Chapter 6: Making Scotland's Homes more Energy Efficient – Strategic Issues

Summary

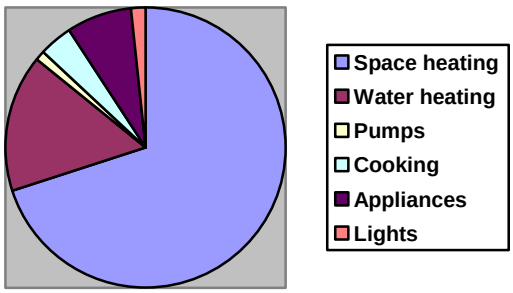
- **The key drivers for improving the energy efficiency of housing are to reduce greenhouse gas emissions, reduce the cost of household fuel bills, and reduce fuel poverty.**
- **Around 29% of all energy consumed and 30% of all greenhouse gas emissions in Scotland derive from the domestic sector through heating of homes and water, cooking, lighting, and running household and home entertainment appliances.**
- **For new homes, the 2007 Sullivan Report recommended staged improvements in Building Regulations towards zero-carbon new buildings. The 2010 Regulations are currently under consultation. Further reviews will be undertaken for 2013 and 2016.**
- **Although the existing housing stock has improved since 1990, a step-change is required to achieve significant reductions in energy demand. Loft and cavity wall insulation are most cost-effective. Virtually all lofts and cavities need to be insulated to current recommended levels as soon as possible.**
- **There are significant opportunities to increase energy efficiency and reduce emissions by upgrading or converting heating systems, improving electrical products, changing habits, and installing other insulation products, draught proofing, glazing and microgeneration technologies. There is broad consensus that virtually all dwellings will be affected, that millions of measures are required, and the total capital cost will be high, though resulting in savings in fuel bills.**
- **It is important to consider the impact of climate change on the design and location of new housing and the maintenance and improvement of the existing housing stock.**
- **Scottish households, like households throughout Great Britain, pay for GB-wide energy efficiency programmes such as CERT and CESP through fuel bills and need to receive the full benefit of these schemes. We have called for a separate co-ordinating body in Scotland for CERT and CESP.**
- **We acknowledge that any increase in the level of CERT-type activity will increase energy prices. Governments need to implement an accompanying strategy to minimise the impacts on households that are vulnerable to fuel poverty.**
- **A range of Scottish Government supported programmes contribute to improving the energy performance of our housing stock. These include the Energy Saving Scotland Advice Centres, Energy Assistance Package, Home Insulation Scheme and the Energy Efficiency Design Awards.**
- **Energy efficiency measures will require substantial up-front investment in housing stock. While greater savings are expected from fuel bills over time, these will be recouped over a variable number of years, and some households may see less savings than others. Due to the significant sums involved, it is assumed that those who are able to pay will invest or borrow to undertake work.**

Introduction

6.1 The key drivers for improving the energy efficiency of housing are to reduce greenhouse gas emissions, reduce the cost of household fuel bills, and reduce fuel poverty. As has already been indicated, meeting the 2020 and 2050 greenhouse gas emissions targets in the Climate Change (Scotland) Act, 2009 is a far-reaching agenda that requires changes in the way we think and act across all sectors of the economy.

6.2 Energy used in housing is a main contributor to emissions, and housing plays a critical role in emissions reduction. Around 52,000 GWh[72] of energy will be used by people in their homes in Scotland in 2009, emitting around 13.58 $MtCO_2$.[73] Around 29%[74] of all energy consumed and 30% of all greenhouse gas emissions in Scotland derive from household energy use - space and water heating, cooking, lighting and running household and home entertainment appliances. This includes both direct (e.g. from domestic boilers) and indirect (e.g. from power stations) CO_2 emissions.

Figure 6.1 Distribution of Energy Use in existing homes in Scotland
(total energy estimated as 52,000 GWh in 2009)



Source: DEMScot distribution for 2009 modelled from a base of Scottish House Condition Survey 2005/06

6.3 As noted in Chapter 1, energy efficiency is often the most cost-effective option in meeting emissions targets. This chapter is strategic in nature and looks at current levels and patterns of energy efficiency in new and existing housing, current action to improve energy efficiency in homes, the gaps in this, and issues for the future. Chapter 7 builds on the strategic options for improving the energy efficiency of housing by looking in more detail at the role of regulatory requirements.

The role of new housing

6.4 While the current economic climate has led to a fall in the number of new build completions, climate change is a long-term issue and it is important to look at underlying trends of housing supply.

6.5 In 2007, the Sullivan Report, 'A Low Carbon Building Standards Strategy for Scotland', set out recommendations for staged improvements in Building Regulations towards zero-carbon new buildings. On 30 June 2009, the Scottish Government published a consultation on proposed changes to the energy standards in the building regulations that will come into effect in October 2010 (see paragraph 6.17). Further reviews will be undertaken for 2013 and 2016, and building regulations will continue to make a significant impact on emissions from new housing.

[72] Modelled using DEMScot carbon assessment tool as described in 'Modelling Greenhouse Gas Emissions in Scottish Housing'. The DEMScot carbon assessment tool has been developed for the Scottish Government by Cambridge Architectural Research Ltd, Cambridge Econometrics, Roger Talbot Ltd. and Alembic Research. The report and model will be made available to the energy modelling community in Autumn 2009.
[73] All figures in this chapter relate to CO_2 rather than all greenhouse gases converted to their carbon dioxide equivalent. We aim to include emissions from the full range of greenhouse gases in the final action plan to be fully consistent with other documents. However for housing, CO_2 is by far the biggest contributor.
[74] Based on UK regional data for Scotland. See paragraphs 2.7-2.10 for detail on different data sources.

The role of existing housing stock

6.6 Although the existing housing stock has improved since 1990, it is clear that a step-change is required in order to achieve a significant reduction in energy demand. In 2009 it is estimated that the average home in Scotland will use over 23,750 kWh per year, emit around 5.8 tCO_2 per year,[75] have an NHER of 6.2,[76] and an Energy Performance Certificate rating of D.[77]

6.7 Due to the cost effectiveness of loft and cavity wall insulation, there is general consensus that virtually all unfilled lofts and cavities need to be tackled soon. Having considered responses to its 2009 Heat and Energy Saving Strategy Consultation (HESS),[78] the UK Government is aiming for all lofts and cavities, where practicable and households want it, to be insulated by 2015.[79] Even this work is likely to need a significant step change in activity for Scotland. Our projections suggest that current delivery will fall well short of this target.

6.8 The modelling discussed later also shows that there are significant opportunities to save carbon emissions by upgrading or converting heating systems. While there is debate around the levels of deployment of different technologies, there is broad consensus that virtually all dwellings will be affected, that millions of measures are required, and the total capital cost will be high, though resulting in savings in fuel bills.

6.9 Many energy efficiency measures, including loft and cavity wall insulation (see Figure 6.2), are already cost-effective to householders, though some still need incentives or assistance to take these up. Others will be achieved as part of the general upgrading and maintenance of a home over the next 10 years.

Figure 6.2 Costs and pay-back of current energy efficiency measures[80]

Energy Efficiency Measure	Capital cost of installation	Annual Saving in fuel bills	Payback period (years)
Virgin loft insulation	£250	£150	2
Top-up loft insulation	£250	£45	6
Cavity Wall Insulation	£250	£115	2
Internal wall insulation	£5,500-£8,500	£380	15-22
External wall insulation	£10,500-14,500	£400	26-36
Improved gas central heating boiler	£2500	£235	10 years or less

6.10 To meet the 2020 greenhouse gas emissions target, more expensive measures will need to be implemented which may not achieve payback for householders for many years and may not be seen as replacement maintenance. Broad figures suggest that measures may cost an average of £7,000 per home by 2020. However, these costs will not be evenly spread across all homes.

[75] The CO_2 figures include direct and indirect emissions. They are taken from DEMScot but are in line with Scottish House Condition Survey calculations. Note the modelled energy use from DEMScot is slightly higher than total energy consumption as reported in Chapter 2.

[76] See Scottish Government, 'Scottish House Condition Survey: Revised Key Findings 2007' (http://www.scotland.gov.uk/Resource/Doc/933/0079066.pdf).

[77] Based on EPCs issued up to August 2009 for homes that have been marketed for sale or rental since the EPC regulations came into force.

[78] DECC, 'Heat and Energy Saving Strategy Consultation', February 2009 (http://hes.decc.gov.uk/).

[79] DECC, 'Low Carbon Transition Plan', July 2009.

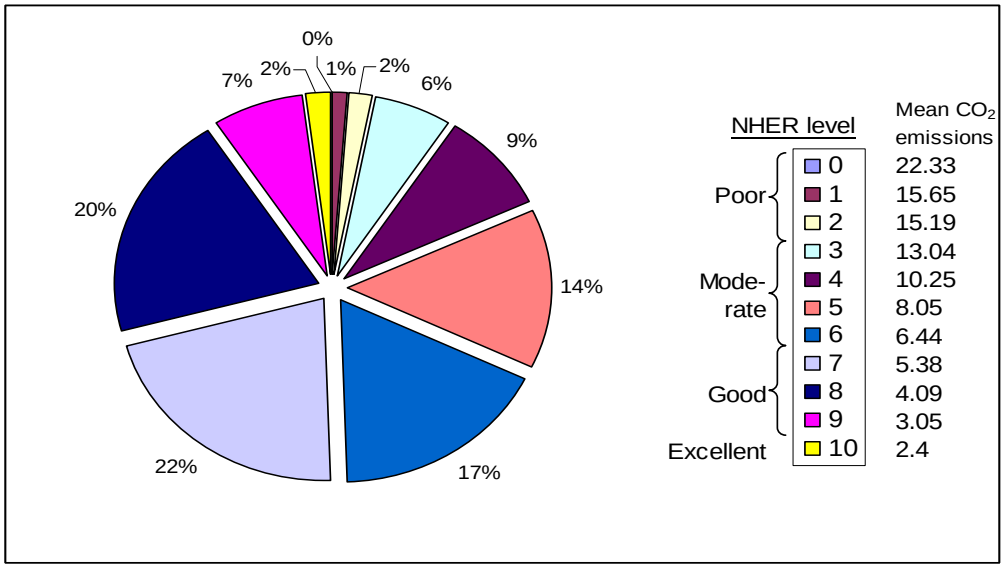
[80] Energy Savings Trust (www.energysavingtrust.org.uk/Energy-saving-assumptions). It is considered that the installed costs of cavity and loft insulation are slightly low for Scotland, which may overestimate payback periods. Boiler payback is difficult to estimate as it depends on whether the household is replacing an old broken boiler or just upgrading to improve boiler efficiency. The costs quoted are the full cost of installing a new boiler, rather than the marginal difference in cost between the least and most efficient boilers. Costs are purely capital costs and do not include costs of organising work, disruption and remediation after work has been completed.

6.11 It is clear that no one sector - government, business or households - can bear the full brunt of the financial implications. The energy efficiency agenda will have implications both in terms of the capital cost of work and the price of energy. It also comes at a time when Government is moving towards key housing targets to improve the general quality of homes in the social sector up to the Scottish Housing Quality Standard by 2015, to improve access to housing for those who are currently homeless or threatened with homelessness by 2012, and to eradicate fuel poverty by 2016. While there are opportunities in improving energy efficiency, finding an equitable path to drive forward this agenda while progressing other housing objectives will be complex and will require a partnership approach between Scottish Government, local authorities, housing associations, industry, business, other stakeholders, and individual households.

Levels and patterns of energy efficiency of existing housing

6.12 It is important to understand patterns of energy efficiency in order to see where action should be targeted. The Scottish House Condition Survey (SHCS) uses an energy efficiency rating system (enhanced NHER), which rates dwellings on a scale of 0 (poor) to 10 (excellent) based on modelled total energy costs per square metre of floor area.[81] Dwellings are also often categorised into poor (0-2), moderate (3-6), good (7-9) and excellent (10). As Figure 6.3 shows, over 20% of dwellings have an NHER of 7, with the mean NHER being 6.2.

Figure 6.3 Dwellings by NHER level and CO_2 emissions



Source: Scottish House Conditions Survey, 2007

6.13 Figure 6.4 shows that the energy efficiency of housing in Scotland has increased over recent years. The majority of this improvement relates to space and water heating. However, while buildings have become more energy efficient, a significant proportion of these energy savings have been lost through:

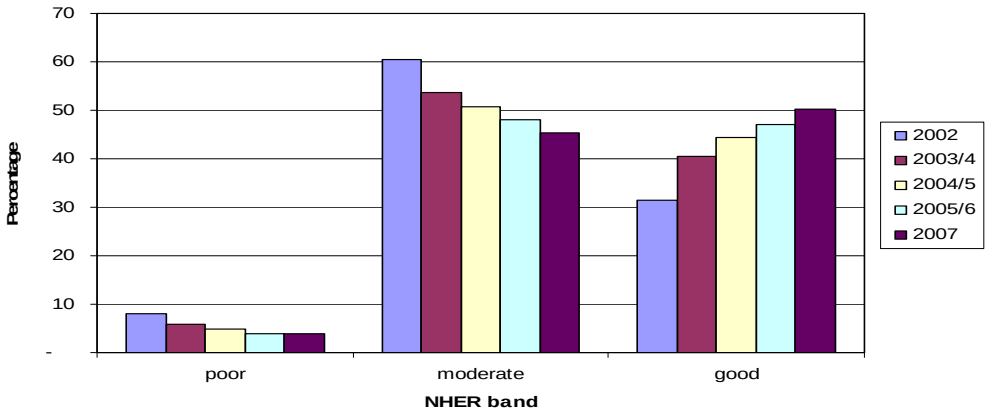
- homes being kept warmer for longer (household thermostats being turned up)[82]
- the greater quantity and choice of electrical products available.[83] Between 1977 and 2007 use of electricity by household domestic appliances in the UK almost doubled

[81] See Scottish House Condition Survey: Revised Key Findings 2007, ibid.
[82] Since 1990 the number of UK homes with central heating has increased by 25% and the average internal home temperature by 1.6ºC (BERR, Energy Consumption in the United Kingdom, 2008 update).
[83] Energy Saving Trust, 'The Ampere strikes back', 2006 (www.energysavingtrust.org.uk/Energy-saving-products/About-Energy-Saving-Recommended-products/A-guide-to-choosing-consumer-electronics).

from 45.5 TWh to 86.3 TWh.[84] The Energy Saving Trust estimates that this consumption is likely to rise by another 12% to over 100TWh by 2010.[85]

- the trend to more single-person households which tend to have a higher per person energy use.[86]

Figure 6.4 Dwellings by NHER bands 2002-2007



Source: Scottish House Conditions Survey, 2007

6.14 Energy efficiency is not consistent across type, age, tenure or location of dwelling.[87] The size and urgency of the overall task means that cost effectiveness has to be a key factor in achieving our objectives. While there are other drivers, the scale of the emission reductions needed means it is likely that almost all existing homes will require some energy efficiency improvements. However, the data identifies particular sectors and types of property where significant action should be prioritised. Some of the key messages emerging from the data suggest we should:

- encourage behaviour change as well as building change – both in terms of day-to-day behaviours and one-off decisions, or savings made will be lost by how homes are used;
- focus early activity on the private sector, both home-owners and landlords, as energy efficiency is considerably worse here than in the social sector;
- continue to improve standards in the social sector, particularly where social landlords are well-placed to act as market leaders and exemplars, for example in provision of low carbon equipment, district heating or for hard-to-treat properties;
- focus early activity on pre-1980 semi-detached and detached houses, because energy consumption tends to be high here;
- focus early activity on homes that are reliant on solid fuel and oil to heat their homes (12% of homes are off-gas grid, rising to 52% in rural areas);
- find a balance between conservation aims, particularly for historic and traditionally built stock, and energy efficiency aims;

[84] DECC, UK Domestic Energy Consumption (2009 update) (www.decc.gov.uk/en/content/cms/statistics/publications/ecuk/ecuk.aspx).
[85] Energy Saving Trust, 'The rise of the machine', 2006 (www.energysavingtrust.org.uk/Media/node_1422/node_18662/Rise-of-the-machines).
[86] Fawcett T, Lane K and Boardman B, 'Lower carbon futures', 2000 (www.eci.ox.ac.uk/research/energy/downloads/lowercarbonfuturereport.pdf).
[87] See Scottish House Condition Survey: Revised Key Findings 2007.

- carefully consider expensive and hard-to-treat building forms and how to support innovation for technologies to improve these, including whether there are specific hard-to-treat building types that should be targeted for demolition and replacement.[88]

Q 8: Do you agree that these are the key concerns for Scottish Government to consider when developing action on energy efficiency in housing?

Adapting to climate change

6.15 While one of the key objectives of this plan is to mitigate climate change by reducing emissions, it is also important to consider the impact of climate change on housing stock. A certain amount of climate change is unavoidable, and adaption to it will be necessary. This may have implications for housing: for example, rising temperatures may lead to an increased desire for summer cooling, while changes in sea level may impact on flood zones and more rain may increase risk of flooding from rivers. It is important to adapt and design new homes and buildings in response to the future climate and to consider the implications for existing housing of, for example, more severe weather events and higher temperatures which may affect energy demand.

6.16 The second National Planning Framework (NPF2) recognises the role of planning in facilitating our adaptation to climate change (see Chapter 10 for detail). Work in Scottish Government is in its early stages, but there is a consultative approach to developing an adaptation framework for Scotland, accompanied by an action plan.[89] The Climate Change (Scotland) Act (Section 53) also requires Scottish Ministers to bring forward a programme of planned action to adapt to climate change.

Q 9: What do you think are the key issues that the Scottish Government should consider in the design and location of new housing and the maintenance and improvement of the existing housing stock to ensure that they are adapted to future climatic conditions?

Current action to improve energy efficiency

New Homes

Scottish Building Standards

6.17 The Scottish Government has published a consultation on proposed changes to energy standards in the building regulations that will come into effect in October 2010.[90] These include a 30% reduction in CO_2 emissions for new buildings compared to 2007 building standards, and around 70% compared to 1990 standards. Changes to the guidance include demanding levels of insulation and air tightness, and improved efficiencies for space heating and hot water. It has been identified that low-carbon equipment is likely to become increasingly important in achieving the standard, and for certain developments district

[88] A number of studies have considered this: BRE, 'Knock it Down or Do it Up?', 2008; Yates, T, 'Sustainable Development of Victorian Housing', 2006; and Empty Homes Agency, 'New Tricks with old bricks' 2006.
[89] See Scottish Government, 'Preparing for a Changing Climate: Second Consultation to Inform Scotland's Climate Change Adaptation Framework', 2009 (www.scotland.gov.uk/Publications/2009/04/23145206/0); and Annex A: Action Programme for Government 2009-2011 (www.scotland.gov.uk/adaptationconsultation).
[90] See paragraphs 7.4 and 8.15 for other aspects of this consultation. Full details: Scottish Building Standards, 'Proposed Amendment to the Building (Scotland) Regulations 2004 - A review of standards and guidance in the Technical Handbooks on Section 6: Energy (incorporating minor changes to Section 3: Environment; Ventilation Guidance)', 2009 (www.sbsa.gov.uk/latestupdates/consul_energy09.htm).

heating would be more cost effective and efficient than individual house solutions. It is worth noting that many affordable housing providers, such as registered social landlords, have already developed new housing which exceeds the energy standards of current building regulations.

6.18 The building regulations require that occupiers are provided with written information on the operation and maintenance of the building services and energy supply systems within the home. Dissemination events for the construction industry to advise of changes will be held in spring 2010.

Planning

6.19 The planning system can ensure that the design and layout of new developments minimise the demand for energy. However, requirement for planning permission for certain technologies can act as a barrier to take up. These and other issues that cut across the built environment are covered in Chapter 10.

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Existing Homes – UK policies

Heat and Energy Strategy and Low Carbon Transition Plan 2009

6.20 The UK Heat and Energy Saving Strategy consultation draft and UK Low Carbon Transition Plan (White Paper) were published in February and July 2009. The Strategy consultation aims for 7 million UK homes by 2020 to receive a 'whole house' package,[91] including all cost-effective energy saving measures, plus renewable heat and electricity measures as appropriate. It and the Transition Plan set out a number of significant existing and new programmes, some of which are covered below. The Transition Plan suggests that all of this action and wider policies will make a substantial contribution to meeting carbon budgets by reducing household emissions from the non-traded sector (non-electrical energy use) by 29% compared to 2008 baseline. By comparison, the Climate Change Delivery Plan identifies that Scotland would need to reduce direct emissions from heating buildings (e.g. excluding electricity) by 46%, against a 2006 baseline, to meet the 2020 emissions target. While these measures are not directly comparable, this gives a sense of the scale of change required (discussed below with reference to the gap between existing and required activity).

6.21 There are a number of programmes running and proposed at a UK level which will make a substantial contribution to energy efficiency in Scotland. These are referred to here, with more detail provided at Annex F. Key existing programmes include:

- The **Carbon Emissions Reduction Target (CERT)** - the largest individual programme contributing to energy efficiency in housing in Scotland. CERT is an obligation on large electricity and gas suppliers to achieve a specified amount of carbon savings in homes across Great Britain between 2008 and 2011. Energy suppliers are free to meet their target in homes irrespective of where these homes are, tenure (owner-occupier, social or private landlord), which of the eligible measures are used (e.g. insulation, low energy lamps, efficient appliances, other less cost-effective technologies), or who supplies the household with energy.

  If it were delivering fully in Scotland, this could lead to 68,000 homes receiving cavity wall and 84,000 homes receiving professional loft insulation per year.[92] Scottish

[91] A 'whole house' approach means considering a household's energy needs and emissions as a whole, and establishing a comprehensive package of measures, which may include microgeneration or district heating, to address them.

[92] Based on 8.9% (population share) of the indicative mix of measures for CERT for the whole of Britain set out in: DECC, 'Carbon Emission Reduction Target Impact Statement' 2009, p.24, CERT +20% (yellow columns)

Government is working closely with energy companies through our CERT Strategy steering group to boost CERT activity in Scotland, as evidence suggests that Scotland is not getting its share of CERT proportional to its population. Reasons for this are discussed in Annex F. Based on delivery figures from previous phases of the scheme, it is estimated that the current phase would equate to roughly £60-80 million of investment by suppliers in Scotland per year compared to roughly £100 million of a pro-rata level of delivery was achieved.

- The **Community Energy Saving Programme (CESP)** will run over three years, beginning in January 2010. It requires energy suppliers and generators to achieve carbon savings in areas of low average income. Like CERT, CESP will apply to both social and private housing and can be met in any of the eligible areas throughout the UK. It is a much smaller programme than CERT. However, it will be used as a learning tool for any future supplier obligation or CERT replacement programme from 2013 onwards. Across Britain, around 90,000 homes are expected to benefit from a 'whole house approach'. CESP could lead to £31million of spend over three years by energy suppliers and generators in Scotland (See Annex F for more details).

6.22 The UK Government has also committed to:

- Rolling out smart meters in every UK home by the end of 2020, in order to enable people to understand their energy use, maximise opportunities for energy saving, and offer better services from energy companies.
- Introducing 'clean energy cash-back' schemes (also known as the feed-in-tariff and renewable heat incentive) so that people, businesses and communities will be paid if they use low-carbon sources to generate heat or electricity (see Chapter 10).
- Regulating for the minimum efficiency of energy-using products such as household appliances and entertainment systems. The minimum standards are agreed at an EU level. Those agreed so far in Europe are expected to save £900 million per year from energy bills across the UK and help save around 7 $MtCO_2$ per annum by 2020 (see Annex F). The UK Government has also introduced a voluntary initiative to bring forward the phase-out of energy-wasting incandescent light bulbs by 2011, ahead of EU legislation.

6.23 Given the scale of the programmes, it is important that Scottish households receive the benefit of these schemes as we pay for these and other UK-wide carbon reduction activities through our gas and electricity bills.[93] A number of the Scottish Government activities outlined below, including the Energy Saving Scotland Advice Service, Energy Assistance Package, and Home Insulation Scheme, aim to maximise take up of these schemes.

6.24 We acknowledge that any increase in the level of CERT-type activity will increase energy prices. Governments need to ensure they have an accompanying strategy to minimise impacts on households that are vulnerable to fuel poverty. We have called for a separate co-ordinating body in Scotland for CERT and CESP. This will guarantee that the funds spent on energy efficiency, fuel poverty and micro-generation are integrated with CERT-type activity. We would expect close integration of the social spend and the carbon reduction activity undertaken by energy companies, or on their behalf by a coordinating body, to achieve this in future.

(www.decc.gov.uk/en/content/cms/consultations/open/cert/cert.aspx).

[93] The cost of implementing the Energy Using Products directive is not applied to energy bills. However, CERT and CESP are, and clean energy cash-backs and smart meters are expected to be.

6.25 We also note that Scotland is not advantaged by the current flat rate benefits to assist fuel poor households. As Scotland is, on average, colder than more southern parts of the UK, a system responsive to temperature and the associated variation in fuel bills would be required to mitigate the effects of fuel poverty equally throughout the UK. Under the current scheme design, recipients living in milder parts of the UK receive the same level of payment to those living in colder areas such as Scotland, even though their fuel bills are likely to be lower. The Scottish Government is further prevented from taking direct action to mitigate problems with benefits design by supplementing payments. Any such payment could result in recipients losing out on other social security benefits or tax credits. Scotland must therefore rely on other policy measures within its control to address fuel poverty such as benefits advice and energy efficiency measures.

Existing homes - Scottish Policies and Programmes

Climate Change (Scotland) Act 2009

6.26 Sections of the Climate Change (Scotland) Act will have both direct and indirect impacts on energy efficiency in housing. This includes the 42% emissions reduction target and other sections highlighted in Box 6.1, such as the Council Tax Discount Scheme (see paragraph 6.65 below) and the framework for the regulation of energy efficiency improvements to individual houses.

Box 6.1 Sections of Climate Change (Scotland) Act 2009 affecting energy efficiency in housing

Section 44 – Each public body must carry out its functions in the way best calculated to contribute to the delivery of the 2050, interim and annual targets and to the climate change adaptation programmes required by the Act. There is also a duty on public bodies to exercise their functions in a way considered most sustainable. Scottish Ministers may, through legislation, impose further duties.

Section 60 - Scottish Ministers must publish and review at least every 3 years an action plan on energy efficiency. This must set annual energy efficiency targets. Ministers must report annually on progress.

Section 61 - Scottish Ministers must publish a renewable heat action plan within 12 months of this section coming into force which must include targets, and must be reviewed at least every 2 years. Ministers must report annually.

Section 64 - Requires Scottish Ministers to bring forward regulations requiring the assessment of the energy performance of houses and requiring action to be taken on the basis of such assessments. Ministers must also publish a report setting out how they intend to use these powers.

Section 65 - Every Scottish local authority must establish a scheme to give discounts on council tax bills for householders installing energy efficiency measures. The minimum allowable discount is £50, but local authorities may offer larger discounts if they wish. Ministers must report annually from 2012.

Section 68 - Gives public bodies and trusts the power to set specific energy efficiency conditions when they sell land.

Section 69 - Changes the definition of maintenance under the Tenements Scotland Act 2004 to include the installation of insulation.

Section 70 – Requires that the Scottish Ministers bring forward a new permitted development order (or orders) to exempt certain air source heat pumps and micro-wind turbines on or in domestic premises from the requirement for planning permission.

Section 71 - Requires that the Scottish Ministers bring forward a new permitted development order (or orders) for non-domestic buildings to exempt certain microgeneration equipment from the requirement for planning permission.

Section 72 – Requires that all Scottish local authorities include requirements in their local development plans to ensure that new buildings avoid a proportion of projected emissions through microgeneration.

6.27 Timescales for the different parts of the Act coming into force are detailed in the commencement order, which the Scottish Government made in October 2009. The majority of provisions in the Act, including Sections 60 and 62 relating to this action plan, will commence in this month. Certain sections of the Act are discussed in more detail below and in later chapters.

Energy Saving Scotland Advice Centres (ESSacs)

6.28 An independent review of energy efficiency found that the landscape for delivering advice was in need of simplification.[94] In response, the Scottish Government established the Energy Saving Scotland advice network, providing a 'one-stop-shop' for advice on a range of issues, including energy efficiency, microgeneration, personal transport and fuel poverty through the Energy Assistance Package.[95] The network will receive around £4 million from the Scottish Government for advice provision in 2009/10, and plays a key role in helping to increase Scotland's share of CERT investment. It uses the single Energy Saving Scotland brand which helps to develop long-term relationships with consumers (see Chapter 5 for detail).

Energy Assistance Package

6.29 Scottish Government has more closely co-ordinated its fuel poverty and energy efficiency programmes through the launching of its new four-stage Energy Assistance Package. As recommended by the Fuel Poverty Forum, a cross-sectoral group of stakeholders, this will help more households overall, and focus enhanced measures on the least energy efficient homes, lived in by the most fuel poor households. The current expectation is that 75,000 households will access the package this year, with around 50,000 referred on for benefit and tariff checks at Stage 2; 30,000 referred on for cavity and loft insulation through CERT at Stage 3; and 10,000 referred on for more enhanced energy efficiency measures at Stage 4. Stage 4 will focus on those in private sector homes who are most affected by fuel poverty and have the most energy inefficient homes.[96] These are not only expensive to heat, but would have a higher carbon footprint if the householder could afford to pay the bills. Delivery will be assessed in Spring 2010, as uptake of schemes is always highest in winter.

Home Insulation Scheme

6.30 The area-based Home Insulation Scheme (HIS) is being supported with £15 million funding from Scottish Government funds, with matching funds being sought from other sources, including energy companies, local authorities, housing associations and private householders. The scheme aims to improve the energy efficiency of houses through an intensive area-based approach to promoting and installing insulation and other energy saving measures in homes within a defined area. This area-based approach has been found to be effective in other schemes.

6.31 Up to 100,000 households will be offered advice and assistance on energy efficiency in the first phase, with many going on to receive the energy efficiency measures on offer, mostly loft and cavity wall insulation. The scheme will be managed by the Energy Saving Trust. In the first year it will operate in parts of 10 local authority areas representing a mix of geographic locations across Scotland, selected on the basis of bids invited from local authorities. These were assessed on the basis of criteria agreed with COSLA, including factors such as levels of fuel poverty and potential for emission reductions and uptake of measures.[97]

[94] Halcrow Group Ltd, for Scottish Government, 'Review of energy efficiency & microgeneration support in Scotland, 2007 (http://www.scotland.gov.uk/Resource/Doc/225346/0060948.pdf).

[95] Advice is available to all householders. However, as social housing providers often own significant numbers of properties, EST has a dedicated support service for local authorities and housing associations.

[96] Homes must be F or G rated to be eligible for Stage 4 enhanced measures. Tenants need permission from their landlord for stage 3 and 4 measures.

[97] Details on areas available at www.scotland.gov.uk/News/Releases/2009/07/30105512.

6.32 HIS will be complementary to the Energy Assistance Package (EAP) and has been designed with the intention of linking closely with this. However, HIS is different to EAP in that it will operate on an area basis and will proactively encourage all households in an area, including those on middle and higher incomes, to take up insulation measures.

Scottish Housing Quality Standard

6.33 One of the Government's key housing targets is to improve the standard of social housing by 2015 to meet the housing quality standard defined in 2004. The energy efficiency criteria of the standard (set out in detail in paragraph 7.68) includes a basic level of energy efficiency - at least 100mm of loft insulation, cavity wall, hot water tank and pipe insulation where appropriate, and a full, efficient central heating system such that the dwelling achieves an NHER score of 5 or a SAP score of 50 (for mains gas heating systems, 60 for other types of heating systems). If an NHER score of 5/SAP score of 50/60 is not achieved after these measures have been taken, then landlords should introduce additional energy efficiency measures at proportionate cost to achieve that score.

6.34 Around 95% of social housing already meets NHER 5 or SAP 50/60 and therefore satisfies one aspect of the energy efficiency criteria of the SHQS. Those properties that don't meet this score may be deemed to have failed the SHQS even if they have received additional insulation and heating measures (depending on technical feasibility and proportionate cost considerations). Despite the majority of social housing meeting the NHER/SAP aspect of the SHQS, the 2007 Scottish House Condition Survey shows considerable basic work still needs to be done in meeting all of the energy efficiency criteria of the SHQS and that there are still significant numbers of properties that do not currently have adequate loft and cavity wall insulation or efficient heating systems. For example, some 233,000 cavity walls in the social sector remain unfilled.[98] In addition, 74,000 houses do not have the minimum 100mm of loft insulation, and 46,000 properties do not have full, efficient central heating.[99] These investments in energy efficiency, which are required by 2015, collectively mean that 53% of local authority properties still fail the basic standard of energy efficiency in one or more respects. In the housing association sector, this failure rate falls to 40%, partly because the stock in this sector is generally younger and therefore built to higher energy efficiency standards.

6.35 The above suggests that social housing being brought up to the SHQS by social landlords results in significant energy efficiency improvements. However, achieving the energy efficiency elements of SHQS is only part of the task which social landlords face in funding widescale repair and general improvement works in order to meet the other four broad SHQS criteria and meet the performance standards set by the Housing Regulator. For example, landlords also need to invest in the internal fabric of the properties and install safety and security measures in their properties using the same funding source, i.e. rental income. Social landlords are therefore encouraged to exploit all opportunities open to them to access CERT funding. Anecdotally, this does not appear to be happening as often as it should, which may be due to a lack of awareness or due to landlords concentrating first on other tenant priorities, such as the installation of new kitchens and bathrooms. As part of the CERT Strategy Group work, EST has been working with some social landlords to encourage them to take up CERT funding.

[98] It is likely that this 233,000 figure is an overestimate due to the problems encountered by surveyors in identifying unfilled cavities, e.g. the survey is non-intrusive and it is often difficult to assess whether a cavity has been filled. Moreover, some properties have undergone re-rendering which masks the signs of cavity wall insulation (essentially bore holes).

[99] Some properties will have multiple energy efficiency requirements e.g. loft insulation *and* full efficient central heating. In general, social landlords do not routinely monitor the detail of the number of properties that are benefiting from individual SHQS energy efficiency measures. Therefore, estimates of progress on this work are limited to the Scottish House Condition Survey.

Tolerable Standard

6.36 The Housing (Scotland) Act 2006, which came into effect on 1 April 2009, gives local authorities new powers to ensure that owners repair and maintain their properties. Local authorities can require owners to undertake works to houses which are sub-standard, which can include houses which fail the tolerable standard. Following the implementation of the 2006 Act, the tolerable standard now requires that a house has satisfactory thermal insulation. The tolerable standard is a minimum condemnatory standard which all houses must meet, and below which a house should no longer be used as living accommodation. Scottish Government guidance defines this element as the presence (or otherwise) of loft insulation. Local authorities are therefore able to take action against owners requiring them to install loft insulation where the property is capable of having it but does not (for example top floor flats), to improve its thermal insulation. As it only requires a very basic level of insulation, this is unlikely to have a significant affect on the overall energy efficiency of the housing stock, though it should help to improve a small number of the most inefficient homes (see also paragraph 7.12 for discussion).

Climate Challenge Fund

6.37 The Climate Challenge Fund is a fund for communities to assist them in developing projects to reduce carbon emissions. Some of the projects focus on insulation in homes, though the greater contribution of the fund is perhaps in encouraging behavioural change (see Chapter 5).[100]

Scottish Building Standards

6.38 Much work to existing houses is subject to the building regulations, even if a warrant is not required. Robust standards of energy efficiency are required for extensions, conservatories, conversions, and alterations including replacement boilers, windows, and doors. These standards apply irrespective of tenure.

Energy Performance Certificates

6.39 The requirement for EPCs ensures that everyone who intends to buy or rent a home has information about how energy efficient the home is and the cost effective changes that could be made to improve the energy efficiency of the property.

6.40 Energy Performance Certificates (EPC) were introduced in May 2007 for new buildings as part of the building warrant process; in December 2008 accompanying the Home Report for sales of existing dwellings; and from January 2009 for all socially or privately rented new tenancies. EPCs fulfil a requirement of the Energy Performance of Buildings Directive,[101] for which the European Commission has now consulted on proposals for a recast. Information obtained from existing homes is held on a register. In August 2009 information from 140,000 EPC surveys was held. This allows EST to target advice to those with low ratings (F & G). The content of EPCs is discussed in more detail in Chapter 7. The EPC also provides contact details where households may receive additional support (such as through the ESSac network).

Pathfinder – Energy Saving Scotland Home Loans

6.41 The £2 million Pathfinder Domestic Loan Scheme, funded by Scottish Government and launched in October 2009, is for householders wanting to invest in energy efficiency and

[100] As the fund is focused on communities, there has been no restriction on tenure type.
[101] Available at: http://europa.eu/legislation_summaries/energy/energy_efficiency/l27042_en.htm.

microgeneration. Loans will be available to individual householders for most costly energy efficiency measures (such as solid wall insulation) and low- and zero-carbon equipment. It is anticipated that loans will be repaid into the loan pot over a maximum of eight years, depending on the size of the loan, at no interest. The loans scheme will work in conjunction with the Home Insulation Scheme.

Private Rented Sector Policies

6.42 Energy efficiency and fuel poverty are particular challenges for the private rented sector, where the costs and benefits of installing measures are poorly aligned. The implementation of the Energy Performance Certificate (EPC) may exert some market pressure on landlords, whilst some regulatory control may be exerted by the Repairing Standard, which requires that installations for space heating and heating water are in a reasonable state of repair, and the addition of 'satisfactory thermal insulation' to the criteria of the tolerable standard. However, there are also a number of incentives available to assist landlords; the voluntary scheme Landlord Accreditation Scotland (LAS) requires landlords to meet the Scottish Core Standards for Accredited Landlords, one of which relates to energy efficiency, insulation and heating;[102] and private landlords can now access Energy Saving Scotland - Small Business Loans, which provide small and medium-sized businesses with interest-free loans from £1,000 to £100,000 to help finance a wide range of energy-saving measures. There is also a tax incentive in the form of the Landlord's Energy Saving Allowance (LESA). This allows private landlords to claim a tax allowance of up to £1,500 per property when they install energy efficiency measures. The allowance can be claimed against income tax or corporation tax.

6.43 There is a lack of knowledge among private landlords of the variety of funding options available in Scotland for energy efficiency measures. The EST will provide an integrated programme of advice and support for landlords through the ESSacs. Potential options for using regulatory requirements to improve the energy efficiency of the private rented sector are considered in Chapter 7.

Energy Efficiency Design Awards

6.44 The Energy Efficiency Design Awards aim to support novel design, materials, methods, technologies, approaches or intervention packages to improve the energy efficiency of hard-to-treat housing, focusing on projects with potential for replication. Seventeen applications covering a wide range of project types, technical solutions and geographies were received this year. They covered traditional tenements, tower blocks, purpose-built sheltered housing, converted historic buildings, four-in-a-block, single properties, flats, semi-detached and terraced housing. The wide-ranging technical solutions offered included solid wall insulation, renewables, CHP, and more novel solutions such as insulating paint. Only projects meeting a 40% CO_2 saving threshold were considered by the judging panel.[103]

Historic Scotland

6.45 Historic Scotland last year published a document on improving energy efficiency in traditional homes. The agency is currently carrying out a number of activities to inform action on historic and traditionally built homes (see 6.59 below), which form a proportion of

[102] This states that the property should provide a satisfactory level of thermal insulation, incorporating, 'where necessary and practical', such measures as draught insulation of doors and windows (or secondary or double glazing); lagging of immersion heaters and hot water pipes; cavity wall insulation; and loft insulation to a depth of 250mm.
[103] The awards are expected to be announced in October 2009.

the hard-to-treat stock. This includes trialling internal insulation in traditional mass walled structures which will allow better choices to be made when considering this option, and evaluating a project which trialled the installation of solar thermal panels on a listed tenement. It is also working with housing associations on options for hard-to-treat properties. Indicative guidance will be published on the appropriate measures.

Microgeneration and Housing

6.46 Energy Saving Scotland Home Renewables and the Community and Renewable Energy Scheme (CARES), funded by Scottish Government, provide encouragement for householders and not-for-profit community organisations to take forward renewable energy projects. In some cases low- and zero-carbon technologies can be the best option for hard-to-treat housing. These programmes and other issues, such as planning permission for microgeneration, are discussed in Chapter 10.

Quantifying the benefits of existing policies and programmes

6.47 Due to a number of factors, it has not been possible to quantify the total expected energy efficiency benefit of existing policies. This is particularly due to the overlap of benefits relating to existing UK and Scottish housing policies, where Scottish Government aims to achieve maximum benefit from UK government policies which are currently not delivering fully. There has also been a stronger focus on CO_2 emissions analysis to date and, as a number of these policies are new, their potential benefits sit in quite a wide range. Further analysis will be carried out, and we hope to provide a stronger indication of expected energy savings from the package of policies outlined above in the final Energy Efficiency Action Plan.

The gap between current and required activity

6.48 There is a significant gap between current energy efficiency activity and what is needed in housing to contribute to 2020 climate change targets. This section will compare the delivery by CERT, which is the best guide we currently have for energy efficiency activity in Scotland's housing, with calculations of what is considered possible. The baseline scenario also includes analysis of new boilers fitted by individual households outwith the CERT programme. Further analysis on the level and type of energy efficiency work already carried out by Scottish households will be carried out for the final action plan. For this reason the baseline scenario can be considered a conservative picture of current activity.

6.49 The following information is based on the outputs of a carbon assessment tool developed over the last year to examine the carbon and financial impact of various scenarios of stock upgrades. As a guide for what improvements are possible, Figure 6.5 shows the effect on CO_2 emissions of carrying out upgrades to all homes that could possibly be improved.[104] The second column shows the resulting saving based on 2005/06 emissions and housing stock in annual CO_2 emissions, assuming that each upgrade is carried out in isolation.[105] The third column shows what proportion of total CO_2 emissions from housing

[104] The 'Realistic maximum uptake' is a proportion of the technical limit of what could be achieved for Scottish housing annually from 2009 to 2050. The technical limit is less than 100% of homes, as some homes are unsuitable for some upgrades. For example, homes without roofs (flats below the top floor) are not suitable for photovoltaics or solar water heating. The realistic limit (a proportion of the technical limit) allows for other limiting issues. For example, solid wall properties may not be able to have wall insulation inside because there are small rooms, or outside because land or building title prevents it.

[105] The CO_2 savings from carrying out all of these upgrades is less than the total savings listed in the table. This is because as some measures are carried out, the CO_2 saved from installing other measures decreases. For example, if all the solid wall properties are upgraded with wall insulation, saving 1.62 CO_2, this reduces the amount of heat needed to keep the same homes warm - boilers in these homes will be on less, using less fuel.

this represents. The number and type of homes that can be upgraded varies according to the upgrade chosen.[106]

6.50 These figures are a realistic estimate of what could be achieved technically. They do not mean that this is appropriate or even desirable in either social or economic terms, or that Government funding would be available to support this. There are many different scenarios and options for reaching future targets. Each different combination will give slightly different costs and take-up rates of specific technologies. The following summarises two example scenarios - one a business-as-usual baseline, the other estimated to meet climate change targets.

Figure 6.5: CO_2 emissions reductions from applying energy efficiency measures

Upgrade Option	Saving/2005 (MtC02)	Percentage savings
Cavity wall insulation	0.80	7%
Solid wall insulation	1.62	14%
Loft insulation	0.41	3%
Short term package: Draught proofing	0.47	4%
Pipe lagging	0.19	2%
Shutters	0.07	1%
Radiator shelves	0.10	1%
Radiator foils	0.05	0.4%
Cylinder insulation	0.04	0.3%
Low energy lights	0.10	1%
Solar water heating	0.91	8%
Double or secondary glazing	0.15	1%
Advanced heating controls	0.13	1%
Boiler upgrade	1.08	9%
Biomass boiler	1.49	12%
Combined heat and power (CHP)	1.61	13%
Ground Source Heat Pump (GSHP)	0.48	4%
Air Source Heat Pump (ASHP)	0.57	5%
Community heating with CHP	6.78	56%
Improved electrical appliances	0.05	0.4%
Photovoltaic	0.55	5%
Wind turbine	0.20	2%
Low consumption users	3.08	26%
High consumption users	-3.84	-32%

Scenario 1 – Baseline

6.51 As noted in 6.20, CERT is a primary policy in delivering energy efficiency measures.[107] Due to its overlap with other policy areas such as EAP and HIS, it is currently the best baseline estimator of the expected energy efficiency measures to be installed in the short term under a business as usual premise. As already indicated, we are working through the CERT Steering Group to ensure that Scotland receives a its pro rata share of measures. Scenario 1 therefore assumes:

- CERT continues from 2009-2012, with Scotland receiving 30% less measures than its pro rata share;
- UK Budget commitments in October 2008 are included in the 2009-2012 figures;

Hence the CO_2 savings from also upgrading all boilers would be less than the 1.49 $MtCO_2$ listed above. As progressively more upgrades are made, the potential savings available fall.

[106] Floor insulation has not been included within the model, but its contribution to energy efficiency is of interest and it may be included in future updates. There is a net increase in CO_2 emissions for the 'High consumption users' category, which is the part of the model used to see the effect of changes in householder behaviour.

[107] The CERT illustrative mix includes insulation, boiler and draught proofing measures amongst others (see www.decc.gov.uk/en/content/cms/consultations/open/cert/cert.aspx).

- A supplier obligation equivalent to CERT continues from 2012 until 2020. The 2006 Energy Review and the 2007 Energy White Paper reaffirmed the Government's commitment to maintain some form of obligation on household energy suppliers until at least 2020, with an ambition level at least equal to CERT. As exact details are not known, figures here are based on a continuation of current policy;
- From 2012 Scotland achieves a pro-rata share of any supplier obligation;
- Savings from boilers and draught-proofing within a supplier obligation are included;
- Outwith the supplier obligation individual households are improving their homes. Additional analysis will be developed for the final action plan. At this stage it is assumed that an additional 40,000 boilers[108] are replaced per year and an additional 10,000 households per year install draught-proofing measures.

6.52 Using these assumptions it is estimated that these measures would cost around £2.6 billion. Assuming there is no increase in housing stock, this would reduce energy consumption by 5,600 GWh by 2020 and save around 1.39 $MtCO_2$, of which around 0.9 $MtCO_2$ would derive from direct emissions.

6.53 These figures assume that there is no change in the housing stock. If we assume new building of 25,000 homes per year and 4,000 demolitions per year during the period to 2020, then the emissions saving by 2020 is only 0.47 $MtCO_2$, of which 0.7 is direct and a reduction in energy consumption of 3000GWh. Scenario 2 below assumes a net increase in housing stock of 21,000 per year.

Scenario 2 – 42% cut in non-traded emissions by 2020 from a 2005 baseline

6.54 Scenario 2 leads to a 42% cut in direct (or non-traded) emissions on a 2005/6 baseline, i.e. from burning coal, oil, solid fuel and gas in homes. In this scenario the impact on electricity is not considered as this is dealt with through the caps set on the European Emissions Trading Scheme.[109] This scenario assumes direct emissions reductions from housing would be broadly consistent with the overall interim target in the Climate Change (Scotland) Act.[110]

6.55 Under this scenario there would need to be substantial fabric upgrades to all stock, along with fitting of substantial low-carbon equipment with over one million dwellings using solar panels to heat water, 100,000 dwellings using biomass boilers, and around 50,000 air source and ground source heat pumps. The total cost would be around £16 billion.

[108] This evidence is taken from CORGI registration entered onto the Home Energy Efficiency Database. Energy Saving Trust consider that this is a low estimate of boiler activity.
[109] Nonetheless, as already indicated in Chapter 4 (Box 4.1), reducing electricity consumption in homes remains desirable for general resource efficiency reasons. Additional scenarios which consider reasonable reduction in indirect emissions will be developed for the final action plan.
[110] The Climate Change Delivery Plan suggests that to achieve an overall 42% emissions target, the heat sector (domestic and non-domestic) would need to achieve a 46% saving.

Figure 6.6: Measures that would be installed under each scenario

Measure	Realistic Potential (no. of homes - '000)	Percentage of estimated realistic potential installed under:	
		Scenario 1: Baseline (%)	Scenario 2: 42% - Direct emissions (%)
Cavity Wall Insulation	625	100	100
Loft Insulation	1,550	78	100
Solid wall insulation (internal or external)	460	5	44
Short term upgrade	2,235	8	100
Glazing	500		100
Boiler upgrade	1,588	32	100
Solar water heating	1,870		62
Biomass boilers	200		50
Air source heat pump	290		15
Ground source heat pump	30		15
Reduced energy behaviour	2,585	No	No

Figure 6.7: Costs and Benefits of Scenarios 1 and 2

Cost/benefit	Scenario 1 Baseline	Scenario 2 Non-traded
Upgrade Costs by 2020 ‡	£2.6 billion	£16 billion
Annual CO_2 reduction in direct emissions by 2020 in $MtCO_{2\ f}$*	0.9 (9%)	3.28 (42%)
Annual CO2 reduction in all emissions by 2020 in $MtCO_2$	1.39 (5%)	
Reduction in annual energy consumption by 2020 in GWh **	5,600 (10%)	14,600 (37%)
Cumulative fuel bill savings to 2020 †	£1.2 billion	£4.4 billion
Cumulative fuel bill saving to 2050	£8.7 billion	£35 billion
New housing supply and demolition per year	None	New Build Supply 25,000, Demolition 4,000
CO_2 emission factors	Based on UK carbon intensity projections as set out by Cambridge Econometrics in the UK Energy and Environment Report, August 2008, with base year energy consumption calibrated against actual gas and electricity sales as recorded by BERR, 2008. These projections may be updated to be fully consistent with UK guidance for the final action plan.	

‡ Costs represent current capital cost of installing the measure irrespective of who pays.
* Percentage shows the estimated drop in CO_2 emissions on a 2009 estimated baseline.
**Energy reduction is the difference between estimated annual consumption in 2009 and 2020. Percentage shows the estimated drop in consumption between those 2 years.
† Scenario does not include any income from the renewable heat incentive, discussed in Chapter 10. Many new technologies will not achieve savings by 2020 but will achieve significant savings in later years. The cost of fuel is assumed to rise. For example, even with savings, Scenario 2 estimates a rise in average household bill from approx £915 in 2009 to £1,300 in 2020 based on 2008 prices.

Further Challenges

6.56 The scale of the housing challenge is large, and is made more complex by a number of barriers to change. These are covered in detail in Chapters 3 (Barriers) and 5 (Changing Attitudes and Behaviours), and some are mentioned above. In the context of housing, it is worth reiterating that home energy consumption is not seen as a key area of action amongst those who consider themselves climate change aware. In the recent Scottish Environmental Attitudes and Behaviours Survey (SEABS'08), people who said they knew something about climate change were asked what two or three actions they thought would most help reduce climate change. The most commonly mentioned actions were recycling (45%), avoiding creating waste in the first place (36%), using a more fuel-efficient car (32%) and making

fewer car journeys (28%). Few priority actions were specifically related to the fabric and use of housing.

Legal issues

6.57 In addition to the specific technical challenge of treating Scottish dwellings, there are legal issues. One key issue relates to common tenements, where the majority of households in a block are required to agree and authorise improvements to the building fabric.

6.58 Around 36% of dwellings are flatted in Scotland. This is much higher than the 17% flatted dwellings in England and Wales and presents a barrier to the delivery of energy efficiency. However, a history of co-ordinated tenement repair, the introduction of factoring systems, and the use of a specific Act in Edinburgh,[111] has succeeded, for example, in bringing up standards, ensuring replacement of lead plumbing and providing door entry systems, giving precedents for coordinated action. The changes under the Housing (Scotland) Act 2006 to encourage this type of action and the implementation of the tolerable standard are noted in para 6.36. The Tenements (Scotland) Act 2004 provides arrangements in default where title deeds are silent or unclear about shared responsibilities for repairs and maintenance. The default arrangements do not apply to improvements. Section 69 of the Climate Change (Scotland) Act 2009 changes the definition of maintenance under the Tenements (Scotland) Act 2004 so that these default arrangements cover the installation of insulation.

Traditional and historic buildings

6.59 Traditional buildings are important in preserving and creating a sense of place and identity for inhabitants and visitors to Scotland.[112] Scottish Ministers greatly value our historic buildings and, through Historic Scotland, encourage their energy efficient upgrading and reuse to reduce future emissions. Most traditional buildings can be made more energy efficient without compromising their historic character, although in some situations this can be challenging.

6.60 Accurate evidence of the environmental performance of traditional materials is critical to the specification of appropriate energy efficiency measures in such buildings. Historic Scotland is currently supporting research into a number of aspects of thermal efficiency and energy use modelling, including the thermal performance of mass masonry walls, traditional windows and modern movement materials; the effectiveness of various types of mass wall insulation; methods of upgrading traditional windows; and whole life energy costing of demolition and rebuilding. This will help traditional building stock to improve energy performance, though zero-carbon emissions cannot be achieved through conventional measures. Project partners include Housing Associations, local authorities, the National Trust for Scotland, Changeworks and Edinburgh World Heritage Trust. This research will help to develop understanding of how traditional buildings perform and the most effective ways of improving their energy efficiency so homeowners can make informed decisions.[113]

[111] Statutory Notices are served under the terms of the City of Edinburgh District Council Order Confirmation Act 1991 or the Civic Government (Scotland) Act 1982.

[112] A traditional building means a building or part of a building of a type constructed before or around 1919 using construction techniques that were commonly in use before 1919 and with permeable components, in a way that promotes the dissipation of moisture from the building fabric. Many more traditionally built buildings are not listed and not in conservation areas than are.

[113] Further information can be found at www.historic-scotland.gov.uk/index/heritage/climatechange/energyefficiency.htm. For information on grants and consents see www.historic-scotland.gov.uk/index/heritage/grants.htm.

6.61 The most cost-effective measures for historic and traditional buildings, such as loft insulation, draught proofing, boiler replacement, thermostats and the use of blinds, enable an effective improvement in performance and do not require Listed Building Consent. Energy efficiency can often be further improved without harming their character by, for example, fitting replacement windows after obtaining listed building consent. Certain low- and zero-carbon equipment fits well with some traditional and historic locations.

6.62 Traditional building materials are often more sustainable and more durable than the modern alternatives made in a carbon intensive way. For example, traditional timber window frames have a number of benefits and are environmentally friendly, since timber has low levels of embodied carbon and a long lifespan if well maintained.

6.63 Listed building and conservation area guidance is based on the principles of sustainability through conservation of existing materials and avoids the emissions associated with unnecessary replacement.

Q 10: With regard to traditional and historic buildings as defined in footnote 40, what do you think are the most important energy efficiency issues?

Ability of supply chain and industry to deliver

6.64 Given the increase of activity required as outlined above, there will need to be a parallel stream of activity to ensure that supply chains and installation industry can deliver. This is covered in the skills section of Chapter 12.

Moving Forward

Council Tax Discount Scheme

6.65 Section 65 of the Climate Change (Scotland) Act 2009 is intended to incentivise uptake of energy efficiency measures and renewable technologies by requiring local authorities to establish council tax discount schemes. Local authorities have considerable discretion to design discount schemes in their areas as they see fit, including offering a greater incentive than the minimum of £50. COSLA and the Scottish Government are working closely to investigate the potential to establish a national scheme. The question of funding will form part of this work. At the moment we envisage a scheme that is funded by energy suppliers as part of their CERT obligations – i.e. that it will be cost neutral to local and central government.

Regulation versus Voluntary Action

6.66 This consultation sets out the case for change and the need for everyone to become active in that change. This chapter has sought to set out the existing activity and the scale of the challenge to reduce emissions from homes to a level approximately in line with the 2020 interim greenhouse gas emissions reduction targets. The Sullivan report has recommended a route-map for new buildings, and Scottish Government is consulting on low carbon building standards for 2010 and will review standards for 2013 and 2016. Momentum will be maintained in this area, though there are challenges that need to be considered, including technical ability, cost of and skills to make further improvements, as well as the affordability of the resultant housing products. These issues will be covered in separate consultations on the building regulations as they are reviewed.

6.67 It will also be crucial to address the issues facing the existing stock. As this chapter has set out, the financial implications and the amount of upgrading work required to meet our carbon targets are substantial. Some of the work will be undertaken as normal replacement and maintenance of a home. For example, modern boilers last about 15 years, so by 2020 virtually all boilers will have been replaced with more energy efficient versions as replacement boilers are required to meet demanding energy efficiency standards specified in building regulations. In a sense, these can therefore be left to 'voluntary' take-up. Other measures, such as solar hot water, will require additional work.

6.68 Some of the work required involves installing highly cost-effective measures such as cavity wall insulation. Nonetheless, there has still been a requirement for significant government policy intervention until now in order to encourage people to take up these cost-effective measures.

6.69 Other measures are neither cheap, nor necessarily currently desired by all householders. These include measures such as solid wall insulation and solar water heating. The government cannot pay for all of this work so we are likely to need a combination of:

- detailed education and information campaigns and incentives to encourage voluntary action; and
- regulation to ensure that home owners and landlords across all tenures undertake required energy efficiency work.

6.70 The Climate Change (Scotland) Act provides a broad regulatory framework to enable the regulation of energy efficiency standards in housing. There is a range of issues affecting how regulation could be implemented which are considered in Chapter 7.

How to Pay

6.71 Energy efficiency measures will require substantial upfront investment in housing stock. While this will result in substantial savings in fuel bills over time, these will be recouped over a variable number of years, and some individual households may see less savings than others. Scottish Government, along with partners, may look at ways to assist with required measures that will not be delivered through any supplier obligation and where households cannot afford to pay and are living in fuel poverty. However, due to the significant sums involved, it is assumed that those who are able to pay will invest or borrow to undertake work.

Cost implications

The rough estimates of costs are up to £16 billion by 2020, which is around £7,000 per household before any subsidy from schemes such as CERT or any successor to this. The cumulative fuel bill savings to 2020 are estimated to be £4.4 billion, though this is dependant on fuel prices in the future. (This does not take into account the income from any energy cash-back schemes being introduced.) As Figure 6.2 shows many technologies will not pay-back in terms of savings from fuel bills during the period 2009-2020, particularly if they are installed late on in that period. However, by 2050 it is estimated that Scenario 2 will have generated around £35 billion in savings.

The up-front costs of meeting these improvements is likely to be spread across a range of people and agencies, including energy suppliers, government, householders and landlords. The source of funding could vary:

- If government was to pay, the additional funding could be derived from income tax or reduction in other services.
- If local authorities were to pay, this could mean increasing council tax or reduction in other services.
- If landlords were to pay, they may increase tenants' rent.
- If utilities were to pay, this would be expected to be added to household gas and electricity bills. The more gas and electricity a household used, the greater proportion they would be likely to pay.
- If households were to pay, they could add the cost to an existing mortgage or borrow money on the open market.

Q 11: What is the right balance in funding between Government, landlords and individual households?

Prioritising and linking policies

6.72 As noted above, meeting fuel poverty targets may not deliver the greatest emissions reductions. Some of these households, especially those that may otherwise live in dangerously cold temperatures, may increase the amount of energy they use and pay the same amount in total fuel bills, i.e. use the energy efficiency savings to increase their comfort. As discussed in Chapter 3, the rebound effect is not restricted to fuel poor households.

6.73 Conversely, meeting emissions reduction targets will increase the cost of electricity and gas due to the obligations and systems suppliers and generators are required to meet. While energy efficiency measures to meet emissions reduction targets will reduce the fuel bills of the households receiving these measures, the bills of other households will increase, thereby increasing the likelihood that homes not benefiting from energy efficiency measures fall into fuel poverty. It is therefore important to join these strategies to ensure that more vulnerable households do not suffer disproportionately.

Q 12: Taking into account the scale of the challenge and behaviour issues, and the work set out in this chapter and Chapter 7 (housing regulation), what other policies should be taken forward to meet our climate change objectives in respect of housing?

Q 13: If Scottish Government were to prioritise the expansion of any individual existing programme, which should that be, and why?