in installation rates necessary to deliver the regional targets.

4.7 Implications for National Action

In order to deliver the regional targets as outlined in section 3, activity within the regions will need to be supported by the following developments at a national level.

- Establish clear expectations of regional and local bodies and establish guidance and build into performance assessment frameworks
- Establish clear expectations of national agencies operating at a regional level in terms of engagement with existing regional bodies
- Increase level of Energy Efficiency Commitment funding by a factor of 3-4 by 2010
- Remove the market confusion between Energy Efficiency Commitment and Warm Front by either integrating or clearly differentiating schemes
- Either increase Low Carbon Buildings Programme allocation to the domestic sector by a factor of 10-12 by 2020 over existing commitments or secure similar increases by integrating on site renewable energy technologies within the Energy Efficiency Commitment programme
- Support solid wall insulation more fully within existing funding mechanisms
- Set clear energy standards within the Code for Sustainable Homes, for example set level 3 to at least 20kg/m²/yr
- Raise building regulations to at least the equivalent of level 3 as soon as possible
- Place higher priority on and increase resources and training for building control
- Extend building regulations to fully cover refurbishment
- Increase the energy standards within the definition of a Decent Home
- Increase fiscal encouragement for householder action
- Increase appliance standards
- Support the setting and policing of high standards for the installation of renewable energy technologies
- Enhance the resources available to local authorities for the delivery of the Home Energy Conservation Act
- Deliver the Sustainable Energy Network programme in partnership with the regions

The region is keen to go further and quicker than is currently possible within the current national framework. In order for existing targets to be met and surpassed there needs to be a clearer recognition of and response to the needs and requirements of enhanced regional and local action within national policy and national delivery mechanisms.